

Phase 1 Heritage Impact Assessment for Eskom's proposed Ganyesa Electrification project in Kagisano Molopo Local Municipality in the Dr Ruth Mophati District Municipality of the North West Province.

Prepared by



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NATIONAL LEGISLATION AND REGULATION GOVERNING THIS REPORT

This is a 'specialist report' and is compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014.

DECLARATION OF INDEPENDENCE

In terms of Chapter 5 of the National Environmental Management Act of 1998 specialists involved in Impact Assessment processes must declare their independence.

I, **Trust Mlilo**, do hereby declare that I am financially and otherwise independent of the client and their consultants, and that all opinions expressed in this document are substantially my own, notwithstanding the fact that I have received fair remuneration from the client for preparation of this report.

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Independence

The views expressed in the document are the objective, independent views of Mr Trust Mlilo and the survey was carried out under MuTingati & Project consulting. MuTingati and appointed associate has no any business, personal, financial or other interest in the proposed development apart from fair remuneration for the work performed.


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this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

EXECUTIVE SUMMARY

Item	Description
Proposed development and location	Electrification of Greater Ganyesa Extensions in the Kagisano Local Municipality in the North West Province.
Purpose of the study	To carry out heritage sensitivity assessment to determine the presence of cultural heritage sites and the impact of the proposed project on graves located along the existing servitude. SAHRA Burial Grounds and Graves Unit recommended that a Phase 1 Heritage Impact Assessment (HIA) should be done for the proposed Ganyesa Electrification project. This would be imperative in identifying any possible impacts on any heritage resources in the project area. In order to be able to mitigate the possible impacts an HIA needs to be conducted and recommendations to be implemented upon construction.
1:50 000 Topographic Map	2624 D
Length and description of line	See attached Span Plan
Eskom Project no.	Greater Ganyesa Electrification
Property	Ganyesa
Coordinates	Start 27°12'31.3972" 25°58'17.4272" Terminal Position 25°58'09.7259" See Appendix 3
Municipalities	Kagisano Molopo Local Municipality and Dr Ruth Mophati District Municipality
Predominant land use of surrounding area	Residential, cemetery and associated infrastructure such as roads, powerlines and local cemetery.
Developer/Applicant	Eskom Distribution North West Operating Unit Land Development Department and Environmental Management Section
Contact Person	Mulalo Michael Mueelwa
Heritage Consultant	 <p>Environmental, Health & Safety Consulting</p> <p><i>"Changing the world for a sustainable living"</i></p> <p>MuTingati Environmental & Projects No 121 GrandRapid 476 Feltead street Northriding 2169 Tel: 076 267 9717, Email: Info @mutingati.co.za</p>
Date of Report	Revised 30-09-2019

Eskom intends to electrify Greater Ganyesa Extensions in the Kagisano Molopo Local Municipality of the North West Province (see attached spanning Sheet). The project entails construction of a 22kv line and associated LV line to connect 404 houses in the Ganyesa area. Eskom noted that some houses earmarked for electrification are located near two township cemeteries. Eskom submitted an NID to SAHRA which instructed that a Phase 1 archaeological Impact Assessment be conducted for the project. As such Eskom commissioned a Heritage study in accordance with SAHRA recommendations dated 10 May 2019. The present document is a Phase 1 HIA that serves to inform and guide the developer (Eskom) and contractors about the possible impacts that the development (electrification) may have on archaeological and heritage resources including graves located near some of the houses earmarked for electrification and to formulate mitigation measures to reduce the potential impacts. The document must also inform SAHRA and North West Provincial Heritage Agency on the appropriate mitigation measures in respect of the proposed electrification of Ganyesa Extensions. The identification, recording, reporting and salvaging (if necessary) of significant heritage resources that may occur on the development footprint should be undertaken by a competent heritage practitioner as required by South Africa heritage legislation. In compliance with the NHRA and SAHRA recommendations, Trans Africa Projects retained MuTingati Environmental and Project consulting (Heritage Division) on behalf of Eskom to carry out a Phase 1 Heritage Impact Assessment (HIA) of the proposed electrification of Ganyesa Extension in the North West Province. The project also involves the use of existing street servitudes to link the existing powerline routes with the new extensions. A stepped approach involving desktop studies, drive-throughs and detailed fieldwalking was employed in order to identify any heritage landmarks on and around the development footprint. However, it should be noted that the proposed powerline routes are not on pristine grounds, having been previously disturbed by the housing developments and associated infrastructure. However, when these resources (including graves) are encountered, work must be stopped forth-with and the finds must be reported to the SAHRA. The study confirmed that the project may indirectly affect two township cemeteries, therefore the proposed project may proceed subject to mitigation measures proposed in this report. In terms of the archaeology of the project area, no mitigation will be required prior to construction. This report must also be submitted to the SAHRA for review.

Report prepared by MuTingati Environmental Consultants (Pty) Ltd on behalf of Eskom Distribution (North West Operating Unit).

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ACKNOWLEDGEMENTS

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ABBREVIATIONS

AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
EIA	Environmental Impact Assessment
EIA	Early Iron Age (<i>EIA refers to both Environmental Impact Assessment and the Early Iron Age but in both cases the acronym is internationally accepted. This means that it must be read and interpreted within the context in which it is used.</i>)
EIAR	Environmental Impact Assessment Report
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
ICOMOS	International Council of Monuments and Sites
LIA	Late Iron Age
LSA	Late Stone Age
LV	Low Voltage
MAA	Mineral Amendment Act, No 103 of 1993
MIA	Middle Iron Age
MPRDA	Mineral and Petroleum Resources Development Act 28 of 2002
MSA	Middle Stone Age
MV	Medium Voltage
NEMA	National Environmental Management Act 107 of 1998

NHRA	National Heritage Resources Act 25 of 1999
NID	Notice of Intention to Develop
PHAR	Provincial Heritage Resource Agency
SAHRA	South African Heritage Resources Agency
ToR	Terms of Reference

DOCUMENT INFORMATION

Periodisation

Archaeologists divide the different cultural epochs according to the dominant material finds for the different time periods. This periodization is usually region-specific, such that the same label can have different dates for different areas. This makes it important to clarify and declare the periodization of the area one is studying. These periods are nothing a little more than convenient time brackets because their terminal and commencement are not absolute and there are several instances of overlap. In the present study, relevant archaeological periods are given below;

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

Early Iron Age (~ AD 200 to 1000)

Late Iron Age (~ AD1100-1840)

Historic (~ AD 1840 to 1950, but a Historic building is classified as over 60 years old)

Definitions

Just like periodisation, it is also critical to define key terms employed in this study. Most of these terms derive from South African heritage legislation and its ancillary laws, as well as international regulations and norms of best-practice. The following aspects have a direct bearing on the investigation and the resulting report:

Cultural (heritage) resources are all non-physical and physical human-made occurrences, and natural features that are associated with human activity. These can be singular or in groups and include significant sites, structures, features, ecofacts and artefacts of importance associated with the history, architecture or archaeology of human development.

Cultural significance is determined means of aesthetic, historic, scientific, social or spiritual values for past, present or future generations.

Value is related to concepts such as worth, merit, attraction or appeal, concepts that are associated with the (current) usefulness and condition of a place or an object. Although significance and value are not mutually exclusive, in some cases the place may have a high level of significance but a lower level of value. Often, the evaluation of any feature is based on a combination or balance between the two.

Isolated finds are occurrences of artefacts or other remains that are not in-situ or are located apart from archaeological sites. Although these are noted and recorded, but do not usually constitute the core of an impact assessment, unless if they have intrinsic cultural significance and value.

In-situ refers to material culture and surrounding deposits in their original location and context, for example an archaeological site that has not been disturbed by farming.

Archaeological site/materials are remains or traces of human activity that are in a state of disuse and are in, or on, land and which are older than 100 years, including artifacts, human and hominid remains, and artificial features and structures. According to the National Heritage Resources Act (NHRA) (Act No. 25 of 1999), no archaeological artefact, assemblage or settlement (site) and no historical building or structure older than 60 years may be altered, moved or destroyed without the necessary authorization from the South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority.

Historic material are remains resulting from human activities, which are younger than 100 years, but no longer in use, including artefacts, human remains and artificial features and structures.

Chance finds means archaeological artefacts, features, structures or historical remains accidentally found during development

A *grave* is a place of interment (variably referred to as burial) and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place. A grave may occur in isolation or in association with others where upon it is referred to as being situated in a cemetery (contemporary) or burial ground (historic).

A *site* is a distinct spatial cluster of artefacts, structures, organic and environmental remains, as residues of past human activity.

Heritage Impact Assessment (HIA) refers to the process of identifying, predicting and assessing the potential positive and negative cultural, social, economic and biophysical impacts of any proposed project which

requires authorization of permission by law and which may significantly affect the cultural and natural heritage resources. Accordingly, a HIA must include recommendations for appropriate mitigation measures for minimizing or circumventing negative impacts, measures enhancing the positive aspects of the proposal and heritage management and monitoring measures.

Impact is the positive or negative effects on human well-being and / or on the environment.

Mitigation is the implementation of practical measures to reduce and circumvent adverse impacts or enhance beneficial impacts of an action.

Mining heritage sites refer to old, abandoned mining activities, underground or on the surface, which may date from the prehistorical, historical or the relatively recent past.

Study area or 'project area' refers to the area where the developer wants to focus its development activities (refer to plan).

Phase I studies refer to surveys using various sources of data and limited field walking in order to establish the presence of all possible types of heritage resources in any given area.

Assumptions and disclaimer

The investigation has been influenced by the unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence) and the difficulty in establishing intangible heritage values. It should be remembered that archaeological deposits (including graves and traces of mining heritage) usually occur below the ground level. Should artefacts or skeletal material be revealed along the powerline routes during construction, such activities should be halted immediately, and a competent heritage practitioner, SAHRA must be notified in order for an investigation and evaluation of the find(s) to take place (cf. NHRA (Act No. 25 of 1999), Section 36 (6)). Recommendations contained in this document do not exempt the developer from complying with any national, provincial and municipal legislation or other regulatory requirements, including any protection or management or general provision in terms of the NHRA. MuTingati assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report.

Terms of Reference (ToR)

The author was instructed to conduct an AIA/HIA study addressing the following issues:

- Assess the potential impacts of the proposed electrification to archaeological, palaeontological and heritage resources the municipal cemetery located in the vicinity of the powerline routes.
- Archaeological, Palaeontological and heritage potential of the proposed development site including any known data on affected areas;
- Provide details on methods of study; potential and recommendations to guide the SAHRA to make an informed decision in respect of authorisation of the proposed development.
- Identify all heritage objects, sites, occurrences and structures of an archaeological, palaeontological or historical nature (cultural heritage sites) located along the section of powerline near the two cemeteries.
- Assess the significance of the cultural resources in terms of their archaeological, Palaeontological, historical, scientific, social, religious, aesthetic and tourism value;
- Describe the possible impact of the proposed development on these cultural remains, according to a standard set of conventions;
- Propose suitable mitigation measures to minimize possible negative impacts on the cultural resources;
- Review applicable legislative requirements;

Introduction

Trans Africa Projects retained MuTingati Environmental Consultants on behalf of Eskom, North West Operating Unity to carry out a heritage sensitivity assessment of the proposed Ganyesa Extension Electrification project in the North West Province. The proposed electrification project falls within the jurisdiction of Kagisano Molopo Municipality in the North West Province. As prescribed by South African Heritage legislations, a heritage study is a pre-requisite for a linear development exceeding 300m. In addition, SAHRA instructed that a Phase 1 HIA study be done for the proposed electrification project. The overall purpose of this heritage report is to identify and assess any heritage resources that may be located in the study area, and evaluate the positive and negative impacts of the proposed electrification development on heritage resources in order to make recommendations for their appropriate management. This can be achieved through a combination of background research on published literature, maps and databases (desktop studies) and ground-truthing by means of field walking.

The study confirmed that there are two township cemeteries in the project area and that chances of encountering *in situ* archaeological remains are very low. However, other heritage resources may still be located in the study area, but these can only be identifiable as chance finds during construction. If the recommendations of this report are adopted, there is no archaeological reason why work cannot proceed, taking full cognizance of clear procedures to follow in the event of chance finds.

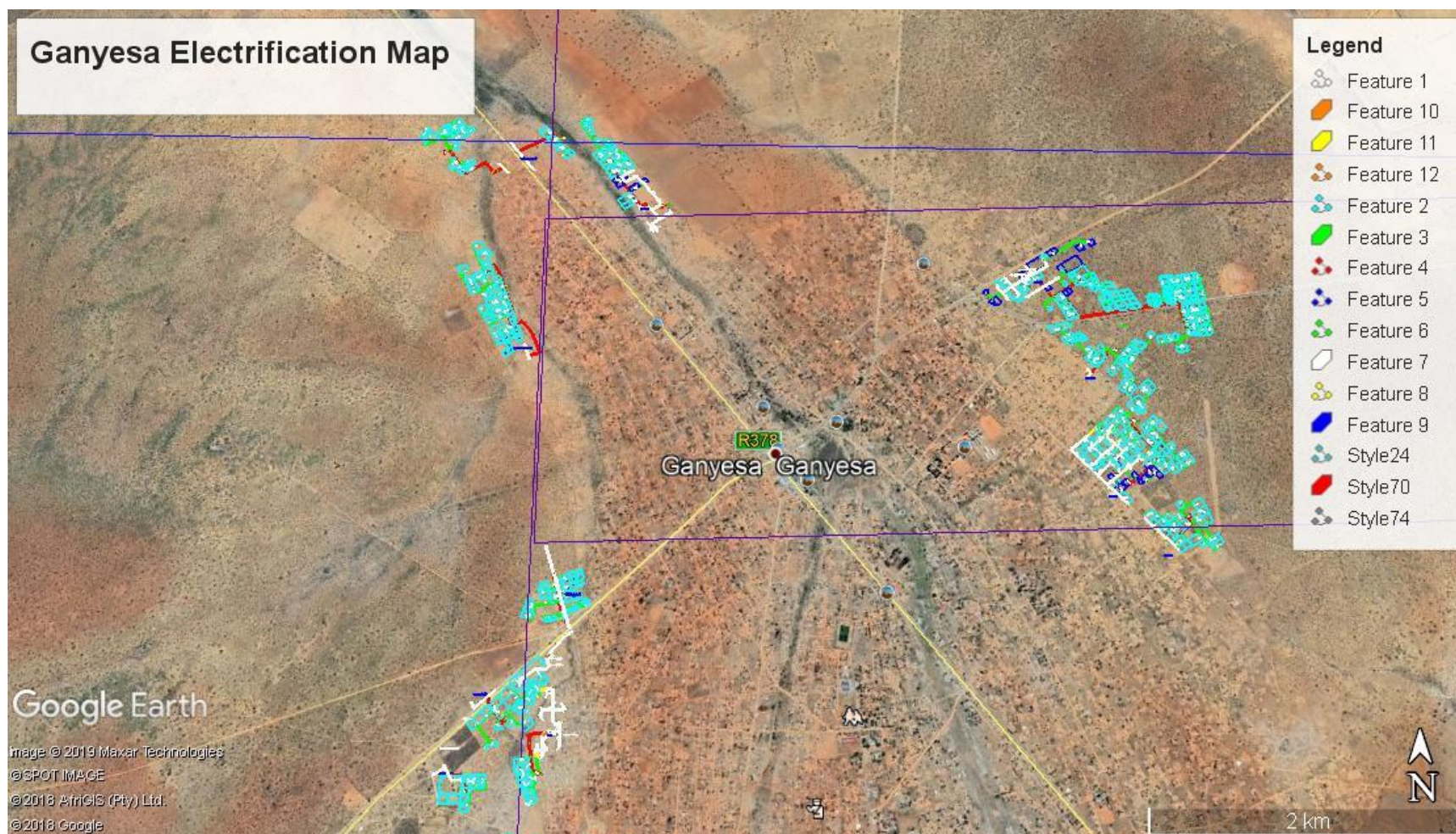


Figure 1: Layout plan for the proposed powerline development and the adjacent graveyard (Eskom 2019).

Project Background and description

Eskom Holdings Soc Limited- North West Operating Unit (NWOU) has been requested by Kagiso Molopo Local Municipality to electrify Ganyesa extensions village. The project falls within Dr Ruth Mompati District Municipality in the North West province. The project comprises of 404 stands, with houses made of tin and brick types and is 100% occupied. In ensuring legal compliance, Eskom Holdings Soc Limited-NWOU submitted an application to the South African Heritage Resource Agency (SAHRA) in terms of section 38(1) of the National Heritage Resources Act, Act 25 of 1999) (NHRA) for the proposed electrification project. SAHRA responded to Eskom with a request for additional information due to the fact that the proposed development is located in an area of moderate paleontological sensitivity. A Heritage Impact Assessment (HIA) in accordance with Section 38(3) of NHRA must be conducted and submitted to SAHRA. The HIA must include archaeological and paleontological components and must be conducted by a qualified archaeological and paleontological specialist. Construction activities will entail construction of a 22 kv power line from the identified T-Offs, install transformers, build low voltage network with pole mounted split boxes and then connect the houses.

Legislation Context

Relevant pieces of legislations to the present study are presented here. Under the National Heritage Resources Act (Act 25 of 1999) (NHRA), Mineral and Petroleum Resources Development Act 28 of 2002, and the National Environmental Management Act (NEMA), an AIA or HIA is required as a specialist sub-section of the EIA.

Heritage management and conservation in South Africa is governed by the NHRA and falls under the overall jurisdiction of the SAHRA and its PHRAs. There are different sections of the NHRA that are relevant to this study. The proposed development is a listed activity in terms of Section 38 of the NHRA which stipulates that the following development categories require a HIA to be conducted by an independent heritage management consultant:

- Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length
- Construction of bridge or similar structure exceeding 50m in length

- Development or other activity that will change the character of a site -
 - ❖ Exceeding 5000 sq. m
 - ❖ Involving three or more existing erven or subdivisions
 - ❖ Involving three or more erven or divisions that have been consolidated within past five years
 - ❖ Rezoning of site exceeding 10 000 sq. m
 - ❖ The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority
- Any other development category, public open space, squares, parks, recreation grounds

Thus any person undertaking any development in the above categories, 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. Section 38 (2) (a) of the NHRA also requires the submission of a heritage impact assessment report for authorization purposes to the responsible heritage resources agencies (SAHRA/PHRAs).

Related to Section 38 of the NHRA are Sections 34, 35, 36 and 37. Section 34 stipulates that no person may alter, damage, destroy, relocate etc. any building or structure older than 60 years, without a permit issued by SAHRA or a provincial heritage resources authority. This section may not apply to present study since none were identified. Section 35 (4) of the NHRA stipulates that no person may, without a permit issued by SAHRA, destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object. This section may apply to any significant archaeological sites that may be discovered before or during construction. This means that any chance find must be reported to SAHRA (the relevant PHRA), who will assist in investigating the extent and significance of the finds and inform about further actions. Such actions may entail the removal of material after documenting the find site or mapping of larger sections before destruction. Key to the proposed project is Section 36 (3) of the NHRA which stipulates that no person may, without a permit issued by the SAHRA, destroy, damage, alter, exhume or 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. This section applies because the powerline may affect some graves located near the cemetery. The procedure for reporting chance finds also applies to the potential discovery of burials or graves by the developer or his contractors. Section 37 of the NHRA deals with public monuments and memorials but this does not apply to this study because none exist.

The end purpose of such a report is to alert the developer (Eskom in this case), SAHRA and interested and affected parties about existing heritage resources that may be affected by the proposed development, and to recommend mitigatory measures aimed at reducing the risks of any adverse impacts on these heritage resources.

The following are the legislative framework relevant to the construction of an MV powerline running near the cemetery.

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

Any remains that may be recovered from the construction site must be kept in an institution where certain conditions are fulfilled. These conditions are laid down in the Human Tissue Act (Act No. 65 of 1983). Should these remains be considered unknown remains and be cleared by relevant authorities for re-burial, such re-interment will be conducted under the same regulations as would apply for known human remains. It is illegal in terms of the Human Tissue Act for individuals to keep human remains, even if they have a permit, and even if the material was found on their own land. As such Eskom /contractor must hand over any recovered remains

Table 1: Evaluation of the proposed development as guided by the criteria in NHRA and NEMA

ACT	Stipulation for developments	Requirement details
NHRA Section 38	Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	Yes
	Construction of bridge or similar structure exceeding 50m in length	No
	Development exceeding 5000 sq. m	
	Development involving three or more existing erven or subdivisions	No
	Development involving three or more erven or divisions that have been consolidated within past five years	No
	Rezoning of site exceeding 10 000 sq. m	Not available
	Any other development category, public open space, squares, parks, recreation grounds	No
NHRA Section 34	Impacts on buildings and structures older than 60 years	No
NHRA Section 35	Impacts on archaeological and paleontological heritage resources	Subject to identification during Phase 1
NHRA Section 36	Impacts on graves	The line must not be built behind the houses, rather the line must run between houses along street servitude. However, a heritage report is still required.
NHRA Section 37	Impacts on public monuments	No
Chapter 5 (21/04/2006) NEMA	HIA is required as part of an EIA	No
Section 39(3)(b) (iii) of the MPRDA	AIA/HIA is required as part of an EIA	No

Methodology

This study aims at providing an informed heritage-related opinion about the proposed Ganyesa Extension electrification project. This is usually achieved through a combination of a review of any existing literature and a basic site inspection. Considering the moderately sparse vegetation and shallow soil profiles, it was assumed that some sense of the archaeological traces to be found in the area of proposed development would be readily identifiable from surface observations. Given that the proposed development is located within rural residential area *in situ* archaeological remains were not likely to have survived in the project area. Accordingly, it was not considered necessary to conduct test excavations.

As part of the desktop study, published literature and cartographic data, as well as archival data on heritage laws, the history and archaeology of the area were studied. The desktop study was followed by field surveys. The field assessment was conducted by an archaeologist accompanied by Eskom Environmental officer. The study was done following generally accepted HIA practices. This field component aimed at assessing the impact of the electrification project to any township cemetery, locating all possible heritage objects, sites and features of cultural significance on the development footprint. Initially a drive-through was undertaken around the proposed development site as a way of acquiring the heritage impression of the general site. Detailed photographic recording was also undertaken where relevant (Figure 3A and B).

This was then followed by a walk down survey on the development footprint itself, with a hand held Global Positioning System (GPS) for recording the location/position of each possible site and artefacts. More photographs were also taken (Figure 4). The findings were then analysed in view of the proposed Ganyesa Electrification project in order to suggest further action. The result of this investigation is a report indicating the presence/absence of heritage resources and how to manage them in the context of the proposed electrification project.

Photographic presentation of the proposed project area



Plate 1A: View of T-off position for the MV line.



Plate 2 B: View of proposed powerline route within newly established residential area.



Plate 3 C: View of street servitude where the proposed MV line will run along.



Plate 4 D: View of proposed powerline route



Plate 5 F: View of proposed powerline route. Note the newly established residential area.



Plate 6 G: View of proposed terminal position of the proposed powerline route.



Plate 7 G: View of the T-off point for the proposed MV line.



Plate 8 H: View of proposed MV line route.



Plate 9 I: View of the T-off point for the proposed MV line from an existing transformer.



Plate 10 J: View of the T-off point for the proposed MV line.



Plate 11 K: View the proposed MV powerline route along a village road.



Plate 12 L: View of proposed MV powerline route.



Plate 13 M: View of the proposed MV line route.



Plate 14 N: View of the proposed powerline route within a recently cleared area.

Results: The archaeology of the proposed development area

Stone Age Archaeology

The project area is located in the North West Province of South Africa that boasts a rich traditional homeland of the contemporary Western Sotho-Tswana including Hurutshe, Kwena, and Kgatla (Huffman 2007, Coetzee 2010). Archaeological and heritages studies in the region indicate that the area is of high pre-historic and heritage significance. It is in fact a cultural landscape where palaeontological, Stone Age, Iron Age and Historical period sites contribute the bulk of the cultural heritage of the region (also Calebrese 1996; Huffman, 2007; van Doornum, 2008).

Stone Age sites are general identifiable by stone artefacts found scattered on the ground surface, as deposits in caves and rock shelters as well as in eroded gully or river sections. Archaeological sites recorded in the project region confirms the existence of Stone Age sites that conform to the generic SA periodization split into the Early Stone Age (ESA) (2.5 million years ago to 250 000 years ago), the Middle Stone Age (MSA) (250 000 years ago to 22 000 years ago) and the Late Stone Age (LSA) (22 000 years ago to 300 years ago). Stone Age sites in the region are also associated with rock painting sites. Cave sites also exist on the landscape south west of the project area. Concentrations of Early Stone Age (ESA) sites are usually present on the flood-plains of perennial rivers and may date to over 2 million years ago. These ESA open sites may contain scatters of stone tools and manufacturing debris and secondly, large concentrated deposits ranging from pebble tool choppers to core tools such as hand axes and cleavers. The earliest hominids who made these stone tools, probably not always actively hunted, instead relying on the opportunistic scavenging of meat from carnivore fill sites.

Very little is known about the pre-historical context of the Project Area. However, at a limestone working site in Taung paleo-anthropological evidence of the emergence of humans' earliest ancestors were found when the fossilised skull of an Australopithecus (man-ape) child were brought to the surface decades ago. So far remains of Australopithecine and Homo habilis have also been found in the Blaauwbank region near Krugersdorp in the Gauteng Province. Homo habilis.

The Acheulian industrial complex replaced the Oldowan industrial complex during the Early Stone Age. This phase of human existence was widely distributed across the world and is associated with Homo Erectus,

who manufactured hand-axes and cleavers from as early as one and a half million years ago. Acheulian sites will most probably be found in the larger Project Area.

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

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

In the northern regions of South Africa at least three settlement phases have been distinguished for early prehistoric agropastoralist settlements during the Early Iron Age (EIA). Diagnostic pottery assemblages can be used to infer group identities and to trace movements across the landscape. The first phase of the Early Iron Age, known as Happy Rest (named after the site where the ceramics were first identified), is representative of the Western Stream of migrations, and dates to AD 400 - AD 600. The second phase of Diamant is dated to AD 600 - AD 900 and was first recognized at the eponymous site of Diamant in the western Waterberg. The third phase, characterised by herringbone-decorated pottery of the Eiland tradition, is regarded as the final expression of the Early Iron Age (EIA) and occurs over large parts of the North West Province, Limpopo Province, Gauteng and Mpumalanga (Huffman 2007, Coetzee 2010). The Eiland tradition occurs over large areas in North West Province. The Eiland tradition has been regarded as the last expression of Early Iron Age that has been dated to AD 900 – 1200. This phase has been dated to about AD 900 - AD 1200. These sites are usually located on low-lying spurs close to water.

The Late Iron Age is well represented in the central parts of North-West although stone walled sites have also been reported near Lichtenburg and Mahikeng. In fact, Mahikeng may have been established on Late Iron Age stone walled sites considering the fact that this name refers to 'the place of stone walls'. The Late Iron Age in the wider study area is associated with Tswana clans such as the Rolong, Tlounge, Kwena and other smaller less well-known groups.

The North West Province region hosts some of southern Africa's most important Late Iron Age archaeological remains. The Iron Age in southern Africa is associated with the recent peopling of South Africa since the arrival of Bantu-speaking mixed farmers who practised food and metal production and sedentarism that stretch as far back at the 5th Century AD (Berg 1999). Stonewalled enclosures situated on hilltops are characteristic of the Late Iron Age (LIA) settlements that are dated between AD 1640-1830 widely found across the affected landscape. These include sites dating to AD 1500 - AD 1700 represented by the Olifantspoort and Madikwe facies of the Urewe tradition (Huffman, 2007). Other LIA sites in the area date to AD 1650 - AD 1840 and include the Uitkomst, Rooiberg, and Buispoort facies of the Urewe tradition (Huffman, 2007). Between AD 1700 and AD 1750 the Kgafela settled in Pilanesberg area named after Chief Pilane ruler of the Kgafela people who reigned between AD 1825 and AD 1859. From AD 1600 to AD 1800 various Sotho-Tswana speaking communities settled in and around the Brits area (Berg, 1999; Pistorius, 2009). These communities included the Kwena, Kgatla, Fokeng and Po and had small farm style settlements throughout the area (Berg, 1999). The Fokeng were very active in this area during the early 19th century and also built their capital at Phokeng. Various Sotho-Tswana sites in the district of Brits have been excavated and yielded faunal remains. These sites include Boitsemagano, Molokwane and Mabjanamatshwana (Plug and Baderhorst, 2006). Some of the sites that are linked to this are found in the neighbouring Waterberg regions.

The province is also endowed with ancient copper mines that date back to pre-colonial times in the Dwarsberg. Grant and Huffman (2007) found 20 homesteads with pottery assemblages belonging to Moloko cluster. According to Grant et al, (2007) Moloko is the archaeological name for the styles of pottery produced by Sotho-Tswana speakers. The facies called Madikwe belongs to the middle phase of the sequence dating between AD 1500 and 1700. Prehistoric copper production was also practiced in the province as is evidenced by copper ore, slag and tuyeres. The North West Province also is host to the Cradle of Human kind area which also a World Heritage Site. From the late 1700s, trade in supply of meat to passing ships on the east coast had increased substantially to an extent that by 1800 meat trade is estimated to have surpassed ivory trade. At the same time population was booming following the increased food production that came with the introduction of maize that became the staple food. These changes promoted further westwards movement by the Nguni farming communities. Naturally, there were signs that population groups had to compete for resources and at time move out of region, which may have been under stress. KwaZulu Natal, east of the North West Province has a special place in the history of the region and country at large. This relates to the most referenced Mfecane (wandering hordes) period of tremendous insecurity and military stress. Around the 1805, the region was witnessing the massive movements, which later came to be associated with the

Mfecane. The causes and consequences of the Mfecane are well documented elsewhere (e.g. Hamilton 1995; Cobbing 1988).

SAHRIS Database and Impact assessment reports in the proposed project area

Beater (20018) completed a survey in the Ganyesa and identified two cemeteries in the area. One of the cemeteries recorded by Beater (20018) is under threat from a housing development including the proposed electrification project. Buttler (2008) also conducted a PIA study for a powerline to the Ganyesa area but found no sites of significance close to the study area. Van der Walt (2017 and 2018) also surveyed the area for a filling station development. The studies mention occurrence of historical buildings protected by Section 34 of the NHRA Act 25 of 1999 but none are located on the proposed powerline routes. Van Schalkwyk (2013 &14) conducted an HIA for the proposed a powerline and substation project in the Ganyesa area. However, they did not see any threats to significant heritage resources in the area.

Elsewhere in the North West Province, the studies conducted for various developments provide an insight into the archaeological and heritage character of the region. Kusel (2008) conducted studies for housing development at Lichtenburg, the study noted colonial heritage and mining heritage in and around Lichtenburg. Pistorius (2011) conducted studies for a photovoltaic solar park in Mahikeng. Pistorius (2011) confirmed that the Lichtenburg-Mahikeng area has not yet been subjected to a detailed archaeological survey. However, ethnographic surveys have pointed out the presence of stone walled sites dating from the Late Iron Age. The Late Iron Age is well represented in the central parts of North-West than it is on the western parts of North West region. However stone walled sites have also been reported near Lichtenburg and Mahikeng but no detailed studies of the sites were conducted. The studies also confirm the occurrence of stone walled Late Iron Age sites in the North West Region in Ventersdorp area (Kusel 2011). All the studies mention the existence of structures older than 60 years and burial sites in the project area (Kusel 2007, 2008, 2009, Van Shchalkwyk 2011, Hutten 2011, 2012, Pretorius 2011, 2011b). Pistorius (2011) detailed historical heritage associated with Lichtenburg and Mahikeng. Van Schalkwyk (2008) also conducted studies for a powerline development from Watershed Substation to Mmabatho Substation in Mahikeng. This study to a large extent is very relevant to the current study as it stretches a longer distance from Lichtenburg to Mahikeng. The report notes potential of encountering ESA, MSA and LSA artefacts but none were recorded along the powerline route probably because the entire project area has been subjected to extensive agriculture and mining activities. The western side of the North west Province has limited stone walled sites compared to the central and northern sections such as the Madibeng, Groot Marico, Zeerust and Pilanesburg

areas where massive LIA sites occur. Van Schalkwyk and De Jong 1995 conducted extensive studies at the Bakersville Provincial heritage site. Kruger (2016) presents a detailed account of heritage resources particularly the Zeerust and Groot Marico area in the northern and eastern part of the North West Province. He provides details about the siege of Mafikeng, the battle of Mosega (Ndebele Boer war), Kaditshwene National Heritage site and a host of other heritage sites in the Ngaka Modiri Molema District Municipality. These studies combined, provide an insight in the heritage character of the current project area.

Results of the Archaeological and Heritage Assessment Field Study

The main cause of impacts to archaeological and heritage sites is direct, physical disturbance of the archaeological remains/heritage resources themselves and their contexts. It is important to note that the heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose buried archaeological sites and artefacts, the artefacts are relatively meaningless once removed from their original position. The severe impacts are likely to occur during construction period although indirect impacts may occur during movements in and out of the site by construction equipment and vehicles. The construction will result in the relocation or destruction of all existing surface heritage material. Similarly, the clearing of additional access roads will impact material that lies buried in the surface sand. Since heritage sites, including archaeological sites, are non-renewable, it is important that they are identified, and their significance assessed prior to construction. It is important to note, that due to the localised nature of archaeological resources, that individual archaeological sites could be missed during the survey, although the probability of this is very low within the proposed development route. Further, archaeological sites and unmarked graves may be buried beneath the surface and may only be exposed during construction activities. The purpose of the AIA is to assess the sensitivity of the area in terms of archaeology and to avoid or reduce the potential impacts of the proposed powerline by means of mitigation measures (see appended Chance Find Procedure). The following section presents results of the field survey.

Table 2: A tabulated summary of the findings.

Heritage resource	Status/Findings
Buildings, structures, places and equipment of cultural significance	None exists within the development footprint
Areas to which oral traditions are attached or which are associated with intangible heritage	None exists on the study area
Historical settlements and townscapes	The study is located within a contemporary settlement.
Landscapes and natural features of cultural significance	None
Archaeological and paleontological sites	None are known to exist within the project site
Graves and burial grounds	two formal cemeteries were recorded in the project area.
Movable objects	None
Significance	Cemeteries are highly significant.
Overall comment	The construction of the proposed MV powelines in their current form and layout plan have been designed to avoid formal cemeteries and therefore no direct impact anticipated. However, construction vehicles and movement of construction workers may indirectly affect the burial sites or activities at the burial site. No construction vehicle should be driven inside the cemetery.

Potential Impacts	Negative impacts anticipated from this proposed powerline development project include heavy construction vehicles driving into the cemetery and vibration during digging of pole positions may cause tombstones to collapse. Construction workers may litter the cemetery and may disrupt burial ceremonies or rituals conducted at the site.
Heritage Monitoring	Although monitoring will be done by Eskom ECO, an archaeologist may be required at the end of the project to ascertain if any burial was disturbed during construction.

Burial grounds and graves

Human remains and burials are commonly found close to archaeological sites; they may be found in abandoned and neglected burial sites, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Archaeological and historical burials are usually identified when they are exposed through erosion and earth moving activities for infrastructure developments such as power lines and roads. In some instances, packed stones or stones may indicate the presence of informal pre-colonial burials. In this case the proposed powerline routes run in the vicinity of two fenced formal cemeteries, Ganyesa Cemetery Site A and B and the third one Ganyesa Cemetery Site C is significantly far off the powerline route.

The field survey confirmed that the powerline development is located in the vicinity of two formal cemeteries, Ganyesa Cemetery Site A located at GPS Coordinates **S 26° 36' 639"**; **E 024° 09'.017"**, B located on GPS Coordinates **S 26° 35' 691"**; **E 24° 11' 795"** and located at GPS coordinates **S 26° 34' 21.44"**; **E 024° 08'.17.26"**. The cemeteries are relatively new and well secured by perimeter fence lines and locked gates. The cemeteries are not yet full so the existing graves are far from the powerline routes. In addition, these cemeteries are known and managed by the local communities. Based on the field assessment the proposed electrification development is not a threat to the cemeteries because the layout plans were designed to avoid

the cemeteries by more than 25m. the planners provided for adequate buffer zones on all sides of the cemeteries in accordance with NHRA (see Figures 1, 2 and 3). Most graves are fairly new and are marked by tombstones and inscribed headstones. As such heavy construction equipment must not be used or driven close to the graves because tombstones may crack or collapse due to excessive vibration especially during digging pole foundations.

Formal burials grounds and cemeteries are easy to deal with in the context of development because they are known and the project designs can be altered to avoid them. In this case the buffer zones were assessed and it is the considered opinion of the author are more than adequate. The proposed powerline development will not affect any of the identified cemeteries directly. The sites are younger than 60 years although the site is still active which means families still conduct new burials and rituals at the site. As such construction activities have the potential to disrupt burial and ritual ceremonies at the grave yards.

It is important to note that burial grounds and gravesites are accorded the highest social significance threshold. They have both historical and social significance and are considered sacred. Wherever they exist or not, they may not be tampered with, or interfered with during any development. The possibility of encountering human remains during subsurface earth moving works anywhere on the landscape is ever present. Although the possibility of encountering previously unidentified burial sites is low on the proposed development site, should such sites be identified during subsurface construction work, they are still protected by applicable legislations and they should be protected (also see Appendices for more details)

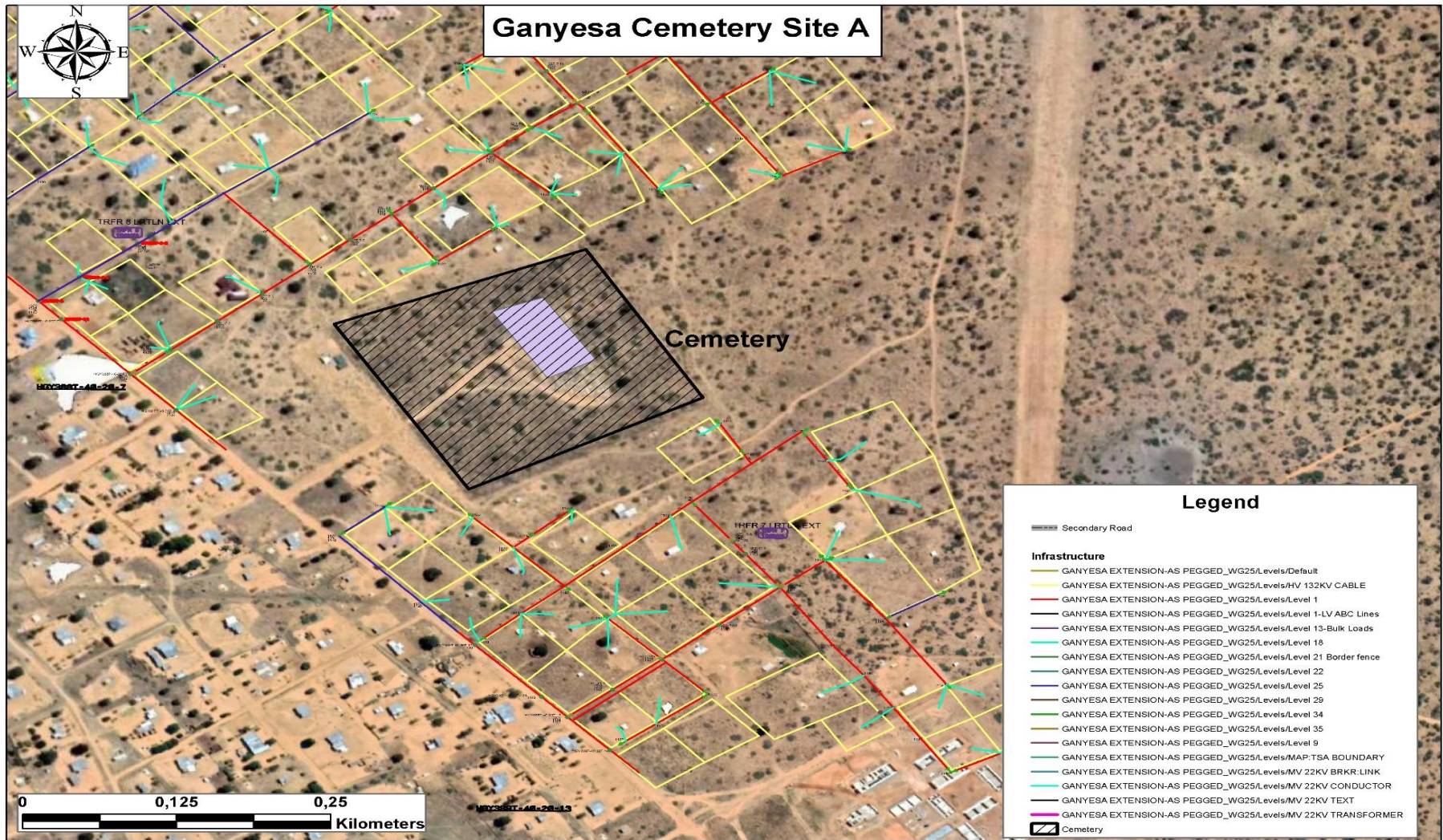


Figure 2: Location of Ganyesa Cemetery Site A marked by red polygon (ISS 2019).



Plate 15 O: View of fenced formal Village cemetery A in the vicinity of the proposed powerline route (see Figure 2)



Plate 16 P: View of few graves in Burial site A (Note that the cemetery is relatively new and not yet full.)



Plate 17 Q: View of entrance to Burial site A. (Note that the study team could not access the cemetery because it is locked)



Plate 18 R: View of graves captured from the boundary fence of Burial site A (Note that the cemetery will not be affected by the proposed powerline development because the layout plan was designed to avoid cemeteries.



Plate 19 S: View of powerline route more than 25m from the boundary of the cemetery

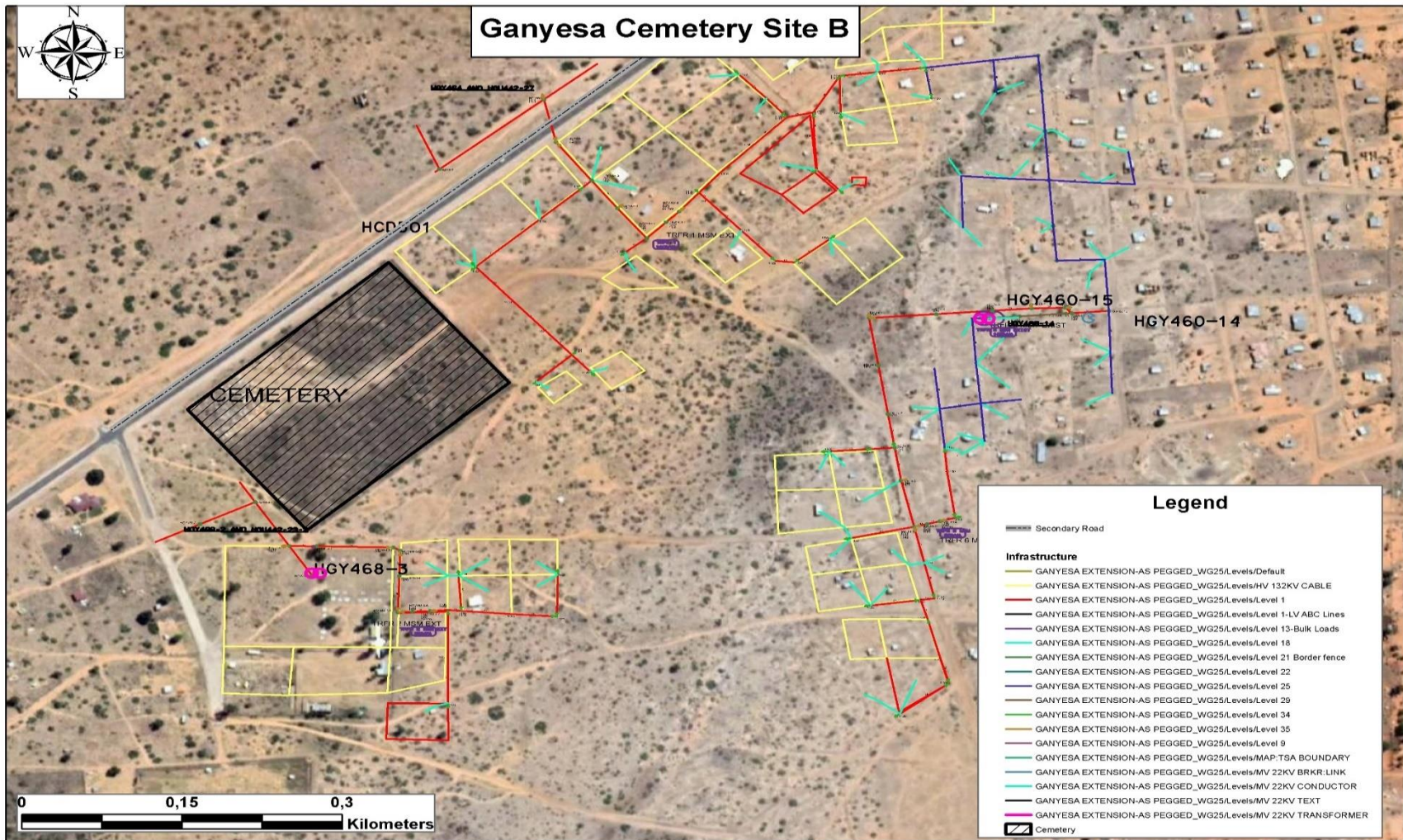


Figure 3: Location of Ganyesa Cemetery Site B marked by red polygon (ISS 2019).

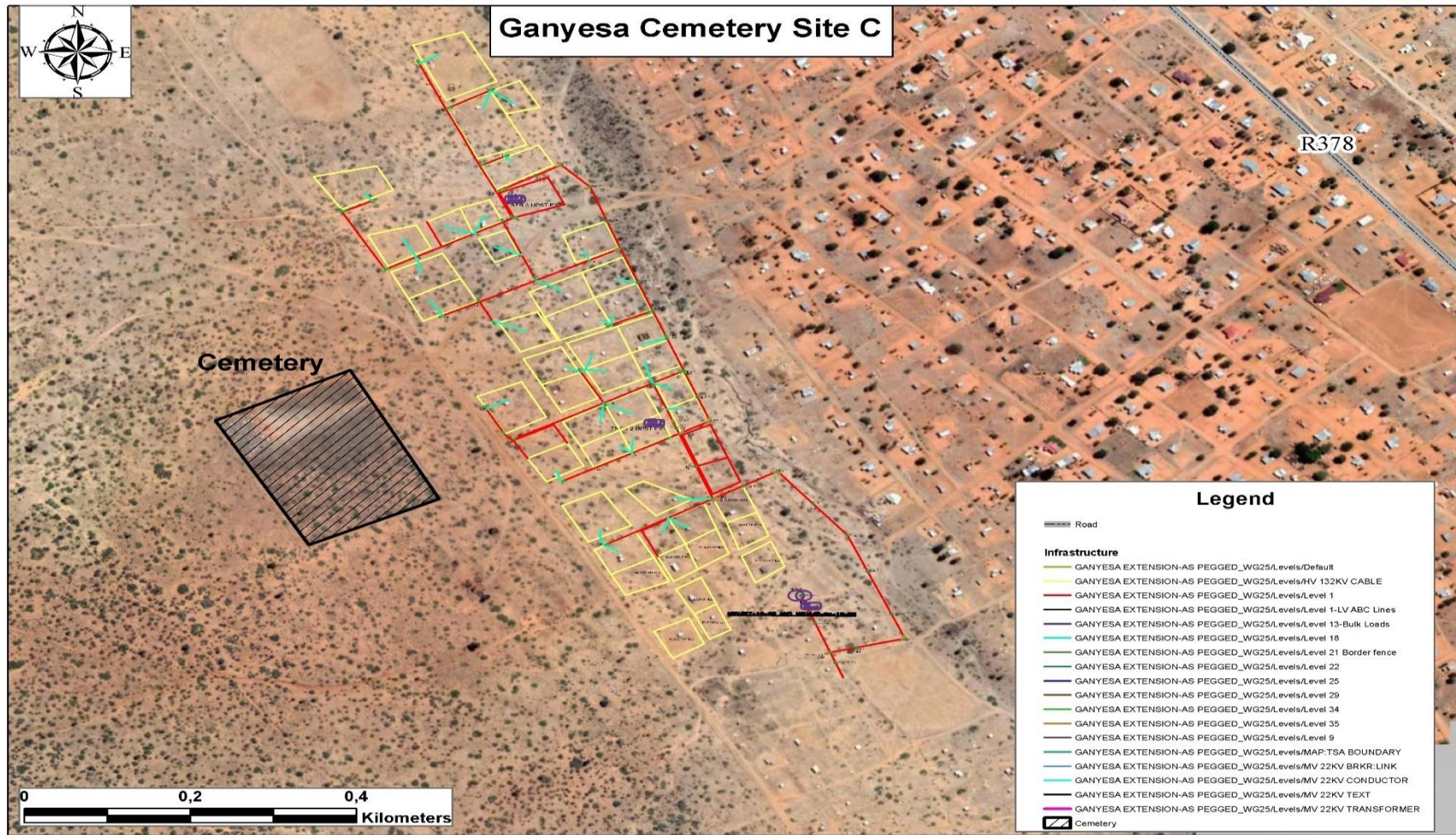


Figure 4: Location of Ganyesa Cemetery Site C marked by red polygon (ISS 2019). Note that this cemetery is far from the footprint of the proposed development



Plate 20 T: View of the 4th T-off point for the proposed MV line.



Plate 21 U: View of the 4th T-off point for the proposed MV line.



Plate 22 V: View of the 4th T-off point for the proposed MV line.



Plate 23 W: View of the 4th T-off point for the proposed MV line.



Plate 24 X: View of perimeter fence line for Ganyesa Cemetery.

Public Monuments and Memorials

No public memorials and monuments were recorded along the proposed powerline routes.

Historical Monuments and Memorials

There are no buildings and structures older than 60 years along the proposed powerline routes.

Palaeontology

The Quaternary aged aeolian sand of the Gordonia Formation of the Kalahari Group underlies the study area (Durand 2019). It forms part of the most extensive body of terrestrial sediments of Cenozoic age in southern Africa (Partridge et al., 2009). The Gordonia Formation covers the Swazian aged igneous rocks of the region comprising of undifferentiated granite, gneiss, migmatite, schist and amphibolite. The Gordonia Formation of the Kalahari Group is identified as having a Moderate Palaeontological Sensitivity and fossils are rare (Groenewald & Groenewald, 2014). Although fossils are scarce in the Quaternary sand and sandy soils, the possibility of finding any in the study area should not be dismissed (see appended Palaeontological Study and Chance find procedure).

Mitigation Measures

The field survey revealed that the two cemeteries in the project area are active township cemeteries. The graves belong to mostly residents of Ganyesa. Burial grounds and gravesites are accorded the highest social

significance threshold therefore must not be tempered with or disturbed during construction. Eskom ECO must closely monitor construction activities near the burial site and report any infringement of the grave yards. In addition, construction workers must be informed about the potential threats of their activities to the grave yard and must also be inducted on the Chance Procedure. Construction activities must be stopped whenever there is a burial ceremony or ritual activities at site.

In most communities' worldwide burials are sacred memorials of the departed and as such they are treated as cultural property; their treatment is a sensitive ethical issue and a matter of public concern (Fforde *et al* 2004). As such construction teams must exercise due respect when working in the vicinity of the grave yards. The construction of new MV lines and associated LV lines may indirectly affect graves within the two cemeteries.

The construction of a section of the proposed powerline in the vicinity of the cemetery is very sensitive and will require Eskom construction workers to exercise maximum caution during construction. The danger lies in the movement of construction vehicles during installation of poles and stringing. It should be noted that any damage to graves may spark protests by affected families and communities in general. Because there are no archaeological sites on the development footprint and the heritage materials in the adjacent areas are of low significance, there are no archaeological grounds that the proposed project should not go ahead.

Chance findings procedures

It has already been highlighted that sub-surface materials may still be lying hidden from surface surveys. Therefore, absence (during surface survey) is not evidence of absence all together. The following monitoring and reporting procedures must be followed in the event of a chance find, in order to ensure compliance with heritage laws and policies for best-practice. This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. Accordingly, all construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds. Although the possibility of encountering previously unidentified burial sites is low to medium along the proposed powerline routes, should such sites be identified during subsurface construction work, they are still protected by applicable legislations and they should be protected (See Appendix 2)

Recommendations

Based on the findings of this study, the construction of MV lines and LV lines along street servitudes and village roads will not impact on any of the three cemeteries directly, however serious precautions must be considered to avoid indirect and accidental impacts during construction. As such construction workers will be expected to exercise maximum caution to minimize the impact of the construction exercise.

- Construction workers must be inducted on the significance of graves and potential impacts of their activities to the affected graves as well as procedures for handling accidental damage to graves during construction.
- The Ganyesa communities should be informed about the construction of powerlines in the vicinity of two township cemeteries and should be informed about the potential impacts of the proposed development activities.
- Construction activities must be stopped should they be a burial or ritual ceremony at any of the two grave yards, disruption of such activities will not be tolerated by local communities.
- Eskom ECO must induct construction workers regarding the potential risks associated with the construction of particularly the MV line and at the end to verify if any grave was affected by the project. This will minimize the chances of communities claiming undocumented damages to their family graves.

The success of the undertaking from an archaeological perspective depends however on the diligence of the Environmental Control Officer (ECO) or a Heritage Monitoring Officer (HMO) and the quality of the surface survey:

- If during the construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- The senior on-site Manager must then make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area before informing SAHRA/Heritage Western Cape
- Eskom should consider employing local people for the construction work near the cemetery to encourage cooperation and tolerance for the project.

- No stone robbing or removal of any material is allowed. Any disturbance or alteration on this grave would be illegal and punishable by law, under section 36 (3) of the National Heritage Resources Act NHRA of 1999 (Act 25 of 1999).
- No dumping of construction material is allowed within the buffer zone and no alteration or damage on these sites may occur.
- If a human grave/burial is encountered during construction, the remains must be left as undisturbed as possible before the local police and SAHRA Burial Grounds and Graves Unit are informed. If the burial is deemed to be over 60 years old and no foul play is suspected, an emergency exhumation permit may be issued by SAHRA for an archaeologist to exhume the remains.

The developer and contractors are reminded that unavailability of archaeological materials (e.g., pottery, stone tools, remnants of stone-walling, graves) and fossils does not mean absentee, archaeological material might be hidden underground, and as such the client is reminded to take precautions during construction. In the event that archaeological materials are unearthed, all construction within a radius of at least 10m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist should be contacted immediately. In the meantime, it is the responsibility of the contractor to protect the site from publicity (i.e., media) until a mutual agreement is reached. Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources or grave goods is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by SAHRA.

Conclusions

For compliance with South African heritage legislation, MuTingati Environmental Consultants (Pty) Ltd was retained by Trans Africa Projects on behalf of Eskom to carry out this study for the proposed Ganyesa Electrification project. The proposed Ganyesa Electrification does not lie on pristine ground. Desktop research suggested that the general area is archaeologically rich but no known sites were reported on the development footprint. The current survey (drive-throughs and fieldwalking) around the proposed area confirmed that the proposed Ganyesa Electrification project will not impact on any known burial grounds and cemeteries recorded during the survey. In terms of the archaeology and heritage in respect of the proposed electrification project, there are no obvious 'Fatal Flaws' or 'No-Go' areas. However, the potential for chance finds, still remains and the developer and contractors are advised to be diligent and observant during clearing

and installation of powerline poles. The procedure for reporting chance finds has clearly been laid out in Appendix 2 and if this report is adopted by SAHRA, then there are no archaeological reasons why construction cannot proceed along the preferred access road route.

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APPENDIX 1: PIA REPORT

**Proposed development of the Ganyesa electrification project,
Northwest Province**

Palaeontological Desktop Study

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1. Executive Summary

The Quaternary-aged aeolian sand of the Gordonia Formation of the Kalahari Group is considered to have a Moderate Palaeontological Sensitivity. Although fossils had been found in the Gordonia Formation at other localities before, the fossils are generally scarce in this unit.

The ECO should take responsibility of monitoring the excavations and development onsite. If a significant find is made the procedure stipulated under Procedure for Chance Palaeontological Finds (p.11-12) should be followed which includes the safeguarding of the exposed fossils and the contacting of a palaeontologist for further advice.

2. Introduction

The Heritage Act of South Africa stipulates that fossils and fossil sites may not be altered or destroyed. The purpose of this document is to detail the probability of finding fossils in the study area that may be impacted by the proposed development.

The purpose of this document is to detail the probability of finding fossils in the study area and whether, if indeed there are fossils, what the impact of the mining activities will be on the fossils and fossil sites.

The palaeontological heritage of South Africa is unsurpassed and can only be described in superlatives. The South African palaeontological record gives us insight in inter alia the origin of dinosaurs, mammals and humans. Fossils are also used to identify rock strata and determine the geological context of the subregion with other continents and played a crucial role in the discovery of Gondwanaland and the formulation of the theory of plate tectonics. Fossils are also used to study evolutionary relationships, sedimentary processes and palaeoenvironments.

South Africa has the longest record of palaeontological endeavour in Africa. South Africa was even one of the first countries in the world in which museums displayed fossils and palaeontologists studied earth history. South African palaeontological institutions and their vast fossil collections are world-renowned and befittingly the South African Heritage Act is one of the most sophisticated and best considered in the world.

Fossils and palaeontological sites are protected by law in South Africa. Construction and mining in fossiliferous areas may be mitigated in exceptional cases but there is a protocol to be followed. This is a Desktop Study that was prepared in line with Regulation 28 of the National Environmental Management Act (No. 107 of 1998) Regulations on Environmental Impact Assessment. This involved an overview of the literature on the palaeontology and associated geology of the area.

3. Terms of reference for the report

According to the South African Heritage Resources Act (Act 25 of 1999) (Republic of South Africa, 1999), certain clauses are relevant to palaeontological aspects for a terrain suitability assessment.

- **Subsection 35(4)** No person may, without a permit issued by the responsible heritage resources authority-
- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
- (c) trade in, sell for private gain, export or attempt to export from the republic any category of archaeological or palaeontological material or object, or any meteorite; or
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist with the detection or recovery of metals or archaeological material or objects, or use such equipment for the recovery of meteorites.
- **Subsection 35(5)** When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedures in terms of section 38 has been followed, it may-
- (a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;
- (b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;
- (c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph (a) to apply for a permit as required in subsection (4); and
- (d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.

South Africa's unique and non-renewable palaeontological heritage is protected in terms of the NHRA. According to this act, heritage resources may not be excavated, damaged, destroyed or otherwise impacted by any development without prior assessment and without a permit from the relevant heritage resources authority.

As areas are developed and landscapes are modified, heritage resources, including palaeontological resources, are threatened. As such, both the environmental and heritage legislation require that development activities must be preceded by an assessment of the impact undertaken by qualified professionals. Palaeontological Impact Assessments (PIAs) are specialist reports that form part of the wider heritage component of:

- Heritage Impact Assessments (HIAs) called for in terms of Section 38 of the National Heritage Resources Act, Act No. 25, 1999 by a heritage resources authority.
- Environmental Impact Assessment process as required in terms of other legislation listed in s. 38(8) of NHRA;
- Environmental Management Plans (EMPs) required by the Department of Mineral Resources.

HIAs are intended to ensure that all heritage resources are protected, and where it is not possible to preserve them in situ, appropriate mitigation measures are applied. An HIA is a comprehensive study that comprises a palaeontological, archaeological, built environment, living heritage, etc specialist studies. Palaeontologists must acknowledge this and ensure that they collaborate with other heritage practitioners. Where palaeontologists are engaged for the entire HIA, they must refer heritage components for which they do not have expertise on to appropriate specialists. Where they are engaged specifically for the palaeontology, they must draw the attention of environmental consultants and developers to the need for assessment of other aspects of heritage. In this sense, Palaeontological Impact Assessments that are part of Heritage Impact Assessments are similar to specialist reports that form part of the EIA reports.

The standards and procedures discussed here are therefore meant to guide the conduct of PIAs and specialists undertaking such studies must adhere to them. The process of assessment for the palaeontological (PIA) specialist components of heritage impact assessments, involves:

Scoping stage in line with regulation 28 of the National Environmental Management Act (No. 107 of 1998) Regulations on Environmental Impact Assessment. This involves an **initial assessment** where the specialist evaluates the scope of the project (based, for example, on NID/BIDs) and advises on the form and extent of the assessment process. At this stage the palaeontologist may also decide to compile a **Letter of Recommendation for Exemption from further Palaeontological Studies**. This letter will state that there is little or no likelihood that any significant fossil resources will be impacted by the development. This letter should present a reasoned case for exemption, supported by consultation of the relevant geological maps and key literature.

A **Palaeontological Desktop Study** – the palaeontologist will investigate available resources (geological maps, scientific literature, previous impact assessment reports, institutional fossil collections, satellite images or aerial photos, etc) to inform an assessment of fossil heritage and/or exposure of potentially fossiliferous rocks within the study area. A Desktop studies will conclude whether a further field assessment is warranted or not. Where further studies are required, the desktop study would normally be an integral part of a field assessment of relevant palaeontological resources.

A **Phase 1 Palaeontological Impact Assessment** is generally warranted where rock units of high palaeontological sensitivity are concerned, levels of bedrock exposure within the study area are adequate; large-scale projects with high potential heritage impact are planned; and where the distribution and nature of fossil remains in the proposed project area is unknown. In the recommendations of Phase 1, the specialist will inform whether further monitoring and mitigation are necessary. The Phase 1 should identify the rock units and significant fossil heritage resources present, or by inference likely to be present, within the study area, assess the palaeontological significance of these rock units, fossil sites or other fossil heritage, comment on the impact of the development on palaeontological heritage resources and make recommendations for their mitigation or conservation, or for any further specialist studies that are required in order to adequately assess the nature, distribution and conservation value of palaeontological resources within the study area.

A **Phase 2 Palaeontological Mitigation** involves planning the protection of significant fossil sites, rock units or other palaeontological resources and/or the recording and sampling of fossil heritage that might be lost during development, together with pertinent geological data. The mitigation may take place before and / or during the construction phase of development. The specialist will require a Phase 2 mitigation permit from the relevant Heritage Resources Authority before Phase 2 may be implemented.

A **'Phase 3' Palaeontological Site Conservation and Management Plan** may be required in cases where the site is so important that development will not be allowed, or where development is to co-exist with the resource. Developers may be required to enhance the value of the sites retained on their properties with appropriate interpretive material or displays as a way of promoting access of such resources to the public.

The assessment reports will be assessed by the relevant heritage resources authority, and depending on which piece of legislation triggered the study, a response will be given in the form of a Review Comment or Record of Decision (ROD). In the case of PIAs that are part of EIAs or EMPs, the heritage resources authority will issue a comment or a record of decision that may be forwarded to the consultant or developer, relevant government department or heritage practitioner and where feasible to all three.

4. Details of study area and the type of assessment:

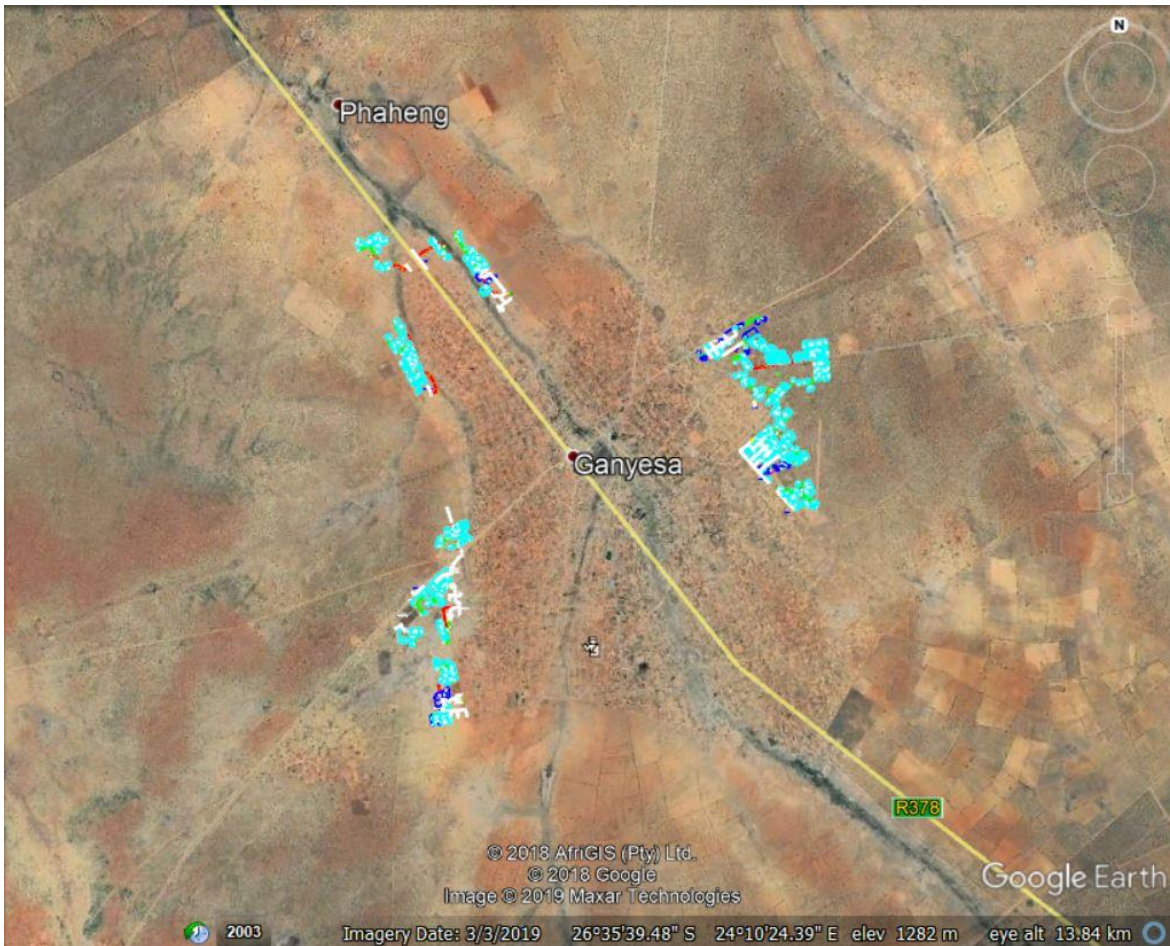


Figure 1: Google Earth photo indicating the study area (blue polygons)

The study site occurs in Ganyesa which is a sprawling town approximately 70 northwest of Vryburg in Northwest Province. A non-perennial river runs through the town. The area is relatively flat and featureless and the surface cover consists mostly of sandy red soil.

The relevant literature and geological maps for the study site, in which the development is proposed to take place, have been studied for a Desktop Study.

5. Geological setting of the study area

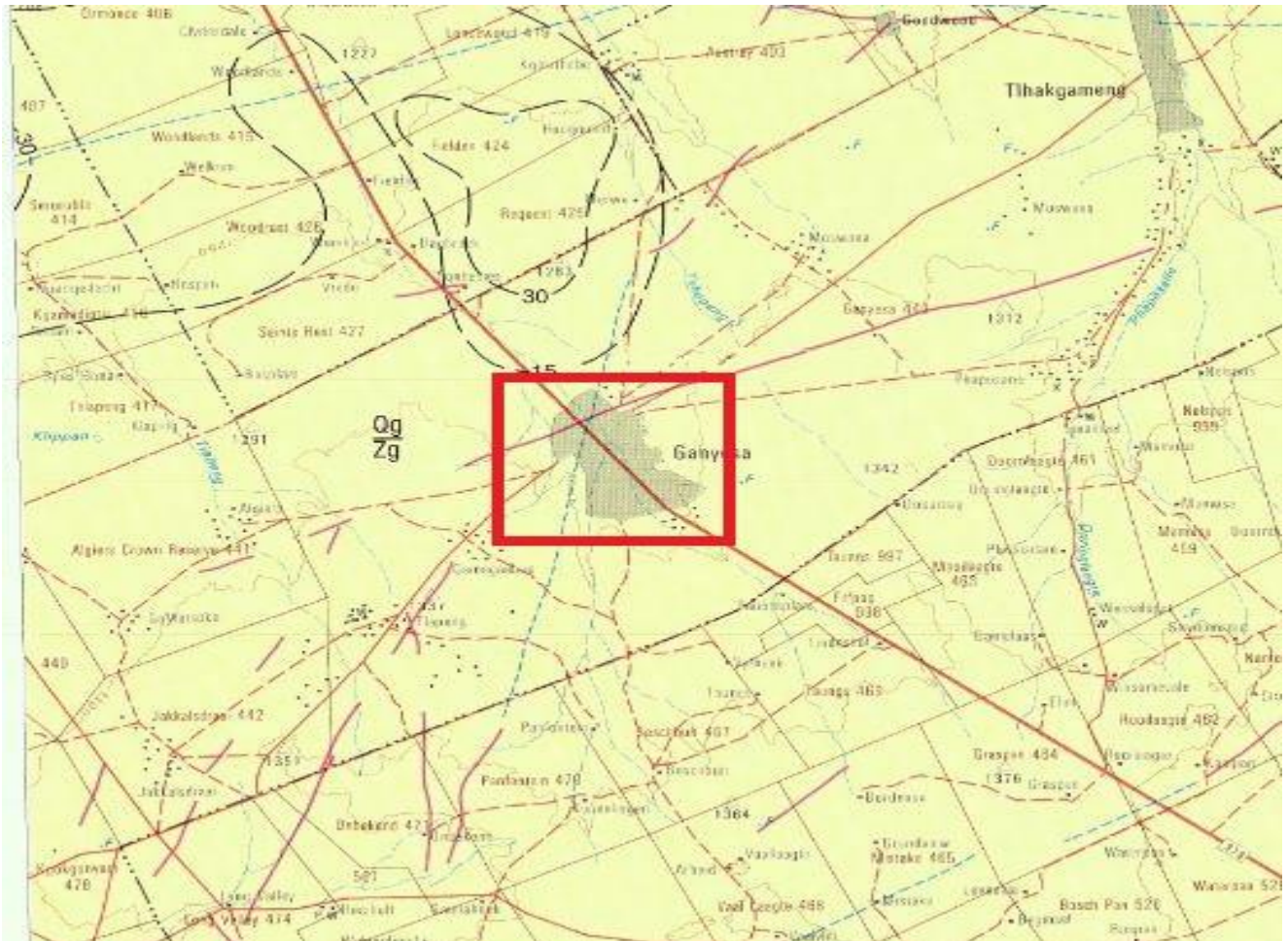


Figure 2: Geology of the study area (red polygon) and surroundings. Adapted from the 2624 VRYBURG 1:250 000 Geology Map (Council for Geoscience, 1993)

GEOLOGY LEGEND

	Lithology	Stratigraphy	Age
Og	Aeolian sand	Gordonia Formation of the Kalahari Group	Quaternary
Zg	Suboutcrop of undifferentiated granite, gneiss, migmatite, schist, amphibolite		Swazian

Phase 1 Heritage Impact Assessment for Eskom's proposed Ganyesa Electrification

The Quaternary aged aeolian sand of the Gordonia Formation of the Kalahari Group underlies the study area (Fig. 3). It forms part of the most extensive body of terrestrial sediments of Cenozoic age in southern Africa (Partridge et al., 2009). The Gordonia Formation covers the Swazian aged igneous rocks of the region comprising of undifferentiated granite, gneiss, migmatite, schist and amphibolite.

7. Palaeontological potential of the study site

The proposed development will take place in an area that is considered to have a Moderate Palaeontological Sensitivity (Groenewald & Groenewald, 2014). The fossil record of the Quarternary sediments that cover the older rock strata in the arid northerly and central regions of South Africa is sparse, occurs sporadically and is low in diversity. The fossils that have been discovered elsewhere in the aeolian sands and sandy soils of the Gordonina Formation include root casts, burrows, termitaria, ostrich egg shells, mollusc shells and isolated bones (Almond & Pether 2008).

8. Conclusion and recommendations:

The areas where the proposed development will take place occur in an area that is identified as having a Moderate Palaeontological Sensitivity.

Although fossils are scarce in the Quaternary sand and sandy soils, the possibility of finding any in the study area should not be dismissed. In fact, the paucity of fossils in this particular area increases the importance of preserving any fossil that will aid in understanding the sedimentology and chronostratigraphy of the Quaternary sediments in this area.

In the rare event of a significant fossil find during excavations or other development on the study site, the ECO should follow the following Chance Find Procedure:

PROCEDURE FOR CHANCE PALAEOLOGICAL FINDS

Extracted and adapted from the National Heritage Resources Act, 1999 Regulations Reg No. 6820, GN: 548.

The following procedure must be considered in the event that previously unknown fossils or fossil sites are exposed or found during the life of the project:

1. Surface excavations should continuously be monitored by the ECO and any fossil material be unearthed the excavation must be halted.
2. If fossiliferous material has been disturbed during the excavation process it should be put aside to prevent it from being destroyed.
3. The ECO then has to take a GPS reading of the site and take digital pictures of the fossil material and the site from which it came.
4. The ECO then should contact a palaeontologist and supply the palaeontologist with the information (locality and pictures) so that the palaeontologist can assess the importance of the find and make recommendations.
5. If the palaeontologist is convinced that this is a major find an inspection of the site must be scheduled as soon as possible in order to minimise delays to the development.

From the photographs and/or the site visit the palaeontologist will make one of the following recommendations:

- a. The material is of no value so development can proceed, or:
- b. Fossil material is of some interest and a representative sample should be collected and put aside for further study and to be incorporated into a recognised fossil repository after a permit was obtained from SAHRA for the removal of the fossils, after which the development may proceed, or:

c. The fossils are scientifically important and the palaeontologist must obtain a SAHRA permit to excavate the fossils and take them to a recognised fossil repository, after which the development may proceed.

7. If any fossils are found then a schedule of monitoring will be set up between the developer and palaeontologist in case of further discoveries.

9. References

Council for Geoscience (1993). 2624 VRYBURG 1:250 000 Geology Map, Council for Geoscience, Pretoria.

Groenewald, G.H. & Groenewald, D. (2014) Palaeontological Heritage of Limpopo, SAHRA Palaeotechnical Report.

Johnson, M.R.; Van Vuuren, C.J.; Visser, J.N.J.; Cole, D.I.; Wickens, H. de V.; Christie, A.D.M.; Roberts, D.L. & Brandl, G. (2009). Sedimentary rocks of the Karoo Supergroup. In: Johnson, M. R., Anhaeusser, C. R. and Thomas, R. J. (eds.), *The Geology of South Africa*. Geological Society of South Africa, Johannesburg & Council for Geoscience, Pretoria. Pp: 461-499.

9. Declaration of Independence:

I, Jacobus Francois Durand declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed development, application or appeal in respect of which I was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.



Palaeontological specialist:

Dr JF Durand (Sci. Nat.)

BSc Botany & Zoology (RAU), BSc Zoology (WITS), Museology Dipl. (UP),

Higher Education Diploma (RAU), PhD Palaeontology (WITS)

APPENDIX 2: CHANCE FIND PROCEDURE

CHANCE FIND PROCEDURE FOR GANYESA EXTENSION ELECTRIFICATION IN THE NORTH WEST PROVINCE

JULY 2019

ACRONYMS

BGG	Burial Grounds and Graves
CFPs	Chance Find Procedures
ECO	Environmental Control Officer
HIA	Heritage Impact Assessment
ICOMOS	International Council on Monuments and Sites
ISS	Integrated Specialist Services (Pty) Ltd
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
SAHRA	South African Heritage Resources Authority
SAPS	South African Police Service
UNESCO	United Nations Educational, Scientific and Cultural Organisation

CHANCE FIND PROCEDURE

INTRODUCTION

An Archaeological Chance Find Procedure (CFP) is a tool for the protection of previously unidentified cultural heritage resources during construction. The main purpose of a CFP is to raise awareness of all construction workers and management on site regarding the potential for accidental discovery or damage of graves and cultural heritage resources and establish a procedure for the protection of these resources. Chance Finds are defined as potential cultural heritage (or paleontological) objects, features, or sites that are identified outside of or after Heritage Impact studies, normally as a result of construction monitoring. Chance Finds may be made by any member of the project team who may not necessarily be an archaeologist or even visitors. Appropriate application of a CFP on development projects has led to discovery of cultural heritage resources that were not identified during archaeological and heritage impact assessments. As such, it is considered to be a valuable instrument when properly implemented. For the CFP to be effective, the site manager must ensure that all personnel on the proposed development site understand the CFP and the importance of adhering to it if cultural heritage resources are encountered. In addition, training or induction on cultural heritage resources that might potentially be found on site should be provided. In short the Chance find procedure details the necessary steps to be taken if any culturally significant artefacts are found during construction.

DEFINITIONS

In short the term 'heritage resource' includes structures, archaeology, meteors, and public monuments as defined in the South African National Heritage Resources Act (Act No. 25 of 1999) (NHRA) Sections 34, 35, and 37. Procedures specific to burial grounds and graves (BGG) as defined under NHRA Section 36 will be discussed separately as this require the implementation of separate criteria for CFPs.

BACKGROUND

Proposed construction site is subject to heritage survey and assessment at planning stage in accordance with the NHRA Act 25 of 1999. These surveys are based on surface indications alone and it is therefore possible that sites or significant archaeological remains can be missed during surveys because they occur beneath the surface. These are often accidentally exposed in the course of construction or any associated construction work and hence the need for a Chance Find Procedure to deal with accidental finds. In this case an extensive Archaeological Impact Assessments completed by Van der Walt (2013), Dreyer (2007a&b),

Pelser (2014 & 2018) and Mlilo (2019) for this current project are adequate. The AIA/HIA conducted was very comprehensive covering the entire site. The studies confirmed the existence of two formal cemeteries and no other significant archaeological or heritage resources in the project area.

PURPOSE

The purpose of this Chance Find Procedure is to ensure the protection of previously unrecorded heritage resources within the proposed powerline development routes. This Chance Find Procedure intends to provide the applicant and contractors with appropriate response in accordance with the NHRA and international best practice. The aim of this CFP is to avoid or reduce project risks that may occur as a result of accidental finds whilst considering international best practice. In addition, this document seeks to address the probability of archaeological remains finds and features becoming accidentally exposed during earth moving and ground altering activities during construction. The proposed construction activities have the potential to cause severe impacts on significant tangible and intangible cultural heritage resources buried beneath the surface. MuTingati developed this Chance Find Procedure to define the process which govern the management of Chance Finds during construction. This ensures that appropriate treatment of chance finds while also minimizing disruption of the construction schedule. It also enables compliance with the NHRA and all relevant regulations. Archaeological Chance Find Procedures are to promote preservation of archaeological remains while minimizing disruption of construction scheduling. It is recommended that due to the low to moderate archaeological potential of the project area, all site personnel and contractors be informed of the Archaeological Chance Find procedure and have access to a copy while on site. This document has been prepared to define the avoidance, minimization and mitigation measures necessary to ensure that negative impacts to known and unknown archaeological remains as a result of project activities and are prevented or where this is not possible, reduced to as low as reasonably practical during construction.

Thus this Chance Finds Procedure covers the actions to be taken from the discovering of a heritage site or item to its investigation and assessment by a professional archaeologist or other appropriately qualified person to its rescue or salvage.

CHANCE FIND PROCEDURE

General

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

- All construction activity in the vicinity of the accidental find/feature/site must cease immediately avoid further damage to the site.
- Briefly note the type of archaeological materials you think you've encountered, and their location, including, if possible, the depth below surface of the find
- Report your discovery to your supervisor or if they are unavailable, report to the project ECO who will provide further instructions.
- If the supervisor is not available, notify the Environmental Control Officer immediately. The Environmental Control Officer will then report the find to the Site Manager who will promptly notify the project archaeologist and SAHRA.
- Delineate the discovered find/ feature/ site and provide 25m buffer zone from all sides of the find.
- Record the find GPS location, if able.
- All remains are to be stabilised *in situ*.
- Secure the area to prevent any damage or loss of removable objects.
- Photograph the exposed materials, preferably with a scale (a yellow plastic field binder will suffice).
- The project archaeologist will undertake the inspection process in accordance with all project health and safety protocols under direction of the Health and Safety Officer.
- **Finds rescue strategy:** All investigation of archaeological soils will be undertaken by hand, all finds, remains and samples will be kept and submitted to a Museum as required. In the event that any artefacts need to be conserved, the relevant permit will be sought from the SAHRA.
- 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.
- In the case of human remains, in addition to the above, the SAHRA Burial Ground Unit will be contacted and the guidelines for the treatment of human remains will be adhered to. If skeletal remains are identified, an archaeological will be available to examine the remains.
- The project archaeologist will complete a report on the findings as part of the permit application process.
- Once authorisation has been given by SAHRA, the Applicant will be informed when construction activities can resume.

MANAGEMENT OF CHANCE FINDS

Should the Heritage specialist conclude that the find is a heritage resource protected in terms of the NRHA (1999) Sections 34, 36, 37 and NHRA (1999) Regulations (Regulation 38, 39, 40), ISS will notify SAHRA and/or PHRA on behalf of the applicant. SAHRA/PHRA may require that a search and rescue exercise be conducted in terms of NHRA Section 38, this may include rescue excavations, for which MuTingati will submit a rescue permit application having fulfilled all requirements of the permit application process.

In the event that human remains are accidentally exposed, SAHRA Burial Ground Unit or MuTingati Heritage Specialist must immediately be notified of the discovery in order to take the required further steps:

- a. Heritage Specialist to inspect, evaluate and document the exposed burial or skeletal remains and determine further action in consultation with the SAPS and Traditional authorities:
- b. Heritage specialist will investigate the age of the accidental exposure in order to determine whether the find is a burial older than 60 years under the jurisdiction of SAHRA or that the exposed burial is younger than 60 years under the jurisdiction of the Department of Health in terms of the Human Tissue Act.
- c. The local SAPS will be notified to inspect the accidental exposure in order to determine where the site is a scene of crime or not.
- d. Having inspected and evaluated the accidental exposure of human remains, the project Archaeologist will then track and consult the potential descendants or custodians of the affected burial.
- e. The project archaeologist will consult with the traditional authorities, local municipality and SAPS to seek endorsement for the rescue of the remains. Consultation must be done in terms of NHRA (1999) Regulations 39, 40, 42;
- f. Having obtained consent from affected families and stakeholders, the project archaeologist will then compile a Rescue Permit application and submit to SAHRA Burial Ground and Graves Unit.

- g. As soon as the project archaeologist receives the rescue permit from SAHRA he will in collaboration with the company/contractor arrange for the relocation in terms of logistics and appointing of an experienced undertaker to conduct the relocation process.
- h. The rescue process will be done under the supervision of the archaeologist, the site representative and affected family members. Retrieval of the remains shall be undertaken in such a manner as to reveal the stratigraphic and spatial relationship of the human skeletal remains with other archaeological features in the excavation (e.g., grave goods, hearths, burial pits, etc.). A catalogue and bagging system shall be utilised that will allow ready reassembly and relational analysis of all elements in a laboratory. The remains will not be touched with the naked hand; all Contractor personnel working on the excavation must wear clean cotton or non-powdered latex gloves when handling remains in order to minimise contamination of the remains with modern human DNA. The project archaeologist will document the process from exhumation to reburial.
- i. Having fulfilled the requirements of the rescue/burial permit, the project archaeologist will compile a mitigation report which details the whole process from discovery to relocation. The report will be submitted to SAHRA and to the company.

Note that the relocation process will be informed by SAHRA Regulations and the wishes of the descendants of the affected burial.