HERITAGE IMPACT ASSESSMENT: PROPOSED CONSTRUCTION OF THE ESIZAYO 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)

Case No: 16041211AS0418E

Prepared for:
Ashlea Strong
WSP/Parsons Brinckerhoff

On behalf of:
BioTherm Energy (Pty) Ltd

January 2017

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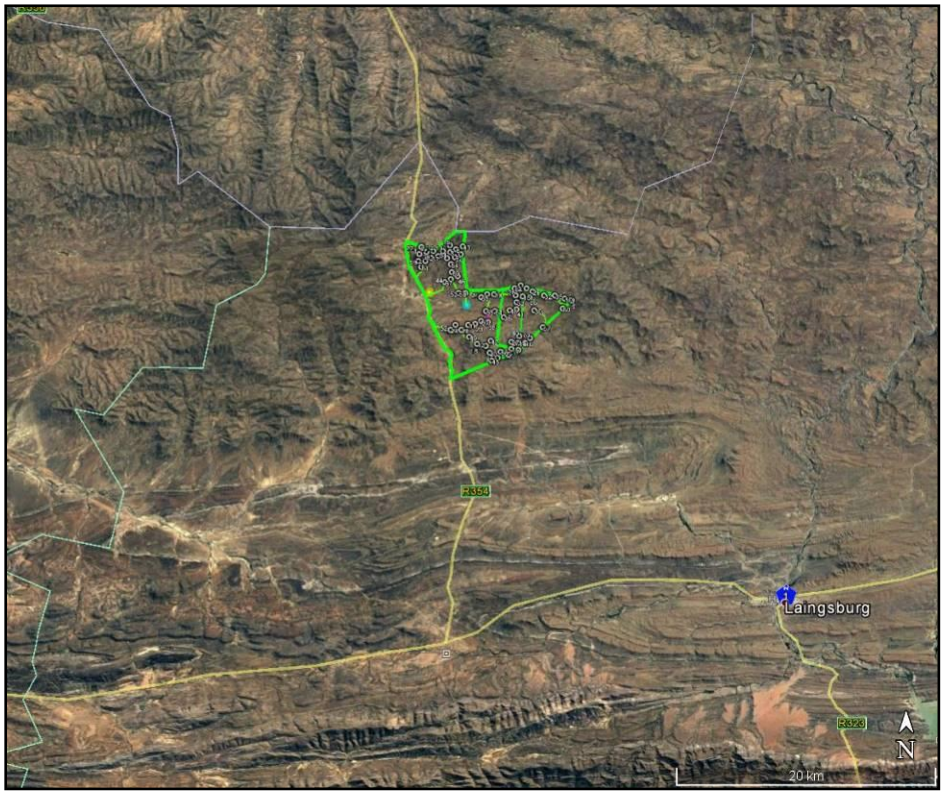
EXECUTIVE SUMMARY

Site Name:
The Esizayo West Wind Energy Facility to the east of the R354, between Laingsburg and Sutherland in the Western Cape Province.

Location



The Esizayo Wind Farm is situated on the R354, midway between Matjiesfontein and Sutherland. The Esizayo WEF is located in the Western Cape Province, the borders here being indicated in mauve.

Heritage Western Cape

The Esizayo WEF falls inside the boundaries of the Western Cape and the heritage authority responsible for providing comments (in terms of Section 38(8) of the NHRA) on the proposed development is *Heritage Western Cape* (HWC).

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 must 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.

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: Esizayo (Western Cape)

Palaeontology

To be supplied by Dr John Almond

Archaeology

- A few large scatters of LSA stone artefacts were identified. Two scatters were found on the talus slopes, below the rock art sites. They are of medium significance;
- A few "pastoralist settlements" were identified containing LSA artefacts, ceramics and grindstones along dry river beds in the bottom of valleys. They are of medium significance;
- At least two rock art sites, the one with indistinct human figures and the other with faded finger daubs, were identified. They are of high significance;
- The Nuwerus cemetery is located next to the R354. There are also a number of other potential graves/cairns within the study area. They are of high significance;
- There is a spread of early 20th century historical material on the lower slopes of two koppies, in association with several stone enclosures (fortifications) on the farm Aanstoot. They may represent the debris from the South African War and are of medium to high significance;
- There are numerous roughly-packed, circular enclosures of dry stone walling, which may represent both pre-colonial and colonial era stone kraals, distributed along the lower slopes of small koppies, and close to streams or fountains across the study area. They are of low to medium significance.

Visual Impacts on the Cultural Landscape

Elsewhere, Hart (2016) has described this landscape: "The sense of isolation, nature and desertification do impart a certain beauty and a distinct sense of place. Overall a Grade IIIB is recommended (Medium Low significance), however there are enclaves of high aesthetic value and views from the higher ridges are spectacular and worthy of Grade IIIA".

Visual impacts to be supplied by Belinda Gebhardt

Anticipated Impacts on Heritage Resources: Esizayo

- Construction of Substation 1 will result in the destruction of stone walled enclosures and historic material, which probably date to the South African War;
- Most archaeological sites are located along river beds. The construction of roads across rivers may result in the destruction of archaeological banks of the river banks;
- Informal cemeteries and graves are located close to settlements and due care must be undertaken when infrastructure, such as roads and powerlines are constructed to avoid destroying them.

Cumulative Impacts

Several renewable energy facilities have been authorised in the area around the Eskom Komsberg substation and they have been subjected to the EIA process. This report consulted the following HIA reports:

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

- The Komsberg Wind Energy Facility (Heritage studies by Hart 2016).

The cumulative impacts of several renewable energy facilities within a 70km radius on the heritage of the Esizayo WEF are acceptable if the required mitigation measures are implemented. If the heritage resources are not directly impacted, 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.

No-Go Areas

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

- Potential South African War stone structures and historic material on a small koppie on Esizayo;
- The Nuwerus cemetery on Esizayo.

The following heritage recommendations are proposed

- No-Go areas should 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;
- If any archaeological remains, including human remains, are uncovered during construction, then work must stop in that area and the responsible heritage authorities (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.

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 Gebhardt) 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	This report addresses these issues
DEA have commented on the Scoping Report (24/11/2016):	A status quo map/layer must be provided that includes the following: Cultural Historical sites and elements	These have been provided in this report.
DEA&DP (Western Cape) have responded to the Scoping HIA	"The final WEF layout must be subjected to an intensive heritage and	It is not possible to do an intensive survey at the EIA phase, as the final

requesting:	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".	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. Several graveyards were recorded during the survey. They will all be protected.

- Insert visual comments

Author/s and Dates

Lita Webley	ACO Associates cc	Archaeology
John Almond	Natura Viva cc	Palaeontology
Belinda Gebhardt		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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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 Esizayo Wind Energy Facility between Laingsburg and Sutherland in the Western Cape Province (**Figure 1**).

A NID was submitted to Heritage Western Cape (HWC) for both the Esizayo WEF and the eastern portion of the Maralla WEF which fall into the boundaries of the Western Cape. HWC have issued an Interim Comment (16041211AS0418E) asking for:

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

The HIA requires an integrated set of recommendations. This includes the comments of registered conservation bodies and the relevant Municipality where provided. Proof of these requests must be supplied in the report.

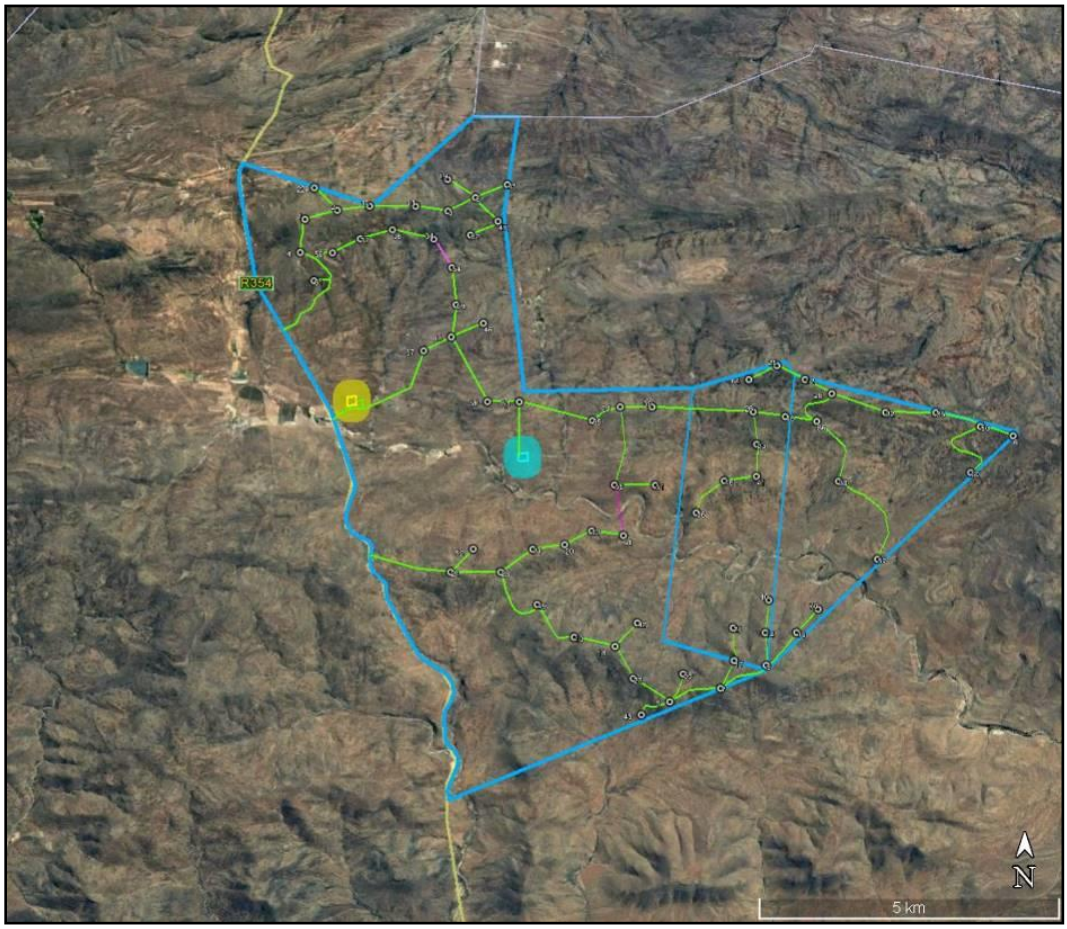

Figure 1: The boundaries of the Esizayo WEF are indicated in blue. The majority of the turbines are placed on the higher ridges. Note the position of the onsite substation 1 (yellow) and substation 2 (blue).

1.1 Scope of Work

This Heritage Impact Assessment considers the potential impacts of the proposed construction of a wind energy facility on Portion 1 of Aanstoot 72, Annex Joseph's Kraal 84 and Aurora 285 (**Figure 1)**. The HIA specifically addresses:

- 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 fossilierous 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 per 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 Esizayo WEF falls inside the boundaries of the Western Cape. The heritage authority responsible for providing comments (in terms of Section 38(8) of the NHRA) on the proposed development is 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).

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 & 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 Esizayo are like 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;
- 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; 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 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.

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.

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.

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.

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

2.1 Esizayo Wind Energy Facility

The proposed 250MW Esizayo WEF is located 28km north-west of Laingsburg, in the Central Karoo District Municipality of the Western Cape Province. The site access is via the R354. The size of the study area is 6 061ha and it comprises the following farms:

- Portion 1 of Aanstoot 72;
- Annex Joseph's Kraal 84;
- Aurora 285.

Each 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, expect 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"

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Environmental attributes

The Study Area is located some 35km south-east of Sutherland, beneath the plateaux. The R354 between Matjiesfontein and Sutherland skirts the western edge of the Esizayo WEF.

Although myriad streams are to be found on all the farms, the main channel draining the Esizayo WEF is the Roggeveld River. 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.

Plate 1: View in a north-westerly direction across the landscape for the proposed Esizayo WEF. Note the location of the Aurora farmhouse in the centre of the photograph.

4 FINDINGS FOR THE ESIZAYO WEF

Surveys by 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 report is attached separately.

4.2 Archaeology

Recent surveys by heritage practitioners as well as academics from the University of Cape Town have increased our knowledge of the archaeology of the area. The field survey identified the following heritage resources:

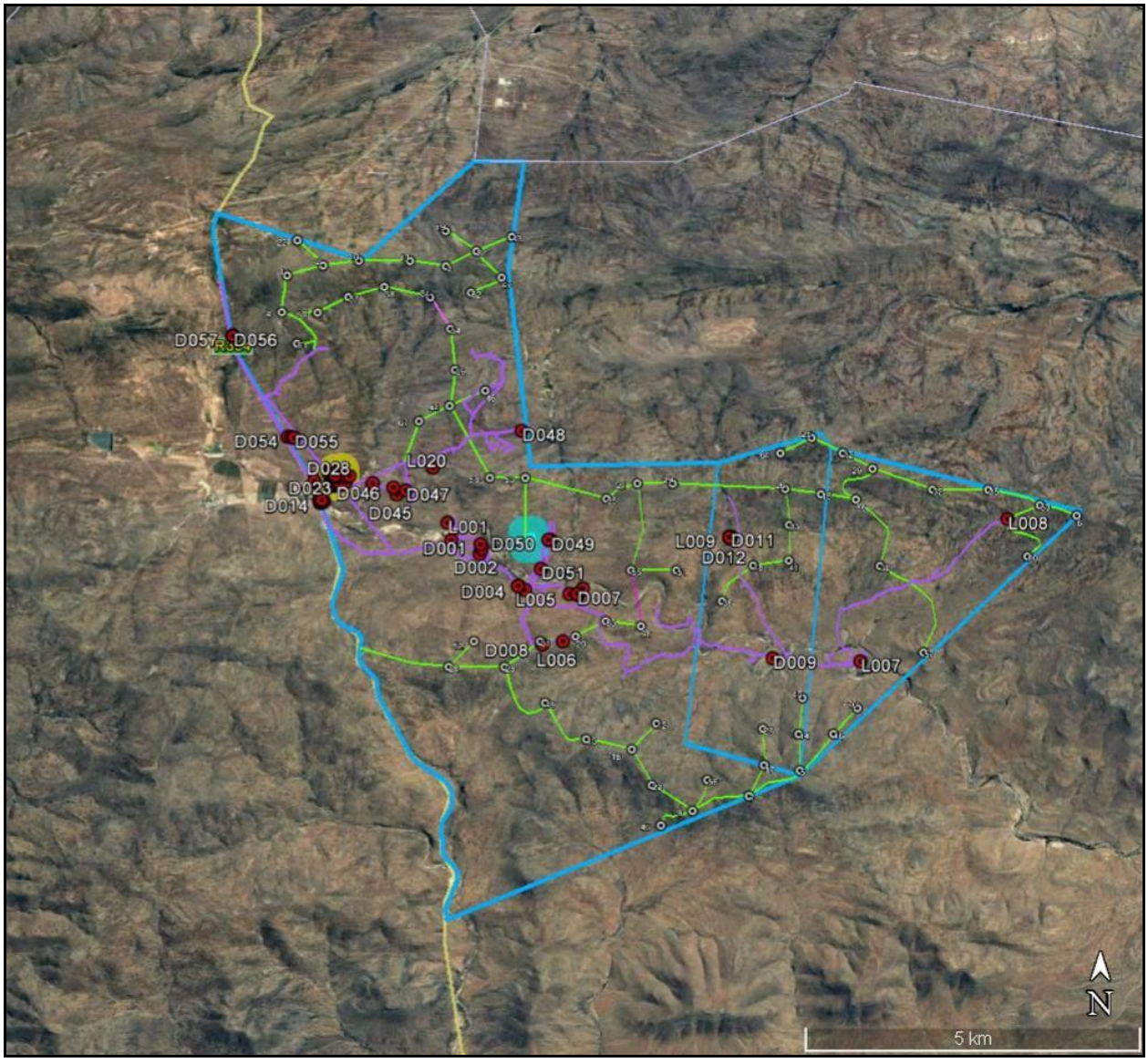

Figure 2: The farm boundaries are outlined in blue. The turbine locations are indicated by small circles while the electrical cabling connecting the turbines is in green. Our tracks are shown in pink, with heritage sites indicated by the red circles. We were not able to access the higher lying areas because of a lack of roads. However, the greatest concentration of sites is along the Roggeveld River.

- There is very little evidence for ESA or MSA material;
- A few large scatters of LSA stone artefacts were identified. Two scatters were found on the talus slopes, below the rock art sites. They are of medium significance;

- A few “pastoralist settlements” were identified containing LSA artefacts, ceramics and grindstones along dry river beds in the bottom of valleys. They are of medium significance;
- At least two rock art sites, the one with indistinct human figures and the other with faded finger daubs, were identified. They are of high significance;
- The Nuwerus cemetery is located next to the R354. There are also several other potential graves/cairns within the study area. They are of high significance;
- There is a spread of early 20th century historical material on the lower slopes of two koppies, in association with several stone enclosures (fortifications) on the farm Aanstoot. They may represent the debris from the South African War;
- There are numerous roughly-packed, circular enclosures of dry stone walling, which may represent both pre-colonial and colonial era stone kraals, distributed along the lower slopes of small koppies, and close to streams or fountains across the study area. They are of low to medium significance.

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. Per 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. A fine example, although much altered, of a 19th century vernacular farmhouse can be found on Wolven Hoek (Maralla West WEF). 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 History of farms on Esizayo WEF

- **Aanstoot 72:** The original loan place was granted to JJ du Toit (Wor.Q.8.35) in November 1838. The survey map shows that the original farmhouse is located on Aanstoot A (next to a weak fountain) which is not part of the study area. A wagon road crossed the farm from north to east. The map also indicates an Outspan to the north-west of the farm on Aprilskraal;
- **Aurora 285:** Consolidated in 2007, it includes portions of the farm Fortuin 74, Aanstoot 72, Wilge Hout Fontein 87 and Annex Dwars in die Weg 83;

Plate 2: The Aurora farmhouse, while retaining a historic core, has been significantly altered in recent years.

- **Annex Joseph's Kraal 84:** The farm was surveyed in 1890, and contains the farmhouse known as Die Bron.

Plates 3 & 4: The farmhouse of Die Bron on the farm Annex Joseph's Kraal, as well as a nearby stone rondawel.

4.4 South African War

During the South African War, the threat of Boer incursions led British forces to build fortifications at several strategic passes through the Roggeveld. With Manie Maritz active in the district, many young men from the Roggeveld joined the Boer cause. A stone redoubt was built at the top of the Brandkloof and Maleishoek passes. Orton & Halkett (2011) reported finding stone-walled structures relating to the South African War on the farm Jakhalsvalley 99, outside Sutherland. They related that stone-walled defensive enclosures were made by both Boer and British and it is difficult to distinguish between them, even when they are associated with historic tin cans, glass and ceramics.

The yellow on-site substation alternative for the Esizayo WEF (Aanstoot 72) is located on top of a little koppie which has several stone walled enclosures and associated historic midden material, probably from the South African War.

4.5 Cemeteries and Graves/Cairns

Farm cemeteries and graves have been recorded on the Esizayo WEF. The cemeteries are generally closely associated with farm settlements but in the case of Aanstoot, the cemetery is separated from the farmhouse of Klawer by the R354. There are also several 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 2a may not be comprehensive.

4.6 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 lllB 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”.

Per 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.

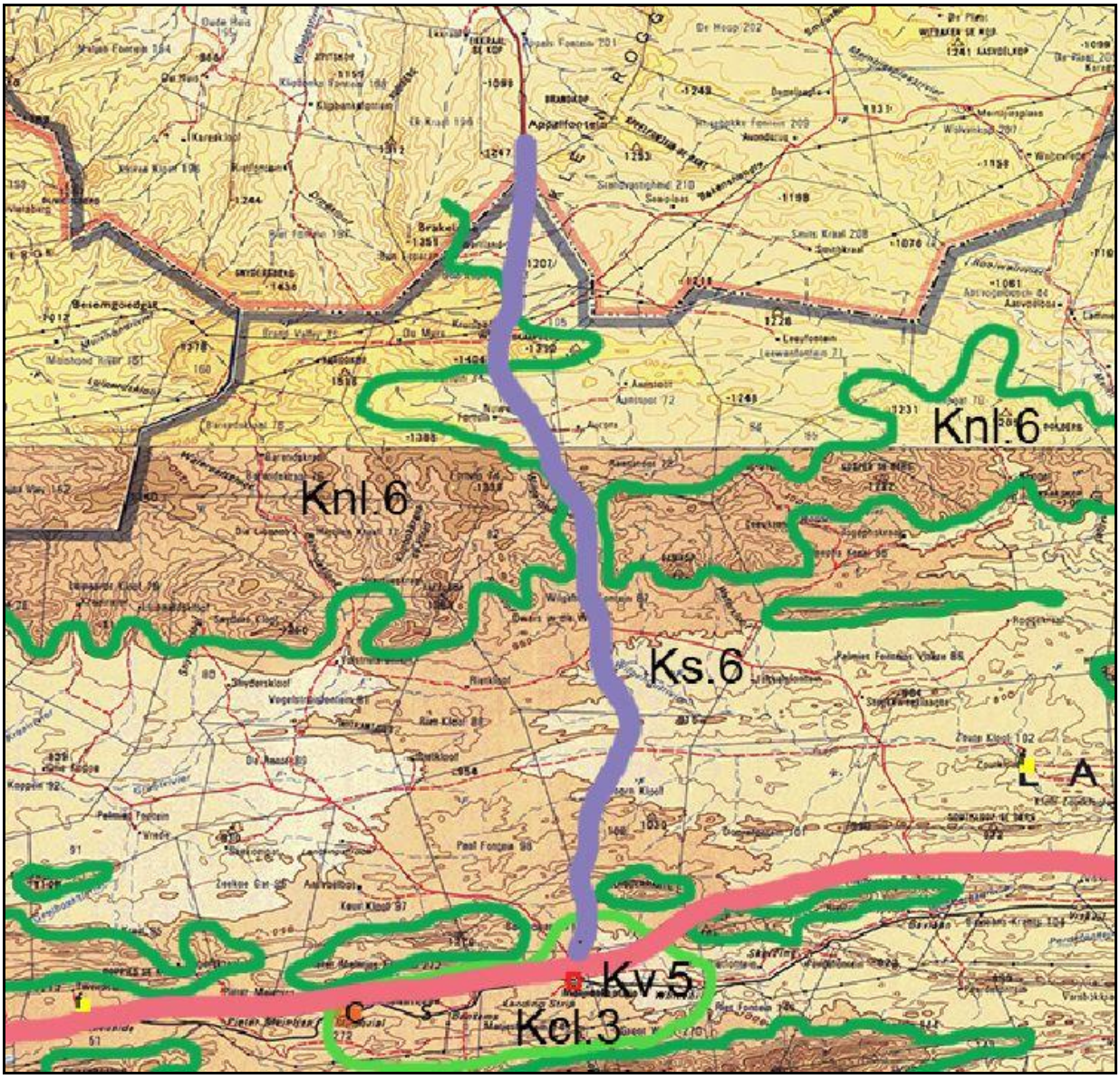

Figure 3: A landscape assessment by Winter & Oberholzer (2013) identifies the R354 (purple line) as a route of high scenic and rural value and an important tourist route to Sutherland (Route III). The abbreviation Knl.6 represents the Klein Roggeveldberge which is described as lying on an important scenic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

The VIA report by Belinda Gebhardt is attached separately.

4.7 Anticipated Impacts to the heritage of the area

4.7.1 Construction Phase

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 near existing settlements (i.e. farmhouse of Aurora) or graveyards such as the Nuwerus cemetery at the side of the R354;
- Excavation of linear trenches for cables through river valleys;
- Construction of electrical infra-structure in the form of sub-stations. Substation 1 is positioned on the top of a dense scatter of archaeological material dating to the early 20th century and appears to be a temporary South African War settlement.

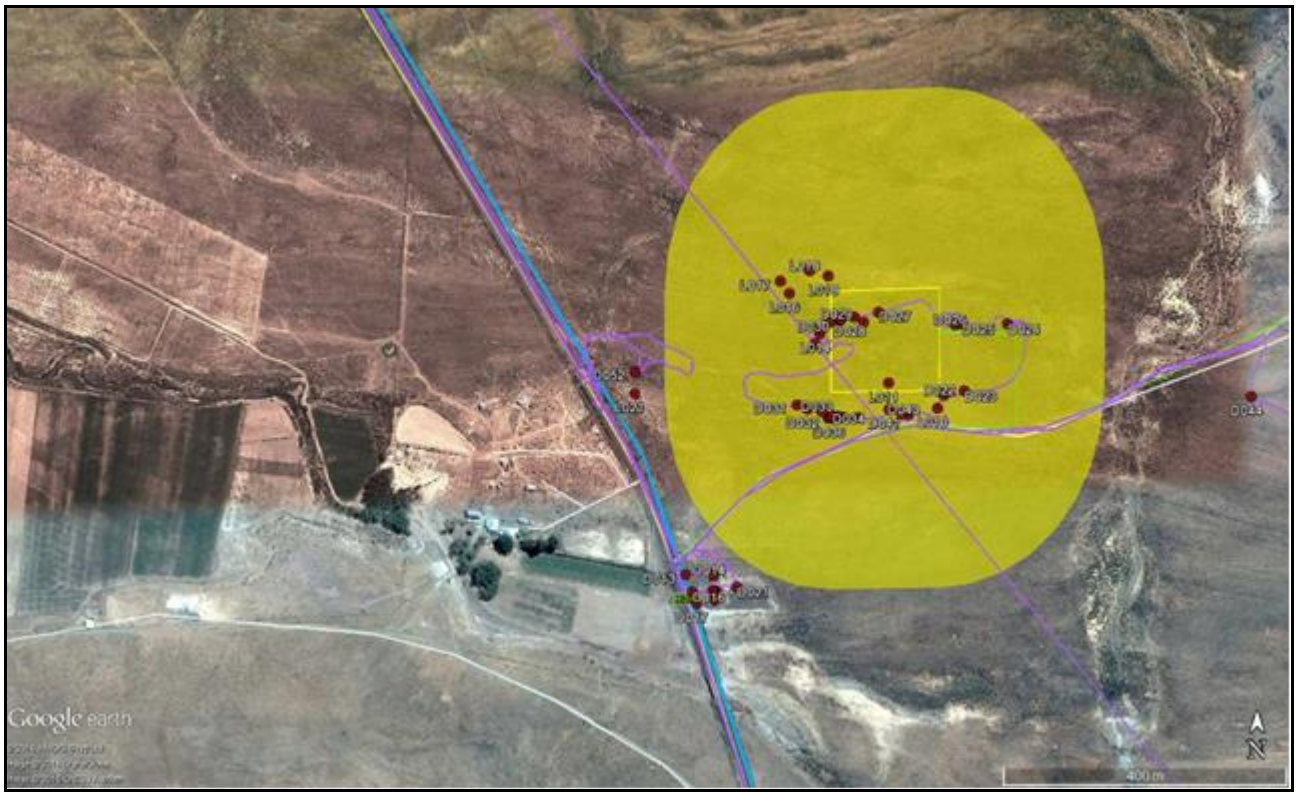

Figure 4: A close-up view of the sensitive heritage locations (red polygons) on the farms Aanstoot and Aurora close to the R354. The substation (1) near the road is situated on several stone wall structures and associated historic material indicating a site/s of significance during the South African War. It is preferable that substations 2 (the turquoise square) is used instead to avoid impacts. The access road to this substation is right next to the Nuwerus cemetery.

4.7.2 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.

4.7.3 De-commissioning 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 felt 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 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.

The early 20th century scatters of historical material and stone structures, possibly from the South African War, on the farm Aanstoot must conserved. While mitigation, in the form of archaeological excavations and collections can be undertaken, and the material stored in a museum, the context of the archaeological site will have been lost forever. For this reason, it is recommended that this location is declared “No-Go”.

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. An extensive consultation process with interested and affected parties is required if exhumation is considered. All graveyards should be declared “No-Go” areas. The Nuwerus farm cemetery, is located right next to the gravel access road to the site from the R354, and is in danger of destruction if the road is widened. *All graveyard and graves should be declared “No-Go” areas.*

Historic structures, such as abandoned farmhouses (such as Aurora) and outbuildings 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 Esizayo, it is expected that impacts to heritage will be moderate if the most sensitive areas are 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 other words, mitigation (preferably avoidance of sensitive sites) would be possible.

Table 3: Two No-Go areas to be mitigated.

Esizayo - No-Go									
Potential Impact	**Mitigation**	**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
Substation 1 will results in destruction of South African War military outpost	**Nature of impact:**	Negative impacts - destruction of site							
	Without Mitigation	2	5	8	4	60	Medium	-	High
	degree to which impact can be reversed:	Heritage resources are non-renewable and destruction is permanent							High
	degree of impact on irreplaceable resources:	High impact							High
	Mitigation Measures	Use alternative substation 2							High
	With Mitigation	1	5	0	1	6	Low	-	Medium
Access road my damage or destroy the Nuwerus cemetery	**Nature of impact:**	Negative impacts - destruction of portion of cemetery							
	Without Mitigation	2	5	6	3	39	Medium	-	medium
	degree to which impact can be reversed:	Heritage resources are non-renewable and destruction is permanent							High
	degree of impact on irreplaceable resources:	Graves have high significance and impacts will be high							High
	Mitigation Measures	Ensure there is a buffer around graveyard to ensure it is not damaged							High
	With Mitigation	1	5	2	2	16	Low	-	High

Table 4: addresses the significance of potential impacts of the proposed wind energy facility on the heritage of the area.

BioTherm Energy - Esizayo									
HERITAGE IMPACT ASSESSMENT									
Significance Rating Table									
Construction Phase									
Esizayo									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
Impacts to buried archaeological and graves	**Nature of impact:**	Negative impacts - to buried sites							
	Without Mitigation	1	5	6	2	24	Low	-	Medium
	degree to which impact can be reversed:	Heritage resources are non-renewable and destruction is permanent							High
	degree of impact on irreplaceable resources:	Impacts to buried heritage sites can vary between low and high, depending on the nature of the resource							High
	Mitigation Measures	Report heritage resources to the ECO							High
	With Mitigation	1	5	2	2	16	Low	-	High

6 MITIGATION AND MANAGEMENT MEASURES

- Construction Phase

- The hill and surrounds on which the yellow substation (Substation 1) is located, must be declared a “No-Go” area;
- The Nuwerus cemetery must be protected during the construction phase;
- 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
	Hill on which yellow substation is located must be declared a "No Go" area.	ECO	Construction	Yes	No
Construction	Protect Nuwerus cemetery at the side of the R354	ECO	Construction	Yes	No
	Report human remains	ECO	Construction	Yes	No

- Operational Phase:

- Any abandoned farm buildings should be protected from vandalism during the operational phase of the wind farm.

Activity	Mitigation and management measure	Responsible Person	Applicable Development Phase	Include as Condition of Authorisation	Monitoring requirements
Operational	Ensure abandoned farm buildings 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 Gebhardt) 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	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	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

	recommendations. All resulting micro-sitting mitigation measures identified must be reported on the in Draft EIA Report".	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. Several graveyards were recorded during the survey. They have been identified. More unmarked graveyards may exist.

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 been authorized in the area around the Eskom Komsberg substation (Table 5). 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)
- The Kareebosch Wind Energy facility (Roggeveld Phase 2) (Hart & Kendrick 2015)
- The Hidden Valley Wind Energy facility (Phases 1, 2 & 3) (Booth 2012).

Table 6: Cumulative impacts of several renewable energy facilities on sites of significance

Esizayo - No-Go									
Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Destruction of a number of sites of medium to high significance in this region	Nature of impact:	Negative impact - loss of heritage							
	Without Mitigation	3	5	8	3	48	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:	The destruction of a number of heritage sites of significance in the region will result in a loss of local heritage							High
	Mitigation Measures	Avoid sites of medium to high significance							High
	With Mitigation	2	5	4	2	22	Low	-	Medium

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:

- Potential South African War stone structures and historic material on a small koppie on Esizayo (the proposed location of substation 1);
- The Nuwerus graveyard on the side of the R354.

The following heritage recommendations are recommended:

- No-Go areas must be avoided;
- If there are any significant changes to the layout of the wind turbines, then a walk down of sensitive areas along river valleys is recommended as part of the EMPr;
- If any 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.

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Table 2a: Archaeological Sites (and Built Environment) recorded during the field survey for Esizayo WEF (NCW = No research potential or other cultural significance). Farm Aanstoot 72 = Aa; Annex Joseph's Kraal 84 = AJK; Aurora 285 = Au.

Farm	Site	Lat S Lon E	Lon E	Type	Description	Significance
Aa	L001	-32.99082496	20.58594799	"Kraal"	Rectangular stone structure (kraal?), skin walling with inner rubble, about 1m high in one corner. Size 2.5m x 2.5m, associated with white refined earthenware and green glass. Against small koppie, overlooking stream	IIIC
Aa	L002	-32.99313200	20.58651301	Homestead	Aurora farmhouse, older core with "solder" outside and old kitchen hearth. But with many additions, including red brick. A large stone kraal next to the house, between it and the river.	IIIC
Aa	L003	-32.99972797	20.59818104	"Kraal" or shepherd hut	At base of small koppie, a small square structure, about 2m x 3m. Stone packed walling with outer skin and inner rubble. A small stone semi-circle attached to the back – a kookskerm? About 5 m from a small stream, across the stream old dump with ash, burnt bone, clear glass and *Patella miniata* shell.	IIIC
Aa	L004	-32.99954298	20.60734699	Cave with paintings and stone artefacts	Small overhang on edge of long kloof. Finger paintings (daubs in red). In groups on all the flat surfaces, 7, 6, 6, 6, 5, 3. Down along the talus slope are artifacts, oes and one modified cartridge case. Two cores (chert & hornfels), 2 large hornfels flakes, 1 hornfels bladelet, 7 chert flakes, 1 quartz crystal flake, 1 ccs backed bladelet, 1 tiny thumbnail chert scraper.	IIIA
Aa	L006	-33.00654598	20.60408399	Stone scatter	Small scatter of quartz flakes and chips over small area near test mast. Quartz has grainy appearance.	NCW
AJK	L007	-33.00929097	20.65162498	Homestead	Die Bron, abandoned house. Shed, including stone shed. Small stone rondavel with reed roof, cement lined square reservoir, stone kraal behind house, near a large dam/weir.	IIIC
Aa	L008	-32.99033102	20.67439601	Stone artefact scatter	6 quartz chunks, chips and flakes, over a small area. Grainy quartz.	NCW
Aa	L009	-32.99274299	20.63053703	Stone artefact scatter	Along sandy banks of river, a single slug (Wesley Richards?), an indurated shale core and one chert adze/reduced core?	NCW
Au	L010	-32.98570303	20.56940203	Boer War scatter	Historic (Boer War?) tin cans (round with lead dot on base), spread of aqua glass	IIIC
Au	L011	-32.98538502	20.56866501	Boer War scatter	Extension of above	
Au	L012	-32.98462403	20.56828396	Boer War scatter	As above, four tin cans and some purple glass, on the koppie, near L013	IIIC
Au	L013	-32.98462504	20.56777501	Stone kraal/ fortification	A roughly rectangular shaped stone wall structure, on the edge of the koppie. 6m x 3m. Roughly packed. Plus some broken glass and a tin can nearby.	IIIC
Au	L014	-32.98476996	20.56762900	Stone kraal/ fortification	A circular stone structure below the koppie (2mx3m), it has a small annex in stone (2mx3m). Dense accumulation of metal, and glass (20th Century).	IIIC
Au	L015	-32.98489803	20.56755398	Historic midden	Large spread of 20th century midden material	NCW
Au	L016	-32.98426403	20.56717101	Stone kraal/ fortification	Semi-circle of stone, on the edge of a little ridge, overlooking the road (R354). 3mx4m. Packed rubble, there does not appear to be any associated historic rubbish	IIIC
Au	L017	-32.98410896	20.56703699	Stone kraal/ fortification	4th stone structure on the koppie. A stone circle looking up the R354 toward the pass. 3mx4m. Roughly packed, no historic rubbish	IIIC
Au	L018	-32.98398198	20.56747201	Stone kraal/ fortification	5th stone structure. A long oval extent, about 7m x 3m. But the ends of the oval are better packed that the central sections. 1 sardine can.	IIIC
Au	L019	-32.98404601	20.56775196	Stone kraal/ fortification	A structure on the koppie which seems to have collapsed in onto itself.2m x 3m. No historic material nearby.	IIIC
Au	L020	-32.98354000	20.58362704	Stone walling	A short section of stone walling in front of a shelter next to a small waterfall. No associated material.	NCW
Au	L021	-32.98551897	20.56485501	Stone ruins	Next to the road, a square building, only one course of rough stones left. About 3mx3m. Associated with ceramics, glass, metal and wire.	IIIC
	D001	-32.99366903	20.59116698	Stone walling	Stone alignment /walling -possible kraal?	NCW
	D002	-32.99428602	20.59135297	Stone walling	Rock ledge with crude stone walling	NCW

	D003	-32.99495799	20.59101200	Stone artefact	Isolated chert bladelet core - LSA	NCW
	D004	-32.99922799	20.59706398	Stone Scatter	Small artefact scatter on rocky outcrop – quartzitic material, mostly flakes, some large. 1 small grey chert bladelet. Nearby is a place where large slabs of rock have been quarried for boundary markers.	IIIC
	D005	-32.99918097	20.59721301	Graves?	Possible graves x3	IIIB
	D006	-33.00043900	20.60658096	Stone walling	Isolated section straight (boundary?) walling separated by a gap from D007	NCW
	D007	-33.00027204	20.60639002	Stone walling	Isolated section straight (boundary?) walling separated by a gap from D006	NCW
	D008	-33.00696901	20.60080399	Stone artefact	Isolated very weathered MSA flake	NCW
	D009	-33.00887103	20.63765201	Stone scatter	Scatter of ESA artefacts near quarried lens of material – flakes/cores	IIIC
	D011	-32.99261701	20.63075596	Stone scatter	Isolated lower grindstones x2 next to stream. Lita notes a few flakes, 1 core, 1x adze (chert)	IIIB
	D012	-32.99297802	20.63066502	Grindstone	Lower grindstone on slab	NCW
	D013	-32.98780496	20.56562204	Cemetery	Cemetery – fenced. Some headstones and crosses	IIIA
	D014	-32.98781502	20.56604700	Cemetery		IIIA
	D015	-32.98801300	20.56603200	Cemetery		IIIA
	D016	-32.98802197	20.56572204	Cemetery		IIIA
	D017	-32.98817502	20.56578699	Cemetery	Area outside formal cemetery containing “informal graves – stones. 1x LGS found on one of the graves.	IIIA
	D018	-32.98812700	20.56606402			
	D019	-32.98800998	20.56604298			
	D020	-32.98801702	20.56608899	Cemetery	Outlier grave and few hornfels artefacts scattered about	IIIA
	D021	-32.98796003	20.56639401	Grave?	Possible grave	IIIC
	D022	-32.98554101	20.56949699	Grave ?	Isolated grave – foot/head stones	IIIC
	D023	-32.98548401	20.56980000	Boer War scatter	Area containing a number of Anglo-Boer era tin cans, some glass	IIIB
	D024	-32.98464398	20.57044096	Stone fortification	Large stone walled enclosure on top of prominent low koppie. Walling covers most of the top of the koppie. Suspect this is a military feature (lookout/fortification. A few green glass fragments, and occasional isolated MSA artefacts.	IIIB
	D025	-32.98464700	20.56975901	Boer War scatter	Tin can	IIIB
	D026	-32.98465798	20.56965801	Boer War scatter	Tin can	IIIB
	D027	-32.98449897	20.56850499	Boer War scatter	Iron chunk	IIIB
	D028	-32.98456200	20.56814399	Boer War scatter	Tin can	IIIB
	D029	-32.98458899	20.56794399	Boer War scatter	Tin can, small stone structure	IIIB
	D030	-32.98460802	20.56792002	Boer War scatter	Tin can	IIIB
	D031	-32.98566297	20.56729096	Boer War scatter	Tin can lid, glass	IIIB
	D032	-32.98571401	20.56744703	Boer War scatter	Tin can	IIIB
	D033	-32.98574503	20.56766496	Boer War scatter	Concentration of tin cans. Also some glass and other metal frags	IIIB
	D034	-32.98579498	20.56781801	Boer War scatter	Tin can	IIIB
	D035	-32.98580403	20.56790099	Grave?	Possible grave. Tightly packed stone mound, semi-circular. A number of tin cans scattered about.	IIIC
	D036	-32.98583102	20.56784400	Grave ?	Possible grave	IIIC
	D037	-32.98582398	20.56779203	Grave?	Possible grave	IIIC
	D038	-32.98582499	20.56776001	Grave?	Possible grave	IIIC
	D039	-32.98581501	20.56798096	Grave?	Possible grave	IIIC
	D040	-32.98582197	20.56820903	Grave?	Possible grave??	IIIC
	D041	-32.98571804	20.56867397	Stone kraal	Small stone enclosure – single stone high	IIIC

	D042	-32.98577604	20.56886299	Boer War scatter	Tin cans, few ceramics (white glassy material)	IIIB
	D043	-32.98578501	20.56896399	Boer War scatter	Tin can	IIIB
	D044	-32.98556004	20.57411098	Boer War scatter	Tin can	IIIB
	D045	-32.98709996	20.57789398	Stone kraal	Stone enclosure – crescent-shaped, 1x tin can on turbine road	
	D046	-32.98616404	20.57734204	Stone kraal/ fortification	Stone enclosure where the centre has been dug down marginally. Looks like hole dug first and soil piled around then walling placed on top of the surrounding mound. Suspect this is military?	IIIB
	D047	-32.98654600	20.57931899	Stone kraal?	small circular stone enclosure approx. 1.5 meter diam. Views obscured by hilly ground so not sure if military?	IIIC
	D048	-32.97864798	20.59761199	Boundary markers	Line of boundary markers of local stone slabs	NCW
	D049	-32.99312102	20.60226504	Stone artefact	Isolated weathered MSA chert flake with retouch	NCW
	D050	-32.99309797	20.60188802	Stone scatters	Small number of very weathered Hornfels artefacts, all likely to be MSA. 1x chert blade.	IIIC
	D051	-32.99694300	20.60070299	Stone artefact	Isolated weathered Hornfels flake MSA?	NCW
	D052	-32.98524597	20.56486197	Stone kraal	semi-circular stone enclosure built up against an outcropping ridge approx. 3m long. One wall collapsed inward. 1x farg telephone insulator, 1x frag refined earthenware. Unsure of age.	IIIC
	D053	-32.97944401	20.56067697	Stone wall	Three points on a stone boundary wall partially destroyed by borrow pit. The wall is mostly on the property to the west of the road but makes a right angle on this farm. Clearly visible on Google Earth.	NCW
	D054	-32.97950604	20.56126596			
	D055	-32.97955298	20.56170098			
	D056 D057	-32.96614897 -32.96616096	20.55210597 20.55195400	Cave with paintings and stone aretefacts	Shallow overhang in rock face with rock paintings. Small level floor with shallow deposit. Numerous LSA artefacts on talus, including pottery, oes. A few Adzes, backed scraper, side scraper, flakes, chunks, predominantly on grey chert, others on quartzitic material. Possible re-use of older MSA flakes for adzes. Two painted panels at left – 2x distinct human figures (fl) one appears to have tassles from bag? At far left – lines with cross hatching. 3-4 meters to right, 10 finger daubs. Also several dubs and smudges. All paint red.	IIIA

Table 5: 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	Networx Eolos Renewables (Pty) Ltd	12 000	280 MW			M	L	M	M											• For archaeology, open air sites mitigated either in the f conservation of the sites wi development or by a Phase where the sites will be recor sampled before the client can ap destruction permit for these site development. • All grave sites should be identi to the development and avoided • It is not envisaged that the build be directly impacted on development. Should any buildi than 60 years need to be den the site should be assesse conservation architect. • Formal and informal cemeteries as pre-colonial graves occu across the region. These r preserved within a developme can also be relocated if conser not possible, but this must be the last resort and is not advisab
Proposed development of renewable energy facility at the Sutherland site, Western and	12/12/20/1782/AM1	S&EIR	Mainstream Power Sutherland	28 600	811 MW			L	M	L	M											• For archaeology, micro siting turbine positions during the EM be done. If micro siting is not a some physical mitigation r required (excavation or collec permit may be required from order to undertake such mitigati • For the built environment, micro turbine positions and as infrastructure must be done du

PROPOS	DEAP	CURRE	PROP	EXT	PROP	FARM								IMPACTS								PROPOSED MITIGATION MEASURES
Northern Cape.																						EMP to avoid placing turb infrastructure directly ove environment features and buil bisecting coherent se complexes. • For graves, once the exact pos infrastructure is known, a more assessment of the acces construction roads, laydown substation positions and cabl needs to be undertaken to id marked graves within the affecte In the case of unmarked grave will need to be a protocol in order to deal with them on a case basis if and when discover course of construction. HWC wil be notified immediately if a human remains are uncovere construction. Work in the spec must stop pending inspecti mitigation as required. • For cultural landscape, any facilities on site must be placed that avoids visual clutter.
Proposed Hidden Valley Wind Energy Facility, Northern Cape	12/12/20/2370/2	S&EIR	Hidden Valley Wind-African Clean Energy Developments (Pty) Ltd	9 530	150 MW			L														• A 10m perimeter boundary fen be established around the heritage structures (dry packe walling dwelling on Portion of t Orange Fontein 201 (HV adjacent to the farm gravel roa and during all constructio development activities. • If concentrations of archa materials are exposed construction, then all work must an archaeologist to investigate human remains (or any concentrations of archa heritage material) are exposed construction, all work must ceas must be reported immediately nearest museum or archaeolog the SAHRA, so that a system professional investigation c undertaken. Sufficient time sh

PROPOS	DEA	CURRE	PROP	EXT	PROP	FARM									IMPACTS									PROPOSED MITIGATION MEASURES
																								allowed to investigate and to re collect such material.
Proposed Hidden Valley wind energy facility , Northern cape	12/12/20/2370/3	S&EIR	Hidden Valley Wind-African Clean Energy Developments (Pty) Ltd	9 180	150 MW			L																• Refer to 12/12/20/2370/2 above.
Proposed Hidden Valley wind energy facility , Northern cape	12/12/20/2370/1	S&EIR	Hidden Valley Wind-African Clean Energy Developments (Pty) Ltd	13 620	150MW			L																• Refer to 12/12/20/2370/2 above
Proposed Hidden Valley wind energy facility , Northern cape	12/12/20/2370	S&EIR	Hidden Valley Wind-African Clean Energy Developments (Pty) Ltd		650 MW			L																• Refer to 12/12/20/2370/2 above.
Proposed Construction Of The 140Mw Roggeveld Wind Farm Within The Karoo Hoogland Local Municipality Of The	12/12/20/1988/1/AM1	Amendment	G7 Renerable Energies (Pty) Ltd	26 529	140 MW			L	L	L	M					M								• For colonial archaeology, a fi down of the proposed route of alignments and transmission lin be done. Heritage resources identified, flagged and avoide construction. No substations built in prominent positions o sight of historic farms. Thes should be avoided for power line • For the built environment, micro turbine positions and as

PROPOS	DEAR	CURRE	PROP	EXT	PROP	FARM								IMPACTS									PROPOSED MITIGATION MEASURES
Northern Cape Province And Within The Laingsburg Local Municipality Of The Western Cape Province																							infrastructure must be done du EMP to avoid placing turb infrastructure directly ove environment features and buil bisecting coherent se complexes. The sensitive r vacant buildings is encouraged as advice is sort on sensitivities) as this will help them. • No practical mitigation meas impacts on the cultural landscap
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	12/12/20/2235	BAR	Inca Komsberg Wind (Pty) Ltd	2	10 MW			L	N/A	L	H												• 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 n Anglo-Boer War sites. • Option 1 is preferable visually partially screened by a low roc that lies between it and R354 the central and eastern parts o would be visible.
Proposed establishment of the Suurplaat wind energy facility and associated infrastructure on a site near Sutherland, Western Cape and	12/12/20/1583	S&EIR	Moyeng Energy (Pty) Ltd	28 600	120 MW			L	L		H						H						• Existing farm tracks must be re upgraded to minimise the an change to un-transformed lands • In general terms, construction of and roads in valley bottoms sl kept to a minimum. Archaeolog close to the access ro Hartebeestfontein and in the bottoms close to the roads Klipfontein and Modderfontein active protective intervention a archaeological sampling. • Any pre-colonial kraal comple

PROPOS	DEAD	CURRE	PROP	EXT	PROP	FARM							IMPACTS								PROPOSED MITIGATION MEASURES
Northern Cape.																					will be affected by the propose should be mapped, and measur to protect the sites. • During the detailed planning drawings of proposed road alig infrastructure and near-final positions should be submitte archaeologist for review an proofing. Micro-adjustment of ali and turbine positions is likel sufficient to achieve adequate m • A “walkdown” of final cable rou all power lines, substation s access roads will be required. • If farm buildings at Louw s Modderfontein are to be re-u middens should be protected. • It is illegal at all times to de change and archaeological site permit. • Conserve old buildings, kraal and wall alignments – do not de damage. • Do not demolish wind pumps. these are protected structures are greater than 60 years of age • Follow a policy of non-intervent farm buildings such as th Modderfontein should be conse rehabilitated. • Theft of fittings from buildings be monitored and offenders fi charged under NHRA. • Seek guidance from a consultant if any buildings ar restored. • Keep infrastructure at least 500 from all farm complexes as mos elements that are of heritage val • Apply to the relevant provincial authorities to demolish or a historic structures (buildings,

PROPOS	DEA	CURRE	PROP	EXT	PROP	FARM								IMPACTS								PROPOSED MITIGATION MEASURES
																						passes, walls kraals etc). • Turbines must be positioned in way that they are at least 500 from farm complexes. • Turbines must be positioned in way that shadow flicker does n any farm complexes. • Road alignments must be pla such a way that the minimum o fill operations are required.
Proposed establishment of the Witberg Bay wind energy facility, Laingsburg Local Municipality, Central Karoo District, Western cape	12/12/20/1966/A2	Amendment	Witberg Wind Power (Pty) Ltd		Unknown																	
Proposed renewable energy facility at Konstabel	12/12/20/1787	S&EIR	South Africa Mainstream Renewable Power Development		170 MW																	
Proposed development of a renewable Energy facility at Perdekraal, Western Cape - Split 1	12/12/20/1783/2/AM1	Amendment	South Africa Mainstream Renewable Power Development		Unknown																	

PROPOS	DEA	CURRE	PROP	EXT	PROP	FARM						IMPACTS									PROPOSED MITIGATION MEASURES
Proposed Touwsrivier Solar energy facility	12/12/20/1956	S&EIR	Unknown	215	36 MW			L	L		L		L	L		L		L	L		M	• For cultural landscape, the old embankments would prov considerable amount of screeni proposed activity from the N1. • No mitigation measures are with respect to pre archaeological heritage as no s finds were identified within th area. Depending on the ty location of grid connection sel final walk down of the transmission line would be ne that tower positions can be adjusted to avoid any sensitive a • The old 1876 rail alignment protected as an archaeological as an element of the built envi The 1930 railway line alignment station foundations, 1946 tunn are protected as elements of environment over 60 years of a recommended that a policy of intervention is implemented whe structures are left as is. • Any necessary changes, destru physical alteration of these would necessitate applying for to modify a protected structu HWC. • It is recommended that in the interests of resource conserva sustainability, re-use of ballas from the 1930 railway alignm permitted provided that the remains a legible feature landscape. This means not d the embankments, culverts, cu other railway related features.
		Total Ha		**Total MW**																	
		128 276		2667 MW																	
Significance Totals	Significance											**Total Hectares per impact**									

P R OP OS	D E A	C UR RE	P R OP	E XT	P R OP	FA R M		IMPACTS							PROPOSED MITIGATION MEASURES					
per impact	Rating																			
	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																			