

**A HERITAGE SCOPING IMPACT ASSESSMENT REPORT
RELATED TO THE DEVELOPMENT OF THE SUN CENTRAL 1,300 MW, SOLAR PV FACILITY
ADDITIONAL ACTIVITIES ON VARIOUS FARM PORTIONS BETWEEN DE AAR & HANOVER,
EMTHANJENI LOCAL MUNICIPALITY, PIXLEY KA SEME DISTRICT MUNICIPALITY,
NORTHERN CAPE PROVINCE, SOUTH AFRICA**

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REPORT: **APAC023/12**

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SUMMARY

APelser Archaeological Consulting cc was appointed by Ecoleges Environmental Consultants, on behalf of SolarAfrica Energy (Pty) Ltd, to undertake a Cultural Heritage Impact assessment related to additional activities associated with the Sun Central Cluster 1, 300MW, Solar PV project in the Northern Cape, between De Aar & Hanover, Emthanjeni Local Municipality, Pixley Ka Seme District Municipality, Northern Cape Province, South Africa. The additional activities include the development and widening of roads; extending the transmission line from the Main Transmission Station (MTS) to Line 1 of the 400 kV Eskom powerline; and consolidation of water uses currently authorized under General Authorisation, including additional boreholes, into an Integrated Water Use License.

Previous archaeological and heritage assessments for the Goedehoop Solar PV Project (Phases 1, 2 & 3) recorded a fairly large number of cultural heritage (archaeological & historical) resources of varying extent and significance in the area (**See References List**). These included scatters of open-air surface Stone Age sites, rock engravings, later agro-pastoralist stone-walled sites, as well as historical Anglo-Boer War (1899-1902) sites. With no field assessment undertaken, the initial assessment report in February 2023 was informed by the results of the previous work, as well as information provided to the Heritage Specialist by the client as a result of field visits conducted by them. In an Interim Comments Letter on Case ID#20135, dated to the 5th of May 2023, SAHRA requested that a field-assessment of the proposed activities be undertaken as part of the EA Application process. The HIA must confirm the location and extent of the sites identified in 2022 by the representatives of Ecoleges and ground truth any areas associated with the proposed amendment activities. A Final Comments (dated to 15 May) letter on the case from SAHRA requested that the undeveloped and undisturbed sections of the proposed access road be subjected to a walkdown by a qualified archaeologist to ensure that no heritage resources of high heritage will be impacted. A field-based assessment was subsequently undertaken between the 20th and 21st of May 2023.

This amended report discusses the results of both the background research and recent fieldwork, and provides recommendations on the way forward at the end, with the potential impacts of the additional activities on the cultural heritage assessed as well.

From a Cultural Heritage point of view, it is recommended that the proposed development activities be allowed to continue, taking into consideration the recommendations put forward at the end of the report.

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1. INTRODUCTION

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Previous archaeological and heritage assessments for the Goedehoop Solar PV Project (Phases 1, 2 & 3) recorded a fairly large number of cultural heritage (archaeological & historical) resources of varying extent and significance in the area. These included scatters of open-air surface Stone Age sites, rock engravings, later agro-pastoralist stone-walled sites, as well as historical Anglo-Boer War (1899-1902) sites. No field assessment was undertaken originally for the current study, and the initial assessment report in February 2023 was informed by the results of the previous work, as well as information provided to the Heritage Specialist by the client obtained through field visits conducted by them. A field-based assessment was subsequently undertaken between the 20th and 21st of May 2023.

The client indicated the location and boundaries of the areas that had to be assessed, and the work focused on these.

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 (Act 25 of 1999)

According to the 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 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 the 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 (No. 107 of 1998)

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.

The specific requirements that specialist studies and reports must adhere to are contained in Appendix 6 of the EIA Regulations.

4. METHODOLOGY

4.1. Review 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. These include Bergh (1999), Huffman (2007) & Lombard et.al (2012).

4.2. Field survey

The field assessment section of any 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 detail 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

The study and proposed development area is located on portions of various farms situated between De Aar & Hanover in the Emthanjeni Local Municipality of the Pixley Ka Seme District Municipality in the Northern Cape Province of South Africa. The Heritage Impact Assessment forms part of the Basic Assessment for Environmental Authorization for the Main Access Road and Part 2 Amendments for the additional activities e.g. the transmission line, associated with the Sun Central Cluster 1 300MW Solar PV project in the Northern Cape. The additional activities include the development (access road) and widening of roads; extending the transmission line from the Main Transmission Station (MTS) to Line 1 of the 400 kV Eskom powerline; and consolidation of water uses currently authorized under General Authorisation, including additional boreholes, into an Integrated Water Use License. Access road to MTS and transmission line

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 is flat and open, with some rocky ridges/outcrops and low hills surrounding present. The area is densely vegetated with typical Karoo ground cover (grasses and shrubs).

For the most part the general area has not been disturbed by modern developments, except for a railway line, existing Eskom Powerline corridors that 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. There is minimal natural erosion, except predominantly water erosion around (now) dry river beds. The area assessed for the current study has been minimally disturbed, besides impacts through roads, farm fences, as well as game and sheep farming activities.



Figure 1: General location of the study & proposed development area footprint (from Screening Report courtesy Ecoleges Environmental Consultants).



Figure 2: District level view of the study area (from Google Earth 2023 courtesy Ecoleges Environmental Consultants).

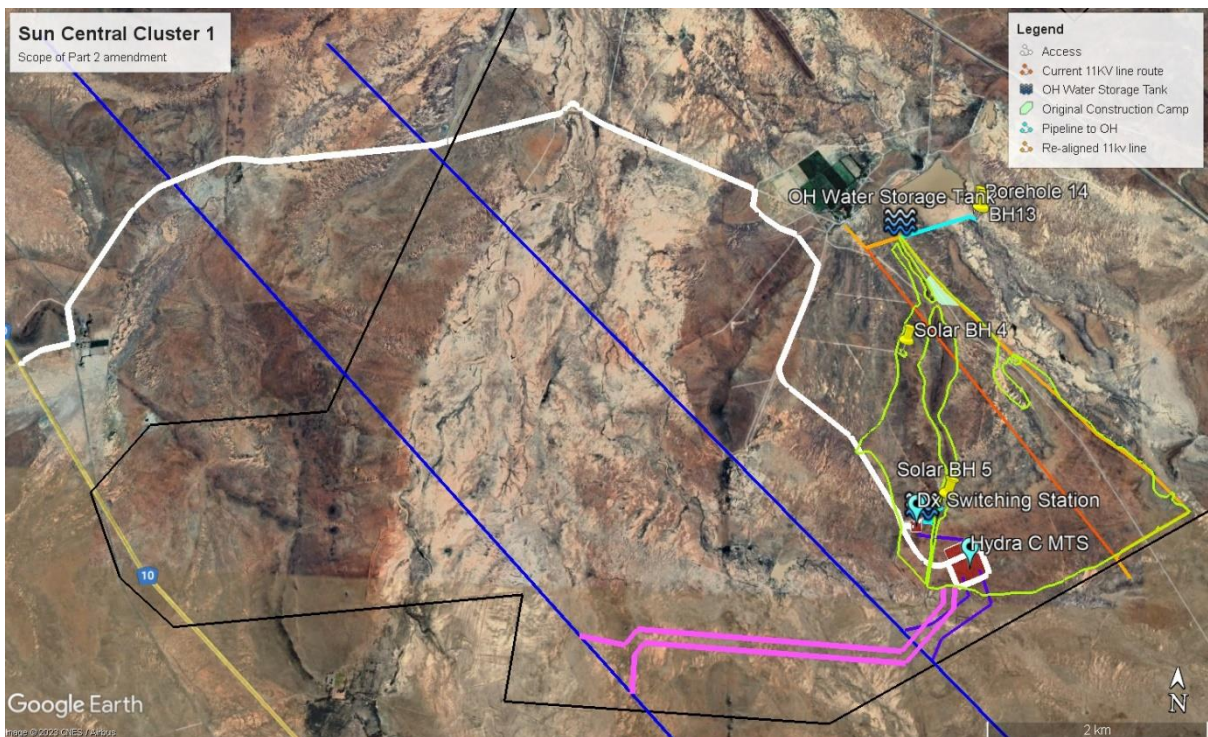


Figure 3: Closer view of study and development area (from Google Earth 2023 courtesy Ecoleges Environmental Consultants).

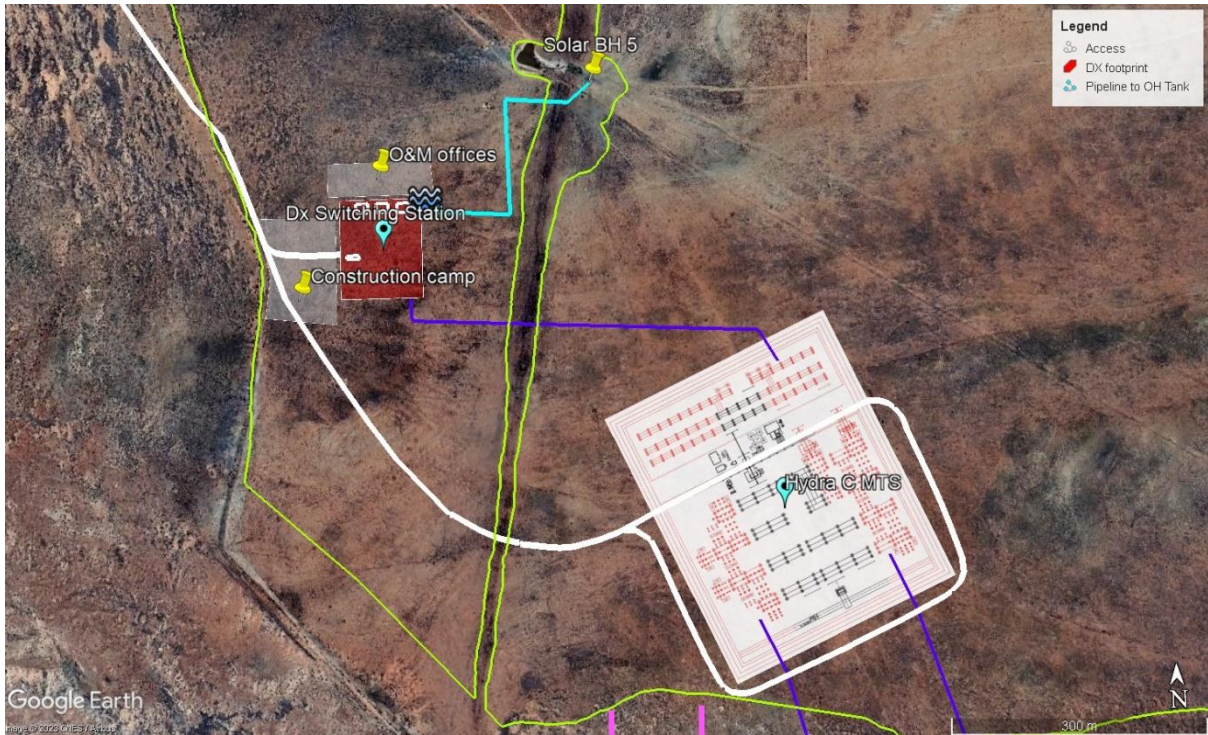


Figure 4: Closer view of MTS and smaller substation location & footprint (from Google Earth 2023 courtesy Ecoleges Environmental Consultants).

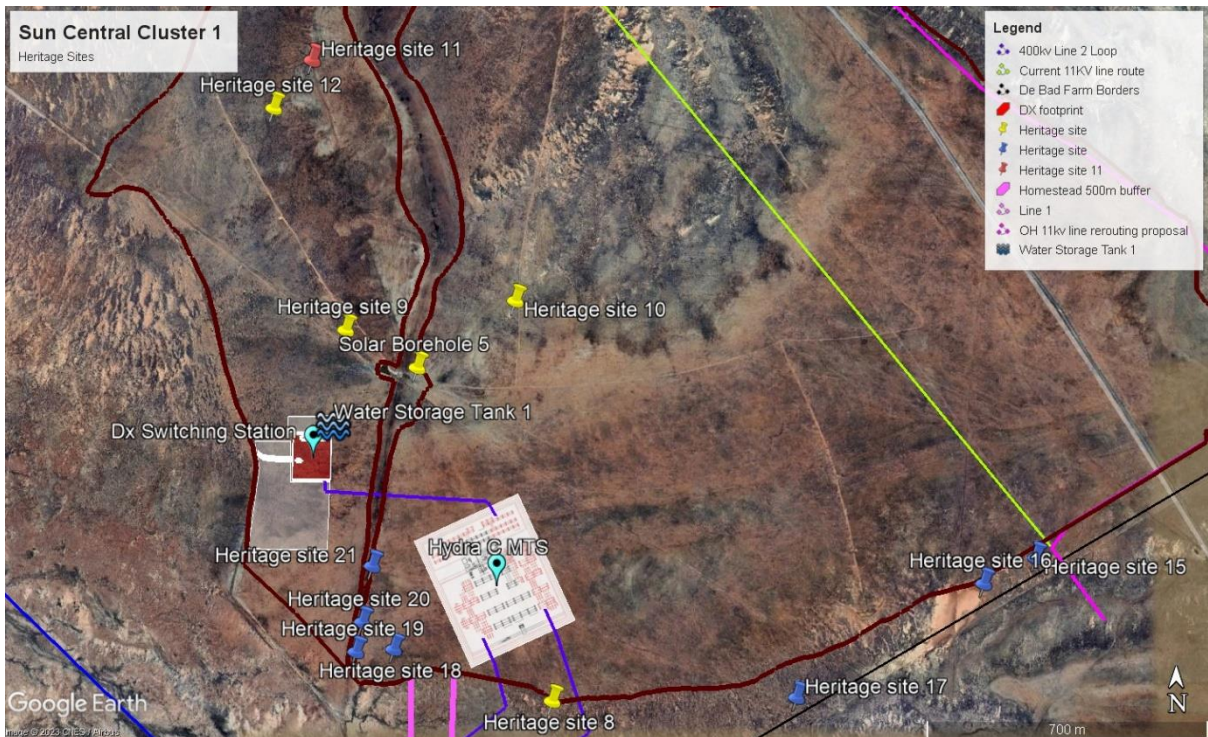


Figure 5: Location of identified heritage sites within the Sun Central Cluster 1 footprint, focussin on the central and southern section (from Google Earth 2023 courtesy Ecoleges Environmental Consultants).

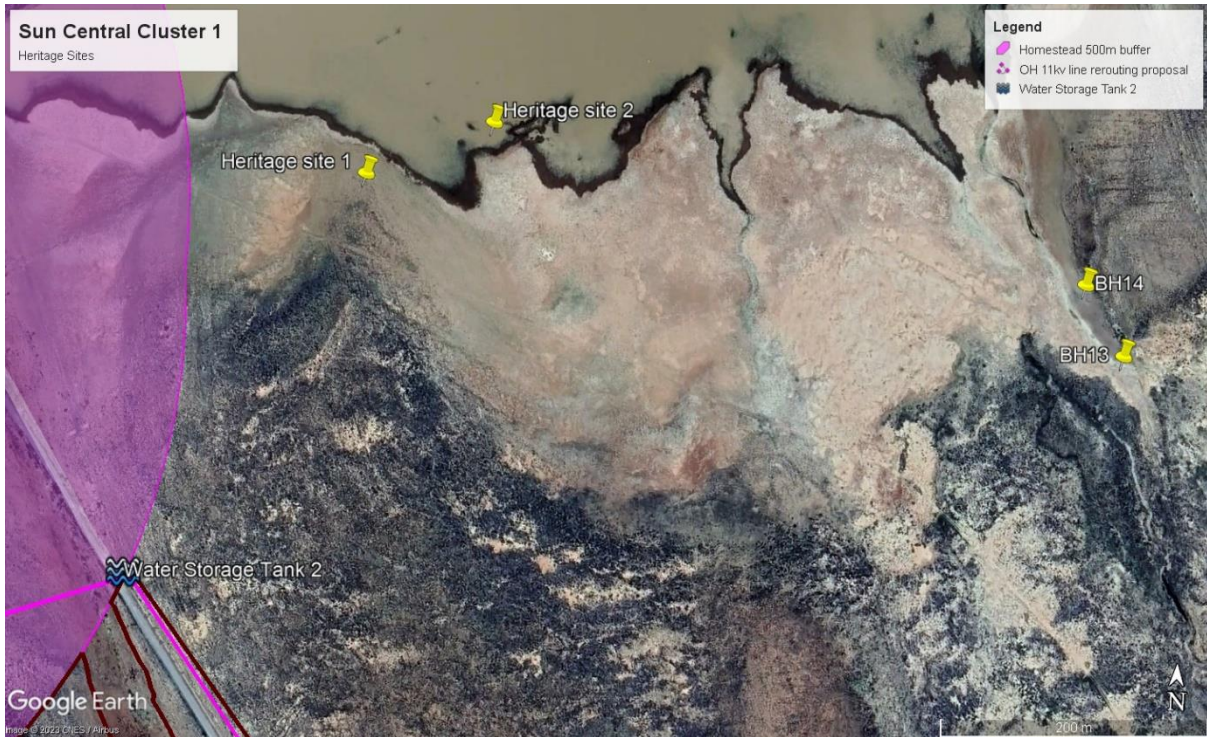


Figure 6: Location of identified heritage sites within the Sun Central Cluster 1 footprint, focussing on the northern section (from Google Earth 2023 courtesy Ecoleges Environmental Consultants).

6. DISCUSSION

In 2016 Ecoleges undertook a S&EIA for the development of a 225 MW Solar PV facility between Hanover and De Aar in the Northern Cape. Three alternative footprints (PV01, PV02, PV03) were investigated during the assessment process. The central footprint (PV02) was identified as the preferred option because of its lower environmental impact and proximity to an existing 400kV Eskom powerline when compared with PV 01 and PV03. The National Department of Environmental Affairs granted an environmental authorization (DEA Reference: 14/12/16/3/3/2/998) on 16th April 2018. This project was originally known as Phase 1. An amendment to increase the capacity (not the footprint) of the facility to 300 MW due to technological advancements in solar photovoltaic efficiency and electrical output was granted on 24th November 2020.

A second amendment was granted in 2021 for the inclusion of containerized lithium-ion battery Storage and dual-fuel backup generators with associated fuel storage as part of the Risk Mitigation Independent Power Producers Procurement Program (RMIPPPP). The competent authority was the National Department of Environmental Affairs because the application was part of the REIPPPP or RMIPPPP BID rounds, which formed part of a Strategic Infrastructure Project (SIP) as described in the National Development Plan, 2011.

Currently there is also an application for environmental authorization to develop an additional 300MW on the PV03 footprint (Phase 2) that was considered during the initial S&EIA. It is proposed to connect this second phase to the substation that forms part of the

authorized facility on PV02 (Phase 1). Additionally, an application for environmental authorization to develop Phase 3, which involves the development of a third 400 MW Solar Photovoltaic (PV) facility on the Remainder of Farm Goede Hoop 26C and Portion 3 of Farm Goede Hoop 26C, is also in process. The two additional Solar PV facilities (Phase 2 and 3) will feed into the authorized Main Transmission Sub-station (MTS) on the Phase 1 footprint.

The subsequent expansion of the MTS, inclusion of a 132 kV switching yard, additional access road and staging area, required a third Part 2 amendment to the existing environmental authorization (EA Reference: 14/12/16/3/3/2/998). The amendment (EA Reference: 14/12/16/3/3/2/998/AM4) was granted on 25th November 2022. The same activities and associated infrastructure also required additional water use authorizations in the form of General authorization for specifically Section 21 (a), (b), (c), (i) & (g).

Following the sale of shares and project rights by Soventix SA to SolarAfrica Energy (SAE), another Part 1 amendment (EA Reference: 14/12/16/3/3/2/998/AM4) was granted on 07th December 2022 to reflect the change of contact details and responsible party. The water use authorizations are also being updated.

As the current project scope has grown beyond what was originally envisaged for Phase 1 (now known as Sun Central Cluster 1), additional authorizations will be required to allow necessary road upgrades to the MTS, due to the size and weight of the MTS transformers and associated transport vehicles and to ensure compliance with Eskom minimum road requirements. Additionally, a Cost Estimate Letter (CEL) issued by Eskom during the baseline S&EIA in 2016, made provision for Loop-In, Loop-Out (LILO) into the 400 kV transmission closest to the MTS (known as Line 2). However, Eskom is now allowing SolarAfrica Energy (SAE) to connect to Hydra-Poseidon Line 1, which is a parallel overhead transmission line approximately 2.5 kms away from Line 2 (Figure 1), in case it becomes necessary to utilise this line in future or for future expansion.

Accordingly, a technical and financial proposal to undertake the following additional activities and associated authorizations is being prepared:

1. These above-listed changes will result in “triggering” additional Listed Activities not currently included in the EA, necessitating application for additional EA by way of Basic Assessment.
2. The scope of the road upgrades and additional length of transmission line will no longer constitute “low-risk” activities, resulting in an application for a Water Use License, which will also consolidate all the current water uses authorized under General Authorization into an Integrated Water Use License. Furthermore, additional water, by way of groundwater, will be required for the project, to ensure adequate water provision for the road upgrades, on-site concrete batching activities, and transmission line pylons.
3. Finally, concrete batching was not included in the scope of the baseline S&EIA and will need to be included in the scope by way of another Part 2 amendment.

The client or applicant is SolarAfrica Energy (Pty) Ltd, a renewable energy company with its head office in Pretoria. The property owner is Mr. Willem Retief that has entered into a land use agreement with SolarAfrica Energy (SAE). The main access to the site is off the N10 between De Aar & Hanover. The current land use is sheep farming, which will continue within the solar PV plants to ensure minimal reduction (if any) on agricultural potential of the land as well as a management tool to control vegetation growth.

A number of Heritage Impact Assessments have been undertaken in the larger geographical area, as well as for the previous Phases for the Solar PV development (**See List of References**). Although a fairly large number of cultural heritage (archaeological and/or historical) resources were identified and recorded during these assessments, 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 possible impact of the proposed development on paleontological 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 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 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 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 artifacts, 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 2017, 2021 & 2022 assessments for the Soventix Solar PV Project (for the Phases 1, 2 & 3 Solar PV Developments). Some of these sites are located in close proximity to the current study area for the additional activities.

The Iron Age is the name given to the period of human history when metal was mainly used to produce metal 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) however indicates that a Middle Iron Age should be included. His dates, which now seem to be 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. While no distinct IA sites were found during the previous assessments, one of the sites recorded during the February 2021 assessment could represent a proto-historic pastoralist structure similar to those described by Sampson.

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 dating to recent historical times (some also related to the Anglo-Boer War) was identified and recorded during the previous assessments for the various Phases of the proposed Solar PV development in the larger study area.

The Heritage Impact Assessment for the Sun Central Cluster 1, 300MW, Solar PV Facility Additional Activities did not include a physical field visit as this stage. The results of previous work done in the area were utilized in order to determine the possible existence of known (earlier recorded sites) cultural heritage resources in the activity areas, the potential impact of the proposed development activities on these, as well as to indicate the potential of similar, unrecorded sites, features and material in the study area. Information provided by the client (Ecoleges) from a recent site visit to the area was also used.

The cumulative impacts of similar developments in the larger region were not investigated as they are not particularly applicable to the Cultural Heritage sites, given the fairly localized context.

A fairly large number of archaeological and recent historical sites and features were identified during the 2017, 2021 and 20223 field assessments for Phases 1, 2 & 3 of the Solar PV development in the area. Most of these were open-air surface scatters of Stone Age material, while a number of sites dated to the Anglo-Boer War (or South African War) of 1899-1902 or are related to recent historical farming-related activities. A number of these sites are being archaeologically investigated as part of Archaeological Mitigation measures (under a SAHRA permit), while the sites are also included in a Cultural Heritage Management Plan recently submitted for implementation.

The heritage sites identified and recorded in the larger area for the Solar PV Phases 1, 2 and 3 Developments will not be discussed in this report as they were dealt with in detail in the 2017, 2021 & 2022 HIA Reports. However, some of the sites recorded in 2017 and 2021 are located in relative close proximity to the Additional Activities (Access Road, MTS) for Sun Central Cluster 1 facility, and these will be discussed and included here.

Discussion

Sites recorded in 2017

1. Site 18

Site 18 is a scatter of low-density stone tools, as well as some ostrich egg shell fragments. The site was given a Medium Heritage Significance rating, and it was recommended that the site be mitigated before destruction. This site is included under SAHRA Permit for Phase 2 Mitigation.

GPS Coordinates: S30.89070 E24.31404.

2. Sites 19, 20 & 21

All three these sites are represented by stone-packed enclosures, and were identified as redoubts associated with the Anglo-Boer War. Cultural material in the form of cartridges, porcelains, glass and metal objects were recorded in association with these sites.

The sites were given a Medium Significance Rating and it was recommended that they should be recorded in detail before destruction. The sites are on the banks of watercourse and development exclusion zone and a 30m no-go buffer zone was therefore recommended. These sites are also included under a SAHRA Permit for archaeological mitigation.

GPS Coordinates: S30.89076 E24.31306 (19); S30.89010 E24.31322 (20) & S30.88885 E24.31347 (21).

3. Site 36

Site 36 is represented by 3 shallow “excavations”, circular in shape, into the bedrock. These features were identified as possible dried-up dams or water reservoirs at the time. The site was given a Medium Heritage Significance Rating. No further mitigation measures were recommended in the 2017 report.

GPS Coordinates: S30.85412 E24.27465.



Figure 7: Stone enclosure/redoubt at Site 19.



Figure 8: late 19th century British .303 cartridge at Site 19.



Figure 9: The stone-packed feature at Site 20.



**Figure 10: One of three circular “excavations” on Site 36.
These are most likely dried-up dams/water reservoirs.**

Sites recorded in 2021

1. Site 1

Site 1 is rocky outcrop with a number of rocks containing possible engravings in the form of various striations and lines. Although the age of the engravings could not be determined without a doubt, it could be related to proto-historic pastoralists that moved through the area. Stone Age material (tools/flakes) was also identified in the general proximity of the site. Should the site be negatively impacted by the proposed development activities it was recommended that Phase 2 Archaeological mitigation work be undertaken. This will entail the detailed mapping, photographic recording and drawing of the site and the individual engravings (through detailed rubbings) to ensure the capturing of the information contained on the site before destruction. The site was given a Medium to High Heritage Significance Rating.

If the development avoids the site and the rock engravings on it, by maintaining a 30m buffer zone around them within which no development is allowed, then no further action will be required for Site 1.

GPS Coordinates: S30 51 32.10 E24 18 43.00.



Figure 11: View of Site 1 with rock engravings.

2. Sites 2, 8, 9 & 10

These sites were all open-air surface scatters with differing densities of material (flakes, more formal tools such as blades and scrapers, hammer stones) on them. These artifacts and sites date to between the MSA and LSA and is similar to those found in other areas during the 2017 assessments and in other studies by archaeologists in the larger geographical area. Although only 10 sites were identified, there could potentially be many more located in the area. and the focus was therefore on more open patches of ground, erosion dongas and pans. Some of the sites were located close to and around the low hill that runs through a section of the study area and around rocky outcrops.

Although these sites and finds are open-air surface locations and not in a primary context, it was believed that they would contribute to our knowledge of the Stone Age of the specific and larger geographical area. The sites were given a Medium to High Heritage Significance Rating. If the sites can't be avoided by the development activities and need to be destroyed as a result then the following mitigation measures were recommended prior to development commencing:

- 1 Mapping of surface sites to determine their extents
2. Surface collection of material to obtain a representative sample of Stone Age material and types to determine the age of the material and sites

GPS Coordinates: S30 51 30.70 E24 18 46.50 (2); S30 53 30.60 E24 19 05.40 (8); S30 53 00.90 E24 18 45.90 (9) & S30 52 58.50 E24 19 01.80 (10).



Figure 12: Some of the material from Site 8. These are typical of the Stone Age scatters at most of the known sites located in the area.

3. Site 11

Site 11 contains the remains of what seemed to be a collapsed stone-walled enclosure close to a low hill in the area, situated on a natural rocky terrace, as well as a smaller section of stone walling. A grinding hollow was also recorded in close proximity. Although the age and function of these features could not be determined without a doubt at the time, it is likely related to proto-historical pastoralists and could represent the remnants of a small camp. Although the site was not completely intact, these types of sites are fairly scarce and slowly disappearing from the landscape as a result of various factors such as developments. It was therefore given a Medium to High Significance rating from a Cultural Heritage perspective. It was recommended that the site should be avoided if possible and be preserved in situ & included in a Heritage Management Plan. If the proposed development actions can't avoid the site the following was recommended:

1. Detailed mapping and drawing of the site and its features
2. Limited archaeological excavations on the site before destruction.

GPS Coordinates: S30 52 39.10 E24 18 42.60.



Figure 13: Collapsed stone-walled enclosure on Site 11.

Although none of the sites discussed above will be directly impacted by the additional activities (access road, MTS, transmission lines and boreholes), it was clear from this that there are a range of archaeological and recent historical sites, features and material present in the study and development area. It was therefore deemed highly likely that many similar sites would be present in the areas that had not been physically assessed prior to the May 2023 field-based study. This would likely have included (to a large degree) open-air Stone Age sites with varying densities of tool scatters.

Although there was therefore a likelihood of negative impacts on cultural heritage sites through the development of the access roads, transmission lines and MTS, the fact that there were already archaeological mitigation measures ongoing on similar sites in the area, would minimize the impacts of the Solar PV developments on the archaeological and historical heritage of the area. It was however also recommended that a Chance Find Procedure be developed and implemented for the Sun Central Cluster 1 300MW Solar PV Facility Additional Activities.

During an early December 2022 field visit by representatives of Ecoleges to the study and development area, some archaeological material and a number of recent historical features and associated cultural material were identified by them. The information and photographic records were provided to the Heritage Specialist. These finds and sites were located close to and in the “reserve” of the Main Access Road off the N10 to de Aar towards Burgerville. Based on this the following conclusions and recommendations were made:

1. The remains of recent historical farming-related settlement are located in the area close to and around the access road. This includes stone-walled enclosures (kraals) and homesteads. Cultural material associated with these remains were found that included fragments of decorated ceramics dating the sites to between the late 19th and early 20th centuries. These sites were given a Medium to High Heritage Significance Rating and if they were to be impacted directly by the development activities, it was recommended that these sites should be mitigated through archaeological measures that will include detailed mapping and drawing, as well as limited excavations. If they could be avoided then these sites were to be included in the Cultural Heritage Management Plan for the Solar PV development.
2. Stone Age material, similar to those found on other sites during previous assessments, also occur here. It is envisaged that more of these scatters of material (individual and denser concentrations of tools) will be present in the area as well. These finds and sites are given a Low to Medium Heritage Significance rating. With many similar sites in the area already forming the focus of detailed archaeological mitigation work, no further mitigation is required.

GPS Coordinates for finds made by Ecoleges: S30 51 25.58 E24 14 33.51 (stone-walled enclosure/kraal; S30 51 25.58 E24 14 33.51 (homestead remains); S30 51 25.73 E24 14 33.78 (decorated ceramics) and S30 57 22.08 E24 21 05.70 (stone tool).

Based on SAHRA's Interim (5th May 2023) and Final Comments Letter (15th May 2023) and the requested physical assessment of the development areas (including the ground-truthing of the sites and features identified by Ecoleges and a walk-down of the access road and transmission lines), a field-based assessment was undertaken between the 20th and 21st of May 2023.

Results of the May 2023 assessment

A total of 22 cultural heritage (archaeological and/or historical) sites and features were identified in the study areas during the recent May field assessment, some of which are associated with the sites identified by Ecoleges in December 2022. A number of these finds are represented by small, low-density scatters of MSA/LSA material in open-air surface scatters, while the others date to the late 19th/early 20th century. Although some are located in close proximity to or adjacent to the Access Road route, most will not be directly impacted by the development activities.

Stone Age

The lithic occurrences recorded at Sites 003, 004, 006 and 007 are within the bounds of a historical farm-scape, and even though predominantly flakes and without prominent archaeological context, these surface scatters should be protected as part of the historical site. The lithic material within the boundaries of the historical farm-scape will receive protection from a buffer zone around the historical farm-scape. Furthermore, the archaeological context of these lithics probably lies more towards the koppie located to the

northwest of the recorded material. The scatters recorded at Sites 011-015 lie within a dry riverbed and were deposited by water at some point. They are without archaeological context and are therefore not conservation worthy. Therefore, no further mitigation is recommended. Very few formalised tools were recorded. The most special is a retouched large flake/scrapper recorded at Site 004.

Site 003: Flakes (MSA) S30°51'25.08 E24°14'33.22 Raw material Dolerite. 10 in 2 m². Surface scatter. Found on a stone structure foundation. Adjacent to the development footprint, no archaeological deposit.

Site 004: Retouched flake, flakes and chunk (MSA/LSA) S30°51'24.47 E24°14'34.03. Raw material Dolerite. 5 in 1 m². Low-density surface scatter. Located at small stone kraal. Adjacent to the development footprint, behind fence, no archaeological deposit.

Site 006: Flakes and chunk (MSA) S30°51'23.04 E24°14'34.15. Medium significance. Mitigation required before destruction. Raw material Dolerite. 5 in 1 m². Low-density surface scatter. Located at the foot of a rocky outcrop. Additional Adjacent to the development footprint, behind the fence, no archaeological deposit.

Site 007: Flakes and scrapper (MSA) S30°51'23.15 E24°14'33.52. Medium significance. Mitigation required before destruction. Raw material Dolerite. 10 in 5 m². Low-density surface scatter. Located at the foot of a rocky outcrop. Adjacent to the development footprint, behind fence, no archaeological deposit.

Site 011: Flakes and chunk (MSA) S30°51'20.35 E24°17'25.73. Raw material Dolerite. 4 in 10 m². Low-density surface scatter. Alluvial deposit. Next to the road, no archaeological deposit.

Site 012: Flakes, thumb scrapper (MSA) S30°51'17.26 E24°17'11.55. Raw material Dolerite. 6 in 10 m². Low-density surface scatter. Alluvial deposit. Next to the road, no archaeological deposit.

Site 013: Retouched flake and chip (MSA) S30°51'13.83 E24°17'3.09. Raw material Dolerite. 2 in 5 m². Low-density surface scatter. Alluvial deposit. Next to the road, no archaeological deposit.

Site 014: Retouched flake (MSA) S30°51'12.02 E24°16'59.18. Raw material Dolerite. 1 in 5 m². Low-density surface scatter. Alluvial deposit. Next to the road, no archaeological deposit.

Site 015: Retouched flake/blade, chunks (MSA/LSA) S30°51'10.03 E24°16'57.87. Raw material Dolerite. 6 in 2 m². Low-density surface scatter. Alluvial deposit. Next to the road, no archaeological deposit.

Historical Period Sites

Site 001, a corrugated iron structure older than 60 years, lies far enough from the proposed access road to not experience any negative impact from the development. Sites 002-005 and

008-010 are all associated with a historical farm-scape. These sites are located on fenced properties, but sections are very close to the road. Care should be taken to avoid these areas if the road gets widened or scraped/tarred. The large household midden is rich in surface material from the late 19th century to the early 20th century and probably contains slightly older material in situ. Large amounts of spent bullet casings are located on the midden's surface. The house foundations are of stone, with brick additions/walls. The circular enclosure/stock kraal close to the house also has surface scatters of ammunition and remains of alcoholic bottle bases. These may be indicative of the 2nd South-African War (1899-1902) activities in the area.

The large fieldstone retaining/dam wall, located at Site 016, is older than 60 years, even though the exact period is unknown. The wall is a somewhat prominent feature within the landscape. Site 017 is quite a distance away from the proposed access and loop-in and -out lines, but they were recorded nonetheless. The circular stone structure might be associated with the 2nd South-African War, based on the small amounts of material found scattered around the structure, including a lid of John Gosnell's cherry toothpaste, dating to the 1890s.

Along the southern part of the access road, at Sites 018-022, are stone embankments with approximately 1m wide openings. More of these embankments may be obscured by vegetation and covered in soil. Although part of the historical farming landscape, they do not possess any particular technological or cultural heritage significance.

The various aspects of the historical farm-scape recorded should be treated as parts of a whole entity, and a buffer zone is recommended, especially during the road construction phase, since parts of the site lie close to the fence. In addition, the large retaining wall should also be protected by a buffer zone so that road construction activities inadvertently damage no part of it. The road construction activities will not affect the redoubt outside the access road footprint, and no mitigation is needed at this stage. The Phase 1 survey is considered sufficient recording of the stone embankments, and no further mitigation is recommended.

Sites 002, 003, 005 and 008 is related to the stone-walled enclosure/kraal homestead remains and decorated ceramics identified by Ecoleges in December 2022.

Site 001: Corrugated structure (Early 20th century). S30°52'19.83 E24°13'47.03. Medium significance. Mitigation required before destruction. A buffer zone is recommended during road construction. Material: Corrugated iron and stone. Fenced and on private property adjacent to the access road.

Site 002: Historical midden (1880s - early 20th century). S30°51'24.82 E24°14'32.08. Medium significance. Mitigation required before destruction. A buffer zone is recommended during road construction. Material: Ceramic, glass, munition, OES (ostrich egg-shell) pieces, harmonica plate, building hardware, and more. 200+ in 450 m². Associated with stone and brick house foundation to the southeast of the midden. The large midden is undisturbed and appears to be deep. It lies adjacent to the access road, behind but close to the property fence.

Site 003: L-shaped long house (1880s - early 20th century) S30°51'25.08 E24°14'33.22. Medium significance. Mitigation required before destruction. A buffer zone is recommended during road construction. Material: Stone and brick. Structure associated with midden and kraal. The house lies adjacent to the access road, behind but close to the property fence.

Site 004: Small live-stock kraal/stone enclosure (1880s - early 20th century). S30°51'24.47 E24°14'34.03. Medium significance. Mitigation required before destruction. A buffer zone is recommended during road construction. Material: Fieldstone. Associated with longhouse. The enclosure lies adjacent to the access road, behind and a distance from the property fence.

Site 005: Small midden (1880s - early 20th century). S30°51'24.15 E24°14'34.54. Medium significance. Mitigation required before destruction. A buffer zone is recommended during road construction. Material: Ceramics, glass, munitions, lithics. 3 m². Likely associated with the other nearby structures. Midden is small and shallow, behind and a distance from the property fence.

Site 008: Large stone kraal (1880s - early 20th century). S30°51'26.60 E24°14'33.34. Medium significance. Mitigation required before destruction. A buffer zone is recommended during road construction. Material: Fieldstone. Large livestock enclosure, associated with house and midden across the road. A few isolated pieces of ceramics around the kraal. The enclosure lies adjacent to the access road, behind and close to the property fence.

Sites 009-010: One small one-room structure with a larger longhouse-type foundation. 1880s - early 20th century. S30°51'26.95 E24°14'34.17 & S30°51'27.71 E24°14'34.43. Medium significance. Mitigation required before destruction. Material: Stone and brick. Located near livestock kraal. The structures lie adjacent to the access road, behind and close to the property fence.

Site 016: Large stone retaining dam wall (Early 20th century). S30°51'6.02 E24°16'35.82. Medium significance. Mitigation required before destruction. A buffer zone is recommended during road construction. Material: Fieldstone and cement. Adjacent to the proposed access road. No above-ground cultural material was identified.

Site 017: Small circular stone enclosure/military redoubt (1890s - 1900s). S30°52'44.15 E24°17'43.88. Medium significance. Mitigation required before destruction. Material: Stone with associated cultural material scattered around. Probably associated with Second South-African War (1899-1902) and the British military forces. The site lies far outside of the access road development.

Sites 018-022: Stone embankments (Early 20th century). S30°51'6.02 E24°16'35.82. Material: Fieldstone and cement. Adjacent and within the proposed access road. The embankments are at regular intervals and probably associated with early 20th-century farming irrigation.

No Iron Age/Agri-pastoral Early Farming Communities sites were identified during the May 2023 field assessment.

Over and above the required mitigation measures provided above, it is recommended that a Chance Find Procedure should be drafted and implemented for the Sun Central Cluster 1 PV Facility additional activities. This will ensure that if any significant previously unrecorded and unknown archaeological and/or recent historical sites, features or material are exposed during the development actions, that proper measures are taken to investigate and record these before recommendations are made on the way forward (which could include surface sampling, mapping and drawing and possibly excavation).

It is furthermore recommended that the cultural heritage sites recorded during the May 2023 field-based assessment be included in the already existing CHMP that has been submitted for the Solar PV Project.



Figure 14: View of the Main Access Road looking west towards the N10 (courtesy Ecoleges).



Figure 15: View of stone-walled enclosure/kraal next to the Main Access Road looking south (courtesy Ecoleges).



Figure 16: Homestead remains next to the Main Access Road looking north (courtesy Ecoleges).



Figure 17: Late 19th to early 20th century decorated ceramics found in association with the site (courtesy Ecoleges).



Figure 18: MSA/LSA waste-flake found in the general area around the access road (courtesy Ecoleges).



Figure 19: Stone Age material from Site 003 (courtesy Ubique Heritage Consultants).



Figure 20: Stone Age material from Site 004 (courtesy Ubique Heritage Consultants).



Figure 21: Stone Age material from Site 006 (courtesy Ubique Heritage Consultants).



Figure 22: Stone Age material from Site 007 (courtesy Ubique Heritage Consultants).



Figure 23: Stone Age material from Site 012 (courtesy Ubique Heritage Consultants).



Figure 24: Stone Age material from Site 015 (courtesy Ubique Heritage Consultants).



Figure 25: A view of the structures at Site 001 (courtesy Ubique Heritage Consultants).



Figure 26: A section of the Site 002 refuse midden (courtesy Ubique Heritage Consultants).



Figure 27: Some of the cultural material from Site 002 (courtesy Ubique Heritage Consultants).



Figure 28: More material from Site 002 (courtesy Ubique Heritage Consultants).



Figure 29: A view of part of Site 003 (courtesy Ubique Heritage Consultants).



Figure 30: General view of Site 003 (courtesy Ubique Heritage Consultants).



Figure 31: The Site 004 livestock kraal (courtesy Ubique Heritage Consultants).



Figure 32: The small midden at Site 005 (courtesy Ubique Heritage Consultants).



Figure 33: Some cultural material from Site 005 (courtesy Ubique Heritage Consultants).



Figure 34: The large livestock kraal at Site 008 (courtesy Ubique Heritage Consultants).



Figure 35: A general view of Site 009 & 010 (courtesy Ubique Heritage Consultants).



Figure 36: Part of the Site 016 retaining wall (courtesy Ubique Heritage Consultants).



Figure 37: Site 017 (courtesy Ubique Heritage Consultants).



Figure 38: One of the so-called stone embankments at Sites 18-22 (courtesy Ubique Heritage Consultants).



Figure 39: Typical landscape of the study and development area (courtesy Ubique Heritage Consultants).



Figure 40: Another view of the area, with the farm access road visible (courtesy Ubique Heritage Consultants).



Figure 41: View of dry riverbed (courtesy Ubique Heritage Consultants).



Figure 42: Another general view of the study and development area (courtesy Ubique Heritage Consultants).



Figure 43: A view showing the relatively dense vegetation cover in sections of the area (courtesy Ubique Heritage Consultants).

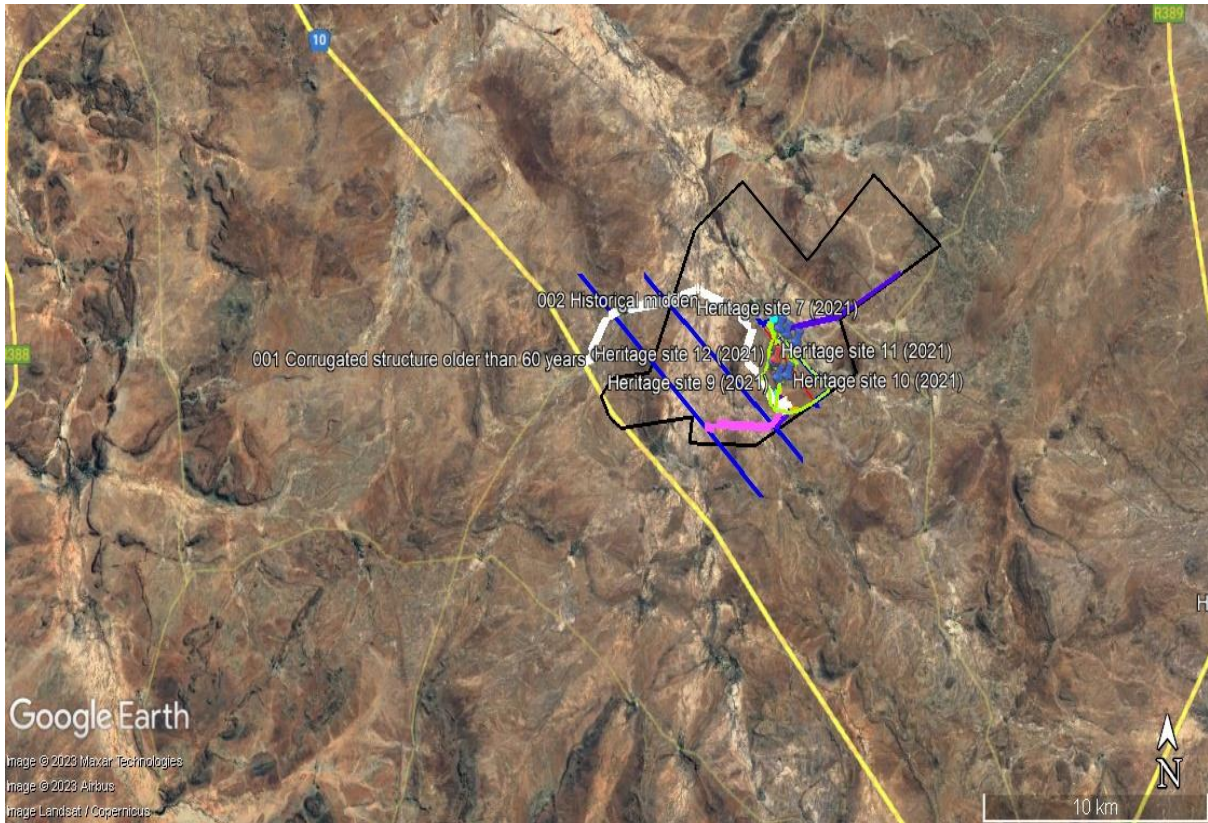


Figure 44: General location of the sites recorded in May 2023 & during previous assessments (Google Earth 2023).

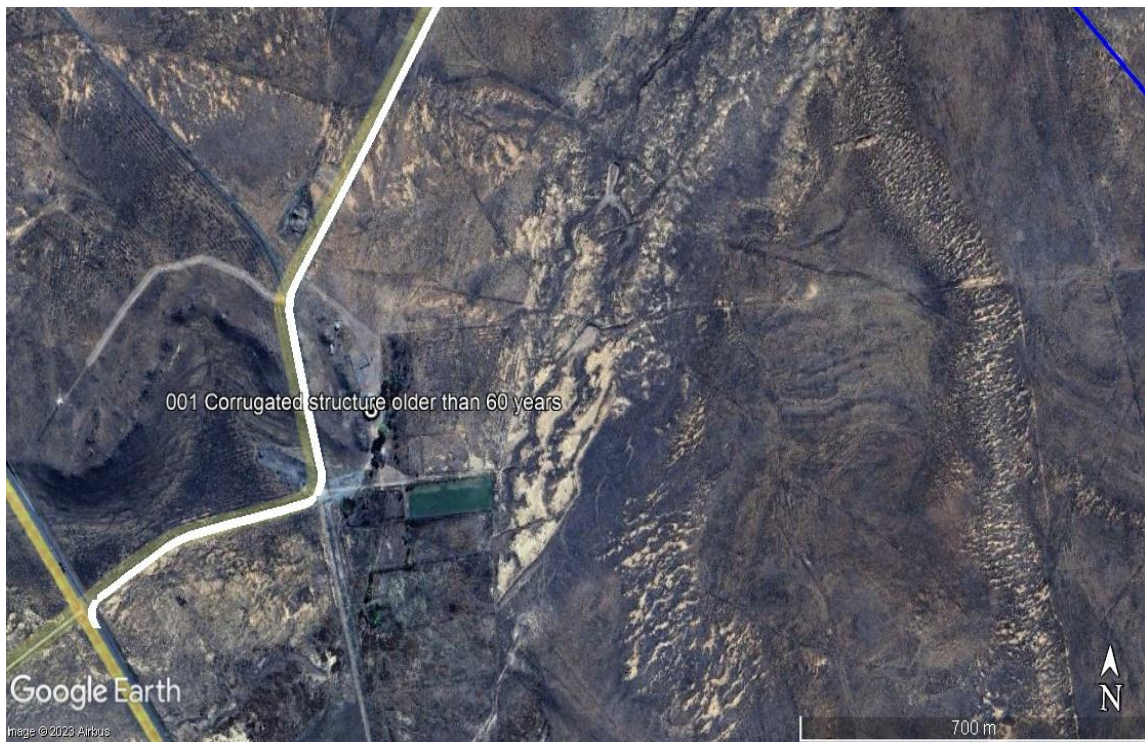


Figure 45: Closer view of Site 001 location close to the Access Road (Google Earth 2023).



Figure 46: Closer view of the location of sites close to and adjacent a section of the access road (Google Earth 2023).



Figure 47: Closer view of another section of the access road with sites located close to and adjacent (Google Earth 2023).

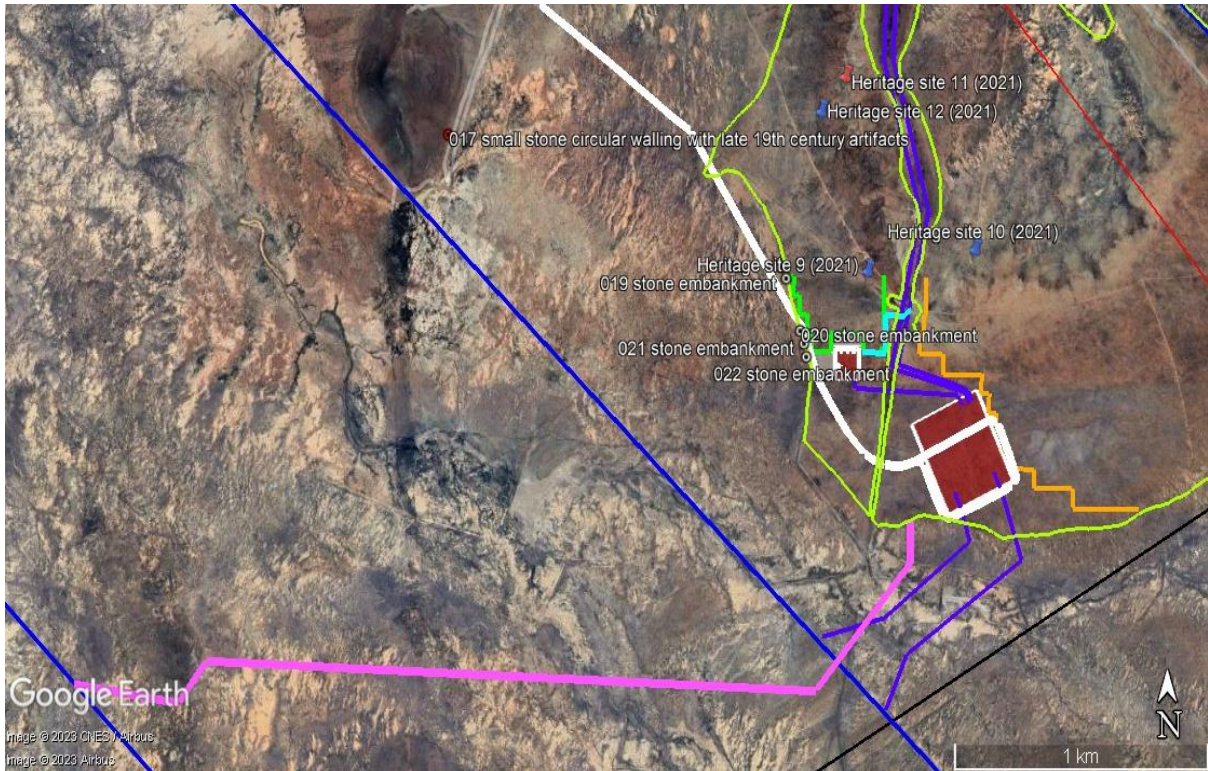


Figure 48: Closer view of part of the study area with more sites located close to the access road and transmission lines (Line in and Line out) sections of the development (Google Earth 2023).

Impact Assessment and Mitigation Measures

The significance of impacts is determined using the following criteria:

Probability: describes the likelihood of the impact actually occurring

- **Improbable:** the possibility of the impact occurring is very low, due to the circumstances, design or experience.
- **Probable:** there is a probability that the impact will occur to the extent that provision must be made therefore.
- **Highly probable:** it is most likely that the impact will occur at some stage of the development.
- **Definite:** the impact will take place regardless of any prevention plans and there can only be relied on mitigation measures or contingency plans to contain the effect.

Duration: the lifetime of the impact

- **Short Term:** the impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.
- **Medium Term:** the impact will last up to the end of the phases, where after it will be negated.

- **Long Term:** the impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
- **Permanent:** the impact is non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

Scale: the physical and spatial size of the impact

- **Local:** the impacted area extends only as far as the activity, e.g., footprint
- **Site:** the impact could affect the whole or measurable portion of the abovementioned property.
- **Regional:** the impact could affect the area including the neighboring residential areas.

Magnitude/Severity: Does the impact destroy the environment, or alter its function

- **Low:** the impact alters the affected environment in such a way that natural processes are not affected.
- **Medium:** the affected environment is altered, but functions and processes continue in a modified way.
- **High:** function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

Significance: This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

- **Negligible:** the impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.
- **Low:** the impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.
- **Moderate:** the impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.
- **High:** The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

The significance is calculated by combining the criteria in the following formula:

Sum (Duration, Scale, Magnitude) x Probability

S = Significance weighting; Sc = Scale; D = Duration; M = Magnitude; P = Probability

With some sites, features and material of cultural heritage origin and significance found in the general and study area during previous assessments, the current site layout provided will have some impact on the cultural heritage resources of the area.

Aspect	Description	Weight
Probability	Improbable	1

	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short Term	1
	Medium Term	3
	Long Term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	Sum (Duration, Scale, Magnitude)	x Probability
	Negligible	≤20
	Low	>20≤40
	Moderate	>40≤60
	High	>60

Results: $4+2+6 \times 4 = 48$ i.e., $>40 \leq 60$

The impact of the proposed development on the recorded and known cultural heritage sites in the area, as well as those unknown sites likely to occur here, is therefore deemed as Moderate based on the Impact Assessment criteria used. There is also always a possibility of sites, features and material being missed as a result of various factors such as vegetation cover hampering visibility on the ground, as well as the often-subterranean nature of cultural heritage resources (including low stone-packed or unmarked graves). These factors need to be taken into consideration and it is therefore recommended that a Chance Finds Protocol be drafted and implemented for the Sun Central Cluster 1 330MW Solar PV Facility additional activities as well.

From a Cultural Heritage point of view it can be said that the proposed Sun Central Cluster 1 300MW Solar PV Facility (Additional Activities) on portions of various farms, between De Aar & Hanover, Emthanjeni Local Municipality, Pixley Ka Seme District Municipality, Northern Cape Province, South Africa should be allowed to continue once the recommended mitigation measures related to the archaeological & historical sites and features have been implemented.

7. CONCLUSIONS AND RECOMMENDATIONS

APelser Archaeological Consulting cc was appointed by Ecoleges Environmental Consultants, on behalf of SolarAfrica Energy (Pty) Ltd, to undertake a Cultural Heritage Impact assessment related to additional activities associated with the Sun Central Cluster 1, 300MW, Solar PV project in the Northern Cape, between De Aar & Hanover, Emthanjeni Local Municipality, Pixley Ka Seme District Municipality, Northern Cape Province, South Africa. The additional activities include the development and widening of roads; extending the transmission line from the Main Transmission Station (MTS) to Line 1 of the 400 kV Eskom powerline; and consolidation of water uses currently authorized under General Authorisation, including additional boreholes, into an Integrated Water Use License.

Previous archaeological and heritage assessments for the Goedehoop Solar PV Project (Phases 1, 2 & 3) recorded a fairly large number of cultural heritage resources of varying extent and significance in the area. These included scatters of open-air surface Stone Age sites, rock engravings, later agro-pastoralist stone-walled sites, as well as historical Anglo-Boer War (1899-1902) sites. In an Interim Comments Letter, SAHRA requested that a field-based assessment of the proposed activities be undertaken as part of the EA Application process. The HIA had to confirm the location and extent of the sites identified in 2022 by the representatives of Ecoleges and ground truth any areas associated with the proposed amendment activities. A Final Comments letter requested that the undeveloped and undisturbed sections of the proposed access road be subjected to a walkdown to ensure that no heritage resources of high heritage significance will be impacted. This field-based assessment was undertaken at the end of May 2023.

A total of 22 cultural heritage (archaeological and/or historical) sites and features were identified in the study areas during this field assessment, some of which are associated with the sites identified by Ecoleges in December 2022. A number of these finds are represented by small, low-density scatters of MSA/LSA material in open-air surface scatters, while the others date to the late 19th/early 20th century.

The Stone Age occurrences recorded at Sites 003, 004, 006 and 007 are within the bounds of a historical farm-scape, and should be protected as part of the historical site. These sites and material will receive protection from a buffer zone around the historical farm-scape. The archaeological context of these lithics probably lies more towards the koppie located to the northwest of the recorded material. The scatters recorded at Sites 011-015 lie within a dry riverbed and are without archaeological context and no further mitigation is recommended.

In terms of the historical sites the following is relevant. Sites 002-005 and 008-010 are located on fenced properties, but some sections are located fairly close to the access road. Care should be taken to avoid these areas if the road gets widened or scraped/tarred. The large household midden is rich in surface material from the late 19th century to the early 20th century and probably contains slightly older material in situ. The circular enclosure/stock kraal close to the house also has surface scatters of ammunition and remains of alcoholic bottle bases. These may be indicative of the 2nd South-African War (1899-1902) activities in the area.

The large fieldstone retaining/dam wall, located at Site 016, is older than 60 years, and a prominent feature within the landscape. Site 017 is located some distance away from the proposed access road and loop-in and -out lines, but were recorded nonetheless. The circular stone structure might be associated with the 2nd South-African War. Along the southern part of the access road, at Sites 018-022, are stone embankments, with more of these embankments possibly obscured by vegetation and soil. They do not possess any particular technological or cultural heritage significance.

The various aspects of the historical farm-scape recorded should be treated as parts of a whole entity, and a buffer zone is recommended, especially during the road construction phase, since parts of the site lie close to the fence. In addition, the large retaining wall should also be protected by a buffer zone so that road construction activities inadvertently damage no part of it.

Finally, from a Cultural Heritage point of view it can be said that the proposed Sun Central Cluster 1 300MW Solar PV Facility (Additional Activities) on portions of various farms, between De Aar & Hanover, Emthanjeni Local Municipality, Pixley Ka Seme District Municipality, Northern Cape Province, South Africa should be allowed to continue once the recommended mitigation measures related to the archaeological & historical sites and features 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.