

**Heritage impact assessment for the  
PROPOSED ESTABLISHMENT OF A WIND FARM BY MAINSTREAM  
RENEWABLE POWER IN THE NOUPOORT REGION,  
NORTHERN CAPE PROVINCE**

**HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED ESTABLISHMENT OF  
A WIND FARM BY MAINSTREAM RENEWABLE POWER IN THE NOUPOORT  
REGION, NORTHERN CAPE PROVINCE**

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**Prepared for:**  
SiVEST Environmental  
**Representative:** Ms K Tucker

**Postal Address:** PO Box 2921, Rivonia, 2128  
**Tel:** 011 798 0600  
**E-mail:** KellyT@sivest.co.za

**Prepared by:**  
J van Schalkwyk (D Litt et Phil), Heritage Consultant  
ASAPA Registration No.: 168  
**Principal Investigator:** Iron Age, Colonial Period, Industrial Heritage

**Postal Address:** 62 Coetzer Avenue, Monument Park, 0181  
**Mobile:** 076 790 6777  
**Fax:** 012 347 7270  
**E-mail:** jvschalkwyk@mweb.co.za

**Declaration:**

I, J.A. van Schalkwyk, declare that I do not have any financial or personal interest in the proposed development, nor its developers or any of their subsidiaries, apart from the provision of heritage assessment and management services.



J A van Schalkwyk (D Litt et Phil)  
Heritage Consultant  
February 2012

## EXECUTIVE SUMMARY

### **HERITAGE IMPACT ASSESMENT FOR THE PROPOSED ESTABLISHMENT OF A WIND FARM BY MAINSTREAM RENEWABLE POWER IN THE NOUPOORT REGION, NORTHERN CAPE PROVINCE**

Mainstream Renewable Power South Africa plans to develop a wind farm on a site east of the town of Noupoort in the Northern Cape Province of South Africa.

In accordance with Section 38 of the NHRA, an independent heritage consultant was therefore appointed by **SiVEST Environmental Division** to conduct a Heritage Impact Assessment (HIA) to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where it is planned to develop the wind farm, to assess the significance thereof and to consider alternatives and plans for the mitigation of any adverse impacts.

The cultural landscape qualities of the region essentially consist of one component. It is a rural area in which the human occupation is made up of a pre-colonial element (Stone Age) as well as a much later colonial (farmer) component.

The following sites, features and objects of cultural heritage significance have been identified (Section 5.4):

- A rock shelter that was occupied during the Later Stone Age is located in a valley which is outside the area that has been identified as buildable for the turbines. The shelter was intensively investigated by Sampson (1970) and later again by Bousman (2005). It contained material ascribed to the Wilton industrial complex and rock paintings. Some graffiti occur on the back of the shelter and some stone walling is located in the in front.

Because of its location in the valley, it is highly unlikely that there would be a physical impact on it arising from the development of the wind farm. However, some of the wind turbines might be visible from the shelter.

As the site is in no physical danger and it has already been intensively studied, no mitigation measures are required.

- Two old farmsteads were identified. One farmstead dates to beginning of the 20<sup>th</sup> century and includes a house, barn and stables, all dating to slightly different periods in time. The structures were built with stone and bricks and have reed ceilings. Most of it is very run down, but the owner plans to restore it for future tourism use.

A second farmstead, possibly dating the late 19th century, occurs some distance to the north of the previous one. Only the outer walls and foundations remain. An old threshing floor and stone walling demarcating agricultural fields occur in close proximity.

Both these features are located outside of the areas that have been identified as buildable for the wind turbines and therefore there would be no physical impact on it.

- Informal cemetery, probably for farm labourers. Approximately 20 graves, all only marked with stones. No names or other inscriptions could be found.

These graves are probably linked to the homestead discussed above. Therefore there would be no impact on it as a result of the proposed development.

- A number of stone walled structures were erected by sheep herders who brought the sheep up onto to high areas during the summer and then vacated then during winter

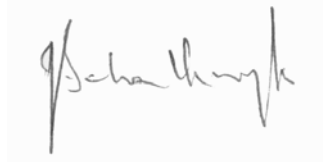
when it became too cold. Typically these structures seem to consist of a small area used for sleeping and a larger enclosed space used to keep the sheep in overnight.

Fortunately all of these structures are located in the valleys or on ridges, areas which are unlikely to be impacted on by the proposed development. However, if there is to be an impact on any of these structures, the relevant structures should be recorded in full (mapped, photographed and excavated) prior to the development taking place.

In order to safeguard the identified sites, it is recommended that buffer zones are set out around each of the identified sites (Section 7.3).

Based on current information regarding sites in the surrounding area, apart from the rock shelter that is viewed to have Grade II significance, all other sites known to occur in the study region are judged to have Grade III significance and therefore would not prevent the proposed development for continuing after the implementation of the proposed mitigation measures and its acceptance by SAHRA.

Therefore, from a heritage point of view we recommend that the proposed development can continue. However, we request that if archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

A handwritten signature in black ink, appearing to read 'J A van Schalkwyk', written in a cursive style.

J A van Schalkwyk  
Heritage Consultant  
February 2012

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## **GLOSSARY OF TERMS AND ABBREVIATIONS**

### **TERMS**

**Study area:** Refers to the entire study area as indicated by the client in the accompanying Fig. 1 & 2.

**Stone Age:** The first and longest part of human history is the Stone Age, which began with the appearance of early humans between 3-2 million years ago. Stone Age people were hunters, gatherers and scavengers who did not live in permanently settled communities. Their stone tools preserve well and are found in most places in South Africa and elsewhere.

|                  |                                    |
|------------------|------------------------------------|
| Early Stone Age  | 2 000 000 - 150 000 Before Present |
| Middle Stone Age | 150 000 - 30 000 BP                |
| Late Stone Age   | 30 000 - until c. AD 200           |

**Iron Age:** Period covering the last 1800 years, when new people brought a new way of life to southern Africa. They established settled villages, cultivated domestic crops such as sorghum, millet and beans, and they herded cattle as well as sheep and goats. As they produced their own iron tools, archaeologists call this the Iron Age.

|                 |                   |
|-----------------|-------------------|
| Early Iron Age  | AD 200 - AD 900   |
| Middle Iron Age | AD 900 - AD 1300  |
| Late Iron Age   | AD 1300 - AD 1830 |

**Historical Period:** Since the arrival of the white settlers - c. AD 1840 - in this part of the country

### **ABBREVIATIONS**

|       |   |
|-------|---|
| ADRC  | Archaeological Data Recording Centre                        |
| ASAPA | Association of Southern African Professional Archaeologists |
| BP    | Before Present  |
| CS-G  | Chief Surveyor-General                                      |
| EIA   | Early Iron Age  |
| ESA   | Early Stone Age   |
| LIA   | Late Iron Age   |
| LSA   | Later Stone Age   |
| HIA   | Heritage Impact Assessment                                  |
| MSA   | Middle Stone Age  |
| NASA  | National Archives of South Africa                           |
| NHRA  | National Heritage Resources Act                             |
| PHRA  | Provincial Heritage Resources Agency                        |
| SAHRA | South African Heritage Resources Agency                     |

## **HERITAGE IMPACT ASSESMENT FOR THE PROPOSED ESTABLISHMENT OF A WIND FARM BY MAINSTREAM RENEWABLE POWER IN THE NOUPOORT REGION, NORTHERN CAPE PROVINCE**

### **1. INTRODUCTION**

Mainstream Renewable Power South Africa plans to develop a wind farm on a site east of the town of Noupoort in the Northern Cape Province of South Africa.

South Africa's heritage resources, also described as the 'national estate', comprise a wide range of sites, features, objects and beliefs. According to Section 27(18) of the National Heritage Resources Act (NHRA), Act 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

In accordance with Section 38 of the NHRA, an independent heritage consultant was therefore appointed by **SiVest Environmental Division** to conduct a Heritage Impact Assessment (HIA) to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where it is planned to develop the wind farm, to assess the significance thereof and to consider alternatives and plans for the mitigation of any adverse impacts.

This HIA report forms part of the Environmental Impact Assessment (EIA) as required by the EIA Regulations in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and is intended for submission to the South African Heritage Resources Agency (SAHRA).

### **2. TERMS OF REFERENCE**

The aim of this HIA, broadly speaking, is to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where it is planned to develop the wind farm and its associated infrastructure.

#### **2.1 Scope of work**

The scope of work for this study consisted of:

- Conducting of a desk-top investigation of the area, in which available literature, reports, databases and maps were studied;
- A visit to the proposed development area.

The objectives were to

- Identify possible archaeological, cultural and historic sites and features within the proposed development area;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical sites and features;

- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

## 2.2 Limitations and assumptions

The investigation was influenced by the following factors:

- Archaeological sites, by their very nature, occur below ground and can in most cases only identified by surface indicators. The unpredictability of buried archaeological material therefore always remains a problem.

Table 1: Applicable category of heritage impact assessment study and report.

| Type of study              | Aim  | SAHRA involved                                       | SAHRA response   |
|----------------------------|--|--|--|
| Heritage Impact Assessment | <p>The aim of a full HIA investigation is to provide an informed heritage-related opinion about the proposed development by an appropriate heritage specialist. The objectives are to identify heritage resources (involving site inspections, existing heritage data and additional heritage specialists if necessary); assess their significances; assess alternatives in order to promote heritage conservation issues; and to assess the acceptability of the proposed development from a heritage perspective.</p> <p>The result of this investigation is a heritage impact assessment report indicating the presence/ absence of heritage resources and how to manage them in the context of the proposed development.</p> <p>Depending on SAHRA's acceptance of this report, the developer will receive permission to proceed with the proposed development, on condition of successful implementation of proposed mitigation measures.</p> | Provincial Heritage Resources Authority              | Comments on built environment and decision to approve or not |
|                            |  | SAHRA Archaeology, Palaeontology and Meteorites Unit | Comments and decision to approve or not                      |

## 3. HERITAGE RESOURCES

### 3.1 The National Estate

The NHRA (No. 25 of 1999) defines the heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations that must be considered part of the national estate to include:

- places, buildings, structures and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;



- graves and burial grounds, including-
  - ancestral graves;
  - royal graves and graves of traditional leaders;
  - graves of victims of conflict;
  - graves of individuals designated by the Minister by notice in the Gazette;
  - historical graves and cemeteries; and
  - other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- sites of significance relating to the history of slavery in South Africa;
- movable objects, including-
  - objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
  - objects to which oral traditions are attached or which are associated with living heritage;
  - ethnographic art and objects;
  - military objects;
  - objects of decorative or fine art;
  - objects of scientific or technological interest; and
  - books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

### 3.2 Cultural significance

In the NHRA, Section 2 (vi), it is stated that “cultural significance” means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This is determined in relation to a site or feature’s uniqueness, condition of preservation and research potential.

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

- its importance in the community, 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.

A matrix was developed whereby the above criteria were applied for the determination of the significance of each identified site (see Appendix 1). This allowed some form of control over the application of similar values for similar sites.

## 4. STUDY APPROACH AND METHODOLOGY

### 4.1 Extent of the Study

This survey and impact assessment covers the area as presented in Section 5 and as illustrated in Figures 1 - 2.

### 4.2 Methodology

#### 4.2.1 Preliminary investigation

##### 4.2.1.1 Survey of the literature

A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. The following sources were consulted – Beaumont & Vogel 1984; Bousman 2005; Playne 1910-1911; Raper 2004; Richardson 2001; Sampson 1970,1985; Wilson & Anhaeusser 1998.

- Information on events, sites and features in the larger region were obtained from these sources.

##### 4.2.1.2 Data bases

The *Heritage Atlas Database*, the *Environmental Potential Atlas*, the *Chief Surveyor General (CS-G)* and the *National Archives of South Africa (NASA)* were consulted.

- Database surveys produced a number of sites located in the larger region of the proposed development. The original Title Deed for the farm was accessed.

##### 4.2.1.3 Other sources

Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

- Information of a very general nature was obtained from these sources.

#### 4.2.2 Field survey

The area that had to be investigated was identified by **SiVEST Environmental Division** by means of maps. The site was surveyed by walking transects over the areas indicated by Mr Lessing, the current owner of the farm, where it is proposed to establish the wind farm. In addition Mr Lessing was interviewed as to the possibility of sites occurring on the property and he kindly took some time off to point out the existence of a number of sites.

## 5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

### 5.1 Site location and description

The study area is an irregular shaped section of land located some distance to the east of the town of Noupoort in the Northern Cape Province (Fig. 1). It is located on Portions of the farm Blydefontein 168 in the Noupoort magisterial district of Northern Cape Province.

The geology is made up of mudstone, with dolerite intrusions to the east of the study area. The original vegetation is classified as South-eastern Mountain Grassland, changing to

Eastern Mixed Nama Karoo west of the study area. The topography is classified as low mountains and the Oorlogspoort River starts on the farm Blydefontein. The current land use is farming, with the largest area used for grazing, although some areas were used as agricultural fields in the past.

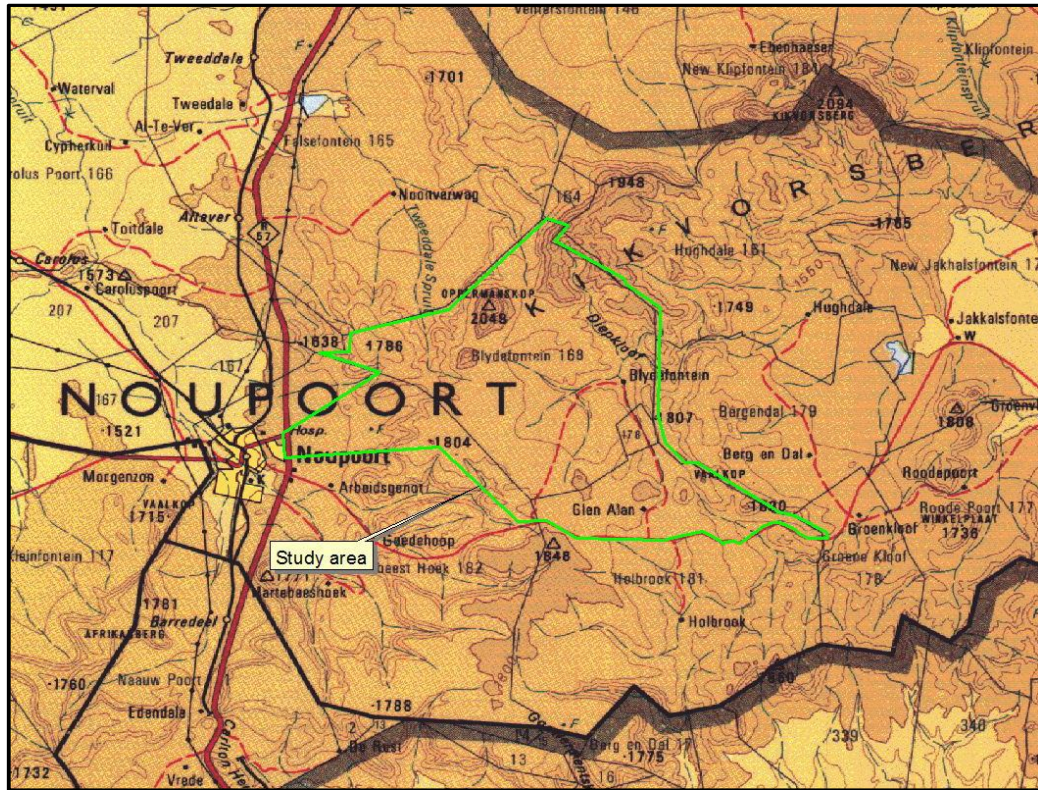


Fig. 1. Location of the study area in regional context.



Fig. 2. Views over the study area.



Fig. 3. Aerial view of the study area.  
(Photo: Google Earth)

## 5.2 Project Description

According to Mr Lessing, the development would mostly take place on the higher laying level areas. As such the broken, steeply sloped areas and valleys could be discounted for the purpose of this survey.

The proposed development would include the following aspects:

- The area where the wind turbines would be erected – approximately 83 turbines with an ultimate capacity of 191MW;
- Electrical connections – which will connect the turbines to each other by means of buried medium voltage cables, except where overhead lines are more appropriate;
- Substations – a new substation will be developed which will supply the electricity to the Eskom grid;
- Access and internal roads – existing roads will be used and internal roads will be developed;
- Temporary construction area – will be a maximum 10 000m<sup>2</sup> temporary lay down area;
- Other infrastructure – which will include administration and warehouse buildings, borrow pits, fencing.

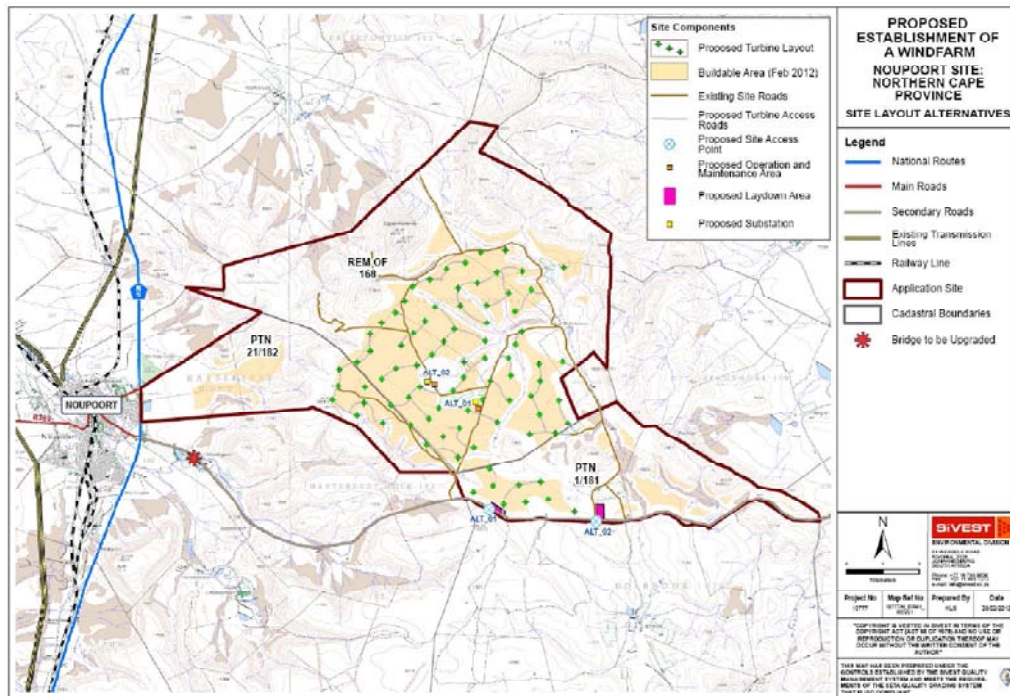


Fig. 4. Layout of the study area.

### 5.3 Regional overview

#### Stone Age

With one exception, little information is available on the Stone Age occupation of the region of the study area. Fortunately, Sampson (1985) did a very intensive survey of the Seacow River valley located some distance to the west. Although it should be acknowledged that environmentally it is somewhat different from that of the study area, it does supply us with a window into the human occupation of the larger region.

The earliest known occupants of the valley, referred to as the Aachelian industry (ESA), dates back to about 250 000 years ago. Their sites indicate a group of hunters passing regularly through the area on a large seasonal mobility pattern. Environmental indicators suggest that their occupation was ended by cold-dry episode during which the valley was virtually abandoned.

The next period of occupation dated between 190 000 and 90 000 years ago (MSA). Although their settlement pattern resembles that of the Aachelian, they concentrated more along river banks. Then there follow another cold-dry episode with another abandonment of the valley.

At the beginning of the Holocene period about 10 000 years ago the valley was repopulated by people represented by the Lockwood industry (LSA). Information suggests that they established camps at spring eyes and circulated from one spring to another on a seasonal round.

During the middle Holocene the Lockwood was replaced by the Interior Wilton. Their settlement pattern shows yet another change. Camps were now set back from the springs on an adjacent hill or ridge crest.

The final occupation before the arrival of white settlers in the area is reflected in the Smithfield industry. There is such a massive increase in site numbers after about 1 000 AD that it is suspected there was a population incursion into the valley. The Smithfield has a settlement pattern similar to that of the Interior Wilton.



Fig. 5. Examples of typical stone tools.

*These stone tools are not from the region and are only used to illustrate the difference between Early (left), Middle (middle) and Later Stone Age (right) technology.*

By the 19<sup>th</sup> century some Dutch speaking trekboers moved into the region, grazing their stock. As they depended on water for their live-stock, these farmers would have stuck close to available water sources and it was only during the wetter parts of the rain season that they might have accessed other areas for short periods of time.

The town of Noupoort (originally Naauwpoort) served as important railway junction, linking the lines from Port Elizabeth and East London, to that from Cape Town at De Aar. As a result of its importance, block houses were erected in the region during the Anglo Boer War (1899-1902), some of which are still standing. In 1911 the town had a population of 112 whites and 99 coloured (Playne 1910-1911:206).



Fig. 6. Old Anglican Church in Noupoort.

An investigation of the Title Deeds of the farms under consideration indicated that they were surveyed during the early part of the nineteenth century, implying that they would have been occupied since then.

The farm Blydefontein 168 was originally granted in Quitrent to Hermanus Christophel Havinga on 15 March 1837. However, in May 1893 it became the property of H.C. van Zyl. For the last more than 40 years the farm has been in the possession of the Lessing family.

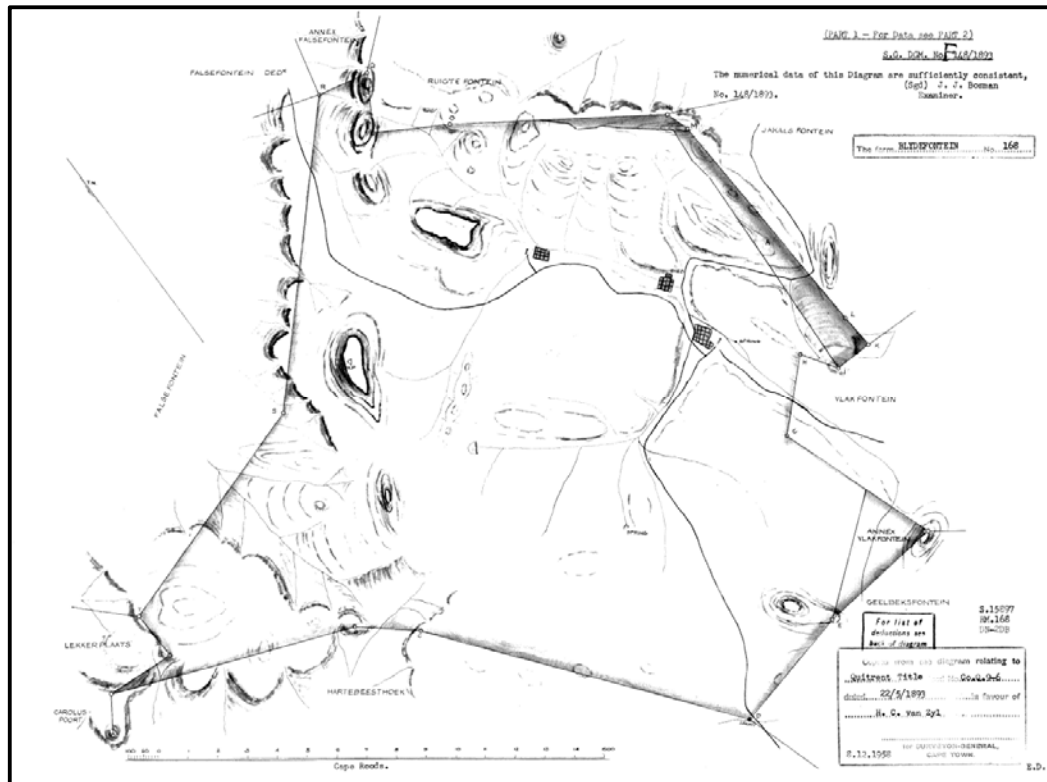


Fig. 7. Copy of the Title Deed for Blydefontein.

#### 5.4 Identified sites

Based on the above literature and other sources and the field visit, the following heritage sites, features and objects were identified in the proposed development area:



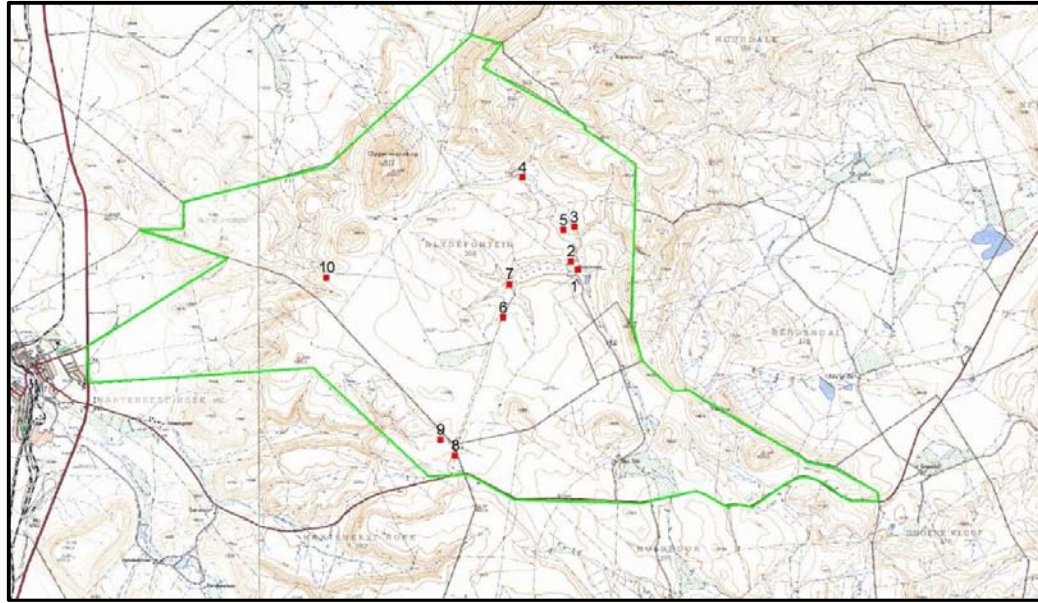


Fig. 8. Map showing the location of the identified sites.  
(Map 3125AA, 3124BB: Chief Surveyor-General)

- Archaeological sites

Archaeological sites can vary from open sites with surface scatters of material, to shelters sites where continuous occupation took place over shorter or longer periods of time. Sites can also vary according to use, ranging from living sites to special purpose (quarries, ritual significance).

|                     |   |            |            |
|---------------------|---|------------|------------|
| <b>Location</b>     | No. 3   | S 31.14913 | E 25.06651 |
| <b>Description</b>  | Rock shelter occupied during the Later Stone Age. It was intensively investigated by Sampson (1970) and later again by Bousman (2005). It contained material ascribed to the Wilton industrial complex and some rock paintings. Some graffiti occur on the back of the shelter and some stone walling is located in the in front. In his analysis of material from the Blydefontein shelter Bousman was able to shown that during wetter periods the population increases, territories shrunk and mobility declined (Bousman 2005:219). |            |            |
| <b>Significance</b> | High on a regional level – Grade II   |            |            |
| <b>Mitigation</b>   | This site is located in a valley which is outside the area of the proposed development. It is therefore highly unlikely that it would be impacted on. Based on current understanding of the project, it is also unlikely that the proposed development would have a physical or visual impact on the site. No mitigation measures are therefore required.   |            |            |

|  |  |
|--|--|
|  |  |
|--|--|



Fig. 9. The rock shelter and some of the paintings inside.

- Farmstead

Farmsteads are complex features in the landscape, being made up of different yet interconnected elements. Typically these consist of a main house, gardens, outbuildings, sheds and barns, with some distance from that labourer housing and various cemeteries. In addition roads and tracks, stock pens and wind mills complete the setup. An impact on one element therefore impacts on the whole.

The architecture of these farmsteads can be described as an eclectic mix of styles modified to adapt to local circumstances. Farm buildings were generally single storied. Walls were thick and built in stone. The roof was either flat or ridged and thatched or tiled and was terminated at either end by simple linear parapet gables.

In some cases outbuildings would be in the same style as the main house, if they date to the same period. However, they tend to vary considerably in style and materials used as they were erected later as and when they were required.

|  |                                      |            |            |
|--|--------------------------------------|------------|------------|
| <b>Location</b>  | No. 1                                | S 31.15812 | E 25.06733 |
| <b>Description</b>   |                                      |            |            |
| Old farmstead dating to beginning of the 20 <sup>th</sup> century. It includes a house, barn and stables, all dating to slightly different periods in time. The structures were built with stone and bricks and have reed ceilings. Most of it is very run down, but the owner plans to restore it for future tourism use. |                                      |            |            |
| <b>Significance</b>  | High on a regional level – Grade III |            |            |
| <b>Mitigation</b>  |                                      |            |            |
| This structure is located outside of the area of proposed development and therefore there would be no impact on it.  |                                      |            |            |



Fig. 10. Views of the farmstead.

- Farmstead

|  |                                      |            |            |
|--|--------------------------------------|------------|------------|
| <b>Location</b>  | No. 3                                | S 31.13805 | E 25.05443 |
| <b>Description</b>   |                                      |            |            |
| Old farmstead possibly dating the late 19th century. Only the outer walls and foundations remain. An old threshing floor and stone walling demarcating agricultural fields occur in close proximity. |                                      |            |            |
| <b>Significance</b>  | High on a regional level – Grade III |            |            |
| <b>Mitigation</b>  |                                      |            |            |
| This structure is located outside of the area of proposed development and therefore there would be no impact on it.  |                                      |            |            |



Fig. 11. View of the threshing floor, now mostly overgrown.

- Cemeteries

Apart from the formal cemeteries that occur in municipal areas (towns or villages), a number of these, some quite informal, i.e. without fencing, is expected to occur sporadically all over, but probably in the vicinity of the various farmsteads. Many might also have been forgotten, making it very difficult to trace the descendants in a case where the graves are to be relocated.

Most of these cemeteries, irrespective of the fact that they are for land owner or farm labourers (with a few exceptions where they were integrated), are family orientated. They therefore serve as important 'documents' linking people directly by name to the land.

|  |                                   |            |            |
|--|-----------------------------------|------------|------------|
| <b>Location</b>  | No. 2                             | S 31.15642 | E 25.06580 |
| <b>Description</b>   |                                   |            |            |
| Informal cemetery, probably for farm labourers. Approximately 20 graves, all only marked with stones. No names or other inscriptions could be found. |                                   |            |            |
| <b>Significance</b>  | High on a local level – Grade III |            |            |
| <b>Mitigation</b>  |                                   |            |            |
| These graves are probably linked to the homestead discussed above. Therefore there would be no impact on it as a result of the proposed development. |                                   |            |            |



Fig. 12. The identified cemetery.

- Farming related features

|   |                                      |            |            |
|---|--------------------------------------|------------|------------|
| <b>Location</b>   | No. 5                                | S 31.14978 | E 25.06417 |
|   | No. 6                                | S 31.16832 | E 25.05141 |
|   | No. 7                                | S 31.16127 | E 25.05273 |
|   | No. 8                                | S 31.19755 | E 25.04126 |
|   | No. 9                                | S 31.19414 | E 25.03819 |
|   | No.10                                | S 31.15982 | E 25.01402 |
| <b>Description</b>  |                                      |            |            |
| According to Mr Lessing, the owner of the farm, these structures were erected by sheep herders who brought the sheep up onto to high areas during the summer, and were vacated during winter when it became too cold. Typically these structures seem to consist of a small area used for sleeping and a larger enclosed space used to keep the sheep in overnight. |                                      |            |            |
| <b>Significance</b>   | High on a regional level – Grade III |            |            |
| <b>Mitigation</b>   |                                      |            |            |
| Fortunately all of these structures are located in the valleys or on ridges, areas which are unlikely to be impacted on by the proposed development. However, if there is to be an impact on any of these structures, the relevant structures should be recorded in full (mapped, photographed and excavated) prior to the development taking place.                |                                      |            |            |



Fig. 13. Examples of the stone walled structures.

## 6. SITE SIGNIFICANCE AND ASSESSMENT

### 6.1 Heritage assessment criteria and grading

The NHRA stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- **Grade I:** Heritage resources with qualities so exceptional that they are of special national significance;
- **Grade II:** Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and
- **Grade III:** Other heritage resources worthy of conservation on a local authority level.

The occurrence of sites with a Grade I significance will demand that the development activities be drastically altered in order to retain these sites in their original state. For Grade II and Grade III sites, the applicable of mitigation measures would allow the development activities to continue.

### 6.2 Statement of significance

A matrix was developed whereby the above criteria, as set out in Sections 3(3) and 7 of the NHRA, No. 25 of 1999, were applied for each identified site (see Appendix 1). This allowed some form of control over the application of similar values for similar sites. Three categories of significance are recognized: low, medium and high. In terms of Section 7 of the NHRA, all the sites currently known or which are expected to occur in the study area are evaluated to have a grading as identified in the table below.

Table 2. Summary of identified heritage resources in the study area.

| Identified heritage resources    |                            |
|----------------------------------|----------------------------|
| Category, according to NHRA      | Identification/Description |
| <b>Formal protections (NHRA)</b> |                            |

|  |      |
|--|------|
| National heritage site (Section 27)            | None |
| Provincial heritage site (Section 27)          | None |
| Provisional protection (Section 29)            | None |
| Place listed in heritage register (Section 30) | None |
| <b>General protections (NHRA)</b>              |      |
| structures older than 60 years (Section 34)    | Yes  |
| archaeological site or material (Section 35)   | Yes  |
| palaeontological site or material (Section 35) | None |
| graves or burial grounds (Section 36)          | Yes  |
| public monuments or memorials (Section 37)     | None |
| <b>Other</b>                                   |      |
| Any other heritage resources (describe)        | None |

### 6.3 Impact assessment

Impact analysis of cultural heritage resources under threat of the proposed development, are based on the present understanding of the proposed development.

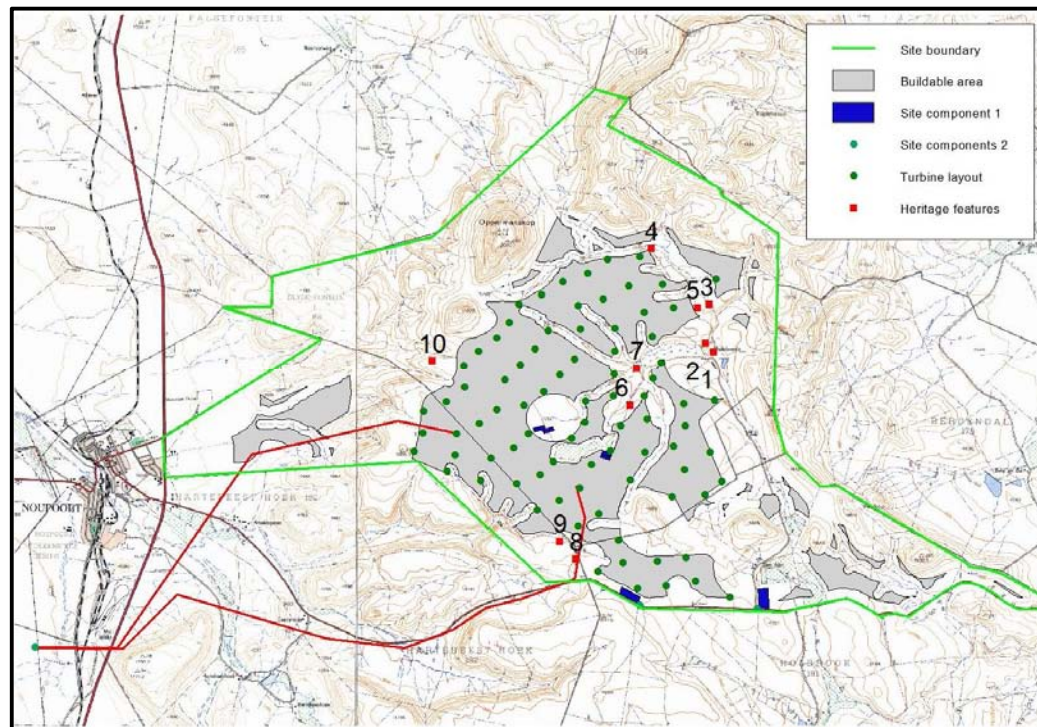


Fig. 14. Layout of the development in relationship to the heritage sites.

| Environmental Parameter                  | <b>Pre-colonial: Stone Age sites</b>   |                               |
|--|--|-------------------------------|
| Issue/Impact/Environmental Effect/Nature | Low possibility of unknown sites. Their potential and significance therefore unknown. The impact will be the physical disturbance of the material and its context. Impact will be focused on a particular node, i.e. turbine positions or access/ inspection roads.  |                               |
| Extent                                   | Local  |                               |
| Probability                              | Can occur  |                               |
| Reversibility                            | Irreversible   |                               |
| Duration                                 | Permanent  |                               |
| Cumulative effect                        | High   |                               |
| Intensity/Magnitude                      | Moderate   |                               |
| Significance Rating                      | Sites have a high significance on a region level – viewed as NHRA Grade II sites. Distinguish from find spots, which have low significance   |                               |
|  | Pre-mitigation impact rating   | Post mitigation impact rating |
| Extent                                   | 2  | 1                             |
| Probability                              | 3  | 1                             |
| Reversibility                            | 4  | 2                             |
| Irreplaceable loss                       | 4  | 3                             |
| Duration                                 | 4  | 4                             |
| Cumulative effect                        | 4  | 1                             |
| Intensity/magnitude                      | 3  | 1                             |
| Significance rating                      | 75 – Negative, very high impact  | 12 – Negative, low impact     |
| Mitigation measures                      | The identified rock shelter is located in a valley which is outside the area of the proposed development. It is therefore highly unlikely that it would be impacted on. Based on current understanding of the project, it is also unlikely that the proposed development would have a visual impact on the site. No mitigation measures are therefore required. Once sites are identified, if the location is to be used for development purposes, then mitigation of the site will be necessary. This could require excavation, or at least mapping and collection of surface material. |                               |

| Environmental Parameter                  | <b>Colonial Period: Farmsteads</b>  |  |
|--|---|--|
| Issue/Impact/Environmental Effect/Nature | The various features are subject to damage. Easier to identify and therefore easier to avoid. Variety of interconnected elements makes up the whole. Impact on part therefore implies an impact on the whole. |  |
| Extent                                   | Local   |  |
| Probability                              | Can occur   |  |
| Reversibility                            | Reversible with human intervention  |  |
| Duration                                 | Permanent   |  |
| Cumulative effect                        | High  |  |
| Intensity/Magnitude                      | Moderate  |  |
| Significance Rating                      | Sites have a high significance on a region level – viewed as NHRA Grade III sites.  |  |

|                     | Pre-mitigation impact rating   | Post mitigation impact rating |
|---------------------|--|-------------------------------|
| Extent              | 2  | 1                             |
| Probability         | 3  | 1                             |
| Reversibility       | 4  | 2                             |
| Irreplaceable loss  | 4  | 3                             |
| Duration            | 4  | 4                             |
| Cumulative effect   | 4  | 1                             |
| Intensity/magnitude | 3  | 1                             |
| Significance rating | 75 – Negative, very high impact  | 12 – Negative, low impact     |
| Mitigation measures | Mitigation should take the form of isolating known sites and declare them as no-go areas with sufficient large buffer zones around them for protection. In exceptional cases mitigation can be implemented after required procedures have been followed. |                               |

| Environmental Parameter                  | <b>Colonial Period: Cemeteries</b>   |                               |
|--|--|-------------------------------|
| Issue/Impact/Environmental Effect/Nature | The various features are subject to damage. Easier to identify and therefore easier to avoid. Variety of interconnected elements makes up the whole. Impact on part therefore implies an impact on the whole.                        |                               |
| Extent                                   | Local  |                               |
| Probability                              | Can occur  |                               |
| Reversibility                            | Irreversible   |                               |
| Duration                                 | Permanent  |                               |
| Cumulative effect                        | High   |                               |
| Intensity/Magnitude                      | Moderate   |                               |
| Significance Rating                      | Sites have a high significance on a local level – viewed as NHRA Grade III sites. Distinguish from find spots, which have low significance.  |                               |
|  | Pre-mitigation impact rating   | Post mitigation impact rating |
| Extent                                   | 2  | 1                             |
| Probability                              | 3  | 1                             |
| Reversibility                            | 4  | 2                             |
| Irreplaceable loss                       | 4  | 3                             |
| Duration                                 | 4  | 4                             |
| Cumulative effect                        | 4  | 1                             |
| Intensity/magnitude                      | 3  | 1                             |
| Significance rating                      | 75 – Negative, very high impact  | 12 – Negative, low impact     |
| Mitigation measures                      | Mitigation should take the form of isolating known sites and declare them as no-go areas with sufficient large buffer zones around them for protection. In exceptional cases mitigation can be implemented after required procedures |                               |



|  |                     |
|--|---------------------|
|  | have been followed. |
|--|---------------------|

| Environmental Parameter                  | <b>Colonial Period: Farming related features</b>  |                               |
|--|---|-------------------------------|
| Issue/Impact/Environmental Effect/Nature | The various features are subject to damage. Easier to identify and therefore easier to avoid. Variety of interconnected elements makes up the whole. Impact on part therefore implies an impact on the whole.                       |                               |
| Extent                                   | Local   |                               |
| Probability                              | Can occur   |                               |
| Reversibility                            | Reversible with human intervention  |                               |
| Duration                                 | Permanent   |                               |
| Cumulative effect                        | High  |                               |
| Intensity/Magnitude                      | Moderate  |                               |
| Significance Rating                      | Sites have a low significance on a region level – viewed as NHRA Grade III sites.   |                               |
|  | Pre-mitigation impact rating  | Post mitigation impact rating |
| Extent                                   | 2   | 1                             |
| Probability                              | 3   | 1                             |
| Reversibility                            | 4   | 2                             |
| Irreplaceable loss                       | 4   | 3                             |
| Duration                                 | 4   | 4                             |
| Cumulative effect                        | 4   | 1                             |
| Intensity/magnitude                      | 3   | 1                             |
| Significance rating                      | 75 – Negative, very high impact   | 12 – Negative, low impact     |
| Mitigation measures                      | Mitigation should take the form of isolating known sites and declare them as no-go areas with sufficient large buffer zones around them for protection. Mitigation can be implemented after required procedures have been followed. |                               |

## 7. RECOMMENDED MANAGEMENT MEASURES

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

### 7.1 Objectives

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during mining activities.

The following shall apply:

- Known sites should be clearly marked in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51(1).

## 7.2 Control

In order to achieve this, the following should be in place:

- A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.
- Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.
- In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.

## 7.3 Safe guarding sites

It is recommended that buffer areas are set out around the identified sites:

- The rock shelter should be demarcated with a buffer of at least 50 metres from the outer edge of the shelter, up to and including the river bank.
- The farmsteads should be demarcated with a buffer of at least 10 metres from the outer edge of all structures and features such as gardens, orchards, etc.
- Cemeteries should be demarcated by a buffer of at least 10 metres from the outer edge of the fence, or the last visible graves if there is no fence.
- The stone walled structures should be demarcated by a buffer of at least 10 metres from the outer edge of the individual structures.

## 8. ALTERNATIVES ASSESSMENT

| Alternative                | Preferred / Not preferred | Reasons   |
|----------------------------|---------------------------|---|
| Office & Maintenance Alt 1 | Preferred                 | It is possible that potential heritage and/or paleontological resources |

|                            |            |   |
|----------------------------|------------|---|
|                            |            | <p>may be un-earthed during construction of the wind farm. Mitigation measures addressing this potential affect have been supplied addressing this concern.</p> <p>Visible heritage resources have been provisionally identified and excluded from the development areas. Operation and maintenance area alternative 1 can be preferred from a heritage resources perspective.</p>  |
| Office & Maintenance Alt 2 | Favourable | <p>It is possible that potential heritage and/or paleontological resources may be un-earthed during construction of the wind farm. Mitigation measures addressing this potential affect have been supplied addressing this concern.</p> <p>Visible heritage resources have been provisionally identified and excluded from the development areas. Operation and maintenance area alternative 2 can equally be viewed as suitable from a heritage resources perspective.</p> |
| Substation Alt 1           | Preferred  | <p>The socio-economic environment is assessed in terms of surrounding communities and those which may be affected by the proposed development as a whole. Site specific preferences in the context of this development have therefore not been provided. Either alternative in this</p>   |

|                  |               |  |
|------------------|---------------|--|
|                  |               | instance may be selected from a socio-economic perspective.  |
| Substation Alt 2 | Favourable    | <p>It is possible that potential heritage and/or palaeontological resources may be un-earthed during construction of the wind farm. Mitigation measures addressing this potential affect have been supplied addressing this concern.</p> <p>Visible heritage resources have been provisionally identified and excluded from the development areas. Substation area alternative 1 can be preferred from a heritage resources perspective.</p> |
| Laydown Alt 1    | Preferred     | <p>It is possible that potential heritage and/or paleontological resources may be un-earthed during construction of the wind farm. Mitigation measures addressing this potential affect have been supplied addressing this concern.</p> <p>Visible heritage resources have been provisionally identified and excluded from the development areas. Laydown area alternative 1 can be preferred from a heritage resources perspective.</p>     |
| Laydown Alt 2    | Not preferred | <p>It is possible that potential heritage and/or paleontological resources may be un-earthed during construction of the wind farm. Mitigation measures</p>   |

|                   |               |   |
|-------------------|---------------|---|
|                   |               | <p>addressing this potential affect have been supplied addressing this concern.</p> <p>Visible heritage resources have been provisionally identified and excluded from the development areas. Laydown area alternative 2 can equally be viewed as suitable from a heritage resources perspective.</p>   |
| Site Access Alt 1 | Preferred     | <p>It is possible that potential heritage and/or paleontological resources may be un-earthed during construction of the wind farm. Mitigation measures addressing this potential affect have been supplied addressing this concern.</p> <p>Visible heritage resources have been provisionally identified and excluded from the development areas. Site access alternative 1 can be preferred from a heritage resources perspective.</p> |
| Site Access Alt 2 | Not preferred | <p>It is possible that potential heritage and/or paleontological resources may be un-earthed during construction of the wind farm. Mitigation measures addressing this potential affect have been supplied addressing this concern.</p> <p>Visible heritage resources have been provisionally identified and excluded from the development areas. Site access alternative 2 can equally be viewed as suitable</p>                       |

|                                       |            |  |  |   |
|---------------------------------------|------------|--|--|---|
|                                       |            |  |  | from a heritage resources perspective.  |
| Grid Access Southern<br>Alternative 1 | Preferred  |  |  | <p>It is possible that potential heritage and/or paleontological resources may be un-earthed during construction of the wind farm. Mitigation measures addressing this potential affect have been supplied addressing this concern.</p> <p>Visible heritage resources have been provisionally identified and excluded from the development areas. Grid access alternative 1 can be preferred from a heritage resources perspective.</p>                   |
| Grid Access Southern<br>Alternative 2 | Favourable |  |  | <p>It is possible that potential heritage and/or palaeontological resources may be un-earthed during construction of the wind farm. Mitigation measures addressing this potential affect have been supplied addressing this concern.</p> <p>Visible heritage resources have been provisionally identified and excluded from the development areas. Grid access alternative 2 can equally be viewed as suitable from a heritage resources perspective.</p> |
| Grid Access Northern<br>Alternative 1 | Preferred  |  |  | Noise can be anticipated during the construction phase of grid access Northern alternative 1. However, this is not expected to be of great magnitude and of low significance to nearby sensitive developments. This   |

|                                    |           |   |
|------------------------------------|-----------|---|
|                                    |           | option can be considered as preferred from a noise perspective.   |
| Grid Access Northern Alternative 2 | Preferred | <p>It is possible that potential heritage and/or paleontological resources may be un-earthed during construction of the wind farm. Mitigation measures addressing this potential affect have been supplied addressing this concern.</p> <p>Grid access northern alternative 2 is preferred from a heritage resources perspective.</p> |

## 9. CONCLUSIONS

The aim of the survey was to locate, identify, evaluate and document sites, features and objects of cultural heritage significance found within the area in which it is proposed to develop a wind farm and associated power lines.

The cultural landscape qualities of the region essentially consist of one component. It is a rural area in which the human occupation is made up of a pre-colonial element (Stone Age) as well as a much later colonial (farmer) component.

The following sites, features and objects of cultural heritage significance have been identified (Section 5.4):

- A rock shelter that was occupied during the Later Stone Age is located in a valley which is outside the area that has been identified as buildable for the turbines. The shelter was intensively investigated by Sampson (1970) and later again by Bousman (2005). It contained material ascribed to the Wilton industrial complex and rock paintings. Some graffiti occur on the back of the shelter and some stone walling is located in the in front.

Because of its location in the valley, it is highly unlikely that there would be a physical impact on it arising from the development of the wind farm. However, some of the wind turbines might be visible from the shelter.

As the site is in no physical danger and it has already been intensively studied, no mitigation measures are required.

- Two old farmsteads were identified. One farmstead dates to beginning of the 20<sup>th</sup> century and includes a house, barn and stables, all dating to slightly different periods in time. The structures were built with stone and bricks and have reed ceilings. Most of it is very run down, but the owner plans to restore it for future tourism use.

A second farmstead, possibly dating the late 19th century, occurs some distance to the north of the previous one. Only the outer walls and foundations remain. An old threshing floor and stone walling demarcating agricultural fields occur in close proximity.

Both these features are located outside of the areas that have been identified as buildable for the wind turbines and therefore there would be no physical impact on it.

- Informal cemetery, probably for farm labourers. Approximately 20 graves, all only marked with stones. No names or other inscriptions could be found.

These graves are probably linked to the homestead discussed above. Therefore there would be no impact on it as a result of the proposed development.

- A number of stone walled structures were erected by sheep herders who brought the sheep up onto to high areas during the summer and then vacated then during winter when it became too cold. Typically these structures seem to consist of a small area used for sleeping and a larger enclosed space used to keep the sheep in overnight.

Fortunately all of these structures are located in the valleys or on ridges, areas which are unlikely to be impacted on by the proposed development. However, if there is to be an impact on any of these structures, the relevant structures should be recorded in full (mapped, photographed and excavated) prior to the development taking place.

In order to safeguard the identified sites, it is recommended that buffer zones are set out around each of the identified sites (Section 7.3)

Based on current information regarding sites in the surrounding area, apart from the rock shelter that is viewed to have Grade II significance, all other sites known to occur in the study region are judged to have Grade III significance and therefore would not prevent the proposed development for continuing after the implementation of the proposed mitigation measures and its acceptance by SAHRA.

Therefore, from a heritage point of view we recommend that the proposed development can continue. However, we request that if archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. A walk down is recommended in order to recover and document any artefacts prior to construction – particularly for the grid lines.



## 9. REFERENCES

### 9.1 Data bases

Chief Surveyor-General  
Environmental Potential Atlas, Department of Environmental Affairs and Tourism.  
Heritage Atlas Database, Pretoria.  
National Archives of South Africa  
SAHRA Archaeology and Palaeontology Report Mapping Project (2009)

### 9.2 Literature

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Bousman, C.B. 2005. Coping with risk: Later Stone Age technological strategies at Blydefontein Rock Shelter, South Africa. *Journal of Anthropological Archaeology* 24:193-226.

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Richardson, D. 2001. *Historic sites of South Africa*. Cape Town: Struik Publishers.

Sampson, C.G. 1970. *The Smithfield Industrial Complex: further field results*. Memoir No. 5. Bloemfontein: National Museum.

Sampson, C.G. 1985. *Atlas of Stone Age settlement in the Central and Upper Seacow Valley*. Memoirs of the National Museum, Bloemfontein 20:1-116.

Wilson, M.G.C. & Anhaeusser, C.R. 1998. *The Mineral Resources of South Africa*. Sixth Edition. Handbook 16. Pretoria: Council for Geosciences.

### 9.3 Maps and aerial photographs

1: 50 000 Topocadastral maps: 3125AA, 3124BB  
Google Earth

### 9.4. Interviews

Mr M Lessing, current owner of the farm Blydefontein. Mr Lessing bought the property a few years ago from his father, who farmed it for more than 40 years.

## APPENDIX 1: CONVENTIONS USED TO ASSESS THE IMPACT OF PROJECTS ON HERITAGE RESOURCES

### Significance

According to the NHRA, Section 2(vi) the **significance** of heritage sites and artefacts is determined by its aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Matrix used for assessing the significance of each identified site/feature

|   |        |      |        |     |
|---|--------|------|--------|-----|
| <b>1. Historic value</b>  |        |      |        |     |
| Is it important in the community, or pattern of history   |        |      |        |     |
| Does it have strong or special association with the life or work of a person, group or organisation of importance in history  |        |      |        |     |
| Does it have significance relating to the history of slavery  |        |      |        |     |
| <b>2. Aesthetic value</b>   |        |      |        |     |
| It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group  |        |      |        |     |
| <b>3. Scientific value</b>  |        |      |        |     |
| Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage  |        |      |        |     |
| Is it important in demonstrating a high degree of creative or technical achievement at a particular period  |        |      |        |     |
| <b>4. Social value</b>  |        |      |        |     |
| Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons  |        |      |        |     |
| <b>5. Rarity</b>  |        |      |        |     |
| Does it possess uncommon, rare or endangered aspects of natural or cultural heritage  |        |      |        |     |
| <b>6. Representivity</b>  |        |      |        |     |
| Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects   |        |      |        |     |
| Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class  |        |      |        |     |
| Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality. |        |      |        |     |
| <b>7. Sphere of Significance</b>  |        | High | Medium | Low |
| International   |        |      |        |     |
| National  |        |      |        |     |
| Provincial  |        |      |        |     |
| Regional  |        |      |        |     |
| Local   |        |      |        |     |
| Specific community  |        |      |        |     |
| <b>8. Significance rating of feature</b>  |        |      |        |     |
| 1.  | Low    |      |        |     |
| 2.  | Medium |      |        |     |
| 3.  | High   |      |        |     |

## APPENDIX 2. RELEVANT LEGISLATION

All archaeological and palaeontological sites and meteorites are protected by the National Heritage Resources Act (Act no 25 of 1999) as stated in Section 35:

(1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(4) No person may, without a permit issued by the responsible heritage resources authority-

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
- (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

In terms of cemeteries and graves the following (Section 36):

(1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority-

- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
- (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.