

MAREETSANE BATHO-BATHO SOLAR PV FACILITY Phase I Cultural Heritage Impact Assessment

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Prepared for:

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STRATEGIC ENVIRONMENTAL FOCUS

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25 June 2013

Mamoluoane Seliane
Heritage Specialist
Accredited by ASAPA Reg. No. 255

Date

EXECUTIVE SUMMARY

The aim of the cultural heritage survey (Phase I Heritage Impact Assessment, in accordance with the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)) was to locate, identify, document and assess sites of cultural heritage, architectural and archaeological significance that may occur within the proposed footprint for the establishment of the Mareetsane Solar photo voltaic (PV) Facility and associated powerline route alternatives. An assessment of the impact of the establishment of the solar farm and the installation of the powerline on such resources will be provided. Where the impact is negative, alternatives and/or mitigation plans will be considered.

The heritage investigation focused on the proposed site for the establishment of the solar facility, including the three powerline route alternatives for connecting the solar facility to the National Grid via one of two nearby Eskom substations. The study area is mainly farmlands, and as such the heritage resources revealed by the study conform to agricultural land heritage and archaeology. The heritage resources found on site constitute graves of various ages (some older and others younger than 60 years).

The heritage survey revealed the following:

- 10 grave sites with graves of various ages.

The following categories of grave sites were identified at the proposed project site.

- Grave sites occurring within the proposed solar facility site – Grave sites 2 and 3 (Plate 3 and 4 respectively);
- Grave sites located outside of the proposed solar facility site but occurring within 20 m of its boundary – Grave sites 1 and 4 (Plate 2 and 5 respectively); and
- Graves sites occurring within the proposed servitude for the powerlines (Grave Sites 8 and 9 (Plates 9 and 10 respectively).

The South African Heritage Resources Agency (SAHRA) recommends a 20m buffer around grave sites. Thus mitigation measures must be implemented, as outlined in this report, to reduce the likely impacts on these identified heritage resources.

It is recommended that the proposed Mareetsane Solar PV Facility proceeds from a heritage point of view with the acceptance of the conditions stated in Sections 8, 9 and 10 of this report.

It is advised that, in the event that new evidence of heritage, historical or archaeological resources are unearthed during the establishment of the solar facility and/or the installation of the powerline along the preferred route, work must stop immediately, pending investigation by a heritage professional identified by the relevant heritage authority. The table below summarises the development constraints from a heritage point of view.

Heritage Feature	Distance from proposed development & impact	Location	No of graves and age / Age of structure	Risk Level before mitigation	SAHRA Permit Required	Proposed mitigation measure	Risk Level after mitigation
Grave Site 1	13 m west of the western boundary of the solar facility site – negative impact	26°13'41.8"S; 25°21'11.8"E	4 graves – all less than 60 years old	High	Yes, if the intension is to exhume the graves	<p>The footprint of the solar facility should be located such that a buffer of at least 20 m exists between the footprint of the solar facility and the outer edge of the grave site. Then fence off the grave site with palisade fencing.</p> <p>Access to the grave site by the construction crew must be prohibited.</p> <p>Ensure that during the operational phase, if water is used to clean the solar panels the water is directed away from the graves to avoid erosion at the grave site.</p> <p>If the footprint of the solar facility cannot be shifted, the graves that are older than 60 years will need to be relocated through SAHRA's grave relocation policy and permit application. This will constitute a Phase II Heritage Impact Assessment (HIA) to be undertaken by an archaeologist.</p> <p>The provisions of the Human Tissue Act, 1983 (Act No. 65 of 1983) as amended, as well as the regulations (22 May 2013) relating to the management of human remains under the National Health Act, 2003 (Act No. 61 of 2003) take precedence when graves are younger than 60 years.</p>	Low
Grave Site 2	This grave site occurs within the solar facility site	26°13'43.5"S; 25°21'29.2"E	At least 5 graves of undetermined	High	Yes	Relocate the graves older than 60 years through SAHRA's grave relocation policy	Low

	– negative impact		age			and permit application. This will constitute a Phase II HIA to be undertaken by an archaeologist. The provisions of the Human Tissue Act, 1983 (Act No. 65 of 1983) as amended, as well as the regulations (22 May 2013) relating to the management of human remains under the National Health Act, 2003 (Act No. 61 of 2003) take precedence once affected graves are younger than 60 years.	
Grave Site 3	This grave site occurs within the solar facility site – negative impact	26°13'47.9"S; 25°21'37.6"E	1 grave in sitting position – undetermined age	High	Yes	Relocate the graves older than 60 years through SAHRA's grave relocation policy and permit application. This will constitute a Phase II HIA to be undertaken by an archaeologist. The provisions of the Human Tissue Act, 1983 (Act No. 65 of 1983) as amended, as well as the regulations (22 May 2013) relating to the management of human remains under the National Health Act, 2003 (Act No. 61 of 2003) take precedence once affected graves are younger than 60 years.	Low
Grave Site 4	About 6 m south-east of the northern boundary of the solar facility site – negative impact	26°13'41.6"S; 25°21'57.3"E	Over 5 graves of undetermined age	High	Yes if the intension is to relocate the graves	The footprint of the solar facility should be located such that a buffer of at least 20 m exists between the footprint of the solar facility and the outer edge of the grave site. Then fence off the grave site with palisade fencing. Access to the grave site by the construction crew must be prohibited. Ensure that during the operational phase, if water is used to clean the solar panels the water is directed away from the	Low

						<p>graves to avoid erosion at the grave site.</p> <p>If the footprint of the solar facility cannot be shifted, the graves that are older than 60 years will need to be relocated through SAHRA's grave relocation policy and permit application. This will constitute a Phase II Heritage Impact Assessment (HIA) to be undertaken by an archaeologist.</p> <p>The provisions of the Human Tissue Act, 1983 (Act No. 65 of 1983) as amended, as well as the regulations (22 May 2013) relating to the management of human remains under the National Health Act, 2003 (Act No. 61 of 2003) take precedence once affected graves are younger than 60 years.</p>	
Grave Site 5	137 m north east of the eastern boundary of the solar facility – no impact	26°13'51.4"S; 25°22'08.3"E	At least 16 graves of undermined age	Low	No	None	Low
Grave Site 6	114 m south of Powerline Route Alternative C	26°07'46.4"S; 25°22'57.7"E	At least 13 graves of undetermined age	Low	No	None	Low
Grave Site 7	66 m west – Powerline Route Alternative B – no impact	26°09'38.3"S; 25°24'11.5"E	About 4 graves of undetermined age	Low	No	None	Low
Grave Site 8	15 m east of Powerline Route Alternative A – the grave site is located within the servitude - negative impact	26°12'05.9"S; 25°15'09.9"E	11 graves – all inscribed (some older and some less than 60 years old)	High	No	<p>The grave site is fenced off already –so ensure the following:</p> <p>Reroute the powerline (Route A) such that at least a 20 m buffer exists between the graves and the outer edge of the servitude.</p> <p>No construction equipment should be placed within 20 m from graves</p>	Low

						<p>Access to the grave site by the construction crew must be prohibited.</p> <p>If the powerline cannot be rerouted, the grave site will need to be relocated following SAHRA's grave relocation policy and permitting procedure. This process will constitute a Phase II HIA to be undertaken by an archaeologist</p>	
Grave Site 9	1 m east of Powerline Route Alternative A – Negative impact	26°11'49.9"S; 25°15'03.5"E	About 15 graves of undetermined age	Very High	Yes if the intention is to exhume the graves	<p>Shift the powerline (Route A) such that there is a 20 m buffer from the outer edge of the grave site to the outer edge of the servitude and fence off the site with palisade fencing for ease of identification by construction crew and ensure the following:</p> <p>Access to the grave site by the construction crew must be prohibited.</p> <p>If the powerline cannot be shifted, a permit application to relocate graves should be lodged with the SAHRA. This will constitute a Phase II HIA undertaken by an Archaeologist</p>	Low
Grave Site 10	114 m south of Powerline Route A – No impact	26°13'39.2"S; 25°19'27.7"E	4 graves some of which are over 60 years old	Low	No	None	Low

ACRONYMS AND ABBREVIATIONS

EIAge	Early Iron Age
ESA	Early Stone Age
GPS	Geographic Positioning System
HIA	Heritage Impact Assessment
KPEVC	Kgatelopele Private Equity and Venture Capital (Pty) Ltd
LIA	Late Iron Age
LSA	Later Stone Age
MW	megawatt
MIA	Middle Iron Age
MSA	Middle Stone Age
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
PV	Photo voltaic
SAHRA	South African Heritage Resources Agency
SAHRA BGG	SAHRA Burial Grounds and Graves Unit
SEF	Strategic Environmental Focus (Pty) Ltd
S&EIR	Scoping and Environmental Impact Reporting

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1 INTRODUCTION

Strategic Environmental Focus (Pty) Ltd (SEF) was commissioned by Kgatelopele Private Equity and Venture Capital (Pty) Ltd (KPEVC) to undertake a Heritage Impact Assessment (HIA) for the proposed Mareetsane Batho-Batho Solar photo voltaic (PV) Facility and associated powerline. This HIA was carried out in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and it is based on the requirements of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). This HIA is a specialist study that forms part of the Scoping and Environmental Impact Reporting (S&EIR) process for the proposed development.

The purpose of the HIA investigation is to assess the impacts that the proposed solar facility and powerline route alternatives may have on identified heritage resources and focuses on the site proposed for the establishment of the solar facility and the powerline route alternatives for both the construction and the operational phases of the solar facility. The corridor/servitude for the proposed 88 kV powerlines would be to 40m (i.e. 20 m on either side of the centre line). It is assumed the impact of construction will be restricted to the powerline servitude/ corridor. However, during the survey, a wider corridor of 150m on either side of the powerline routes was investigated.

According to Section 3 (2) of the NHRA, the heritage resources of South Africa include:

- a) *“places, buildings, structures and equipment of cultural significance;*
- b) *places to which oral traditions are attached or which are associated with living heritage;*
- c) *historical settlements and townscapes;*
- d) *landscapes and natural features of cultural significance;*
- e) *geological sites of scientific or cultural importance;*
- f) *archaeological and palaeontological sites;*
- g) *graves and burial grounds, including-*
 - i. *ancestral graves;*
 - ii. *royal graves and graves of traditional leaders;*
 - iii. *graves of victims of conflict;*
 - iv. *graves of individuals designated by the Minister by notice in the Gazette;*
 - v. *historical graves and cemeteries; and*
 - vi. *other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);*
- h) *sites of significance relating to the history of slavery in South Africa;*
- i) *movable objects, including-*
 - i. *objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;*

- ii. *objects to which oral traditions are attached or which are associated with living heritage;*
- iii. *ethnographic art and objects;*
- iv. *military objects;*
- v. *objects of decorative or fine art;*
- vi. *objects of scientific or technological interest; and*
- vii. *books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996)."*

In terms of Section 3 (3) of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of:

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

The main aim of the investigation was to identify, verify and analyse heritage resources and to recommend how to manage them within the context of the proposed solar facility and associated powerline. The terms of reference included:

- Identifying and analysing heritage places, objects, buildings, structures, graves etc.;
- Assessing broad cultural significance of identified sites, places, buildings, structures, graves and objects within the study area;
- Surveying and mapping of significance/sensitivity issues and opportunity/constraint issues;
- Reviewing of the general compatibility of the proposed solar facility and associated activities with heritage policy planning frameworks;

- Undertaking a preliminary assessment of the acceptability of the proposed establishment of the solar facility and associated powerline from a heritage perspective;
- Identifying the need for alternatives, if necessary; and
- Recommending appropriate management measures to conserve significant heritage elements and reduce the impact on heritage resources.

2. BACKGROUND INFORMATION TO THE PROJECT

Table 1: Background Information

Consultant:	Mamoluoane Seliane
Type of development:	Establishment of a solar facility and associated 88 kV powerline
Rezoning or subdivision:	Rezoning for the solar facility (i.e. change in land use)
Terms of reference	Phase 1 HIA
Legislative requirements:	The HIA was carried out in terms of the NEMA, and following the requirements of the NHRA.

2.1 Details of the study area

KPEVC are proposing to establish a solar facility with maximum generation capacity of 30 megawatt (MW). The proposed site falls within parent portion of the Setlagoli Native Reserve. The solar facility site is approximately 140 ha in extent. The solar facility will be connected to the National Grid via an overhead powerline to one of the two existing nearby Eskom substations (Figure 1).

Current Land-use

The site earmarked for the Mareetsane Batho-Batho Solar PV Facility project is largely vacant, with random cattle grazing.

2.2 Locational Data

- Province: North West
- District Municipality: Ngaka Modiri Molema
- Local Municipality: Ratlou
- General Coordinates: Solar Facility: 26°13'51.17"S; 25°21'34.54"E

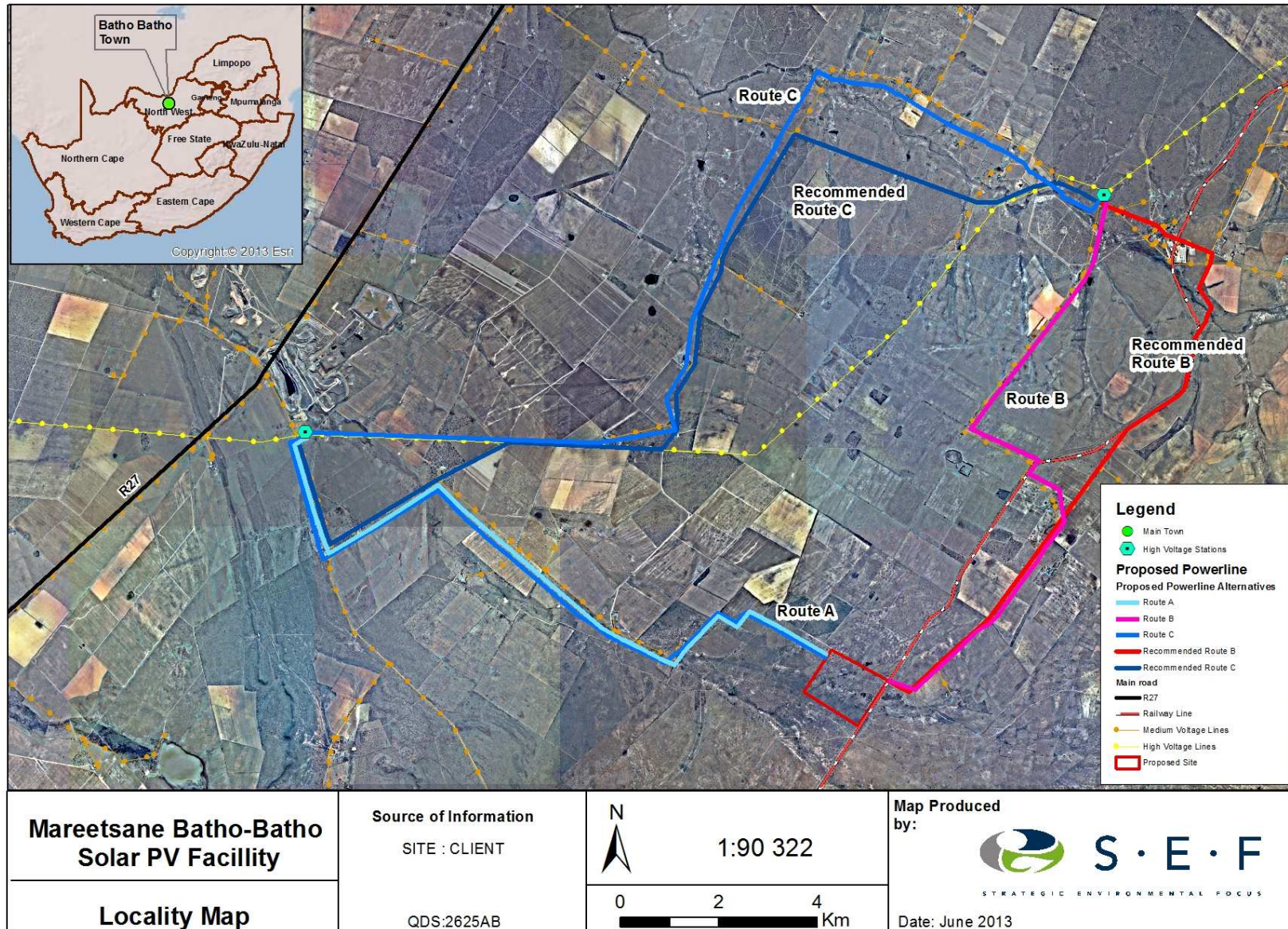


Figure 1: Locality Map for the proposed Mareetsane Solar PV Facility and associated powerline route alternatives

3 BACKGROUND INFORMATION OF THE SURVEY

3.1 Methodology

3.1.1 Details of the site visit

The site visit for the proposed Mareetsane Solar PV Facility was conducted over two visits: 9 – 10 April and 21 – 22 May 2013. The survey was undertaken by means of walking and driving throughout the study area to:

- Search for, locate and identify objects and structures of heritage and/or archaeological significance in accordance with accepted archaeological practices;
- Document all heritage/ archaeological sites, objects and structures according to minimum standards and procedures accepted by the archaeological profession; and
- A corridor of about 150m on either side of the centre line of the proposed powerline route alternatives was investigated to accommodate possible realignment to accommodate heritage resources/ other sensitivities. The proposed powerline servitude will be approximately 40m in total. It is assumed the impact of construction will be restricted to the powerline servitude/ corridor.

3.1.2 Literature Review

A brief literature review pertaining to the prehistory of the North West Province was undertaken.

3.2 Restrictions to the survey

3.2.1 Visibility

Visibility varied across the solar facility site as well as along the proposed powerline route alternatives. Some areas were thickly vegetated and access could not be gained. This resulted in difficulty in the identification of heritage resources especially graves (Plate 1).

3.2.2 Disturbance

There is no disturbance of any potential archaeological stratigraphy noted.

3.3 Details of the equipment used in the survey

- Geographic Positioning System (GPS): Garmin eTrek Camo; and
- Digital cameras: Canon Powershot A460.

All readings were taken using the GPS. Accuracy was to a margin of error of 4 m.



Plate 1: Thick vegetation found on the solar facility site (difficult for graves to be identified).

4 BRIEF ARCHAEOLOGICAL HISTORY OF THE NORTH WEST PROVINCE

4.1 Stone Age

The North West Province's prehistory dates back to more than 3 million years ago. Evidence for this was revealed at major hominid fossil sites such as Taung Heritage Site and the Cradle of Humankind. The Cradle of Humankind sites are mainly in the Gauteng Province but extend into the North West Province. The scientific importance of the lime fossil sites and their incredible contribution to the understanding of human evolution has led to their being proclaimed of World Heritage Status. At the Taung Heritage Site, a fossil skull of a child belonging to the species 'Australopithecus africanus' was discovered by Prof Dart in 1924 (Garth 1974). This skull was thought to belong to a human ancestor who lived 2.4 million years ago. The adult counterpart of the same species, known as 'Mrs Ples' was found in Skerfontein in the Cradle of Humankind Site in 1947. Another hominid fossil found in the Cradle, named 'Little Foot'

was dated to about 4.1 million years. This hominid fossil also belongs to the genus 'Australopithecine' (Kuykendall 2007).

Stone tool technology is evident in parts of the North West as well as in the Cradle. This technology spans from the Early Stone Age (ESA) throughout to the Late Stone Age (LSA). The ESA tools were manufactured using simple, primitive knapping techniques. The Oldowan and Acheulean Tool Industries fall within the ESA period dating to between over 2 million years (possibly earlier) to about 250 000 years ago. ESA tools include cores, choppers, cleavers, discoids and hand axes, which were generally crudely made (Garth 1974).

The Middle Stone Age (MSA) (250 000 – 40 000 years ago) is associated with the emergence of modern humans and this saw the manufacture of a diverse range and more sophisticated tools, especially towards the end of the period). However, archaic *Homo sapiens* may also have produced MSA tools. Notably, the MSA was the period during which a new knapping technique, known as the Levallois technique, was developed. This was a technique whereby many more flakes of predetermined shape and size were produced with first carefully preparing the core. MSA tools include tools flakes, blades, scrapers and tools hafted on wood as spears such as segments (Wadley 2007).

The Later Stone Age (LSA) dating to about 40 000 to 2000 years ago and possibly beyond), is a period signalled by social transformation and technological innovation. This period saw the emergence of microlithic tool types such as adzes for cutting wood, backed tools, blades, segments and trapezoids (Wadley 2007). Also part of the Later Stone Age period is the rich rock art legacy in the province. These include the famous Bosworth Rock Engraving site near Klerksdorp and the Thaba Sione near Mafikeng. Thaba Sione consists of more than 559 rock engravings, with especially predominant depictions of rhinoceros¹

4.2 Iron Age

The Iron Age (IA) in Southern Africa is marked by the arrival of the agro-pastoralists in the region at around 2000 years ago (Huffman 2007). The North West Province is one of the richest provinces in Iron Age Archaeology in South Africa. Extensive stone walling complexes are visible on aerial photographs depicting various settlement sites in this province. Stone walling is the most visible sign of agro-pastoral settlement on the landscape. The settlement pattern of the stone walls can be used in the reconstruction of the social organization, spatial organization and specific worldviews of the people that constructed them (Pistorius 1994).

The Iron Age period has been divided into Early Iron Age (EIA) (AD 200 – 900), Middle Iron Age (MIA) (900 – 1300 AD) and Late Iron Age (LIA) (AD 1300 – 1820).

¹ www.tourismnorthwest.co.za

EIA sites such as Diamant Farm have been located in the Soutpansberg. Klein Africa and Happy Rest ceramics have been recovered from those sites in the Soutpansberg. LIA settlements are however, the most common in the North West Province. Kaditshwene, in the Madikwe area, is the largest Iron Age stone-built city in South Africa. In 1820 this city was larger than Cape Town. It was the manufacturing, trading and cultural capital of the Bahurutshe from before 1600 to 1823. Molokwane, is a 17th century Tswana stone walled settlement of the Bakwena Bamodisosana Bammatau in the Rustenburg district (Pistorius 1994). Marothodi is another town in the Pilanesburg area which has evidence for metal production and was occupied between 1815 and 1823 by the Batlokwa (Hall et al. 2006). A Tlhaping town known as Dithakong with massive stone walling is also found in the North West Province. In 1802 Dithakong, which now falls in the North-West Province was visited by Burchell who documented that it was then the size of Cape Town (Maggs 1990). The Tswana town of Khunwana was the Barolong capital between 1820's and 1830's and the site of two battles of Difaqane in 1823 and 1832. On 6 August 1832, the town was attacked by Mzilikazi's Ndebele, thus precipitating the Barolong migrations **Error! Bookmark not defined..** Sol Plaatjie based his novel, Mhudi, on this event (Plaatje 1930). Most of these Tswana towns were abandoned and destroyed during the Difaqane.

5 DESCRIPTION OF THE STUDY AREA HERITAGE

The investigation revealed the following heritage resources:

- 10 Grave Sites (Figure 2).

These grave sites are discussed below in detail, followed by a summary table highlighting the construction constraints and opportunities as well as the author's recommended mitigation measures.

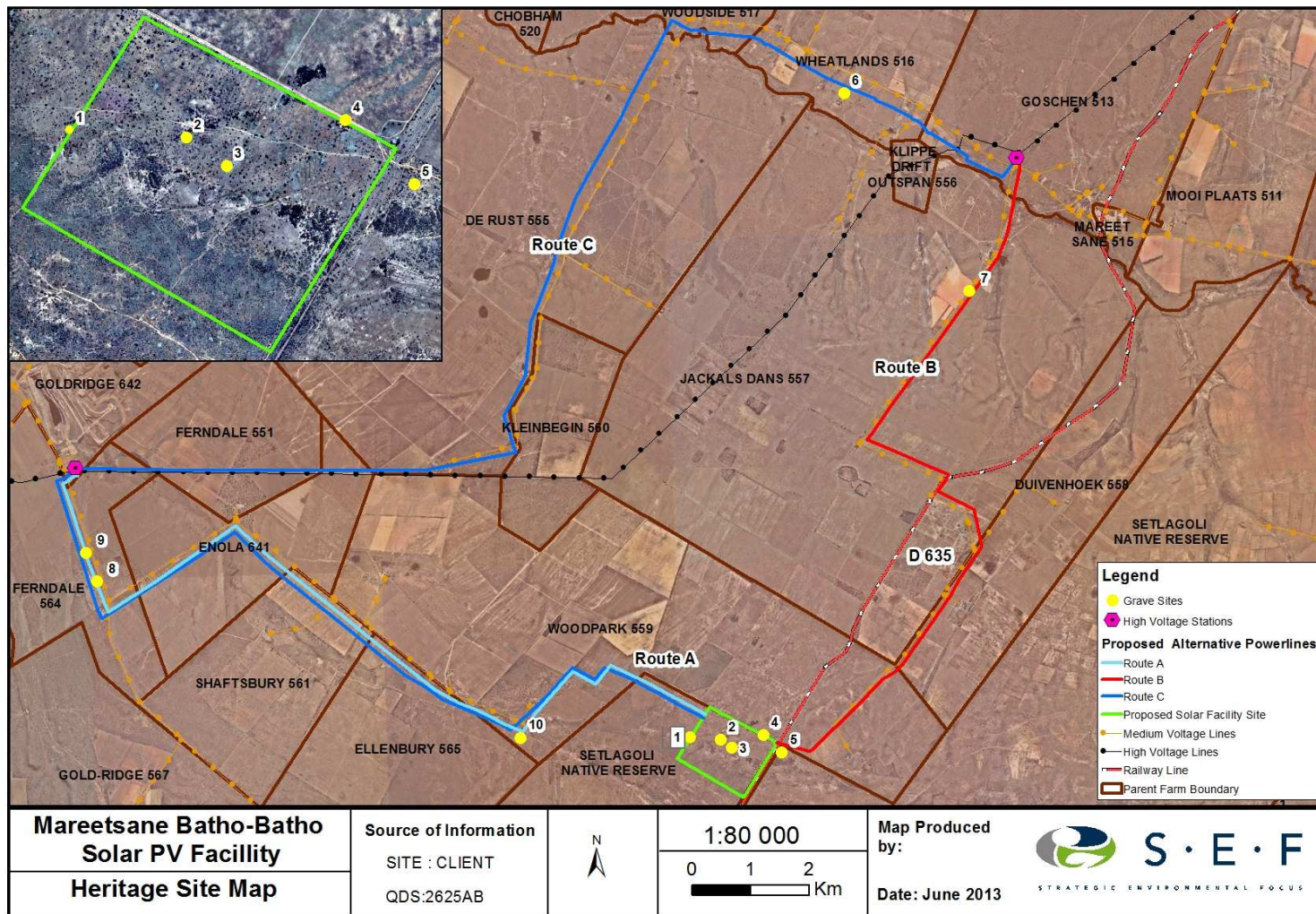


Figure 2: Grave Sites identified at the proposed Mareetsane Solar PV Facility site and the associated powerline route alternatives

5.1 Description of the grave sites observed

The majority of the graves identified on the solar facility site are ancestral graves belonging to families who lived on the native reserve in the past and have relocated elsewhere in the surrounding places, which made it impossible for the author to have had any contact with the direct relatives during the investigation. Most of the graves have no inscriptions, and the age and the name of the deceased cannot be known.

5.1.1 Grave Site 1

This Grave Site is located at 26°13'41.8"S; 25°21'11.8"E (Plate 2). The site contains four (4) graves. Some of the graves do have head stones and are inscribed. All graves are younger than 60 years. This site is located about 13m west of the western boundary of the solar facility site. This site will be impacted upon by the proposed installation of the solar facility as it occurs less than 20m away from the edge of the proposed developmental boundary. The following mitigation measures are proposed:

- The footprint of the solar facility should be located such that a buffer of at least 20 m exists between the footprint of the solar facility and the outer edge of the grave site.
- Fence off the grave site with palisade fencing.
- If the solar facility cannot be shifted due to other sensitivity elements, the graves older than 60 years or of an unknown age, will need to be relocated through SAHRA's grave relocation policy and permit application. This will constitute a Phase II HIA to be undertaken by an archaeologist.
- The provisions of the Human Tissue Act, 1983 (Act No. 65 of 1983) as amended, as well as the regulations (22 May 2013) relating to the management of human remains under the National Health Act, 2003 (Act No. 61 of 2003) take precedence if affected graves are younger than 60 years.



Plate 2: Grave Site 1

5.1.2 Grave Site 2

This grave site is located at approximately 26°13'43.5"S; 25°21'29.2"E (Plate 3). There are about five (5) graves at this site. All of the graves do not have inscriptions and therefore their ages are unknown. An informant, by the name of Oneleng Mogodu, indicated that these graves belonged to ancestors of the Mogodu Family. The grave site occurs within the proposed solar site. This site will be impacted upon negatively by the proposed establishment of the solar facility. The following mitigation measure is proposed:

- If the graves are older than 60 years or of an undetermined age, relocate the graves through SAHRA's grave relocation policy and permit application. This will constitute a Phase II HIA to be undertaken by an archaeologist. If the graves are younger than 60 years, relocate that graves following the provisions of the Human Tissue Act, 1983 (Act No. 65 of 1983) as amended and the regulations (22 May 2013) relating to the management of human remains under the National Health Act, 2003 (Act No. 61 of 2003).



Plate 3: Grave Site 2

5.1.3 Grave Site 3

This grave site is located at approximately 26°13'47.9"S; 25°21'37.6"E (Plate 4). There is only one (1) grave at this site belonging to the Mogodu Family. The remains are buried in a sitting position according to the informant Oneleng Mogodu. This site occurs within the proposed solar facility site. This site will be impacted upon negatively by the proposed establishment of the solar facility. The following mitigation measure is proposed:

If the grave is older than 60 years or of an undetermined age, relocate the graves through SAHRA's grave relocation policy and permit application. This will constitute a Phase II HIA to be undertaken by an archaeologist. If the graves are younger than 60 years, relocate that graves following the provisions of the Human Tissue Act, 1983 (Act No. 65 of 1983) as amended and the regulations (22 May 2013) relating to the management of human remains under the National Health Act, 2003 (Act No. 61 of 2003).



Plate 4: Grave Site 3

5.1.4 Grave Site 4

This grave site is located at approximately 26°13'41.6"S; 25°21'57.3"E (Plate 5). There are over five (5) graves of undetermined age at this site. The informant Mr Mogodu believes that the graves belong to the Modise Family. None of them have inscriptions so their age is unknown. The grave site is located 6m south-west of the northern boundary of the solar facility site. This site will be impacted upon negatively by the establishment of the solar facility if the footprint of the solar facility is located less than 20 m from the outer edge of the grave site. The following mitigation measures are proposed:

- The footprint of the solar facility should be located such that a buffer of at least 20 m exists between the footprint of the solar facility and the outer edge of the grave site.
- Fence off the grave site with palisade fencing.
- If the solar facility cannot be shifted, the graves older than 60 years or of an unknown age will need to be relocated through SAHRA's grave relocation policy and permit application. This will constitute a Phase II HIA to be undertaken by an archaeologist.
- The provisions of the Human Tissue Act, 1983 (Act No. 65 of 1983) as amended, as well as the regulations (22 May 2013) relating to the management of human remains under the National Health Act, 2003 (Act No. 61 of 2003) take precedence once affected graves are younger than 60 years.



Plate 5: Grave Site 4

5.1.5 Grave Site 5

This grave site is located at approximately 26°13'51.4"S; 25°22'08.3"E (Plate 6). This grave site contains at least sixteen (16) graves. The grave site is located approximately 137m south of the proposed powerline route alternative B. Hence this site will not be impacted upon negatively by the proposed powerline. Likewise, this grave site will not be impacted upon by the establishment of the solar facility as it is approximately 156m north-east of the eastern boundary of the proposed solar facility site.

5.1.6 Grave Site 6

This grave site is located at approximately 26°07'46.4"S; 25°22'57.7"E (Plate 7). There are at least thirteen (13) graves at this site. The grave site is situated at about 114 m south of the powerline route alternative C. This grave site will not be impacted upon by the installation of the proposed powerline as it occurs over 20 m from the outer edge of the proposed servitude for the powerline. Hence no further mitigation measures are required.



Plate 6: Grave Site 5



Plate 7: Grave Site 6

5.1.7 Grave Site 7

This grave site is located at approximately 26°09'38.3"S; 25°24'11.5"E (Plate 8). There are about four (4) graves at this site. The grave site is situated at about 66m west of the proposed powerline route alternative B. This grave site will not be impacted upon by the installation of the proposed powerline. Hence no further mitigation measures are required.



Plate 8: Grave Site 7

5.1.8 Grave Site 8

This grave site is located at approximately 26°12'05.9"S; 25°15'09.9"E (Plate 9). There are about eleven (11) graves at this site. Some of the graves are older and others are younger than 60 years. The grave site is situated at about 15m east of the proposed powerline alternative route A. This grave site will be impacted upon by the installation of the proposed powerline as it is located within the servitude of the proposed powerline. The following mitigation measures are proposed:

- Reroute the powerline alternative route A such that at least a 20 m buffer exists between the graves and the outer edge of the servitude.
- There is an existing fence around the graves at about 2m from the graves. Hence there will be no barrier marking the 20m buffer, so no construction equipment should be placed within 20m from the graves.

- If the powerline cannot be rerouted, the graves older than 60 years or of an unknown age, will need to be relocated through SAHRA's grave relocation policy and permit application. This will constitute a Phase II HIA to be undertaken by an archaeologist.
- The provisions of the Human Tissue Act, 1983 (Act No. 65 of 1983) as amended, as well as the regulations (22 May 2013) relating to the management of human remains under the National Health Act, 2003 (Act No. 61 of 2003) take precedence once affected graves are younger than 60 years.



Plate 9: Grave Site 8

5.1.9 Grave Site 9

This grave site is located at approximately 26°11'49.9"S; 25°15'03.5"E (Plate 10). There are about fifteen (15) graves with no inscriptions at this site. The grave site is situated at 1m east of the proposed powerline alternative route A. This grave site will be impacted upon negatively by the installation of the proposed powerline as it is located within the servitude of the proposed powerline. The following mitigation measures are proposed:

- Reroute the powerline alternative route A such that at least a 20m buffer exists between the graves and the outer edge of the servitude.
- Fence off the grave site.
- If the powerline cannot be rerouted, the graves older than 60 years or of an unknown age, will need to be relocated through SAHRA's grave relocation policy

- and permit application. This will constitute a Phase II HIA to be undertaken by an archaeologist.
- The provisions of the Human Tissue Act, 1983 (Act No. 65 of 1983) as amended, as well as the regulations (22 May 2013) relating to the management of human remains under the National Health Act, 2003 (Act No. 61 of 2003) take precedence once affected graves are younger than 60 years.



Plate 10: Grave Site 9

5.1.10 Grave Site 10

This grave site is located at approximately 26°13'39.2"S; 25°19'27.7"E (Plate 11). There are about four (4) graves at this site. The grave site is situated at about 114m south of the proposed powerline alternative route A. This grave site will not be impacted upon by the installation of the proposed powerline. Hence no further mitigation measures are required.



Plate 11: Grave Site 10

Table 2: Summary of construction/development constraints/opportunities for the solar facility and the associated powerline from a heritage point of view

Heritage Feature	Distance from proposed development & impact	Location	No of graves and age / Age of structure	Risk Level before mitigation	SAHRA Permit Required	Proposed mitigation measure	Risk Level after mitigation
Grave Site 1	13 m west of the western boundary of the solar facility site – negative impact	26°13'41.8"S; 25°21'11.8"E	4 graves – all less than 60 years old	High	Yes, if the intension is to exhume the graves	<p>The footprint of the solar facility should be located such that a buffer of at least 20 m exists between the footprint of the solar facility and the outer edge of the grave site. Then fence off the grave site with palisade fencing.</p> <p>Access to the grave site by the construction crew must be prohibited.</p> <p>Ensure that during the operational phase, if water is used to clean the solar panels the water is directed away from the graves to avoid erosion at the grave site.</p> <p>If the footprint of the solar facility cannot be shifted, the graves that are older than 60 years will need to be relocated through SAHRA's grave relocation policy and permit application. This will constitute a Phase II Heritage Impact Assessment (HIA) to be undertaken by an archaeologist.</p> <p>The provisions of the Human Tissue Act, 1983 (Act No. 65 of 1983) as amended, as well as the regulations (22 May 2013) relating to the management of human remains under the National Health Act, 2003 (Act No. 61 of 2003) take precedence when graves are younger than 60 years.</p>	Low

Grave Site 2	This grave site occurs within the solar facility site – negative impact	26°13'43.5"S; 25°21'29.2"E	At least 5 graves of undetermined age	High	Yes	Relocate the graves older than 60 years through SAHRA's grave relocation policy and permit application. This will constitute a Phase II HIA to be undertaken by an archaeologist. The provisions of the Human Tissue Act, 1983 (Act No. 65 of 1983) as amended, as well as the regulations (22 May 2013) relating to the management of human remains under the National Health Act, 2003 (Act No. 61 of 2003) take precedence once affected graves are younger than 60 years.	Low
Grave Site 3	This grave site occurs within the solar facility site – negative impact	26°13'47.9"S; 25°21'37.6"E	1 grave in sitting position – undetermined age	High	Yes	Relocate the graves older than 60 years through SAHRA's grave relocation policy and permit application. This will constitute a Phase II HIA to be undertaken by an archaeologist. The provisions of the Human Tissue Act, 1983 (Act No. 65 of 1983) as amended, as well as the regulations (22 May 2013) relating to the management of human remains under the National Health Act, 2003 (Act No. 61 of 2003) take precedence once affected graves are younger than 60 years.	Low
Grave Site 4	About 6 m south-east of the northern boundary of the solar facility site – negative impact	26°13'41.6"S; 25°21'57.3"E	Over 5 graves of undetermined age	High	Yes if the intension is to relocate the graves	The footprint of the solar facility should be located such that a buffer of at least 20 m exists between the footprint of the solar facility and the outer edge of the grave site. Then fence off the grave site with palisade fencing. Access to the grave site by the construction crew must be prohibited.	Low

						<p>Ensure that during the operational phase, if water is used to clean the solar panels the water is directed away from the graves to avoid erosion at the grave site.</p> <p>If the footprint of the solar facility cannot be shifted, the graves that are older than 60 years will need to be relocated through SAHRA's grave relocation policy and permit application. This will constitute a Phase II Heritage Impact Assessment (HIA) to be undertaken by an archaeologist.</p> <p>The provisions of the Human Tissue Act, 1983 (Act No. 65 of 1983) as amended, as well as the regulations (22 May 2013) relating to the management of human remains under the National Health Act, 2003 (Act No. 61 of 2003) take precedence once affected graves are younger than 60 years.</p>	
Grave Site 5	137 m north east of the eastern boundary of the solar facility – no impact	26°13'51.4"S; 25°22'08.3"E	At least 16 graves of undermined age	Low	No	None	Low
Grave Site 6	114 m south of Powerline Route Alternative C	26°07'46.4"S; 25°22'57.7"E	At least 13 graves of undetermined age	Low	No	None	Low
Grave Site 7	66 m west – Powerline Route Alternative B – no impact	26°09'38.3"S; 25°24'11.5"E	About 4 graves of undetermined age	Low	No	None	Low
Grave Site 8	15 m east of Powerline Route Alternative A – the grave site is located within the servitude - negative impact	26°12'05.9"S; 25°15'09.9"E	11 graves – all inscribed (some older and some less than 60 years old)	High	No	<p>The grave site is fenced off already –so ensure the following:</p> <p>Reroute the powerline (Route A) such that at least a 20 m buffer exists between the graves and the outer edge of the servitude.</p>	Low

						<p>No construction equipment should be placed within 20 m from graves</p> <p>Access to the grave site by the construction crew must be prohibited.</p> <p>If the powerline cannot be rerouted, the grave site will need to be relocated following SAHRA's grave relocation policy and permitting procedure. This process will constitute a Phase II HIA to be undertaken by an archaeologist</p>	
Grave Site 9	1 m east of Powerline Route Alternative A – Negative impact	26°11'49.9"S; 25°15'03.5"E	About 15 graves of undetermined age	Very High	Yes if the intention is to exhume the graves	<p>Shift the powerline (Route A) such that there is a 20 m buffer from the outer edge of the grave site to the outer edge of the servitude and fence off the site with palisade fencing for ease of identification by construction crew and ensure the following:</p> <p>Access to the grave site by the construction crew must be prohibited.</p> <p>If the powerline cannot be shifted, a permit application to relocate graves should be lodged with the SAHRA. This will constitute a Phase II HIA undertaken by an Archaeologist</p>	Low
Grave Site 10	114 m south of Powerline Route A – No impact	26°13'39.2"S; 25°19'27.7"E	4 graves some of which are over 60 years old	Low	No	None	Low

Notes

- **During the construction/installation phase** of the proposed project, the proposed **mitigation** measures should be applied to all the grave sites **that occur less than 20 m to the edge of the construction/development boundary of the solar facility as well as**

to those graves occurring on the servitude or less than 20 m from the edge of the servitude for the proposed powerline route alternative as stated in the table above.

- SAHRA's grave relocation policy is presented in Appendix 1;
- The SAHRA's permitting procedure is presented in Appendix 2
- The average time required for grave relocation is about six (6) months;
- Permit applications for grave exhumation and relocation are lodged with SAHRA's Burial Grounds and Graves Unit (BGG) in Pretoria; and
- The permitting application is facilitated by an independent heritage consultant.

6 STATEMENT OF SIGNIFICANCE

The statement of significance outlines the principal value that a site or object holds to a community or sections of a community. The significance of the graves is determined using the following rating and grading (Table 3) as recommended by SAHRA (2005).

6.1 Significance of the graves

In terms of Section 3 (3) of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of: “*its importance in the community...*” The identified graves are ancestral graves that belong to the communities and relatives whose members were once farm workers or lived on farmlands and are regarded as of high to medium significance in terms of the SAHRA’s (2005) recommended field rating for sites. As observed during the investigation and as indicated by the informant, some graves could be older than 60 years. The NHRA protects graves older than 60 years. However, the Human Tissue Act, 1983 (Act No. 65 of 1983) and the National Health Act, 2003 (Act No. 61 of 2003) take precedence whenever graves are younger than 60 years. The age of the majority of the identified graves is not known as most graves were not inscribed and the relatives are not known.

The SAHRA has a policy for the relocation of graves older than 60 years (Appendix 1). This process would be employed if the grave(s) are of an undetermined age or are older than 60 years and if the proposed project intends to disturb the graves. A permit would have to be applied for from SAHRA. However, if the project does not intend to disturb the grave, risk preventative measures must be employed during construction as provided in Section 10 of this report.

Table 3: Field rating and recommended grading of sites (SAHRA 2005)

Level	Details	Action
National (Grade I)	The site is considered to be of National Significance	Nominated to be declared by SAHRA
Provincial (Grade II)	This site is considered to be of Provincial significance	Nominated to be declared by Provincial Heritage Authority
Local Grade IIIA	This site is considered to be of HIGH significance locally	The site should be retained as a heritage site
Local Grade IIIB	This site is considered to be of HIGH significance locally	Mitigation necessary, and part retained as a heritage site
Generally Protected A	High to medium significance	Mitigation necessary before destruction
Generally Protected B	Medium significance	The site needs to be recorded before destruction
Generally Protected C	Low significance	No further recording is required before destruction

7 PREFERRED ROUTE DETERMINATION

Three powerline route alternatives have been suggested for connecting the solar facility to the National Grid, i.e. Alternative route A, B or C. Since there are no significant heritage resources occurring within 20m (i.e. which would be negatively impacted upon) of the outer edge of the proposed powerline route alternative B and C corridors, both of these alternative routes are equally preferred from a heritage perspective. Powerline route alternative A is not preferred as two grave sites (Grave Site 8 and 9) are located within 20m of the proposed powerline corridor.

8 MITIGATION MEASURES

Two options are suggested as mitigation measures:

- To shift the entire solar facility site in order to create a 20m buffer around grave sites to the outer edge of the construction/development boundary; or
- To ensure that all grave sites are buffered with 20m from the construction/development footprint and are appropriately fenced to ensure access is restricted; and
- To reroute the powerlines in order to create a 20m buffer around grave sites to the outer edge of the proposed corridor/ servitude.

If shifting the solar facility site or rerouting the powerlines is not an option, then it is recommended that the affected graves be relocated. The relocation processes would involve SAHRA permit applications.

9 RECOMMENDATIONS

It is recommended that the proposed Mareetsane Solar PV Facility and associated infrastructure (i.e. powerline) proceed from a heritage point of view, with acceptance of the following conditions:

- Construction activities should be limited to the proposed development boundary for the solar facility site and to the servitude for the proposed powerline. If the size of the footprint, its orientation or the construction corridors/servitude of the powerline is increased at a later stage, a heritage specialist should be consulted in order to assess how the changes may affect heritage resources.
- The footprint of the solar facility site must be shifted around such that there is a 20 m buffer from significant heritage resources (i.e. the identified graves) to the outer edge of the construction / development boundary.
- The footprint of the solar facility and the powerline servitude must allow a buffer of at least 20m to all grave sites. If it is not possible due to other sensitivity elements to accommodate the 20m buffer around graves, construction and/or

- operational activities will impact grave sites located less than 20m negatively. Hence permits will be required for the relocation of such grave sites.
- Access by the construction crew must be prohibited and the relatives of the deceased must be allowed access as and when they would like to visit the grave site.
 - Access during both the establishment and operational phases to the fenced graves sites by their relatives must always be granted.

10 RISK PREVENTATIVE MEASURES ASSOCIATED WITH CONSTRUCTION

Archaeological material, by its very nature, occurs below ground. The developer should therefore keep in mind that archaeological sites, including graves, might be exposed during the construction work. If anything is noticed, work in that area should be stopped and the occurrence should immediately be reported to SAHRA at 021 462 4502 or a museum, preferably one at which an archaeologist is available. The find should then be investigated and evaluated by the archaeologist, who will provide recommendations on when construction activities in the area where the discovery was made can resume.

11 CONCLUSION

The heritage survey for the proposed Mareetsane Solar PV Facility revealed 10 grave sites. Although some grave sites appear to be within the proposed site and powerline corridors, with the implementation of the suggested mitigation measures and recommendations, the said graves can be protected against adverse impacts. Therefore, from a heritage point of view, the proposed Mareetsane Solar PV Facility and associated most preferred powerline can proceed.

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APPENDIX 1: RELOCATION OF GRAVES

Burial grounds and graves are dealt with in Article 36 of the NHR Act, no 25 of 1999. Below follows a broad summary of how to deal with grave in the event of proposed development.

If the graves are younger than 60 years, an undertaker can be contracted to deal with the exhumation and reburial. This will include public participation, organising cemeteries, coffins, etc. as they need permits and have their own requirements that must be adhered to.

If the graves are older than 60 years old or of undetermined age, an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. This is a requirement by law.

Once it has been decided to relocate particular graves, the following steps should be taken:

- Notices of the intention to relocate the graves need to be put up at the burial site for a period of 60 days. This should contain information where communities and family members can contact the developer/archaeologist/public-relations officer/undertaker. All information pertaining to the identification of the graves needs to be documented for the application of a SAHRA permit. The notices need to be in at least 3 languages, English, and two other languages. This is a requirement by law.
- Notices of the intention needs to be placed in at least two local newspapers and have the same information as the above point. This is a requirement by law.
- Local radio stations can also be used to try contact family members. This is not required by law, but is helpful in trying to contact family members.
- During this time (60 days) a suitable cemetery need to be identified close to the development area or otherwise one specified by the family of the deceased.
- An open day for family members should be arranged after the period of 60 days so that they can gather to discuss the way forward, and to sort out any problems. The developer needs to take the families requirements into account. This is a requirement by law.
- Once the 60 days has passed and all the information from the family members have been received, a permit can be requested from SAHRA. This is a requirement by law.
- Once the permit has been received, the graves may be exhumed and relocated.
- All headstones must be relocated with the graves as well as any items found in the grave

APPENDIX 2: SAHRA PERMITTING PROCEDURE FOR RELOCATION OF GRAVES

