

# **Archaeological Impact Assessment**

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**For the proposed Castle Wind Energy Facility, De Aar, Northern Cape**

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Prepared For

**Savannah Environmental (Pty) Ltd**

By



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## EXECUTIVE SUMMARY

**Site name and location:** Castle Wind Farm (Pty) Ltd has identified a site between De Aar and Phillipstown within the Emthanjeni Local Municipality (Northern Cape Province) for the establishment of a wind energy facility. The wind energy facility will be referred to as the "Castle Wind Energy Facility".

The site is located 28 km north-east of De Aar and 22 km south-west of Phillipstown. The wind energy facility is proposed to be located on the following farm portions:

- » Portion 12 of Farm 165 (Vendussie Kuil)
- » Portion 13 of Farm 165 (Vendussie Kuil)
- » The Remaining Extent of Portion 0 of Farm 8 (Knapdaar)

**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 wind energy development.

**1:50 000 Topographic Map:** 3024 CB

**EIA Consultant:** Savannah Environmental (Pty) Ltd

**Developer:** Castle Wind Farm (Pty) Ltd

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

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**Date of Report:** 30 October 2014

**Findings of the Assessment:** The abundance of locally available raw material in the form of hornfels or indurated shale was probably one of the factors that resulted in Stone Age people using the landscape over millennia. Archaeological remains are mostly represented by scatters of Middle Stone Age (MSA) tools and quarries that are spread over the study area. Later Stone Age (LSA) artefacts are also present as well as engravings, mostly on prominent features on the landscape, such as hills and pans. Erosion on the hills results in the gravitating of raw material and artefacts towards gently dipping plains between the dolerite hills and outcrops. Some of these artefacts might be covered by the clay and sandy soils in the valleys or plains.

Morris (2011) noted that the predominant archaeological component, at most documented sites in the area, appears to be Pleistocene and early Holocene in age. As a result of prolonged exposure to the elements, most of the artefacts show signs of weathering and/or oxidation and the knapped surfaces are thus highly patinated. There are, however, also places with a much younger component of tools, probably dating to the late Holocene LSA. These assemblages are still relatively fresh-looking (with little or no patination – the artefacts are nearly black or gray as, opposed to the more heavily patinated orange-brown of older stone tools). It can, therefore, be concluded that MSA and LSA assemblages are present on the landscape, but Earlier Stone Age (ESA) tools may occur although none were recorded during the survey.

Windmills, dilapidated dwellings, historical engravings and stone kraals were also recorded and represent aspects of the farm history.

The 31 turbine positions and immediate surrounds were surveyed for sites of archaeological, cultural and historical significance. Nine sites of heritage significance and three find spots were identified during the survey although MSA material are found thinly and unevenly scattered throughout the site that can be attributed to the abundance of raw material (hornfels) that is found all over the area.

From a heritage point of view, there is no reason why this development cannot commence if the recommendations made in this report are adhered to and based on the approval from SAHRA. The proposed project will not have an impact of great significance on the recorded sites and potentially on other archaeological remains.

If any possible archaeological or heritage finds are made during construction, the operations must be stopped and a qualified archaeologist contacted for an assessment of the find.

### **General**

The possibility of unmarked or informal graves and archaeological finds cannot be excluded. If any possible finds are made during construction, the operations must be stopped and a qualified archaeologist contacted for an assessment of the find/s.

**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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- The technology described in any report; and
- Recommendations delivered to the Client.

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## ABBREVIATIONS

<i>ASAPA</i> : Association of South African Professional Archaeologists	<i>SAHRA</i> : South African Heritage Resources Agency
<i>CRM</i> : Cultural Resource Management	<i>MIA</i> : Middle Iron Age
<i>EIA Practitioner</i> : Environmental Impact Assessment Practitioner	<i>EIA</i> : Environmental Impact Assessment*
<i>EIA</i> : Early Iron Age*	<i>ESA</i> : Early Stone Age
<i>GPS</i> : Global Positioning System	<i>HIA</i> : Heritage Impact Assessment
<i>LSA</i> : Late Stone Age	<i>LIA</i> : Late Iron Age
<i>MSA</i> : Middle Stone Age	

*\*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

<b>Kind of Study</b>	Archaeological Impact Assessment
<b>Type of development</b>	Wind Energy Facility
<b>Developer:</b>	Castle Wind Farm (Pty) Ltd
<b>Consultant:</b>	Savannah Environmental
<b>Farm Owner:</b>	Andries van der Merwe

A Heritage scoping report was conducted by Van der Walt (2013) for the project and Heritage Contracts and Archaeological Consulting CC was subsequently contracted by Savannah Environmental (Pty) Ltd to conduct an Archaeological Impact Assessment of the 31 proposed turbine positions, access roads and power lines for connection into the grid for the proposed Castle Wind energy facility located between the town of De Aar and Phillipstown in the Northern Cape. The report forms part of the EIA for the proposed project.

The aim of this study is to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. Furthermore, it aims 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 any existing heritage resources in a responsible manner. The goal is to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

This report outlines the three-phased approach and methodology utilized before and during the survey. Phase 1 consisted of a heritage scoping report Van der Walt (2013). Phase 2 comprises the physical surveying of the pylon positions on foot and by vehicle. Phase 3 reports on the outcome of the study.

During the survey ten heritage sites and several find spots were identified. General site conditions and features on these sites were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified, and mitigation measures are proposed in the report following below.

This report must also be submitted to SAHRA for peer review.

## **1.1 Terms of Reference**

### **Conduct a field study to:**

Systematically survey the proposed project area to locate, identify record, photograph and describe sites of archaeological, historical or cultural interest; and record GPS points of significant areas identified. Determine the levels of significance of the various types of heritage resources recorded in the project area;

### **Reporting**

Identify the anticipated impacts, as well as cumulative impacts, of the operational units of the proposed project activity 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 are sufficient to comply with the relevant legislation and the code of ethics and guidelines of the Association of Southern African Professional Archaeologist (ASAPA).

To assist the developer in managing the discovered heritage resources in a responsible manner, in order 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, 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 23(2)(b) of the NEMA and sections 39(3)(b)(iii) of 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 or with a proven ability to do archaeological work.

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 a legal body, 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 administered by a local authority. Graves in this age category, located inside a formal cemetery administered 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 project is located in the Northern Cape, 28 km north-east of De Aar and 22 km south-west of Philipstown (Figure 2). The wind energy facility is proposed to be located on the following farm portions:

- » Portion 12 & 13 of Farm 165 (Vendussie Kuil)
- » The Remaining Extent of Portion 0 of Farm 8 (Knapdaar)

The proposed project is situated on the plateau of the mountain ranges to the east of de Aar. The area is rugged and falls within the bioregion described by Mucina et al (2006) as the Upper Karoo Bioregion with the vegetation described as Northern Upper Karoo. Land use in the general area is characterized by agriculture and dominated by sheep farming. The specific segment of land investigated for this study comprises an undulating landscape with shallow soil veneers with calcrete and dolerite substrates with dolerite outcrops throughout the study area.



Figure 1: Landscape conditions in the study area.

### 1.3.2. Location Map

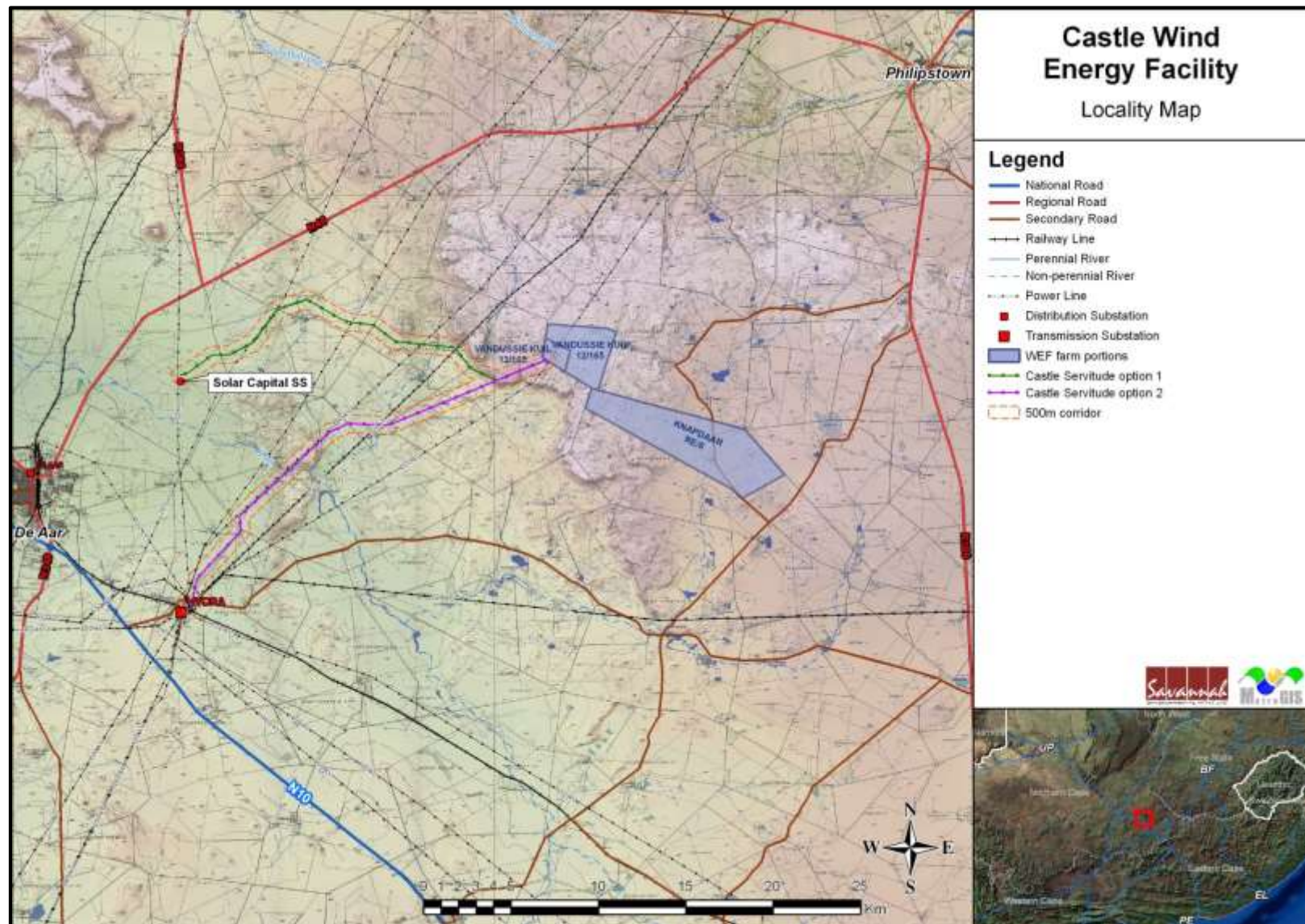


Figure 2: Location map of the proposed project also indicating transmission line alternatives.



### 1.3.3. Google Maps

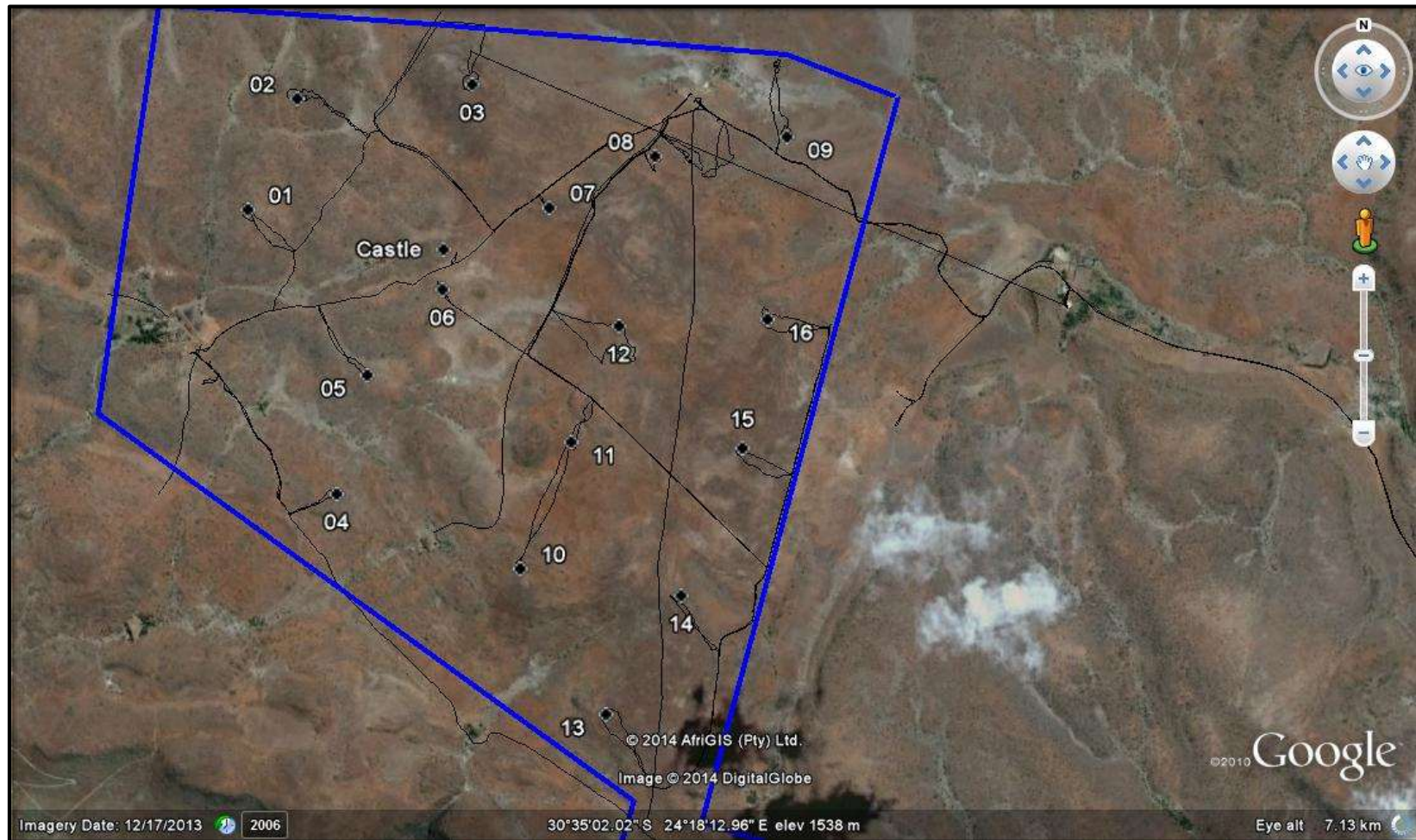


Figure 3: Google image showing the turbines on the farm Vendussiekul and track logs of the areas covered.



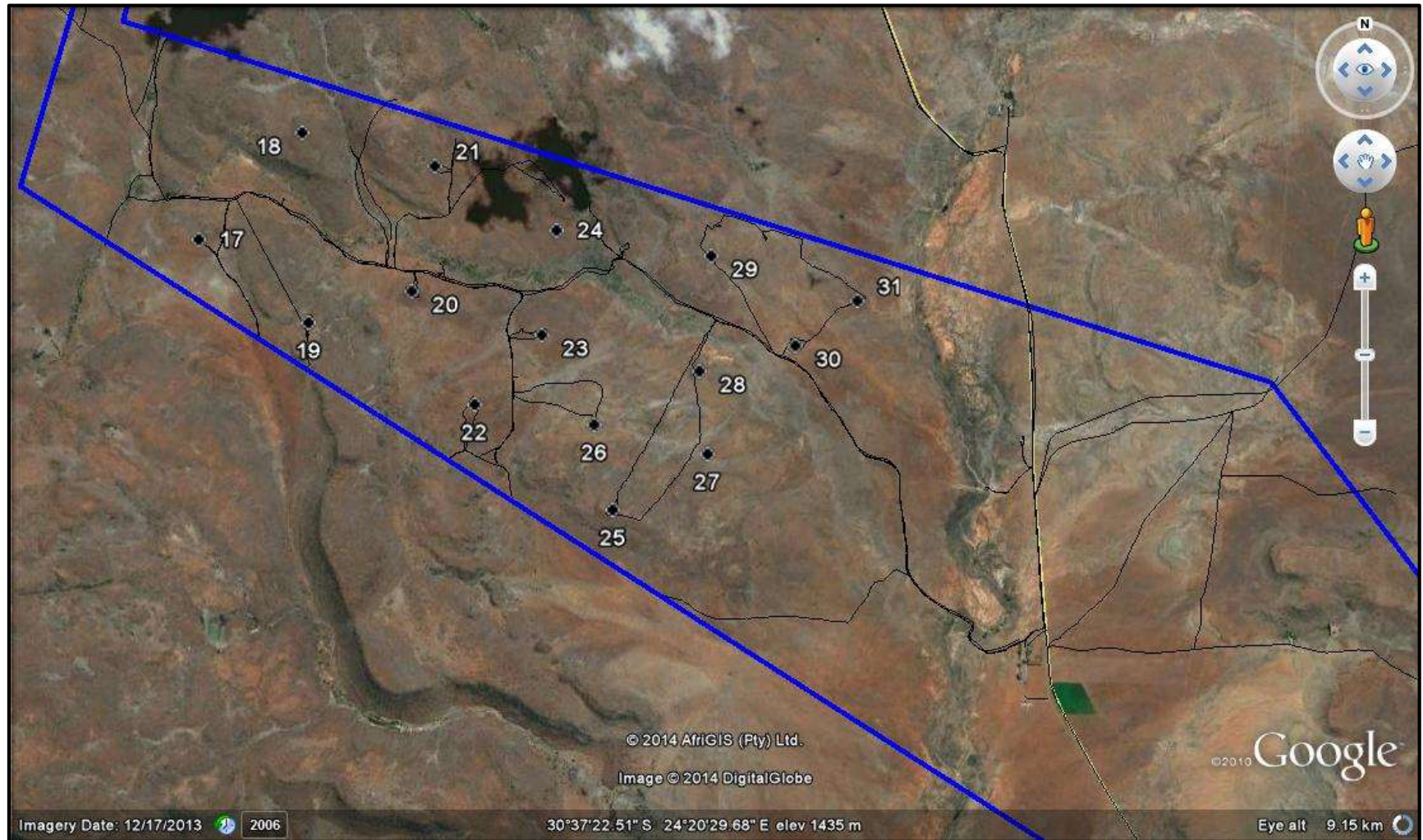


Figure 4: Google image showing the turbines on the farm Knapdaar and track logs of the areas covered.



## **2. APPROACH AND METHODOLOGY**

The aim of the study is to consult 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 phases described below.

### **2.1 Phase 1 - Desktop Study**

The first phase comprised a desktop study. Data were gathered to compile a background history of the area in question. These data included any existing information on archaeological sites, historical sites and graves in the area. This phase was reported in a heritage scoping report drafted by Jaco van der Walt (2013).

#### **2.1.1 Literature Search**

In addition to the information from the scoping study the actions as described below was taken.

#### **2.1.2 Information Collection**

The SAHRIS was consulted to further collect data from CRM practitioners who undertook work in the area, with the aim to provide the most comprehensive account of its history.

#### **2.1.3 Public Consultation**

A brief consultation with the landowner was conducted during this phase.

#### **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**

Due to the nature of cultural remains, the majority of which occurs below surface, a field survey of the study area was conducted over 5 days. The study area was surveyed by means of vehicle and extensive surveys on foot during the week of the 13<sup>th</sup> October 2014. The survey was aimed at covering the proposed infrastructure, but also focused on specific areas on the landscape that would be likely to contain archaeological and/or other heritage remains such as, drainage lines, rocky outcrops as well as slight elevations in the natural topography. These areas were searched more intensively but many other areas were walked in order to confirm expectations in those areas. Track logs of the areas covered were taken (Figure 3 and 4).

All the proposed turbine positions were visited and physically walked apart from turbine position 18. The power line options were spot checked but has been mostly subjected to a desktop evaluation.

At the start of the survey it was immediately noticed that artefacts are scattered widely in low densities throughout the study area. Low density scatters (between 4 - 5 artefacts per m<sup>2</sup>) were recorded as find spots. Scatters higher than 5 artefacts per m<sup>2</sup> were given site numbers and areas where hornfel outcrops were exploited were also recorded as sites. Scatters with densities less than 3 artefacts per m<sup>2</sup> were not recorded as they occur throughout the area. Individual occurrences or isolated artefacts were not point plotted within the recorded scatters; however an attempt was made at determining site extent. GPS readings were taken roughly in the middle of each identified scatter.

All sites documented was plotted on 1:50 000 maps and their GPS co-ordinates noted. Photographs were taken at all the sites.

### **2.3. Restrictions**

Due to the fact that most cultural remains may occur below surface and the extent of the study area, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of unmarked graves and other cultural material cannot be excluded.

Only the proposed access routes and turbine positions were surveyed as indicated in the location map, and not the entire farm or the power line corridors. This was assessed at a desktop level.

It is assumed that information obtained for the wider region is accurate and applicable to this study.

Although HCAC 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 facility will comprise up to 31 wind turbines with a generating capacity of up to 3.5MW each, with a hub height of up to 120m and a rotor diameter of up to 130m (i.e. each blade is approximately 56m in length). The entire facility would have a capacity of up to 109 MW.

The typical infrastructure associated with the wind energy facility includes:

- Wind turbines.
- Concrete foundations to support each turbine.
- Cabling between turbines, to be laid underground where practical, this will connect to an on-site substation.
- An on-site substation to facilitate the connection between the wind energy facility and the electricity grid.
- A 132 kV overhead power line to connect into the authorised Ilanga Lethemba Substation (Solar Capital Substation) or alternatively to the Hydra Substation, near De Aar.
- Internal access roads to each turbine to link the wind turbines and other infrastructure on the site. Existing roads will be used as far as possible.
- Workshop area / office for control, maintenance and storage.

## **4. HISTORICAL AND ARCHAEOLOGICAL BACKGROUND OF THE STUDY AREA**

### **4.1 Databases Consulted**

#### ***SAHRIS***

Several previous heritage studies were conducted in the general study area. CRM projects by Van Ryneveld (2008), Kaplan (2010), van der Walt (2011), Morris (2011), Kruger (2012) and Orton (2012) as well as Fourie (2014) has revealed a rich archaeological and historical background to the greater study area ranging from Earlier Stone Age (ESA) through to the Later Stone Age (LSA) and herder settlements represented by stonewalled kraals along numerous ridges in the greater study area. The colonial period is also represented by historical farm infrastructure as well as Anglo Boer War remains.

#### ***Genealogical society and Google Earth Monuments***

Neither the genealogical society nor the monuments database at Google Earth (Google Earth also includes some archaeological sites and historical battlefields) have any recorded sites in the study area.

## **Public Consultation**

The author consulted with the landowner regarding the presence of any archaeological or historical sites. He pointed out a cemetery (that will not be affected by any turbine) and also mentioned that he is not aware of any engraving sites in the area earmarked for development.

### **4.2 Archaeological and Historical Information Available on the Study Area**

The town of De Aar was founded in 1881 on the farm by the same name. The farm originally belonged to Jan Vermeulen who sold it for the purpose of the development of the town. With the development of railways the town became an important station with one of the largest marshaling yards in the country.

Occupation by early humans would probably date to at least the Middle Stone Age (Earlier Stone Age sites are known in the wider region) and would consist of open sites near stream beds or hills and outcrops. Raw material sources would have been amongst the foci for Stone Age activity. Population density might have increased during the Later Stone Age and people would have occupied rock shelters where available, as well as open sites. During this later period they also produced rock engravings, of which some are known to occur on the farm Tafelkop north of the study area, as well as rock paintings, some of which occur on the farm Veekraal east of the study area and others on Jakkalsfontein north of the study area.

The following heritage sites, features, and objects are known to occur in the larger region (Morris 2011):

- » Stone Age sites located near the foot of hills and in rock shelters where these have developed;
- » Sites with either rock engravings or rock paintings. Dolerite koppies in the region are known to have rock engravings (Fock & Fock 1989; Morris 1988; Parkington *et al.* 2008);
- » Stock enclosures constructed of stone;
- » Burial sites in the vicinity of the Brak River (power line servitudes);
- » Houses and other structures older than 60 years;
- » Farming infrastructure such as wind mills, etc; and
- » Graves and cemeteries, both formal and informal.

A variety of heritage resources occur in this larger region and there is thus a likelihood that similar resources will be located in the study area. Sites can be expected especially in the areas where hills and outcrops occur, as well as along the banks of the Brak River.

## 5. 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 Castle Wind Energy Facility, the local extent of its impact necessitates a representative sample and only the footprints of the demarcated areas were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This chapter 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 deposit;
- » 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 or is known);
- » The preservation condition of the site;
- » Potential to answer present research questions.

According to the Heritage Act, the criteria listed below should also be taken into account. 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 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; and
- » sites of significance relating to the history of slavery in South Africa.

### 5.1. Field Rating Of Sites

Site significance classification standards prescribed by the SAHRA (2006) and approved by the ASAPA for the Southern African Development Community (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.

<b>FIELD RATING</b>	<b>GRADE</b>	<b>SIGNIFICANCE</b>	<b>RECOMMENDED MITIGATION</b>
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

## 5.2 Impact Rating of Assessment

The following criteria 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); and
- » 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).



## 6. BASELINE STUDY -DESCRIPTION OF SITES

### **Wind farm facility**

It is important to note that the entire farm was not surveyed, but only the footprint of the proposed turbine positions as indicated in Figure 3 and 4. At the start of the survey Stone Age material was immediately noticed scattered in varying densities throughout the study area. Therefore low density scatters (between 3 - 5 artefacts per m<sup>2</sup>) were recorded as find spots. Scatters higher than 5 artefacts per m<sup>2</sup> were given site numbers and areas where hornfel outcrops were exploited were also recorded as sites. Scatters with densities less than 3 artefacts per m<sup>2</sup> were not recorded as they occur throughout the area. Individual occurrences were not point plotted within the recorded scatters; however an attempt was made to determine site extent. Find spots and sites were numerically numbered (Refer to section 6.2).

Artefacts were observed in low densities over much of the study area where hornfel is almost exclusively used as raw material. Morris (2011) notes in most cases at documented sites in the area, the predominant component appears to be Pleistocene and early Holocene in age (the greater number of artefacts are highly patinated – a weathering/oxidation process resulting from long exposure of knapped surfaces), but there are also places with a much younger component of tools, late Holocene Later Stone Age, that are still relatively fresh-looking (little or no apparent patination – the artefacts are nearly black (Figure 18 &19) or gray as opposed to the more heavily patinated orange-brown of older stone tools).

Some of the patinated artefacts show a high degree of weathering probably being washed in from their original context and are therefore of lower archaeological value. In areas where slightly elevated frequencies of artefacts occurred these were documented as find spots and when the artefact ratio is higher than 5 per m<sup>2</sup> these were documented as 'sites'. The use of the term 'site' was entirely arbitrary and does not necessarily reflect a knapping, quarry or habitation site. GPS points were taken at such places and selections of artefacts were photographed. MSA and LSA artefacts are mixed at some locations and indicate that downward deflation had occurred in the study area. Nine sites were recorded consisting of six Stone Age sites (Site 1, 3, 4, 6, 7, 9) of which site 6 is engraving site, a historical stone kraal (Site 8) and 2 historical farmstead complexes (Site 2 and 5). A further total of 3 find spots were mapped, recorded and digitally photographed.

### **Power Line options**

Two servitude options were assessed at a desktop level. Both originate on the farm Vandussiekul in a southerly direction option 1 going to the Solar Capital Sub Station the other to Hydra Substations close to de Aar. Some of the properties that the proposed power lines traverse were assessed in previous studies (e.g Morris 2011 and van der Walt 2011b) and the following archaeological features is can occur in the power line servitude options.

- Rock Engravings on dolerite koppies and boulders (Morris 1988, Parkington *et al* 2008);

- Historical sites i.e Anglo Boerwar remains, farm infrastructure and graves;
- A spread of Stone Age Material of varying densities.

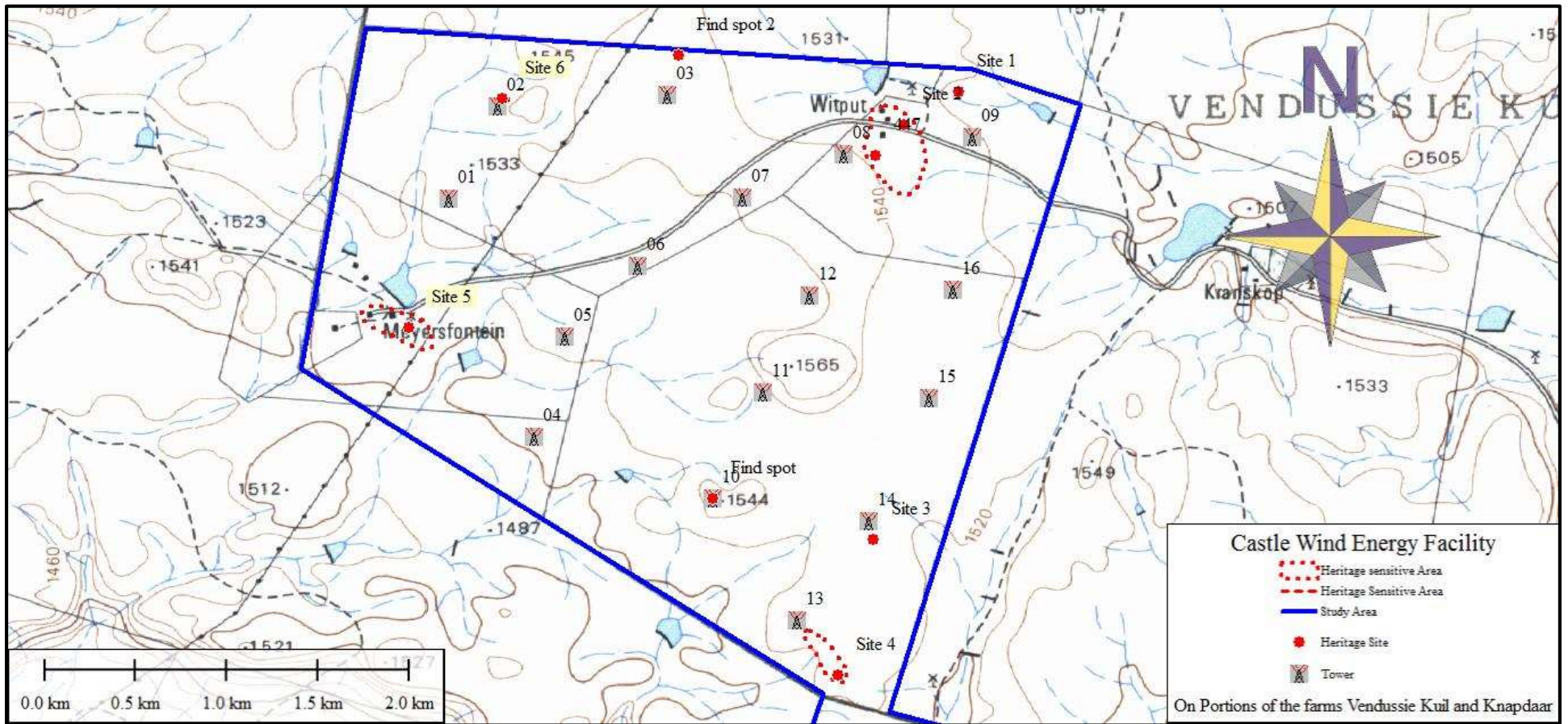


Figure 5: Showing the location of recorded sites in relation to tower positions on the farm Vendussie Kuil.

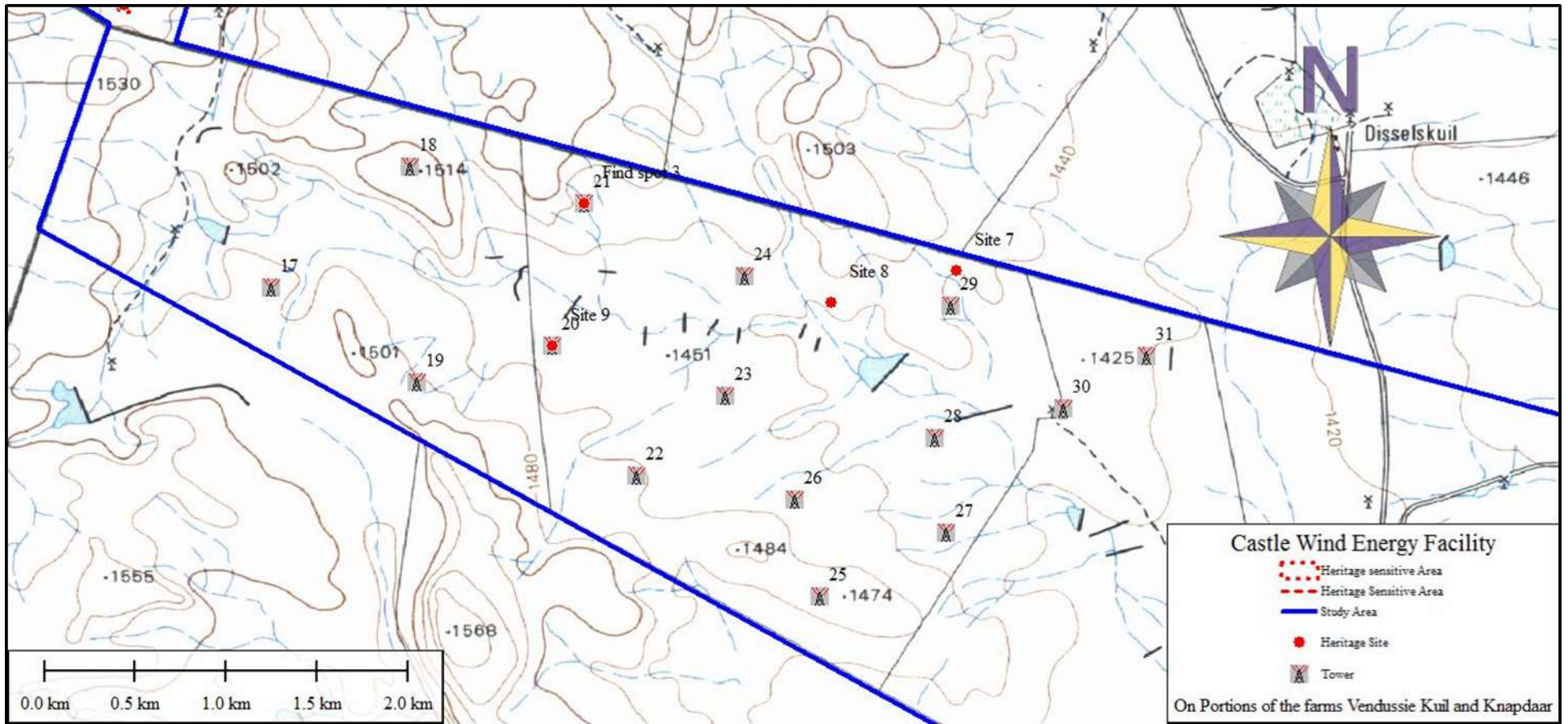


Figure 6: Showing the location of recorded sites in relation to turbine positions on the farm Knapdaar.

## 6.2. Sites with Coordinates

Site Number	Landscape	Type Site	Cultural Markers	Co ordinate
<b>Site 1</b>	Archaeological	Middle Stone Age	Stone tools with facets on the striking platform scattered around pan	S30 34 11.1 E24 18 22.9
<b>Site 2</b>	Historical	Witput Farm complex	Vernacular buildings	S30 34 17.0 E24 18 13.3
<b>Site3</b>	Archaeological	Stone Age quarry/workshop site	Hornfel outcrop with scar flaking. Low density of MSA flakes	S30 35 30.7 E24 18 07.9
<b>Site 4</b>	Archaeological	Stone Age quarry/workshop site	Hornfel outcrop with scar flaking. Low density of MSA flakes	S30 35 54.8 E24 18 01.5
<b>Site 5</b>	Historical	Meyersfontein Farm complex	Vernacular buildings	S30 34 53.0 E24 16 45.1
<b>Site 6</b>	Archaeological	Later Stone Age	Engravings	S30 34 12.3 E24 17 01.8
<b>Site 7</b>	Archaeological	LSA	Stone enclosure with lithics	S30 36 42.0 E24 20 29.7
<b>Site 8</b>	Historical	Large Kraal	Dry stone walling	S30 36 47.7 E24 20 07.3
<b>Site 9</b>	Archaeological	Stone Age quarry/workshop site	Hornfel outcrop with scar flaking. Medium high density of flakes	S30 36 55.5 E24 19 17.7

### 6.2.1 Find spot with Coordinates

Site Number	Landscape	Type Site	Cultural Markers	Co ordinate
<b>Find spot</b>	Archaeological	Middle Stone Age	Stone tools with facets on the striking platform. Snapped blades with dorsal flaking and scrapers	S30 35 23.4 E24 17 39.3
<b>Find spot 2</b>	Archaeological	Middle Stone Age	Rough flakes and chunks, almost no formal tools although some show signs of use.	S30 34 04.7 E24 17 33.2
<b>Find spot 3</b>	Archaeological	MSA/LSA	Highly weathered as well as fresh looking flakes, mostly blades and triangular flakes	S30 36 30.1 E24 19 23.4

### 6.3. Site Descriptions

#### 6.3.1 Site 1

<b>Site Number</b>	Site 1	<b>1:50 000 map nr</b>	3024 CB
<b>Site Data</b>	<b>Description:</b>		
<b>Type of site</b>	Open air site		
<b>Site categories</b>	Mostly Middle Stone Age		
<b>Context</b>	<p>The site consists of artefacts made on hornfels scattered around a dry pan. On the north western side of the pan is a slight rise and a lot of the artefacts have gravitated from here down towards the pan. The concentration of artefacts becomes less far away from the periphery of the pan. Raw material is readily available in the form of hornfel scree and artefacts consist of highly weathered, unmodified flakes, chunks, blade tools, a few cores and retouched flakes. Calcrete deposits protrude through the thin soils.</p>		
<b>Cultural affinities, approximate age and significant features of the site;</b>	<p>Approximate age for MSA in this region dates to 30-300 thousand years ago.</p>		
<b>Description of artefacts</b>	<p>Most artefacts are highly patinated and appear orange/brown. They include blades (&gt; 5 cm in length) and convergent pieces, mostly with faceted striking platforms characteristic of MSA assemblages. Most pieces from this site also have a rolled appearance, indicating that they could have been washed from the hill. Some artefacts are less patinated but not "fresh" looking like other LSA assemblages in the area.</p>		
<b>Estimation or measurement of the extent</b>	<p>Artefacts are found scattered around a pan over an approximate area of less than 1 ha.</p>		
<b>Depth and stratification of the site</b>	<p>Not known</p>		



**Photographs**



Figure 7: Dry pan viewed from the west.



Figure 8: Calcrete exposures around the edge of the pan.



Figure 9: Dorsal and ventral view of artefacts.

<p><b>Field Rating</b> (Recommended grading or field significance) of the site:</p>	<p>Generally Protected B</p>
<p><b>Statement of Significance (Heritage Value)</b></p>	<p>Low to medium significance.</p>



## Impact Evaluation

<b>Nature:</b> During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position Stone Age Material or objects.		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local (2)	Local (1)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	Low (3)	Low (2)
<b>Probability</b>	Improbable (3)	Improbable (3)
<b>Significance</b>	<b>30 (Medium)</b>	<b>24 (Low)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	The site will not be impacted so action will be required.	
<b>Mitigation:</b> The site is not located close to any turbine and no impact is foreseen on the site and therefore no mitigation is required. However the general location should be demarcated to avoid impact on the site.		
<b>Cumulative impacts:</b> No impact on the site is foreseen.		
<b>Residual Impacts:</b> Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive		

### 6.3.2 Site 2

<b>Site Number</b>	Site 2	<b>1:50 000 map nr</b>	3024 CB
<b>Site Data</b>	<b>Description:</b>		
<b>Type of site</b>	Open air site		
<b>Site categories</b>	Historical Farm complex.		
<b>Context</b>	<p>The site consists of a vernacular historical farm complex with a dilapidated main dwelling and rectangular dry stone walled kraal (S30 34 14.0 E24 18 10.1). The dwelling was added onto in later years with an additional room to the south. The site consists of a stone wall foundation with clay bricks on top of it with a hipped roof and wood floors. The remains of other demolished stone foundations are also visible in the area. To the south of this dwelling is a recent farm labourer house consisting of 3 rooms and an outside toilet (S30 34 22.5 E24 18 08.3). To the south west of the site (217m) is several rectangular and circular stone wall foundations (S30 34 22.5 E24 18 08.3) with iron, wire and glass artefacts scattered widely across the area that could possibly be associated with shelters for shepherds. There is also a cemetery associated with the complex according to the farm owner but could not be located during the survey.</p>		
<b>Cultural affinities, approximate age and significant features of the site;</b>	According to the farm owner the complex was constructed by his grandfather in the early 1900's and it is therefore older than 60 years.		
<b>Description of artefacts</b>	Industrial wire and glass are scattered over the site together with plastic and modern house hold material.		
<b>Estimation or measurement of the extent</b>	The complex covers an approximate area of 7 ha.		
<b>Depth and stratification of the site</b>	Not known		

**Photographs**



Figure 10: Farm house viewed from the north



Figure 11: Stone walled kraal.



Figure 12: Ill-defined stone wall foundations.



Figure 13: artefacts scattered over site

<p><b>Field Rating</b> (Recommended grading or field significance) of the site:</p>	<p>Generally Protected B</p>
<p><b>Statement of Significance (Heritage Value)</b></p>	<p>Medium significance</p>

## Impact Evaluation

<p><b>Nature:</b> During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position Historical Material or objects.</p>		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local (2)	Local (1)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	High (8)	Low (2)
<b>Probability</b>	Improbable (2)	Improbable (3)
<b>Significance</b>	<b>30 (Medium)</b>	<b>24 (Low)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	Yes	
<p><b>Mitigation:</b> No turbine is located close to the sites and no direct impact is foreseen on the site. The area should be demarcated to avoid impact on the site.</p>		
<p><b>Cumulative impacts:</b> Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.</p>		
<p><b>Residual Impacts:</b> Depletion of Archaeological record of the area.</p>		

**6.3.3 Site 5 and 8**

<b>Site Number</b>	Site 5 and Site 8	<b>1:50 000 map nr</b>	3024 CB
<b>Site Data</b>	<b>Description:</b>		
<b>Type of site</b>	Open air		
<b>Site categories</b>	Historical		
<b>Context</b>	<p>Site 5 consists of the historical (very dilapidated) Meyersfontein farm complex. The main dwelling was constructed of red sundried clay bricks but has fallen over and only the foundations remain. A Farm labourer house consisting of 3 rooms is located at (S30 34 51.4 E24 16 42.6) and a large dry stone walled kraal at (S30 34 53.0 E24 16 45.1). On a large rock outcrop next to a small drainage are some historical engravings of amongst others a person on a horse and some initials (S30 34 54.7 E24 16 46.9) and are possibly associated with earlier farm occupants/owners.</p> <p>Site 8 consists of at least two large dry stone walled kraals measuring approximately 9 by 18 meters. Several isolated MSA artefact are found scattered over the site</p>		
<b>Cultural affinities, approximate age and significant features of the site;</b>	The sites probably date to the early/ middle 1900's.		
<b>Description of artefacts</b>	Glass, iron and earthenware fragments are scattered over the site.		
<b>Estimation or measurement of the extent</b>	Site 5 measures approximately 8000 m <sup>2</sup> . Site 8 covers an area of 50 x 50 meters.		
<b>Depth and stratification of the site</b>	Not known		

**Photographs**



Figure 14: Engravings of initials on a person on a horse/donkey.



Figure 15: Engravings of initials.



Figure 16: Stone walled kraal



Figure 17: Farm labourer dwelling

**Field Rating**

(Recommended grading or field significance) of the site:

Generally protected B

**Statement of Significance (Heritage Value)**

Medium Significance.

## Impact Evaluation

<p><b>Nature:</b> During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position Stone Age Material or historical objects.</p>		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local (4)	Local (4)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	High (8)	Moderate (6)
<b>Probability</b>	Improbable (2)	Improbable (2)
<b>Significance</b>	<b>34 (Medium)</b>	<b>30 (Low to Medium)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	Yes	
<p><b>Mitigation:</b> No turbine in close proximity but access routes should avoid this area.</p>		
<p><b>Cumulative impacts:</b> Depletion of Archaeological record of the area.</p>		
<p><b>Residual Impacts:</b> Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.</p>		

**6.3.4 Site 3, 4 and 9**

<b>Site Number</b>	Site 3, 4 and 9	<b>1:50 000 map nr</b>	3024 CB
<b>Site Data</b>	<b>Description:</b>		
<b>Type of site</b>	Open air site		
<b>Site categories</b>	MSA/LSA quarry/workshop sites		
<b>Context</b>	The sites consist of hornfel outcrops that are fairly low standing, approximately 10 cm above the surface, with some evidence of flake scarring. Although there are plenty of raw materials available, fairly few pieces were worked apart from site 9 where a much higher concentration of artefacts are found. Site 3 and 4 have an artefact density of 4 per m <sup>2</sup> and at site 9 more than 10m <sup>2</sup> .		
<b>Cultural affinities, approximate age and significant features of the site;</b>	Approximate age for MSA in this region dates from 250 000 to 40-25 000 years ago and for the LSA from 40 000-25 000, until as recently as 100 years ago		
<b>Description of artefacts</b>	Artefacts consist mostly of blades, triangular flakes (some with dorsal flaking) and cores. Most of the flakes are black in colour (not patinated) and is easily recognisable.		
<b>Estimation or measurement of the extent</b>	At site 9 artefacts are scattered over an approximate area of 2000 m <sup>2</sup> and site 3 and 4 approximately 5 x 5 meters.		
<b>Depth and stratification of the site</b>	None visible.		



**Photographs**

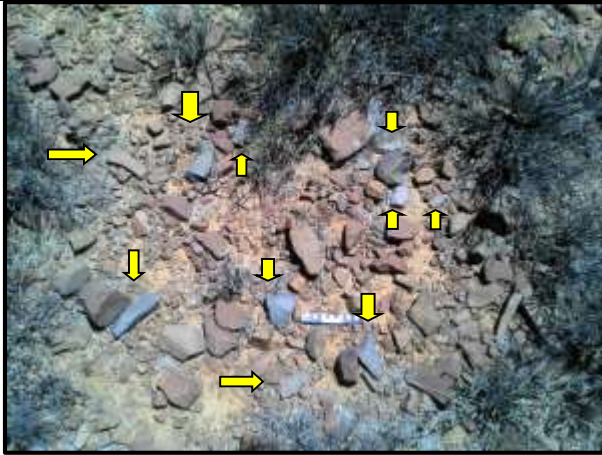


Figure 18: Unpatinated flakes easily visible at Site 9.



Figure 19: Dorsal and ventral views of artefacts at site 3.



Figure 20: Core and flakes at Site 9:

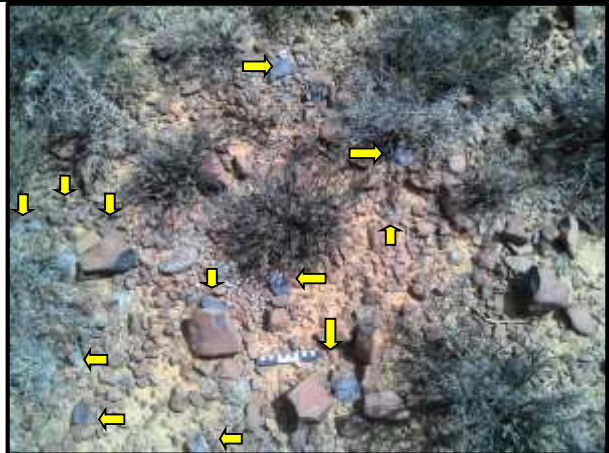


Figure 21: Unpatinated flakes easily visible at Site 4.

**Field Rating**

(Recommended grading or field significance) of the site:

Generally Protected B

**Statement of Significance (Heritage Value)**

Medium Significance.

## Impact Evaluation

<p><b>Nature:</b> During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position Stone Age Material or objects.</p>		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local (2)	Local (1)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	High (8)	Low (2)
<b>Probability</b>	Probable (3)	Improbable (2)
<b>Significance</b>	<b>45 (Medium)</b>	<b>16 (Low)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	Yes	
<p><b>Mitigation:</b></p> <p>At Site 9 surface sampling should be conducted and the site should be monitored during construction. Preferably, the area should be demarcated to avoid impact on the site. Site 3 and 4 are not impacted by a proposed tower position and no impact is foreseen on the site but the sites should be demarcated and avoided during construction.</p>		
<p><b>Cumulative impacts:</b></p> <p>Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.</p>		
<p><b>Residual Impacts:</b> Depletion of Archaeological record of the area.</p>		

**6.3.5 Site 6**

<b>Site Number</b>	Site 6	<b>1:50 000 map nr</b>	3024 CB
<b>Site Data</b>	<b>Description:</b>		
<b>Type of site</b>	Open air site		
<b>Site categories</b>	Engraving.		
<b>Context</b>	The site consists of a large boulder with the engravings of two elephants on it. Unfortunately a portion of the boulder flaked off in the past and some of the panel was destroyed.		
<b>Cultural affinities, approximate age and significant features of the site;</b>	Unknown.		

**Photographs**



Figure 22: Engraved boulder with flaking evident.



Figure 23: Close up of engraved elephant.

**Field Rating**

(Recommended grading or field significance) of the site:

Generally Protected a

**Statement of Significance (Heritage Value)**

High Significance.

## Impact Evaluation

<p><b>Nature:</b> During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position Stone Age Material or objects.</p>		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local (2)	Local (2)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	High (8)	Moderate (5)
<b>Probability</b>	Probable (4)	Probable (3)
<b>Significance</b>	<b>60 (Medium to high)</b>	<b>36 (Medium)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	Yes	
<p><b>Mitigation:</b></p> <p>The site is located close to turbine 2 and a direct impact is foreseen on the site. Ideally the area should be demarcated to avoid impact on the site. Alternatively the engraving must be traced and documented and the boulder relocated to a museum.</p>		
<p><b>Cumulative impacts:</b></p> <p>Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive, this site is unique and should be recorded as part of the heritage landscape of the area. .</p>		
<p><b>Residual Impacts:</b> Depletion of Archaeological record of the area.</p>		

**6.3.6. Site 7**

<b>Site Number</b>	Site 7	<b>1:50 000 map nr</b>	3024 CB
<b>Site Data</b>	<b>Description:</b>		
<b>Type of site</b>	Open air site		
<b>Site categories</b>	Possibly Later Stone Age.		
<b>Context</b>	The site consists of a crescent shaped stone wall feature. The feature faces towards a drainage line and open area where water accumulates in wetter periods and could be a hunting blind. Isolated hornfel flakes and chunks are scattered around this feature. Artefact ratio is low measuring approximately 1 per 5m <sup>2</sup> .		
<b>Cultural affinities, approximate age and significant features of the site;</b>	Approximate age for LSA is from 40 000-25 000, until as recently as 100 years ago.		
<b>Description of artefacts</b>	Artefacts are nearly black or grey as opposed to the more heavily patinated orange-brown of older stone tools.		
<b>Estimation or measurement of the extent</b>	Artefacts are scattered over an approximate area of 1.115 x 15 meter.		
<b>Depth and stratification of the site</b>	Non visible		

**Photographs**



Figure 24: Range of artefacts.



Figure 25: Stone packed feature.

**Field Rating**

(Recommended grading or field significance) of the site:

Generally Protected B

**Statement of Significance (Heritage Value)**

Medium Significance.

## Impact Evaluation

<p><b>Nature:</b> During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position Stone Age Material or objects.</p>		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local (2)	Local (1)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	High (8)	Low (2)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	<b>45 (Medium)</b>	<b>24 (Low)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	Yes	
<p><b>Mitigation:</b></p> <p>The site is located 200 meter from turbine 29 and an indirect impact is foreseen on the site. The site should be demarcated to avoid impact on the site.</p>		
<p><b>Cumulative impacts:</b></p> <p>Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.</p>		
<p><b>Residual Impacts:</b> Depletion of Archaeological record of the area.</p>		



## Impact evaluation of power line corridors

<p><b>Nature:</b> During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological or historical material.</p>		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local (2)	Local (1)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	Low (3)	Low (2)
<b>Probability</b>	Probable (3)	Improbable (2)
<b>Significance</b>	<b>30 (Low)</b>	<b>16 (Low)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	Yes	
<p><b>Mitigation:</b></p> <p>From the desktop assessment no fatal flaws were identified in the Power Line corridors. It is recommended that the preferred power line corridor is subjected to a heritage walk through when the pylon positions are determined and mitigation includes the micro adjustments of tower positions for the in situ preservation of sites.</p>		
<p><b>Cumulative impacts:</b></p> <p>No impact on any site is foreseen, this should be verified by a heritage walk through prior to construction.</p>		
<p><b>Residual Impacts:</b> Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive</p>		

## 7. CONCLUSIONS AND RECOMMENDATIONS

The abundance of locally available raw material in the form of hornfels or indurated shale resulted in the use of the landscape over millennia by Stone Age people. Stone Age remains are mostly represented by thinly spread MSA scatters but more substantial quarries/workshops that are found scattered over the study and to a lesser extent also by LSA quarries/workshops on higher lying areas or hills. Erosion of the hills results in the gravitating of raw material and artefacts towards gently dipping plains between the dolerite hills and outcrops. Some of these deposits might be covered by the clay and sandy soils in the valleys or plains.

As Morris (2011) notes in most cases at documented sites in the area, the predominant component appears to be Pleistocene and early Holocene in age (the greater number of artefacts are highly patinated – a weathering/oxidation process resulting from long exposure of knapped surfaces), but there are also places with a much younger component of tools, late Holocene Later Stone Age, that are still relatively fresh-looking (little or no apparent patination – the artefacts are nearly black or gray as opposed to the more heavily patinated orange-brown of older stone tools). Stone Age industries present certainly include Middle and Later Stone Age assemblages (referred to as MSA and LSA) but no Earlier Stone Age (ESA) were recorded during the survey. Rock engravings associated with the LSA were also recorded.

Some remnants of the farms history is represented in the form of two dilapidated farm complexes.

The proposed tower positions was surveyed for sites of archaeological, cultural and historical significance and nine sites of heritage significance were identified during the survey as well as some Stone Age find spots and is summarised below:

<b>Turbine Number</b>	<b>Archaeological Finds</b>	<b>Recommendations</b>
<b>1</b>	None	No Action Required
<b>2</b>	Stone Age Engravings (Site 6)	Preservation of the site in situ. If this is not possible, documentation and tracing of the site as well as the relocation of the boulder with the required permits.
<b>3</b>	Background scatter of Stone Age tools in area (example Find Spot 2)	No further action required.
<b>4</b>	None	No Action Required
<b>5</b>	None	No Action Required
<b>6</b>	None	No Action Required
<b>7</b>	None	No Action Required
<b>8</b>	Historical farm complex of Witput (site 2)	Area should be demarcated and avoided.
<b>9</b>	Background scatter of Stone tools	No further action required.
<b>10</b>	Background scatter of Stone Age tools in area (example Find Spot)	No further action required.
<b>11</b>	None	No Action Required
<b>12</b>	Background Scatter	No action required.
<b>13</b>	Background Scatter	No action required

<b>14</b>	Isolated tools gravitating down from Site 3	Site 3 must be avoided and demarcated.
<b>15</b>	None	No Action required
<b>16</b>	Isolated Tools and back ground scatter	No Action required
<b>17</b>	Background Scatter	No Action required
<b>18</b>	None	No Action required
<b>19</b>	None	No Action required
<b>20</b>	Quarry / workshop site. High concentration of tools	Avoidance of area and relocation of turbine. If this is not possible surface sampling and documentation of site with the required permits.
<b>21</b>	Background scatter of Stone Age tools in area (example Find Spot 3)	No action required
<b>22</b>	Plenty if raw material i.e. hornfel scree. Isolated tools.	No Action required
<b>23</b>	None	No Action required
<b>24</b>	None	No Action required
<b>25</b>	Background scatter	No Action required
<b>26</b>	Isolated artefacts out of context gravitating down from hill.	No Action required.
<b>27</b>	Isolated artefacts out of context gravitating down from hill.	No Action required.
<b>28</b>	Isolated artefacts out of context gravitating down from hill.	No Action required.
<b>29</b>	Background scatter of isolated, lightly spread tools.	Site 7 is located 200 m to the North and should be avoided during construction.
<b>30</b>	Isolated artefacts out of context gravitating down from hill.	No Action required.
<b>31</b>	None	No Action required

The location all the recorded features should be taken into account in the future planning of the Windfarm project especially for internal roads, underground cabling and construction camps as it is recommended that the sites are preserved as is, and demarcated for its future protection this will require a full Heritage Management Plan apart from the actions below for the draft EMP.

**OBJECTIVE:** Prevent unnecessary disturbance and/or destruction of archaeological sites or features that has not been mitigated for the development. Also to limit all secondary impacts during the medium and longer term working life of the facility.

<b>Project component/s</b>	All phases of construction and all linear construction more than what is required and any extension of components addressed in this report. .		
<b>Potential impact</b>	Damage/disturbance to archaeological sites.		
<b>Activity risk/source</b>	Activities that could have an impact include deviations from the planned infrastructure as well as secondary impact from Construction in the study area.		
<b>Mitigation: target/objective</b>	To retain sites in undisturbed condition through clear demarcation of no go areas and a buffer zone in order to protect sensitive sites. An EMP that includes heritage considerations should any changes to the facility be proposed in future. .		
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>	
Provision for ongoing heritage monitoring in a facility EMP that also includes Chance Find Procedures for all phases of development and operation of the facility.	Environmental management Provider with ongoing monitoring role included by the developer.	To be in place before commencement of the development.	
<b>Performance indicator</b>	Mitigation and recommendations in this report including the demarcation of sites. Inclusion of heritage consideration in all future extension of the facility and/ or infrastructure.		
<b>Monitoring</b>	No pedestrians or construction vehicles allowed inside the demarcated areas. Officials from both Provincial and National Heritage authorities should be allowed to inspect the operation of the facility at any time in relation to the heritage component of the management plan		

Although all the power line servitudes are acceptable from a heritage point of view it is clear that Stone Age manifestations and engravings can be expected in the proposed power line options and it is therefore, recommended that when the final alignment is determined that the power lines and specifically the pylon positions are subjected to a heritage walk through. If any sites occur they can be preserved through micro adjustments to pylon positions.

If the recommendations as made in this report are adhered to, there is from a heritage point of view no reason why the development cannot commence based on approval from SAHRA.

If during construction any possible finds are made, the operations must be stopped and a qualified archaeologist be contacted for an assessment of the find.

### **General**

The possibility of the occurrence of unmarked or informal graves and subsurface finds cannot be excluded. If during construction any possible finds are made, the operations must be stopped and a qualified archaeologist be contacted for an assessment of the find.

## **8. PROJECT TEAM**

Jaco van der Walt, Project Manager

## 9. STATEMENT OF COMPETENCY

The author of the report is a member of the Association of Southern African Professional Archaeologists, (member number 159) and is also accredited in the following fields of the Cultural Resource Management (CRM) Section: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation.

Jaco serves as a council member for the CRM Section of the Association of Southern African Association Professional Archaeologists and is also a accredited CRM Archaeologist with SAHRA and AMAFA.

Jaco has been involved in research and contract work in South Africa, Botswana, Zimbabwe, Mozambique and Tanzania and conducted well over 300 AIAs since he started his career in CRM in 2000.

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