

Limpopo Water Initiative (Pty) Ltd

**PROPOSED ESKOM POWER LINE PROJECT
FROM MACHADODORP TO DULLSTROOM AND
SUBSTATION CONSTRUCTION AT DULLSTROOM
IN ENKANGALA DISTRICT MUNICIPALITY,
MPUMALANGA PROVINCE**

**PHASE 1 CULTURAL AND ARCHAEOLOGICAL
HERITAGE ASSESSMENT SPECIALIST STUDY**

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REPORT DETAILS

PROJECT NAME: Proposed Eskom Power Line Project From Machadodorp to Dullstroom and Substation Construction at Dullstroom.

REPORT TITLE: CULTURAL AND ARCHAEOLOGICAL HERITAGE ASSESSMENT SPECIALIST STUDY

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PROVIDER (PSP)

MANAGEMENT SUMMARY

Background

The present Cultural Heritage Assessment (CHA) study was conducted as part of the Environmental Impact Assessment (EIA) for the proposed Machadodorp to Dullstroom Eskom power line project in the Enkangala District, Mpumalanga Province. The study was commissioned by Eskom Northern Distribution. The CHA study focus on identifying and assessing archaeological, cultural, and historical heritage resources associated with the proposed powerline's receiving environment from the existing power substation just outside Machadodorp Town to a new proposed substation in Dullstroom.

Summary Results

This study was conducted in three phases. The first phase involved a reconnaissance survey of the proposed route followed by the archaeological and cultural heritage field survey and finally the assessment and report production. No archaeological, historical or any other physical cultural heritage properties of significance were identified on the direct path of the proposed power line. The proposed power line follows the existing line from Machadodorp substation. In most parts the proposed power line will pass through area previously disturbed by agricultural activities and built-up infrastructures and properties.

Summary Recommendations

- No archaeological and any other category of cultural heritage resources are affected or potentially affected by the proposed power line development.
- Although this study did not identify archaeological heritage sites directly affected by the proposed power line project, there is potential of encountering chance archaeological or historical finds, (the may include unmarked human burials) that may accidentally be found during the construction and erection of the proposed power line. Therefore, a heritage monitoring plan should be devised to cover the construction period.
- We further recommend that a heritage awareness workshop be organised for the construction contractors and their work teams that will work on the project. Such a workshop would be an information session for site workers of heritage issues they may deal with or may potentially encounter (*in situ*) subsurface during power line development work.
- With these considerations, this study did not identify archaeological or cultural heritage barrier to the proposed power line project. As such, there are no objections to the proposed Eskom powerline project from Machadodorp to Dullstroom.

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ABBREVIATIONS

CHA	Cultural Heritage Assessment
EIA	Environmental Impact Assessment
HeSSA	Nzumululo Heritage Solutions (South Africa)
LWI	Limpopo Water Initiative
PI	Principal Investigator
PSP	Professional Service Provider
SAHRA	South African Heritage Resources Agency

DEFINITIONS

Archaeological Material remains resulting from human activities, which are in a state of disuse and are in, on, land and which are older than 100 years, including artefacts, human and hominid remains, and artificial features and structures.

Chance Finds Archaeological artefacts, features, structures or historical cultural remains such as human burials that are found accidentally in context previously not identified during cultural heritage scoping, screening and assessment studies. Such finds are usually found during earth moving activities such as water pipeline trench excavations.

Cultural Heritage Resources Same as Heritage Resources as defined and used in the South African Heritage Resources Act (Act No. 25 of 1999). Refer to physical cultural properties such as archaeological and palaeontological sites; historic and prehistoric places, buildings, structures and material remains; cultural sites such as places of ritual or religious importance and their associated materials; burial sites or graves and their associated materials; geological or natural features of cultural importance or scientific significance. Cultural Heritage Resources also include intangible resources such as religion practices, ritual ceremonies, oral histories, memories and indigenous knowledge.

Cultural Significance The complexities of what makes a place, materials or intangible resources of value to society or part of, customarily assessed in terms of aesthetic, historical, scientific/research and social values.

Grave A place of interment (variably referred to as burial), including 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.

Historic Material 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.

In Situ material **Material culture** and surrounding deposits in their original location and context, for example an archaeological site that has not been disturbed by farming.

Material culture Buildings, structure, features, tools and other artefacts that constitute the remains from past societies.

Site A distinct spatial cluster of artefacts, structures, organic and environmental remains, as residues of past human activity.

PROPOSED ESKOM POWER LINE PROJECT FROM MACHADODORP TO DULLSTROOM AND SUBSTATION CONSTRUCTION: PHASE 1 CULTURAL AND ARCHAEOLOGICAL HERITAGE ASSESSMENT SPECIALIST STUDY

1 INTRODUCTION

Eskom commissioned the construction of a transmission power line from Machadodorp Substation to the proposed new Dullstroom substation in Emakhazeni Local Municipality of Enkangala District, Mpumalanga Province. In order to obtain environmental authorisation and clearances from the Department of Environmental Affairs and Tourism, Eskom appointed Limpopo Water Initiative (LWI) to handle the environmental aspects of the proposed project. LWI subcontracted Nzumbululo Heritage Solutions cc (South Africa) (HESSA) to conduct the Cultural Heritage Assessment (CHA) study for the project area. The terms of reference are summarised and tabulated below (Table 1).

Table 1: Terms of Reference for the Cultural Heritage Study for proposed Eskom Power line from Machadodorp Power substation to proposed Dullstroom Power substation.

PURPOSE	ACTIVITIES
<ul style="list-style-type: none"> <input type="checkbox"/> To identify and describe (in terms of their conservation and / or preservation importance) sites of cultural and archaeological importance that may be affected by the proposed power line upgrade and associated activities. This study should include the identification of gravesites. <input type="checkbox"/> Identify and describe impacts to archaeological and cultural resources. <input type="checkbox"/> Make recommendations on mitigation measures. <input type="checkbox"/> Identify and describe management measures. 	<ul style="list-style-type: none"> <input type="checkbox"/> Identify, describe and map sites of archaeological, historical or cultural interest affected by the power line upgrade project. <input type="checkbox"/> Identify, where possible, the gravesites affected by the development. <input type="checkbox"/> Liaise with the local communities (if applicable) with regards to the impact of the development on the heritage resources. <input type="checkbox"/> Describe the importance or significance of these sites and whether these sites need to be conserved, protected or relocated. <input type="checkbox"/> Describe the procedures for mitigation or relocation of sites and provide an indication of time required for these management measures to be implemented. <input type="checkbox"/> Document findings and recommendations.

2 AIMS OF THE CHA STUDY

This CHA study primarily seeks to fulfil the requirements of South African Heritage Resources Act (Act No. 25 of 1999) Section 38 by:

- Identifying heritage resources affected by the proposed power line development and the associated infrastructural development.
- Assess the significance of the resources.
- Evaluate the impact thereon with respect to the socio-economic opportunities and benefits that would be derived from the proposed power line development.
- Consult with the affected and other interested parties in regard to the impact on the heritage resources in the project's receiving environment.
- Make recommendations on mitigation measures with the view to reduce specific adverse impacts and enhance specific positive impacts on the heritage resources.
- Identify and discuss with local communities (where applicable) on potential impacts of the proposed development on graves and burials sites within the development area and make the necessary recommendations on how to handle the matter.
- Take responsibility for communicating with the SAHRA and other authorities in order to obtain the relevant permits and authorization.

As heritage specialists, the HESSA team was charged with the responsibility of:

- Identifying and assess the significance of the heritage resources affected by the proposed power line upgrade.

3 BACKGROUND SUMMARY

The proposed power line development consists of construction of transmission lines from Machadodorp substation to a new proposed Dullstroom substation 34km from the former, in the Enkangala District, Mpumalanga Province. The proposed project is a linear development that would run from an existing electricity substation outside Machadodorp town and would traverse through commercial farming areas. In some sections, the proposed line would run parallel and next to an existing transmission power line and along farm boundary fence lines. In sections the line follows existing local roads.

Culture-historically general area within which the project falls has a long history of human occupation going back as far as the hunter-gatherer communities. The area was also occupied by in the incoming iron-using farming communities most in the second millennium AD. General archaeological studies indicate that the entire region from the present day Swaziland borders to Phalaborwa contains archaeological material classified into the following facies: (i) *Doornkop* (dating to AD 750-1000); *Klingbeil* (AD 1000-1300) and *Maguga* (AD1300-1500) (Huffman 2004: 101). Thereafter the area received different migrating Nguni-speaking and Sotho-Tswana-speaking farming communities. In the mid-1800s, the area played host to more migrating groups fleeing from the *mfecane* Hammond-Tooke 1993) and eventually like most of South Africa, the territory was brought under colonial rule by the beginning of the 20th-century. Today most the land is under commercial farms. The local African communities comprise of a mixture of groups that claim decadency from the Langa and Musi Nguni-speaking groups (the Ndebele); Sotho-Tswana and Tsonga-speaking groups.

Concerning archaeological and physical cultural heritage resources, no systematic archaeological or cultural heritage assessment studies are on record covering the specific route of the proposed power line. However, judging from the developments and previous and current land use activities in the project area, it was anticipated that some archaeological resources, if they existed, might have been affected previously.

4 CHA STUDY METHODS

We began the CHA study with a desktop survey of archaeological databases and inventories in search of available data on the heritage of the study area. We then proceeded to a field reconnaissance study of the power line upgrade route. In the third segment we conducted an archaeological and cultural heritage field survey of the affected area and finally conducted an assessment and report production for the study.

4.1 ARCHIVAL AND DATABASE SEARCH

Search for existing archaeological studies for the area was not successful. No records, including reports filed through the SAHRA, that yielded any relevant data on the proposed power line route were identified.

4.2 FIELD SURVEY

We conducted reconnaissance study to collect geographical and topographical background information along the proposed route from Machadodorp to Dullstroom site for the proposed new substation. The general field visit was conducted in the company of LWI field researchers. We proceeded to a full field survey of the affected landscape. We sought to identify archaeological sites and physical cultural resources signatures as well as other cultural heritage sites such as graves, burial and religious or sacred sites associated with the powerline route.

A team of two archaeologists systematically transacted the transmission powerline route in most parts on foot and in sections from slow-moving field vehicle. We started from the Machadodorp substation (Plate 1) just north of N4 road to Neispruit and ended at the proposed site for Dullstroom Eskom Power substation.

Distribution of archaeological sites across the landscape depends on a number of related factors, such as preservation conditions over time, the degree to which sites are exposed through erosion or lack of vegetation and the actual decisions of the people who created the sites and deposited the materials originally. Using the preliminary findings from the reconnaissance study we applied a judgement surveying strategy (stratified sampling). We divided the landscape through which the proposed power line passes into geographical zones (built up sections, hills, gully, ridge, and stream or river valley section). Naturally, we placed more emphasis on areas we believed had potential of archaeological, historical or other physical cultural resources.



Plate 1: Proposed powerline will begin at this Machadodorp Eskom Substation 132/22/11KV

Identification of archaeological sites during surveying also depends on visibility and accessibility. All areas along the proposed power line route are generally accessible. In some sections the proposed power line route will run parallel to existing transmission line cutting transecting through commercial farmland, parallel to roadsides and farm-boundary fence lines. Heading to the North West towards Dullstroom, the line would go through heavily degraded communal lands leading to a proposed substation site just outside Dullstroom town. Under these disturbed conditions, the chances for archaeological material preserved *in situ* to present day in most areas of the powerline routes were very slim.

5 RESULTS

LOCATION DETAILS

Province: Mpumalanga

District Municipality: Enkangala

Name Properties affected: De Kroon Farm, Waterval 351JT, Winnaarspoort 350JT, Vlakfontein 323 JT, Elandsfontein 322JT, Middelpunt 320JT, Hartbeesfontein 130JT, and Elandslaagte 131JT.

Proposed development: Linear electricity transmission power line from Machadodorp substation to proposed new substation at Dullstroom

1:50 000 map name: 2530 (see attached Map)

GPS Co-ordinates and description of powerline route:

- Proposed power line would start at S25.65711° E30.23088° (existing Machadodorp substation off N4 road to Nelspruit on north-western side. From the substation proposed power line route goes parallel to the existing line cutting through an open grazing land near Mr Albers farm boundary fence);
- S25.65010° E30.22189° (along existing powerline / pole no: MACV 17 next to Mr Immelman farm house and beans plantation in De Kroon Farm;
- S25.64786° E30.2211° (proposed power line will cross the gravel road and cut through a small portion of Mr Isaac Tajard farm. From here the power line route will cut through Mr Talbod farm next to the old bluegum trees plantation.
- S25.62849° E30.20498° (area adjacent to the end of Mr Talbod farm close to the boundary fence of Vlakfontein farm. The affected area of Vlakfontein farm is just an open grazing land);
- S25.62228° E30.19155° (line route cross gravel road to Farrefontein and will follow existing electricity powerline traversing through the mountainous area)
- S25.57508° E30.19014° (portion of Elandsfontein farm where the proposed power line will cut through already disturbed areas with existing facilities such as Vodacom towers ,telephone lines and ESKOM lines)
- S25.49286° E30.08910° (at this GPS readings line route will turn to the right hand side and run along R540 road from Belfast to Dullstroom. The area is flanked by other developments such as railway line, Telkom lines and electricity lines. From here line route will proceed through an open grazing land)
- S25.43307° E30.09986° (line route reaches the area of proposed new power substation into the outskirts of Dullstroom town)



Plate 2: In some sections proposed power line will follow an existing electricity power line.

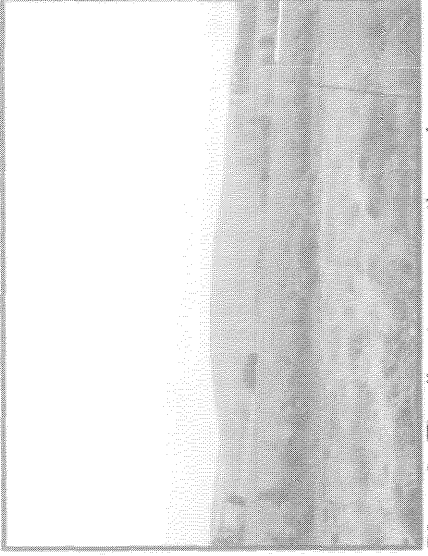


Plate 3: The line traverses through commercial farm landscape such as this.

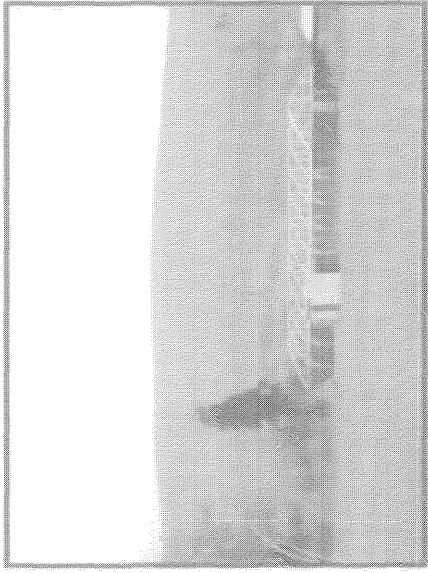


Plate 4 & 5: In most parts, the line will run through already disturbed areas with these kinds of existing and previous developments.

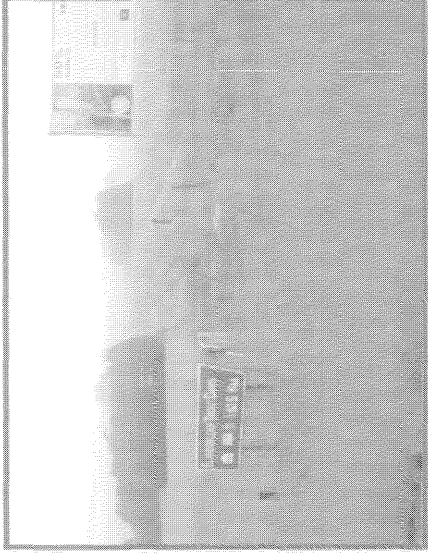


Plate 6: In Vlakfontein and Elandsfontein farmland through which the line will traverse these grazing lands.

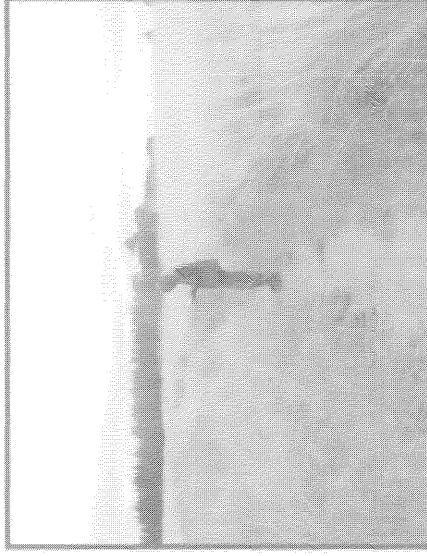


Plate 7: Proposed site for substation on the periphery of Dullstroom town to the southeast. The area is covered with dense grass for an effective ground survey to be conducted.

Current land use: (See Plate 1 to 7) From the Machadodorp power substation the proposed line route runs parallel to existing power transmission line cutting through commercial farmland currently used for crop cultivation and livestock grazing in some sections. The route follows farm-boundary fence lines and in some sections, it runs parallel to existing access roads and distribution power lines. In most parts it goes through heavily disturbed old agricultural land, current farmland and grazing land. Generally, the entire route goes through previously disturbed land, currently disturbed areas and built up land portions.

ARCHAEOLOGICAL AND PHYSICAL CULTURAL RESOURCES

No archaeological heritage resources were identified during the CHA study of the proposed power line route. Although the proposed power line traverses through on old farmlands, no historical sites or features of significance were identified as potentially affected by the proposed powerline development. The historical farm houses and associated infrastructures and features observed in the vicinity of the powerline route are all contemporary and have no cultural heritage significance threshold. No other physical cultural properties or remains were identified along route. Nonetheless in most part the proposed line runs through areas already disturbed for archaeological materials to have survived on the ground surface.

Statement of overall impacts

In principle any development that alters the ground surface status quo will potentially destroy any archaeological resources or any other category of physical cultural remains in its direct path, and the impact will be permanent in nature, extent and duration (also see Bickford and Sullivan, 1977). However, since there were no archaeological or cultural heritage sites that were identified on the path of the proposed power line project, from a heritage perspective, no impacts were identified or measured in probabilities or intensity. Furthermore, most of the open areas along the proposed route are covered with thick grass which hampered total surface inspection or survey for isolated and small archaeological remains.

Recommendations

No further predevelopment study or mitigation is necessary for the archaeological and physical cultural heritage resources with regards to the proposed power project. However, there is always a probability of discovering archaeological sites during

subsurface earth moving activities such as those associated with electricity poles foundation construction work. Be that as it may, we recommend that an archaeological heritage-monitoring plan be put in place to deal with potential chance archaeological or physical cultural resource finds during the powerline construction period.

BURIAL GROUNDS AND GRAVE SITES

We identified a formal graveyard in the vicinity of the proposed site for the new substation construction. However the graves are well marked and they are not going to be affected by the substation construction project.

Recommendations: Burials and Grave Sites

Burial grounds or gravesites which were identified during this study are not within direct reach of proposed substation site. As such every effort should be made not to interfere with the graves during the proposed development.

In principle, all burial grounds and gravesites, known or previously unknown, are accorded special protection under applicable national and provincial legislations and ordinances. Keeping on mind that there is a possibility in any development to encounter previously unknown burials, it should be emphasised here that even unknown human remains should be protected when accidentally discovered during development. Should such sites be discovered during the construction of the powerline, we recommend that, the following steps be considered before grave(s) relocation is assessed as a mitigation measure:

- Consultation with individuals or communities related to the deceased;
- Notices at the grave sites and other local media;
- Notification of the impending or proposed removals;
- Consent from all affected parties;
- Satisfactory arrangements for the exhumation and re-interment;
- Calling on relatives to claim the remains;
- Satisfactory arrangements for curation where applicable.

Furthermore, the South African Heritage Resources Agency should be notified if human remains falling under the National Heritage Resources Act (Act No 25 of 1999) are accidentally uncovered during development. An archaeologist must

supervise exhumations conducted under this Act. The removal must be conducted with due respect for the customs and beliefs of the affected relatives, and where requested, in the presence of relatives or community representatives. Burial grounds and graves are especially protected by both the provincial and national heritage legislations and ordinances.

6 MONITORING

Since it is not possible to predict where the previously unidentified archaeological and physical cultural materials, including human burials, may be uncovered during powerline construction activities, we recommended that a heritage specialist be retained to monitor the construction sites when digging powerline pole foundations and the development of associated access roads and work camps. Since the archaeological resources would permanently be damaged, should archaeological features be exposed during the construction they should be documented. Such operations are known as salvage excavations. Thus it will be important from the construction scheduling phases that the archaeological monitoring activities are taken into consideration.

In addition, prior to the beginning of construction work, an information workshop for the contractors should be held to highlight to them the importance of archaeological and other physical cultural materials that they may potentially encounter during the proposed power line construction work.

7 CONCLUDING REMARKS

If our recommendations are acceptable and taken into consideration, from a heritage perspective, the proposed development is unlikely to impact upon archaeological or physical cultural heritage resources. As such there are no identified archaeological or cultural heritage barriers to the proposed power line-upgrade construction project.

ACKNOWLEDGEMENTS

We would like to thank the local farmers and landowners for their assistance and for giving us access to their properties and taking us through the powerline route during the fieldwork. Most of the Farmers had to bear with our several phone calls. We mention particularly Mr J Albers and Mr J Immelman who took time off their work schedule to attend to us.

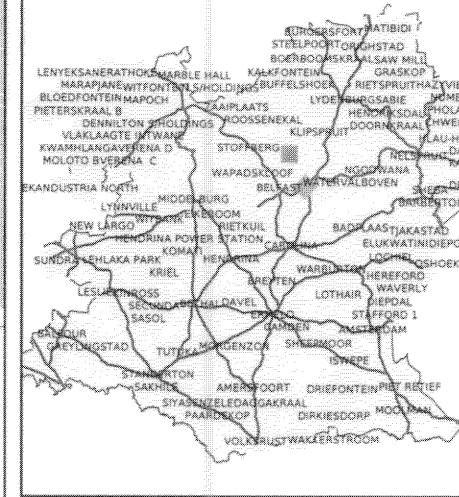
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- The National Heritage Resources Act (Act No 25 of 1999).

LOCALITY MAP



MPUMALANGA PROVINCE



Legend

- | | |
|--|---|
| <ul style="list-style-type: none"> — mprail — mpriv | Municipi |
| Road <ul style="list-style-type: none"> — all other values— — MAIN ROAD — SECONDARY ROAD | MUNICIPALITY NAME <ul style="list-style-type: none"> Highlands (MP314) Middelburg (MP313) Thaba Chweu (MP3) |
| ROAD_NAME <ul style="list-style-type: none"> N4 R33 R37 eskom_high_voltage hydro | |
| <ul style="list-style-type: none"> — all other values— Farm boundaries | |
| TOWNS <ul style="list-style-type: none"> Dullstroom Machadodorp | |

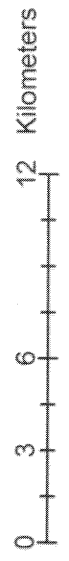


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from Machadodorp to Dullstroom

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MORPHOLOGY MAP



Project Name:
Proposed Eskom Power Line Project
from Machadodorp to Dullstroom



Legend

DESCRIPTION	ROAD_NAME
MAIN ROAD	—
SECONDARY ROAD	- - - - -
TOWNS	
Dullstroom	[Pattern]
Machadodorp	[Pattern]
Farm boundaries	[Pattern]
High Mountains	[Pattern]
Hills and Lowlands	[Pattern]
Low Mountains	[Pattern]
Lowlands with Parallel Hills	[Pattern]

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