

HERITAGE IMPACT ASSESSMENT: PROPOSED CONSTRUCTION OF THE MARALLA EAST WIND ENERGY FACILITY NEAR LAINGSBURG IN THE WESTERN CAPE PROVINCE

(Assessment conducted under Section 38 (8) of the
National Heritage Resources Act No 25 of 1999)

SAHRA CaseID: 10184 & HWC Case No: 16041211AS0418E

Prepared for:
Ashlea Strong
WSP/Parsons Brinckerhoff

On behalf of:
BioTherm Energy (Pty) Ltd

January 2017



Prepared by:

Lita Webley & David Halkett
ACO Associates cc
8 Jacobs Ladder
St James

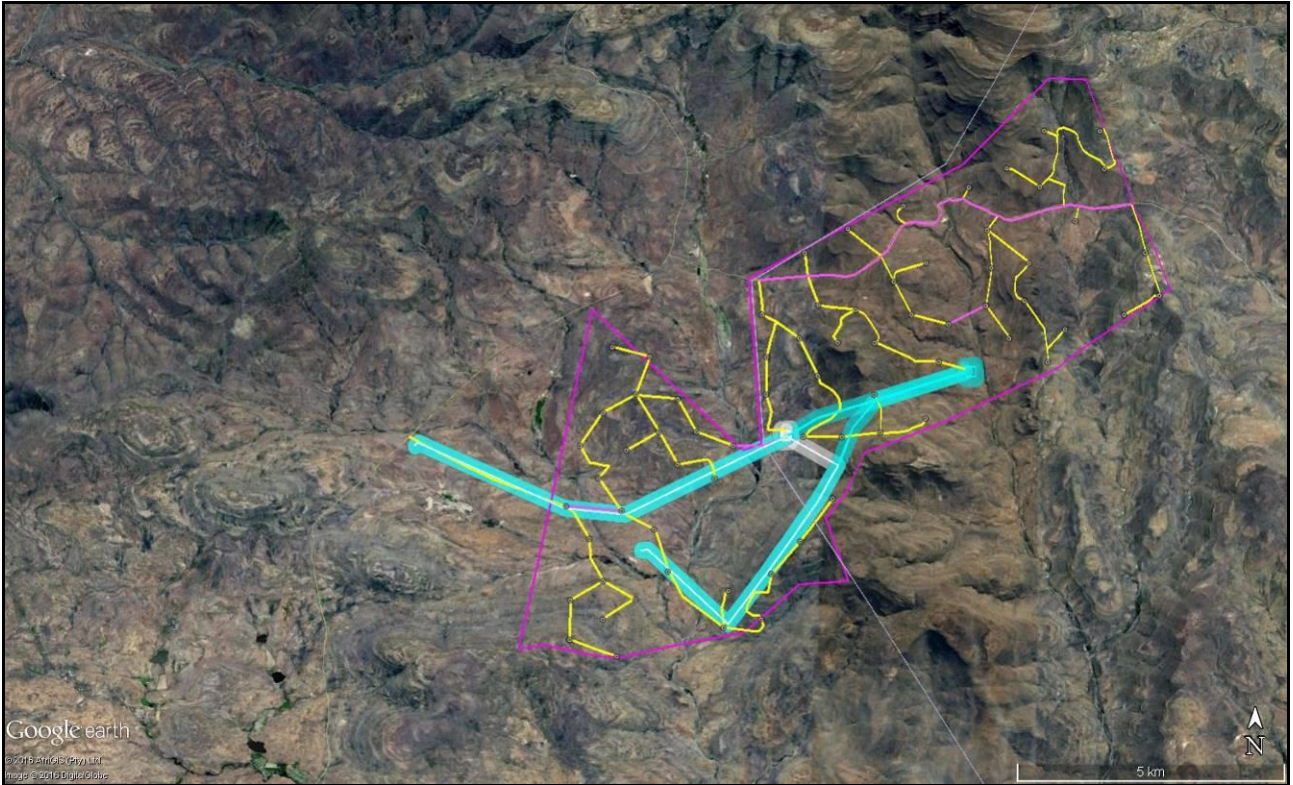
Email: lita.webley@aco-associates.com
Tel: 0217064104
Fax: 0866037195

EXECUTIVE SUMMARY

Site Name:

The Maralla East Wind Energy Facilities to the east of the R354, between Laingsburg and Sutherland, predominantly within the Western Cape Provincial boundary.

Location



Locality Map: The Maralla East Wind Farm is situated on the R354, midway between Matjiesfontein and Sutherland. It is located predominantly within the Western Cape Province, with a smaller portion inside the Northern Cape. The provincial border is shown in pale mauve.

SAHRA/Heritage Western Cape

The Maralla East WEF falls predominantly inside the boundaries of the Western Cape, with a small farm portion in the Northern Cape. The heritage authorities responsible for providing comments (in terms of Section 38(8) of the NHRA) on the proposed development are both the *South African Heritage Resources Agency* (SAHRA) and *Heritage Western Cape* (HWC), and both have been notified.

NID Response and Specialist Studies

A NID was submitted to Heritage Western Cape for the Maralla East WEF which falls into the boundaries of the Western Cape. HWC have asked for:

- Impacts to Palaeontological heritage resources (Dr John Almond of Natura Viva cc)
- Impacts to Archaeological heritage resources (Dr Lita Webley and Mr David Halkett of ACO Associates cc)
- Visual Impacts on the Cultural Landscape (Ms Belinda Genhardt)

Heritage Western Cape requires that the HIA must have an integrated set of recommendations. The comments of registered conservation bodies and the relevant Municipality must be requested and included in the HIA where provided. Proof of these requests must be supplied.

While Heritage Western Cape have only requested palaeontological, archaeological and visual assessments, the EIA phase study needs to fulfil the requirements of heritage impact assessments as defined in Section 38 of the NHRA. This means that the assessment has to cover the full range of potential heritage resources as defined in the NHRA. *For this reason, this report also briefly comments on the Built Environment on the affected farms.*

SAHRA was also notified and they issued an interim comment requesting an HIA including archaeological and historical heritage resources, burial grounds and graves, the palaeontological assessment conducted by Dr J Almond, a visual impact assessment and any comments provided by the public regarding heritage resources.

Limitations

- The limitations of this study are primarily related to the rough terrain, with many of the areas identified for turbines and powerline situated on the high ridges which were completely inaccessible;
- The size of the study area, and the time available for a survey, meant that a comprehensive field assessment of all heritage resources was not possible. Inferences must be drawn based on assessments conducted on adjoining farms.

Heritage Resources Identified: Maralla East (Western Cape and Northern Cape)

Palaeontology

To be inserted by Dr John Almond

Archaeology

There are at least three concentrations of archaeological (with superimposed historical) sites along river banks on Maralla East WEF site which must be avoided:

- There is a large and informal graveyard (at least 5-10 graves) on the banks of the Komsberg River in the southern portion of the farm Schalkwykskraal, associated with 19th century historic remains and a nearby stone kraal;
- Also on the Komsberg River, are the remains of a late 19th century stone stockpost, with small dwelling and extensive stone kraal complex;
- There is extensive archaeological and colonial period sites along the Ventersrivier on the farm Welgemoed, including stone artefact scatters, rock art as well as ruined farm buildings, kraals, stockposts and graves.

This report has not identified any significant archaeological resources on the high lying ridges which will accommodate the wind turbines.

Visual Impacts on the Cultural Landscape

To be inserted by Belinda Gebhardt

Anticipated Impacts on Heritage Resources: Maralla East

- Informal cemeteries and graves are located close to settlements and along river beds and due care must be undertaken when infrastructure, such as roads and powerlines are

constructed to avoid destroying them. Graves are considered to have high heritage sensitivity;

- The majority of archaeological sites are located along river beds. The construction of access roads and underground cabling across river beds may result in the destruction of archaeological sites. Some, not all, archaeological sites have medium to high significance;
- There is a single, abandoned but intact building on Welgemoed, which may be negatively impacted if it is used as a storage facility/temporary accommodation during construction of the WEF.

Cumulative Impacts

Several renewable energy facilities have received environmental authorisation in the area around the Eskom Komsberg substation and they have been subjected to the EIA process. They include:

- The Suurplaat Wind Energy facility (Hart et al. 2010)
- The Roggeveld Wind Energy facility (Hart & Webley 2011, 2013)
- The Sutherland WEF facility (Halkett & Webley 2011 & 2016)
- The Kareebosch Wind Energy facility (Roggeveld Phase 2) (Hart & Kendrick 2015)
- The Hidden Valley Wind Energy facility (Phases 1, 2 & 3) (Booth 2012)
- The Komsberg Wind Energy Facility (Hart 2016).

The cumulative impacts of a number of several renewable energy facilities within a 70km radius on the heritage of the Maralla East WEF are acceptable if the required mitigation measures are implemented. If the heritage resources are not directly impacted by the facility, then they will still be available for the public, tourists and academics to enjoy.

However, it is the indirect, cumulative visual impact of the renewable energy facilities on the Cultural Landscape of the area which is more difficult to quantify. Due to the size of the turbines, and landscape scarring that will result from road construction, the impact of the proposed activity will be of high significance.

Comments from Interested and Affected Parties

STAKEHOLDER DETAILS	COMMENT	SPECIALIST RESPONSE
Heritage Western Cape has responded to the NID	Requested: An HIA comprising Impacts to Palaeontological heritage resources (Dr John Almond of Natura Viva cc); Impacts to Archaeological heritage resources (Dr Lita Webley and Mr David Halkett of ACO Associates cc); Visual Impacts on the Cultural Landscape (Ms Belinda Genhardt) The required HIA must have an integrated set of recommendations. The comments of registered conservation bodes and the relevant Municipality must be requested and included in the HIA where provided. Proof of these requests must be supplied	This report addresses these issues
SAHRA	The pending HIA must take into consideration the following aspects: archaeological and historical heritage, burial grounds and graves, detailed Palaeontological Impact Assessment, Visual Impact of the proposed development, and any comments by the public regarding heritage resources	These are addressed in the HIA

DEA&DP (Western Cape) have responded to the Scoping HIA requesting:	"The final WEF layout must be subjected to an intensive heritage and archaeological survey and impact assessment, as per the specialist recommendations. All resulting micro-sitting mitigation measures identified must be reported on the in Draft EIA Report".	It is not possible to do an intensive survey at the EIA phase, as the final layout of the facility has not been finalised. The walk-down of the most sensitive area must take place during the EMPr.
Mr B Kleinbooi has commented:	"There is also a graveyard that we want protected"	The exact location of the graveyard which Mr Kleinbooi is referring to is unknown. However, a number of graveyards were recorded during the survey. They will all be protected.

DEA&DP as well as some of the local landowners have raised the matter of the accumulative impacts of the authorized renewable energy facilities on the landscape. DEA&DP endorses the recommendations of the visual expert with respect avoiding placing turbines on prominent ridgelines on the landscape. In addition, that steep slopes, which are visually sensitive, should be excluded from the development footprint. Farmers have noted that the cumulative impacts of the wind energy facilities are that they will "industrialize the Karoo" and "destroy a massive part of the Karoo".

No-Go Areas

In general it is noted that both archaeological and historical settlement occurs along the river valleys, and Stone Age sites, rock art sites, graves and 19th century stone settlements were recorded.

The following highly sensitive areas have been identified and they must be declared *no-go* areas during the construction:

- A graveyard on the farm Schalkwyskraal, along the Komsberg River;
- The late 19th century stone stockpost and kraal development on the Komsberg River;
- Graves and a rock art site on the Ventersrivier, Maralla East WEF.

The following heritage recommendations are proposed

The following highly sensitive areas have been identified and they must be declared *no-go* areas during the construction:

- A graveyard on the Komsberg River, Schalkwyskraal;
- An historic stockpost on the Komsberg River;
- Graves and a rock art site in the Ventersrivier, Welgemoed.

The following recommendations are proposed:

- The "No-Go" areas must be avoided;
- If there are any significant changes to the layout of the wind turbines, then a walk down of the proposed facility is recommended as part of the EMPr;
- It is recommended that there is a walk down of all river crossings during the EMP phase of the project, once the final location of the access roads and cable crossings has been finalised of the EMPr, to ensure that no heritage resources are destroyed;
- If there is any intention of adaptive re-use of the Welgemoed house during the construction or operation of the WEF, then any proposed alterations to the building, which is older than 60 years, must be submitted to Heritage Western Cape;

- If any archaeological remains, including human remains, are uncovered during construction, then work must stop in that area and the responsible heritage authorities (SAHRA or Heritage Western Cape) must be notified.
- The potential visual impacts of the proposed facility on the heritage resources of the area (i.e. the results of the VIA), must be integrated with the heritage study. It is assumed that a buffer will be required along the R354, as the road between Matjiesfontein and Sutherland is considered a scenic tourism route.

Author/s and Dates

Lita Webley
John Almond
Belinda Gebhardt

ACO Associates cc
Natura Viva cc

Archaeology
Palaeontology
Visual Impact Assessment

GLOSSARY

Archaeology: Remains resulting from human activity which is in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures.

Early Stone Age: The archaeology of the Stone Age between 700 000 and 2500 000 years ago.

Fossil: Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

Heritage: That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999).

Holocene: The most recent geological time period which commenced 10 000 years ago.

Late Stone Age: The archaeology of the last 20 000 years associated with fully modern people.

Middle Stone Age: The archaeology of the Stone Age between 20-300 000 years ago associated with early modern humans.

National Estate: The collective heritage assets of the Nation

Palaeontology: Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

Pleistocene: A geological time period (of 3 million – 20 000 years ago).

SAHRA: South African Heritage Resources Agency – the compliance authority which protects national heritage in the Northern Cape.

Structure (historic:) Any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith. Protected structures are those which are over 60 years old.

Acronyms

DEA	Department of Environmental Affairs
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
HWC	Heritage Western Cape
LSA	Late Stone Age
MSA	Middle Stone Age
NHRA	National Heritage Resources Act
SAHRA	South African Heritage Resources Agency
WEF	Wind Energy Facility

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Figure 2: The boundaries of Maralla East WEF are outlined in pink. The yellow lines indicate the underground cabling which will connect the turbines. The blue lines are the onsite powerlines which will connect to the Komsberg substation. Heritage sites are shown as red dots. The physical survey tracks are not shown. It is clear that the turbines are mainly on the high lying areas, while the heritage sites are in the valleys.

Figure 3: A landscape assessment by Winter & Oberholzer (2013) identifies the R354 (purple line) as a route of high scenic and rural value and an important tourist route to Sutherland (Route III). The abbreviation Knl.6 represents the Klein Roggeveldberge which is described as lying on an important scenic tourist route between Matjiesfontein on the N1 and Sutherland on the plateau (Grade III).

Figure 4: The blue substation, on the Venters River, is in close proximity to a number of heritage sites including ruined stone dwellings, stone kraals and a rock art site.

Figure 5: A cluster of heritage resources (including stone structures, kraals and graves) around the farmhouse on Welgemoed on the Venters River. Note the concentration of heritage resources on the adjoining, unnamed river to the east.

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1 INTRODUCTION

ACO Associates cc was appointed by WSP/Parsons Brinckerhoff on behalf of BioTherm Energy (Pty) Ltd to undertake a Heritage Impact Assessment for the construction of the Maralla East Wind Energy Facility between Laingsburg and Sutherland in the Western Cape Province (**Figure 1**).

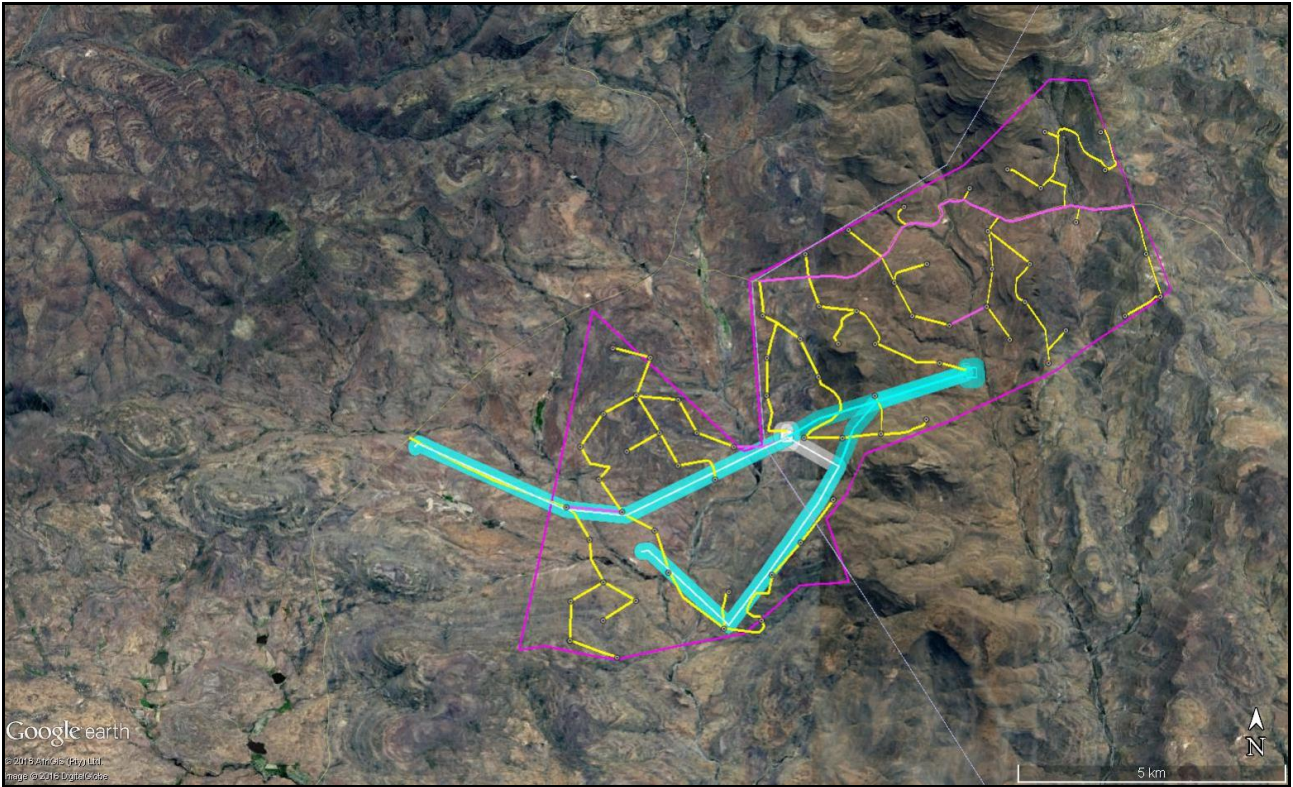


Figure 1: The boundaries of the Maralla East WEF are indicated in pink. The boundary between the Northern Cape Province and the Western Cape Province is indicated in pale mauve. The majority of the turbines are placed on the higher ridges. However, the electrical cabling and access roads needs to cross river valleys. Note the position of the onsite substations (blue and white).

1.1 Scope of Work

This Heritage Impact Assessment considers the potential impacts of the proposed construction of a wind energy facility on the Remaining extent of Annex Drie Roodeheuvels 181; Remaining extent of Schalkwykskraal 204 and a portion of Welgemoed 268 (**Figure 1**). The HIA specifically considers:

- The potential impacts on the palaeontological resources of the area (Dr John Almond);
- The potential impacts of the WEF on the archaeology and history of the site;
- Impacts on graves and cemeteries;
- Visual impacts of the proposed facility on the heritage of the area (Ms Belinda Gebhardt); and
- Addresses any comments of the public with regard impacts to heritage resources.

This impact assessment is based on the knowledge which has been accumulated from heritage impact assessment undertaken in surrounding areas as well as a site visit in March 2016.

1.2 Objectives of the Report

The objectives of the report are to:

- Identify any potential impacts which may result from the proposed construction of the wind energy facility and associated infrastructure;
- Determine the significance of the heritage resources;
- Provide recommendations for mitigation of impacts.

1.3 Legislative Framework

While the National Department of Environmental Affairs is the decision making authority acting in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) and Regulations (2014), they must ensure that the evaluation of the statutorily defined broad range of heritage resources fulfils the requirements of the relevant heritage resources authority in terms of Section 38 (3) of the National Heritage Resources Act (Act 25 of 1999) (NHRA) and that any comments and recommendations of the relevant heritage resources authority with regard to proposed development have been taken into account prior to the granting of the consent.

This report is conducted in terms of Section 38 (8) of the National Heritage Resources Act, No 25 of 1999.

The NHRA provides protection for the following categories of heritage resources:

- Landscapes, cultural or natural (Section 3 (3))
- Buildings or structures older than 60 years (Section 34);
- Archaeological Sites, palaeontological material and meteorites (Section 35);
- Burial grounds and graves (Section 36);
- Public monuments and memorials (Section 37);
- Living heritage (defined in the Act as including cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships) (Section 2 (d) (xxi)).

1.3.1 Structures (Section 34(1))

No person may alter or demolish any structure part of a structure which is older than 60 years without a permit issued by SAHRA or HWC, i.e. the responsible provincial heritage resources authority.

1.3.2 Archaeology & Palaeontology (Section 35(4))

No person may, without a permit issued by HWC, destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite.

Archaeological is defined as: “material remains resulting from human activity which is in a state of disuse and is in or on land and which is older than 100 years, including artefacts, human and hominid remains and artificial features and structures”.

Palaeontological is defined as: “any fossilised remains or fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace”.

1.3.3 Burial Grounds and Graves (Section 36(3))

No person may, without a permit issued by the South African Heritage Resources Authority (SAHRA), destroy, damage, alter, exhume or 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.

1.3.4 Grading

The significance of heritage resources is assessed according to the grading criteria established by the National Heritage Resources Act, No 25 of 1999.

Table 1: Grading of Heritage Resources

Grade	Level of significance	Description
I	National	Of high intrinsic, associational and contextual heritage value within a national context, i.e. formally declared or potential Grade 1 heritage resources.
II	Provincial	Of high intrinsic, associational and contextual heritage value within a provincial context, i.e. formally declared or potential Grade 2 heritage resources.
IIIA	Local	Of high intrinsic, associational and contextual heritage value within a local context, i.e. formally declared or potential Grade 3a heritage resources.
IIIB	Local	Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3b heritage resources.
IIIC	Local	Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3c heritage resources.

The subdivision of Grade III sites has been introduced in the Western Cape to facilitate significance grading at the local level.

1.3.5 Heritage Authority

The Maralla East WEF falls predominantly inside the boundaries of the Western Cape although there is a smaller portion inside the Northern Cape. The heritage authorities responsible for providing comments (in terms of Section 38(8) of the NHRA) on the proposed development are both SAHRA and Heritage Western Cape.

Heritage Western Cape (HWC) is required to provide comment on the proposed project in order to facilitate final decision making by the Department of Environmental Affairs (DEA).

A NID was submitted to Heritage Western Cape for the Maralla East WEF which falls predominantly within the boundaries of the Western Cape. A small farm portion falls in the Northern Cape. HWC have asked for (HWC Case No: 16041211AS0418E):

- Impacts to Palaeontological heritage resources
- Impacts to Archaeological heritage resources
- Visual Impacts on the Cultural Landscape

The required HIA must have an integrated set of recommendations. The comments of registered conservation bodies and the relevant Municipality must be requested and included in the HIA where provided. Proof of these requests must be supplied.

The BID documents were uploaded to SAHRIS (CaseID: 10184) and they have requested the pending HIA must take into consideration the following aspects: archaeological and historical heritage, burial grounds and graves, detailed Palaeontological Impact Assessment, Visual Impact of the proposed development, and any comments by the public regarding heritage resources.

1.4 Study Approach and Methodology

This study has been commissioned as Heritage Impact Assessment.

It includes a review of the published material as well as unpublished reports on the SAHRIS database. The 1:50 000 maps of the area as well as Google Earth aerial images were consulted. Numerous impact assessments have been conducted in proximity to the proposed facility as reflected on the SAHRIS database. Little was known of the archaeology of the study area until recently, when the area was identified as suitable for wind farm development. The following CRM reports provide valuable information on the heritage resources of the area and were consulted:

- The Suurplaat Wind Energy facility (Hart et al. 2010)
- The Roggeveld Wind Energy facility (Hart & Webley 2011, 2013)
- The Sutherland WEF facility (Halkett & Webley 2011), subsequently the Sutherland, Sutherland 2 and Rietrug Wind Energy facilities (Halkett & Webley 2016)
- The Kareebosch Wind Energy facility (Roggeveld Phase 2) (Hart & Kendrick 2015)
- The Hidden Valley Wind Energy facility (Phases 1, 2 & 3) (Booth 2012)
- The Komsberg Wind Energy facility (Hart 2016).

1.5 Assumptions

This impact assessment is based on the knowledge which has been accumulated from heritage impact assessment undertaken in surrounding areas as well as a site visit in March 2016. It assumes that the heritage resources on Maralla East are similar to the surrounding areas.

1.6 Limitations to this Study

- Due to the mountainous nature of the terrain, only a small percentage of the proposed locations for the wind turbines could be assessed;
- Due to time constraints, an exhaustive field survey was not possible and various sensitive locations were sampled during this study. Many archaeological sites are probably undetected. Graves in particular, are difficult to identify, if they are not within a formal graveyard. Numerous cairns were recorded during the survey, but many more may occur. It is possible that they represent graves, but we can only be certain of this once construction uncovers them;
- The resolution on aerial photography (Google Earth) is not sufficiently high to identify all stone structures (including kraals), archaeological sites or graves. We are limited to our field assessment of the study area.

1.7 Declaration of Independence

Lita Webley is an archaeologist (PhD from the University of Cape Town 1992) with ACO Associates cc and has been conducting Heritage Impact Assessment and archaeological specialist studies in the Western Cape, Northern Cape and Eastern Cape Provinces since 1996. She is a member of the Archaeology, Palaeontology and Meteorites Committee and the Impact Assessment Committee of Heritage Western Cape (HWC), the Provincial Heritage Resources Authority. She is accredited as a Principal Investigator by the Association of Southern African Professional Archaeologists (ASAPA) CRM section as follows:

- Principal Investigator: Stone Age, Shell Middens and Colonial Period; and
- Field Director: Grave Relocations.

David Halkett (BA, BA Hons, MA (UCT)) is an Archaeologist and Member of the Association of Professional Archaeologists of Southern Africa (ASAPA) and accredited with Principal Investigator status. He has been working in heritage management for 23 years and has considerable experience in impact assessments with respect to a broad range of archaeological and heritage sites in the Northern Cape.

ACO Associates cc has no financial or other interest in the proposed development and will derive no benefits other than fair remuneration for consulting services provided.

SPECIALIST DECLARATION

I, Lita Webley, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have potential of influencing – any decision to be taken with respect to the application by the competent authority; and – the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offense in terms of regulation 71 and is punishable in terms of section 24F of the Act.

Signature of specialist



Specialist Field: Archaeology and Heritage
Name of Company: ACO Associates

2 DESCRIPTION OF THE PROJECT

The two proposed Maralla wind energy facilities (Maralla East and Maralla West), each of 200MW, are located 33km south of the town of Sutherland (Figure 2). The site access to Maralla East is via a gravel road off the R354. It comprises the following farms:

- Remaining extent of Annex Drie Roodeheuvelds 181;
- Remaining extent of Schalkwykskraal 204;

- and a portion of Welgemoed 268

The boundary dividing Maralla West WEF from Maralla East runs through the centre of the farm Drie Roodeheuveld 180 (**Figure 1**).

The Wind Farm will comprise:

- “Up to 125 wind turbines generators with a generating capacity of between 2 and 4MW each. The turbines will have a hub height of up to 120m and rotor diameter of up to 150m;
- Concrete foundation to support the turbines
- Onsite 132kV Substation, with the transformers for voltage step up from medium voltage to high voltage. Substation will occupy an area of 150mx 150m
- The medium voltage collector system will comprise of cables (1kV up to and including 33kV) that will be run underground, except where a technical assessment suggest that overhead lines are applicable, in the facility connecting the turbines to the onsite substation
- A laydown area for the temporary storage of materials during the construction activities.
- The laydown area will be a maximum of 4ha in size
- Permanent laydown for turbine crane platforms
- Haul roads between 4 – 6m wide. Double width roads required in strategic places for passing
- Temporary site compound for contractors

Operations and maintenance compound area including O&M building, car park and storage area”

The Maralla West WEF will have a 33/132kV powerline connection from the Onsite IPP substation to the Common Eskom substation, with a 250m wide corridor. The Common Eskom substation and Powerline will be assessed through a separate Basic Assessment Process.

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Environmental attributes

The Study Area is located some 35 km south-east of Sutherland, beneath the plateaux. The old road to Sutherland including the Komsberg pass runs through the Maralla West WEF and provides access to the plateaux.



Plate 1: Wind mast on the farm Welgemoed on the Maralla East WEF.

Although myriad streams are to be found on all the farms, the Venters and the Komsberg Rivers are the main channels draining the Maralla East WEF. Old settlements tend to focus on the water resources and along river valleys. These areas contain numerous kraals, located near water and built against the rocky ridgelines along the valley sides.

4 FINDINGS FOR THE MARALLA EAST WEF

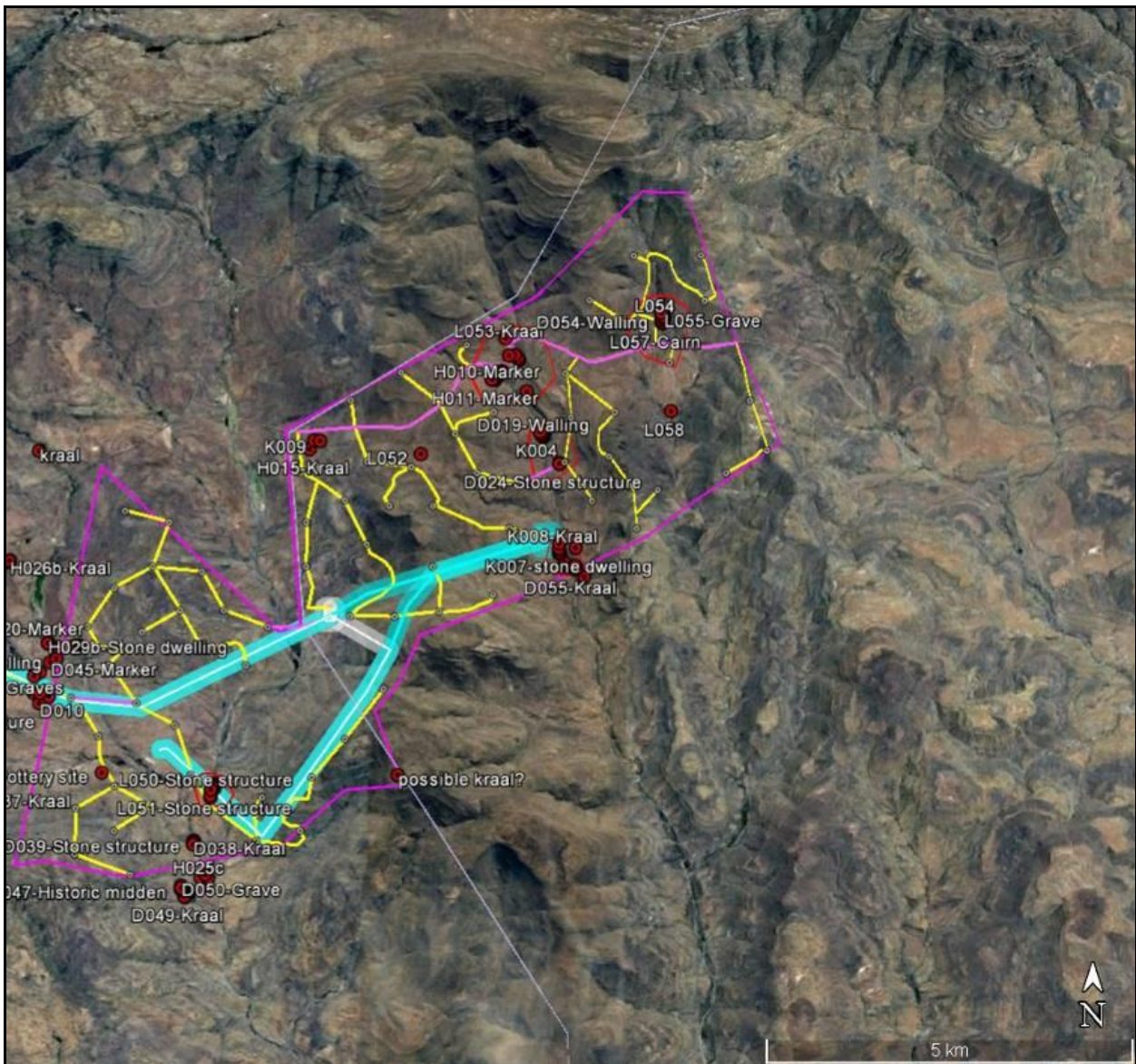


Figure 2: The boundaries of Maralla East WEF are outlined in pink. The yellow lines indicate the underground cabling which will connect the turbines. The blue lines are the onsite powerlines which will connect to the Komsberg substation. The distribution of heritage sites is shown as red dots. The physical survey tracks are not shown. It is clear that the turbines are mainly on the high lying areas, while the heritage sites are in the valleys.

The study area was surveyed twice, once for the Sutherland WEF (Halkett & Webley 2011) in 2011 and for a second time in 2016 with the fieldwork for Maralla East WEF (**Figure 2**). In addition, surveys by students and academics from the Archeology Department at the University of Cape Town have increased our knowledge of the distribution of heritage resources in the area. The surveys have confirmed the fact that the heritage resources are concentrated in the valleys and that there has been re-occupation of the area over many hundreds of years, with colonial (late 19th century ruins overlaying archaeological sites).

4.1 Palaeontology

A palaeontological impact assessment (PIA) of the site was commissioned as part of a comprehensive HIA for BioTherm Energy (Pty) Ltd. The detailed PIA is attached separately.

4.2 Archaeology

The archaeological resources are described in detail in the AIA document. Briefly they include:

There are at least three concentrations of archaeological (with superimposed historical) sites along river banks on Maralla East WEF site:

- There is a large and informal graveyard (at least 5-10 graves) on the banks of the Komsberg River in the southern portion of the farm Schalkwykskraal, associated with 19th century historic remains and a nearby stone kraal;
- Also on the Komsberg River, are the remains of a late 19th century stone stockpost, with small dwelling and extensive stone kraal complex;
- There is extensive archaeological and colonial period sites along the Ventersrivier on the farm Welgemoed, including stone artefact scatters, rock art as well as ruined farm buildings, kraals, stockposts and graves.

There are no significant archaeological resources on the high lying ridges which will accommodate the wind turbines.

4.3 Historical Background

Heritage Western Cape's response to the NID did not include a request for information on the Built Environment. However, many of the farmhouses in the Roggeveld and Sutherland environment have historic farmhouses and they are briefly described and illustrated below.

The Roggeveld and Sutherland area were settled from as early as 1750 (Schoeman 1986; Penn 2005). The early farmers found the escarpment, which enjoys the highest rainfall, particularly suitable for small stock farming during the summer months but they moved down into the valleys and plains of the Karoo to escape the extreme winters. Drought, poor grazing and attacks by the San caused many farms to be abandoned. According to Penn (2005), in the 18th century there were numerous independent Khoekhoen kraals located amongst the Trekboer farms in the Roggeveld. While the violent conflict between the various groups has been well documented, very little is known of the peaceful interaction and assimilation which took place over the last 200 years.

The Built Environment of the area is characterised by farmhouses (some containing an inner core dating to the 19th century), barns, stone kraals, shepherds stockposts, etc. The generic house comprised a "small oblong low hut" built of slabs of *leiklip* piled on top of each other, un-plastered, with a reed roof. However, very few of these structures have been preserved. Some of the stone structures described above under pre-colonial settlements, may in fact represent colonial-era stockposts. They are generally identified by associated historic ceramics and glass. These colonial settlements are invariably found in river valleys, close to a permanent source of water.

4.3.1 The following farms are located in the Maralla East WEF:

- **Schalkwykskraal 204:** Surveyed and granted in 1838 to SJ Botma and JA Victor. It then passed through the hands of Meiring, Paulsen, Esterhuysen, Roussouw, Moller and de Vos. At one stage it was also owned by Abraham le Roux (of Wolvenhoek and Schietfontein). There is a single, abandoned stone stockpost on this farm within the boundaries of the WEF;



Plate 2: Abandoned 19th century stockpost on Schalkwyskraal

- **Welgemoed 268:** It was surveyed in 1834 and granted to Stephanus Botma, and was retained in the family until 1905 when it is listed as part of the deceased estate of Johannes Botma. Schoeman (1986) describes how a Jan Fourie of Welgemoed joined the commando of Manie Maritz in 1901 and became active during the South African War.



Plate 3: The abandoned farmhouse on Welgemoed, currently being used as a store room. It is in reasonably good condition.

4.4 Cemeteries and Graves/Cairns

Farm cemeteries and graves have been recorded in the Maralla East WEF. The cemeteries are generally closely associated with farm settlements. In some cases, the cemetery is situated in proximity to a ruined settlement and is no longer easily identifiable, as in the case of Schalkwyskraal. There are also a number of isolated graves in the veld, many of them covered with flat slabs and without headstones. These are very difficult to identify and the list provided in Table 2 may not be comprehensive.



Plate 4: A cairn, probably representing a grave, on a river bank on the farm Welgemoed (L055).

4.5 Landscape and Scenic Routes

Hart (2016) describes the Cultural Landscape of the region thus: “The ridge tops where the proposed activities will take are windswept and bleak; some areas are completely devoid of farm tracks making access to the higher mountain areas a tortuous task. The sense of isolation, nature and desertification do impart a certain beauty and distinct sense of place. Overall a Grade IIIB is recommended (medium local significance), however there are enclaves of high aesthetic value and views from the higher ridges are spectacular and worthy of Grade IIIA”.

According to Winter & Oberholzer (2013), the R354 between Matjiesfontein and Sutherland, which crosses the Klein Roggeveld Mountains, is an area of high scenic and rural value. It is an important tourism route to the Sutherland Observatory and is considered of Route III significance.

Webley & Halkett (2016) have given this landscape a preliminary field grading of IIIB to IIIA as the study area is remarkably intact and deeply layered.

The VIA report by Belinda Gebhardt is attached separately.

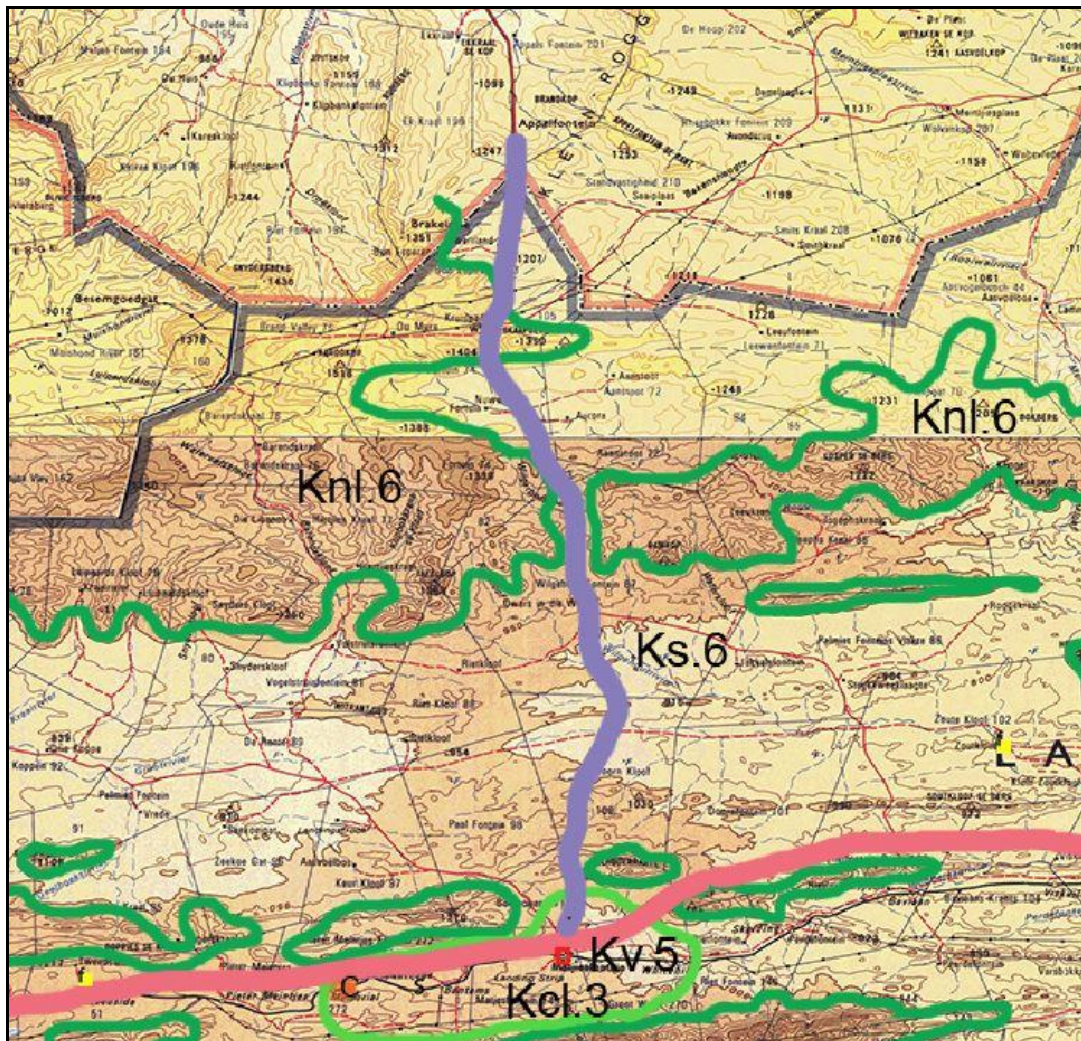


Figure 3: A landscape assessment by Winter & Oberholzer (2013) identifies the R354 (purple line) as a route of high scenic and rural value and an important tourist route to Sutherland (Route III). The abbreviation Knl.6 represents the Klein Roggeveldberge which is described as lying on an important scenic tourist route between Matjiesfontein on the N1 and Sutherland on the plateau (Grade III).

4.6 Anticipated Impacts to the heritage of the area

4.6.1 Construction Phase

It is expected that most of the damage to the heritage resources on Maralla East will occur during construction. Heritage sites are concentrated along river valleys, while the turbines are generally located along the tops of the mountain ridges. Therefore the following activities may result in direct impacts to the landscape and any heritage that lies on it:

- Bulldozing of roads across river valleys to the turbine sites;
- Upgrading of existing roads particularly where they cut through river valleys or are in close proximity to existing settlements (i.e. farmhouse of Welgemoed);
- Excavation of linear trenches for cables through river valleys, resulting in destruction of archaeological sites or graves on the banks of the rivers.

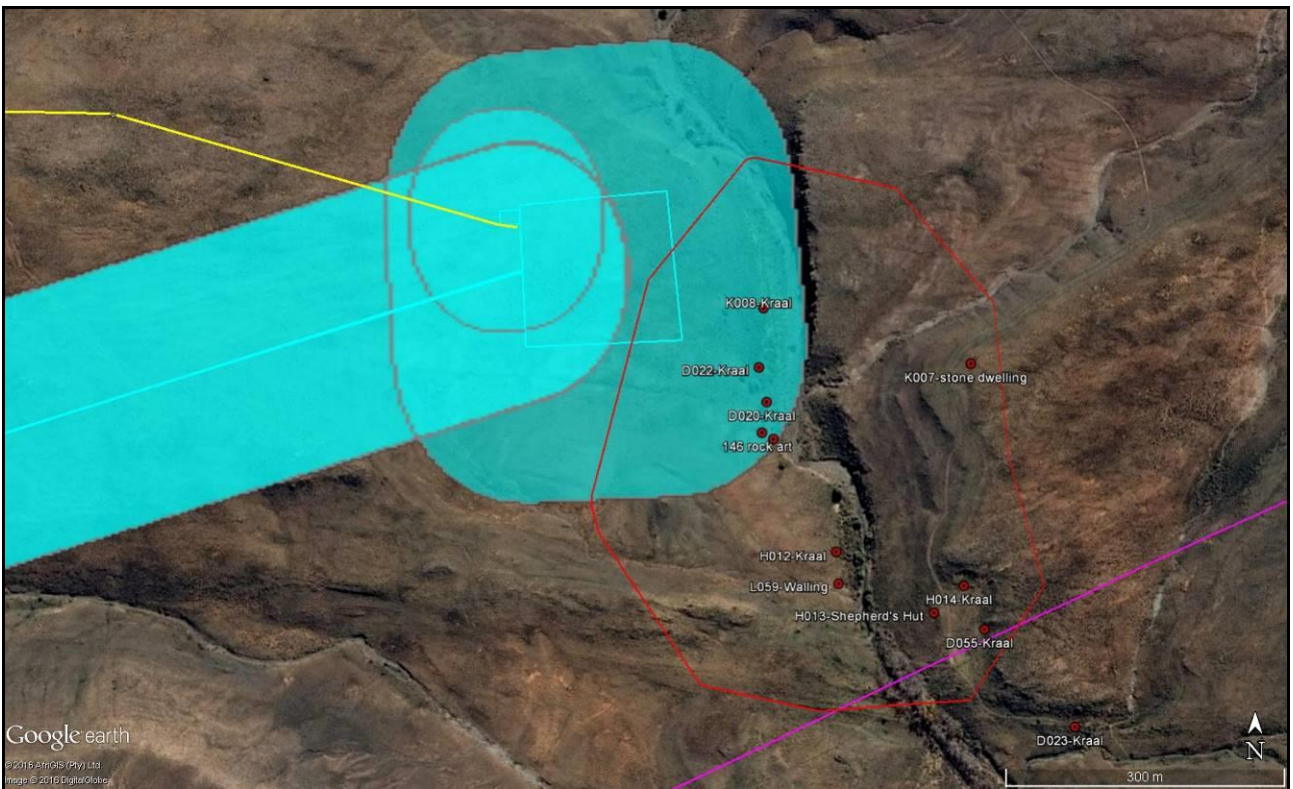


Figure 4: The blue substation, on the Venter's River, is in close proximity to a number of heritage sites including ruined stone dwellings, stone kraals and a rock art site.



Figure 5: A cluster of heritage resources (including stone structures, kraals and graves) around the farmhouse on Welgemoed on the Venter's River. Note the concentration of heritage resources on the adjoining, unnamed river to the east.

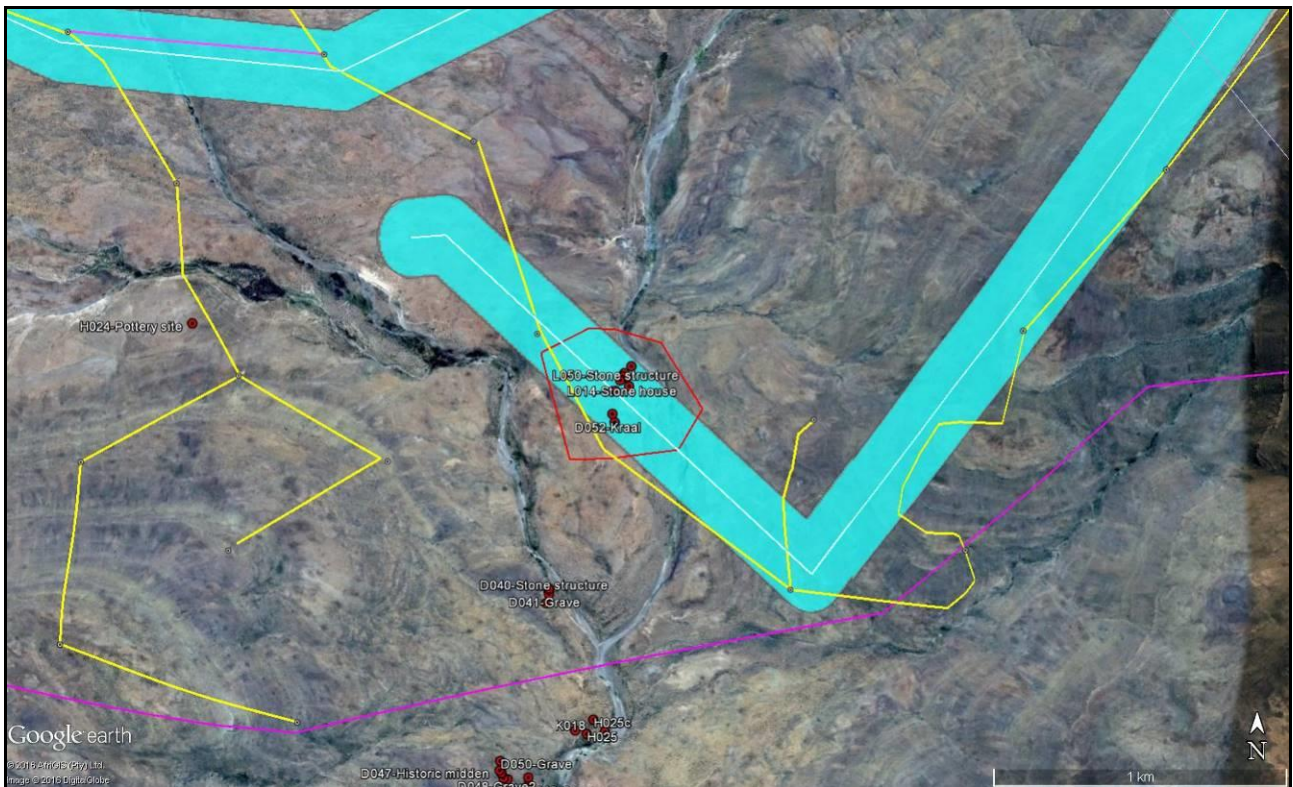


Figure 6: A concentration of heritage sites on the Komsberg River in the buffer zone of the on-site powerline.

4.6.2 Operational Phase

During the operational phase of the wind facility the only risks are potential vandalism of heritage sites by staff of the wind facility(s). This includes stripping of fittings from abandoned farm buildings, careless damage to kraal walls, graffiti on rock art sites, etc. No further impacts to heritage would occur during operation of the currently proposed facility, although any expansion to the facility (effectively a new construction phase), would introduce new impacts.

- In the case of Maralla East WEF, the proximity of the blue substation to the rock art site on the Venters Rivier may result in damage (graffiti) during the operational life of the wind farm (Figure 4);
- Similarly, the potential adaptive re-use of the Welgemoed farmhouse (Plate 3) may result in vandalism and damage (Figure 5).

4.6.3 Decommissioning Phase

The decommissioning phase of the wind farm facilities may include the dumping of electrical infrastructure on heritage sites. At this stage, indirect impacts to heritage resources that were experienced during construction and operation can be reduced or removed with the successful rehabilitation of the site. Direct impacts to heritage resources would, however, remain the same. These impacts are all considered to be negative.

5 ASSESSMENT OF IMPACTS

This study notes that the proposed wind turbines are located on high lying ridges and hills and that these areas are generally devoid of heritage resources.

The most significant heritage sites, both colonial settlements and archaeological sites, are located in river valleys and kloofs, and they will not be impacted by the construction of the turbines. However, impacts may occur when access roads, underground cabling or powerlines cross these river valleys/kloofs. This is where careful placement of the access roads through river valleys will be required. In this respect, the rock art site in the Venters River valley is particularly vulnerable.

In general, heritage resources are non-renewable, and once they are destroyed they cannot be recovered or re-introduced. This applies to palaeontological and archaeological resources, buildings that are older than 60 years as well as cemeteries and graves. It is therefore important that heritage resources are identified and their significance assessed prior to development.

It is preferable that archeological sites are conserved. Mitigation, in the form of archaeological excavations, means that while the material may have been retained and while conserved in a museum, the context of the archaeological site has been lost forever.

Table 3: No-Go Areas

Maralla East - No-Go										
Potential Impact	Mitigation	Extent	Duration	Magnitude	Probability	Significance		Status	Confidence	
		(E)	(D)	(M)	(P)	(S=[E+D+M]*P)		(+ve or -ve)		
Impacts to a graveyard on the Komsberg River, Schalkwykskraal	Nature of impact:	Negative - destruction of a graveyard.								
	Without Mitigation	2	5	8	4	60	Medium	-	High	
	degree to which impact can be reversed:	Heritage resources are non-renewable and impacts cannot be reversed								High
	degree of impact on irreplaceable resources:	High impacts on graveyard								High
	Mitigation Measures	Avoid construction at this locality								High
	With Mitigation	1	5	2	2	16	Low	-	high	
Impacts to a 19th century stone stockpost and kraal on the Komsberg River, Schalkwykskraal	Nature of impact:	Negative - destruction of 19th century stockpost								
	Without Mitigation	2	5	6	3	39	Medium	-	Medium	
	degree to which impact can be reversed:	Heritage resources are non-renewable and impacts cannot be reversed								High
	degree of impact on irreplaceable resources:	High impacts on 19th century stockpost								High
	Mitigation Measures	Avoid construction at this locality								High
	With Mitigation	1	5	4	2	20	Low	-	High	
Impacts to graves and a rock art site on Venters River, Welgemoed	Nature of impact:	Negative - destruction of rock art and graves								
	Without Mitigation	2	5	8	4	60	Medium	-	High	
	degree to which impact can be reversed:	Heritage resources are non-renewable and impacts cannot be reversed								High
	degree of impact on irreplaceable resources:	High impacts on rock art and graves								High
	Mitigation Measures	Avoid construction at this locality								High
	With Mitigation	1	5	4	2	20	Low	-	High	

With respect to cemeteries and graves, any impacts which result in a disturbance to a grave are considered high. They are best avoided by development. There is a single large graveyard on Maralla East WEF, as well as a number of scattered graves throughout the area. They are generally located in the soft soils of the river banks, close to human settlement. *All graveyard and graves must be declared "No-Go" areas.*

Historic structures, such as abandoned farmhouses (such as Welgemoed) and outbuildings as well as graveyards (Schalkwykskraal) are sensitive to physical damage such as demolition as well as neglect. They are also context sensitive, in that changes to the surrounding landscape will affect their significance.

In the case of the proposed wind energy on Maralla East, it is expected that impacts to heritage will be moderate to high, if the most sensitive areas are not avoided.

With respect the proposed wind energy facility, the probability of encountering heritage sites is “probable” and the severity impact is likely to range between “low” on the tops of the ridges and “moderately severe” in the river valley such as the Venters River.

6 MITIGATION AND MANAGEMENT MEASURES

- Construction Phase
 - Since heritage resources are concentrated in the river valleys, such as the Venters River and Komsberg River valleys, it is important that access roads and underground cabling is carefully placed to avoid negative impacts. This will require a final walk down during the EMP phase, of all river crossings;
 - The proximity of the blue substation to significant heritage resources may result in their destruction. It is recommended that the white substation should be used instead. Alternatively, move the blue substation at least 500m to the west to avoid sites on the Venters River (Figure 4);
 - If any high concentrations of archaeological material, such as stone artefacts are recovered, HWC must be notified;
 - If any human remains are uncovered during the excavations for the Wind Farm, work must stop in that area and HWC must be alerted immediately.

Activity	Mitigation and management measure	Responsible Person	Applicable Development Phase	Include as Condition of Authorisation	Monitoring requirements
Construction	Careful placement of access roads and underground cabling to avoid impacts to heritage on river banks	Heritage specialist	EMP	Yes	No
	Either use the white substation, or else move the blue substation at least 500 m to the west.	ECO	Construction	Yes	No
	Walk down of river crossings to avoid archaeological sites and graves	Arcaheologist	EMPr	Yes	No
	Report high concentrations of archaeological material	ECO	Construction	Yes	No
	Report graves/human remains	ECO	Construction	Yes	No

- Operational Phase:
 - Any abandoned farm buildings (such as Welgemoed) should be protected from vandalism during the operational phase of the wind farm. If there are any proposals for adaptive re-

use of the building during the operational phase of the wind farm, then the provisions of the NHRA must be complied with regarding any restoration or renovation of the building.

Activity	Mitigation and management measure	Responsible Person	Applicable Development Phase	Include as Condition of Authorisation	Monitoring requirements
Operational	Ensure abandoned farm buildings (like Welgemoed) are not vandalised	ECO	Operational	Yes	Yes

- De-commissioning Phase – no further requirements
- Cumulative Impacts – see Section 8

7 STAKEHOLDER CONSULTATION

7.1 Stakeholder Consultation Process

Public consultation has been completed for the Scoping Phase of the proposed development. The only comments received to the Scoping Report were from SAHRA.

STAKEHOLDER DETAILS	COMMENT	SPECIALIST RESPONSE
Heritage Western Cape has responded to the NID	Requested: An HIA comprising Impacts to Palaeontological heritage resources (Dr John Almond of Natura Viva cc); Impacts to Archaeological heritage resources (Dr Lita Webley and Mr David Halkett of ACO Associates cc); Visual Impacts on the Cultural Landscape (Ms Belinda Genhardt) The required HIA must have an integrated set of recommendations. The comments of registered conservation bodes and the relevant Municipality must be requested and included in the HIA where provided. Proof of these requests must be supplied	This report addresses these issues
SAHRA	The pending HIA must take into consideration the following aspects: archaeological and historical heritage, burial grounds and graves, detailed Palaeontological Impact Assessment, Visual Impact of the proposed development, and any comments by the public regarding heritage resources	This report addresses these issues
DEA&DP (Western Cape) have responded to the Scoping HIA requesting:	“The final WEF layout must be subjected to an intensive heritage and archaeological survey and impact assessment, as per the specialist recommendations. All resulting micro-sitting mitigation measures identified must be reported on the in Draft EIA Report”.	It is not possible to do an intensive survey at the EIA phase, as the final layout of the facility has not been finalised. The walk-down of the most sensitive area must take place during the EMPr.
Mr B Kleinbooi has commented:	“There is also a graveyard that we want protected”	The exact location of the graveyard which Mr Kleinbooi is referring to is unknown. A number of graveyards were recorded during the survey.

		They will all be protected.
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DEA&DP as well as some of the local landowners have raised the matter of the accumulative impacts of the authorized renewable energy facilities on the landscape. DEA&DP endorses the recommendations of the visual expert with respect avoiding placing turbines on prominent ridgelines on the landscape. In addition, that steep slopes, which are visually sensitive, should be excluded from the development footprint. Farmers have noted that the cumulative impacts of the wind energy facilities are that they will “industrialize the Karoo” and “destroy a massive part of the Karoo”.

8 CUMULATIVE IMPACTS

Several renewable energy facilities have received environmental authorisation:

- The Suurplaat Wind Energy facility (Hart et al. 2010)
- The Roggeveld Wind Energy facility (Hart & Webley 2011, 2013)
- The Sutherland WEF facility (Halkett & Webley 2011)
- The Kareebosch Wind Energy facility (Roggeveld Phase 2) (Hart & Kendrick 2015)
- The Hidden Valley Wind Energy facility (Phases 1, 2 & 3) (Booth 2012)

Table 5: Cumulative impacts of the proposed WEF

BioTherm Energy - Maralla East								
HERITAGE IMPACTS								
Significance Rating Table								
Cumulative Impacts								
Maralla East								
Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)	Status (+ve or -ve)	Confidence
	Nature of impact:	Negative impacts - loss of heritage resources in this region						
Destruction of heritage sites of significance, leading to a loss of heritage resources	Without Mitigation	2	5	6	4	52	Medium	High
	degree to which impact can be reversed:	Heritage resources are non-renewable and cannot be replaced						High
	degree of impact on irreplaceable resources:	High impacts on heritage resources in the region, leading to a loss of heritage						High
	Mitigation Measures	Avoid sensitive areas which have been identified during the field work and walk down						High
	With Mitigation	1	5	2	3	24	Low	High

The cumulative impacts of several Wind Energy facilities in this area – increases the probability of negative impacts to heritage resources, of medium to high significance, such as cemeteries and the potential South African War military outpost. This is despite the mitigation measures proposed in each individual HIA report. This is because:

- Heritage resources are non-renewable. The loss of heritage resources during the construction of a wind farm is inevitable, despite implementing robust mitigation measures. Incrementally, this results in the loss of heritage which cannot be renewed;

- Surveys can never achieve a 100% cover of the area which may potentially be impacted. They sample a portion of the proposed area, and make deductions from this. There may be significant sites (such as rock art sites or graves) which were not identified during the survey and which may be destroyed or damaged;
- Many archaeological sites (including graves) are located under the soil surface, and are only exposed once the construction work commences. For this reason, it is necessary to have a robust management plan in place to ensure that significant sites are not destroyed.

9 CONCLUSIONS

The following highly sensitive areas have been identified and they must be declared *no-go* areas during the construction:

- A graveyard on the Komsberg River, Schalkwyskraal;
- An historic stockpost on the Komsberg River;
- Graves and a rock art site in the Ventersrivier, Welgemoed.

The following heritage recommendations are proposed:

The following highly sensitive areas must be declared no-go areas during construction:

- A graveyard on the Komsberg River, Schalkwyskraal;
- An historic stockpost on the Komsberg River;
- Graves and a rock art site in the Ventersrivier, Welgemoed.

The following recommendations are proposed:

- No-Go areas must be avoided;
- If there are any significant changes to the layout of the wind turbines, then a walk down of the proposed facility is recommended as part of the EMPr;
- It is recommended that there is a walk down of all river crossings during the EMP phase of the project, once the final location of the access roads and cable crossings has been finalised of the EMPr, to ensure that no heritage resources are destroyed;
- If there is any intention of adaptive re-use of the Welgemoed house during the construction or operation of the WEF, then any proposed alterations to the building, which is older than 60 years, must be submitted to Heritage Western Cape;
- If any archaeological remains, including human remains, are uncovered during construction, then work must stop in that area and the responsible heritage authorities (SAHRA/Heritage Western Cape) must be notified.
- The potential visual impacts of the proposed facility on the heritage resources of the area (i.e. the results of the VIA), must be integrated with the heritage study. It is assumed that a buffer will be required along the R354, as the road between Matjiesfontein and Sutherland is considered a scenic tourism route.

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Table 2: Archaeological Sites (and Built Environment) recorded during the field survey for Maralla East WEF (NCW = No research potential or other cultural significance). Farm Drie Roodeheuvelds 180 = DRH; Annex Drie Roodeheuvelds 181 = ADRH; Wolven Hoek 182 = WH; Schalkwyskraal 204 = SWK; Welgemoed 268 = WG.

Farm	Site	Lat S	Lon E	Type	Description	Significance
DRH	L009	-32.76762301	20.77522896	Midden	On sandy banks of river, spread of green bottle glass, white porcelain with blue design, 1 burnished red potsherd (4mm thick and grit tempered).	
DRH	L010	-32.76773399	20.77523399	Grindstone	A double sided grindstone	NCW
DRH	L011	-32.76774899	20.77521899	Burial cairn	Stone cairn burial (on soft river bank soil), also with a frag of porcelain with blue design.	IIIB
DRH	L012	-32.76739603	20.77521798	Grindstone	A single sided grindstone	NCW
SWK	L013	-32.75485201	20.77907701	Kraal	A large square stone kraal (50mx50m), with only the lower stone left, mostly removed. It is against a stone koppie, it contains two tiny lamb kraals. With green and white glass, refined earthenware	IIIC
SWK	L014	-32.75458102	20.77898003	House	A stone walled house, without a roof, adjoining the kraal wall. Comprised two well-packed stone rooms, leading into a "skern" of rougher walling. The 1 st room has a very small window, the door, leading into the second room, has a stone lintel. Associated late 19 th , early 20 th century material	IIIC
SWK	L047	-32.75453903	20.77882103	Stone structure	A small (3mx2m) stone structure	NCW
SWK	L048	-32.75443501	20.77889596	Stone structure	A very small square structure, possibly an oven (1mx1m)	NCW
SWK	L049	-32.75421901	20.77916100	Stone walling	A short section of stone walling, semi-circular, near the river, large rocks, maybe the back of a kraal?	NCW
SWK	L050	-32.75466702	20.77873997	Stone structure	Against the back wall of the large kraal, a small (1.5mx1m) stone structure (lambkraal?)	NCW
SWK	L051	-32.75500104	20.77855197	Stone structure	In the corner of the large kraal, a section of stone walling making a tiny triangular kraal (lambkraal?)	NCW
WG	L052	-32.71370198	20.80916201	Isolated stone artefact	In the small pan near T31, a very weathered hornfels flake	NCW
WG	L053	-32.69957897	20.82143404	Kraal	A large rectangular kraal, about 50mx50m, against a koppie, with a stone base. Walling up to 1.3m high	IIIC
WG	L054	-32.69649804	20.84401203	Grindstone	Grindstone on the banks of a small river	NCW
WG	L055	-32.69693901	20.84439802	Cairn/Burial	Raised earth mound with packed large rocks, two upright stones at one end (headstones?), one of the rocks is a grindstone. 1.5mx1.5m in size. On the edge of a river	IIIB
WG	L056	-32.69728401	20.84445703	Midden	A large ash heap, with widespread distribution of bone frags, glass, 3 cartridge cases, ceramics (spongeware, willow pattern & flow blue), OES, penknife blade.	IIIC
WG	L057	-32.69774501	20.84422099	Cairn	One upright stone, could be grave	IIIB
DRH	L058	-32.70841601	20.84561298		?	
DRH	L059	-32.72734101	20.83037401	Stone walling	Stone walling as the old road crossed the drift of the river	NCW
DRH	12H			Kraal	Stone kraal (50mx30m) against the side of the hill, about 1m high.	IIIC
SWK	D013	-32.76743601	20.77443603	Pottery	2x pot sherds and 2x stone flakes (1 of green chert)	
SWK	D014	-32.76740198	20.77428197	Grave?	Probable grave – accumulation of stones including 2x LGS on a sandy outwash fan.	
SWK	D047	-32.76714499	20.77413403	Historic scatter	Small scatter of sherds of refined earthenware with blue/black floral decoration. Also some light green glass and 1 x chert flake. Perhaps once associated with a grave?	
SWK	D048	-32.76723300	20.77420402	Grave?	Probable grave	
SWK	D049	-32.76820497	20.77461197	Kraal	Section of wall of a large rectangular stone kraal where it abuts the rock face close to the powerline route.	
SWK	D050	-32.76684299	20.77415298	Grave	Grave with associated ceramics – blue transfer print decoration on refined earthenware	

SWK	D051	-32.75600402	20.77852498	Historic material	Iron horseshoe, tin can and base of a green moulded bottle near kraal.	
SWK	D052	-32.75573504	20.77844300	Stone kraal	Large rectangular stone kraal on slope abutting a rocky ridge (approx. 40x20m).	
WG	D053	-32.69742399	20.84405998	Stone kraal	Crude single layer stone kraal immediately adjacent to a windpump and reservoir. (approx. 3-4m diam). Two possible small lobes attached.	
WG	D054	-32.69713498	20.84421798	Stone walling	Semi-circular section of stone walling (not enclosed)	
WG	D055	-32.72778600	20.83208098	Stone kraal	Rough circular stone kraal on steepish slope up against a "kopple" some 5-6m diam (possibly Regensburg's 141.3)	

Table 4: Cumulative Impacts – Wind Heritage

PROPOSED DEVELOPMENT NAME	DEA REFERENCE	CURRENT EA STATUS	PROPONENT	EXTENT	PROPOSED CAPACITY	FARMS	IMPACTS													PROPOSED MITIGATION MEASURES					
							Construction					Operation					Decommissioning								
							Overall	Archaeology	Built Environment	Graves	Cultural Landscape	Overall	Archaeology	Built Environment	Graves	Cultural Landscape	Overall	Archaeology	Built Environment		Graves	Cultural Landscape			
Proposed 280 MW Gunstfontein Wind Energy Project	14/12/16/3/3/2/395	S&EIR	Network Eolos Renewables (Pty) Ltd	12 000	280 MW			M	L	M	M														<ul style="list-style-type: none"> For archaeology, open air sites should be mitigated either in the form of conservation of the sites with development or by a Phase 1 survey where the sites will be recorded before the client can apply for a destruction permit for these sites with development. All grave sites should be identified before the development and avoided. It is not envisaged that the built environment will be directly impacted on by the development. Should any buildings older than 60 years need to be demolished, the site should be assessed by a conservation architect. Formal and informal cemeteries and graves, as pre-colonial graves occur across the region. These should be preserved within a development where possible, but this must be the last resort and is not advisable.
Proposed development of renewable energy facility at the Sutherland site,	12/12/20/1782/AM1	S&EIR	Mainstream Power Sutherland	28 600	811 MW			L	M	L	M														<ul style="list-style-type: none"> For archaeology, micro siting of turbine positions during the EIA should be done. If micro siting is not a viable option, some physical mitigation measures may be required (excavation or collection of soil) and a permit may be required from the relevant authority in order to undertake such mitigation measures. For the built environment, micro siting of turbine positions during the EIA should be done.

PROJECTS	DATE	CURR	PRO	EXT	PRO	FA	IMPACTS	PROPOSED MITIGATION MEASURES
Western and Northern Cape.								<p>turbine positions and as infrastructure must be done due to EMP to avoid placing turbine infrastructure directly over environment features and built bisecting coherent structures complexes.</p> <ul style="list-style-type: none"> For graves, once the exact position of infrastructure is known, a more detailed assessment of the access roads, construction roads, laydown areas, substation positions and cable routes needs to be undertaken to identify marked graves within the affected area. In the case of unmarked graves, a protocol will need to be a protocol in order to deal with them on a case basis if and when discovered during the course of construction. HWC will be notified immediately if a human remains are uncovered during construction. Work in the specific area must stop pending inspection and mitigation as required. For cultural landscape, any facilities on site must be placed in a way that avoids visual clutter.
Proposed Hidden Valley Wind Energy Facility, Northern Cape	12/12/2020/2370/2	S&EIR	Hidden Valley Wind-African Clean Energy Developments (Pty) Ltd	9530	150 MW	L		<ul style="list-style-type: none"> A 10m perimeter boundary fence must be established around the heritage structures (dry packed walling dwelling on Portion of t Orange Fontein 201 (HV) adjacent to the farm gravel road and during all construction and development activities. If concentrations of archaeological materials are exposed during construction, then all work must cease until an archaeologist to investigate the human remains (or any concentrations of archaeological heritage material) are exposed. During construction, all work must cease until the nearest museum or archaeologist is notified. The SAHRA, so that a system

PROJECTS	DATE	CURR	PROJECT	EXT	POWER	FA	IMPACTS	PROPOSED MITIGATION MEASURES
								professional investigation of the area should be undertaken. Sufficient time should be allowed to investigate and to record the area and to collect such material.
Proposed Hidden Valley wind energy facility , Northern cape	12/12/202370/3	S&EIR	Hidden Valley Wind-African Clean Energy Developments (Pty) Ltd	9180	150 MW		L	<ul style="list-style-type: none"> Refer to 12/12/20/2370/2 above.
Proposed Hidden Valley wind energy facility , Northern cape	12/12/202370/1	S&EIR	Hidden Valley Wind-African Clean Energy Developments (Pty) Ltd	13620	150 MW		L	<ul style="list-style-type: none"> Refer to 12/12/20/2370/2 above.
Proposed Hidden Valley wind energy facility , Northern cape	12/12/202370	S&EIR	Hidden Valley Wind-African Clean Energy Developments (Pty) Ltd		650 MW		L	<ul style="list-style-type: none"> Refer to 12/12/20/2370/2 above.
Proposed Construction Of The 140Mw Roggeveld Wind Farm Within The Karoo Hoogland Local	12/12/201988/1/AM1	Amendment	G7 Renewable Energies (Pty) Ltd	26529	140 MW		L L L M	<ul style="list-style-type: none"> For colonial archaeology, a full-scale archaeological assessment should be done down of the proposed route of the power line, alignments and transmission lines. A full-scale archaeological assessment should be done. Heritage resources should be identified, flagged and avoided during construction. No substations should be built in prominent positions or in the sight of historic farms. These areas should be avoided for power line

PROJECT DESCRIPTION	DATE	CATEGORY	PROJECT NAME	EXTENSION	POWER (MW)	FACTOR	IMPACTS	PROPOSED MITIGATION MEASURES
Municipality Of The Northern Cape Province And Within The Laingsburg Local Municipality Of The Western Cape Province								<ul style="list-style-type: none"> For the built environment, micro-turbine positions and associated infrastructure must be done during EMP to avoid placing turbine infrastructure directly over environment features and buildings bisecting coherent residential complexes. The sensitive vacant buildings is encouraged as advice is sort on sensitivities) as this will help them. No practical mitigation measures impacts on the cultural landscape.
Proposed Photovoltaic (PV) Solar Energy Facility On A Site South Of Sutherland, Within The Karoo Hoogland Municipality Of The Namakwa District Municipality, Northern Cape Province	12/12/202235	BAR	Inca Komsberg Wind (Pty) Ltd	2	10 MW		L N/A L H	<ul style="list-style-type: none"> Use Option 1 as it has the pre-stone-walled structures about north of it compared to Option they are <50 m to the east of it. Consider option 1 as it does not Anglo-Boer War sites. Option 1 is preferable visually partially screened by a low road that lies between it and R354 the central and eastern parts of would be visible.
Proposed establishment of the Suurplaat wind energy facility and associated infrastructure on a site near Sutherland,	12/12/201583	S&EIR	Moyeng Energy (Pty) Ltd	28 600	120 MW		L L H H	<ul style="list-style-type: none"> Existing farm tracks must be re-upgraded to minimise the amount change to un-transformed landscape. In general terms, construction of roads in valley bottoms should be kept to a minimum. Archaeological close to the access roads Hartebeestfontein and in the bottoms close to the roads Klipfontein and Modderfontein active protective intervention a

P R O P O S	D E A R	C U R R E	P R O P	E X T	P R O P	F A R M		IMPACTS	PROPOSED MITIGATION MEASURES
Western Cape and Northern Cape.									<p>archaeological sampling.</p> <ul style="list-style-type: none"> Any pre-colonial kraal complexes will be affected by the proposed road. These should be mapped, and measures should be taken to protect the sites. During the detailed planning stage, drawings of proposed road alignments and near-final infrastructure positions should be submitted to an archaeologist for review and approval. Micro-adjustment of alignment and turbine positions is likely to be sufficient to achieve adequate mitigation. A “walkdown” of final cable route and all power lines, substation sites and access roads will be required. If farm buildings at Louw se Modderfontein are to be re-used, middens should be protected. It is illegal at all times to demolish or change and archaeological sites without a permit. Conserve old buildings, kraal walls and wall alignments – do not demolish or damage. Do not demolish wind pumps. Structures that are greater than 60 years of age should be protected. Follow a policy of non-intervention. Farm buildings such as those at Louw se Modderfontein should be conserved and rehabilitated. Theft of fittings from buildings should be monitored and offenders fined or charged under NHRA. Seek guidance from a heritage consultant if any buildings are to be demolished or restored. Keep infrastructure at least 500m away from all farm complexes as most of the heritage elements that are of heritage value are located on the farms.

PROPOSED PROJECTS	DATE OF DECISION	CURRENT STATUS	PROPOSED PROJECTS	EXTENT	PROPOSED PROJECTS	FAIRNESS	IMPACTS	PROPOSED MITIGATION MEASURES
								<ul style="list-style-type: none"> Apply to the relevant provincial authorities to demolish or a historic structures (buildings, passes, walls kraals etc). Turbines must be positioned in way that they are at least 500m from farm complexes. Turbines must be positioned in way that shadow flicker does not affect any farm complexes. Road alignments must be planned such a way that the minimum of fill operations are required.
Proposed establishment of the Witberg Bay wind energy facility, Laingsburg Local Municipality, Central Karoo District, Western cape	12/12/2019/66/A2	Amendment	Witberg Wind Power (Pty) Ltd	Unknown				
Proposed renewable energy facility at Konstabel	12/12/2017/87	S&EIR	South Africa Mainstream Renewable Power Development	170 MW				
Proposed development of a renewable Energy facility at Perdekraai, Western	12/12/2017/83/2/AM1	Amendment	South Africa Mainstream Renewable Power Development	Unknown				

PROPOSED	DESCRIPTORS	CURRENT	PROPOSED	EXTENT	PROPOSED	FARM	IMPACTS										PROPOSED MITIGATION MEASURES			
Significance Totals per impact	Significance Rating						Total Hectares per impact													
	High Significance						28602								28600					
	Medium Significance				12000	28600	12000	67129							26529				215	
	Low Significance				116276	67344	55131	215		215	215	0	215		215	215				
	Positive Impacts																			