

Archaeological Impact Assessment

For the proposed Boshof - Les Marais \ Buitenfontein 5MW Solar Energy Facility near the town of Boshoff in the Free State Province

Prepared For
Savannah Environmental (Pty) Ltd
By



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EXECUTIVE SUMMARY

Site name and location: Boshof - Les Marais \ Buitenfontein 5MW Solar Energy Facility is located approximately 5km south east of the town of Boshof in the Free State Province, on the eastern point of the Farm Les Marais 137.

Purpose of the study: Phase 1 Archaeological Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed project on these resources within the areas demarcated for the solar development.

1:50 000 Topographic Map: 2825 CB

EIA Consultant: Savannah Environmental (Pty) Ltd

Developer: Bluewave Capital SA (Pty) Ltd

Heritage Consultant: Heritage Contracts and Archaeological Consulting CC (HCAC).

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Date of Report: 19 November 2013

Findings of the Assessment:

The impacts to heritage resources by the proposed development are considered to be low. The only archaeological remains recorded in the study area consist of highly weathered MSA scatters (MSA 1 - 5) consisting of isolated artefacts located on the northern periphery of the development footprint. These low frequency isolated artefacts are recorded as occurrences and does not constitute a site. These occurrences are of low significance as they consist of ex situ material with no stratigraphy and no further mitigation is needed for this aspect. Apart from the Stone Age occurrences no other heritage features exists on site.

No buildings exist in the development footprint and no cultural landscape elements were noted. Visual impacts to scenic routes and sense of place are slightly higher due to the projects close proximity to the provincial R64. An Independent visual impact assessment is facilitated by the environmental consultant.

An independent Palaeontological desktop study (Dr Almond 2013) was conducted for the project area who recommended exemption from further specialist palaeontological studies.

General

Due to extensive sand cover, ground visibility was low on portions of the site during survey. The possible occurrence of unmarked or informal graves and subsurface finds can thus not be excluded. If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find.

Disclaimer: *Although all possible care is taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. Heritage Contracts and Archaeological Consulting CC and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

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**Annexure A: Recommended Exemption From Further Palaeontological Studies: Proposed Boshof
- Les Marais / Buitenfontein Solar Energy Facility, Farm Les Marais 137 Near Boshof, Free State
Province**

ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BIA: Basic Impact Assessment
CRM: Cultural Resource Management
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Plan
ESA: Early Stone Age
GPS: Global Positioning System
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA: National Environmental Management Act
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)

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)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

1 BACKGROUND INFORMATION

<i>Kind of study</i>	Archaeological Impact Assessment
<i>Type of development</i>	Photovoltaic solar energy facilities
<i>Rezoning/subdivision of land</i>	Rezoning
<i>Developer:</i>	Bluewave Capital SA (Pty) Ltd
<i>Consultant:</i>	Savannah Environmental

Heritage Contracts and Archaeological Consulting CC has been contracted by Savannah Environmental (Pty) Ltd to conduct an Archaeological Impact Assessment for the proposed Boshof - Les Marais / Buitenfontein Solar Energy Facility is located approximately 5 km south east of the town of Boshof in the Free State Province, on the eastern point of the Farm Les Marais 137

The Archaeological Impact Assessment report forms part of the Basic Assessment (BA) for the proposed project.

The aim of the study is to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, a background study that includes collection from various sources and consultations; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey no sites of heritage significance were identified within the development footprint although several Stone Age occurrences were documented. General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report.

This report must also be submitted to SAHRA for review.

1.1 Terms of Reference

Field study

Conduct a field study to: a) systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

1.2. Archaeological Legislation and Best Practice

Phase 1 of an AIA or a HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of a heritage specialist input is to:

- » Identify any heritage resources, which may be affected;
- » Assess the nature and degree of significance of such resources;
- » Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- » Assess the negative and positive impact of the development on these resources;
- » Make recommendations for the appropriate heritage management of these impacts.

The AIA or HIA, as a specialist sub-section of the EIA, is required under the National Heritage Resources Act NHRA of 1999 (Act 25 of 1999), Section 38(1), Section 38(8) of the NEMA and the MPRDA.

The AIA should be submitted, as part of the EIA, BIA or EMP, to the PHRA if established in the province or to SAHRA. SAHRA will be ultimately responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the EIA, BIA/EMP, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level).

Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIAs are primarily concerned with the location and identification of sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for from SAHRA by the client before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare.

Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

1.3 Description of Study Area

1.3.1 Location Data

The proposed Boshof - Les Marais / Buitenfontein Solar Energy Facility is located approximately 5km south east of the town of Boshof in the Free State Province, on the eastern point of the Farm Les Marais 137. An area of approximately 10 hectares of the farm is intended to be utilised for the 5MW solar energy facility.

The proposed PV site is located adjacent to the Bosplaat Rural 66/22kV Substation which is located on Portion 3 of the farm Merriesfontein 70. The proposed project area occurs within the Tokologo Local Municipality and broader Lejeweletputswa District Municipality. The coordinates of the centre point of the PV site are 28° 33' 50" S; 25° 17' 35" E.

The study area falls within the eastern Kalahari Bushveld Biome as described by Mucina *et al* (2006) with the vegetation described as Kimberley Thornveld. Land use in the general area is characterized by agriculture, dominated by cattle farming. The study area is characterised by sandy to loamy soils with dolerite protruding through the sand cover.

1.3.2. Location Map

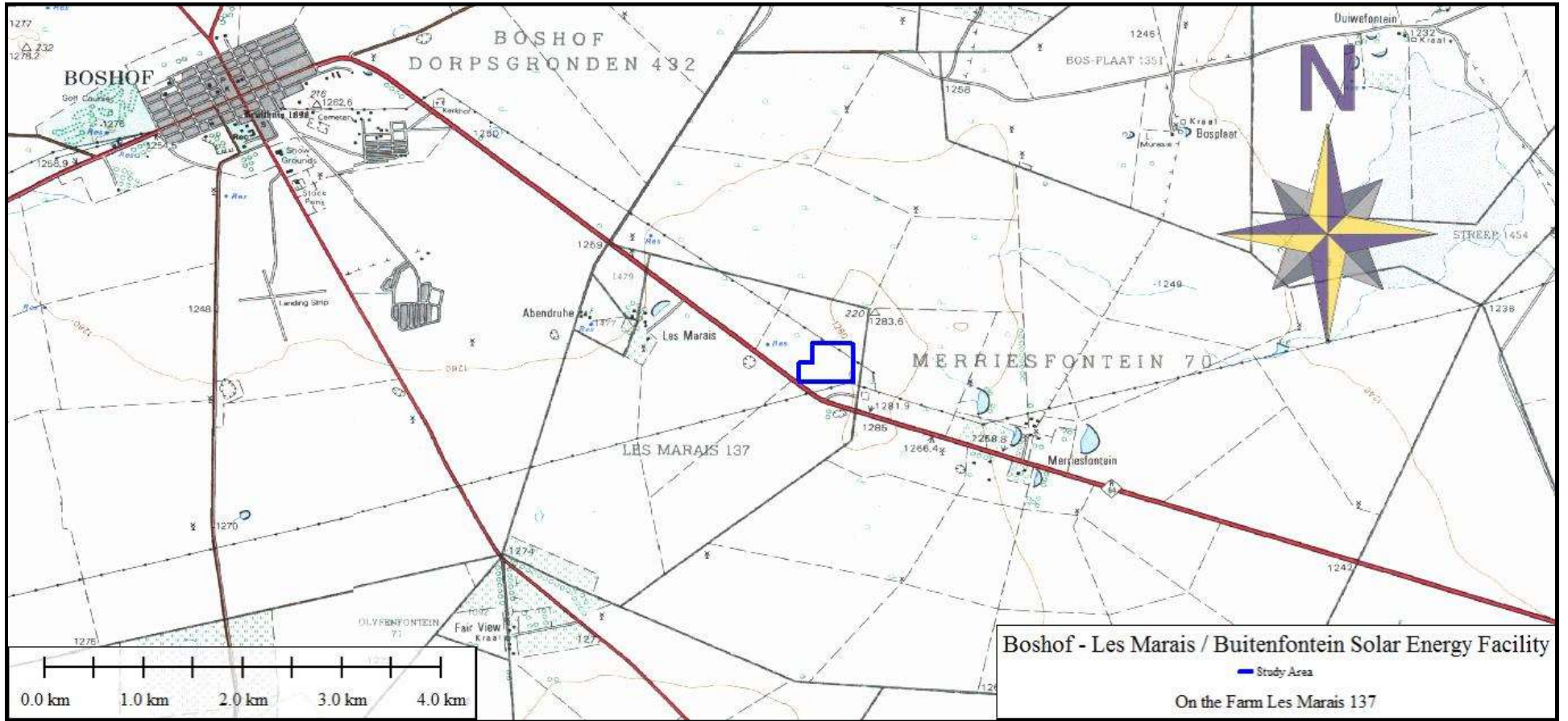


Figure 1: Location map.

2. APPROACH AND METHODOLOGY

The aim of the study is to cover archaeological databases and historical sources to compile a background history of the study area followed by field verification; this was accomplished by means of the following phases (the results are represented in section 4 of this report).

2.1 Phase 1 - Desktop Study

The first phase comprised a desktop study, gathering data to compile a background history of the area in question. It included scanning existing records for archaeological and historical sites in the area.

2.1.1 Literature Search

Utilising data from previous CRM reports done in the area as well as a search in the National archives. The aim of this is to extract data and information on the area in question, looking at archaeological sites, historical sites and graves of the area.

2.1.2 Information Collection

The SAHRA report mapping project (Version 1.0) and SAHRIS was consulted to collect data from previously conducted CRM projects in the region to provide a comprehensive account of the history of the study area.

2.1.3 Consultation

A public participation process is facilitated by the Environmental Consultant for the project.

2.1.4 Google Earth and Mapping Survey

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located.

2.1.5 Genealogical Society of South Africa

The database of the Genealogical Society was consulted to collect data on any known graves in the area.

2.2 Phase 2 - Physical Surveying

A field survey of the study area measuring less than 20 ha was conducted over a period of one day, focusing on drainage lines, hills and outcrops, high lying areas and disturbances in the topography. The study area was surveyed by means of vehicle and extensive surveys on foot by a professional archaeologist in November 2013.

All sites discovered inside the proposed development area was plotted on 1:50 000 maps and their GPS co-ordinates noted. Digital photographs were taken at all the sites.

2.3. Restrictions

Due to the fact that most cultural remains may occur below surface, the possibility exists that some features or artefacts may not have been discovered/ recorded during the survey. Only the surface infrastructure footprint areas were surveyed as indicated in the location map, and not the entire farm.. Although Heritage Contracts and Archaeological Consulting CC surveyed the area as thoroughly as possible, it is incumbent upon the developer to stop operations and inform the relevant heritage agency should further cultural remains, such as stone tool scatters, artefacts, bones or fossils, be exposed during the process of development.

3 NATURE OF THE DEVELOPMENT

The solar energy facility will have a development footprint of less than 20 ha, within which the following typical infrastructure will be established:

- » PV array
- » Cabling between the project components, to be lain in trenches ~ 1-2m deep.
- » Power inverters between the PV arrays ($\pm 4.5\text{m}^2$).
- » Power lines to evacuate the power into the Eskom grid via the Bosplaat Rural substation.
- » Internal access roads (up to 7m wide).
- » Water storage facilities/ reservoirs (1 000 m³).
- » Office, workshop area for maintenance and storage (50m²).
- » During construction (temporary infrastructure) such as temporary housing for workers and a laydown area (~1 hectare in extent) will also be required.

4. REGIONAL OVERVIEW

4.1 General Information

Through CRM reports on the area together with secondary source material, primary sources, maps and online sources the study is contextualised. At least 4 CRM projects were conducted within the greater study area, van Jaarsveld (2006) completed a desktop assessment of the area to the south of Boshoff for an Eskom Powerline, he identified some low significance Stone Age sites as well as known battlefield sites. Van Schalkwyk (2003) also conducted a scoping for an Eskom line to the East of the study area and his findings were similar to those of Van Jaarsveld. In 2004, Cobus Dreyer conducted an AIA for a Residential development in Boshoff – he found some artefacts that possibly relate to the Anglo Boer War as well as some Late Stone Age occurrences, a possible ash heap and a pump house structure dating to 1982. Dreyer (2008) did another project between Kimberley and Boshoff and again recorded low significance LSA scatters.

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological and historical sites might be located. No buildings or structures are located within the proposed study area alternatives. The database of the Genealogical Society of South Africa indicated no known grave sites within the study area.

4.2 Archaeological Background

The archaeological background and timeframe of the study area can be divided into the Stone Age and Iron Age.

4.2.1. Stone Age

The Stone Age is divided in Early; Middle and Late Stone Age and refers to the earliest people of South Africa who mainly relied on stone for their tools.

Early Stone Age: The period from ± 2.5 million yrs. - $\pm 250\ 000$ yrs. ago. Acheulean stone tools are dominant. No Acheulean sites are on record near the project area, but isolated finds may be possible. However, isolated finds have little value. Therefore, the project is unlikely to disturb a significant site. The lack of any ESA sites was confirmed during the field investigation.

Middle Stone Age: The Middle Stone Age includes various lithic industries in SA dating from $\pm 250\ 000$ yrs. – 25 000 yrs. before present. This period is first associated with archaic Homo sapiens and later Homo sapiens sapiens. Material culture includes stone tools with prepared platforms and stone tools attached to handles. An MSA occurrence was documented during the survey but does not have conservation value and is discussed further in Section 7 of this report.

Late Stone Age: The period from $\pm 25\ 000$ -yrs before present to the period of contact with either Iron Age farmers or European colonists. This period is associated with *Homo sapiens sapiens*. Material culture from this period includes: microlithic stone tools; ostrich eggshell beads and rock art. Sites in the open are usually poorly preserved and therefore have less value than sites in caves or rock shelters. Since there are no caves in the study area no LSA sites of significance were recorded and no isolated finds or occurrences were recorded. Some rock engravings are on record to the North of Boshoff (Bergh 1999) and also on a neighbouring farm (Merriesfontein).

4.2.2. Iron Age (general)

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. It can be divided into three distinct periods:

The Early Iron Age: Most of the first millennium AD.

The Middle Iron Age: 10th to 13th centuries AD

The Late Iron Age: 14th century to colonial period.

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living.

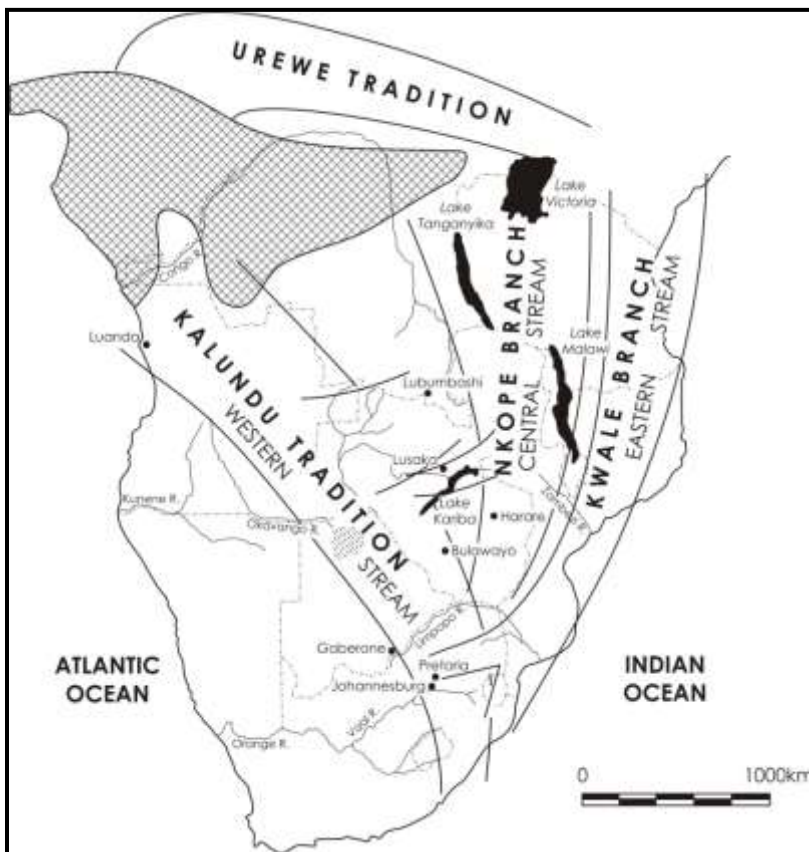


Figure 2: Movement of Bantu speaking farmers (Huffman 2007)

No Sites dating to the Early or Middle Iron Age have been recorded or is expected for the study area. The same goes for the Later Iron Age period where the study area is situated outside the southern periphery of distribution of Late Iron Age settlements in the North West Province. Boshoff is located south of the known Iron Age sequence (Huffman 2007). No sites dating to this period was recorded in the study area.

4.3 Palaeontology

A paleontological study was commissioned by Heritage Contracts and Archaeological Consulting CC by Dr John Almond. He reported the following:

“Large portions of the broader study area of the proposed Boshof - Les Marais / Buitenfontein Solar Energy Facility near Boshof, Free State, are underlain by Permian basinal mudrocks of the Tierberg Formation (Ecca Group) and Late Caenozoic calcretes and pan sediments, all of which are of MEDIUM to LOW palaeontological sensitivity. However, the proposed solar facility development site is underlain by Early Jurassic intrusive igneous rocks of the Karoo Dolerite Suite that are entirely unfossiliferous. The impact significance of the proposed solar project development on local fossil heritage resources, given its small footprint and underlying geology, is considered to be LOW.

It is therefore recommended that, pending the discovery of substantial new fossil remains during construction, exemption from further specialist palaeontological studies is granted for the proposed Boshof - Les Marais / Buitenfontein Solar Energy Facility.

Any substantial fossil remains (e.g. stromatolites, fossil shells, petrified wood or plant remains, vertebrate bones, teeth) encountered during excavation should be reported to SAHRA”

5. HISTORICAL BACKGROUND

The following section will endeavour to give a brief overview of the history of the area and district in which it is located. The report has been divided into several sections that will focus on the following aspects:

- General history of human settlement in the area
- The history of the greater study area
- The history of Boshoff

5.1. Historiography and Methodology

It was necessary to use a range of sources in order to give an accurate account of the history of the area in which the study area is located. Sources include secondary source material, maps, electronic sources and archival documents. This study is by no means all-inclusive, and there are doubtlessly still sources to be found on the history of the property and area researched in this study.

5.2. Maps of the Area under Investigation

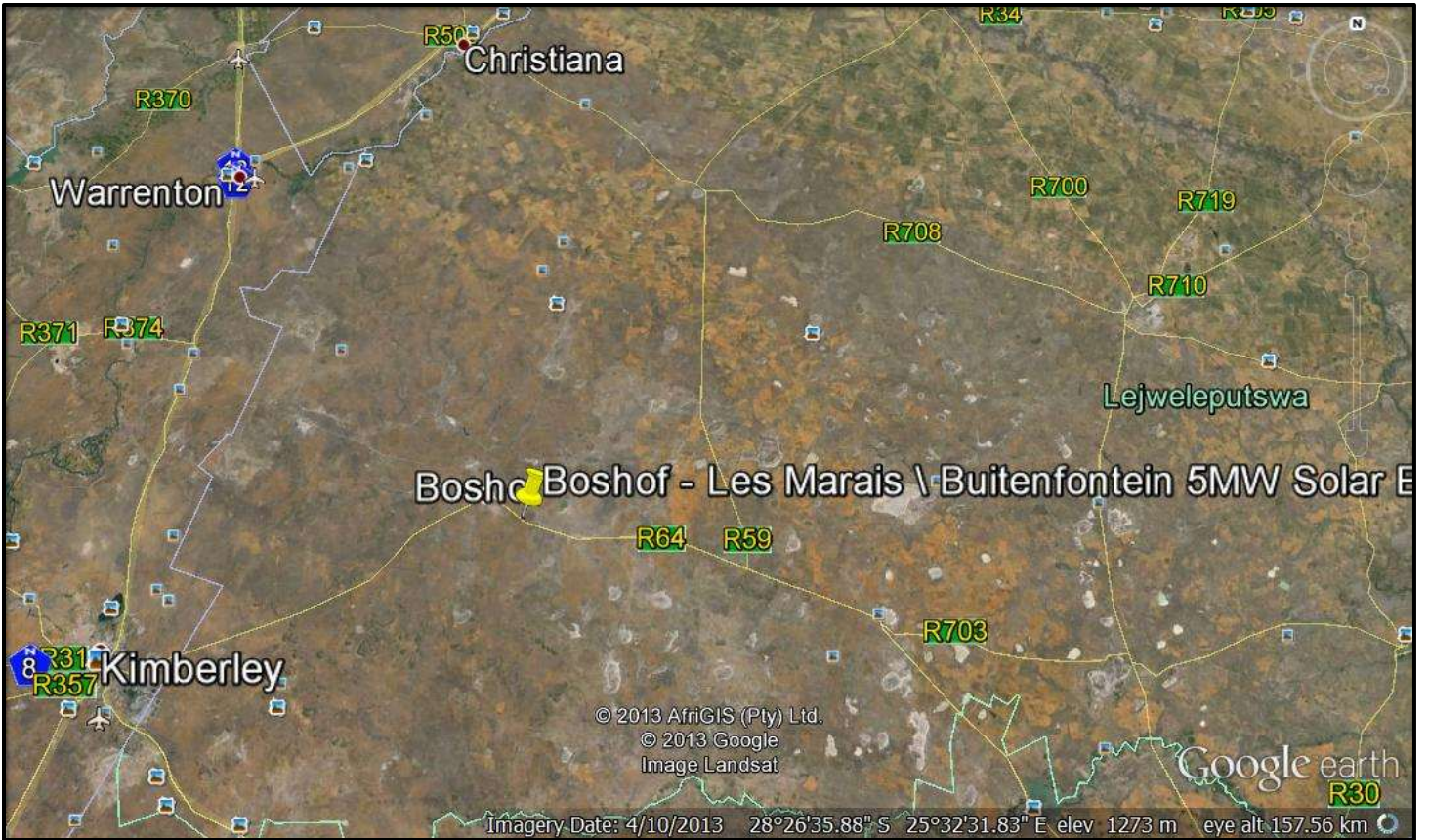


Figure 3: Google Earth image showing the project area in relation to Boshof, Kimberley, Warrenton and Christiana (Google Earth 2013)



Figure 4: 1885 Map showing the area of Griqualand West, which was in British possession at the time. Kimberley and the farm area were located in this district. (The British Empire 2011)

5.3. A Brief History of Human Settlement and Black And White Interaction In The greater study Area

A farm does not exist in isolation, and it is important to understand the social history of the surrounding area. It is essential to consider the history of towns in the vicinity of the property under investigation, since these social centres would have affected those individuals living in the rural areas. The city of Kimberley is of obvious significance, but some smaller towns such as Christiana, Bloemhof and Warrenton are also of importance. The history of these towns will be discussed briefly.

Roberts' book provides a lovely description of the Kimberley area: "The earth was grey, stony, cindery, carpeted in long silvery grass and dotted with thousands upon thousands of umbrella-shaped thorn trees...When it rained, the normally dry watercourses became raging torrents; when it blew, the dust was choking; when, as happened for most days of the year, the sun shone, it was like an oven. In more ways than one could it be described as a no-man's-land; lying between the Great Karoo to the south, the undulating grasslands to the north-east and the Kalahari desert to the north-west." (Roberts 1985: 3) The land was however all but uninhabited.

Among the earliest inhabitants in the area were the Koranas, the Khoikhoi and the Bushmen. The latter existed as hunter-gatherers, whereas the Khoikhoi and Koranas grazed livestock. In other respects, their cultures were much alike. A group of people, who more recently started to inhabit the Kimberley district, were the "Bastards", in whose veins flowed the blood of white adventurers, the Khoikhoi and Bushmen peoples. These people, who often owned firearms and wagons, formed bands that joined Bushman and Khoikhoi tribes. "Together they made up a nomadic, independent, haphazard society, each group following its own chief." (Roberts 1985: 3)

The London Missionary Society, which arrived on the scene in the early nineteenth century, attempted to bring order to the Kimberley area. The society renamed the "Bastards" as Griquas, and in due time the territory would become known as Griqualand West. The order however did not last long, and the Griqua split into factions and resumed their raiding expeditions. Boer farmers that moved inland from the Cape Colony during the 1830s and 1840s, further added to this arena of conflicting claims. Colesberg, which came into being in the 1830s, was one of the earliest towns to develop in this area. The settlement of Hopetown was established later on, but the area remained inhospitable and desolate. It was however only in 1866 that an occurrence took place that would forever change the social fibre of this area. In December 1866, during a visit to a family on a neighbouring property, the landowner and amateur geologist Schalk van Niekerk picked up an interesting stone. On further inspection, this was found to be the first diamond that was ever discovered in South Africa. (Roberts 1985: 3-7)

As more diamonds were found on the banks of the Vaal River, just above its confluence with the Gariep, mining and the industry associated with it started to become something that would always be at the centre of South Africa's social, economic and political life. Within a few years, in four locations between the Vaal and the Gariep, volcanic pipes were discovered in which diamonds had crystalized in the distant past. These pipes seemed to be of limitless capacity, and Kimberley developed between them in the early 1870s. In a few years, this town would become the second largest settlement in South Africa, producing 80 per cent of the region's exports. The need for a constant stream of labour dramatically changed the social structure of the area. By the mid-1870s, 50 000 black men a year sought work in Kimberley. The majority of these people were Bapedi and other Sotho-Tswana speakers from Transvaal. There were not many black individuals from Natal and the Cape who came to work at Kimberley, and those who did were mainly educated and Christian, and worked as artisans and clerks. In 1889, the company of Cecil John Rhodes, De Beers Consolidated Mines, acquired the monopoly over the diamond pipes at Kimberley. Rhodes had realized that working the mines as single units rather than multiple claims would prove much more profitable. The organization of black labour changed considerably with the consolidation of the mines. Workers henceforth lived in closed barracks, called compounds, which they could only leave to go to work. Since De Beers had the monopoly of the mines, workers' wages were also reduced. In this way the path was set for a new, and ultimately disastrous, organization of labour in South Africa. (Ross 2002: 54-56)

The discovery of diamonds and gold in the Northern provinces also had other consequences. The British, who at the time had colonized the Cape and Natal, had intentions of expanding their territory into the northern Boer republics. This eventually led to the Anglo-Boer War, which took place between 1899 and 1902 in South Africa, and which was one of the most turbulent times in South Africa's history. Even before the outbreak of war in October 1899 British politicians, including Sir Alfred Milner and Mr. Chamberlain, had declared that should Britain's differences with the Z.A.R. result in violence, it would mean the end of republican independence. This decision was not immediately publicized, and as a consequence republican leaders based their assessment of British intentions on the more moderate public utterances of British leaders. Consequently, in March 1900, they asked Lord Salisbury to agree to peace on the basis of the status quo ante bellum. Salisbury's reply was, however, a clear statement of British war aims. (Du Preez 1977)

The siege of Kimberley took place between 14 October 1899 and 15 February 1900. By this time, the town was the centre of Cecil John Rhodes' De Beers diamond mining enterprise. Before the war, as Rhodes realized that the conflict was eminent, he moved to Kimberley with a large battalion to defend it against the advancing Boers. On 14 October 1899 the Boers invaded the Northern Cape Colony, beginning the siege of Kimberley. The Boers were however unable to lay siege to the town, as the British were relieved by General French's Cavalry Division. (British Battles.com 2011)

Kimberley became the legislative capital of the Northern Cape Province in 1994, when apartheid ended. (Wikipedia 2011) Apart from considering the history of Kimberley, it is also important to take note of some of the smaller towns that are located in the vicinity of the farm area. The history of the towns of Warrenton and Christiana will be discussed briefly.

Warrenton was founded in 1882. A number of cattle farmers had lived in the area before this time. They were scattered and few, but at the discovery of diamonds in the area, they realized the irrigation potential of the Vaal River. These farmers understood that there would be a considerable market for their produce, and started growing vegetables to provide food for the mines at Kimberley. A community of farmers started to develop, and the settlement further expanded when diamonds were found alongside the Vaal River, where Warrenton is located today. The town also developed partially as a church town, as many towns in South Africa had. The leaders of the Nederduitse Gereformeerde Church Council were at one point effectively in charge of the town, and used its authority to influence the community. (Van Wyk 1982.: vii) Warrenton was named after Sir Charles Warren, who was a British land surveyor who had been sent to the Cape to serve as a mediator in the border conflict between the Orange Free State and Griqualand West. Because of the work he did in this respect, as well as serving in military operations, the pioneers at Warrenton decided to name the town after him. (Van Wyk 1982.: 4-5)

Warrenton was severely affected by the Anglo-Boer War, since it was a British town surrounded by individuals of republican persuasion. On Tuesday 17 October 1899, the town was seized by Boer forces. Several of Warrenton's inhabitants joined the republican forces at that time. In December of that year the population of the entire town was commandeered by the Boers. The British however successfully occupied the town in March 1900 and imprisoned almost the whole male population of Warrenton. The siege ended in a few weeks' time, but massive damage had been done during that time. (Van Wyk 1982: 32)

The area in which the town of Christiana was established was initially very sparsely populated. This was due to the constant droughts and cattle diseases that made the area very hard to settle in. Some of the earliest inhabitants in this area were the Batlapin, the Barolong and the Koranas. These populations were however displaced during the Difaqane: a time of bloody upheavals in South Africa, which occurred around the early 1820's until the late 1830's. (Geskiiedenisatlas van Suid-Afrika 1999: 109-115) It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes. (Geskiiedenisatlas van Suid-Afrika 1999: 14; 116-119) These tribes were assaulted by the Ndebele troupes of Mzilikazi, and migrated to the Blesberg. Skirmishes between different tribes in the area continued to cause unrest, but it was not long before the need developed for towns to be established for the white farmers that have settled in the area. Bloemhof was founded on 28 March 1866, and only three years later Christiana was also established. The latter town was named after Christina Petronella Pretorius, the only child of the State President M. W. Pretorius (1857-1860 and 1864-1871). In 1870, plots were first sold at Christiana, and this helped the expansion of the town. (Anon 1970: 3-7)

The discovery of diamonds predictably affected the town of Christiana significantly. On 3 October 1904, the town lands of Christiana were declared public diggings. More than 200 diggers came to the area during this time. Shortly before this, the Anglo-Boer War had also left its mark on Christiana. Several serious battles took place in the vicinity of the town, and several British soldiers are buried in the old grave yard. In May 1900 the town was seized by the British Lieutenant-General Sir A. Hunter. Another incidence of note is an influenza epidemic in the town that killed 60 individuals, including the Chief of Police, in 1918. (Anon 1970: 11-12, 15)

5.4 History of Boshoff

The town of Boshoff was established on a farm bought from a local Griqua, Dawid Danster. The farm was bought by DS Fourie and sold to the Nederduitse Gereformeerde Kerk. Under direction from Rev Andrew Murray the town was laid out in 1856. The new town was named after the second president of the Orange Free State – Jacobus Nicolaas Boshoff.



Figure 5. JN Boshoff (1808 – 1881)

Boshoff was established as a municipality in 1872, in 1874 The Dutch Reformed Church was built. It was enlarged in 1913, and renovated in 1954.

Solomon Tshekisho Plaatje (9 October 1876 – 19 June 1932) was born in Doornfontein near Boshof, Orange Free State, the sixth of eight sons. His grandfather's name was Selogilwe Mogodi but his employer nicknamed him Plaatje and the family started using this as a surname. Sol Plaatje was a writer, intellectual and Christian, he spoke 7 languages and was the founding member of the South African Native National Congress (SANNC) which later became the African National Congress (ANC). He died of Pneumonia in 1932 and was buried close to Kimberley.



Figure 6: Sol Plaatje

The gaol of Boshof is a stone building erected in 1891.

In 1895 Georges Henri Anne-Marie Victor de Villebois-Mareuil (1847-1900) resigned as Colonel from the First Foreign Legion of the French Army. When he joined the Boer forces, they made him General of International Forces.

De Villebois-Mareuil became military advisor to the Free State forces. He led a party of about 75 foreign volunteers, which consisted of French, German, Dutch and Americans, and 11 Boers, to blow up a bridge on the Modder River (which is about 30Km south of Boshof), south of Boshof. On 5 April 1900 they encountered a British force of 750 men and 4 field-guns under leadership of Lord Methuen. During this Battle of Boshof, after about 3 hours of fighting, a cannon shell killed De Villebois-Mareuil (<http://routes.co.za/fs/boshof> 2005).

The spot he is said to have been killed is on the farm Middelkuil, 10Km east from Boshof on the Bosvarkpad, where there is a memorial to him. He was originally buried in the town cemetery, but was later reburied at Magersfontein.

The local Boshoff commando was involved in the Siege of Kimberley (between 1899 – February 1900) specifically in the disruption of the water supply at Riverton.

The Poplar Grove Battlefield site is located close to town. On 7 March 1900, the Boer General, Christiaan de Wet, ambushed the British forces advancing on Bloemfontein on this site. The ambush was not a success and the British nearly succeeded in surrounding the Boers, who were forced to leave their defences and fall back. There is a Gunpowder House dating from the Anglo-Boer War.

Rooidakskool (i.e. Red Roof School): the school was established in 1907. When the school changed names, a museum was established by that name. Cultural exhibits from the school's history can be viewed in the museum.

In 1912 some South Africans visited Sweden and attended an evening of folk dancing. One of the South Africans was Samuel Henri Pellisier (born in Bethulie on 10 November 1887), who was a teacher at Boshof's Rooidak School.

On his return to South Africa, Pellisier adapted four Swedish dances and taught them to his pupils. The dances were first performed on 28 February 1914 (according to Wynand Theron) on the farm Vuisfontein, about 3Km from Boshof on the road to Hertzogville. Today there is a monument at this spot (<http://routes.co.za/fs/boshof> 2005).



Figure 7: The 1914 picnic where Volkspele was first performed.
Photo: Wynand Theron (<http://routes.co.za/fs/boshof> 2005).



Figure 8: Samuel Pellisier and his wife in Volkspele dress.
Photo: Wynand Theron (<http://routes.co.za/fs/boshof> 2005).

6. HERITAGE SITE SIGNIFICANCE AND MITIGATION MEASURES

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed PV Solar Facility the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance:

- » The unique nature of a site;
- » The integrity of the archaeological/cultural heritage deposits;
- » The wider historic, archaeological and geographic context of the site;

- » The location of the site in relation to other similar sites or features;
- » The depth of the archaeological deposit (when it can be determined/is known);
- » The preservation condition of the sites;
- » Potential to answer present research questions.

Furthermore, The National Heritage Resources Act (Act No 25 of 1999, Sec 3) distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

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

6.1. Field Rating of Sites

Site significance classification standards prescribed by SAHRA (2006), and approved by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 9 of this report.

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

6.2 Impact Rating of Assessment

The criteria below are used to establish the impact rating of a site. as provided by the client:

- » The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- » The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- » The **duration**, wherein it will be indicated whether:
 - * the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
 - * the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
 - * medium-term (5-15 years), assigned a score of 3;
 - * long term (> 15 years), assigned a score of 4; or
 - * permanent, assigned a score of 5;
- » The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- » The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- » the **status**, which will be described as either positive, negative or neutral.
- » the degree to which the impact can be reversed.
- » the degree to which the impact may cause irreplaceable loss of resources.

the *degree* to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:

$$S=(E+D+M)P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- » < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- » 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- » > 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

7. BASELINE STUDY-DESCRIPTION OF SITES

It is important to note that the entire farm was not surveyed but only the footprint of the proposed alternatives for the PV layout area, power line for connection to the grid and access routes as indicated in Figure 1. The study area is flat with no landscape features with very little vegetation cover (figure 11 to 14). No heritage sites are located within the proposed alternatives (figure 7) although several MSA scatters (**MSA 1 - 5**) were recorded on the Northern periphery of the study area.



Figure 9: Google Earth image of the area surveyed in blue, track logs of the survey in black and the numbers 1 -4- indicating where photos of the survey area was taken to give the reader of the report more context of the study area.

7.1 Site Distribution Map

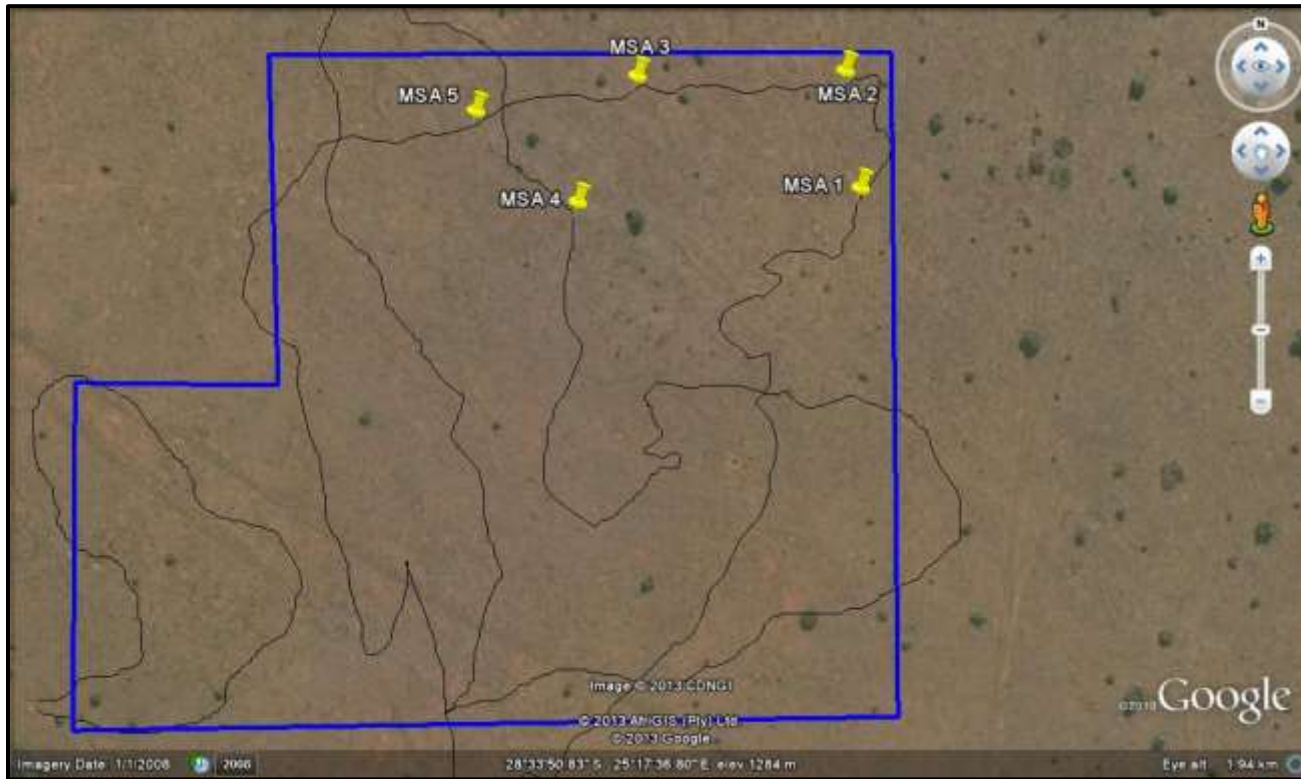


Figure 10: Showing the location of MSA scatters in relation to the proposed footprint.



Figure 11. Boshoff 1 Study area viewed from the south.



Figure 12. Boshoff 2 Central part of the study area.



Figure 13. Boshoff 3 Northern view of the study area



Figure 14. Boshoff 4 .Central study area viewed from the west.


7.2. Sites with Coordinates

Site Number	Landscape	Type Site	Cultural Markers	Co ordinate
MSA 1	Archaeological	Stone Age	Chunk and a pointed flake	S28 33 47.3 E25 17 41.0
MSA 2	Archaeological	Stone Age	Proximal end of a broken blade	S28 33 45.1 E25 17 40.7
MSA 3	Archaeological	Stone Age	Proximal end of a broken pointed flake	S28 33 45.1 E25 17 36.2
MSA 4	Archaeological	Stone Age	Pointed flake	S28 33 47.5 E25 17 34.9
MSA 5	Archaeological	Stone Age	Unretouched flake x 2	S28 33 45.8 E25 17 32.7

7.3. Site Descriptions

7.3.1. Low density MSA occurrence (MSA 1 -5) - Northern periphery of development

Field Number	MSA 1 - 5	1:50 000 map nr	2626 AA
Site Data	Description:		
Type of site	Open scatter		
Site categories	MSA		
Context	Isolated un-retouched flakes and chunks were noted along the northern boundary of the development footprint. Artefacts occur mostly as single artefacts with a density of between 1 - 2 artefacts per 30m ²) and recorded as an occurrence (Figure 7) and does not constitute a site. No archaeological stratigraphy is present and the artefact show a high degree of weathering possibly from being washed.		

Description of artefacts	<p>The artefacts are weathered and out of context possibly from being washed. Diagnostic features on the tools consist of facets on the striking platform indicating Middle Stone Age occupation. Artefacts consist of chunks, a broken blade and pointed flakes with a faceted striking platform mainly on hornfells.</p>
Photographs	
	
<p>Figure 15: Dorsal view of artefacts</p>	
Field Rating (Recommended grading or field significance) of the site:	Generally Protected C
Statement of Significance (Heritage Value)	Low significance.

Impact evaluation of the proposed project on heritage resources

MSA Scatter 1 – 5

Nature: During the construction phase earthworks might impact on the recorded artefacts.

	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Probable (3)	Probable (3)
Significance	21 (Low)	21 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation: The MSA occurrence is of low significance and no further action is necessary. (Please refer to section 7 for full details on recommendations).		
Cumulative impacts: Archaeological and cultural sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.		
Residual Impacts: N.A		

8. RECOMMENDATIONS AND CONCLUSIONS

The impacts to heritage resources by the proposed development are considered to be low. The only archaeological remains recorded in the study area consist of highly weathered MSA scatters (**MSA 1 - 5**) consisting of isolated artefacts located on the northern periphery of the development footprint. These low frequency isolated artefacts are recorded as occurrences and does not constitute a site. These occurrences are of low significance as they consist of ex situ material with no stratigraphy and no further mitigation is needed for this aspect. Apart from the Stone Age occurrences no buildings exist on the site and no cultural landscape elements were noted.

An independent Palaeontological desktop study (Dr Almond 2013) was conducted for the project area who recommended exemption from further specialist palaeontological studies.

Due to the subsurface nature of archaeological material and unmarked graves the possibility of the occurrence of unmarked or informal graves and subsurface finds cannot be excluded. If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find.

If the recommendations as made in section 7 of this report are adhered to (subject to approval from SAHRA) there is from an archaeological point of view no reason why the development should not proceed. If any possible finds such as tool scatters, bone or fossil remains are exposed or noticed during construction, the operations must be stopped and a qualified archaeologist must be contacted to assess the find.

9. PROJECT TEAM

Jaco van der Walt, Project Manager and Archaeologist

Liesl Bester, Archival Specialist

10. STATEMENT OF COMPETENCY

I (Jaco van der Walt) am a member of ASAPA (no 159), and accredited in the following fields of the CRM Section of the association: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation. This accreditation is also valid for/acknowledged by SAHRA and AMAFA.

I have been involved in research and contract work in South Africa, Botswana, Zimbabwe, Mozambique and Tanzania; having conducted more than 300 AIAs since 2000.

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