




**RENOSTERBERG WIND ENERGY COMPANY
(RWECC)**

Proposed Wind Farm Facility

Heritage Scoping Report

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Executive Summary

PGS Heritage & Grave Relocation Consultants (PGS) was appointed by Sivest Environmental Division to undertake a Heritage Scoping Report that forms part of the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the Proposed Wind Farm Facility for Renosterberg Wind Energy Company (RWEC) near Petrusville, Northern Cape Province.

Heritage resources are unique and non-renewable and as such any impact on such resources must be seen as significant.

The Heritage Scoping Report has shown that the Renosterberg area may have heritage resources present on the property. This has been confirmed through archival research and evaluation of aerial photography of the sites.

The archival research have indicated the definite existence of archaeological find in the study area and palaeontological finds just outside the study area.

These findings provide the basis for the recommendation of further field thruthing through an archaeological walk down and palaeontological study covering the areas to be impacted. The aim of this will be to compile a comprehensive database of heritage sites in the study areas, with to develop a heritage management plan for inclusion in the Environmental Management Plan as derived from the EIA.

RENOSTERBERG WIND ENERGY COMPANY (RWEC)

HERITAGE SCOPING REPORT

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1 INTRODUCTION

PGS Heritage & Grave Relocation Consultants (PGS) was appointed by Sivest Environmental Division to undertake a Heritage Scoping Report that forms part of the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the Proposed Wind Farm Facility for Renosterberg Wind Energy Company (RWEC) near Petrusville, Northern Cape Province.

1.1 Scope of the Study

The aim of the study is to identify possible heritage sites and finds that may occur in the impact areas identified for the EIA study. The Heritage Impact Assessment aims to inform the Environmental Impact Assessment in the development of a comprehensive Environmental Management Plan to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999) (NHRA).

1.2 Assumptions and Limitations

The aim of the scoping document is to identify the possible types of heritage resources that might be present in the study area, as well as possible hotspots for the locality of such resources.

This report can in no way be seen as the final report and study phase for the EIA project and it assumes that a full ground thruthing and survey will be conducted during the EIA phase of the project to identify heritage sites present in the impacted areas.

1.3 Legislative Context

The identification, evaluation and assessment of any cultural heritage site, artefact or find in the South African context is required and governed by the following legislation:

- National Environmental Management Act (NEMA), Act 107 of 1998
- National Heritage Resources Act (NHRA), Act 25 of 1999
- Mineral and Petroleum Resources Development Act (MPRDA), Act 28 of 2002
- Development Facilitation Act (DFA), Act 67 of 1995

The following sections in each Act refer directly to the identification, evaluation and assessment of cultural heritage resources.

- National Environmental Management Act (NEMA) Act 107 of 1998
 - Basic Environmental Assessment (BEA) – Section (23)(2)(d)
 - Environmental Scoping Report (ESR) – Section (29)(1)(d)
 - Environmental Impact Assessment (EIA) – Section (32)(2)(d)
 - Environmental Management Plan (EMP) – Section (34)(b)
- National Heritage Resources Act (NHRA) Act 25 of 1999
 - Protection of Heritage Resources – Sections 34 to 36; and
 - Heritage Resources Management – Section 38
- Mineral and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
- Section 39(3)
- Development Facilitation Act (DFA) Act 67 of 1995
 - The GNR.1 of 7 January 2000: Regulations and rules in terms of the Development Facilitation Act, 1995. Section 31.

The NHRA stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority. Section 34(1) of the NHRA states that, “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...” The NHRA is utilized as the basis for the identification, evaluation and management of heritage resources and in the case of CRM those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through NEMA, MPRDA and the DFA legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorizations are granted for development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impacts Processes required by NEMA and MPRDA. This change requires us to evaluate the Section of these Acts relevant to heritage (Fourie, 2008):

The NEMA 23(2)(b) states that an integrated environmental management plan should, “...identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage”.

A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken account of in the Regulations under NEMA is the Specialist Report requirements laid down in Section 33 of the regulations (Fourie, 2008).

Refer to for further information on the interpretation of heritage Appendix A.

Terminology

ABBREVIATIONS	DESCRIPTION
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
DWA	Department of Water Affairs
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
LSA	Late Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
MIA	Middle Iron Age
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Authority
PSSA	Palaeontological Society of South Africa
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency

▪ **Archaeological resources**

This includes:

- material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;
- rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is

older than 100 years, including any area within 10m of such representation;

- wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;
- features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

▪ **Cultural significance**

This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance

▪ **Development**

This means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in a change to the nature, appearance or physical nature of a place or influence its stability and future well-being, including:

- construction, alteration, demolition, removal or change in use of a place or a structure at a place;
- carrying out any works on or over or under a place;
- subdivision or consolidation of land comprising a place, including the structures or airspace of a place;
- constructing or putting up for display signs or boards;
- any change to the natural or existing condition or topography of land; and
- any removal or destruction of trees, or removal of vegetation or topsoil

▪ **Early Stone Age**

The archaeology of the Stone Age between 700 000 and 2 500 000 years ago.

▪ **Fossil**

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

▪ **Heritage**

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

▪ **Heritage resources**

This means any place or object of cultural significance

- **Holocene**

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

- **Late Stone Age**

The archaeology of the last 20 000 years associated with fully modern people.

- **Late Iron Age (Early Farming Communities)**

The archaeology of the last 1000 years up to the 1800's, associated with iron-working and farming activities such as herding and agriculture.

- **Middle Stone Age**

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

- **Palaeontology**

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

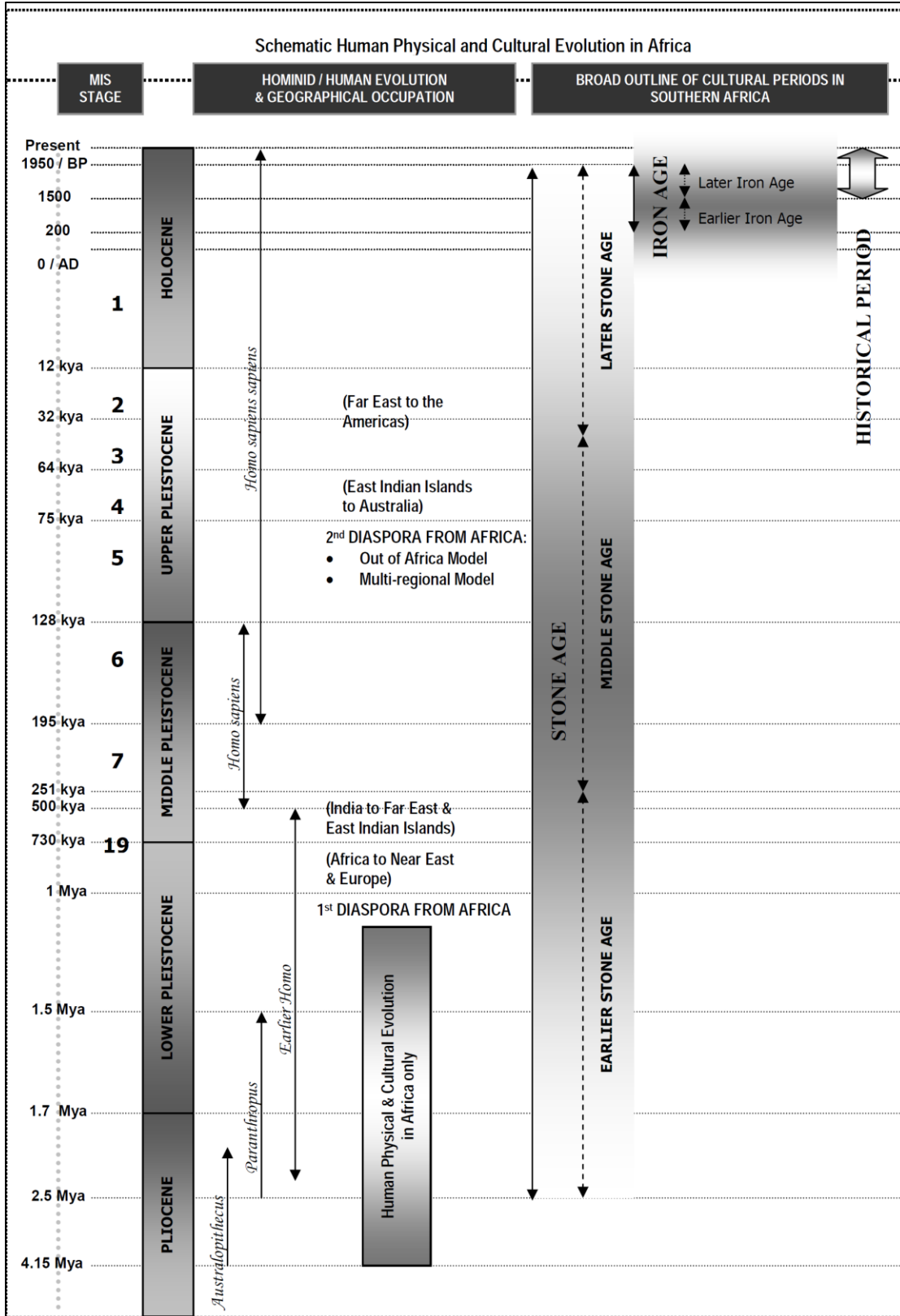


Figure 1 – Human and Cultural Timeline in Africa (Morris, 2008)

2 TECHNICAL DETAILS OF THE PROJECT

2.1 Site Location and Description

Location	30°25'36.17"S 23°59'3.16"E The site is 18km North of the town of De Aar and 40 km west of Philipstown in the Northern Cape
Land	8,000 Hectares of land under option, expect to subdivide areas as needed.

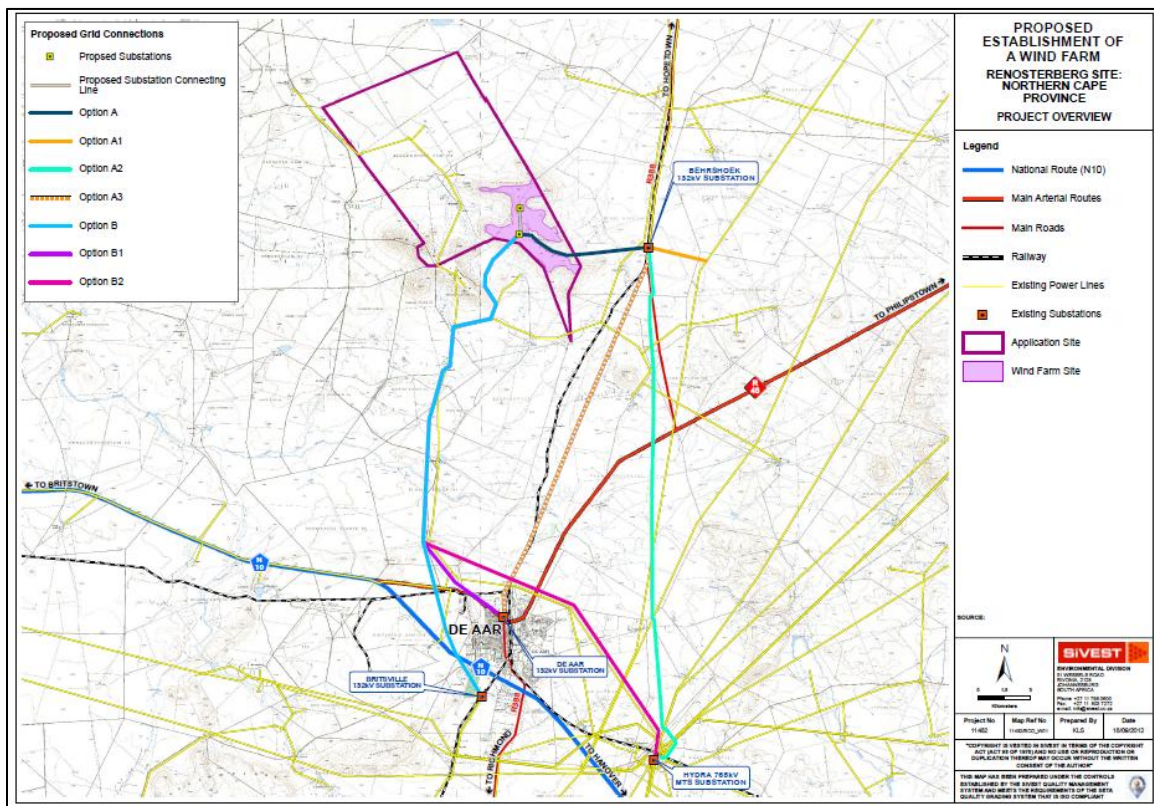


Figure 2 – Renosterberg Wind Project locality

2.2 Technical Project Description

Refer to **Appendix B** for description of the Wind Farm technical details.

3 ASSESSMENT METHODOLOGY

The section below outlines the assessment methodologies that will be utilised in the final detailed study of the site for the Heritage Impact Report.

This chapter describes the evaluation criteria to be utilised during the EIA phase for the evaluation of the heritage significance of heritage resources to be identified during the field work in the EIA report.

The significance of archaeological sites was based on four main criteria:

- site integrity (i.e. primary vs. secondary context),
- amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter)
 - Low - <10/50m²
 - Medium - 10-50/50m²
 - High - >50/50m²
- uniqueness; and
- potential to answer present research questions.

Management actions and recommended mitigation, which will result in a reduction in the impact on the sites, will be expressed as follows:

- A - No further action necessary;
- B - Mapping of the site and controlled sampling required;
- C - No-go or relocate pylon position
- D - Preserve site, or extensive data collection and mapping of the site; and
- E - Preserve site

Impacts on these sites by the development will be evaluated as follows

3.1 Impact

The potential environmental impacts that may result from the proposed development activities.

2.1.1 Nature and existing mitigation

Natural conditions and conditions inherent in the project design that alleviate (control, moderate, curb) impacts. All management actions, which are presently implemented, are considered part of the project design and therefore mitigate impacts.

3.2 Evaluation

Site Significance

Site significance classification standards prescribed by the South African Heritage Resources Agency (2006) and approved by the Association for Southern African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region, were used for the purpose of this report.

Table 2: Site significance classification standards as prescribed by SAHRA

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade 1	-	Conservation; National Site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Site nomination
Local Significance (LS)	Grade 3A	High Significance	Conservation; Mitigation not advised
Local Significance (LS)	Grade 3B	High Significance	Mitigation (Part of site should be retained)
Generally Protected A (GP.A)	-	High / Medium Significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium Significance	Recording before destruction
Generally Protected C (GP.A)	-	Low Significance	Destruction

4 ARCHIVAL FINDINGS

The aim of the archival background research is to identify possible heritage resources that could be encountered during the field work. The archival research included in this report covers the larger study area and will be updated with detailed information based on discussions with the local landowners and inhabitants during the field work in the EIA phase of the HIA.

Evaluation of archaeological work completed on the Perseus Hydra Transmission line that traverses the eastern section of the study area have produced some ground thruthed information on archaeology to be expected in the study area. Further to this Archaeological Impact Assessments (AIA) and Heritage Impact Assessments (HIA) completed by Archer, Kaplan (2010), Kruger (2012), Orton (2012), PGS (2012) and Van Ryneveld (2008), has revealed a rich archaeological and historical back ground to the greater study area ranging from Earlier Stone Age (ESA) through to the Later Stone Age (LSA) and herder settlements represented by

stonewalled kraals along numerous ridges throughout the study area (**Figure 3**). The colonial period is represented by abandoned and current historical farmsteads dating from the mid to late 1800's (Kruger 2012, Orton, 2012 and PGS, 2011), while remnants of stone walling and ash middens dating from the turn of the 20th Century representing the South African War (Orton, 2012 and PGS, 2012).

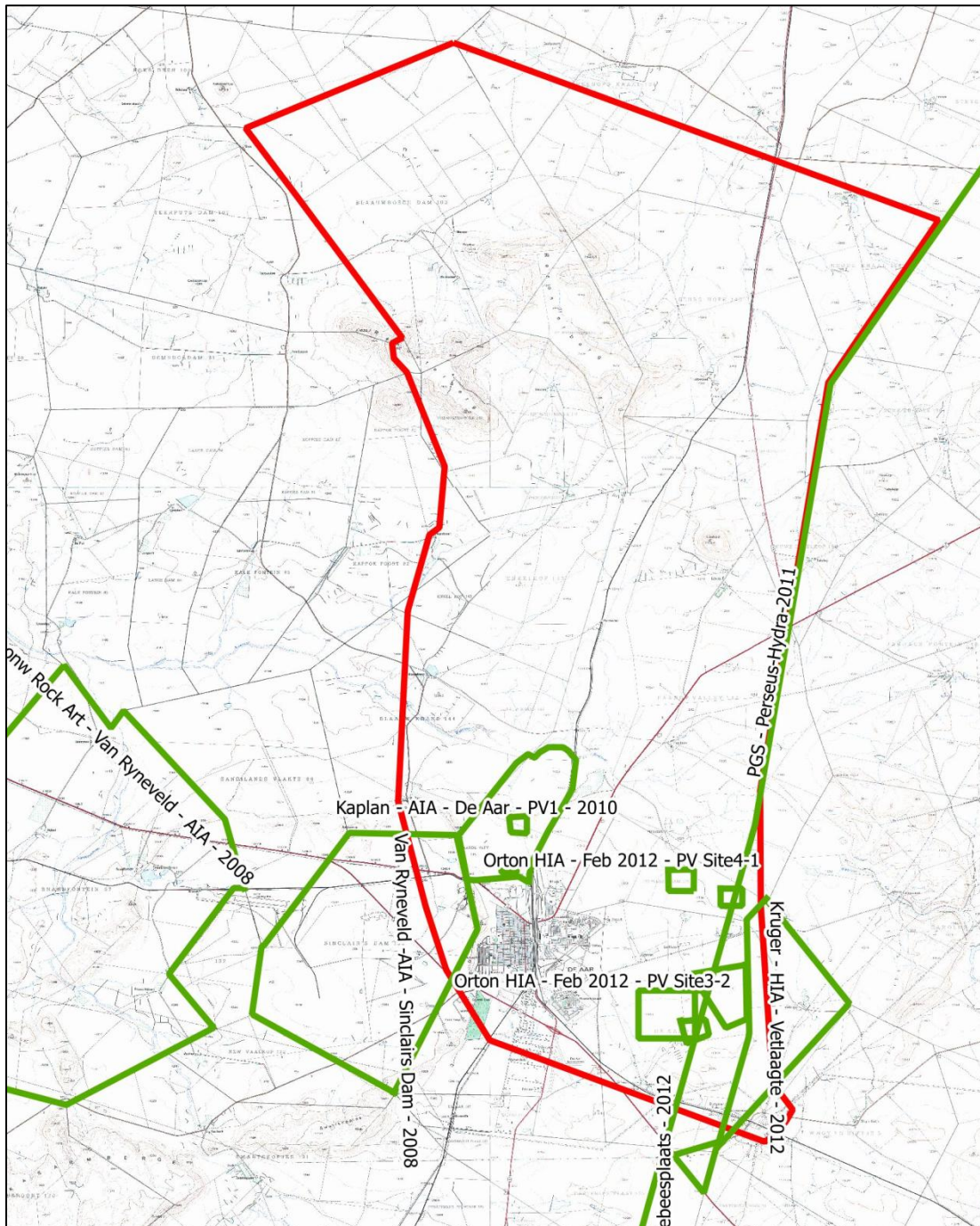


Figure 3 – The study area for this Scoping Report (red) with previous heritage studies conducted indicated (green)

Initial desktop studies completed created a map indicating that area exposed to sheet erosion produced more Stone Age finds as deflated site was exposed during erosion (**Figure 4**).

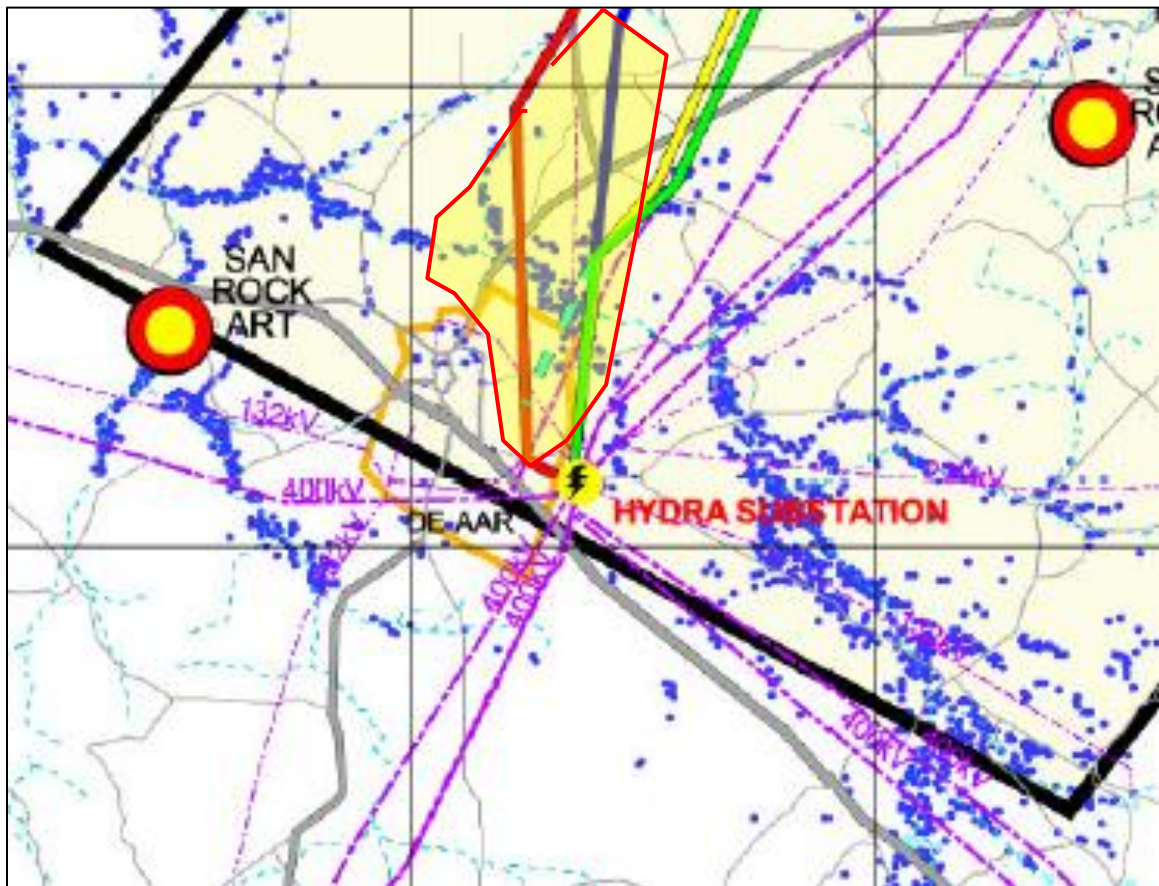


Figure 4 – The greater De Aar region indicating San Rock Art finds – Blue spot indicate areas of sheet erosion (Red outline study area) (Van Jaarsveld, 2006)

Follow up field work by PGS Heritage & Grave Relocation Consultants, have provided some valuable information on the archaeology and palaeontology in the study area where the Perseus Hydra line traverses the study area.

- **Archaeology**

The PGS (2010) revealed numerous find spots from single low concentration Stone Age finds (**Figure 5**) in eroded areas to larger significant Middel Stone Age Scatters (**Figure 6**) in the sections of the study area impacted by the Perseus Hydra Transmission line that runs east of the Renosterberg down to De Aar.



Figure 5 – Low density scatter of MSA finds



Figure 6 – Area scattered with eroded MSA artefacts – Renosterberg in the background

- **Historical Context**

De Aar Junction played key strategic role during the South Africa War (Anglo-Boer War) and specifically two battles: the Battle of Stormberg and the Battle of Colenso. It acted as both the supply strategic place between Cape Town and the west central regions of South Africa

through the Karoo, which remained devoid of any battles during the war. It is located central western region of the country, South Africa.

The town of De Aar was established just after the South African War after two Friedlander brothers, Isaac and Wolf, surveyed the land on farm De Aar which they had purchased during the construction of a junction in the late 1800's when the railway line between Cape Town and Kimberley was built. The site for the construction of the junction was first identified in 1881 and by 1899 the Friedlander brothers were already operating a trading store and a hotel at the junction. It is during this time that they purchased the farm De Aar which the later built the town of De Aar in 1900. However, it took another 5 years after the war had ended (1902) and 6 years after the creation of the town municipality (1900) for the town to elect its first municipal mayor in 1907. The name, De Aar, means 'Artery' after the underground water supply and is the second most important South African rail junction.

Understanding the Importance of De Aar during the Second South Africa War

Two South African war battles become important in the history of De Aar; the Battle of Stormberg and the Battle of Colenso. The Battle of Stormberg was one of the famous encounters between the Boers and the British in the South African war. This skirmish/battle took place when the Boers were triumphant and it formed part of a chain of disasters which the British termed the 'The Black Week' (Meintjes, 1969).

The first involvements of De Aar in the war can be dated to November 1899 when the Boers moved southward from the areas of their strong hold the Orange Free State and the Transvaal. On the 1st of November 1899 a small detachment of Boers from the Orange Free State, had seized the railway bridge over the Orange River at Norvalspont. This bridge was at the time guarded by only six policemen who were quickly overcome by the Boers. On the same day Hans Swanepoel of Smithfield and Floris du Plooy of Bethulie with a combined commando of 900 men and two guns crossed the Bethulie bridges over the Orange River and headed from Naauwpoort and Stormberg (Meintjes, 1969). Up until this time the Boers are argued to have deliberately avoided and neglected to occupy some of the principal railway junctions in the Colony, notably: De Aar, Naauwpoort and Stormberg (ibid).

Idea to deliberately neglect these junctions is argued to have been aimed at offending the Schreiner Ministry based on an agreement made between Steyn and Schreiner, which Steyn withdrew in consultation with President Kruger of the Transvaal after it became apparent that the Cape could play a significant role in the war. Steyn then issued proclamations in which parts of the British Bechuanaland and the Northern Cape were annexed to the two Boer Republics, the Transvaal and the Orange Free State. The reason behind these annexations is that, they were made to "...permit commandeering of men and supplies as well as to protect rebels who annexed territories of the Cape Colony and the Protectorate would be guilty of High Treason and perhaps be punishable by execution" (Meintjes, 1969).

When hostility between the British and the Boers across the Orange River commenced, the British had small garrisons at Stormberg Junction, Albert Road, Aliwal North, Norvalspont, Colesberg, Arundel and Naauwpoort (Meintjes, 1969). However, they had no garrison in De Aar which was one of the key strategic supply and distribution junctions. The garrisons along some of the railway line and stations were strategic as the railway lines formed an integral part of the British offensive. During the war they therefore played a significant role throughout South Africa and their disruption became a major target for the Boers; for example, during the capture of armoured train at Kraaipan by De le Ray where the first shots of the war were fired.

Stormberg Junction was chosen as a target junction of annexation, over De Aar Junction, by the Boers advancing south because of its link-up with East London and was an important strategic point for a sprong up through the eastern Cape to Bloemfontein and Kimberley.

De Aar did, however, play a role during the war times as a stop and transfer junction with the transportation of British brigades and Naval Police from Cape Town to the central interior and for the transportation and transfer of supplies. The Naval Brigades who fought in the Stormberg skirmish pass through the large railway junction De Aar then described as a ‘...dreary sight of platforms and dusty trains, tin shanties and corrugated iron houses, gray boulders and ashy sky...’ (Meintjes, 1969).

The De Aar junction further acted as a major stockpile for stores to be sent forward to the British forces. Doyle (1902) noted that “immense” supplies were gathered at De Aar (**Figure 7**). Danes (1903) writes, “...*De Aar was a wonderful sight in those days. Hundreds of mules and oxen were there. Countless wagons, packages and cases of food and ammunition, ambulances, hospitals, medical stores...*”



Figure 7 – Stockpiles of oats at De Aar (ca. 1900)

This stock piling was due to De Aar being a stopover and staging post for troops and supplies towards the Free State and access point from the Cape and Port Elizabeth. A large Remount Depot (Horse and Mule replenishment) was also present at De Aar, which provided much needed fresh horses and mules for the war effort (**Figure 8**).



Figure 8 – The Remount Depot Garrison at De Aar (December 1899)

Among the people of Note who passed through De Aar during the war is Winston Spencer Churchill. This is during the time when various war correspondents were travelling between the Cape, the Eastern Cape, Northern Cape and the Transvaal. It is suggested that, after staying at the Mount Nelson Hotel in Cape, Churchill travelled by rail to East London, via Matjiesfontein, De Aar, Stormberg, Molteno and Queenstown.

During the Colenso Battle, De Aar was used by the British to transfer guns between the Cape Town, the central interior and the Natal region such as, the long Tom-tom guns. The reason for this is that they were encountering hostile enemy lines along the east coast regions of the country (Martins, 1988). Nasson (1999: 135), for example, argues that “the failure of Black Week had prised things open, almost inviting a capitalizing counterstroke from some bold and resolute Boer leadership. Exposed to a broader offensive, the Cape Colony virtually asked for deeper penetration to throttle the strategic junction of De Aar, thereby severing Methuen’s supply lines. On the eastern front, almost all of Natal remained under the enemy thumb, with the British confined or paralysed by the Orange Free State

commandos who, in their most southerly groupings, had pegged out substantial swathe of land running down to within 120miles of the Indian Ocean”.

5 POSSIBLE FINDS

Evaluation of aerial photography has indicated the whole of the study area that may be sensitive from a heritage resources perspective (**Figure 9**). Archaeological surveys and studies in the Northern Cape have shown rocky outcrops, dry river, riverbanks and confluence to be prime localities for archaeological finds and specifically Stone Age sites. Included in the archaeological timeframe is the South African War as well as colonial farmer settlements.

The aerial photography has reference the following asof possible heritage sensitivity:

Drainage lines

Drainage lines, such as dry river beds, erosion dongas as well as sheet erosion has been shown to yield rich archeological deposits due to the exposure of archaeological material as well as the fact that human settlement is drawn to water sources in arid regions (Kruger 2012; Orton 2012; PGS 2012).

Farmsteads

Most of the farmsteads in the study area date from the mid to late 1800's and are of great historical and significance r (Kruger 2012; Orton 2012; PGS 2012).

Structures

Numerous structures and outlines of man mad structures have been identified and rated as possible sensitive heritage resources from the aerial survey. Some of the early settler farmsteads have been abandoned for close to 100 years and only the remnants of the walling, middens and paddocks remain. These sites can be of high heritage significance regions (Kruger 2012; Orton 2012; PGS 2011).

Pans

Previous research in the Northern Cape has shown that as with drainage line and rivers human occupation is drawn to pans and ephemeral water sources by the chance of water and of hunting due to the availability of game in such areas.

Ridges

Numerous ridges, koppies and mountains have been identified in the study area and AR associated with human settlement and activity. Stonewalling from herders, rock engravings and knapping sites associated with Later Stone Age manufacturing technology is known to occur in these areas (Kruger 2012; Orton 2012; PGS 2011 and 2012, Van Ryneveld 2008).

South African War

The archival research has shown that De Aar was a major staging post during the South African War. Along with the infrastructure and remnants found close to town, the railway line running northwards through the study area will have the remains of numerous blockhouse, constructed by the British Forces to protect the railway line from attack, in close vicinity.

Sensitive areas as indicated from previous HIA's

Sensitive areas as identified in previous HIA's and AIA's have been included in the mapping and are in all cases associates with one or more of the categories listed above.

To be able to compile a heritage management plan to be incorporated into the Environmental Management Plan the following further work will be required for the EIA.

- Archaeological walk through of the areas where the project will be impacting will be able to provide a detailed inventory of the heritage resources of the area;
- Palaeontological assessment of the areas and selective site visits where required by the palaeontologist – already commissioned as part of the EIA study;

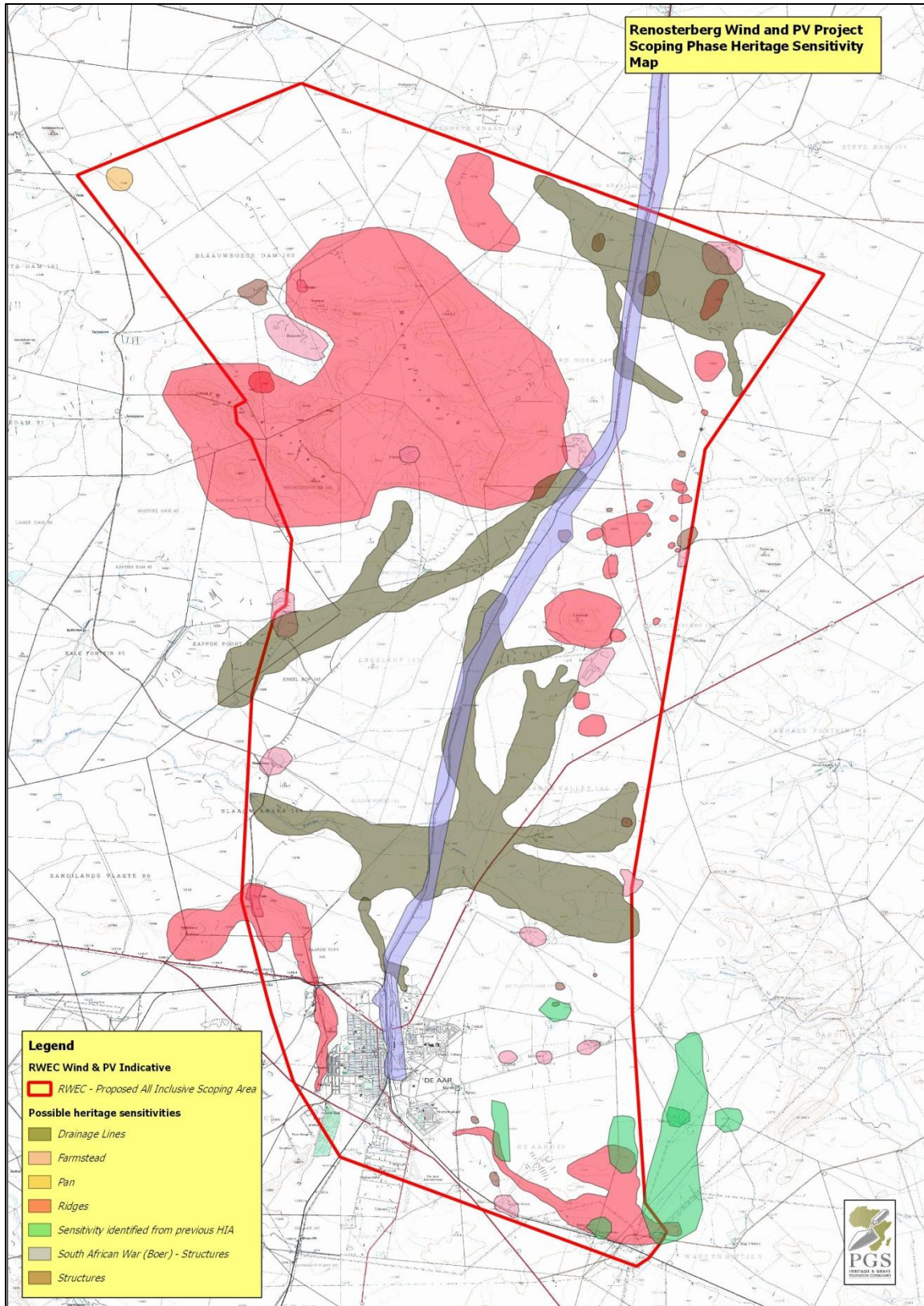


Figure 9 – Areas with possible heritage resources present

5.1 Environmental Issues and Potential Impacts

ISSUE	Impact on archaeological sites
DISCUSSION	As seen from the archival work and discussion in Section 4 the possibility of archaeological finds have been identified as being high and thus further field work is required to develop a comprehensive Heritage Management Plan.
EXISTING IMPACT	None known
PREDICTED IMPACT	Unidentified archaeological sites and the discovery of such sites during construction can seriously hamper construction timelines. Field work can thus provide valuable information on such site in the study area and provide timeous management of such site through realignment of development or mitigation of such sites where needed.
EIA INVESTIGATION REQUIRED	Archaeological walk down of impact areas
CUMULATIVE EFFECT	None foreseen at this stage.

ISSUE	Impact on palaeontological sites
DISCUSSION	As seen from the archival work and discussion in section 4.1-4.3 the possibility of palaeontological finds have been identified as being high and thus further field work is required to develop a comprehensive Heritage Management Plan.
EXISTING IMPACT	Site impacted by existing developments such as transmission lines and road networks.
PREDICTED IMPACT	Unidentified archaeological sites and the discovery of such sites during construction can seriously hamper construction timelines. Field work can thus provide valuable information on such site in the study area and provide timeous management of such site through realignment of development or mitigation of such sites where needed.
EIA INVESTIGATION REQUIRED	Further palaeontological desktop work as well as selected ground thruthing as required by palaeontologist
CUMULATIVE EFFECT	None foreseen at this stage.

ISSUE	Impact on historical sites
DISCUSSION	As seen from the archival work and discussion in Section 4 the possibility of historical finds have been identified as being high and thus

	further field work is required to develop a comprehensive Heritage Management Plan.
EXISTING IMPACT	None known
PREDICTED IMPACT	Unidentified historical structure and the discovery of such structures during construction can seriously hamper construction timelines. Field work can thus provide valuable information on such site in the study area and provide timeous management of such site through realignment of development or mitigation of such sites where needed.
EIA INVESTIGATION REQUIRED	Archaeological walk down of impact areas will identify possible impacted sites
CUMULATIVE EFFECT	None foreseen at this stage.

ISSUE	Impact on graves and cemeteries site
DISCUSSION	The existence of graves and cemeteries has not been verified during the archival research. It has however been found that such structures are rarely noted in maps and documents and can only really be identified during field work.
EXISTING IMPACT	None known
PREDICTED IMPACT	Unidentified graves and cemeteries and the discovery of such structures during construction can seriously hamper construction timelines. In the event that these graves and cemeteries could not be avoided a grave relocation proses needs to be started. Such a process impacts on the spiritual and social fabric of the next of kin and associated communities. Field work can thus provide valuable information on such site in the study area and provide timeous management of such site through realignment of development or relocation of such sites where needed.
EIA INVESTIGATION REQUIRED	Archaeological walk down of impact areas will identify possible impacted sites
CUMULATIVE EFFECT	None foreseen at this stage.

6 CONCLUSIONS AND RECOMMENDATIONS

Heritage resources are unique and non-renewable and as such any impact on such resources must be seen as significant.

The Heritage Scoping Report has shown that the Renosterberg area may have heritage resources present on the property. This has been confirmed through archival research and evaluation of aerial photography of the sites.

The archival research has indicated the definite existence of archaeological find in the study area and palaeontological finds just outside the study area.

These findings provide the basis for the recommendation of further field thruthing through an archaeological walk down and palaeontological study covering the areas to be impacted. The aim of this will be to compile a comprehensive database of heritage sites in the study areas, with to develop a heritage management plan for inclusion in the Environmental Management Plan as derived from the EIA.

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Appendix A

LEGISLATIVE PRINCIPLES

LEGISLATIVE REQUIREMENTS – TERMINOLOGY AND ASSESSMENT CRITERIA

3.1 General principles

In areas where there has not yet been a systematic survey to identify conservation worthy places, a permit is required to alter or demolish any structure older than 60 years. This will apply until a survey has been done and identified heritage resources are formally protected.

Archaeological and palaeontological sites, materials, and meteorites are the source of our understanding of the evolution of the earth, life on earth and the history of people. In the new legislation, permits are required to damage, destroy, alter, or disturb them. People who already possess material are required to register it. The management of heritage resources are integrated with environmental resources and this means that before development takes place heritage resources are assessed and, if necessary, rescued.

In addition to the formal protection of culturally significant graves, all graves, which are older than 60 years and are not in a cemetery (such as ancestral graves in rural areas), are protected. The legislation protects the interests of communities that have interest in the graves: they may be consulted before any disturbance takes place. The graves of victims of conflict and those associated with the liberation struggle will be identified, cared for, protected and memorials erected in their honour.

Anyone who intends to undertake a development must notify the heritage resource authority and if there is reason to believe that heritage resources will be affected, an impact assessment report must be compiled at the developer's cost. Thus, developers will be able to proceed without uncertainty about whether work will have to be stopped if an archaeological or heritage resource is discovered.

According to the National Heritage Act (Act 25 of 1999 section 32) it is stated that:

An object or collection of objects, or a type of object or a list of objects, whether specific or generic, that is part of the national estate and the export of which SAHRA deems it necessary to control, may be declared a heritage object, including –

- objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, meteorites and rare geological specimens;
- visual art objects;
- military objects;
- numismatic objects;
- objects of cultural and historical significance;
- objects to which oral traditions are attached and which are associated with living heritage;
- objects of scientific or technological interest;
- books, records, documents, photographic positives and negatives, graphic material, film or video or sound recordings, excluding those that are public records as defined in section 1 (xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996), or in a provincial law pertaining to records or archives; and
- any other prescribed category.

Under the National Heritage Resources Act (Act No. 25 of 1999), provisions are made that deal with, and offer protection, to all historic and pre-historic cultural remains, including graves and human remains.

3.2 Graves and cemeteries

Graves younger than 60 years fall under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925) as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the Office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning, or in some cases the MEC for Housing and Welfare. Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. In order to handle and transport human remains the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act) as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the South African Heritage Resource Agency (SAHRA). The procedure for Consultation Regarding Burial Grounds and Graves (Section 36(5) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administered by a local authority. Graves in the category located inside a formal cemetery administered by a local authority will also require the same authorisation as set out for graves younger than 60 years over and above SAHRA authorisation.

If the grave is not situated inside a formal cemetery but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws set by the cemetery authority must be adhered to.



Appendix B

PROJECT DESCRIPTIONS

7.1 Wind Farm Technical Description

At this stage, it is estimated that the proposed project will encompass the installation of a number of wind turbine generators and their associated components in order to generate electricity that is to be fed into the existing Eskom distribution and/or transmission lines that cross or are located nearby the proposed site. The total power generation capacity limit and the number of wind turbines to be accommodated will ultimately depend on the size of the developable area which will be determined by the EIA. However, it is currently envisaged that approximately 83-138 wind turbines (depending on the maximum output capacity of each wind turbine) are to be developed covering a total area of approximately with a cumulative generation capacity of approximately 250 Megawatts (MW). The maximum output capacity of each wind turbine may range from 1.8 to 3 MW each. The voltage of the connection lines from the wind farm substation to the grid will be dependent on the total generation capacity and the actual available connection as to be determined by Eskom at a later stage.

7.1.1 Turbines

Ultimately, the size of the wind turbines will depend on the developable area and the total generation capacity that can be produced as a result. The wind turbines will have a hub height of between 80 to 125m and a rotor diameter of 80 to 112m (Figure 10). The blade rotation direction will depend on wind measurement information received later in the process. The rotation will range from 6 to 20 rpm. The foundation of each wind turbine will be approximately 18m x 18m. The footprint for each wind turbine will therefore be approximately 324m². A hard standing area, of between 50m x 25m (assuming a compact mobile crane) or 150m x 25m (assuming a traditional crawler crane) is anticipated for crane usage for each wind turbine. The total hard standing area will therefore either be 1 250m² or 3 750m² depending on which crane type will be used. This will be decided on at a later stage in the proposed development based on environmental constraints and design factors. The total footprint for each wind turbine and the associated hard standing area will either be 1 574m² or 4 074m². The foundation will be up to 4m deep.

As already mentioned, it is anticipated at this stage that 83-138 wind turbines will be constructed. The total area for all the wind turbines for the Renosterberg study site will therefore be between approximately 26 892m² and approximately 44 712m² (not including the hard standing areas).

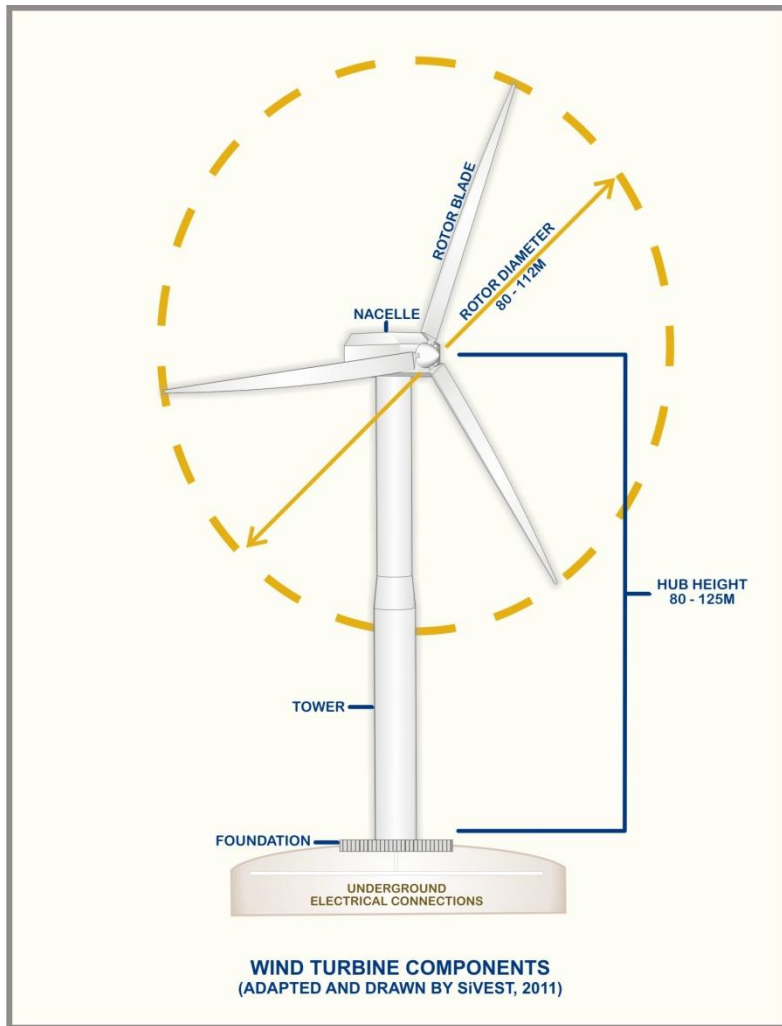


Figure 10: Typical Components of a wind turbine

7.1.2 Electrical Connections

The wind turbines will be connected to each other and to a substation using buried 33kV voltage cables (Figure 11) except where a technical assessment of the proposed design suggests that overhead lines are appropriate such as over rivers and gullies. Where overhead power lines are to be constructed, the connection will be established using either pole or pylon structures depending on the voltage. The dimensions of the monopole structures will depend on grid safety requirements and the grid operator. No servitudes will be associated with the wind farm infrastructure although servitudes for Eskom infrastructure may be required on site. As previously mentioned, the electrical connection to the grid will be dependent on the total generation capacity and the actual available connection as determined by Eskom.

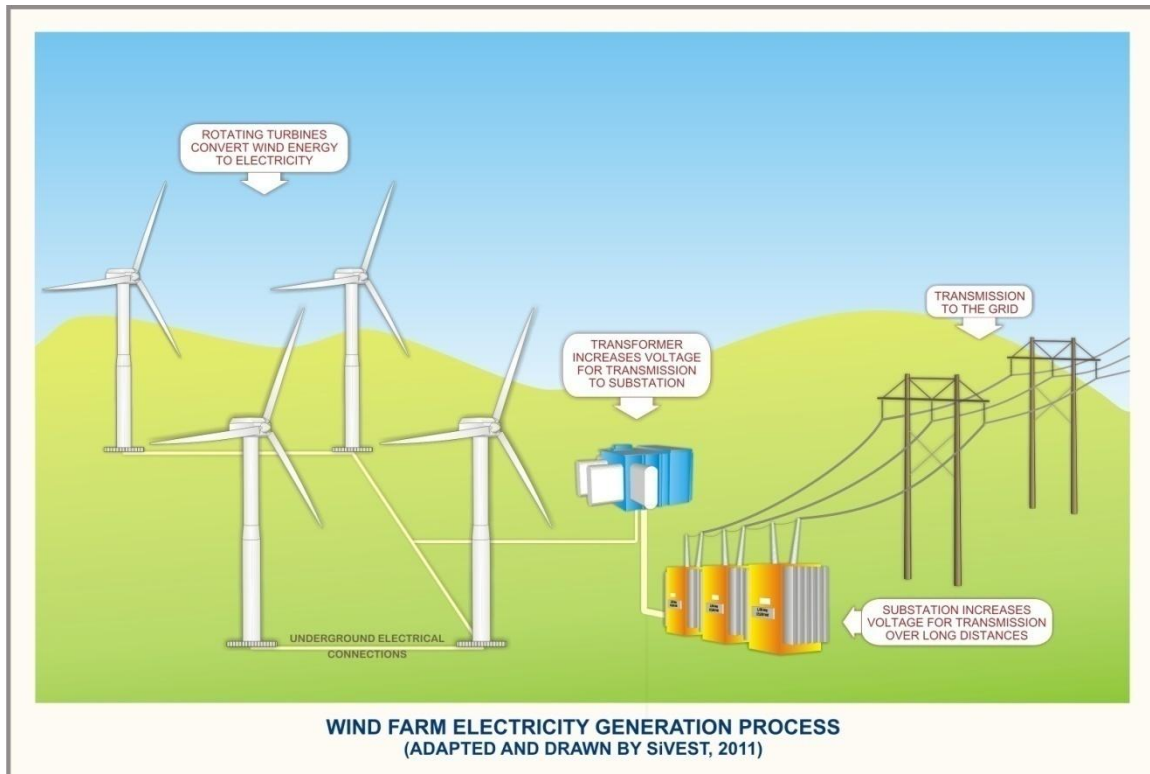


Figure 11: Conceptual wind farm electricity generation process showing electrical connections

At this stage a number of power line route alternatives have been proposed (Figure 3) and will be further investigated in the EIA phase. The proposed alternatives may either link into existing lines in which case a switchyard will also be required, or alternatively establish a completely new line that will link into an existing Eskom substation. A number of potential Eskom substations have preliminarily been identified including Behrshoek 132kV Distribution Substation, De Aar 132kV Distribution Substation, Britsville 132kV Distribution Substation and Hydra 765kV Transmission Substation.

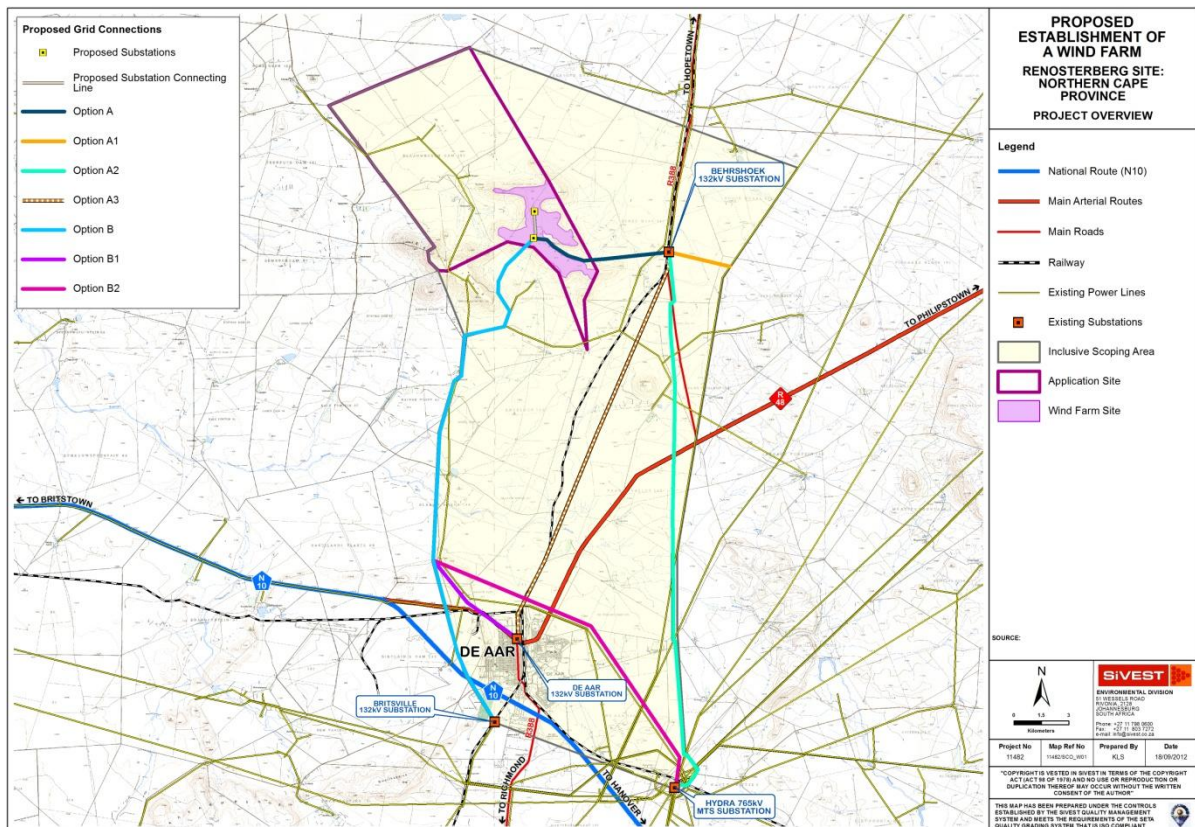


Figure 12: Wind farm grid connection options

7.1.3 Substation

A new substation and associated transformers will be developed which will supply the generated electricity to the Eskom grid. The distribution substation will ideally be located in close proximity to the existing power lines where possible to limit impact. The substation will be a transmission substation and will include transformer bays which will contain transformer oils. Bunds will be constructed to ensure that any oil spills are suitably attenuated and not released into the environment. The substation will be securely fenced.

Where the substation is beside the line, the connection to the line will be via drop-down conductors. Where the line is remote from the substation, the connection will be by overhead line, using either pole or pylon structures depending on the voltage.

7.1.4 Roads

The access roads are proposed to be 5-8m wide. The roads are anticipated to be gravel roads from the site on to the public road. However, mountain access to the Renosterberg Plateau may require

upgrading in order to ensure geometric and load bearing suitability for the transportation of the wind turbine components. An internal road network to the turbines and other infrastructure will include:

- Turning circles for large trucks (where required);
- Passing points and culverts over gullies and rivers (where required); and
- Existing roads will be upgraded (where required).

7.1.5 Building infrastructure

The solar field will require an onsite building which will relate to the daily operation of the plant. The solar PV power plant will therefore require an administration building (office). Potential locations for the administration building will be determined at a later stage in the EIA process based on environmental constraints and design factors. The buildings will likely be a single storey building approximately 150 to 350m² which will be required to accommodate the following:

- Control room
- Workshop
- High Voltage (HV) switchgear
- Mess Room
- Toilets
- Supervisory Control And Data Acquisition (SCADA) Room
- Storeroom

7.1.6 Construction Lay-down Area

A general construction lay-down area will be required for the construction phase of the proposed solar PV power plant. The area may be up to approximately 80 hectares in size. However, this is likely to be smaller. The location of the construction lay-down area will be determined at a later stage in the EIA process based on environmental constraints and design factors.

7.2 Alternatives

In terms of the EIA regulations, feasible and reasonable alternatives are required to be considered through the EIA process. Layout Alternatives and the no-go alternative were thus considered in this draft Scoping Report.

The map (Figure 12) below illustrates the provisional wind farm layout in terms of the alternatives being assessed. Layout alternatives relate mainly to the associated infrastructure at this stage of the proposed development. At this stage, substation and grid connection alternatives have been investigated (elaborated on below). Alternative locations for the administration building and construction lay-down area will be investigated at a later stage in the EIA process based on environmental constraints and design factors.

7.2.1 Wind Farm Substation

At this stage, two alternative locations have been proposed as potential locations for the substation (Figure 3 above). Substation Alternative 1 is located in the central regions of the Renosterberg Plateau towards the north of the study site. Substation Alternative 2 is located approximately 1.5km directly south from Substation Alternative 1. An overhead interconnecting line between the two substation alternatives for an approximate length of 1.5km is being proposed. However, these locations may be subject to change later in the process depending on environmental constraints and design factors.

7.2.2 Grid Connection Alternatives

As mentioned above, the option of constructing a new power line to link into an existing power line or to link to nearby Eskom substations will be assessed. As such, provisional routes are being investigated. These include Power Line Options A and B. The Power Line Option A has three sub-alternatives whilst Power Line Option B has two sub-alternatives. The details pertaining to the various proposed power line routes alternatives are explored in greater detail below.

- Power Line Route Option A

The Power Line Route Option A has three potential sub-alternatives (A1, A2 and A3). Power Line Route Option A1 will be a direct connection to the Behrshoek 132kV Distribution Substation. Option A1 will consist of an overhead interconnecting line between the two substation alternatives for an approximate length of 1.5km.

The Power Line Route Option A routes to the east and then south east, traversing the plateau and then the plateau escarpment, before heading in a slightly north but mostly, easterly direction for an approximate length of 6.5km to the Behrshoek 132kV Distribution Substation. The total length of Option A1 is approximately 6.5km.

Power Line Route Option A2 follows the same path as Option A1 but routes past the Behrshoek 132kV Distribution Substation for approximately 3km linking into (Loop-in/Loop-out connection via switchyard) the existing 765kV transmission power line running to the Hydra 765kV Transmission Substation. The total length of the alternative is approximately 11km.

Power Line Route Option A2 likewise follows the same routes as Option A1 routing to the Behrshoek 132kV Distribution Substation. However, from this point, the sub-alternative will run southwards directly to the Hydra 765kV Transmission Substation for approximately 30km in length.

Power Line Route Option A3 similarly follows the same routes as Option A1 routing to the Behrshoek 132kV Distribution Substation. However, from this point, the sub-alternative heads in a southerly direction for an approximate length of 25.5km linking directly into De Aar 132kV Distribution Substation.

- Power Line Route Option B

PV Power Line Route Option B route heads from the proposed wind farm substation site in a southerly direction for an approximate length of 29km linking directly into Britsville 132kV distribution substation. The total length of PV Power Line Route Option 2B is 35.2km.

PV Power Line Route Option B1 route heads from the proposed wind farm substation site in a southerly direction following the same path as PV Power Line Route Option B for an approximate length of 19.9km but deviates in a south easterly direction for a distance of 5.8km from this point linking directly into De Aar 132kV distribution substation. The total length of PV Power Line Route Option B1 is approximately 32.4km.

PV Power Line Route Option B2 route heads from the proposed wind farm substation site in a southerly direction following the same path as PV Power Line Route Option B for an approximate length of 19.9km but deviates in a south easterly direction for a distance of 18km from this point linking directly into Hydra 765kV transmission substation. The total length of PV Power Line Route Option B2 is approximately 44km.

As a final note, it is important to point out that whilst several power line route options have preliminarily been identified, these fall within a greater 'all inclusive scoping area' that has been proposed for assessment to consider a wider area for potential environmental constraints. This area has been delineated to allow for flexibility in the environmental assessment process should any major constraints be identified. Therefore, the above-mentioned proposed power line routes are subject to change or be refined based on environmental constraints and design factors.

- No-go Alternative

The 'no-go' alternative is the option of not establishing the proposed wind farm. South Africa is currently under immense pressure to provide electricity generating capacity to accommodate for the pressures which have been identified in this regard. With the current global focus on climate change, the government are under severe pressure to explore alternative energy sources in addition to coal fired power stations. Although wind farm is not the only solution to solving the energy crisis in South Africa, not establishing the proposed solar PV power plant would be detrimental to the mandate that the government has set to promote the implementation of renewable energy. It is a suitable sustainable solution to the energy crisis and this project would contribute to this solution. This project will aid in achieving South Africa's goals in terms of sustainability, energy security, mitigating energy cost risks, local economic development and national job creation.



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