

Archaeological Impact Assessment

For the proposed Tewa Isitha Solar 2 PV Facility East Of Upington, Northern Cape Province.

Prepared For

Savannah Environmental (Pty) Ltd

By



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EXECUTIVE SUMMARY

Site name and location: The Tewa Isitha Solar 2 PV Facility is proposed to be located on remaining extent of the farm Albany 405 located 50 km east of Upington within the //Khara Hais Local Municipality of the Northern Cape Province.

1: 50 000 Topographic Map: 2821 BC

EIA Consultant: Savannah Environmental (Pty) Ltd.

Developer: Tewa Isitha Solar 2 (Pty) Ltd

Heritage Consultant: Heritage Contracts and Archaeological Consulting CC (HCAC).

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Date of Report: 14 August 2015

Findings of the Assessment:

Savannah Environmental (Pty) Ltd, on behalf of TEWA Isitha Solar 2 (Pty) Ltd, appointed Heritage Contracts and Archaeological Consulting CC (HCAC) to conduct an Archaeological Impact Assessment for the proposed Tewa Isitha solar 1 energy facility and Tewa Isitha solar 2 energy facility. This report focuses on phase 2 (Tewa Isitha Solar 2) of the proposed project.

It is important to note that the entire farm was not surveyed but only the footprint of the proposed solar facilities that was surveyed on foot and by vehicle. In terms of the built environment (Section 34 of the NHRA), no features of significance were recorded in the study area. In terms of the archaeological component of Section 35, isolated Middle Stone Age (MSA) artefacts were recorded scattered over the study area. These artefacts are scattered too sparsely to be of any significance apart from noting their presence, which has been done so in this report.

No buildings exist on the site and no cultural landscape elements were noted. Visual impacts to scenic routes and sense of place are not assessed to be high from a heritage perspective but are assessed independently by a visual specialist as part of the EIA process.

There were no red flags identified during the AIA and subject to approval from SAHRA there is from an archaeological point of view no reason why the development should not proceed if the recommendations as made in this report are adhered to.

General

Due to the subsurface nature of archaeological material and unmarked graves, the possibility of the occurrence of such finds cannot be excluded. If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find/s.

Disclaimer: *Although all possible care is taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. Heritage Contracts and Archaeological Consulting CC and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

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- The technology described in any report;
- Recommendations delivered to the Client.

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BIA: Basic Impact Assessment
CRM: Cultural Resource Management
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Plan
ESA: Early Stone Age
GPS: Global Positioning System
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA: National Environmental Management Act
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

1 BACKGROUND INFORMATION

Savannah Environmental (Pty) Ltd, on behalf of TEWA Isitha Solar 2 (Pty) Ltd, appointed Heritage Contracts and Archaeological Consulting CC (HCAC) to conduct an Archaeological Impact Assessment for the proposed Tewa Isitha solar 1 energy facility and Tewa Isitha solar 2 energy facility. This report focuses on phase 2 (Tewa Isitha Solar 2) of the proposed project.

The aim of the study is to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, a desktop study (van der Walt 2015) that includes collection from various sources and consultations; Phase 2, the physical surveying of the study area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey no heritage sites were identified although a number of find spots consisting of isolated MSA flakes were noted. General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report.

This report must also be submitted to the SAHRA for review and comment.

1.1 Terms of Reference

Desktop study

Conduct a brief desktop study where information on the area is collected to provide a background setting of the archaeology that can be expected in the area.

Field study

Conduct a field study to: a) systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with Heritage legislation and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

1.2. Archaeological Legislation and Best Practice

Phase 1, an AIA or a HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of a heritage specialist input is to:

- » Identify any heritage resources, which may be affected;
- » Assess the nature and degree of significance of such resources;
- » Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- » Assess the negative and positive impact of the development on these resources;
- » Make recommendations for the appropriate heritage management of these impacts.

The AIA or HIA, as a specialist sub-section of the EIA, is required under the National Heritage Resources Act NHRA of 1999 (Act 25 of 1999), Section 23(2)(b) of the NEMA and section s.39(3)(b)(iii) of the MPRDA.

The AIA should be submitted, as part of the EIA, BIA or EMP, to the PHRA if established in the province or to SAHRA. SAHRA will be ultimately responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the EIA, BIA/EMP, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level).

Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIAs are primarily concerned with the location and identification of sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for from SAHRA by the client before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare.

Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

1.3 Description of Study Area

1.3.1 Location Data

Tewa Isitha Solar 2 Energy Facility is proposed to be located on the remaining portion 405 of the farm Albany 405 located 50 km east of Upington within the //Khara Hais Local Municipality of the Northern Cape Province (Figure 1). The site is located at 28° 25' 09.6253" S, 21° 43' 43.2314" E. The existing Garona-Gordonia 132kV power line traverses to the south of the study area.

There are various drainage lines in the southern portion of the farm (outside of the development footprint) draining the study area in a southerly direction to the Orange River. The topography of the area is relatively gentle sloping in a southerly direction towards the Orange River. The climate can be described as arid to semi-arid with rainfall occurring from November to April. The study area falls within a Savannah Biome as described by Mucina et al (2006) with the vegetation described as Bushmanland Arid Grassland.

1.3.2. Location Map

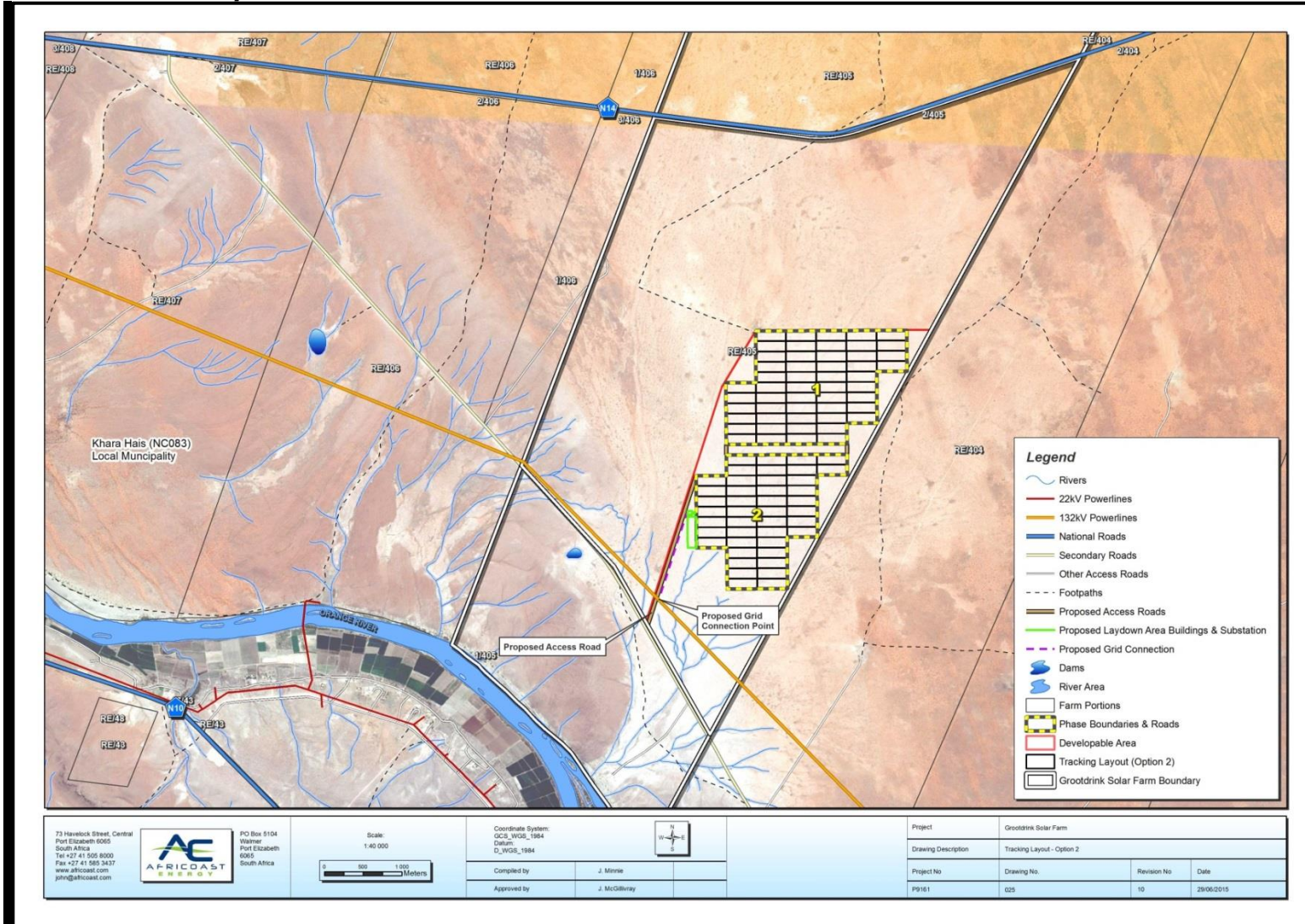


Figure 1: Location map showing both phases of the proposed development.

2. APPROACH AND METHODOLOGY

The aim of the study is to cover archaeological databases to compile a background of the archaeology that can be expected in the study area followed by field verification; this was accomplished by means of the following phases.

2.1 Phase 1 - Desktop Study

The first phase comprised a scoping study, scanning existing records for archaeological sites, historical sites, graves, architecture (structures older than 60 years) of the area (van der Walt 2015). The following approach was followed for the compilation of the scoping report.

2.1.1 Literature Search

Utilising data for information gathering stored in the national archives and published reports relevant to the area. The aim of this is to extract data and information on the area in question.

2.1.2 Information Collection

SAHRIS was consulted to collect data from previously conducted CRM projects in the region to provide a comprehensive account of the history of the study area.

2.1.3 Consultation

No public consultation was done during the study as this was done as part of the EIA. The team did however consult with the farm owner Mr Botha regarding graves or sites of archaeological and historical significance. He is not aware of sites within the area earmarked for the development.

2.1.4 Google Earth and Mapping Survey

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located.

2.1.5 Genealogical Society of South Africa

The database of the Genealogical Society was consulted to collect data on any known graves in the area.

2.2 Phase 2 - Physical Surveying

Due to the nature of cultural remains, the majority of which occurs below surface, a field survey of the study area was conducted over 3 days. The study area was surveyed by means of vehicle and extensive surveys on foot during the week of 22 June 2015. The survey was aimed at covering the proposed infrastructure, but also focused on specific areas on the landscape that would be more likely to contain archaeological and/or other heritage remains like drainage lines, rocky outcrops as well as slight elevations in the natural topography. These areas were searched more intensively, but many other areas were walked in order to confirm expectations in those areas. Track logs of the areas covered were taken (Figure 2).

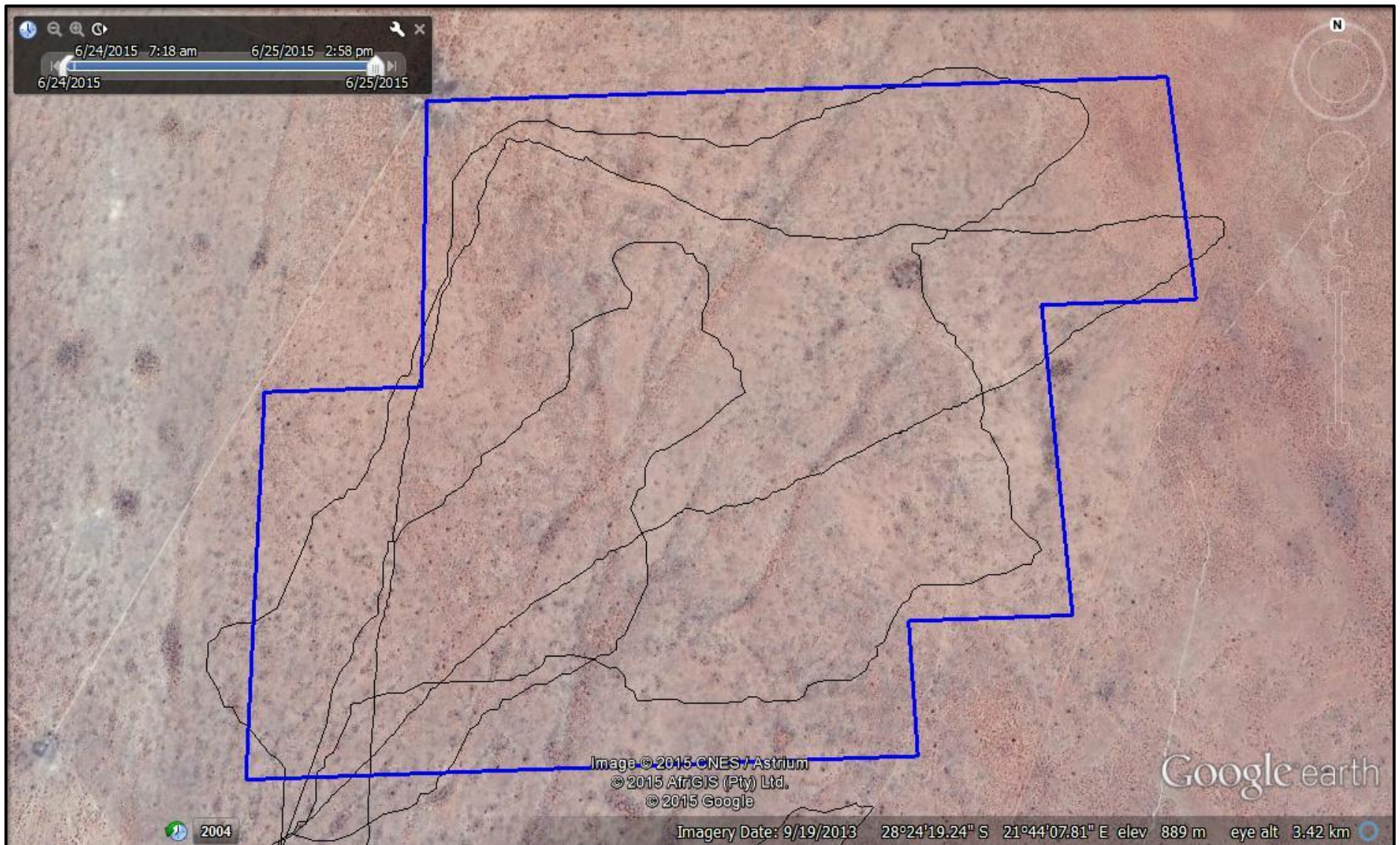


Figure 2: Track logs of the areas surveyed indicated in black.

2.3. Restrictions

Due to the fact that most cultural remains may occur below surface, the possibility exists that some features or artefacts may not have been discovered/ recorded during the survey. Therefore the possible occurrence of unmarked graves and other cultural material cannot be excluded. Only the footprint of the project was surveyed as indicated in the location map, and not the entire farm.

It is assumed that information obtained for the wider region is accurate and applicable to this study. This report does not claim to have recorded every single artefact cluster due to the size of the area and the occurrence of cultural material throughout. Sufficient information was recorded to establish the cultural sequence of the area and to mitigate the anticipated impacts resulting from the development. This study did not assess intangible heritage.

Although HCAC surveyed the area as thoroughly as possible, it is incumbent upon the developer to stop operations and inform the relevant heritage agency should further cultural remains, such as stone tool scatters, artefacts, bones or fossils, be exposed during the process of development.

3. NATURE OF THE DEVELOPMENT

The solar energy facilities are proposed to accommodate an array of photovoltaic (PV) panels with generating capacity of up to 150 MW (to be developed in 2 stand-alone phases of 75 MW each). It is proposed to make use of either static or tracking solar panel technology for this facility. Other infrastructure associated with each phase will include:

- » Arrays of photovoltaic (PV) panels
- » Appropriate mounting structures
- » Cabling between the project components, to be laid underground where practical.
- » New on-site substation and power line to evacuate the power from the facility into the Eskom grid via the existing Garona-Gordonia 132kV power line that traverses the south western corner of the site.
- » Internal access roads and fencing.
- » Workshop area for maintenance, storage, and offices.

4. HISTORICAL AND ARCHAEOLOGICAL BACKGROUND OF THE STUDY AREA

A detailed scoping report was compiled for this project (van der Walt 2015). The scoping phase comprised of a desktop study and below is a short summary of the findings.

4.1 Databases Consulted

SAHRA Report Mapping Project

Several previous heritage studies were conducted in the general study area (SAHRA report mapping project V1.0 and SAHRIS) mostly to the west, east and south west of the study area (Dreyer, 2006, Van Schalkwyk 2011, Gaigher 2012 and van der Walt 2014, Morris 2014). These studies identified Early and Middle Stone Age assemblages as well as historical structures

Genealogical Society and Google Earth Monuments

Neither the Genealogical Society nor the monuments database at Google Earth (Google Earth also include some archaeological sites and historical battlefields) have any recorded sites in the study area.

4.2. A Brief Archaeological background to the study area

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases.

Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable (Lombard 2011). The three main phases can be divided as follows;

- Later Stone Age; associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago
- Middle Stone Age; associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago.
- Earlier Stone Age; associated with early Homo groups such as Homo habilis and Homo erectus. 400 000-> 2 million years ago.

To the south of the study area the region is well-known as one that produced the largest sample (n = 56) of prehistoric skeletons in South Africa (Morris 1995). Apart from the graves, archaeological sites of this period in the region (to the south) have been further divided into Swartkop and Doornfontein sites. Doornfontein sites are mostly confined to permanent water sources. The assemblages contain a consistently large complement of thin-walled, grit-tempered, well-fired ceramics with thickened bases, lugs, bosses, spouts, and decorated necks or rims. Lithics are often produced on quartz, and dominated by coarse irregular flakes with a small or absent retouched component (Beaumont et al. 1995; Lombard & Parsons 2008; Parsons 2008). Late occurrences contain coarser potsherds with some grass temper, a higher number of iron or copper objects, and large ostrich eggshell beads. These assemblages are mostly associated with the Khoi (Beaumont et al. 1995).

Previous collections of stone tools in the region include artefacts with advanced prepared cores, blades and convergent flakes or points. Most of the scatters associated with the Middle Stone Age have a 'fresh' or un-abraded appearance. They appear to be mostly associated with the post-Howiesons Poort (MSA 3) or MSA 1 sub-phases (Beaumont et al. 1995).

Substantial Middle Stone Age sites seem uncommon. However, where archaeological sites were excavated, such as the farm Zoovoorbij 458 south of Upington, a Middle Stone Age assemblage was

excavated beneath Later Stone Age deposits (Smith 1995). This shows that, although not always visible on the surface, the landscape was inhabited during this phase. The large flake component of the lower units of Zoovoorbij Cave has Levallois-type preparation on the striking platforms, reinforcing their Middle Stone Age context.

5. HERITAGE SITE SIGNIFICANCE AND MITIGATION MEASURES

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed quarry extension the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance:

- » The unique nature of a site;
- » The integrity of the archaeological/cultural heritage deposits;
- » The wider historic, archaeological and geographic context of the site;
- » The location of the site in relation to other similar sites or features;
- » The depth of the archaeological deposit (when it can be determined/is known);
- » The preservation condition of the sites;
- » Potential to answer present research questions.

Furthermore, The National Heritage Resources Act (Act No 25 of 1999, Sec 3) distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- » Its importance in/to the community, or pattern of South Africa's history;
- » Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- » Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- » Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- » Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- » Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- » Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- » Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- » Sites of significance relating to the history of slavery in South Africa.

5.1. Field Rating of Sites

Site significance classification standards prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 7 of this report.

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

5.2 Impact Rating of Assessment

The criteria below are used to establish the impact rating of sites as per the impact rating methodology employed by Savannah environmental:

- » The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- » The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- » The **duration**, wherein it will be indicated whether:
 - * the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
 - * the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
 - * medium-term (5-15 years), assigned a score of 3;
 - * long term (> 15 years), assigned a score of 4; or
 - * permanent, assigned a score of 5;
- » The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- » The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- » the **status**, which will be described as either positive, negative or neutral.
- » the degree to which the impact can be reversed.
- » the degree to which the impact may cause irreplaceable loss of resources.
- » the *degree* to which the impact can be mitigated.

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

$$S=(E+D+M)P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- » < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- » 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- » > 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

6. BASELINE STUDY-DESCRIPTION OF SITES

It is important to note that the entire farm Albany 405 was not surveyed but only the footprint of the proposed solar facility that was surveyed on foot and by vehicle (Figure 1 & 2). The study area measures 236 ha and is characterised by hard packed (deflated) Aeolian sand on top of a calcrete sub strata with shallow soils and shrubs (Figure 5 - 8). The study area is gently sloping to the south towards the Orange River with no major landscape features like pans, hills or rocky outcrops.

At the start of the survey a marked paucity of Stone Age material was noticed and no knapping, quarry or habitation sites were recorded. There is however MSA isolated artefacts observed in low densities scattered over the study area (Figure 3) where Quartzite strongly dominates as raw material although jaspelite and chalcedony was also used. Although no source of raw material was noted within the study area a quartzite "pebble plain" occurs approximately 1km **outside** and to the west of the study area next to a palaeo channel (Figure 4). Artefacts consist mostly of cores and large flakes, some with dorsal flaking. Triangular flakes have no scars or secondary trimming and are unutilised. These low density scatters are of low significance and corroborates findings in the area where these isolated artefacts has been given a low significance rating (Morris 2014, Dreyer 2006)

These low density (less than 1 artefact per 10m²) isolated artefacts were recorded as find spots. These find spots were given field numbers (Table 1). GPS points were taken at such places and selections of artefacts were photographed.

Table 1. Find Spots with Coordinates

Field Number	Type Site	Cultural Markers	Co ordinate
577	MSA	Single broken pointed flake on chalcedony	28° 24' 10.1089" S, 21° 43' 46.7039" E
578	MSA	Triangular flake on chalcedony	28° 24' 00.4427" S, 21° 44' 01.4893" E
579	MSA	Triangular flake on quartzite	28° 24' 05.8175" S, 21° 44' 38.0471" E
580	MSA	Quartzite flake and core	28° 24' 04.9177" S, 21° 44' 51.0071" E
581	MSA	Large Quartzite flake	28° 24' 19.9656" S, 21° 44' 23.7876" E
582	MSA	Triangular flake from Quartzite.	28° 24' 20.3832" S, 21° 44' 22.6141" E
583	MSA	Broken pointed flake on quartzite	28° 24' 38.2283" S, 21° 43' 44.7565" E

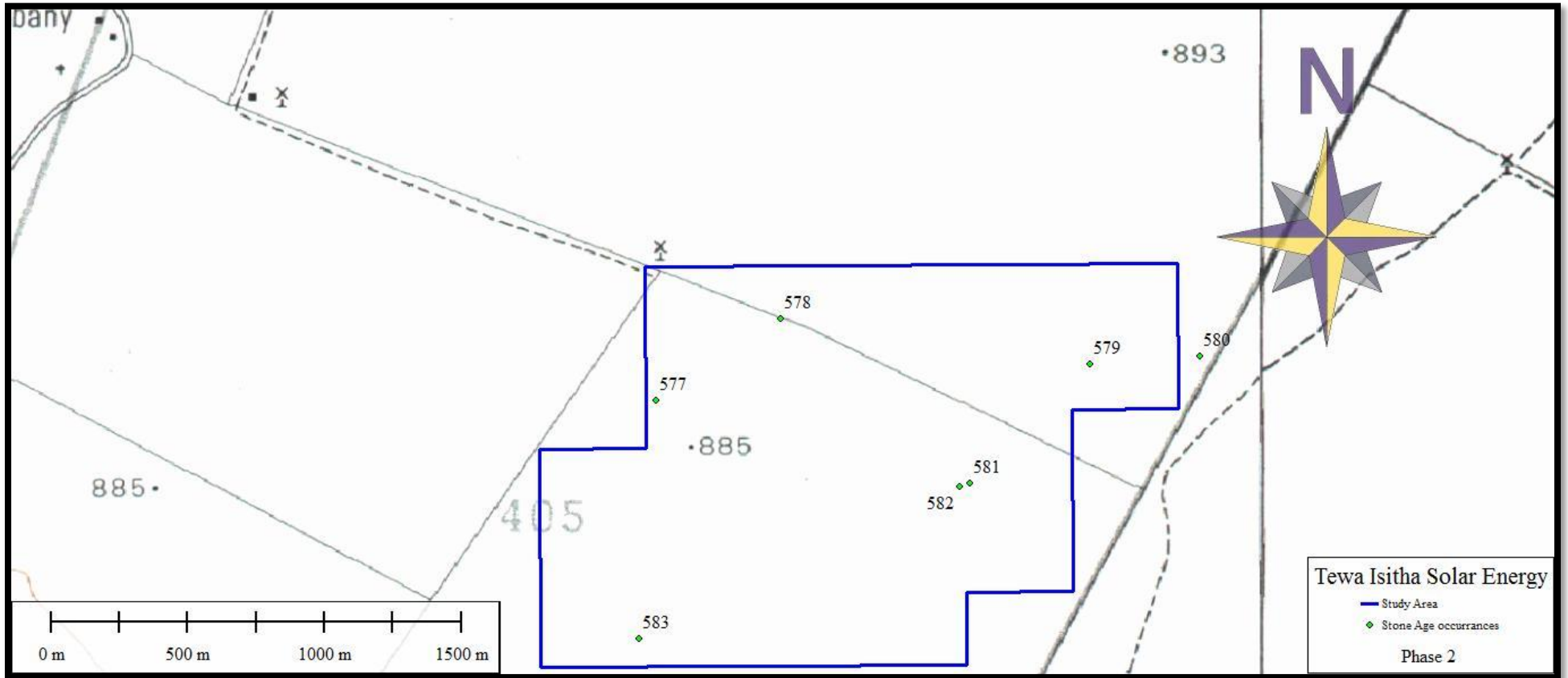


Figure 3: Distribution of Stone Age occurrences.

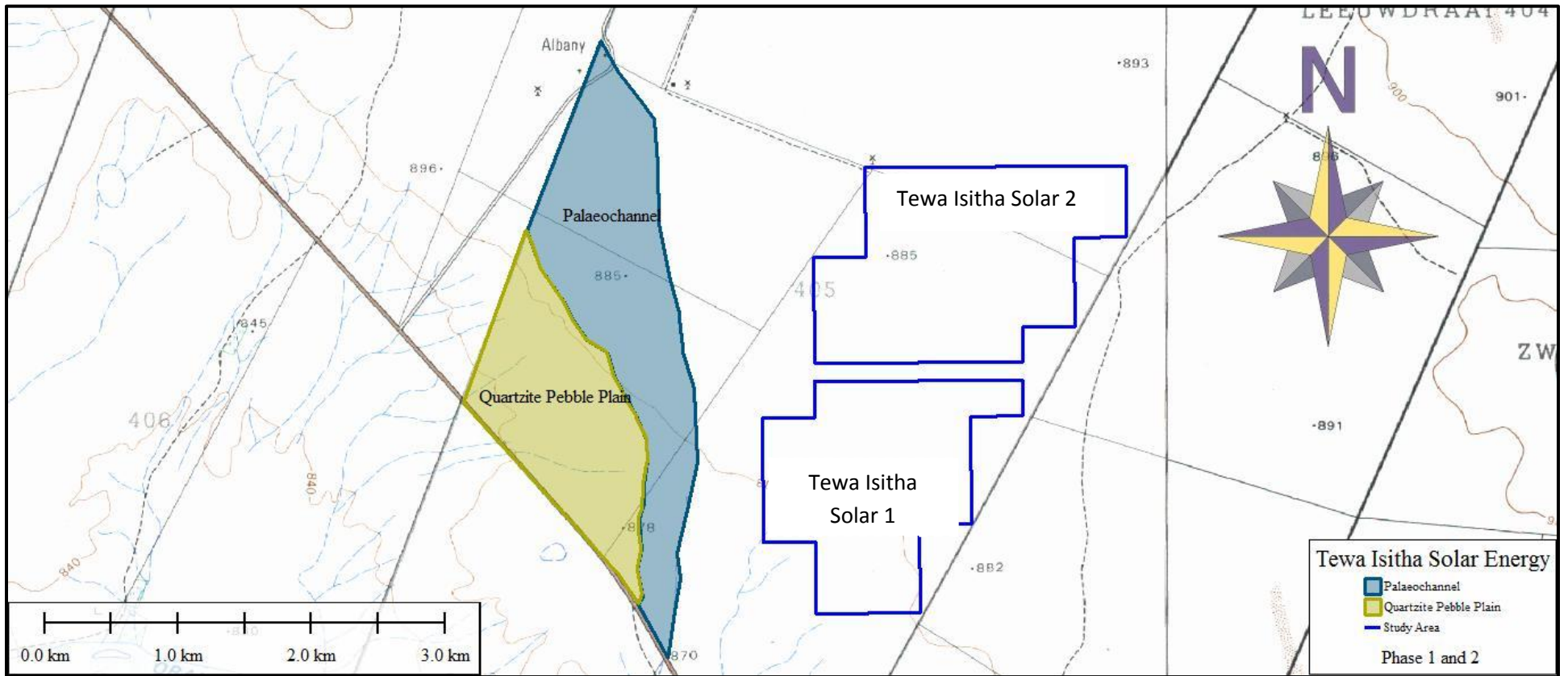


Figure 4. Environmental features in relation to the study area.

Tewa Isitha Solar 2



Figure 5. Aeolian sand mantling calcrete substrata.



Figure 6. General Site conditions.



Figure 7. Hard packed Aeolian sand.



Figure 8. Shallow sand cover exposed by burrowing animals.



Figure 9: Dorsal view of MSA material in study area (scale in cm)

Impact evaluation of the proposed project on heritage resources

Find Spots (7 in total)

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects.

	Without mitigation	With mitigation
Extent	Local (2)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (1)
Probability	Most Likely (4)	Most Likely (4)
Significance	36 (Medium)	28 (low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	

Mitigation:

No preconstruction mitigation needed. The artefacts within the study area are scattered too sparsely to be of any significance apart from noting their presence, which has been done so in this report.

Cumulative impacts:

Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.

Residual Impacts: Depletion of archaeological record of the area.

7. CONCLUSIONS AND RECOMMENDATIONS

Heritage Contracts and Archaeological Consulting CC has been contracted by Savannah Environmental (Pty) Ltd to conduct an Archaeological Impact Assessment for the proposed Tewa Isitha Solar Energy Facility (consisting of 2 phases) is proposed to be located on the remaining portion 405 of the farm Albany 405 located 50 km east of Upington within the //Khara Hais Local Municipality of the Northern Cape Province. The study area of approximately 236 ha was surveyed over a period of two days.

In terms of the archaeological component of Section 35 of the NHRA isolated Middle Stone Age (MSA) artefacts were recorded scattered over the study area. The artefacts are scattered too sparsely to be of any significance apart from noting their presence, which has been done so in this report. The lack of distinct sites corroborates finding in the area by Morris (2014) and Dreyer (2006) who also recorded widely dispersed low density MSA scatters of low significance. No further mitigation is recommended for this aspect.

The impacts to heritage resources by the proposed development are not considered to be highly significant and the impact on archaeological sites can very easily be mitigated. Based on the results of the study there are no significant archaeological risks associated with the proposed solar facility. It is however recommended that the following chance find procedures should be implemented:

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or rock engraving, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

No cultural landscape elements were noted and visual impacts to scenic routes and sense of place are also considered to be low from a heritage perspective but are assessed by a separate study by a visual specialist. In terms of the built environment (Section 34 of the NHRA), no standing buildings of significance were recorded.

7.1 Reasoned Opinion

If the above recommendations are adhered to and based on approval from SAHRA, HCAC is of the opinion that the development can continue as the impact of the development on heritage resources is acceptable as no red flags were identified during the AIA. If during construction, any archaeological finds are made (e.g. graves, stone tools, and skeletal material), the operations must be stopped, and the archaeologist must be contacted for an assessment of the finds

Due to the subsurface nature of archaeological material and graves the possibility of the occurrence of unmarked or informal graves and subsurface finds cannot be excluded. If during construction any possible

finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find.

8. PROJECT TEAM

Jaco van der Walt, Project Manager

9. STATEMENT OF COMPETENCY

I (Jaco van der Walt) am a member of ASAPA (no 159), and accredited in the following fields of the CRM Section of the association: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation. This accreditation is also valid for/acknowledged by SAHRA and AMAFA.

I have been involved in research and contract work in South Africa, Botswana, Zimbabwe, Mozambique, Tanzania and the DRC; having conducted more than 300 AIAs since 2000.

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