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**REPORT ON A PHASE 1 HERITAGE ASSESSMENT
FOR THE PROPOSED SOVENTIX SOLAR PV PROJECT
ON VARIOUS FARMS, NEAR HANOVER, ENTHANJENI MUNICIPALITY,
PIXLEY KA SEME DISTRICT, NORTHERN CAPE**

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REPORT: APAC017/11

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SUMMARY

APelser Archaeological Consulting (APAC) was appointed by Ecoleges Environmental Consultants to undertake a Phase 1 HIA for the proposed Soventix Solar PV Project, located on portions of various farms between Hanover and De Aar in the Northern Cape Province. The development of three (3) separate but integrated 75MW facilities, each with an on-site substation to link with the existing 400Kv ESKOM Powerline, is proposed. Alternative 3 would loop-in and loop-out of the overhead 132KV powerline, while alternatives 1 & 2 into the 400Kv overhead powerline. A Scoping Report for the work was done and submitted in November 2016 as part of the project.

A number of known cultural heritage sites (archaeological and/or historical) exist in the larger geographical area within which the study area falls. A number of archaeological and historical sites, features and finds were identified and recorded during the physical assessment undertaken. The report will discuss the results of the Desktop and Field Assessment and provide recommendations on mitigating the impact of the proposed development on the cultural heritage resources in the study and development areas.

Finally, from a Cultural Heritage point of view the development should be allowed to continue, once the mitigation measures recommended in the document has been implemented.

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1. INTRODUCTION

APelser Archaeological Consulting (APAC) was appointed by Ecoleges Environmental Consultants to undertake a Phase 1 HIA for the proposed Soventix Solar PV Project, located on portions of various farms between Hanover and De Aar in the Northern Cape Province. The development of three (3) separate but integrated 75MW facilities, each with an on-site substation to link with the existing 400Kv ESKOM Powerline, is proposed. Alternative 3 would loop-in and loop-out of the overhead 132KV powerline, while alternatives 1 & 2 into the 400Kv overhead powerline. A Scoping Report for the work was done and submitted in November 2016 as part of the project.

A number of known cultural heritage sites (archaeological and/or historical) exist in the larger geographical area within which the study area falls. A number of archaeological and historical sites, features and finds were identified and recorded during the physical assessment undertaken.

The client indicated the location and boundaries of the Project Area, and the assessment focused on this.

2. TERMS OF REFERENCE

The Terms of Reference for the study was to:

- 1. Identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located on the portion of land that will be impacted upon by the proposed development;*
- 2. Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value;*
- 3. Describe the possible impact of the proposed development on these cultural remains, according to a standard set of conventions;*
- 4. Propose suitable mitigation measures to minimize possible negative impacts on the cultural resources;*
- 5. Review applicable legislative requirements;*

3. LEGISLATIVE REQUIREMENTS

Aspects concerning the conservation of cultural resources are dealt with mainly in two acts. These are the National Heritage Resources Act (Act 25 of 1999) and the National Environmental Management Act (Act 107 of 1998).

3.1 The National Heritage Resources Act

According to the above-mentioned act the following is protected as cultural heritage resources:

- a. Archaeological artifacts, structures and sites older than 100 years
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
- 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. Grave yards and graves older than 60 years
- h. Meteorites and fossils
- i. Objects, structures and sites of scientific or technological 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 features of cultural significance
- e. Geological sites of scientific or cultural importance
- f. Sites of Archaeological and palaeontological importance
- g. Graves and burial grounds
- h. Sites of significance relating to the history of slavery
- i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.)

A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon. An Archaeological Impact Assessment (AIA) only looks at archaeological resources. An HIA must be done under the following circumstances:

- a. The construction of a linear development (road, wall, power line, canal etc.) exceeding 300m in length
- b. The construction of a bridge or similar structure exceeding 50m in length
- c. Any development or other activity that will change the character of a site and exceed 5 000m² or involve three or more existing erven or subdivisions thereof
- d. Re-zoning of a site exceeding 10 000 m²
- e. Any other category provided for in the regulations of SAHRA or a provincial heritage authority

Structures

Section 34 (1) of the mentioned act states that no person may demolish any structure or part thereof 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 of structural or other works, by painting, plastering or the decoration or any other means.

Archaeology, palaeontology and meteorites

Section 35(4) of this act deals with archaeology, palaeontology and meteorites. The act states that no person may, without a permit issued by the responsible heritage resources authority (national or provincial)

- 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 that assists in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.
- e. alter or demolish any structure or part of a structure which is older than 60 years as protected.

The above mentioned may only be disturbed or moved by an archaeologist, after receiving a permit from the South African Heritage Resources Agency (SAHRA). In order to demolish such a site or structure, a destruction permit from SAHRA will also be needed.

Human remains

Graves and burial grounds are divided into the following:

- a. ancestral graves
- b. royal graves and graves of traditional leaders
- c. graves of victims of conflict
- d. graves designated by the Minister
- e. historical graves and cemeteries
- f. human remains

In terms of Section 36(3) of the National Heritage Resources Act, no person may, without a permit issued by the relevant heritage resources authority:

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

Human remains that are less than 60 years old are subject to provisions of the Human Tissue Act (Act 65 of 1983) and to local regulations. Exhumation of graves must conform to the standards set out in the **Ordinance on Excavations (Ordinance no. 12 of 1980)** (replacing the old Transvaal Ordinance no. 7 of 1925).

Permission must also be gained from the descendants (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated to) before exhumation can take place.

Human remains can only be handled by a registered undertaker or an institution declared under the **Human Tissues Act (Act 65 of 1983 as amended)**.

3.2 The National Environmental Management Act

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

Environmental management should also take the cultural and social needs of people into account. Any disturbance of landscapes and sites that constitute 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.

4. METHODOLOGY

4.1 Survey of literature

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

4.2 Field survey

The field assessment section of the study is conducted according to generally accepted HIA practices and aimed at locating all possible objects, sites and features of heritage significance in the area of the proposed development. The location/position of all sites, features and objects is determined by means of a Global Positioning System (GPS) where possible, while detailed photographs are also taken where needed.

4.3 Oral histories

People from local communities are sometimes interviewed in order to obtain information relating to the surveyed area. It needs to be stated that this is not applicable under all circumstances. When applicable, the information is included in the text and referred to in the bibliography.

4.4 Documentation

All sites, objects, features and structures identified are documented according to a general set of minimum standards. Co-ordinates of individual localities are determined by means of the Global Positioning System (GPS). The information is added to the description in order to facilitate the identification of each locality.

5. DESCRIPTION OF THE AREA

APelser Archaeological Consulting (APAC) was appointed by Ecoleges Environmental Consultants to undertake a Phase 1 HIA for the proposed Soventix Solar PV Project, located on portions of various farms between Hanover and De Aar in the Northern Cape Province.

The following farms and farm portions form part of the Environmental Authorization application by Ecoleges: The Remainder of Goedehoop 26C; Portion 6 of Leuwefontein 27C; The Remainder of and Portion 1 of Rietfontein 39C; The Remainder of and Portion 1 of Kwanselaars Hoek 40C; Portion 4 of Taaiboschfontein 41C and Portion 1 of Kafferspoort 56C. Several potential sites were considered for the three PV Plant locations, but 3 have been identified as preferred in consultation with the EAP, Client and Landowner.

The proposed areas for the placement of the Solar PV Plants are:

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

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 plain areas and hills with rocky outcrops. The geology is mostly Dwyka / Ecca shales overlaid with shallow sandy soils that drain well. In general the topography of the study area where the three sites are to be located are flat and

open, with some rocky ridges/outcrops and low hills surrounding and on the outer boundaries. Visibility was fairly good during the assessment. Recent rains also accentuated the presence of wetlands and streams in the study area, with some sections inaccessible at the time of the assessment. In general the area has not been disturbed by modern developments, except for the railway line that is situated on the northeast of the study area and west of and bordering Area 2 and east of Areas 1 & 3. Existing 400Kv Eskom Powerline corridors cuts through the areas and have had some impact, with the largest other type of impact being agricultural activities (sheep/cattle; grazing and limited crop growing and ploughing). Farmsteads and related infrastructure are also present, but these will not be directly impacted by the proposed development actions.

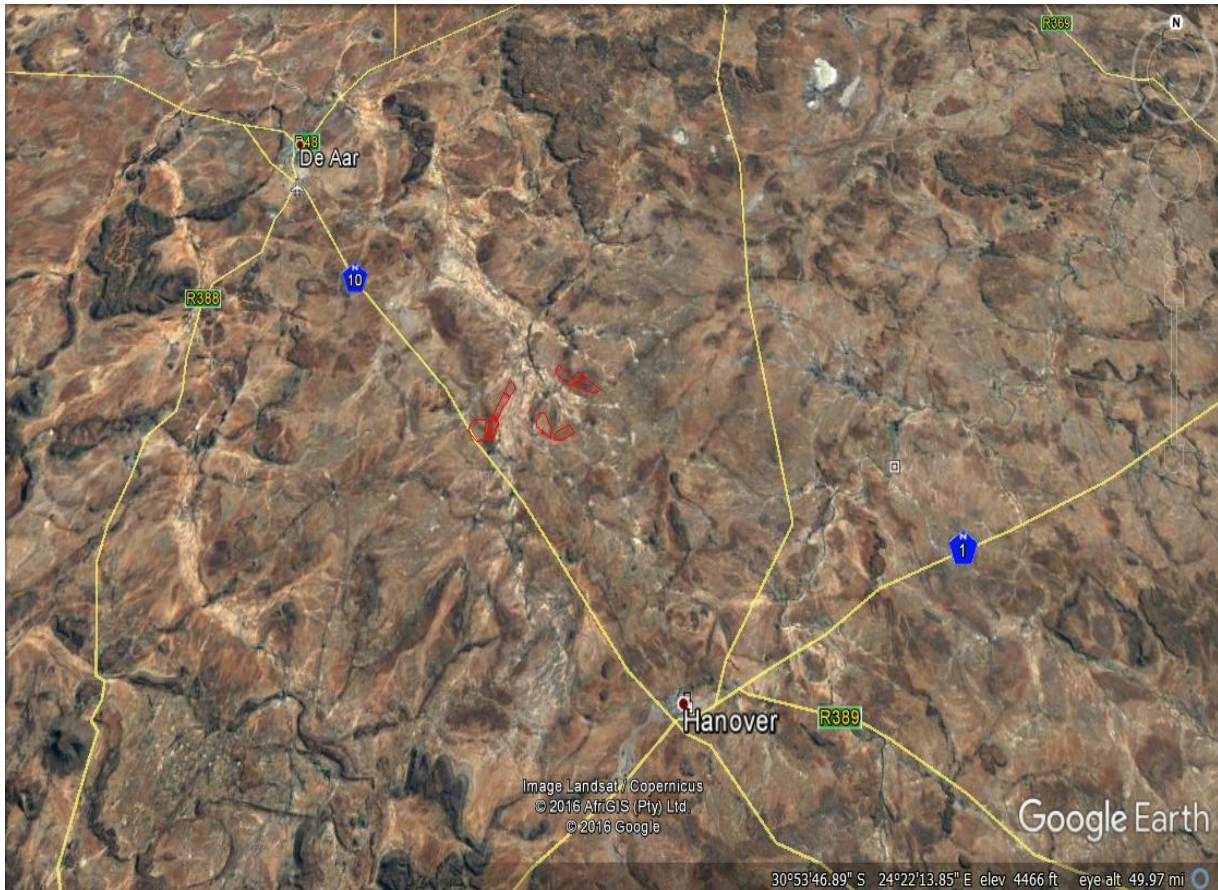


Fig.1: General location of study area. The areas in red are the 3 proposed PV Plant locations (Google Earth 2016).

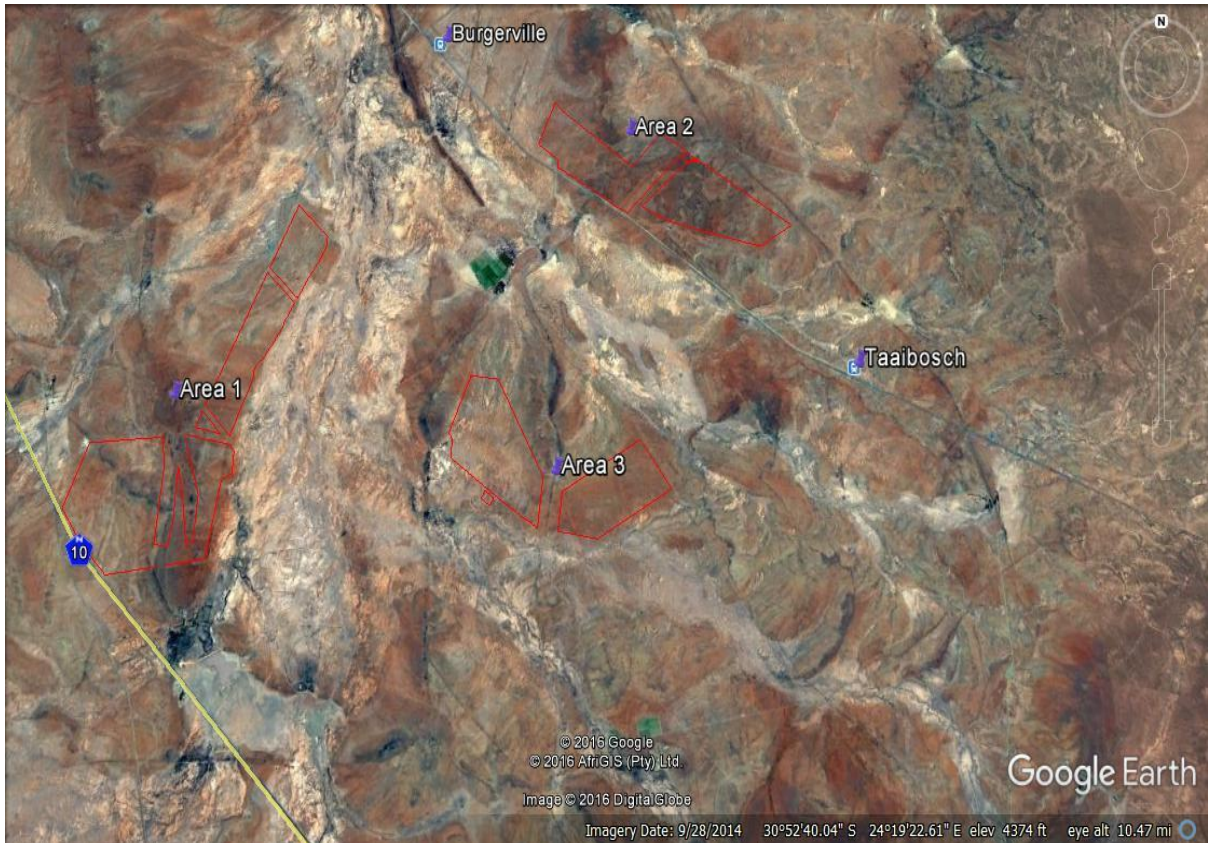


Fig.2: Closer view of study area showing the 3 PV Plant areas (Google Earth 2016).

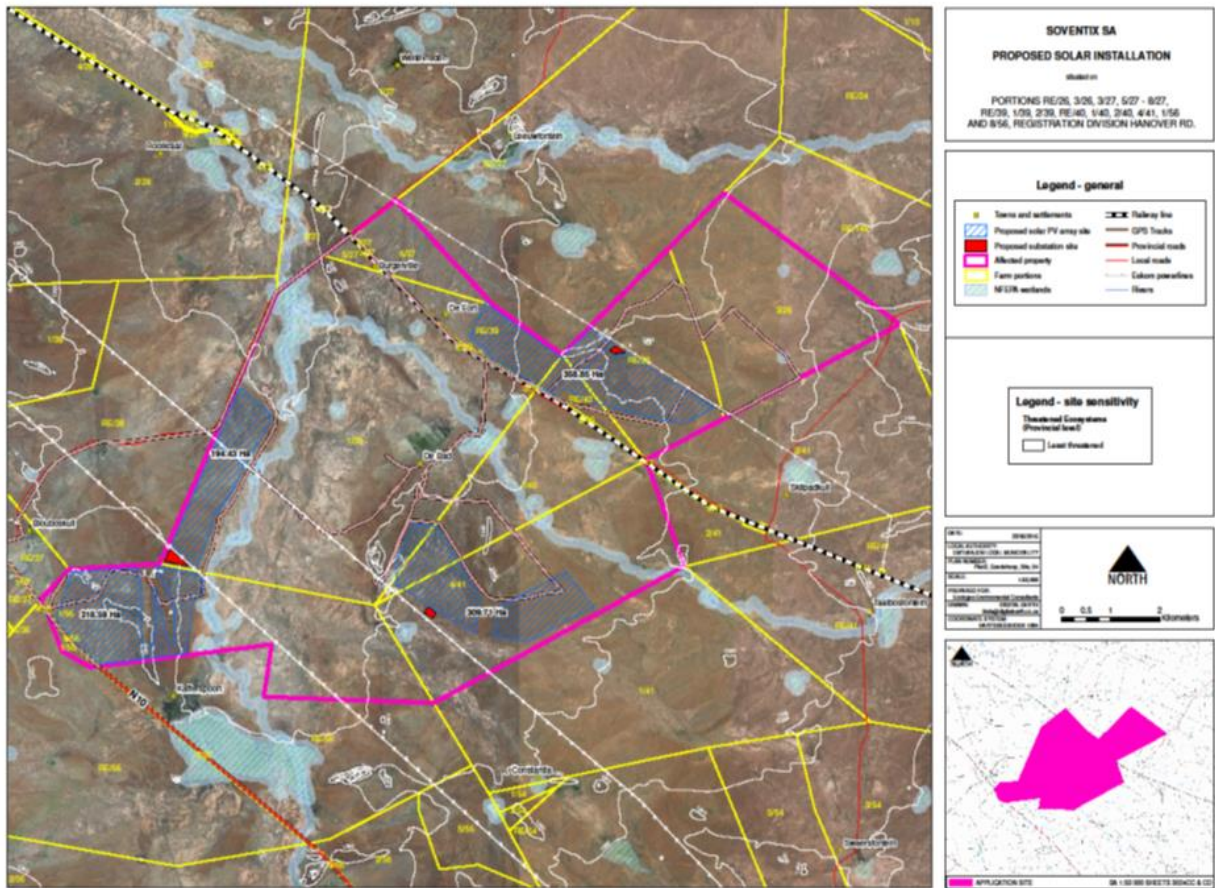


Fig.3: Location & Layout plan of the area showing the 3 PV Plant locations & the larger impact area (provided by Ecoleges).



Fig.4: A general view of the Area 3 location.



Fig.5: A view of a section of the larger area showing some open eroded areas.



Fig.6: Some rocky ridges and low hills are also located in sections of the study area.



Fig.7: Recent rains have filled pans and streams in the area accentuating the wetlands present here.



Fig.8: A view of the De Aar-Hanover railwayline.



Fig.9: Another of the rocky ridges in the area.



Fig.10: Open areas and wetland sections/dry pans are located throughout the larger area.



Fig.11: View of one of the ESKOM powerline corridors close to the Area 1 proposed substation.

6. DISCUSSION

A number of Heritage Impact Assessments have been undertaken in the larger geographical area. No Grade I or II sites (National or Provincial Heritage Sites) have been identified in close proximity to the proposed development area as yet.

The literature review conducted for the Scoping Report indicated the following:

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). The area of the proposed development where this geological signature occurs is regarded as highly sensitive with regards to palaeontological heritage (Palaeo Field Services cc 2014: 5).

Karoo Dolerites

No fossil heritage has been recorded in these intrusive dolerites (dykes, sills) and associated diatremes. The dolorite 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 where hornfels outcrops occur. Dolerite is also associated with engraving sites. One such site has been recorded at the Commonage in Hanover Town (Palaeo Field Services 2014: 5).

The Stone Age is the period in human history when lithic (stone) material was mainly used to produce tools. In South Africa the Stone Age can be divided basically into three periods. It is however important to note that dates are relative and only provide a broad framework for interpretation. A basic sequence for the South African Stone Age (Lombard et.al 2012) is as follows:

Earlier Stone Age (ESA) up to 2 million – more than 200 000 years ago

Middle Stone Age (MSA) less than 300 000 – 20 000 years ago

Later Stone Age (LSA) 40 000 years ago – 2000 years ago

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. 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 (Palaeo Field Services 2014: 6).

For prehistory, Sampson's (1972, 1974) survey of the Seacow drainage near Hanover (part of his Orange River Scheme) is the most important archaeological project in the Karoo environment of the Northern Cape. His team recorded sites and quarries, ranging from the Earlier, Middle and Later Stone Ages, to proto-historic pastoralist camps and Historic farmyards. Among other things, the research noted a correlation between age and the patina on hornfels (also called lydianite and indurated shale): dark brown to yellow = Earlier Stone Age; red = Middle Stone Age; grey to grey brown = Lockshoek; light brown/tan = Interior Wilton; and black = Smithfield (the last three belonging to the Later Stone Age). This culture-history sequence forms a basis for identifying stone tool industries and historic occupations over the entire district. There have been several investigations in the De Aar district itself because of the ammunition disposal plant to the west and various solar panel projects (e.g. Kaplan 2010; Kruger 2012; Morris 2011). Generally, archaeologists have found scatters of stone tools dating to the Middle and Later Stone Ages. In addition, the ammunition area yielded an Earlier Stone Age scatter, and a few rock art sites are on record for the district (Morris 1988; Rudner and Rudner 1968). These reports show that the De Aar district has a rich archaeological heritage (Huffman 2013: 3).

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

- The farm Plooyfontein 93 (Palaeo Field Services 2014: 6; 24) in the Hanover District.
- Erf 3094 on the old De Aar 180 farm (Huffman 2013: 5-6)
- 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 Plant between De Aar and Hanover (David Morris 2011)

Rock art sites have also been recorded (Morris 1988, Rudner & Rudner 1968). Included are the engraving sites at the Hanover Town Commonage and at the farm Groenfontein, Hanover District. (Palaeo Field Services 2014).

A number of Stone Age sites were identified and recorded during the Soventix Solar PV Project assessment. The results will be discussed in the next section.

The Iron Age is the name given to the period of human history when metal was mainly used to produce artifacts. In South Africa it can be divided in two separate phases (Bergh 1999: 96-98), namely:

Early Iron Age (EIA) 200 – 1000 A.D.

Late Iron Age (LIA) 1000 – 1850 A.D.

Huffman (2007: xiii) indicates that a Middle Iron Age should be included. His dates, which are widely accepted in archaeological circles, are:

Early Iron Age (EIA) 250 – 900 A.D.

Middle Iron Age (MIA) 900 – 1300 A.D.

Late Iron Age (LIA) 1300 – 1840 A.D.

The Iron Age is not represented in the general area of the development. No sites were found during the assessment as well.

The historical age started with the first recorded oral histories in the area. It includes the moving into the area of people that were able to read and write, but more recently also refers to the last five hundred years of South African history. Farms and other historical settlements in the area date back to the 1840's, while 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 (at nearby Burgervilleweg (Becker 2012). 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 (Beater 2011).

A number of historical sites, features and artifacts related to the above was identified and recorded during the current assessment and will be discussed in the next section as well.

Results of the February 2017 Assessment

A total of 36 sites were identified and recorded during the February 2017 assessment. Most of these are open-air Stone Age surface scatters of varying density and significance, while some historical sites, feature and cultural material most likely associated with the Anglo-Boer War (1899-1902) and farming history of the area was also identified. Some of the sites are located close to and within the 3 Areas where the Solar PV facilities and associated substations are planned, and mitigation measures will have to be implemented, while others are located in the general area of study as indicated by the client. The main focus of the field assessment was the 3 indicated footprint areas, although areas outside of this (in the larger impact area) were also looked at. It should once again be stressed that certain portions were inaccessible as a result of recent rains and the fact that sections contains extensive wetlands. Existing dirt

tracks/roads and ESKOM servitudes were used and large portions were walked on foot. Areas with the potential for containing evidence of human presence and activity such as erosion dongas; unnatural looking clumps of trees and low outcrops or rocky ridges were focused on as well. Large parts of the study area is flat and open and has been disturbed by agricultural activities that include grazing and crop growing in the recent past and currently. The results of the assessment and recommended mitigation measures are discussed in more detail below.

Stone Age Sites: Sites 1 – 9; 11; 12; 15-16; 18; 22-23; 25-29; 31-33

All the Stone Age sites identified during the assessment are open-air surface scatters of varying densities, with many single or more tool occurrences to extensive and very dense scatters covering a fairly large area (mainly Site 23). Many of the sites fall outside the areas of direct impact, while Site 23 (the most significant of the sites) falling in what we termed PV Plant Area 2. This site needs therefore to be mitigated. This site and others recorded during the February 2017 survey is similar to those recorded by others in the larger area during earlier assessments. They are located close to and around low rocky ridges and dolerite outcrops/dykes. Stone Age quarry sites are usually found at the foot of dolerite hills where hornfels outcrops occur. Site 23 and some of the other smaller sites seem to be so-called quarry sites, with dense scatters of flakes, more formal tools and numbers of cores occurring at these sites. Dolerite is also associated with engraving sites. One such site has been recorded at the Commonage in Hanover Town (Palaeo Field Services 2014: 5). Although no rock engravings were identified in the area during the assessment, some rocks with signs of edges being hammered or used were identified. Many of these are located close to sites with stone-packed enclosures though to be associated with the Anglo-Boer War period in the area, although the possibility of these features being related to earlier pastoralist camps cannot be excluded.

Sampson's (1972, 1974) survey of the Seacow drainage near Hanover recorded sites and quarries, ranging from the Earlier, Middle and Later Stone Ages, to proto-historic pastoralist camps and Historic farmyards. This culture-history sequence forms a basis for identifying stone tool industries and historic occupations over the entire district. There have been several investigations in the De Aar district itself because of the ammunition disposal plant to the west and various solar panel projects (e.g. Kaplan 2010; Kruger 2012; Morris 2011). Generally, archaeologists have found scatters of stone tools dating to the Middle and Later Stone Ages. In addition, the ammunition area yielded an Earlier Stone Age scatter, and a few rock art sites are on record for the district (Morris 1988; Rudner and Rudner 1968). These reports show that the De Aar district has a rich archaeological heritage (Huffman 2013: 3).

Surface scatters of stone tools (mostly Early and Middle Stone Age) were recorded during various earlier Heritage Impact Assessments. Of most importance to the current assessment was work conducted by Morris in 2011 for the proposed Taaibosch Photovoltaic Plant between De Aar and Hanover (David Morris 2011). He recorded a variable density of stone artifacts, mostly of Pleistocene age, over most of the area examined during the Archaeological Specialist Input for this project.

It is recommended that Site 23 be mitigated through detailed archaeological investigation prior to development commencing. The site covers an extensive area and dense scatters of cores, unworked and worked flakes and more formal tools are found in the area covered by Site 23. Although the possibility that similar sites are still to be located in the larger area,

especially around rocky outcrops and low ridges, this site more than likely represents the Stone Age in the area. One site (Site 18) is represented by a small scatter of ostrich eggshell fragments, although the age of the find cannot be determined.

GPS Locations of Sites: S30.88294 E24.33964 (1); S30.88180 E24.34175 (2); S30.88106 E24.34267(3); S30.87953 E24.34794(4); S30.87787 E24.34549(5); S30.87423 E24.34620(6); S30.87229 E24.34713(7); S30.87033 E24.34777(8); S30.86413 E24.34636(9); S30.86496 E24.34499(11); S30.87028 E24.34580(12); S30.88862 E24.33071(15); S30.88920 E24.32936(16); S30.89070 E24.31404(18); S30.84758 E24.32518(22); S30.84625 E24.32480(23 - **Start**); S30.84395 E24.32683(23 – **Furthest extent**); S30.84137 E24.33806(25); S30.84204 E24.33847(26); S30.84346 E24.33838(27); S30.84409 E24.33701(28); S30.84504 E24.33320(29); S30.84546 E24.33106(31); S30.84626 E24.32862(32); S30.84167 E24.31572(33).

Cultural Significance of Sites: High (**Site 23**); Low (**1-5; 11; 12; 15-18; 22; 27-29; 31; 32**)
Low – Medium (**6-9; 25; 26**)

Heritage Significance of Sites: Grade II: Heritage Resources with qualities giving it Provincial or Regional importance although it may form part of the National Estate (Site 23).

Field Ratings for Sites: Local Grade IIIB: Should be included in the heritage register and may be mitigated (Site 23).

Mitigation Measures for Sites: Site 23 covers an extensive area with dense scatters of Stone Age material including flakes, cores and more formal tools. Mitigation measures should include detailed mapping and drawing; surface collection of representative material as well as possible excavations. The other sites in the study area are similar but contain varying degrees of scatter density, from single tools to denser scatters. Site 23 can therefore be seen as a representation of the Stone Age in the area and detailed mitigation needs to be undertaken if the site cannot be avoided.

Historical Sites: Sites 10; 13-14; 17; 19-21; 24; 30; 34-36

Many of the historical sites found during the February 2017 assessment are similar to those found by Beater during her HIA for the Taaiboschfontein Solar PV Project in 2011. She indicates that these are related to the Anglo-Boer War period and assesses their significance as of local importance and therefore worthy of preservation (Beater 2011). Most of the sites found during 2017 fall outside of the areas of direct impact, except Site 24 located in PV Plant Area 2. Site 30 is a stone cairn that could possibly be a grave (located in Area 2 as well) and care should be taken not to impact this site without proper investigation.

Farms and other historical settlements in the area date back to the 1840's, while the area also have evidence associated with the South African (Anglo Boer) War. Signs of historical occupation are common in the general area and include abandoned sheep kraals and homestead ruins (Sites 13, 35, 36). Old railway infrastructure (housing, old railway lines and foundations) was also recorded at nearby Burgervilleweg (Becker 2012).

According to Beater, during the Anglo-Boer War of 1899-1902, the De Aar/Hanover/Graaf Reinet area was a hive of activity. Boer forces were strong in Northern Cape as towns had been scarcely garrisoned and towns as far east as Molteno were occupied by Boer commandos. The Cape Colony was initially seen as safe as it was a British Colony but Boers from the Orange River Colony crossed into the Cape Colony and occupied several towns. The railway links between Cape Town and the interior as well as smaller railway lines were

crucial for the British as they provided transport from the harbour to the interior that carried soldiers, food and other goods. Disruption of the railway line by the Boer forces during the guerrilla warfare period from 1900 was ongoing and deliberate with the Boer commandos blowing up railway lines, derailing trains, and taking supplies from the trains meant for the British forces. Between December 1900 and September 1901 135 train wrecking incidents were recorded. Due to the expanding activities of the Boer commandos in the Cape more British troops had to be detailed to guard the Cape railways and from July 1901 onwards blockhouses and redoubts were built, eventually all the way down to Wellington in the Western Cape. Lord Kitchener was also forced to divert increasing numbers of troops from the occupied Boer Republics to aid the colonial detachments in dealing with the Boer commandos. In the cemetery on the outskirts of Hanover, a pyramid of stone marks the grave of three young men executed during the Anglo-Boer War of 1899-1902. A train had been derailed and plundered at Taaibosch, 20 km from town. Shortly afterwards several young men sleeping in the outside rooms of a nearby farm were taken into custody. They were charged with ‘maliciously assisting Boer forces,’ robbery and the deaths of passengers. Tried on somewhat dubious authority by a military court at De Aar, Sarel Nienaber, J. P. Nienaber and J. A. Nieuwoudt, were shot. They protested their innocence to the end (Beater 2011: 12-13).

GPS Locations of Sites: S30.86413 E24.34636 & S30.86391 E24.34581(10); S30.87615 E24.34385(13); S30.87650 E24.34393(14); S30.89174 E24.32450(17); S30.89076 E24.31306(19); S30.89010 E24.31322(20); S30.88885 E24.31347(21); S30.84179 E24.33003(24); S30.84516 E24.33266(30); **Site 34 – No GPS Coordinates;** S30.82383 E24.28488(35) & S30.85412 E24.27465 (36).

Cultural Significance: Low (Sites 17; 24 & 34); Medium (Sites 10; 13; 14; 19-21; 35 & 36); High (30)

Heritage Significance: Grade III: Other heritage resources of local importance and therefore worthy of conservation.

Field Ratings: General protection C (IV C): Phase 1 is seen as sufficient recording and it may be demolished (Sites with Low Significance); General protection B (IV B): Site should be recorded before destruction (Sites with Medium Significance) & Local Grade IIIB: should be included in the heritage register and may be mitigated (High/Medium Significance)

Mitigation: The Anglo-Boer War (1899-1902) related sites (Sites 10, 14, 19-21 & 24) should be mitigated if they are to be impacted by the proposed development actions. This will include detailed mapping and drawing of the sites, as well as limited historical-archaeological excavations. If Site 30 is a grave then the site should be avoided and no impact on it allowed. The site can be fenced-off and protected. If it cannot be avoided then the site can be mitigated through exhumation and relocation after all due social consultation & permitting processes have been completed.

It should be noted that although all efforts were made to cover the total area and therefore to identify all possible sites or features of cultural (archaeological and/or historical) heritage origin and significance, that there is always the possibility of something being missed. Certain areas could not be accessed due to it being waterlogged (the existing wetland areas covering large parts of the larger study area). This should be kept in mind when development work commences and if any sites (incl. unmarked or unknown low stone-packed graves) are identified then an expert should be called in to investigate and recommend on the best way forward.

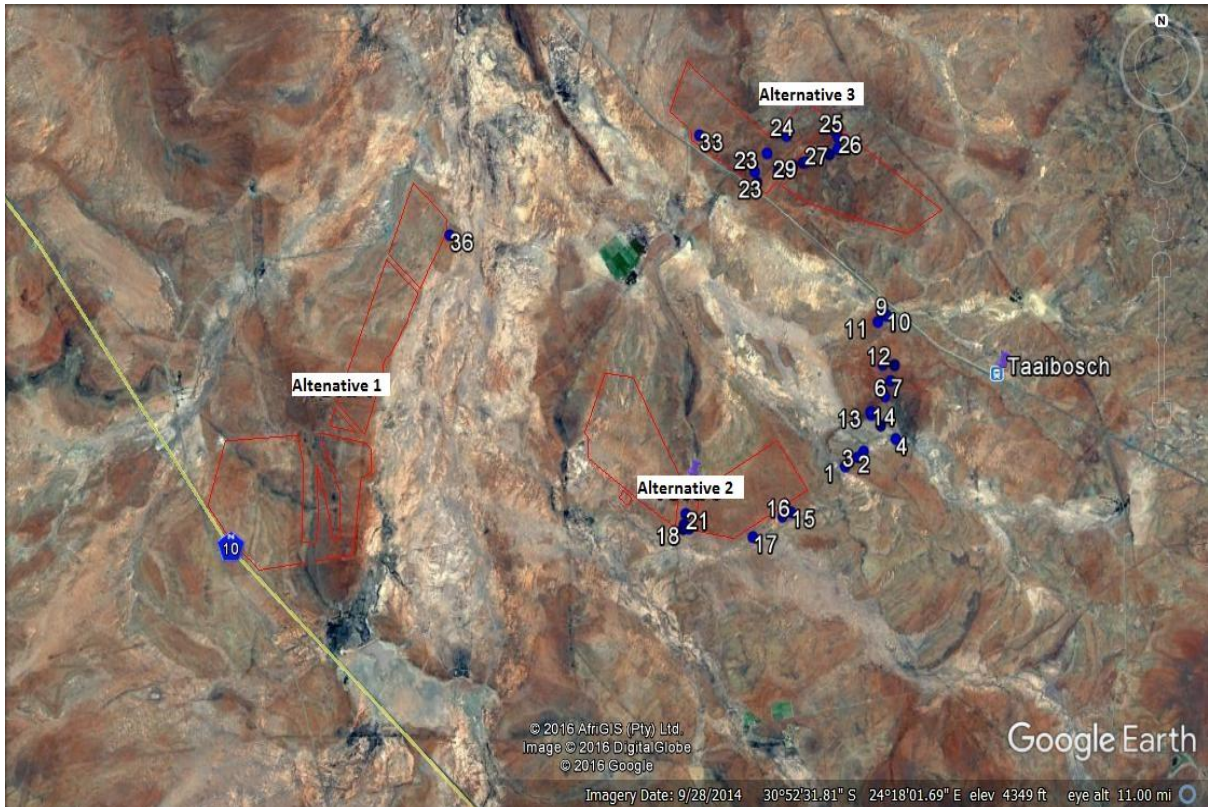


Fig.12: Distribution of sites found during February 2017. The whitish-grey areas indicate waterlogged/wetland sections and most of these were inaccessible during the survey (Google Earth 2016).



Fig.13: Stone tools found at Site 3.



Fig.14: A denser scatter of Stone tools at Site 6.



Fig.15: Site 6 location.



**Fig.16: Circular enclosure at Site 10.
This is likely an Anglo-Boer War Redoubt.**



Fig.17: Late 19th century glass and porcelain at Site 10.



Fig.18: Site 13 stone kraal.



**Fig.19: Site 14 stone enclosure.
Possible Anglo-Boer War redoubt.**



Fig.20: Food tin, spent Martini-Henry cartridge & porcelain from Site 14.



Fig.21: A rectangular enclosure at Site 14.



Fig.22: Site 19 stone enclosure/redoubt.



Fig.23: A late 19th century British .303 cartridge at Site 19.



Fig.24: Another stone-packed enclosure at Site 20.



Fig.25: A number of stones close to these Stone-packed enclosures have evidence of being hammered and used.



Fig.26: A scatter of Stone tools at Site 22.



Fig.27: A view of a section of Site 23.



Fig.28: Another section of Site 23.



Fig.29: Site 23 contains dense scatters of Stone tools that include cores and flakes.



Fig.30: More tools from Site 23.



Fig.31: A dense scatter of Stone Age material on Site 23.



Fig.32: Site 24 Stone-packed feature.



Fig.33: Horseshoe found at Site 24.



Fig.34: Stone tools at Site 27.



Fig.35: Possible grave at Site 31.



Fig.36: Spent British .303 cartridge at Site 34 dating to the Anglo-Boer War period.



**Fig.37: Ruins of old farmstead near Burgerville
Site 35.**



**Fig.38: One of three circular “excavations” on Site 36.
These are most likely dried-up dams/water holes.**



Fig.39: Aerial view showing possible extent of Site 23 Stone Age scatter & material (Google Earth 2017 – Image date 28/09/2014).

7. CONCLUSIONS AND RECOMMENDATIONS

A number of known cultural heritage sites (archaeological and/or historical) exist in the larger geographical area within which the study area falls. A number of archaeological and historical sites, features and finds were identified and recorded during the physical assessment undertaken.

A total of 36 sites were identified and recorded during the February 2017 assessment. Most of these are open-air Stone Age surface scatters of varying density and significance, while some historical sites, feature and cultural material most likely associated with the Anglo-Boer War (1899-1902) and farming history of the area was also identified. Some of the sites are located close to and within the 3 Areas where the Solar PV facilities and associated substations are planned, and mitigation measures will have to be implemented, while others are located in the general area of study as indicated by the client. The main focus of the field assessment was the 3 indicated footprint areas, although areas outside of this (in the larger impact area) were also looked at. It should once again be stressed that certain portions were inaccessible as a result of recent rains and the fact that sections contains extensive wetlands. Existing dirt tracks/roads and ESKOM servitudes were used and large portions were walked on foot. Areas with the potential for containing evidence of human presence and activity such as erosion dongas; unnatural looking clumps of trees and low outcrops or rocky ridges were focused on as well. Large parts of the study area is flat and open and has been disturbed by agricultural activities that include grazing and crop growing in the recent past and currently.

All the Stone Age sites identified during the assessment are open-air surface scatters of varying densities, with many single or more tool occurrences to extensive and very dense scatters covering a fairly large area (mainly Site 23). Many of the sites fall outside the areas of direct impact, while Site 23 (the most significant of the sites) falling in what we termed PV Plant Area 2. This site needs therefore to be mitigated. This site and others recorded during the February 2017 survey is similar to those recorded by others in the larger area during earlier assessments. They are located close to and around low rocky ridges and dolerite outcrops/dykes. Stone Age quarry sites are usually found at the foot of dolerite hills where hornfels outcrops occur. Site 23 and some of the other smaller sites seem to be so-called quarry sites, with dense scatters of flakes, more formal tools and numbers of cores occurring at these sites. Dolerite is also associated with engraving sites. One such site has been recorded at the Commonage in Hanover Town (Palaeo Field Services 2014: 5). Although no rock engravings were identified in the area during the assessment, some rocks with signs of edges being hammered or used were identified. Many of these are located close to sites with stone-packed enclosures though to be associated with the Anglo-Boer War period in the area, although the possibility of these features being related to earlier pastoralist camps cannot be excluded.

Sampson's (1972, 1974) survey of the Seacow drainage near Hanover recorded sites and quarries, ranging from the Earlier, Middle and Later Stone Ages, to proto-historic pastoralist camps and Historic farmyards. This culture-history sequence forms a basis for identifying stone tool industries and historic occupations over the entire district. There have been several investigations in the De Aar district itself because of the ammunition disposal plant to the west and various solar panel projects (e.g. Kaplan 2010; Kruger 2012; Morris 2011). Generally, archaeologists have found scatters of stone tools dating to the Middle and Later Stone Ages. In addition, the ammunition area yielded an Earlier Stone Age scatter, and a few rock art sites are on record for the district (Morris 1988; Rudner and Rudner 1968). These reports show that the De Aar district has a rich archaeological heritage (Huffman 2013: 3).

Surface scatters of stone tools (mostly Early and Middle Stone Age) were recorded during various earlier Heritage Impact Assessments. Of most importance to the current assessment was work conducted by Morris in 2011 for the proposed Taaibosch Photovoltaic Plant between De Aar and Hanover (David Morris 2011). He recorded a variable density of stone artifacts, mostly of Pleistocene age, over most of the area examined during the Archaeological Specialist Input for this project.

Site 23 covers an extensive area with dense scatters of Stone Age material including flakes, cores and more formal tools. Mitigation measures should include detailed mapping and drawing; surface collection of representative material as well as possible excavations. The other sites in the study area are similar but contain varying degrees of scatter density, from single tools to denser scatters. Site 23 can therefore be seen as a representation of the Stone Age in the area and detailed mitigation needs to be undertaken if the site cannot be avoided.

Many of the historical sites found during the February 2017 assessment are similar to those found by Beater during her HIA for the Taaiboschfontein Solar PV Project in 2011. She indicates that these are related to the Anglo-Boer War period and assesses their significance as of local importance and therefore worthy of preservation (Beater 2011). Most of the sites found during 2017 fall outside of the areas of direct impact, except Site 24 located in PV

Plant Area 2. Site 30 is a stone cairn that could possibly be a grave (located in Area 2 as well) and care should be taken not to impact this site without proper investigation.

Farms and other historical settlements in the area date back to the 1840's, while the area also have evidence associated with the South African (Anglo Boer) War. Signs of historical occupation are common in the general area and include abandoned sheep kraals and homestead ruins (Sites 13, 35, 36). Old railway infrastructure (housing, old railway lines and foundations) was also recorded at nearby Burgervilleweg (Becker 2012).

According to Beater, during the Anglo-Boer War of 1899-1902, the De Aar/Hanover/Graaf Reinet area was a hive of activity. Boer forces were strong in Northern Cape as towns had been scarcely garrisoned and towns as far east as Molteno were occupied by Boer commandos. The Cape Colony was initially seen as safe as it was a British Colony but Boers from the Orange River Colony crossed into the Cape Colony and occupied several towns. The railway links between Cape Town and the interior as well as smaller railway lines were crucial for the British as they provided transport from the harbour to the interior that carried soldiers, food and other goods. Disruption of the railway line by the Boer forces during the guerrilla warfare period from 1900 was ongoing and deliberate with the Boer commandos blowing up railway lines, derailing trains, and taking supplies from the trains meant for the British forces. Between December 1900 and September 1901 135 train wrecking incidents were recorded. Due to the expanding activities of the Boer commandos in the Cape more British troops had to be detailed to guard the Cape railways and from July 1901 onwards blockhouses and redoubts were built, eventually all the way down to Wellington in the Western Cape. Lord Kitchener was also forced to divert increasing numbers of troops from the occupied Boer Republics to aid the colonial detachments in dealing with the Boer commandos. In the cemetery on the outskirts of Hanover, a pyramid of stone marks the grave of three young men executed during the Anglo-Boer War of 1899-1902. A train had been derailed and plundered at Taaibosch, 20 km from town. Shortly afterwards several young men sleeping in the outside rooms of a nearby farm were taken into custody. They were charged with 'maliciously assisting Boer forces,' robbery and the deaths of passengers. Tried on somewhat dubious authority by a military court at De Aar, Sarel Nienaber, J. P. Nienaber and J. A. Nieuwoudt, were shot. They protested their innocence to the end (Beater 2011: 12-13).

The Anglo-Boer War (1899-1902) related sites (Sites 10, 14, 19-21 & 24) should be mitigated if they are to be impacted by the proposed development actions. This will include detailed mapping and drawing of the sites, as well as limited historical-archaeological excavations. If Site 30 is a grave then the site should be avoided and no impact on it allowed. The site can be fenced-off and protected. If it cannot be avoided then the site can be mitigated through exhumation and relocation after all due social consultation & permitting processes have been completed.

Finally, it should be noted that although all efforts are made to locate, identify and record all possible cultural heritage sites and features (including archaeological remains) there is always a possibility that some might have been missed as a result of grass cover and other factors. The subterranean nature of these resources (including low stone-packed or unmarked graves) should also be taken into consideration. Should any previously unknown or invisible sites, features or material be uncovered during any

development actions then an expert should be contacted to investigate and provide recommendations on the way forward.

From a cultural heritage point of view the development should be allowed to continue, once the recommended mitigation measures have been implemented.

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APPENDIX A
DEFINITION OF TERMS:

Site: A large place with extensive structures and related cultural objects. It can also be a large assemblage of cultural artifacts, found on a single location.

Structure: A permanent building found in isolation or which forms a site in conjunction with other structures.

Feature: A coincidental find of movable cultural objects.

Object: Artifact (cultural object).

(Also see Knudson 1978: 20).

APPENDIX B
DEFINITION/ STATEMENT OF HERITAGE SIGNIFICANCE:

Historic value: Important in the community or pattern of history or has an association with the life or work of a person, group or organization of importance in history.

Aesthetic value: Important in exhibiting particular aesthetic characteristics valued by a community or cultural group.

Scientific value: Potential to yield information that will contribute to an understanding of natural or cultural history or is important in demonstrating a high degree of creative or technical achievement of a particular period

Social value: Have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.

Rarity: Does it possess uncommon, rare or endangered aspects of natural or cultural heritage.

Representivity: Important in demonstrating the principal characteristics of a particular class of natural or cultural places or object or a range of landscapes or environments characteristic of its class or of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province region or locality.

APPENDIX C SIGNIFICANCE AND FIELD RATING:

Cultural significance:

- Low: A cultural object being found out of context, not being part of a site or without any related feature/structure in its surroundings.
- Medium: Any site, structure or feature being regarded less important due to a number of factors, such as date and frequency. Also any important object found out of context.
- High: Any site, structure or feature regarded as important because of its age or uniqueness. Graves are always categorized as of a high importance. Also any important object found within a specific context.

Heritage significance:

- Grade I: Heritage resources with exceptional qualities to the extent that they are of national significance
- Grade II: Heritage resources with qualities giving it provincial or regional importance although it may form part of the national estate
- Grade III: Other heritage resources of local importance and therefore worthy of conservation

Field ratings:

- i. National Grade I significance: should be managed as part of the national estate
- ii. Provincial Grade II significance: should be managed as part of the provincial estate
- iii. Local Grade IIIA: should be included in the heritage register and not be mitigated (high significance)
- iv. Local Grade IIIB: should be included in the heritage register and may be mitigated (high/medium significance)
- v. General protection A (IV A): site should be mitigated before destruction (high/medium significance)
- vi. General protection B (IV B): site should be recorded before destruction (medium significance)
- vii. General protection C (IV C): phase 1 is seen as sufficient recording and it may be demolished (low significance)

APPENDIX D
PROTECTION OF HERITAGE RESOURCES:

Formal protection:

National heritage sites and Provincial heritage sites – Grade I and II

Protected areas - An area surrounding a heritage site

Provisional protection – For a maximum period of two years

Heritage registers – Listing Grades II and III

Heritage areas – Areas with more than one heritage site included

Heritage objects – e.g. Archaeological, palaeontological, meteorites, geological specimens, visual art, military, numismatic, books, etc.

General protection:

Objects protected by the laws of foreign states

Structures – Older than 60 years

Archaeology, palaeontology and meteorites

Burial grounds and graves

Public monuments and memorials

APPENDIX E
HERITAGE IMPACT ASSESSMENT PHASES

1. Pre-assessment or Scoping Phase – Establishment of the scope of the project and terms of reference.
2. Baseline Assessment – Establishment of a broad framework of the potential heritage of an area.
3. Phase I Impact Assessment – Identifying sites, assess their significance, make comments on the impact of the development and makes recommendations for mitigation or conservation.
4. Letter of recommendation for exemption – If there is no likelihood that any sites will be impacted.
5. Phase II Mitigation or Rescue – Planning for the protection of significant sites or sampling through excavation or collection (after receiving a permit) of sites that may be lost.
6. Phase III Management Plan – For rare cases where sites are so important that development cannot be allowed.