

A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE PROPOSED POWER LINE ALTERNATIVES AND SUBSTATION OPTIONS FOR THE RIETKLOOF WIND ENERGY FACILITY (WEF) SITUATED IN THE WITZENBURG LOCAL MUNICIPALITY AND LAINGSBURG LOCAL MUNICIPALITY, CAPE WINELANDS AND CENTRAL KAROO DISTRICT MUNICIPALITIES.

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A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE PROPOSED POWER LINE ALTERNATIVES AND SUBSTATION OPTIONS FOR THE RIETKLOOF WIND ENERGY FACILITY (WEF) SITUATED IN THE WITZENBURG LOCAL MUNICIPALITY AND LAINGSBURG LOCAL MUNICIPALITY, CAPE WINELANDS AND CENTRAL KAROO DISTRICT MUNICIPALITIES.

NOTE: The phase 1 archaeological impact assessment was conducted as a requirement of the National Heritage Resources Act 25 of 1999, Section 38 (1)(c)(i):

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as –

- (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- (c) any development or other activity which will change the character of the site –
 - (i) exceeding 5000 m² in extent
 - (ii) involving three or more erven or subdivisions thereof

This report follows the minimum standard guidelines required by Heritage Western Cape and the South African Heritage Resources Agency (SAHRA) for compiling a Phase 1 Archaeological Impact Assessment (AIA).

EXECUTIVE SUMMARY

Purpose of the Study

The purpose of the study was to conduct a phase 1 archaeological impact assessment (AIA) including the built environment and other cultural heritage resources for the proposed power line alternatives and substation options for the proposed Rietkloof Wind Energy Facility (WEF) situated in the Witzenburg Local Municipality and Laingsburg Local Municipality, Cape Winelands and Central Karoo District Municipalities.

The survey was conducted to establish the range and importance of the exposed and *in situ* archaeological heritage material remains, sites and features; to establish the potential impact of the development; and to make recommendations to minimize possible damage to the archaeological heritage.

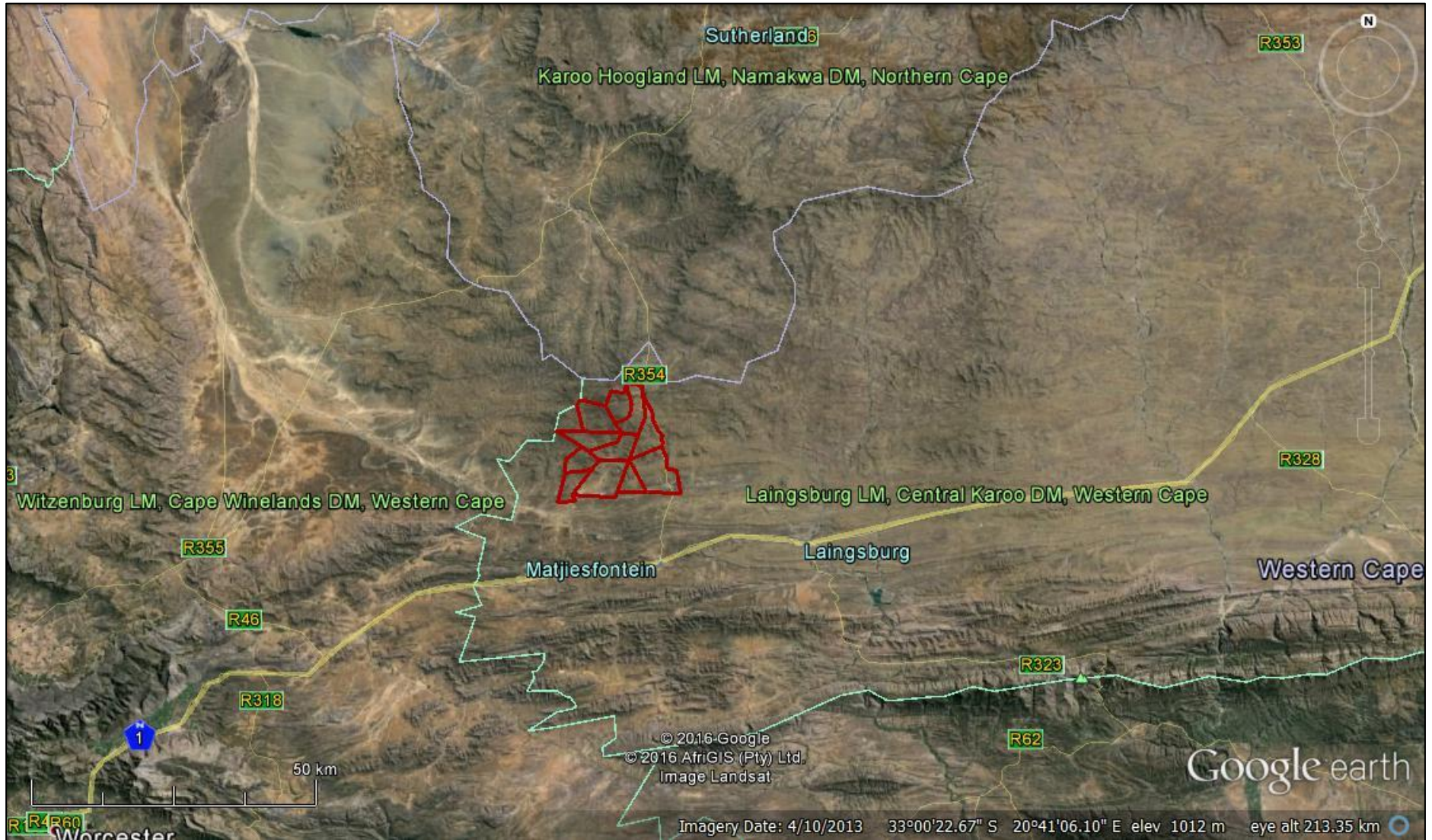


Figure 1. Aerial view showing the location of the proposed Rietkloof Wind Energy Facility (WEF) showing the surrounding areas mentioned in the report.

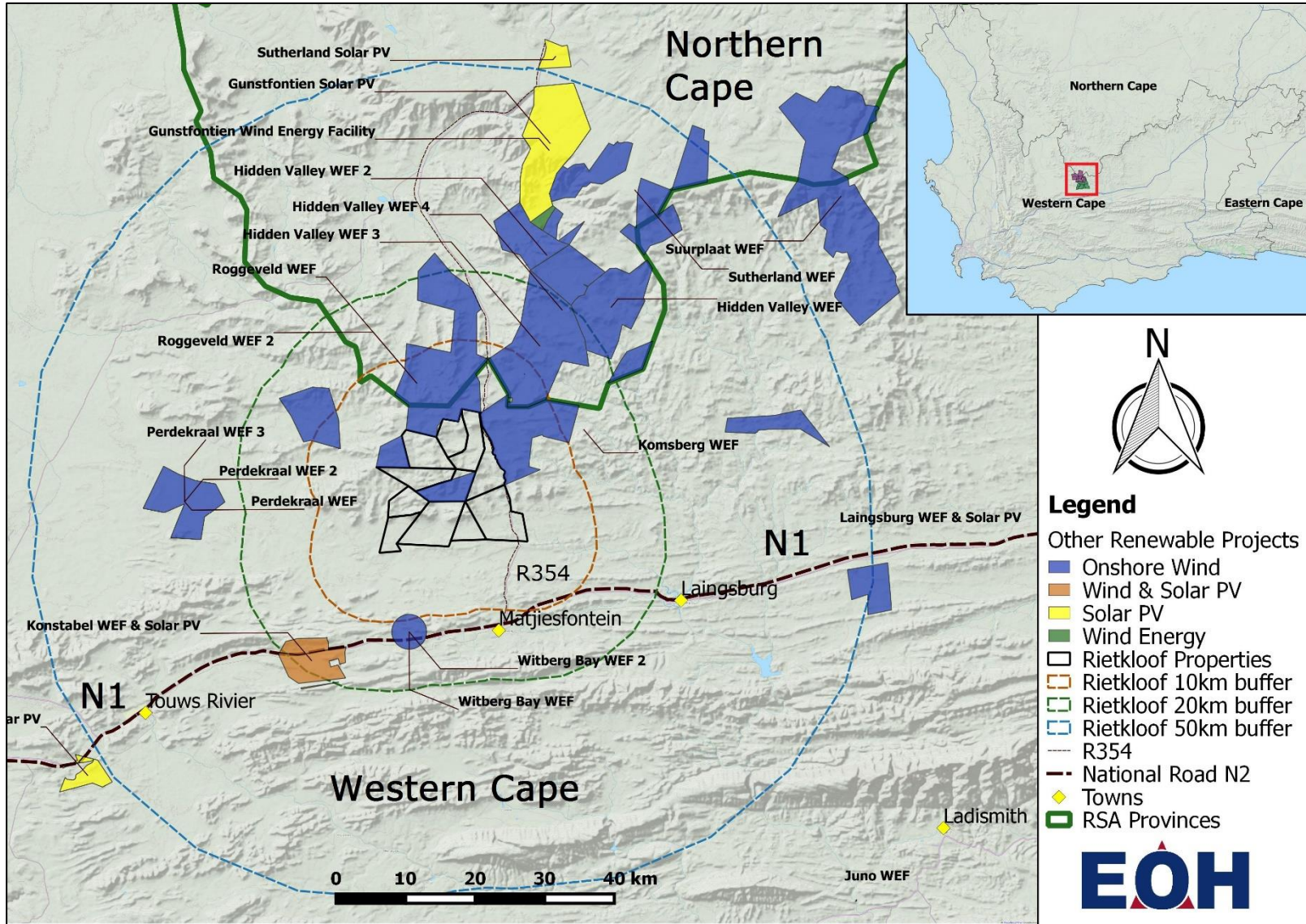


Figure 2: Map showing the location of the proposed Rietkloof Wind Energy Facility and nearby Wind and Solar Energy projects (courtesy of EOH Coastal and Environmental Services).

Brief Summary of Findings

It must be noted that the layout for the final power line alternatives were not finalised by the time of the survey conducted for the Rietkloof Wind Energy Facility and associated infrastructure and access roads, therefore the brief summary of findings is a generalised summary observed during the survey of the WEF. Heritage resources located nearby, within 200 m, of the proposed power line route have been identified and included in this report. It must be emphasized that once the final layout for the power lines has been confirmed an archaeological heritage walk-through must be conducted to determine the positioning of the pylons and make further recommendations.

The assumption of the field study was to locate very little precolonial archaeological heritage material and several historical features and associated artefacts. This assumption arose from previous studies conducted on parts of site and proximity (ACO Associates 2011, 2013, 2014), and from the author's experience in conducting studies for the Hidden Valley (now Karusa, Soetwater and the Great Karoo) WEFs (Booth 2010, 2011, 2015).

As assumed the area held several of historical features (stone walling kraals and cottages) some with associated historical artefacts situated along the access roads in the valleys and associated with the homestead settlements. The area, however, also held evidence of both Middle and Later Stone Age stone artefacts alongside water courses and on the flat floodplains. The heritage resources encountered are briefly explained below:

- **Precolonial / Stone Age material (RKPL_SA1 – RKPL_SA4)**

Both Later Stone Age and Middle Stone Age stone artefact scatters were identified mainly on the flat floodplains up to the foot of the mountains as well as within the valleys along water courses. The artefacts were manufactured from fine-grained chalcedony material as well as hornfels and local shale raw materials.

No other cultural or organic archaeological heritage materials were assumed to be directly related or associated with the stone artefact scatters. In several instances stone artefacts would occur within the same vicinity as historical built environment structures, stone walling features as well as historical artefact scatters, similarly situated on the flat floodplains and within the valleys close to water courses.

- **Stone Walling Features (RKPL_SW1 - RKPL_SW3)**

Up to three (3) stone walling features were documented along the access routes on the flat floodplains and in the valleys. These features include historical stone packed dwellings / cottages as well as kraals, pens, and a threshing floor. Historical artefacts were also located within the vicinity of some of the stone packed dwellings and kraals.

- **Historical Artefact Scatters (RKPL_Hist1)**

The historical artefacts scatter include fragments of glass, ceramics and metal material probably dating to the late 19th century. These scatters are mainly identified to be associated within the vicinity of stone packed dwellings / cottages and/or stone packed kraals.

- **Built Environment Structures (RKPL_BE1 – RKPL_BE3)**

These exclude structures that have been constructed by the historical stone packing method. The structures may be younger than 60 years and with very little or no heritage significance. These include abandoned buildings, used and unused reservoirs and drinking troughs. These structures occur across the landscape along the existing access roads.

The farm houses and associated buildings situated on the homestead / farm complex have been outlined and as a whole are considered as homesteads (described below).

- **Graves (formal and informal burials) (RKPL_G1 – RKPL_G2)**

The historical family cemeteries are usually situated within close proximity or apart of the homestead. RKPL_G1 is a family cemetery situated across a watercourse from the Hartjieskraal homestead. RKPL_G2 resemble informal stone packed burials that may be associated with the ruins of a stone walling cottage situated in a valley next to a watercourse on the farm Hartjieskraal 77.

- **Homesteads / Farmhouse Complexes (RKPL_HS1 – RKPL_HS2)**

Four homesteads / farm complexes were identified and demarcated where the proposed power line routes will pass. These have been demarcated purely for ease of reference, description and mitigation measures. Most of these homesteads / farm complexes include historically stone packed features including kraals and dwellings as well as nineteenth century farmhouses, modern buildings and typically historical graveyards. These earlier buildings and features have most likely been modified over time for maintenance purposes for continued and contemporary occupation. The homesteads are situated either adjacent to the proposed access roads or in some cases the proposed internal access roads are expected to go through the homesteads.

These homesteads include the farm house and associated staff accommodation, outbuildings and stone walling features and built environment structures.

Recommendations

The overall area is considered as having a medium - high heritage significance. The following recommendations must be followed:

- This report must be submitted to Heritage Western Cape (HWC), the heritage authority for any Western Cape developments, and as a commenting authority in terms of the National Heritage Resources Act 25 of 1999, Section 38.
- Substation 7 (SS7) situated south on the Farm Hartjiesfontein 81 is the only option not favoured for the establishment of the substation.
- The preferred power line route runs from the Komsberg Substation (no. 105, figure 5) along the existing 400 kV and 765 kV power lines to connect with the preferred substation alternative for the Brandvalley WEF (no. 13, Figure 5) which then connects at the Central Hub (no. 14). The power line route not preferred is no. 7 (Figure 5) which would connect to the Substation 7 (SS7) (not preferred). It is suggested that the power lines should extend for the shortest routes (possibly no 1 and No 2, Figure 5) with as few as possible valley bottoms being transversed.
- An archaeological heritage walk-through survey of the final layout of the power lines must be conducted to assess the changes where further recommendations and mitigatory measures may be made if necessary.

Declaration of Independence and Qualifications

This section confirms a declaration of independence that the archaeological heritage specialist, Ms Celeste Booth, has no financial or any other personal interests in the project for a phase 1 archaeological impact assessment (AIA) for the proposed power line alternatives and substation options for the Rietkloof Wind Energy Facility (WEF) situated in the Witzenburg Local Municipality and Laingsburg Local Municipality, Cape Winelands and Central Karoo District Municipalities.

Ms Celeste Booth was appointed on a strictly professional basis to conduct a Phase 1 Archaeological Impact Assessment in line with the South African national heritage legislation, the National Heritage Resources Act 25 of 1999 (NHRA 25 of 1999) and in response to the recommendations provided by the Department of Environmental Affairs and according to the relevant environmental impact assessment regulations.

Ms Celeste Booth (BSc Honours: Archaeology) is an archaeologist who has had eight and a half years of full time Cultural Resource Management in the Eastern Cape and sections of the Northern Cape and Western Cape. Ms Booth has conducted several Archaeological Desktop Studies and Phase 1 Archaeological Impact Assessments within the Eastern Cape and in the Karoo region across the Eastern Cape, Northern Cape and Western Cape.

1. INTRODUCTION

1.1. BACKGROUND INFORMATION (extract from the Environmental Scoping Report, EOH Coastal and Environmental Services, 2016)

Rietkloof Wind Farm (Pty) Ltd, propose to develop a 132kV above-ground electricity distribution line, in order to evacuate up to 140 megawatt (MW) energy from the Rietkloof Wind Energy Facility (WEF) near Laingsburg, bordering and adjacent to the Northern and Western Cape Province, South Africa to the national grid.

The electrical distribution infrastructure related to this Basic Assessment process is:

- High voltage components of the 33/132kV onsite substation including transformers, isolators, cabling, light mast and other as required by Eskom. The onsite substation would have a footprint of up to 200m x 200m that would also house site offices, storage areas, ablution facilities and the maintenance building.
- 132kV above-ground distribution line to connect the onsite 33/132kV substation to the grid. The pylons for this line will have an average spacing of 250m to 300m.
- Connection to the national grid in order to connect the wind farm. There are three options being considered and the preferred option will be informed by environmental, technical considerations and Eskom's preference:
 - The existing 400kV Komsberg substation with several electrical components to be defined by Eskom (e.g. additional feeder bay, transformer bay) on the existing substation property or
 - The Bon Espirange satellite 132kV substation, upgrading with several electrical components. The Bon Espirange satellite substation will be established by Eskom and other IPPs as an alternative to connecting all wind farms west of Komsberg directly to the Eskom Komsberg Substation.
 - Construction of a central switching station (up to 200m x 200m) to be shared by both Brandvalley and Rietkloof if both are awarded preferred bidders. If the central hub or switching station option is ultimately selected by Eskom, each project will build their own 33/132kV substation and connect to the central station. From there one 132kV line for both projects will lead to either the Komsberg or Bon Espirange substation.

Rietkloof Alternatives

Various alternatives are being considered to 1) step up the voltage from 33kV to 132kV (onsite 33.132kV substations), 2) to distribute the 132kV electricity to the grid (overhead distribution line) and 3) various grid connection options.

There are three potential grid connection options being considered:

- Komsberg's existing 400kV substation
- Bon Espirange satellite hub substation that will be constructed for all wind farms connecting from the West of Komsberg

- Rietkloof and Brandvalley Central Hub switching station in case both projects Rietkloof and Brandvalley get awarded preferred bidder at the same time. This option would be an opportunity to share infrastructure and reduce the project footprint.

All three grid connection options above have different sub-alternatives for line routings to connect to the seven potential onsite 33/132kV substations as indicated below.

- Substation alternative 1 to:
 - Brandvalley and Rietkloof shared central switching station via one 132kV overhead distribution line from substation 1 (referred to as alternative RK SS1- central switching station)
 - Eskom Komsberg substation via one 132kV overhead distribution line from substation 1 (referred to as alternative RK SS1-Komsberg)
 - Bon Espirange Substation via one 132kV overhead distribution line from substation 1 (referred to as alternative RK SS1- Bon Espirange)
- Substation alternative 2 to:
 - Brandvalley and Rietkloof shared central switching station via one 132kV overhead distribution line from substation 2 (referred to as alternative RK SS2- central switching station)
 - Eskom Komsberg substation via one 132kV overhead distribution line from substation 2 (referred to as alternative RK SS2-Komsberg)
 - Bon Espirange Substation via one 132kV overhead distribution line from substation 2 (referred to as alternative RK SS2- Bon Espirange)
- Substation alternative 3 to:
 - Brandvalley and Rietkloof shared central switching station via one 132kV overhead distribution line from substation 3 (referred to as alternative RK SS3- central switching station)
 - Eskom Komsberg substation via one 132kV overhead distribution line from substation 3 (referred to as alternative RK SS3-Komsberg)
 - Bon Espirange Substation via one 132kV overhead distribution line from substation 3 (referred to as alternative RK SS3- Bon Espirange)
- Substation alternative 4 to:
 - Brandvalley and Rietkloof shared central switching station via one 132kV overhead distribution line from substation 4 (referred to as alternative RK SS4- central switching station)
 - Eskom Komsberg substation via one 132kV overhead distribution line from substation 4 (referred to as alternative RK SS4-Komsberg)
 - Bon Espirange Substation via one 132kV overhead distribution line from substation 4 (referred to as alternative RK SS4- Bon Espirange)
- Substation alternative 5 to:
 - Brandvalley and Rietkloof shared central switching station via one 132kV overhead distribution line from substation 5 (referred to as alternative RK SS5- central switching station)
 - Eskom Komsberg substation via one 132kV overhead distribution line from substation 5 (referred to as alternative RK SS5-Komsberg)

- Bon Espirange Substation via one 132kV overhead distribution line from substation 5 (referred to as alternative RK SS5- Bon Espirange)
- Substation alternative 6 to:
 - Brandvalley and Rietkloof shared central switching station via one 132kV overhead distribution line from substation 6 (referred to as alternative RK SS6- central switching station)
 - Eskom Komsberg substation 132kV overhead distribution line from substation 6 (referred to as alternative RK SS6-Komsberg)
 - Bon Espirange Substation via one 132kV overhead distribution line from substation 6 (referred to as alternative RK SS6- Bon Espirange)
- Substation alternative 7 to:
 - Brandvalley and Rietkloof shared central switching station via one 132kV overhead distribution line from substation 7 (referred to as alternative RK SS7- central switching station)
 - Eskom Komsberg substation via one 132kV overhead distribution line from substation 7 (referred to as alternative RK SS7-Komsberg)
 - Bon Espirange Substation via one 132kV overhead distribution line from substation 7 (referred to as alternative RK SS7- Bon Espirange)

Each of these distribution line alternatives will be buffered by 100m in order to allow for micro-sitting. Although numerous alternatives are considered, only one 33/132kV substation and one 132kV overhead power line will be built to connect to one grid connection option per project.

1.2. Applicant

Rietkloof Wind Farm (Pty) Ltd

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1.4. Terms of reference

The purpose of the study was to conduct a phase 1 archaeological impact assessment (AIA) of the proposed power line alternatives and substation options for the Rietkloof Wind Energy Facility (WEF) situated in the Witzenburg Local Municipality and Laingsburg Local Municipality, Cape Winelands and Central Karoo District Municipalities.

- Determine the likelihood of heritage or archaeological remains of significance being present on the proposed site;
- Identify and map (where applicable) the location of any significant heritage or archaeological remains and comment on the potential for the proposed project to impact these;
- Assess the sensitivity and significance of heritage and archaeological remains in the site; and
- Identify mitigatory measures to protect and maintain any valuable heritage or archaeological sites and remains that may exist within the proposed site.
- Determine which power line alternatives are not feasible, which lines are possible, and which lines are preferred in terms of the heritage component.

1.5. Cumulative impact assessment

Project induced cumulative impacts should be considered, along with direct and indirect impacts, in order to better inform the developer's decision making and project development process. The International Finance Corporation (IFC) Performance Standards (PS) (2012) defines cumulative impacts as those *"that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted."* Cumulative impacts result from incremental changes caused by other past, present or reasonably foreseeable actions acting in concert with the project. Individually minor impacts from different developments can interact in various ways over time to become collectively significant. Barbour (2007: 39), adapting work by Cooper, 2004, describes cumulative impacts as impacts which "may be:

- **Additive:** the simple sum of all the effects (e.g. the accumulation of ground water pollution from various developments over time leading to a decrease in the economic potential of the resource);
- **Synergistic:** effects interact to produce a total effect greater than the sum of individual effects. These effects often happen as habitats or resources approach capacity (e.g. the accumulation of water, air and land degradation over time leading to a decrease in the economic potential of an area);
- **Time crowding:** frequent, repetitive impacts on a particular resource at the same time (e.g. multiple boreholes decreasing the value of water resources);
- **Neutralizing:** where effects may counteract each other to reduce the overall

effect (e.g. infilling of a wetland for road construction, and creation of new wetlands for water treatment); and,

- **Space crowding:** high spatial density of impacts on an ecosystem (e.g. rapid informal residential settlement)."

Cumulative impacts are, however, difficult to accurately and confidently assess, owing to the high degree of uncertainty, as well as it often being based on assumptions. It is therefore difficult to provide as detailed an assessment of cumulative impacts as is the case for direct and indirect project induced impacts. This is usually because of the absence of specific details and information related to cumulative impacts. In these situations, the EAP ensured that any assumptions made as part of the assessment are made clear. Accordingly, the EIA Phase includes an overview and analysis of cumulative impacts related to a variety of project actions, and does not provide a quantitative significance rating for these impacts, as was done for direct project induced impacts. The objective is to identify and focus on potentially significant cumulative impacts so these may be taken into consideration in the decision-making process. It is important to realise these constraints, and to recognise that the assessment will not, and indeed cannot, be perfect. The potential for cumulative impacts will, however, be considered, rather than omitted from the decision making-process and is therefore of value to the project and the environment.

The following assumptions guided the cumulative assessments:

- All projects within a 30km radius were considered along with the existing Eskom 400kV and 765kV powerlines just north of Brandvalley.
- All projects will also require the establishment of a 132kV overhead powerline.
- It was assumed that all projects proposed (both energy generation and electrical infrastructure projects) will be implemented as a worst case scenario.

The numerous applications and proposed establishment of several wind energy and solar energy facilities (Figure 2) between Matjiesfontein and Sutherland as well as the adjacent regions have sparked a concern with regards to cumulative impacts that these projects may have on the heritage resources and the cultural landscape. Therefore it is of the utmost importance to provide a thorough documentation of the archaeological and historical heritage resources, sites and features within the specific project area. The archaeological and historical heritage resources must be appropriately mitigated at a project / site specific level so that there is less of a risk of losing the information after the construction of these alternative energy facilities. The loss of information at regional scale is at risk as these facilities cause an immense amount of surface disturbance and destruction where archaeological and historical heritage resource are at risk of being destroyed without justification.

In addition, the cultural landscape of the wider region is inhibited by mass industrialisation of the landscape that changes the character of the landscape and hence impacts on the sense of place and aesthetic value negatively. The Karoo has been

considered as a wilderness landscape whereby the cumulative impact will involve significant sterilisation of the aesthetic qualities of the landscape, the Karoo heritage and its character and sense of place.

Therefore, is it necessary that effective rehabilitation of the landscape after decommissioning is implemented to as much as possible restore the character of the landscape. A walk-through of the final layout of the preferred powerline alternative should be conducted before any final mitigation measures can be established.

2. HERITAGE LEGISLATIVE REQUIREMENTS

Parts of sections 3(1)(2)(3), 34(1), 35(4), 36(3) and 38(1)(8) of the National Heritage Resources Act 25 of 1999 apply:

S3. National estate

3. (1) For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.

3. (2) Without limiting the generality of subsection (1), the national estate may include –

- (a) places, buildings, structures and equipment of cultural significance;
- (b) places to which oral traditions are attached or which are associated with living heritage;
- (c) historical settlements and townscapes;
- (d) landscapes and natural features of cultural significance;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and palaeontological sites;
- (g) graves and burial grounds, including –
 - (i) ancestral graves;
 - (ii) royal graves and graves of traditional leaders;
 - (iii) graves and victims of conflict;
 - (iv) graves of individuals designated by the Minister by notice in the Gazette;
 - (v) historical graves and cemeteries; and
 - (vi) other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- (h) sites of significance relating to the history of slavery in South Africa;
- (i) movable objects, including –
 - (i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological specimens;
 - (ii) objects to which oral traditions are attached or which are associated with living heritage;
 - (iii) ethnographic art and objects;
 - (iv) military objects;

- (v) objects of decorative or fine art;
- (vi) objects of scientific or technological interest; and
- (vii) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act (Act No. 43 of 1996).

3. (3) Without limiting the generality of subsections (1) and (2), a place or object is to be considered part of the national estate if it has cultural significance or other special value because of –

- (a) its importance in the community, or pattern of South Africa's history;
- (b) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- (c) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- (d) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- (e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- (f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- (g) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- (i) sites of significance relating to the history of slavery in South Africa.

S34. Structures

34. (1) No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

S35. Archaeology, palaeontology and meteorites

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

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

S36. Burial grounds and graves

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

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

S38. Heritage resources management

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as –

- (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- (b) the construction of a bridge or similar structure exceeding 50 m in length;
- (c) any development or other activity which will change the character of the site –
 - (i) exceeding 5 000 m² in extent, or
 - (ii) involving three or more erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
- (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA, or a provincial resources authority;
- (d) the re-zoning of a site exceeding 10 000 m² in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must as the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

3. ARCHAEOLOGICAL BACKGROUND

Little systematic archaeological research has been conducted within this region bordering the Northern Cape and Western Cape Provinces, therefore, little is known about the archaeology of the immediate area proposed for the Rietkloof WEF. The literature research was extended to include the wider Karoo region.

Several heritage impact assessment studies conducted within the wider and immediate region have aided in the collection of archaeological sites on this landscape. Heritage

impact assessments have been conducted south of Sutherland (Hart 2005; Hart *et al.* 2010; Orton & Halkett 2011) as well as within the Komsberg Valley east and north-east of the current study site (Booth 2011, 2012, 2015a, 2015b; Hart 2015; Webley 2016). The most relevant studies conducted for the Roggeveld and Kareebosch Wind Farms include portions of the current Rietkloof Wind Energy Facility (Hart & Webley 2011, 2013, 2014). A mitigation phase excavation (Evans *et al.* 1985) has been undertaken at two small rock shelters in the grounds of the South African Astronomical Observatory near Sutherland during November 1983 and March 1984.

It is known that wider Karoo landscape has been occupied by humans since the Early Stone Age (ESA), spanning an occupation period of about 1.5 million years. Archaeological evidence is usually observed as surface scatters and is widely dispersed across the landscape. Caves are uncommon in the Karoo and open sites (Early Stone Age to the last 2 000 years) generally consist of single-level occupations near sources of water such as rivers, streams and springs. Rock engravings are widespread over the Karoo landscape, substantial research has been conducted within the Northern and Western Cape areas of the Karoo (Parkington *et al.* 2008). Early travellers and trekboere (Dutch farmers) started entering this part of colonial South Africa towards the end of the 18th century and colonial settlement increased towards the second half of the 19th century.

3.1. Early Stone Age (ESA) - 1.5 million to 250 000 years ago

The Early Stone Age from between 1.5 million and 250 000 years ago refers to the earliest that *Homo sapiens sapiens* predecessors began making stone tools. The earliest stone tool industry was referred to as the Olduvai Industry originating from stone artefacts recorded at Olduvai Gorge, Tanzania. The Acheulian Industry, the predominant southern African Early Stone Age Industry, replaced the Olduvai Industry approximately 1.5 million years ago, is attested to in diverse environments and over wide geographical areas. The hallmark of the Acheulian Industry is its large cutting tools (LCTs or bifaces), primarily handaxes and cleavers. Bifaces emerged in East Africa more than 1.5 million years ago (mya) but have been reported from a wide range of areas, from South Africa to northern Europe and from India to the Iberian coast. The end products were similar across the geographical and chronological distribution of the Acheulian techno-complex: large flakes that were suitable in size and morphology for the production of handaxes and cleavers perfectly suited to the available raw materials (Sharon 2009).

One of the most well-known Early Stone Age Acheulean sites in southern Africa is Amanzi Springs (Deacon 1970), situated about 10 km north-east of Uitenhage and 45 km south east of the WEF site. The site is situated on a north-facing hill overlooking the Coega River. The earliest reference to the spring was made by an early traveller, Barrow (1801). FitzPatrick first reported stone artefacts in the area in 1924. Ray Inskip (Inskip 1965) conducted a small-scale excavation of the site in 1963. It was only in 1964 and 1965 that large scale excavations were conducted by Hilary Deacon. In a

series of spring deposits a large number of stone tools were found *in situ* to a depth of 3-4 m. Wood and seed material preserved remarkably very well within the spring deposits, and possibly date to between 800 000 to 250 000 years old.

Other Early Stone Age sites that contained preserved bone and plant material include Wonderwerk Cave in the Northern Province, near Kimberly and Montagu Cave in the Western Cape, near the small town of Montagu (Mitchell 2007). Early Stone Age sites have also been reported in the foothills of the Sneeuberge Mountains (in Prins 2011). Early Stone Age handaxes were reported from a site near Victoria West (Binneman et al. 2011).

It is rare that Middle Stone Age stone artefacts are found to be in association with other archaeological remains and are usually in secondary context owing to natural disturbances over time and, more recently, human and domestic animal impact. These artefacts may be found exposed between the surface and 50 cm – 80 cm below the ground on floodplains and at the foot of hill and ridges.

Within the wider region a few surface scatters of Early Stone Age stone artefacts were documented on the WEF site to west of Matjiesfontein (Hart & Miller, nd) and on the site south of Sutherland (Hart et al. 2010).

3.2. Middle Stone Age (MSA) – 250 000 – 30 000 years ago

The Middle Stone Age spans a period from 250 000 - 30 000 years ago and focuses on the emergence of modern humans through the change in technology, behaviour, physical appearance, art and symbolism. Various stone artefact industries occur during this time period, although less is known about the time prior to 120 000 years ago, extensive systemic archaeological research is being conducted on sites across southern Africa dating within the last 120 000 years (Thompson & Marean 2008). The large handaxes and cleavers were replaced by smaller stone artefacts called the Middle Stone Age flake and blade industries. Surface scatters of these flake and blade industries occur widespread across southern Africa although rarely with any associated botanical and faunal remains. It is also common for these stone artefacts to be found between the surface and approximately 50-80 cm below ground. Fossil bone may in rare cases be associated with Middle Stone Age occurrences (Gess 1969). These stone artefacts, like the Earlier Stone Age handaxes are usually observed in secondary context with no other associated archaeological material.

From as early as 1915, stone artefacts which were of a “peculiar character”, referred to as hand-axes and tortoise-cores by Reginald A. Smith, were plentiful within the Victoria West district. The latter were only found in certain areas and the hand-axes occurred in conjunction with the cores or without them (Smith 1919). During the 1920’s, A.H.J Goodwin (1926, 1946), identified the Victoria West stone artefact industry, presumably referring to those artefacts with a “peculiar character” found within the district, the wider

Karoo region, as well as along the Vaal Rivier. They comprised mainly of stone tools that had been manufactured using a prepared core technique, and were regarded as being transitional between the Early Stone Age and Middle Stone Age. Recent research has established that the Victoria West cores were the “evolutionary step” towards the Levallois prepared core industry, indicating an outward spread of this technological change (Lycett 2009).

The Middle Stone Age is distinguished from the Early Stone Age by the smaller-sized and distinctly different stone artefacts and *chaîne opératoire* (method) used in manufacture, the introduction of other types of artefacts and evidence of symbolic behaviour. The prepared core technique was used for the manufacture of the stone artefacts which display a characteristic faceted striking platform and includes mainly unifacial and bifacial flake blades and points. The Howiesons Poort Industry (80 000 - 55 000 years ago) is distinguished from the other Middle Stone Age stone artefacts: the size of tools are generally smaller, the range of raw materials include finer-grained rocks such as silcrete, chalcedony, quartz and hornfels, and include segments, backed blades and trapezoids in the stone toolkit which were sometimes hafted (set or glued) onto handles. In addition to stone artefacts, bone was worked into points, possibly hafted, and used as tools for hunting (Deacon & Deacon 1999).

Other types of artefacts that have been encountered in archaeological excavations include tick shell (*Nassarius kraussianus*) beads, the rim pieces of ostrich eggshell (OES) water flasks, ochre-stained pieces of ostrich eggshell and engraved and scratched ochre pieces, as well as the collection of materials for purely aesthetic reasons. Although Middle Stone Age artefacts occur throughout the Eastern Cape, the most well-known Middle Stone Age sites include the type-site for the Howiesons Poort stone tool industry, Howiesons Poort (HP) rock shelter, situated close to Grahamstown and Klasies River Mouth Cave (KRM), situated along the Tsitsikamma coast. Middle Stone Age sites are located both at the coast and in the interior across southern Africa.

Surface scatters of Middle Stone Age stone artefacts are widely distributed across the Karoo landscape and have been reported from the site to the west of Matjiesfontein (Hart & Miller, nd) and at the site south of Sutherland (Hart et al. 2010).

3.3. Later Stone Age (LSA) – 30 000 years ago – recent (100 years ago)

The Later Stone Age (LSA) spans the period from about 20 000 years ago until the colonial era, although some communities continue making stone tools today. The period between 30 000 and 20 000 years ago is referred to as the transition from the Middle Stone Age to Later Stone Age; although there is a lack of crucial sites and evidence that represent this change. By the time of the Later Stone Age the genus *Homo*, in southern Africa, had developed into *Homo sapiens sapiens*, and in Europe, had already replaced *Homo neanderthalensis*.

The Later Stone Age is marked by a series of technological innovations, new tools and artefacts, the development of economic, political and social systems, and core symbolic beliefs and rituals. The stone toolkits changed over time according to time-specific needs and raw material availability, from smaller microlithic Robberg (20/18 000-14 000 ya), Wilton (8 000-the last 500 years) Industries and in between, the larger Albany/Oakhurst (14 000-8 000ya) and the Kabeljous (4 500-the last 500 years) Industries. Bored stones were used as part of digging sticks, grooved stones for sharpening and grinding and stone tools fixed to handles with mastic also become more common. Fishing equipment such as hooks, gorges and sinkers also appear within archaeological excavations. Polished bone tools such as eyed needles, awls, linkshafts and arrowheads also become a more common occurrence. Most importantly bows and arrows revolutionized the hunting economy. It was only within the last 2 000 years that earthenware pottery was introduced, before then tortoiseshell bowls were used for cooking and ostrich eggshell (OES) flasks were used for storing water. Decorative items like ostrich eggshell and marine/fresh water shell beads and pendants were made.

Hunting and gathering made up the economic way of life of these communities; therefore, they are normally referred to as hunter-gatherers. Hunter-gatherers hunted both small and large game and gathered edible plantfoods from the veld. For those that lived at or close to the coast, marine shellfish and seals and other edible marine resources were available for gathering. The political system was mainly egalitarian, and socially, hunter-gatherers lived in bands of up to twenty people during the scarce resource availability dispersal seasons and aggregated according to kinship relations during the abundant resource availability seasons. Symbolic beliefs and rituals are evidenced by the deliberate burial of the dead and in the rock art paintings and engravings scattered across the southern African landscape.

The majority of archaeological sites found in the area would date from the past 10 000 years where San hunter-gatherers inhabited the landscape living in rock shelters and caves as well as on the open landscape. These latter sites are difficult to find because they are in the open veld and often covered by vegetation and sand. Sometimes these sites are only represented by a few stone tools and fragments of bone. The preservation of these sites is poor and it is not always possible to date them (Deacon and Deacon 1999). Caves and rock shelters, however, in most cases, provide a more substantial preservation record of pre-colonial human occupation.

Later Stone Age sites occur both at the coast (caves, rock shelters, open sites and shell middens) and in the interior (caves, rock shelters and open sites) across southern Africa. The Later Stone Age archaeology of the Great Karoo stretching across the Eastern Cape, Western Cape, and Northern Cape Provinces is rich and varied. Various studies (Beaumont & Vogel 1984, Morris & Beaumont 1990), have shown that the general area surrounding the proposed area for development has been relatively marginal regarding pre-colonial human settlement, but is in fact exceptionally rich in archaeological sites and rock art (paintings and engravings). Garth Sampson (1985; Close & Sampson 1998,

1999; Sampson 1988; Sampson et al. 1989, 1997; and Sampson & Vogel 1996) has conducted thirty years of extensive research within the Seacow River Valley and provides invaluable insight on the distribution of both Later Stone Age and pastoralist / herder sites across the landscape. Unfortunately no such similar studies have yet been conducted within this area.

Substantial Later Stone Age research has been conducted in the surrounding Northern Cape region in the Richtersveld within the Orange River Valley, to the north near the Carnarvon area, Bushman \land and areas surrounding Kimberly, as well as to the south in the Klein Karoo at a site called Boomplaas near Oudtshoorn. The research conducted provides considerable evidence of Later Stone Age occupation within the wider region of the proposed development area.

Scatters of Later Stone Age destone artefacts were documented at the site to the south-east of Matjiesfontein (Hart & Miller, nd) and at the site to the south of Sutherland (Hart et al. 2010). The rescue excavations conducted at the two Observatory Shelters near Sutherland yielded a collection comprised of a variety of lithic variants including cores, utilized flakes, blades and chunks, as well as formal tools such as scrapers, adzes, backed blades, points and miscellaneous retouched pieces. In addition, fragments of ostrich eggshell (OES) and ostrich eggshell beads, faunal remains and fresh water molluscs were documented (Evan et al. 1985).

3.4. Last 2 000 years – Khoekhoen Pastoralism

Until 2 000 years ago, hunter-gatherer communities traded, exchanged goods, encountered and interacted with other hunter-gatherer communities. From about 2 000 years ago the social dynamics of the southern African landscape started changing with the immigration of two 'other' groups of people, different in physique, political, economic and social systems, beliefs and rituals. Relevant to the study area, one of these groups, the Khoekhoen pastoralists or herders entered southern Africa with domestic animals, namely fat-tailed sheep and goats, travelling through the south towards the coast. Khoi pastoralist sites are often found close to the banks of large streams and rivers. They also introduced thin-walled pottery common in the interior and along the coastal regions of southern Africa. Their economic systems were directed by the accumulation of wealth in domestic stock numbers and their political make-up was more hierarchical than that of the hunter-gatherers.

There are two main suggestions on the migration routes of the Khoekhoen pastoralists into South Africa within the last 2 000 years that have been based on linguistic comparisons and archaeological evidence. The first route, based on rock art and oral traditions suggest that the pastoralists groups entered from Namibia moved down the west coast into south-western Cape and then spread to the east along the southern Cape coast (Stow 1905; Cooke 1965). The second route, based on linguistic evidence, suggests that the pastoralist groups entered from Botswana with one branching to the

west along the Orange River to the Atlantic west coast and groups branching down the central plateau, through the Karoo (via the Seacow River Valley), down the escarpment into the Eastern Cape (Elphick 1977; 1985). Extensive pastoralist research has yielded evidence from sites along the suggested routes within the Northern Cape, Karoo, Orange River Valley, along the Namaqualand and west coast into the southern and south-eastern Cape.

Circular dry stone piled wall enclosures up to half a metre high and 3 m – 4m and 9 m in diameter situated on the leeward slopes of low ridges were documented on the WEF site south of Sutherland (Hart et al. 2010). These enclosures were arranged in complexes of up to thirteen (13) interlocking enclosures with adjoining 'lammerkraals' (lamb pens). Archaeological remains associated with these enclosures included fine red burnished pottery and ostrich eggshell fragments (OES). In addition, open Khoekhoen encampments situated among the Kameeldoring trees along dry river beds in the bottom of valleys were documented on the site south of Sutherland. These encampments are rare and have only been recorded in the Richtersveld area (Hart et al. 2010). These sites are relatively extensive, approximately 80 m x 80 m in diameter. The archaeological material remains associated with these encampments included very fine thin walled burnished Cape Coastal pottery, numerous informal stone artefacts, stone features, grinding surfaces, discreet ash middens, animal bone, and a number of graves that have broken grinding stones placed on top. Nineteenth century glass and ceramics were documented at two of the sites. A few small plain body sherds of fine-grained pottery, about 5 mm thick, and probably from the same pot, were documented on a talus slope of one of the two Observatories near Sutherland (Evans et al. 1985).

3.5. Human Remains

It is difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Human remains are usually observed when they are exposed through erosion or construction activities for development. Several human remains have been rescued eroding out of the dunes along this coastline. In some instances packed stones or rocks may indicate the presence of informal pre-colonial burials.

3.6. Rock Art (Paintings and Engravings)

Rock art is generally associated with the Later Stone Age period mostly dating from the last 5 000 years to the historical period. It is difficult to accurately date the rock art without destructive practices. The southern African landscape is exceptionally rich in the distribution of rock art which is determined between paintings and engravings. Rock paintings occur on the walls of caves and rock shelters across southern Africa. Rock engravings, however, are generally distributed on the semi-arid central plateau, with most of the engravings found in the Orange-Vaal basin, the Karoo stretching from the Eastern Cape (Cradock area) into the Northern Cape as well as the Western Cape, and

Namibia. At some sites both paintings and engravings occur in close proximity to one another especially in the Karoo and Northern Cape. The greatest concentrations of engravings occur on the andesite basement rocks and the intrusive Karoo dolerites, but sites are also found on about nine other rock types including dolomite, granite, gneiss, and in a few cases on sandstone (Morris 1988). Substantial research has also been conducted in the Western Cape Karoo area around Beaufort West (Parkington 2008), in the northern parts of the Northern Cape between Springbok, Calvinia, Carnarvon, Kimberly, Kuruman, Pomfret and Upington as the outline of the area. Rock paintings are prolific in the inland mountainous regions situated north of the site.

3.7. Historical Background

Historical archaeology refers to the last 500 years when European settlers and colonialism entered into southern Africa. In the early days of colonialism the Karoo was still a sparse and unknown area. It was only until the early travellers and pioneer Dutch trekboere (trek farmers or migrant farmers) ventured into this harsh landscape and documented their encounters with the San hunter-gatherers and Khoekhoen who has originally inhabited the landscape. Various trade goods exchanged between these pioneering Europeans, the San hunter-gatherers, and Khoekhoen have been recorded in travellers' diaries, historical documents and archaeological excavations within the wider region of the proposed area for development. These include glass beads that documentary evidence suggests were first given to the local Bushmen in the upper Seacow Valley during the Sneeuwberg War (c. AD 1770-1795) and later by travellers, missionaries, and resident farmers (Saitowitz & Sampson 1992). In addition, rare instances of ammunition and firearm paraphernalia have been excavated from sites in the upper Seacow Valley. Historical records show that the first Dutch farmers transferred their firearms to the Bushmen as early as the 1770's.

Evidence of the remains of historical buildings, stone cairns and features, as well as European ceramic ware has been recorded in one of the specialist studies. Stone packed foundations of rectangular cottages and associated dumping (waste) area, as well as stone packed kraals positioned at the bottom half of slight-gradient koppies. Broken and fragmented pieces of iron implements, glass bottles and European ceramic wares including stoneware, transfer print and willow pattern ceramic types are included. It is likely that these features may be associated with early farming activities where shepherds would have lined with their flocks and herds of domesticated stock (cattle, sheep, and goats).

4. DESCRIPTION OF THE PROPERTY

Sutherland is the closest town within the Northern Cape Province and is situated approximately 60 km north of the project area. The closest town within the Western Cape Province is Matjiesfontein, situated 30 km south of the project area. Laingsburg is

a further 30 km east Matjiesfontein, along the N1 national road in the Western Cape Province.

The project area can be accessed via the R354 that connects to the N1 between Matjiesfontein and Laingsburg. The R354 is the main arterial road providing access to the project area, where there are a number of existing local untarred roads providing access within the project area.

Three major routes are proposed for the power line alternatives with routings from Komsberg Substation to the east, the Central Hub situated within the Rietkloof WEF area and Bon Espirange situated to the north with various smaller minor routes in between.

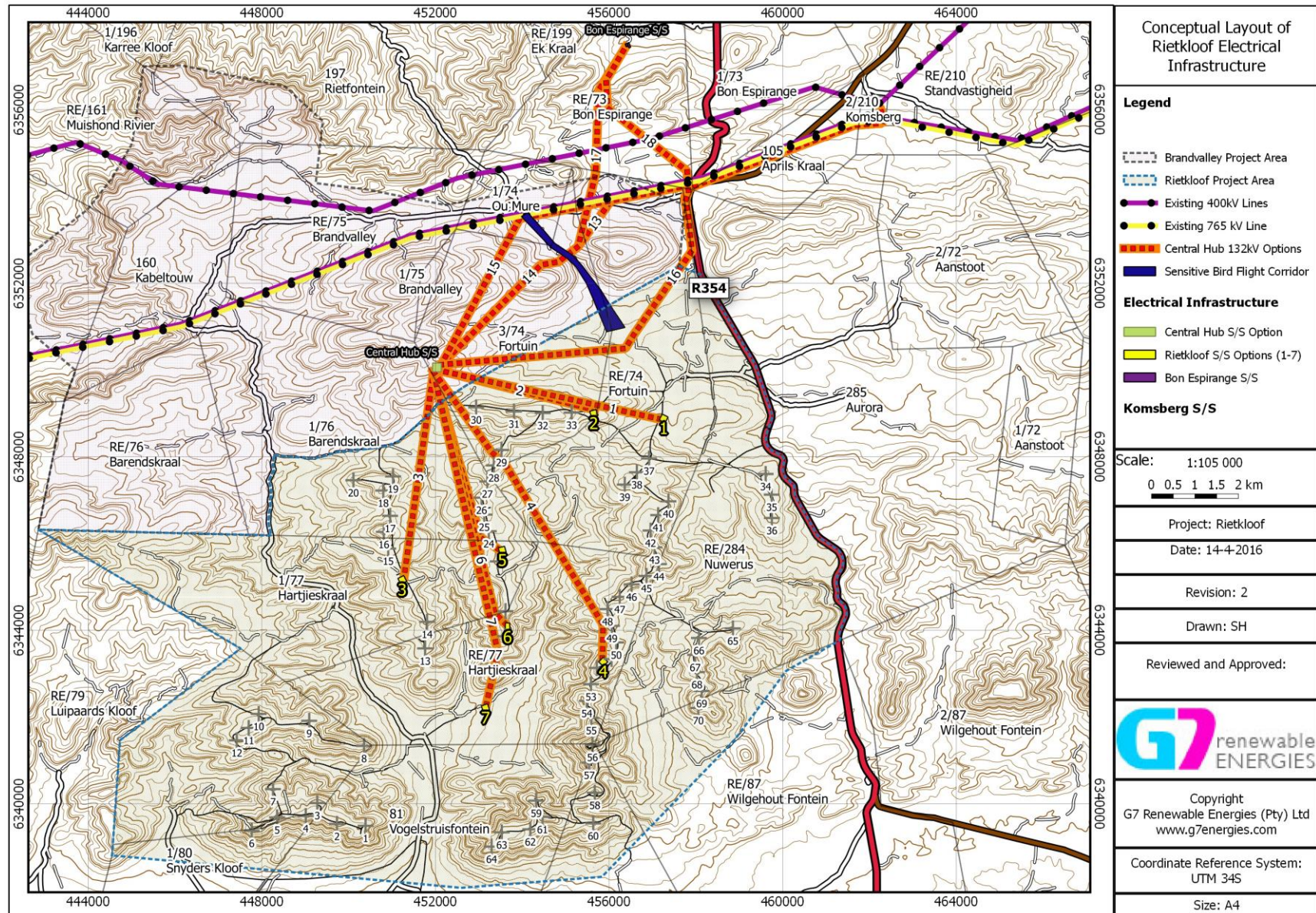


Figure 3. Map showing the location of the proposed Rietkloof Wind Energy Facility and proposed power line alternatives (Central Hub) and substation options (courtesy of EOH Coastal and Environmental Services).

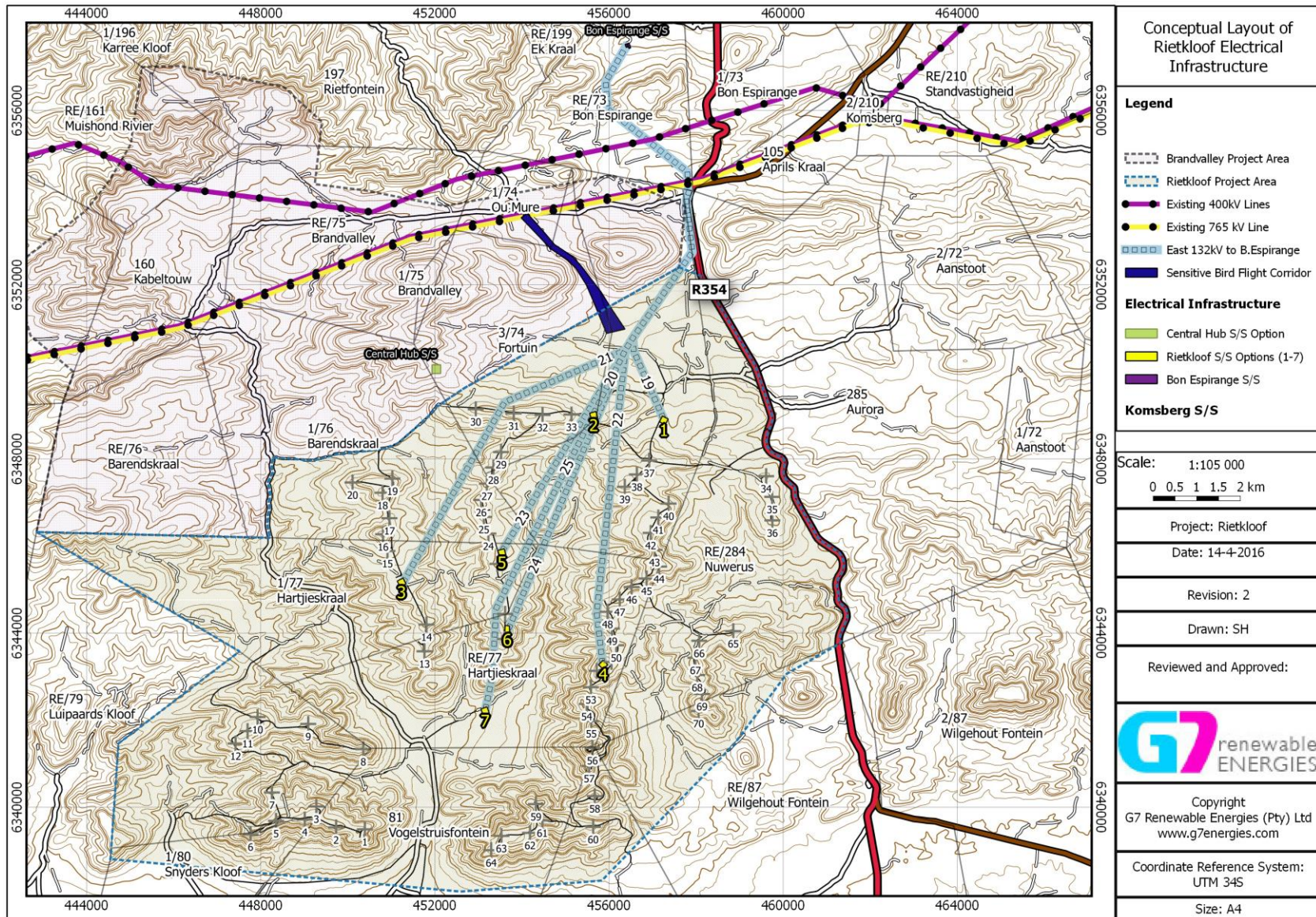


Figure 4. Map showing the location of the proposed Rietkloof Wind Energy Facility and proposed power line alternatives (East Connection to Bon Espirange) and substation options (courtesy of EOH Coastal and Environmental Services).

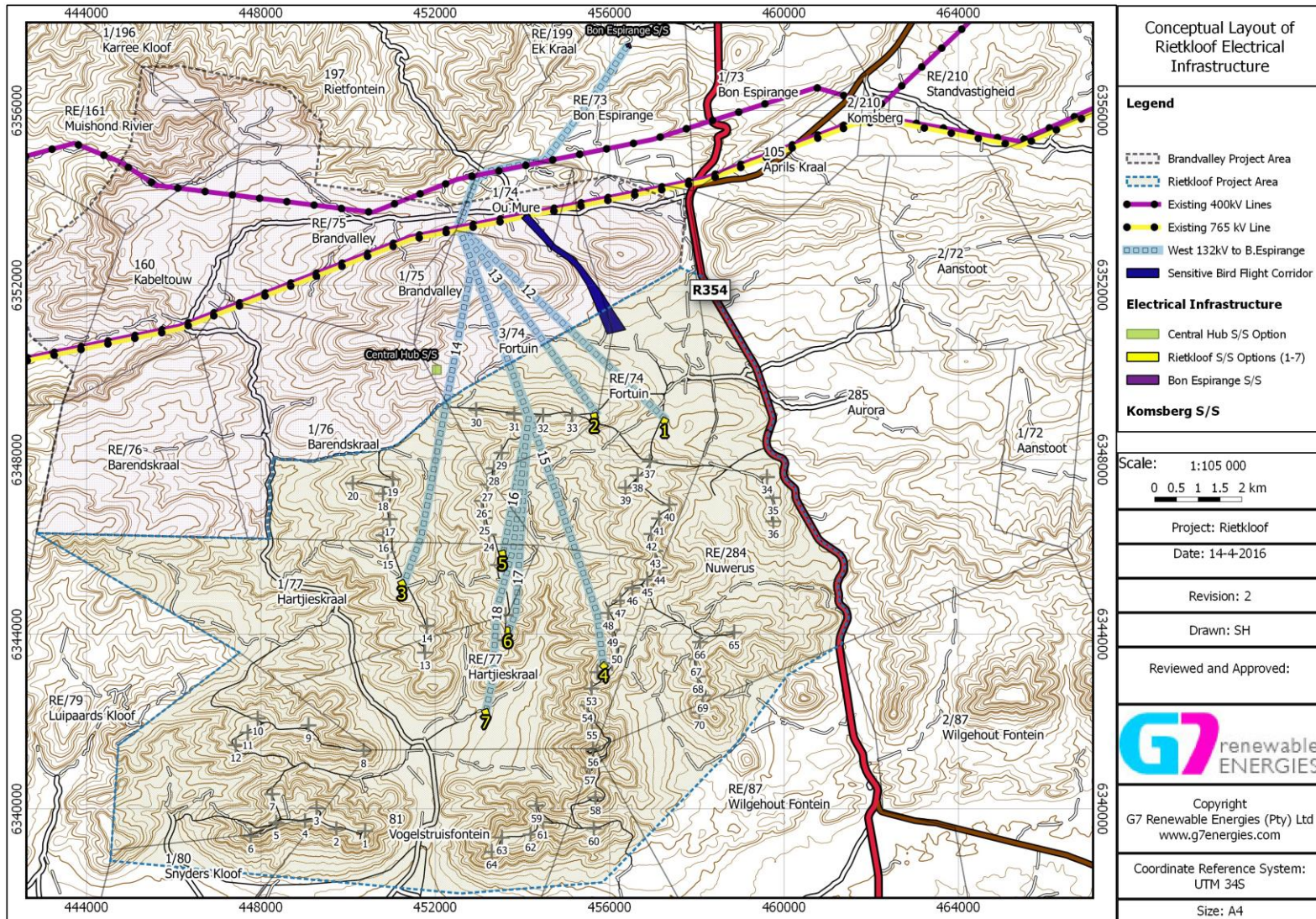


Figure 5. Map showing the location of the proposed Rietkloof Wind Energy Facility and proposed power line alternatives (West Connection to Bon Espirange) and substation options (courtesy of EOH Coastal and Environmental Services).

5. ARCHAEOLOGICAL INVESTIGATION

5.1. Methodology

An archaeological desktop study was conducted and has been included within this report. Very little systematic archaeological research has been conducted within the immediate area of the proposed WEF therefore the literature research was extended to include the wider Karoo region. Several archaeological and heritage impact assessments have been conducted within close proximity to the study area and were included as part of the literature review.

In 2011, Tim Hart and Dr Lita Webley, ACO Associates CC, conducted a heritage impact assessment for two proposed WEFs for the area to the north of the current proposed Rietkloof WEF project and on several of the farms included in the current project. These farms include: Barendskraal 1/76 and RE/76, Fortuin 1/74 and 3/74 and RE/74, Rietkloof 1/75, Hartjieskraal 1/77 and RE/77. A revised heritage impact assessment report on Phase 1 of the Roggeveld Wind Farm was compiled in 2013 (Hart & Webley 2013). Several historical built environment and stone features and structures were recorded. The heritage resources documented within the boundary of the proposed Rietkloof WEF were visited during the survey for the current study.

Heritage Western Cape (HWC) commented on the first assessment conducted for the Proposed Roggeveld Wind Farm (Case No. 111020JB18, 2011) and then revised the comments in 2013 (Appendix A). These recommendations have been included in the recommendations made in this report.

The proposed area for the Rietkloof WEF (together with the survey for the Brandvalley WEF) was visited between 9 March and 17 March 2016. The season of visitation is not relevant to the study concerned.

Waypoints and Tracks for the proposed WEF provided by EOH Coastal and Environmental Services were downloaded onto a handheld Garmin Oregon 650 GPS which aided in tracking and finding the proposed development areas. The survey was conducted by following the accessible roads to be upgraded and used for the transportation of wind turbines and associated infrastructure, this was done mostly in a 4x4 vehicle and conducting spot checks when relevant. The proposed accessible areas proposed for the infrastructure (power line, substations, construction camps) were investigated. Archaeological visibility can be considered as relatively good over most of the area. Photographs were taken using the handheld GPS which automatically plotted location and sites.

5.2. Limitations

Very little systematic precolonial archaeological research has been conducted within the immediate area of the proposed WEF. However, information on the heritage resources

has been accumulated by several heritage impact assessments that have been conducted for wind and solar facilities within the area. Historical archaeological research is currently being conducted by members of the Department of Archaeology, University of Cape Town, on the Khoekhoen trekboere interaction in the Klein Roggeveld and neighbouring escarpment.

Owing to vast extent of the area and the slow pace of conducting the survey by road and on foot the investigation and spot checks were limited to the accessible roads to the top of the mountains and within the valleys and floodplains. Therefore, the areas between these stops that may have yielded potential archaeological remains could not be surveyed on foot.

Vegetation cover across the landscape was relatively sparse allowing for good archaeological visibility. However, the observation of precolonial artefacts is limited to the surface. The artefacts documented occur mainly in secondary context as they sometimes occur in washed and eroded areas. It is likely that stone artefacts and, depending on the state of preservation and extent of surface disturbance over time, associated cultural and organic materials may be uncovered between the surface and generally 50-80 cm below the surface.

5.3. Results of the Archaeological Investigation

Table 1. Coordinates and sites for the proposed power line alternatives and substation options for the Rietkloof Wind Energy Facility (WEF) situated in the Witzenburg Local Municipality and Laingsburg Local Municipality, Cape Winelands and Central Karoo District Municipalities.

REFERENCE	DESCRIPTION	CO-ORDINATE	HERITAGE GRADING
Homesteads situated within the Rietkloof WEF area			
RKPL_HS1	Hartjieskraal 77	33°03'29.58"S; 20°29'25.32"E	Not graded
Stone Artefact Occurrences, Scatters and Sites			
RKPL_SA1	Stone artefact scatters	33°03'33.31"S; 20°28'59.88"E	'General' Protection B (Field Rating IV B) <i>IIIB</i>
RKPL_SA2	Stone artefact scatters	33°03'51.88"S; 20°29'03.69"E	'General' Protection B (Field Rating IV B) <i>IIIB</i>
RKPL_SA3	Stone artefact scatters	33°03'32.98"S; 20°29'39.89"E	'General' Protection B (Field Rating IV B) <i>IIIB</i>
RKPL_SA4	Stone artefact scatters	33°03'25.32"S; 20°29'51.36"E	'General' Protection B (Field Rating IV B) <i>IIIB</i>
Graves / Burials			
RKPL_G1	Vogelstruisfontein 81	33°05'33.42"S; 20°28'35.20"E	High Significance
RKPL_G2	Hartjieskraal 77	33°03'36.29"S; 20°29'28.23"E	High Significance
Stone walling features			
RKPL_SW1	Stone packed wall, Barendskraal 76	33°00'35.50"S; 20°29'00.70"E	<i>Grade IIIC significance</i>
RKPL_SW2	Stone packed cottage / dwelling, Barendskraal 76	33°02'33.00"S; 20°28'59.46"E	<i>Grade IIIC significance</i>
RKPL_SW3	Stone packed dwelling, Hartjieskraal 77	33°02'47.02"S; 20°30'34.95"E	<i>Grade IIIC significance</i>
Historical Artefacts Occurrences, Scatters and Sites			
RK_Hist1	Historical artefact scatter associated with the original Rietkloof homestead	33°06'23.52"S; 20°32'06.70"E	'General' Protection B (Field Rating IV B) <i>IIIB</i>
Built Environment (structures, buildings, drinking troughs, reservoirs, etc.)			
RK_BE1	Reservoir	33°03'32.47"S; 20°29'39.91"E	N/A
RK_BE2	Reservoir / kraal	33°02'57.78"S; 20°30'33.40"E	N/A

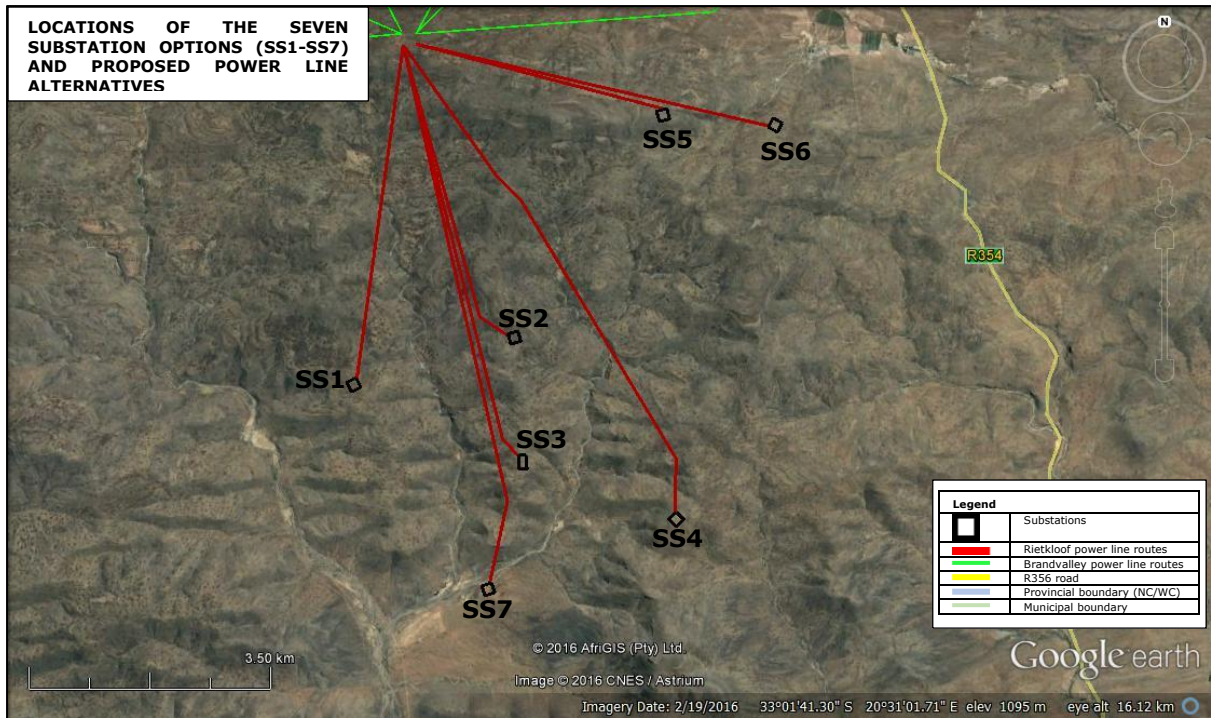


Figure 6: View of the locations of the seven substation positions (SS1 – SS7) proposed within the Rietkloof WEF area

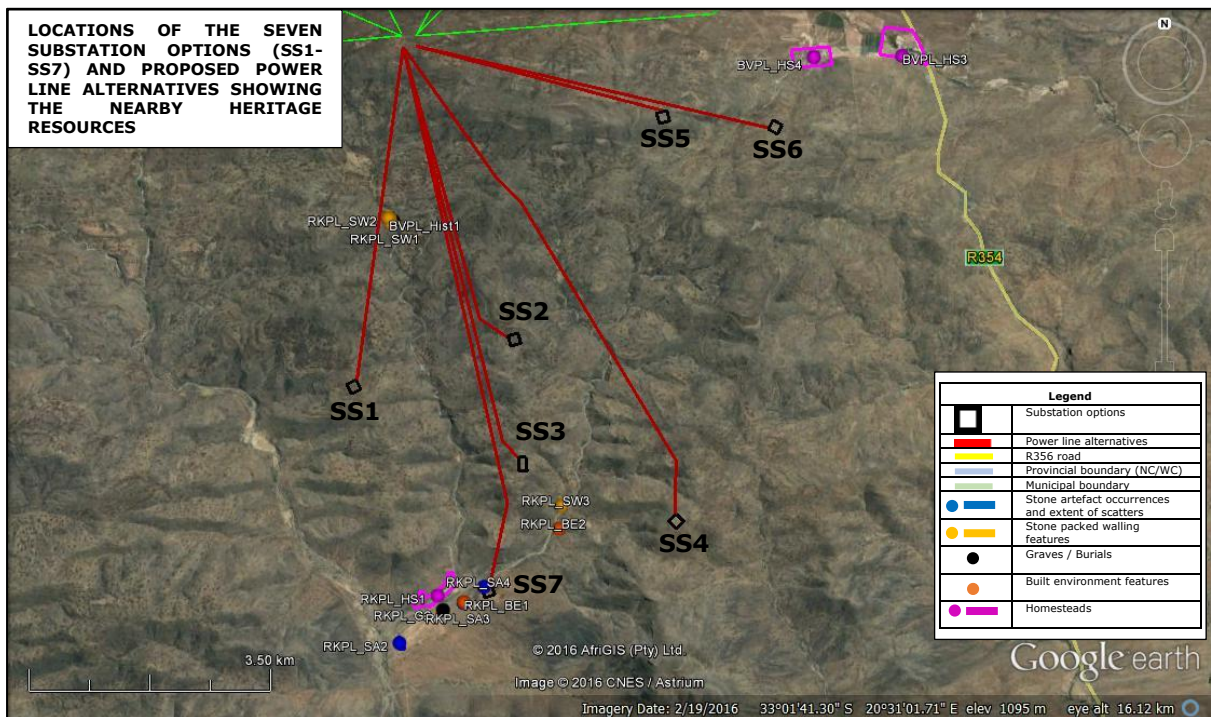


Figure 7: View of the locations of the seven substation positions (SS1 – SS7) and power line alternatives showing the nearby heritage resources encountered during the survey.

5.3.1. POSITION OF THE SUBSTATIONS

Seven potential 33/132kV onsite substation locations were assessed. The total footprint of this onsite substation will be approximately 200 m x 200 m.

The alternatives proposed for Substation 1 (SS1) – Substation 4 situated on the Farm Hartjieskraal 77 (SS4) and Substation 5 (SS5) and Substation 6 (SS6) on the Farm Fortuin 74 are all preferred for the establishment of an on-site substation.

The only exception area would be the proposed site for Substation 7 (SS7) situated on the Farm Hartjieskraal 77 (Figures 7-8). This alternative could also possibly omit the establishment of the proposed off-shoot access road that would link to the main access road through the valley therefore creating less of an impact on the landscape. Middle Stone Age stone artefacts were documented within this area and the site is in too close proximity to the homestead and graveyard to the west. It is suggested that this bit of the cultural landscape be preserved.

The preferred alternatives (SS1-SS4, SS6 and SS7) are all proposed to be constructed on the mountain and hilltops within the vicinity of the turbines and turbine access roads. It has been established that very little archaeological and historical remains occur within these areas and that there would be the least negative impact on these resources.



Figure 8. View of the area proposed for substation alternative 7 (SS7) facing north (Hartjieskraal 77).



Figure 9. View of the area proposed for substation alternative (SS7) facing north (Hartjieskraal 77).



Figure 10 and 11. Examples of the types of stone artefacts located on the plains where Substation 7 (SS7) is proposed.



Figure 12 and Figure 13. Examples of the types of stone artefacts located on the plains where Substation 7 (SS7) is proposed.



Figure 14. Examples of the types of stone artefacts located on the plains where Substation 7 (SS7) is proposed.

5.3.2. POSITIONS OF THE POWER LINES

It must be noted that the layout for the final power line alternatives were not finalised by the time of the survey conducted for the Rietkloof Wind Energy Facility and associated infrastructure and access roads. It must be emphasized that once the final layout for the power lines has been confirmed an archaeological heritage walk-through must be conducted to determine the positioning of the pylons and make further recommendations.

The proposed power line alternatives all follow the hilltops except where the line cross the valleys. Heritage resources located nearby, within 200 m, of the proposed power line route have been identified and included in this report. Very few heritage resources, mostly occurring within the valleys, were recoded within this area and none have been recorded in the direct path of the power line routes.

The ruins of a stone packed dwelling and wall (RKPL_SW1 and RKPL_SW2) occurs on the banks of the water course in the valley to the east of the proposed power line route that extends from the Central Hub to Substation 3 (SS3). A scatter of historical artefacts is associated with the dwelling and packed stone resembling graves are situated on the bank of the water course.

Scatters of Middle and Later Stone Age stone artefacts were documented within the vicinity of the proposed Substation alternative 7 (SS7) on the flat floodplains on the Farm Hartjiesfontein 77. It is therefore possible that the stone artefact scatters would occur within the buffer zone of the proposed power line route extending to this Substations.

The locations of the proposed power lines occur on the hilltops were the potential of finding any precolonial archaeological heritage remains is very unlikely. The hill and mountain tops have elevation ranges between 1 100 and 1 400 meters. It is unlikely that pre-colonial communities would have considered the top of the mountain range an attractive occupation area owing to the elevation range of the site and steep hills to access the top of the mountain range as well as a lack of easily accessible water and food resources.

The preferred power line route runs from the Komsberg Substation (no. 105, figure 5) along the existing 400 kV and 765 kV power lines to connect with the preferred substation alternative for the Rietkloof WEF (no. 13, Figure 5) which then connects at the Central Hub (no. 14). The power line route not preferred is no. 7 (Figure 5) which would connect to the Substation 7 (SS7) (not preferred). It is suggested that the power lines should extend for the shortest routes (possibly no 1 and No 2, Figure 5) with as few as possible valley bottoms being transversed.

6. CULTURAL LANDSCAPE

Cultural landscapes have become a significant considering factor when conducting various archaeological and heritage impact assessments for proposed developments. The areas investigated for the proposed Rietkloof Wind Energy Facility (WEF) situated in the Karoo Hoogland Local Municipality, Namakwa District Municipality and the Witzenburg Local Municipality and Laingsburg Local Municipality, Cape Winelands and Central Karoo District Municipalities, is considered as having a *medium - high* cultural heritage significance.

This section gives a brief introduction to the concept of cultural landscape and its relation to various aspects of the dynamic interaction of humans as cultural agents and the landscape as a medium. A description of the interwoven relationships of humans with the landscape over time will be given including the archaeological, historical, and contemporary connections. Lastly, the living heritage makes up a small part of the study undertaken, its significance will be highlighted in relation to the communities who still identify with the area and retain a sense of identity to the landscape.

6.1. Concept of Cultural Landscape

Cultural landscapes can be interpreted as complex and rich extended historical records conceptualised as organisations of space, time, meaning, and communication moulded through cultural process. The connections between landscape and identity and, hence, memory are fundamental to the understanding of landscape and human sense of place. Cultural landscapes are the interface of culture and nature, tangible and intangible heritage, and biological and cultural diversity. They represent a closely woven net of relationships, the essence of culture and people's identity. They are symbol of the growing recognition of the fundamental links between local communities and their heritage, human kind, and its natural environment. In contemporary society, particular landscapes can be understood by taking into consideration the way in which they have been settled and modified including overall spatial organisation, settlement patterns, land uses, circulation networks, field layout, fencing, buildings, topography, vegetation, and structures. The dynamics and complex nature of cultural landscapes can be regarded as text, written and read by individuals and groups for very different purposes and with very many interpretations. The messages embedded in the landscape can be read as signs about values, beliefs, and practices from various perspectives. Most cultural landscapes are living landscapes where changes over time result in a montage effect or series of layers, each layer able to tell the human story and relationships between people and the natural processes.

The impact of human action of the landscape occurs over time so that a cultural landscape is the result of a complex history and creates the significance of place in shaping historical identities by examining a community's presence or sense of place. The deeply social nature of relationships to place has always mediated people's

understanding of their environment and their movements within it, and is a process which continues to inform the construction of people's social identity today. Social and spatial relationships are dialectically interactive and interdependent. Cultural landscape reflects social relations and institutions and they shape subsequent social relations.

Cultural landscapes tell the story of people, events, and places through time, offering a sense of continuity, a sense of the stream of time. Landscapes reflect human activity and are imbued with cultural values. They combine elements of space and time, and represent political as well as social and cultural constructs. Culture shapes the landscape through day-to-day routine and these practices become traditions incorporated with a collective memory the ultimate embodiments of memorial consciousness', examples such as monuments, annual events and, archives. As they have evolved over time, and as human activity has changed, they have acquired many layers of meaning that can be analysed through archaeological, historical, geographical, and sociological study.

Indigenous people, European explorers, missionaries, pastoralists, international and domestic travellers all looked or look at similar landscapes and experience different versions of reality. Regardless of the power of different cultural groups, however, all groups create cultural landscape and interpret them from their own perspectives. This gives rise to tensions and contradictions between groups, invariably expressed in landscape forms as well.

The dynamics and complex nature of cultural landscapes can be regarded as text, written and read by individuals and groups for very different purposes and with very many interpretations. The messages embedded in the landscape can be read as signs about values, beliefs, and practices from various perspectives.

Most cultural landscapes are living landscapes where changes over time result in a montage effect or series of layers, each layer able to tell the human story and relationships between people and the natural processes. A common theme underpinning the concept of ideology of landscape itself is the setting for everything we do is that of the landscape as a repository of intangible values and human meaning that nurture our very existence. Intangible elements are the foundation of the existence of cultural landscapes, and that are still occupied by contemporary communities, Landscape, culture and collective memory of a social group are intertwined and that this binds the individuals to their community. Culture shapes their everyday life, the values bind gradually, change slowly, and transfer from generation to generation – culture is a form of memory. We see landscapes as a result of our shared system of beliefs and ideologies. In this way landscape is a cultural construct, a mirror of our memories and myths encoded with meanings which can be read and interpreted. Pivotal to the significance of cultural landscapes and the ideas of the ordinarily sacred is the realisation that it is the places, traditions, and activities of ordinary people that create a rich cultural tapestry of life, particularly through our recognition of the values people attach to their everyday places and concomitant sense of place and identity.

Living heritage means cultural expressions and practices that form a body of knowledge and provide for continuity, dynamism, and meaning of social life to generations of people as individuals, social groups, and communities. It also allows for identity and sense of belonging for people as well as an accumulation of intellectual capital current and future generation in the context of mutual respect for human, social and cultural rights.

Protection of these cultural landscapes involves some management issues such as successful conservation is based on the continuing vital link between people and their landscapes. This link can be disrupted or affected by for instance economic reasons. Other threats can also be attributed to urban expansion and development, tourism, war and looting and something beyond our human intervention: natural disasters and climate change. Cultural landscape management and conservation processes bring people together in caring for their collective identity and heritage, and provide a shared local vision within a global context. Local communities need, therefore, to be involved in every aspect of identification, planning and management of the areas as they are the most effective guardians of landscape heritage.

Most elements of living heritage are under threat of extinction due to neglect, modernisation, urbanisation, globalisation, and environmental degradation. Living heritage is at the centre of people's culture and identity, it is important to provide space for its continued existence. Living heritage must not be seen as merely safeguarding the past, but it must be seen as safeguarding the logic of continuity of what all communities or social groups regard as their valuable heritage, shared or exclusive.

In some instances, villages may capitalise on local landscape assets in order to promote tourism. Travel and tourism activities are built around the quest for experience, and the experience of place and landscape is a core element of that quest. It is a constant desire for new experiences that drives tourism, rather than a quest for authenticity. It is, therefore, important to engage actively with the tourism industry so that aspects of life and landscape important to cultural identity, including connection with place are maintained.

6.2. Archaeological Landscape

Very little is known about the pre-colonial archaeology of this area owing to the lack of systematic research in the area and the lack of finding any evidence of occupation according to previous impact assessments conducted. Therefore it was assumed that the archaeological landscape was sparse and almost non-existent. This study has however brought to light that this area was once part of an ancient landscape inhabited by various families of the genus *Homo*. With the identification of the Middle Stone Age stone artefacts and Later Stone Age stone artefacts occurring on the flat floodplains and near to water courses shows evidence of these precolonial communities' movement and possible occupation and interaction with the landscape. No sites showing clear periods of

long-term occupation were identified during the survey, however, it is not to say that these sites do not occur and could be found with a rigorous and intensive investigation of the attractive areas for occupation.

Pre-colonial human remains are mostly unmarked and invisible on the landscape, however, in some instances, they may be marked by organised piles of stones.

6.3. Historical and Contemporary Landscape

The archaeological interpretation of the cultural landscape relies solely on the presence and surface visibility of artefacts left behind on the landscape by the populations who occupied and migrated through the proposed development area. A more comprehensive historical layer is able to be fitted onto the cultural landscape owing to the availability of written documents and the continuing existence of the traces left behind by European Settlers and the moulding of these traces used to shape the contemporary communities that occupies and regards itself attached to its present cultural landscape.

The contemporary cultural landscape is the product of centuries of human interaction, more so when the European Settlers entered the area. Remnants of these cultural interactions remain on the landscape, such as the built environment, features, artefacts, and marked and unmarked graves / burials with only oral histories and stories handed down from one generation to the next to remain in the collective memory of the community/ies living on the landscape.

7. DESCRIPTION OF SITES

7.1. Precolonial / Stone Age material (RKPL_SA1 – RKPL_SA4):

Generally, no precolonial archaeological sites would occur within the turbine areas as the area comprises steep hills and high summits with elevation ranges between 1 100 m and 1400 meters above sea level and would be deemed inhospitable for any long-term occupation.

Both Later Stone Age and Middle Stone Age stone artefact scatters were identified mainly on the flat floodplains up to the foot of the mountains as well as within the valleys along water courses. The artefacts were manufactured from fine-grained chalcedony material as well as hornfels and local shale raw materials. The artefacts occurred at the surface and eroding at about 20 cm - 30 cm below the surface, therefore, it possible that artefacts may occur further below the surface when excavations for construction begins. No other cultural or organic archaeological heritage materials were assumed to be directly related or associated with the stone artefact scatters.

It is unlikely that the stone artefacts occur *in situ* and are regarded as being in a secondary and out of context position as they have been washed into the exposed areas and have been disturbed by domestic animal and human activities. It is also possible that stone artefact may occur below the vegetation cover between the surface and 50 – 80 cm below the ground.

The grading of the stone artefacts has been determined due to the lack of systematic research in this area, therefore, the stone artefact scatters (RK_SA1 – RK_SA9) are considered as having a *medium* cultural significance and have been allocated a heritage grading of:

'General' Protection B (Field Rating IV B): These sites should be recorded before destruction (usually *Medium significance*).

7.2. Stone Walling Features (RK_SW1 - RK_SW3) and Historical Artefact Scatters (RK_Hist1):

Up to three (3) stone walling features were documented along the access routes on the flat floodplains and in the valleys. These features include historical stone packed dwellings / cottages as well as kraals, pens, and a threshing floor. Historical artefacts were also located within the vicinity of some of the stone packed dwellings and kraals. It is difficult to grade the historical artefact scatters in isolation from their association within the areas they were documented, therefore, the grading of the stonewalling features includes the historic artefact scatters as a unit.

The grading of the stone walling features has been determined by their existence as part of a wider cultural landscape, therefore, the stone walling features (RK_SW1-RK_SW8) are considered as having a high cultural significance and have been allocated a heritage grading of:

Local: This site is suggested to be *Grade IIIB significance* (IIIB, HWC 2016). It could be mitigated and (part) retained as a heritage register site (*High significance*). However, recommendations to avoid negative impact to these features in terms of 20-30m buffer have been made.

7.3. Built Environment Structures (RKPL_BE1 – RKPL_BE2):

These include structures that have not been as being constructed by the historical stone packing method. The structures may be younger than 60 years and with very little or no heritage significance. These include abandoned buildings, used and unused reservoirs and drinking troughs.

The farm houses and associated buildings situated on the homestead / farm complex have been outlined and as a whole are considered as homesteads (described below).

7.4. Graves (formal and informal burials) (RKPL_G1 – RKPL_G2):

The historical family cemeteries are usually situated within close proximity or apart of the homestead. RKPL_G1 is a family cemetery situated across a watercourse from the Hartjieskraal homestead. RKPL_G2 resemble informal stone packed burials that may be associated with the ruins of a stone walling cottage situated in a valley next to a watercourse on the farm Hartjieskraal 77.

The graves / burials are considered as having a *high cultural significance* and has been allocated a heritage grading of:

Protection under Section 36 of the National Heritage Resources Act 25 of 1999.

7.5. Homesteads / Farmhouse Complexes (RKPL_HS1 – RKPL_HS2):

The farm houses and associated buildings situated on the homestead / farm complex have been outlined and as a whole considered as homesteads.

Six homesteads / farm complexes were identified within the proposed Rietkloof WEF area. The homesteads are situated either adjacent to the proposed access roads or in some cases the proposed internal access roads are expected pass through the homesteads.

These homesteads include the farm house and associated staff accommodation, outbuildings and stone walling features and built environment structures. These have not been allocated grading.

7.6 Landscape Grading

It has been noted that the general area of the Rietkloof WEF landscape is considered a remote wilderness, sparsely inhabited and seldom visited by tourists. The landscape has not yet been impacted by large developments or industry and therefore retains its aesthetic qualities.

In keeping with previous grading assessments of the area (Hart & Webley 2013), the landscape is considered as having a high cultural significance and has been allocated a heritage grading of:

IIIA - with views down the valleys from the southern ridges reaching

8. IMPACT ASSESSMENT

8.1. Precolonial / Stone Age material (RKPL_SA1 – RKPL_SA4)

The Destruction of Precolonial / Stone Age material (RKPL_SA1 – RKPL_SA4):

Cause and Comment: It has been established in this report that precolonial / archaeological heritage remains occur on the flat floodplains and along water courses within the proposed project area. Therefore it is likely that more stone artefacts and possibly other material and organic material may be uncovered during the construction of Substation 7 (SS7). The stone artefacts are considered as being irreplaceable heritage resources, once the artefact or the site has been destroyed so has the information for interpretation.

Mitigation Measures: A walk-through of the final layout of the preferred power line alternative should be conducted before any final mitigation measures can be established.

Table 2: Impact assessment of destruction of precolonial / Stone Age material

Impact	Effect			Risk or Likelihood	Overall Significance
	Temporal Scale	Spatial Scale	Severity of Impact		
Planning and Design Phase					
Without mitigation	Permanent (4)	Regional (3)	Very severe (8)	Definite (4)	Very High (19)
With mitigation	Permanent (4)	Regional (3)	Slight (1)	Definite (4)	Moderate (12)

8.2. Stone Walling Features (RKPL_SW1 - RKPL_SW2) and associated Historical Artefact Scatters (RKPL_Hist1)

The Destruction of Stone Walling Features (RKPL_SW1 - RKPL_SW3) and associated Historical Artefact Scatters (RKPL_Hist1):

Cause and Comment: Only two stone packed features occur within 200 m of the proposed power line alternatives. It is unlikely that these features will be negatively impacted by the proposed project.

Mitigation Measures: A walk-through of the final layout of the preferred power line alternative should be conducted before any final mitigation measures can be established.

Table 3: Impact assessment of the destruction of stone walling features

Impact	Effect			Risk or Likelihood	Overall Significance
	Temporal Scale	Spatial Scale	Severity of Impact		
Planning and Design Phase					
Without mitigation	Permanent (4)	Study site (2)	Very severe (8)	May occur (2)	Very High (16)
With mitigation	Long term (3)	Study site (2)	Slight (1)	May occur (2)	Moderate (8)

8.3. Graves (formal and informal burials) (RKPL_G1 – RKPL_G2)

The Destruction of Graves (formal and informal burials) (RKPL_G1 – RKPL_G2):

Cause and Comment: Only two of the three areas with graves / burials encountered are within close proximity of any development activities. These family graves are mostly older than 60 years protected and should be respected.

Mitigation Measures: A walk-through of the final layout of the preferred power line alternative should be conducted before any final mitigation measures can be established.

Table 4: Impact assessment of the destruction of graves

Impact	Effect			Risk or Likelihood	Overall Significance
	Temporal Scale	Spatial Scale	Severity of Impact		
Planning and Design Phase					
Without mitigation	Permanent (4)	Study site (2)	Very severe (8)	May occur (2)	Very High (16)
With mitigation	Long term (3)	Study site (2)	Slight (1)	May occur (2)	Moderate (8)

8.4. Homesteads / Farmhouse Complexes (RK_HS1 – RK_HS6)

The Destruction of Homesteads / Farmhouse Complexes (RKPL_HS1 – RKPL_HS2):

Cause and Comment: Two homesteads / farm complexes (BVPL_HS1 and BVPL_HS2) were identified 200 m of the proposed power line alternatives. The homesteads are situated adjacent to the proposed power line alternatives, however, it is unlikely that they will be negatively impacted by the proposed project. BVPL_HS3 and BVPL_HS4 have merely been shown in the report for their positions and do not occur nearby, within 200m, of the proposed power line routes.

Mitigation Measures: A walk-through of the final layout of the preferred power line alternative should be conducted before any final mitigation measures can be established.

Table 5: Impact assessment of the destruction of homesteads/ farmhouses

Impact	Effect			Risk or Likelihood	Overall Significance
	Temporal Scale	Spatial Scale	Severity of Impact		
Planning and Design Phase					
Without mitigation	Permanent (4)	Study site (2)	Very severe (8)	Definite (4)	Very High (19)
With mitigation	Long term (43)	Study site (2)	Slight (1)	Definite (4)	Moderate (12)

8.5. Cultural Landscape

The impact of the construction of the proposed project on the cultural landscape:

Cause and Comment: It has been stipulated by Heritage Western Cape (HWC) that the impact on the cultural landscape is necessary. The construction of these immense wind turbines and associated infrastructure required completely changes the character of the landscape and hence impacts on the sense of place and aesthetic value negatively as well as impedes and threatens untouched heritage resources.

Mitigation Measures: Effective rehabilitation of the landscape after decommissioning.

Table 6: The impact of the construction of the proposed Rietkloof WEF infrastructure on the cultural landscape

Impact	Effect			Risk or Likelihood	Overall Significance
	Temporal Scale	Spatial Scale	Severity of Impact		
Planning and Design Phase					
Without mitigation	Long term (3)	Study site (2)	Very Severe (8)	Definite (4)	Very High (17)
With mitigation	Medium term (2)	Study site (2)	Moderate (2)	Definite (4)	Moderate (10)

8.6. Cumulative Impacts

The construction of the proposed Brandvalley WEF and cumulative impacts on heritage resources:

Cause and Comment: The numerous applications and proposed establishment of several wind energy and solar energy facilities between Matjiesfontein and Sutherland as well as the adjacent regions have sparked a concern with regards to cumulative impacts that these projects may have on the heritage resources and the cultural landscape. Therefore

it is of the utmost importance to provide a thorough documentation of the archaeological and historical heritage resources, sites and features within the specific project area. The archaeological and historical heritage resources must be appropriately mitigated at a project / site specific level so that there is less of a risk of losing the information after the construction of these alternative energy facilities. The loss of information at regional scale is at risk as these facilities cause an immense amount of surface disturbance and destruction where archaeological and historical heritage resource are at risk of being destroyed without justification.

In addition, the cultural landscape of the wider region is inhibited by mass industrialisation of the landscape that changes the character of the landscape and hence impacts on the sense of place and aesthetic value negatively. The Karoo has been considered as a wilderness landscape whereby the cumulative impact will involve significant sterilisation of the aesthetic qualities of the landscape, the Karoo heritage and its character and sense of place.

Mitigation Measures: Effective rehabilitation of the landscape after decommissioning. A walk-through of the final layout of the preferred powerline alternative should be conducted before any final mitigation measures can be established.

Table 7: The construction of the proposed Rietkloof WEF electrical infrastructure and cumulative impacts on heritage resources:

Impact	Effect			Risk or Likelihood	Overall Significance
	Temporal Scale	Spatial Scale	Severity of Impact		
Planning and Design Phase					
Without mitigation	Long term (3)	Study site (2)	Very Severe (8)	Definite (4)	Very High (17)
With mitigation	Medium term (2)	Study site (2)	Moderate (2)	Definite (4)	Moderate (10)

9. CONCLUSION

The survey was conducted by following the positions and routes for the turbines, underground cabling and areas outline for the associated infrastructure such as the substations, construction camps and roads proposed for upgrading and construction.

No stone artefacts were documented within areas the areas comprising of steep hills and high elevations ranging between 1 100 m and 1 400 m above sea level. Surface scatters of Middle Stone Age and Later Stone Age stone artefacts were recorded in some low lying areas within exposed surface and disturbed donga areas. It is unlikely that the stone artefact surface scatters that occur on the exposed surface areas are positioned *in situ*; however, stone artefacts may occur between 50 – 80 cm below the surface.

Two stone walling features were identified. Historical artefacts were also located within the vicinity of stone packed dwellings and wall. The historical artefacts scatters include fragments of glass, ceramics and metal material probably dating to the late 19th century.

The preferred power line route runs from the Komsberg Substation (no. 105, figure 5) along the existing 400 kV and 765 kV power lines to connect with the preferred substation alternative for the Rietkloof WEF (no. 13, Figure 5) which then connects at the Central Hub (no. 14). The power line route not preferred is no. 7 (Figure 5) which would connect to the Substation 7 (SS7) (not preferred). It is suggested that the power lines should extend for the shortest routes (possibly no 1 and No 2, Figure 5) with as few as possible valley bottoms being transversed.

The proposed development would have negative implications on the archaeological heritage remains documented within the proposed area during all phases of the development. The negative implications include the destruction of the surface scatters of stone artefacts and further occurrences that are not immediately visible. The recommendations must be considered as appropriate mitigation measures to protect and conserve the archaeological heritage remains observed within the proposed development area and further archaeological remains that may occur and are not immediately visible on the surface.

10. RECOMMENDATIONS

The overall area is considered as having a medium - high heritage significance. The following recommendations should be considered prior to the development activities:

1. This report must be submitted to Heritage Western Cape (HWC), the heritage authority for any Western Cape developments, and as a commenting authority in terms of the National Heritage Resources Act 25 of 1999, Section 38.
2. Substation 7 (SS7) situated south on the Farm Hartjiesfontein 81 is the only option not favoured for the establishment of the substation.
3. The preferred power line route runs from the Komsberg Substation (no. 105, figure 5) along the existing 400 kV and 765 kV power lines to connect with the preferred substation alternative for the Rietkloof WEF (no. 13, Figure 5) which then connects at the Central Hub (no. 14). The power line route not preferred is no. 7 (Figure 5) which would connect to the Substation 7 (SS7) (not preferred). It is suggested that the power lines should extend for the shortest routes (possibly no 1 and No 2, Figure 5) with as few as possible valley bottoms being transversed.

4. An archaeological heritage walk-through survey of the final layout of the power lines must be conducted to assess the changes where further recommendations and mitigatory measures may be made if necessary.

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13. GENERAL REMARKS AND CONDITIONS

NOTE: This report is a phase 1 archaeological impact assessment (AIA) only and does not include or exempt other required specialist assessments as part of the heritage impact assessments (HIAs).

The National Heritage Resources Act (Act No. 25 of 1999, Section 35 [Brief Legislative Requirements]) requires a full Heritage Impact Assessment (HIA) in order that all heritage resources including all places or objects of aesthetics, architectural, historic, scientific, social, spiritual, linguistic, or technological value or significance are protected. Thus any assessment should make provision for the protection of all these heritage components including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects.

It must be emphasized that the conclusions and recommendations expressed in this phase 1 archaeological impact assessment (AIA) are based on the visibility of archaeological remains, features and, sites and may not reflect the true state of affairs. Many archaeological remains, features and, sites may be covered by soil and vegetation and will only be located once this has been removed. In the event of such archaeological heritage being uncovered (such as during any phase of construction activities), archaeologists or the relevant heritage authority must be informed immediately so that they can investigate the importance of the sites and excavate or collect material before it

is destroyed. The onus is on the developer to ensure that this agreement is honoured in accordance with the National Heritage Resources Act No. 25 of 1999 (NHRA 25 of 1999).

Archaeological Specialist Reports (desktops and AIA's) will be assessed by the relevant heritage resources authority. The final comment/decision rests with the heritage resources authority that may confirm the recommendations in the archaeological specialist report and grant a permit or a formal letter of permission for the destruction of any cultural sites.

APPENDIX A: GRADING SYSTEM

The National Heritage Resources Act 25 of 1999 stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act and the South African Heritage Resources Agency:

- National: This site is suggested to be considered of Grade 1 significance and should be nominated as such. Heritage resources with qualities so exceptional that they are of special national significance.
- Provincial: This site is suggested to be considered of Grade II significance and should be nominated as such. Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region
- Local: This site is suggested to be Grade IIIA significance. This site should be retained as a heritage register site (High significance) and so mitigation as part of the development process is not advised.
- Local: This site is suggested to be Grade IIIB significance. It could be mitigated and (part) retained as a heritage register site (High significance).
- 'General' Protection A (Field Rating IV A): This site should be mitigated before destruction (usually High/Medium significance).
- 'General' Protection B (Field Rating IV B): This site should be recorded before destruction (usually Medium significance).
- 'General' Protection C (Field Rating IV C): This site has been sufficiently recorded (in the Phase 1). It requires no further recording before destruction (usually Low significance).

APPENDIX B: IDENTIFICATION OF ARCHAEOLOGICAL FEATURES AND MATERIAL FROM INLAND AREAS: guidelines and procedures for developers

1. Human Skeletal material

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general the remains are buried in a flexed position on their sides, but are also found buried in a sitting position with a flat stone capping and developers are requested to be on the alert for this.

2. Freshwater mussel middens

Freshwater mussels are found in the muddy banks of rivers and streams and were collected by people in the past as a food resource. Freshwater mussel shell middens are accumulations of mussel shell and are usually found close to rivers and streams. These shell middens frequently contain stone tools, pottery, bone, and occasionally human remains. Shell middens may be of various sizes and depths, but an accumulation which exceeds 1 m² in extent, should be reported to an archaeologist.

3. Stone artefacts

These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified

4. Fossil bone

Fossil bones may be found embedded in geological deposits. Any concentrations of bones, whether fossilized or not, should be reported.

5. Large stone features

They come in different forms and sizes, but are easy to identify. The most common are roughly circular stone walls (mostly collapsed) and may represent stock enclosures, remains of wind breaks or cooking shelters. Others consist of large piles of stones of different sizes and heights and are known as *isisivane*. They are usually near river and mountain crossings. Their purpose and meaning is not fully understood, however, some are thought to represent burial cairns while others may have symbolic value.

6. Historical artefacts or features

These are easy to identified and include foundations of buildings or other construction features and items from domestic and military activities.

APPENDIX C: LIST OF ACRONYMS AND GLOSSARY

ACRONYMS

AIA: Archaeological Impact Assessment
 EIA: Environmental Impact Assessment
 ESA: Early Stone Age
 GPS: Global Positioning System
 ECO: Environmental Control Officer
 HIA: Heritage Impact Assessment
 HWC: Heritage Western Cape
 LSA: Later Stone Age
 MSA: Middle Stone Age
 NEMA: National Environmental Management Act
 NHRA: National Heritage Resources Act 25 of 1999
 OES: Ostrich Eggshell
 PHRA: Provincial Heritage Resources Agency
 SAHRA: South African Heritage Resources Agency
 SEF: Solar Energy Facility
 WEF: Wind Energy Facility

GLOSSARY

Archaeology: The scientific study and reconstruction of past communities through the systematic recovery of the remains (organic and material) older than 100 years.

Bored Stone: A rounded stone of various sizes with a bored / drilled hole in the middle. Some were used as weights on digging sticks.

Cultural Landscape: Cultural landscapes can be interpreted as complex and rich extended historical records conceptualised as organisations of space, time, meaning, and communication moulded through cultural process.

Early Stone Age: The Early Stone Age from between 2.5 million and 250 000 years ago refers to the earliest that *Homo sapiens sapiens* predecessors began making stone tools.

Historical Archaeology: Historical archaeology refers to the last 500 years when European settlers and colonialism entered into southern Africa.

Later Stone Age: The Later Stone Age (LSA) spans the period from about 20 000 years ago until the colonial era, although some communities continue making stone tools today.

Middle Stone Age: The Middle Stone Age spans a period from 250 000 - 30 000 years ago and focuses on the emergence of modern humans through the change in technology, behaviour, physical appearance, art and symbolism.

National Estate: Heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations

Protected Structures, Features and Buildings: Structure or part of a structure which is older than 60 years



APPENDIX D: ACTIVITY MOTIVATION

Motivate and explain the need and desirability of the activity (including demand for the activity):

1. Is the activity permitted in terms of the property's existing land use rights?		NO	Please explain
<p>The majority of the land within the project area is currently zoned for agricultural, with the exception of the existing 400kV servitude and 765kV servitude for the Eskom distribution line running just north of the project region. There's no current permits in place for the onsite substations, overhead distribution lines or the central hub substation. Once the 132kV distribution line is finalised a servitude would be registered.</p>			
<p>The Bon Espirange Substation was previously authorised (DEA Ref Number: 12/12/20/1988/1/AM1) The proposed activity is therefore permitted in terms of the property's land use rights. The Komsberg footprint is zoned for authority zone and is therefore permitted in terms of the property's current land use rights</p>			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES		Please explain
<p>According to the Northern Cape PSDF¹, one goal of the PSDF is to ensure and promote Economic Efficiency within the province. This is understood as the optimisation of benefit at the lowest cost. It includes the innovative and efficient use of available resources. The evacuation of energy from this project will allow for greater energy availability throughout the country, allowing for greater consumption and stimulation of the economy. The NCPsdf furthermore stresses the importance of the renewable energy sector to promote economic opportunity within the province. In addition, the plan also calls for close co-operation between the public and private sectors to improve economic development.</p>			
<p>The Western Cape provincial spatial development framework² further targets the renewable energy sector as one key growth sector for the province, of which this development will form part of, recognising the need for support and encouragement for Independent Power Producers. Through these sorts of statements it is clear that the PSDF includes sustainable renewable energy development within the province.</p>			
(b) Urban edge / Edge of Built environment for the area		NO	Please explain
<p>The project area is located between Matjiesfontein and Sutherland within the Cape Winelands District Municipality, the Central Karoo District Municipality and the Namakwa District Municipality. The site does not fall within the urban edge and will not impact on the urban edge in any way.</p>			

¹ Northern Cape Provincial Spatial Development Framework 2012. NCPsdf Final Document - 22 August 2012 (25 MB) [online]. Available from http://northerncapepsdf.co.za/wp-content/uploads/Northern_Cape_Psdf_22_August_2012.pdf [Accessed 25 May 2016].

² Western Cape Provincial Spatial Development Framework 2014. Western Cape Provincial Spatial Development Framework [online]. Available from https://www.westerncape.gov.za/eadp/sites/eadp.westerncape.gov.za/files/your-resource-library/2014%20Provincial%20Spatial%20Development%20Framework%20%28PSDF%29_0.pdf] Accessed 25 May 2016.

<p>c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).</p>	<p>YES</p>		<p>Please explain</p>
<p>By virtue of the fact that this project will be evacuating power generated by the Brandvalley WEF, the need and desirability of the power line extends from that of the Wind Farm. Should the wind farm not be authorised, there will be no need for this project, however, should this project not proceed, the wind farm will have no means of evacuating the power produced. As such, this project's need and desirability is inextricably linked to that of the associated Brandvalley WEF. The following thus applies to this project as well as the WEF:</p>			
<p>Local Planning Guide</p>	<p>Relevance</p>		
<p>Cape Winelands District Municipality (CWDM) IDP (2012/13-2016/17)</p>	<p>The overarching vision and mission statement of the CWDM IDP promotes both sustainable development and job creation. The key stakeholder priorities highlighted in the strategic objectives includes the promotion of renewable energy projects. The IDP furthermore calls for an increase in employment opportunities through the green economy, and more specifically, through green energy initiatives.</p>		
<p>Central Karoo District Municipality (CKDM) IDP (2012-2017)</p>	<p>The CKDM IDP promotes sustainability through the integration of social, economic and ecological components. The planning document highlights the increasingly importance of sustainable energy, emphasising the national vision to focus on renewable energy as a movement towards less carbon-intensive electricity production. The CKDM IDP and SDF make provision for wind farms within the Central Karoo as an alternative energy source.</p>		
<p>Namakwa District Municipality (NDM) IDP (2012-2016)</p>	<p>The NDM commits to sustainable development and the transition to a low-carbon economy through the expansion of renewable energy. The IDP calls for the development and implementation of a Renewable Energy Strategy to achieved their infrastructure objectives. Although such a strategy is not in place, the establishment of a 140MW WEF are in line with the commitment to move towards a low-carbon economy by increasing renewable energy generation capacity.</p>		
<p>Witzenberg Local Municipality IDP (2012/2017)</p>	<p>The Witzenberg LM IDP promotes renewable energy and the management and use of natural resources as an opportunity to stimulate growth and achieve sustainable development. The environmental policy of the LM calls for environmental projects that ensure environmental sustainability and contribute to job creation. The Brandvalley WEF aims to be environmentally sustainable and to contribute to local job opportunities.</p>		
<p>Laingsburg Local Municipality (LLM) IDP (2012/2017)</p>	<p>The key strategies proposed by the LLM IDP within the Strategic Infrastructure and the Environmental and Spatial Development approaches include the support and promotion of wind, solar and bio-gas developments as a source of alternative energy.</p>		
<p>Karoo Hoogland Local Municipality IDP (2015-2016)</p>	<p>The mission statement of the Karoo Hoogland LM IDP is to provide leadership on environmental sustainability and climate change response. The Environmental and Spatial Analysis includes the promotion and diversification of renewable energy projects in accordance with the Integrated Resource Plan (IRP) for Electricity 2010-2030 in addition to the creation of job opportunities through the Green Economy.</p>		
<p>(d) Approved Structure Plan of the Municipality</p>	<p>YES</p>		<p>Please explain</p>
<p>All the municipalities are aware of the ongoing authorisation application for the Brandvalley WEF and will be notified of this Basic Assessment process. Should the WEF project succeed, the development of a distribution line would be required. The proposed substation and distribution line feeding into the grid connection options support this project and do not compromise the structure of the municipal plan.</p>			

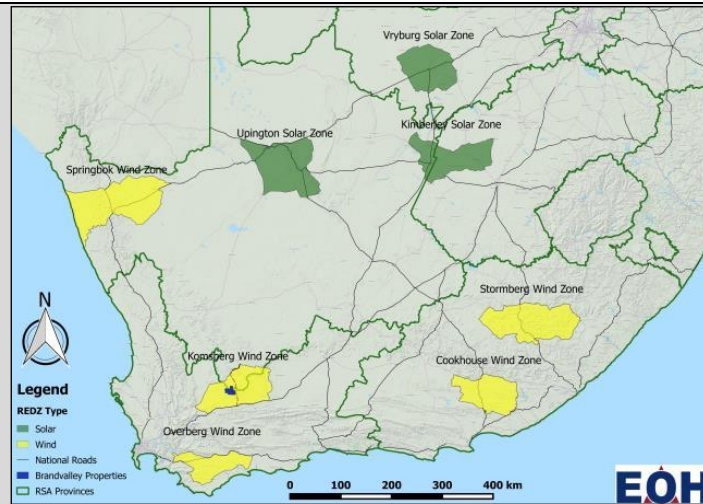
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	YES		Please explain
<p>Only one EMF exists for the project region, that of the Cape Winelands DM³. According to this plan, no wetland sensitivity regions occur within the project area. Additionally, the project area falls within a moderate river sensitivity region, a fish support area, various low-high biodiversity sensitivity areas, and no wetland management zones.</p> <p>The central Karoo IDP⁴ calls for the development into renewable energy sources as a means of securing greater energy supply for current and future needs. Renewables such as solar and wind are thus prioritised, to which this development will contribute.</p>			
f) Any other Plans (e.g. Guide Plan)		NO	Please explain
<p>The Strategic Environmental Assessment (SEA) for wind and solar PV energy in South Africa (CSIR, 2013⁵) supports of the Strategic Integration Project (SIP) 8 which focuses on the implementation of sustainable green energy initiatives. The SEA integrates environmental, economic and social factors to identify eight (8) Renewable Development Zones (REDZs). The identified REDZs included areas where large scale wind energy facilities can be developed in a manner that limits significant negative impacts on the environment while yielding the highest possible socio-economic benefits to the country. The SEA process and the determination of the REDZs provided an opportunity for government authorities, the private sector and the public to provide input and agree on appropriate development areas. The SEA additionally identified priority areas for investment opportunities into the electricity grid, providing a solution to the current limitations of existing grid infrastructure and the challenges faces in expanding the grid. The proposed Brandvalley WEF and this associated and necessary infrastructure thus falls within the Komsberg Wind REDZ. The REDZs are considered areas of the highest development potential on land that is technically suitable for wind and solar developments. Proposed projects that fall within these areas are thus incentivised and streamlined. Cabinet approved the gazetting of REDZs on 17 February 2016⁶.</p>			

³ Cape Winelands EMF 2011. Cape Winelands EMF [online]. Available from http://www.capewinelands.gov.za/DocumentsDownload/Cape%20Winelands%20Environmental%20Management%20Framework/CWDM%20EMF_Status%20Quo_Non-tech%20Summary_Eng.pdf [Accessed 25 May 2015].

⁴ Central Karoo IDP 2014. Central Karoo Integrated Development Plan [online]. Available from <https://www.westerncape.gov.za/text/2012/11/central-karoo-dm-idp-2012-2017.pdf> [Accessed 25 May 2016].

⁵ CSIR. (2013). Strategic Environmental Assessment for wind and solar PV energy in South African – Renewable Energy Development Zones (REDZs). Available: <https://redzs.csir.co.za/>. (Accessed: 11/01//2016).

⁶ South African Government, 2016. <http://www.gov.za/speeches/statement-cabinet-meeting-17-february-2016-18-feb-2016-0000>.



There are other wind energy developments and electrical infrastructure proposed and existing in close proximity to the Brandvalley WEF. These facilities are in various stages of development ranging from application phase to authorisation (environmental authorisation and preferred bidder). Although each location has its own wind patterns, the close proximity of wind farms in an area does have environmentally preferred advantages such as limiting certain impacts to that location as opposed to impacting a number of areas. It also confirms the region/locality as a high wind resource and a suitable area for renewable energy development.

Furthermore, there are Eskom high voltage transmission lines (one 786kV and two 400kV power lines) running immediate south of the project area, running between the Komsberg station and the Kappa substation.

The recently built 765kV line runs from the Gamma substation near Victoria West past the Kappa substation near Touwsriver (southwest of the project site) to connect to the Omega substation near Koeberg. This is part of Eskom’s grid strengthening project for power transmission and distribution in South Africa. The Komsberg capacitor station located northeast of the project site has two 400 kV lines running through its capacitor banks from the Droerivier substation to the Bacchus and Muldersvlei substations, respectively, via the Kappa substation. The approved renewable energy projects located in the vicinity are intended to be connected to the Komsberg or Kappa substations. The Komsberg substation will be upgraded to connect more projects to the grid.

<p>3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?</p>	<p>YES</p>	<p>Please explain</p>
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Although the specific project is not considered in the SDF, the broader region surrounding the project area has been specifically earmarked for development of solar and onshore wind projects, under the auspices of the REIPPP Programme. As such, this project (and the land use it represents) is in agreement with the development goals of the IDP.

<p>4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)</p>	YES		Please explain
<p>Electricity provision in South Africa is currently a critical issue, and has direct impact on the economic growth of the country, as South Africa is an energy intensive economy. The project region is currently being serviced sufficiently through the existing electrical infrastructure. However, there's a big need for employment opportunities which this project along with the WEF will respond to. An immediate local benefit in terms of electricity supply is not expected, however, short term increase in locally sourced labour from the construction activities associated with the electrical infrastructure and a significant increase in employment opportunities associated with the WEF are expected. A percentage of the revenue per annum from the operational WEF will be made available to the community through a social beneficiation scheme, in accordance with the DoE bidding requirements of the REIPPPP. Therefore, the potential for creation of employment and business opportunities, and the opportunity for skills development for the local community is significant.</p>			
<p>5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</p>	YES		Please explain
<p>The project is outside of the normal municipal service areas and therefore no services will be required from the local municipality. Contractors will be appointed to provide the required services for sewage and refuse removal. No effluent other than normal sewage are anticipated. A contractor will be appointed to manage it according the management measures included in the Environmental Management Programme (EMPr). It is expected that portable ablution facilities will be used during the construction phase, which will be managed by the appointed contractor. Although low quantities of waste are anticipated, a contractor will be appointed to manage recycling activities and final disposal of waste that cannot be recycled. Electricity will be provided via a 11kV line servicing at least the construction camp and batching plant (associated with the WEF). Where required and no electricity is available onsite temporary generators will be used instead.</p>			
<p>6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</p>	YES		Please explain
<p>The project proponent is a private developer under the REIPPPP programme, and will not require any services from the local or district municipalities. The project will not impact infrastructure planning of the municipality.</p>			
<p>7. Is this project part of a national programme to address an issue of national concern or importance?</p>	YES		Please explain
<p>This project in its contribution to the renewable energy sector forms part of the National Development Plan.</p>			
<p>8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)</p>	YES	NO	Please explain
<p>Yes, please see the motivation for selecting this project location described under the alternatives section.</p> <p>The Karoo, and more specifically the proposed location, is identified as a feasible area for wind energy in terms of the Wind Atlas for South Africa (WASA) for the Western Cape and parts of the Northern, Western and Eastern Cape Provinces. WASA is a tool for identifying areas suitable for large-scale wind power generation and to provide more accurate wind resource data to identify potential off-grid wind generation location opportunities, using high climatological (30-year) annual mean wind speed (m/s) 100m above ground level. Figure 14 below indicates the proposed location in relation to the WASA.</p>			

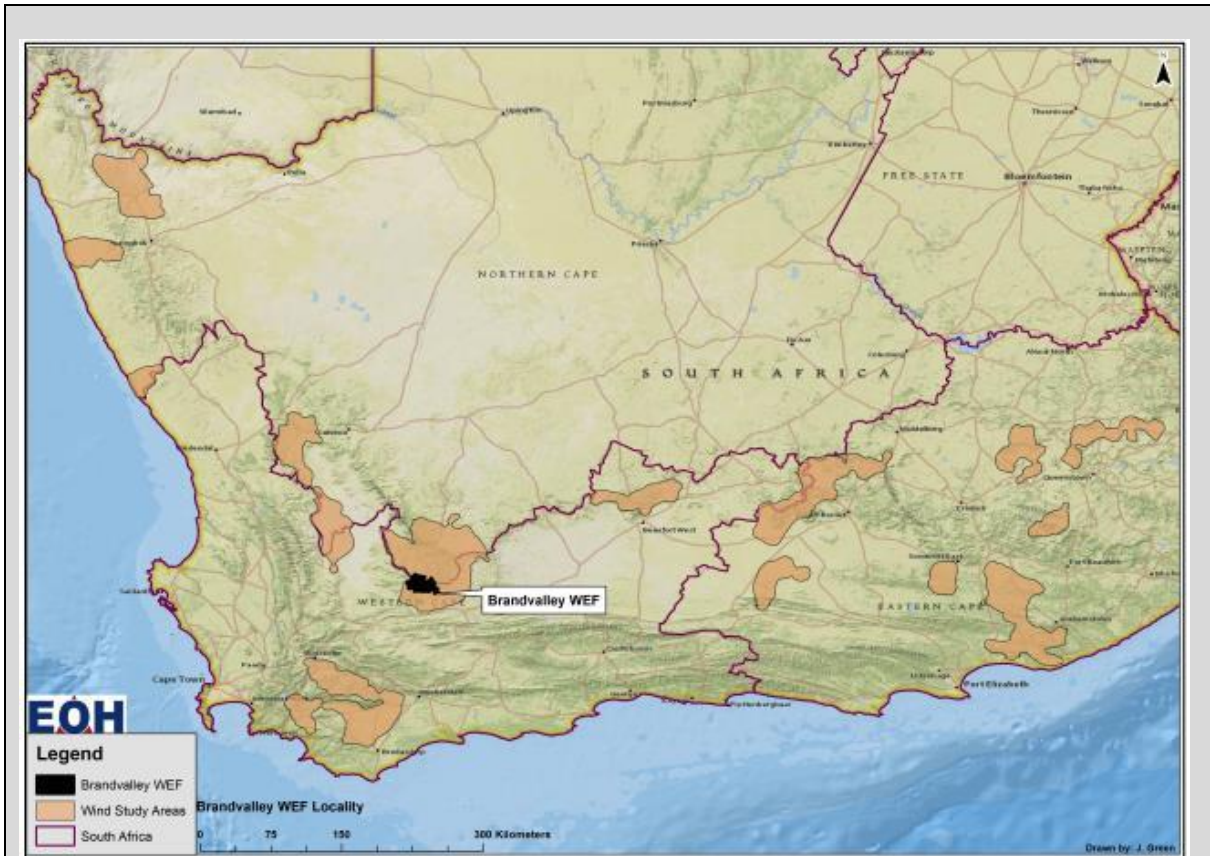


Figure 14: The proposed project area in relation to the WASA.

Brandvalley WEF is located in an area where three wind projects were selected as preferred bidders under the Round 4 REIPPPP. This is a good indication that the area has high wind resources and the projects are competitive for succeeding in the REIPPPP. Grid access is deemed favourable for this site due to the close proximity of the existing Eskom Capacitor station, which is planned to be upgraded to a 400kV substation. The current Komsberg substation area is currently proposed to be expanded as a hub for connecting future developments in the area. The distance from a substation directly affects construction costs and losses associated with power transmission over a distance. The existing Eskom Komsberg Substation has sufficient grid capacity for the proposed project to connect. The same is true for the planned Bon Espirange substation.

Similar to the Renewable Energy SEA, Eskom's Electricity Grid Infrastructure Strategic Environmental Assessment (Grid SEA) is also underway. The SEA is in accordance with the government's commitment to implement the NDP and improve on infrastructure. More specifically, the Grid SEA is in support of SIP 10, which aims to achieve "Electricity and distribution for all". The area in which the Rietkloof Wind Farm is proposed is currently within the corridor planned to be strengthened by Eskom as part of the Grid SEA. The Grid SEA aims to provide widespread distribution of electricity throughout South Africa and to initialise economic development within areas limited to electricity access to meet the country's economic and social development needs.

9. Is the development the best practicable environmental option for this land/site?	YES		Please explain
<p>Yes, the current agricultural activities can continue as it is not mutually exclusive with the proposed electrical infrastructure and associated WEF. While variation in the micro-siting of the distribution lines are still expected in line with environmental and technical specifications, the overall project location cannot be altered, as this project would feed into the fixed or authorised location of the associated Brandvalley WEF.</p> <p>The specialist studies undertaken as part of this Basic Assessment conclude that the development of the substation and power lines will have medium - low environmental impacts. Should the infrastructure not be constructed as proposed, the wind energy facility would not be connected to the electricity grid. The implementation of the proposed project is therefore the best practicable environmental option.</p>			
10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES		Please explain
<p>Yes, the specialist studies undertaken to inform this Basic Assessment concluded that the development of the electrical infrastructure will have medium - low environmental impacts. Should the infrastructure not be constructed as proposed, the proposed WEF would not be connected to the national grid which will have a negative impact at a local, regional and national level.</p> <p>Localised positives such as an increased job creation, in addition to the national supply of renewable energy and the moderate to low environmental risk (as per specialist reports) combine to provide support that this project which will result in greater benefit than negative impact.</p>			
11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?		NO	Please explain
<p>The region is declared as a REDz and there are numerous wind and solar developments already authorised or being proposed. Please see section (f) above for the detailed map.</p>			
12. Will any person's rights be negatively affected by the proposed activity/ies?		NO	Please explain
<p>No. Landowners already provided consent to proceed with the proposed development on their properties. Local labour will be employed as far as possible, thus reasonably promoting job creating in the short term, and the improved electrical supply and infrastructure will nurture economic growth and reduced electricity prices in the national context. All landowners and neighbours were notified of the proposed project through the circulation of a Background Information Document (BID) as included in Appendix E. No concerns were raised to date. If the project is not authorised, the rights of the developer will be severely affected as the WEF will not be able to connect to the National Grid.</p>			
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?		NO	Please explain
<p>No. the property is not located near the urban edge, and will not impact thereon. Private landowners (mainly farming) will be affected by the proposed project and these landowners and neighbours have been consulted by the environmental team and are aware of the proposed project. See proof of communication included in Appendix E.</p>			
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	YES		Please explain
<p>Although not strictly designated a strategic integrated project in and of itself, this project will contribute to a few subcomponents of the Strategic Integrated Projects goals, namely that of promoting balanced economic development, unlocking economic opportunities, addressing socio-economic needs, promoting job creation, helping integrate human settlements and economic development and SIP8: green energy in support of South African economy. The construction of the proposed electrical infrastructure will provide local residents opportunities to gain short term employment, which would contribute towards the socio economic needs of individuals and the community.</p>			

15. What will the benefits be to society in general and to the local communities?	Please explain
<p>Society in general:</p> <ul style="list-style-type: none"> • Contributing to reach the goals set out in the National Development Plan, Integrated Energy Plan for the Republic of South Africa, IRP 2010. • Increased generation capacity from a renewable resource that will be feed into the national grid; • Additional grid connection options to allow for more flexible distribution locally in the future; and • A small reduction in employment needs; <p>Local communities:</p> <ul style="list-style-type: none"> • Community upliftment through additional employment opportunities within the project area and economic development contributions in terms of the REIPPPP. 	
16. Any other need and desirability considerations related to the proposed activity?	Please explain
<p>A further motivating factor is the proximity of the project to the N1 highway. This enables easy access to and from site for all staff members in the nearby communities, and will simplify the transport of components to site, thus avoiding large scale access road requirements. This project will also make use of the access roads provided for with the Brandvalley Wind Energy Facility, further reducing access road requirements.</p>	
17. How does the project fit into the National Development Plan for 2030?	Please explain
<p>The National Development Plan (NDP) is aimed at reducing and eliminating poverty in South Africa by 2030. It promotes sustainable and inclusive development in South Africa, in favour of a decent standard of living for all. The proposed distribution line fulfils 3 of the 12 key focus areas namely contributing to an economy that will create more jobs; improving infrastructure and transition to a low carbon economy. The NDP outlines the need for South Africa to increase production of electricity by 40,000 MW by 2030, 20,000 MW of this capacity has been proposed for production from renewable sources. The proposed project aims to be a contributor towards such target, by forming a vital link in the feasibility of the associated Brandvalley WEF, and by being the only means of benefiting the energy produced from the associated WEF.</p> <p>Integrated Energy Plan</p> <p>Furthermore, the proposed distribution line project is in line with the Integrated Energy Plan for the Republic of South Africa (2003) commissioned by then Department of Minerals and Energy (now the Department of Energy (DoE)) in response to the requirements of the National Energy Policy. The framework is intended to create a balance between energy demand and resource availability so as to provide low cost electricity for social and economic development, while taking into account health, safety and environmental parameters. This project would contribute to diversification of energy supply and the promotion of universal access to clean energy, by allowing for evacuation and beneficiation of the energy produced by the associated WEF.</p> <p>Integrated Resource Plan</p> <p>The Integrated Resource Plan (IRP 2010) for South Africa illustrates a clear need for renewable energy projection. The IRP was initiated by the DoE and lays the foundation for the country's energy combination up until 2030, and seeks to find an appropriate balance between the expectations of different stakeholders considering a number of key constraints and risks, including the reduction of carbon emissions; security of supply; Southern African regional development and integration and localisation and job creation. The Policy-Adjusted IRP includes recent development prices and issues allocations of 17.8GW for renewable energies, of the total 42.6GW new-build up to 2030 distributed to wind (8.4GW), concentrated solar power (1.0GW) and photovoltaic (8.4GW).</p> <p>REIPPPP</p> <p>Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), aims to promote and procure electricity generated by the private-sector from renewable energy sources. DoE has placed a target of 10 000 Gigawatt hours (GWh) of renewable energy power generation for the country. The REIPPPP initially aimed to procure 3725MW renewable energy by 2016, however in 2012 it was announced that an additional</p>	

3200MW of renewable energy would be procured and in August 2015, this allocation further increased by a renewable energy generation capacity of 6300 MW gazetted in a Ministerial determination (DoE, 2015).

As demonstrated above there is a need for renewable energy in South Africa. If the project is deemed feasible, Brandvalley Wind Farm intends to bid this wind farm under the REIPPP programme in order to supply the electricity generated to Eskom. This project (this application) would serve as ancillary infrastructure to the WEF project and would be indispensable in order to make use of the energy produced.

18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.

This proposed 132kV distribution line development has been adequately assessed by competent Environmental Assessment Practitioners and a team of specialists. All potential impacts that may have a significant impact on the receiving environment have been identified and adequately assessed as required by the NEMA 2014 EIA regulations and mitigation measures developed and the impact significance assessed. The conclusions of the Basic Assessment have been concisely summarised to adequately inform decision-making by the competent authority. A comprehensive Public Participation Process was also undertaken which conformed to requirements of the 2014 EIA Regulations. Furthermore, all Interested and Affected Parties were given ample time (as per the requirements of the EIA Regulations) to review and comment on all documents and reports and the affected landowners will be empowered to be able to state their concerns and issues adequately.

19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.

The principles of NEMA have been considered in this assessment through compliance with the requirements of the relevant legislation in undertaking the assessment of potential impacts, as well as through the implementation of the principle of sustainable development where appropriate mitigation measures have been recommended for impacts which cannot be avoided.

In addition, the successful implementation and appropriate management of this proposed project will aid in achieving the principle of minimisation of pollution and environmental degradation. This process has been undertaken in a transparent manner and all effort have been made to involve interested and affected parties, stakeholders and relevant Organs of State such that an informed decision regarding the project can be made by the Regulating Authority.

APPENDIX E: COMMENTS FROM HERITAGE RESOURCES AGENCIES

Notification of Intent to Develop: POWER LINE ALTERNATIVES AND SUBSTATION OPTIONS FOR THE RIETKLOOF WIND ENERGY FACILITY (WEF)

Our Ref:



an agency of the
Department of Arts and Culture

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CaseID: 9749

Date: Tuesday July 19, 2016
Page No: 1

Interim Comment

In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999)

Attention: EOH Coastal & Environmental Services (CES) - Cape Town
The Point, Suite 408,
4th Floor, 76 Regent Road, Sea Point
Cape Town | Western Cape | South Africa

PROPOSED POWER LINE ALTERNATIVES AND SUBSTATION OPTIONS FOR THE RIETKLOOF WIND ENERGY FACILITY (WEF) SITUATED IN THE WITZENBURG LOCAL MUNICIPALITY AND LAINGSBURG LOCAL MUNICIPALITY, CAPE WINELANDS AND CENTRAL KAROO DISTRICT MUNICIPALITIES.

EOH Coastal & Environmental Services have been appointed by Rietkloof Wind Farm (Pty) Ltd to conduct a Basic Assessment Process for the proposed 132kV electricity distribution line for the Rietkloof Wind Energy Facility (WEF). The proposed project is located in both the Northern Cape and the Western Cape Province. SAHRA cannot provide comments for projects located in the Western Cape Province. Comments regarding the section of the development within the Western Cape must be sought from Heritage Western Cape.

Celeste Booth was appointed to conduct the Heritage Impact Assessment (HIA) for the project.

Booth, 2016. A Phase 1 Archaeological Impact Assessment (AIA) for the Proposed Powerline Alternatives and Substations for the Brandvalley Wind Energy Facility (WEF) situated in the Karoo Hoogland Local Municipality (Namakwa District Municipality), the Witzenburg Local Municipality (Cape Winelands District Municipality) and Laingsburg Local Municipality (Central Karoo District Municipality)

As SAHRA cannot comment on project located within the Western Cape, only the results of the HIA pertaining to the Northern Cape will be discussed here.

A very small section of the proposed powerline is to be located within the Northern Cape. The final route of the proposed powerline was not finalised at the time of the survey, and the findings are a general summary of the survey conducted. No heritage resources were identified within the Northern Cape section of the proposed development.

Recommendations provided in the report include the following:

- Once the final layout of the powerline has been confirmed, an archaeological walk-through must be conducted to determine the positioning of the pylons and make further recommendations and

**Notification of Intent to Develop: POWER LINE ALTERNATIVES AND
SUBSTATION OPTIONS FOR THE RIETKLOOF WIND ENERGY FACILITY (WEF)**

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CaseID: 9749

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mitigation measures if necessary.

It must be noted that the Northern Cape section of the development is located within an area of very high palaeontological sensitivity.

Interim Comment

A Palaeontological Impact Assessment or a Letter for Exemption for further studies completed by a qualified palaeontologist must be completed before further comments can be provided. Additionally, the BAR and all appendices must be submitted to the case file so that an informed decision can be made.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

Natasha Higgitt
Heritage Officer
South African Heritage Resources Agency

John Gribble
Manager: Maritime and Underwater Cultural Heritage Unit / Acting Manager: Archaeology, Palaeontology and
Meteorites Unit
South African Heritage Resources Agency

ADMIN:

**Notification of Intent to Develop: POWER LINE ALTERNATIVES AND
SUBSTATION OPTIONS FOR THE RIETKLOOF WIND ENERGY FACILITY (WEF)**

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Direct URL to case: <http://www.sahra.org.za/node/365022>
(DEA, Ref:)

Terms & Conditions:

1. This approval does not exonerate the applicant from obtaining local authority approval or any other necessary approval for proposed work.
2. If any heritage resources, including graves or human remains, are encountered they must be reported to SAHRA immediately.
3. SAHRA reserves the right to request additional information as required.