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## SOVENTIX SOLAR PV PROJECT

- ON THE FARM GOEDEHOOP, NR HANOVER, ENTHANJENI  
MUNICIPALITY, PIXLEY KA SEME DISTRICT, NORTHERN CAPE

Anton Pelsler & Annie Radford

For



**Justin Bowers** (M Tech, Pr.Sci.Nat., M.G.S.S.A.)

*Main Member and Senior Consultant*

**Ecoleges Environmental Consultants**

**Address:** Generaal Street, Machadodorp (eNtokozweni), 1170

**Postal:** P.O. Box 516, Machadodorp, 1170

P.O. Box 9005, Nelspruit, 1200

**Mobile:** +27 (0)82 451 5608

**Fax:** 0866979316

**Email:** justin@ecoleges.co.za

**Website:** www.ecoleges.co.za

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## EXECUTIVE SUMMARY

The aim of this Scoping Report is to identify the possible heritage related stakeholders, potential heritage resources within the development area, associated potential impact and risks, and further recommendations for the EIA phase.

A 225MW PV solar plant is proposed to be established on portions of the farm Goedehoop located approximately halfway between the towns of Hanover and De Aar, off the N10.

A survey of available literature (published and unpublished) was undertaken in order to place the development area in an archaeological, historical and cultural context.

The public participation process has so far not identified any interested and affected parties with regards to cultural heritage, other than the farm owner and labourers.

There has been **no** cultural heritage sites recorded within the area of the proposed development, but surveys conducted in the vicinity has recorded numerous Stone Age sites and historical sites associated with the railway line that passed to the east of the proposed heritage sites. The Karoo Sedimentary Rocks (Beaufort Group) that occur on the site is regarded as highly sensitive with regards to its potential to yield palaeontological material.

It is doubtful that the proposed development would impact on any historical sites, but this should not be excluded **as** a possibility. Impact on open air Stone Age sites and palaeontological remains is, however a probability.

A Phase 1 Archaeological Impact Assessment and a Palaeontological Impact Assessment is recommended.

## DECLARATION OF INDEPENDENCE

WE HEREBY DECLARE THAT WE ARE INDEPENDENT SPECIALISTS APPOINTED BY THE CLIENT ON A CONSULTANCY BASIS



## **CONTENTS**

## **DEFINITIONS**

## **ABBREVIATIONS**

**AIA** Archaeological Impact Assessment

**DEA** Department of Environmental Affairs

**DENC** Department of Environment and Nature Conservation (Northern Cape)

**HIA** Heritage Impact Assessment

**NEMA** National Environmental Management Act (107/1998)

**NHRA** National Heritage Resources Act (5/1999)

**PIA** Palaeontological Impact Assessment

**SAHRA** South African Heritage Resources Agency

**SAHRIS** South African Heritage Resources Information System

**VIA** Visual Impact Assessment

## 1. INTRODUCTION

### 1.1. SCOPE OF WORK

To comply with environmental (National Environmental Management Act 107/1997) and heritage legislation (South African Heritage Resources Act 5/1999), Ecologes Environmental Consultants (the independent Environmental Consultant) commissioned APAC to produce a Heritage Scoping Report for the project area.

The terms of references requires APAC to provide a description of the archaeology, and cultural heritage of the proposed project and identify/map any known sites of archaeological or cultural significance that may be impacted by the proposed project.

### 1.2. PROJECT DESCRIPTION

Size of farm and portions	
Magisterial District	Pixley Ka Same
1: 50 000 map sheet number	3024 CC & DC
Central co-ordinate of the development	

TABLE 1

Table 2 provides a description of the proposed development.

### 1.3. DESCRIPTION OF THE AFFECTED AREA

Several potential sites have been considered, but 3 sites have been identified as preferred in consultation with the EAP, Client and Landowner. The proposed areas for the placement of the solar plant is found on the following locations:

1. To the east of the N10, approximately halfway between Hanover and De Aar, south of the Road to Burgerville.
2. West of the Burgerville Taaibos Road, Approximately 2km from Burgerville.
3. In between area 1 and 2, slightly south (between Constantia and De Bad).

The areas are indicated in Figure 1.

Project Title	Proposed development of a 225MW solar PV plant on several portion of the farm Goedehoop, Hanover District, Northern Cape.
Location	Several portions of the farm Goedehoop, Hanover District, Northern Cape as per Appendix A – Layout Map and attached Google Earth .KMZ file.
Access to Site	The main access is off the N10 between De Aar & Hanover.
Size	The size of the proposed development footprint, is approximately 520ha. This area includes three 75MW solar PV plants (170ha each), with associated infrastructure, as well as the sub-station that will tie-into the ESKOM overhead 400KV powerlines. Existing roads will be used for main access, which may need to be enlarged to allow large equipment to access the site during construction.
Project Description	The construction of a 225MW solar photo-voltaic (PV) farm, in the form of 3 interconnected 75MW plants; connected to a sub-station that ties into the existing ESKOM 400KV overhead powerlines.
	Several potential sites have been considered, but 3 sites have been identified as preferred in consultation with the EAP, Client and Landowner.
	The alternative sites must also be assessed to ensure the preferred sites do not result in unacceptable biodiversity impact relative to the alternatives.

TABLE 2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

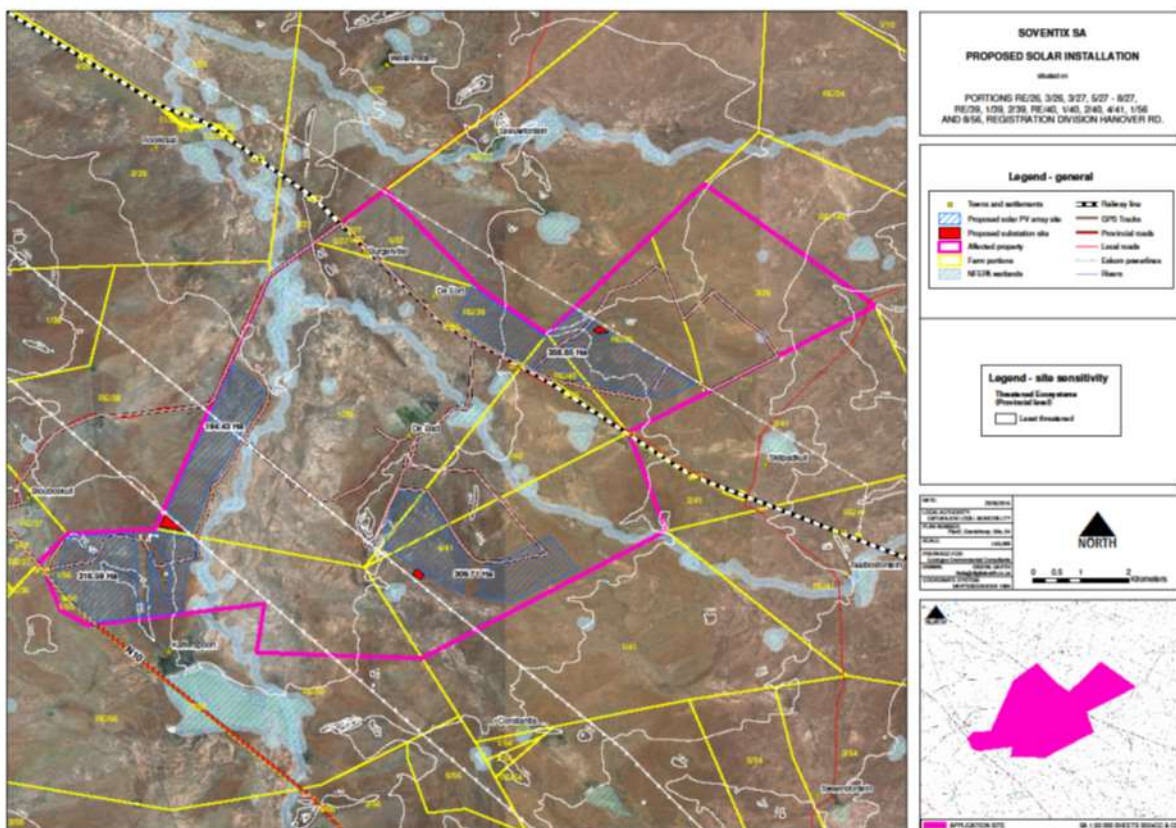


FIGURE 1 MAP OF THE DEVELOPMENT



*FIGURE 2 MAP INDICATION THE LANDSCAPE OF THE PROPOSED DEVELOPMENT*

#### **4. LEGISLATIVE REQUIREMENTS**

Aspects concerning the conservation of cultural heritage resources are dealt with mainly in two pieces of legislation. These are the Environmental Management Act (107/1998) and the National Heritage Resources Act (5/1999).

##### **4.1. THE NATIONAL HERITAGE RESOURCES ACT**

According to this Act the following is protected as cultural heritage resources:

- a. Archaeological artefact, structures and site older than 100 years
- b. Ethnographic art objects
- c. Objects of decorative and visual arts
- d. Military objects, structures and sites older than 75 years
- e. Historical objects, structures and sites older than 60 years
- f. Proclaimed heritage sites
- g. Graves older than 60 years
- h. Meteorites and palaeontological material
- i. Objects, structures and sites of technological or scientific value.

The National Estate includes the following:

- (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 of 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 objects and material, meteorites and rare geological 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, 1996 (Act No. 43 of 1996).

Section 38(4) of NHRA requires a process of assessment to be followed in order to determine whether any cultural heritage resources are located within an area to be developed, as well as the possible impact of the proposed development thereon. This process must be followed under the following circumstances:

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m 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 a site—
  - (i) exceeding 5 000 m<sup>2</sup> in extent; or
  - (ii) involving three or more existing 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 heritage resources authority
- (d) the re-zoning of a site exceeding 10 000 m<sup>2</sup> in extent or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.

Section 38(8) is, however, applicable to this proposed project:

(8) The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

Notice must also be taken of the following Sections:

- 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.

A structure means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.



Alter means any action affecting the structure, appearance or physical properties of a place or object whether by way or structural or other works, by painting, plastering or the decoration or by any other means.

- 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;
  - (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
  - (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

Permits from the applicable heritage resources are required for the actions mentioned above.

#### **4.2. THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT**

This Act states that a survey and assessment of cultural resources must be done in areas where development projects will change the face of the environment. The impact of the development on these resources should be determined and proposals for the mitigation thereof made.

Environmental management should also take the cultural and social needs of people into account. Any disturbance of landscapes and sites that constitutes the nation's cultural heritage should be avoided as far as possible and where this is not possible the disturbance should be minimized and remedied.

### **5. METHODOLOGY**

#### **5.1. LITERATURE REVIEW**

A survey of available literature (published and unpublished) was undertaken in order to place the development area in an archaeological, historical and cultural context. The sources utilized in this regard are indicated in the bibliography.

The South African Heritage Resources Information System (SAHRIS) was consulted to find out if any known sites occur within the footprint of the proposed development or its proximity.

## 6. LITERATURE REVIEW/BACKGROUND STUDY

The Upper Nama Karoo (Nku3) vegetation of the region is limited by the low annual rainfall (ca. 190 - 200 mm/a) and is dominated by flat Pedi plain areas and hills with rocky outcrops. The geology is mostly Dwyka / Ecca shales overlaid with shallow sandy soils that drain well.

A number of heritage impact assessments have been undertaken in the area, none of them on this specific property.

No Grade I or II sites (National or Provincial Heritage Sites) have been identified in close proximity of the proposed development.

The literature review indicated the following:

### 6.1. PALAEOLOGICAL RESOURCES

The possible impact of the proposed development on palaeontological resources is gauged by using the fossil sensitivity maps available on the SAHRIS and the nature of the proposed development.

#### *Karoo Sedimentary Rocks*

The Beaufort Group contains fossils of diverse terrestrial and freshwater tetrapods of Tapinocephalus and Lystrosaurus genere (amphibians, true reptiles, synapsids – especially therapsids), palaeoniscoid fish, freshwater bivalves, trace fossils (including tetrapod trackways) and sparse vascular plants (Glossopteris Flora, including petrified wood) that dates to the Late Permian – Early Triassic Periods (c. 266 – 250 Ma).

<http://www.sahra.org.za/sahris/fossil-heritage-layer-browser#>

The area of the proposed development where this geological signature is regarded as highly sensitive with regards to palaeontological heritage.

#### *Karoo Dolerites*

No fossil heritage has been recorded in these intrusive dolerites (dykes, sills) and associated diatremes.

<http://www.sahra.org.za/sahris/sites/default/files/styles/large/public/remoteserver/sahrisdepot/fossilimages/2013/11/11/Karoo%20Jurassic%20Dolerite%20Suite.jpg?itok=cSE2vg-8>

The dolerite dykes and sills within the area of the proposed development are not palaeontologically significant. Notice must however be taken of the presence of these features as Stone Age quarry sites are usually found at the foot of dolerite hills hornfel outcrops occur. Dolerite is also associated with engraving sites. One such site have been recorded at the Commonage in Hanover Town.

## Archaeological resources-

Archaeological heritage resources and cultural landscapes are linked to specific time periods. In summary the various eras are as follows:

The Stone Age time period is divided between three different time periods, namely:

Early: c. 2 500 000 to 150 000 Before Common Era

Middle: c. 150 000 to 30 000 Before Common Era

Late: c. 30 000 Before Common Era until the historical time periods commenced

The Stone Age is well represented in the area by the archaeological remains associated with Stone Age hunter gatherers and herders and includes cave shelters and surface sites (Goodwin & van Riet Lowe 1929, Sampson 1985 and Bousman 1991). These occurrences cover represent the Early, Middle and Later Stone Ages. Erosion gullies and river/streambeds and dolerite outcrops are usually associated with stone tool assemblages.

Sampson (1972 & 1974) surveyed the Seaco Drainage near Hanover and recorded numerous Stone Age sites ranging from the Early, Middle and Later Stone Ages. Proto-historic sites associated with pastoralist was also recorded. His research established a model for identifying stone tool industries and occupations in the entire district (Huffman...).

Surface scatters of stone tools (mostly Early and Middle Stone Age) were recorded during a various Heritage Impact Assessments:

- The farm Ploosfontein 93 (Palaeo Field Services...) in the Hanover District.
- Erf 3094 on the old De Aar 180 farm (Huffman,,,,)
- Low to medium density stone tools have been identified within 46 metres of the borrow pit and these are the type of stone tools that are known to occur in the De Aar and Burgerville areas. S 30 50 1.95 E 24 18 10.3
- A variable density of stone artefacts, mostly of Pleistocene age, was noted over most of the area examined during the Archaeological Specialist Input on the site of the proposed Taaibosch Photovoltaic between De Aar and Hanover (David Morris, 2011)

Rock art sites have also been recorded (Morris 1988, Rudner & Rudner 1968). Included is the engraving sites at the Hanover Town Commonage and at the farm Groenfontein, Hanover District. (Palaeo Field Services.....)

The Iron Age and farmer period occurred in southern Africa from Common Era (2000 years ago to 1950) to historical periods. The definition is divided between Early Iron Age (c. 200 CE to c. 1400 CE) and Late Iron Age (c. 1400 CE to 1800's (Archaic, 2008)). The historical period

indicates dates from 1500s to present (Natalie Swanepoel, Amanda Esterhuysen and Phillip Bonner, 2007). The Iron Age is defined as a time period that occurred during c. 200 to c. 1000 Common Era, named as the early period, and c. 1000 to 1800's Common Era (Archaic, 2008). The Iron Age is not represented in the general area of the development. No Iron Age sites should be present.

More recent events/Historical Period-

Usually refers to white or literate history, but more recently also refers to the last five hundred years of South African history. Dates from 1500s to present. Farms and other historical settlements in the area dates back to the 1840's, whilst the area also have evidence associated with the South African (Anglo Boer War). Signs of historical occupation is common in the general area and includes abandoned sheep kraals and homestead ruins. Old railway infrastructure (housing, old railway lines and foundations) was also recorded (S30°49'26.29" E24°17'31.31") at nearby Burgervilleweg (Becker). The proximity of the railway means that material traces may exist alongside that relate to its construction, maintenance and use, and its protection by way of blockhouses, as a major transport route for British forces further inland during the Anglo-Boer War. The Google Earth image of the area clearly shows different generations of railway alignment within the study area. Jean Beater's heritage report describes Anglo-Boer War redoubts (components of a blockhouse line) on the north side of the older railway.

Where dolerite koppies occur there is a possibility that rock engravings might be found, while rock paintings might be found in shelters formed either in certain dolerite topographic formations or in shelters where sandstone scarps provide for their formation. » More or less rich spreads of Stone Age artefacts may occur across this Karoo landscape with localised 'sites' having higher densities. More recent heritage features of note may exist in the vicinity of railway and farm infrastructure.

## **7. SOCIO-ECONOMIC ENVIRONMENT**

The nearby town of De Aar was established in 1908. The current population 29 990 (2011). Nearly 60% of the population is Coloured, with 33, 2% Black African and 8, 3% White. The main language is Afrikaans (69, 3%). De Aar is the second most important railway junction in the country, en route between Cape Town and Kimberley. This makes it the main commercial distribution centre for the greater central Great Karoo. Wool production and livestock farming is the main economic activities of the area.

Hanover is an older town, established in 1854, with a significantly smaller population (4 594). The population is mainly Black African (49, 1%) and Coloured (46, 4%), with Afrikaans the main language (54, 9%). The main economic activity around Hanover is Merino sheep farming. (Wikipedia)

## **8. POTENTIAL IMPACTS AND RISKS TO HERITAGE RESOURCES**

The destructive impacts that are possible in terms of heritage resources would tend to be direct, once-off events occurring during the initial construction period. In the long term, the proximity of operations in a given area could result in secondary indirect impacts resulting from the movement of people or vehicles in the immediate or surrounding vicinity.

With respect to the magnitude and extent of potential impacts, it has been noted that the erection of power lines would have a relatively small impact on Stone Age sites, in light of Sampson's (1985) observations during surveys beneath power lines in the Karoo (actual modification of the landscape tends to be limited to the footprint of each pylon – tower positions, once known, would need to be assessed for possible mitigation), whereas a road would tend to be far more destructive (modification of the landscape surface would be within a continuous strip), albeit relatively limited in spatial extent, i.e. width (Sampson compares such destruction to the pulling out of a thread from an ancient tapestry).

## 9. RECOMMENDATIONS

**No** heritage resources **in** the proposed **development** area has been previously recorded. It is recommended that a heritage impact assessment be undertaken comprising the following:

- An archaeological component undertaken by a professional archaeologist with Stone Age experience.
- A palaeontological assessment by a qualified palaeontologist.

## 10. REFERENCES

*Archaeological Specialist input on the site of the proposed Taaiboschfontein Photovoltaic construction site between De Aar and Hanover, Northern Cape (Morris 2011)*

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