SCOPING ASSESSMENT: PROPOSED CONSTRUCTION OF HUMANSRUS SOLAR 4 ON FARM HUMANSRUS 147 NEAR COPPERTON, NORTHERN CAPE

(Assessment conducted under Section 38 (8) of the National Heritage Resources Act No 25 of 1999)

Prepared for:

Cape EAPrac
Environmental Assessment Practitioners

On behalf of Humansrus Solar 4 (Pty) Ltd

October 2015

Prepared by:

Lita Webley
ACO Associates cc
8 Jacobs Ladder
St James

Email: lita.webley@aco-associates.com
Tel: 0217064104
Fax: 0866037195
EXECUTIVE SUMMARY

ACO Associates cc was appointed by Perception Planning on behalf of Cape EAPrac Environmental Practitioners for Humansrus Solar 4 (Pty) Ltd to undertake a Scoping assessment for the construction of Humansrus Solar 4 (75 MW PV) facility on Farm Humansrus 147, near Copperton in the Siyathemba Municipality, Northern Cape.

Numerous renewable energy facilities are planned in the Copperton area around the substations of Cuprum and Kronos.

Orton & Webley (2013a & b) have undertaken impact assessments on the farm Hoekplaas 146 and the farm Klipgats Pan 117 to the south-west of Humansrus 147. Van der Walt (2013) has assessed the farm Bosjesmansberg to the north-east of the study area. Kaplan & Wiltshire (2011) assessed Vogelstruisbult to the west of the study area.

The construction of a solar facility on the farm Humansrus 147 will result in direct, physical disturbance of any archaeological material (and its context) on the property. The heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. Large scale excavations will damage archaeological sites and construction of roads and laydown areas can contribute to high levels of impact. The impacts are likely to be most severe during the construction period although indirect impacts may occur during the operational phase of the project.

It is not anticipated that there will be any impacts to the Built Environment. Historic graveyards are particularly sensitive to physical damage such as demolition as well as neglect. There do not appear to be any buildings or graveyards on the property. The appropriate recommendations will need to be implemented during the EMP should unmarked graves be encountered during construction.

Archaeological surveys by Orton & Webley (2013a & b), Kaplan & Wilshire (2011) and Van der Walt (2013) on farms adjoining Humansrus indicate that there are very concentrations of ESA, MSA and LSA material. Some areas on the adjoining solar farms have been graded as potentially of very high research value and the “No-Go” option has been recommended in certain locations.

The aim of the EIA would be to identify and assess the significance of all heritage resources on the property, to determine the potential impacts on the resources, and where appropriate to recommend “no-go’ areas and to propose mitigation if avoidance is not possible.

• The proposed study area, including proposed routes of linear infrastructure (access roads, underground services, power lines) have already been subject to a detailed survey by the heritage practitioner/archaeologist. They have walked a pattern of transects over the site recording details and locations of any heritage material found;
• The significance of each find will need to be assessed along with the impacts of the proposed activity;
• In the case of impacts to significance heritage resources, the proposed mitigation measures may include the “No-Go” alternative, avoidance, archaeological excavations or monitoring during earthworks;
• The archaeologist should consider the cumulative impact of a number of solar facilities in the Copperton area on the archaeology of the study area and make recommendations for mitigation.

Based on the archaeology of the adjoining areas, the terrain on which the proposed Humansrus Solar 4 will be located is likely to contain at least some archaeological sites of high significance.

However, no red flag issues have been identified in this study.
GLOSSARY

**Archaeology:** Remains resulting from human activity which is in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures.

**Early Stone Age:** The archaeology of the Stone Age between 700 000 and 2500 000 years ago.

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

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

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

**Late Stone Age:** The archaeology of the last 20 000 years associated with fully modern people.

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

**National Estate:** The collective heritage assets of the Nation

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

**Pleistocene:** A geological time period (of 3 million – 20 000 years ago).

**SAHRA:** South African Heritage Resources Agency – the compliance authority which protects national heritage in the Northern Cape.

**Structure (historic):** 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. Protected structures are those which are over 60 years old.

**Acronyms**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>DEA</td>
<td>Department of Environmental Affairs</td>
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<tr>
<td>ESA</td>
<td>Early Stone Age</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>HIA</td>
<td>Heritage Impact Assessment</td>
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<tr>
<td>LSA</td>
<td>Late Stone Age</td>
</tr>
<tr>
<td>MSA</td>
<td>Middle Stone Age</td>
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<tr>
<td>NHRA</td>
<td>National Heritage Resources Act</td>
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<td>SAHRA</td>
<td>South African Heritage Resources Agency</td>
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1. SCOPE AND PURPOSE OF THE REPORT

1.1 Introduction

ACO Associates cc was appointed by Perception Planning on behalf of Cape EAPract Environmental Practitioners for Humansrus Solar 4 (Pty) Ltd to undertake a Scoping assessment for the construction of a 75 MW PV facility on the Remainder of the Farm 147, Humansrus near Copperton in the Siyathemba Municipality, Northern Cape (Figure 1).

![Figure 1: An aerial image of the preliminary outline for Humansrus 4 indicated by the white polygon. The alternative grid connections, via a 132 kV powerline, to the Cuprum or Kronos substations are shown as green lines.](image)

2. PROJECT DETAILS

Two alternatives have been proposed. A preferred layout (Figure 2) and an alternative layout (Figure 3):

- The preferred layout (Figure 2) will be 75MW;
- The alternative layout (Figure 3) will be 75MW.
Figure 2: The preferred location for Humansrus 4 is shown as a pale green polygon.

Figure 3: The alternative location for Humansrus 4 is shown as a dark green polygon.
Humansrus Solar 4 (Pty) Ltd proposes to construct a 75 MW on an estimated site layout of 220ha. The solar technology will comprise PV and/or concentrated PV with fixed, single or double axis tracking technology. The height of the facility will be less than 10m, it will be north-facing and approximately 2-5ha will be required for the laydown area.

Grid Connections:

There are two substations within the surrounding area, namely Kronos and Cuprum.

- The facility plans to connect to the Kronos substation via a self-built 132kV line;
- The 132 kV powerlines will require a servitude of less than 32m;
- The pylons will be monopole steel structures with a height of less than 25m.

Other Infrastructure:

- Auxiliary buildings of approximately 2ha in size for ablutions, workshops, storage areas and site offices, etc. Fencing height will not exceed 3m;
- Laydown areas of approximately 2-5ha will be required.

Access Roads:

- Access Road_01 is opposite the authorised Humansrus SEF 1 access road, same road access as Humansrus Solar 3.
- Access road entrance_02 from R357 same as for proposed Humansrus Solar 3 (parallel to the Cuprum - Hydra line).
- The access roads which are not used during operation of the facility to be closed and rehabilitated;
- Access roads expected to be 6m widen but less than 8m in width.

3. HERITAGE: POLICY AND LEGISLATIVE FRAMEWORK

While the National Department of Environmental Affairs is the decision making authority acting in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) and Regulations (2014), they must ensure that the evaluation of the statutorily defined broad range of heritage resources fulfils the requirements of the relevant heritage resources authority in terms of Section 38 (3) of the National Heritage Resources Act (Act 25 of 1999) (NHRA) and that any comments and recommendations of the relevant heritage resources authority with regard to proposed development have been taken into account prior to the granting of the consent.

This report is conducted in terms of Section 38 (8) of the National Heritage Resources Act, No 25 of 1999.

The NHRA provides protection for the following categories of heritage resources:

- Landscapes, cultural or natural (Section 3 (3))
- Buildings or structures older than 60 years (Section 34);
- Archaeological Sites, palaeontological material and meteorites (Section 35);
- Burial grounds and graves (Section 36);
- Public monuments and memorials (Section 37);
- Living heritage (defined in the Act as including cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships) (Section 2 (d) (xxi)).
3.1 Structures (Section 34(1))

No person may alter or demolish any structure part of a structure which is older than 60 years without a permit issued by the South African Heritage Resources Agency (SAHRA), the responsible provincial heritage resources authority.

3.2 Archaeology & Palaeontology (Section 35(4))

No person may, without a permit issued by SAHRA, destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite.

Archaeological is defined as: “material remains resulting from human activity which is in a state of disuse and is in or on land and which is older than 100 years, including artefacts, human and hominin remains and artificial features and structures”.

Palaeontological is defined as: “any fossilised remains or fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace”.

3.3 Burial grounds and graves (Section 36(3))

No person may, without a permit issued by the SAHRA, 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.

3.4 Grading

The South African heritage resources management system is based on grading, which provides for assigning the appropriate level of management responsibility to a heritage resource.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Level of significance</th>
<th>Description</th>
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<tbody>
<tr>
<td>I</td>
<td>National</td>
<td>Of high intrinsic, associational and contextual heritage value within a national context, i.e. formally declared or potential Grade 1 heritage resources.</td>
</tr>
<tr>
<td>II</td>
<td>Provincial</td>
<td>Of high intrinsic, associational and contextual heritage value within a provincial context, i.e. formally declared or potential Grade 2 heritage resources.</td>
</tr>
<tr>
<td>IIIa</td>
<td>Local</td>
<td>Of high intrinsic, associational and contextual heritage value within a local context, i.e. formally declared or potential Grade 3a heritage resources.</td>
</tr>
<tr>
<td>IIIb</td>
<td>Local</td>
<td>Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3b heritage resources.</td>
</tr>
<tr>
<td>IIIc</td>
<td>Local</td>
<td>Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3c heritage resources.</td>
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4. METHODOLOGY

This study has been commissioned as a Scoping assessment. It provides a brief baseline description and attempts to predict the possible range of impacts and identify issues in terms of accumulated knowledge of the area. It sets out the methodology for a full heritage impact study.
This Scoping study derives from a review of the published material as well as unpublished reports on the SAHRIS database. The 1:50 000 maps of the area as well as Google Earth aerial images were consulted. Numerous impact assessments have been conducted in proximity to the proposed facility as reflected on the SAHRIS database. The following CRM reports provide valuable information on the heritage resources of the area and were consulted:

Orton & Webley (2013a & b) have undertaken impact assessments on the farm Hoekplaas 146 and the farm Klipgats Pan 117 to the south-west of Humansrus. Van der Walt (2013) has assessed the farm Bosjesmansberg to the north-east of the study area. Kaplan & Wiltshire (2011) assessed Vogelstruis Bult to the west of the study area.

Van Ryneveld (2006) conducted an assessment on the farm Vogelstruis Bult 104 for Amber Mountain Investments interested in re-working the old mine dump and, pending the results of this activity, the re-opening of the old Copperton Mine. The mine is located to the north-west of the farm Humansrus 147.

Webley & Halkett (2014a&b) have conducted an assessment of RE Capital 13 PV (Humansrus Solar 1) and RE Capital 14 PV (Humansrus Solar 2) on the farm Humansrus 147 and these reports form the basis of this Scoping report.

5. BASELINE DESCRIPTION OF THE SITE

5.1 Environmental attributes

Orton & Webley (2013a) have described the adjoining farms of Hoekplaas and Klipgats Pan as generally undulating with large area of gravel that afforded good archaeological visibility. In general, the substrate across the site varies from gravel to fine silt. The area was covered in knee-high vegetation. Klipgats Pan has a large pan and a slightly hilly area to the south.

Van der Walt (2013) described the farm Bosjesmansberg as slightly undulating with several prominent quartzite ridges. He also mentions two ephemeral pans. The area comprises large gravel area as well as hard packed Aeolian sand on calcrites layers.

Humansrus has a similar topography to the surrounding farms.

5.2 Archaeological Background

Early and Middle Stone Age

Orton & Webley (2013a&b) have reviewed the archaeology of the general area.

Much of the Karoo is covered by gravels that contain abundant stone artefacts in varying densities. Beaumont et al. (1995: 240) has declared with regard the Bushmanland area that “thousands of square kilometres of Bushmanland are covered by a low density lithic scatter”. These artefacts are generally very well weathered and mostly belong to the Early (ESA) and Middle Stone Age (MSA). Occasional Later Stone Age (LSA) artefacts are also present within this scatter. These kinds of finds were made by Kaplan (2010) and Wiltshire (Kaplan & Wiltshire 2011) on proposed PV and wind energy sites of Vogelstruis Bult to the east. According to Beaumont et al (1995) the ESA in this area is said to be characterised by the presence of long blades, Victoria West cores and relatively few hand-axes and cleavers. Orton & Webley (2013) recorded a number of handaxes across the study area. While a few were large, the majority were smaller. These smaller handaxes were, prior to 1965, considered to signify a transitional stone tool industry between the ESA and the MSA called the Fauresmith. However, in a recent review, Underhill (2011) has highlighted the need to determine the validity of this industry. Van der Walt (2013) identified isolated scatters of ESA tools including bifaces made on quartzite to the north of the study area.
Orton & Webley (2013a & b) recorded large scatters of MSA material across Hoekplaas and Klipgats pan to the south-east of the study area. A highly significant MSA site, associated with a fossilised equid tooth, was recorded in a borrow pit at the side of the road. Substantial MSA sites are rare with only a few isolated examples known (Beaumont et al. 1995). The open landscape holds few caves but one called Zoovoorbij Cave close to the Orange River near Upington did include an early MSA occupation (Smith 1995a). Van der Walt (2013) concurs about the presence localised MSA quarries utilising quartz and quartzite outcrops. He describes the MSA as including large flakes, radial and bipolar cores, end scrapers, large utilised and retouched blade tools, and utilised and retouched flakes.

A significant aspect of the Northern Cape archaeological record is the presence of pans which frequently display associated archaeological material. The only detailed work in this regard is that of Kiberd (2001, 2006) who excavated a site known as Bundu Pan, some 25 to 30 km northwest of Copperton. The site was subsequently excavated between 1998 and 2003 and, importantly, found to contain stratified deposits ascribable to the ESA, MSA and LSA. Local pans were also examined by Wiltshire and found to have greater densities of archaeological material surrounding them (Kaplan & Wiltshire 2011). Orton & Webley (2013a & b) and Van der Walt (2013) have all mentioned the importance of pans in this arid area.

**Later Stone Age**

Several LSA sites in the Bushmanland area to the northwest, west and southwest of Copperton have been investigated by Beaumont and colleagues (1995), Smith (1995a) and Parsons (2003, 2008). Work on these sites led to a distinction between hunter-gatherer and herder sites (Beaumont et al. 1995; Beaumont & Vogel 1984, 1989; Parsons 2003), which has recently been called into question (Parsons 2007). Briefly, it is asserted that hunter-gatherer assemblages, termed ‘Swartkop’ may be distinguished from herder sites, termed ‘Doornfontein’ based on stone artefact assemblages. All these LSA sites have very few, if any, organic items on them. The only organic material generally present is fragments of ostrich eggshell which originated either from eggs eaten or else whole shells used as flasks.

Orton & Webley (2013a & b) observed that LSA artefacts were often found in clusters, suggesting that they represented occupation sites. These artefacts are recognised by their small size, their relatively unweathered surface appearance and the inclusion of quartz in the assemblages. Most LSA scatters were found located around pans. There is also some evidence for the quarrying of quartzite outcrops. Van der Walt (2013) described fewer concentrations of LSA material, including scraper, retouched and utilised flakes, blades and small round cores predominantly made on crypto-crystalline silica (CCS) material.

Rock art, in the form of engravings, is widely known from Bushmanland and the Northern Cape in general (Beaumont et al. 1995; Beaumont & Vogel 1989; Rudner & Rudner 1968; Rusch & Parkington 2010). Examples of well-known sites include Wildebeest Kuil and Driekopseiland. Various styles occur and are attributed to different time periods: incised finelines extend back the furthest in time, while pecked and scraped engravings occurred within the last 2000 years. However, no engravings have been recorded in the study area.

**5.3 Historical Background**

Smith (1995b) notes that around that time white farmers were making extensive use of Bushmanland for summer grazing and that this led to the extermination of the massive springbok herds on which the indigenous population subsisted. This in turn led to the descendants of indigenous groups turning to the farmers for food (and employment), effectively ending the span of prehistory in the region.
The farm complex of Humansrus and Platsambok lie outside the study area. The farms of Humansrus and Hoekplaas were surveyed in 1977 and appear to comprise portions of the farms Plat Sjambok 102 and Vogelstruis Bult 104 both of which date to the 1880s and appear to be some of the older farms in this district.

The town of Copperton was established in 1972 to provide housing for the nearby copper mine, but after the mine closed down in 1992 the town was sold and some of the housing has been demolished.

6. SPECIFIC IDENTIFIED HERITAGE SENSITIVITY OF THE SITE

There are no national or provincial heritage resources in the study area. The study area is not close to any declared National Park. Heritage resources on the property and immediately adjoining property are all of Grade III or local significance.

7. ALTERNATIVES

A preferred and alternative location has been proposed and these will be assessed at the EIA phase.

8. IMPACTS AND RISKS

Since heritage sites, including archaeological sites, are non-renewable, it is important that they are identified and their significance assessed prior to development.

8.1 Nature of Impacts

The main cause of impacts to archaeological sites is direct, physical disturbance of the material itself and its context. The heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose buried archaeological sites and artefacts, the artefacts are relatively meaningless once removed from the area in which they were found. Large scale excavations will damage archaeological sites, construction of roads and laydown areas, injudicious use of off-road vehicles can contribute to high levels of impact. The impacts are likely to be most severe during the construction period although indirect impacts may occur during the operational phase of the project.

It is not anticipated that there will be any impacts to the Built Environment. Historic structures and graveyards are sensitive to physical damage such as demolition as well as neglect. They are also context sensitive, in that changes to the surrounding landscape will affect their significance.

8.2 Extent of Impacts

In the case of the proposed solar facility, it is expected that impacts will be extensive. The clearance and levelling of the ground surface to install the PV units will result in the destruction of all surface material. Similarly, the clearing of access roads could impact material that lies buried in the surface sand.

Potential impacts caused by a 132 kV power line and the power line access roads are likely to be limited and local, however these will need to be physically searched and assessed during the EIA phase and the routes adjusted where necessary. The access road required for a 132 kV powerline is likely to be a ‘two-track’ which generally only requires limited physical disturbance of the ground surface.
### 8.3 Impact tables

**Impact Phase: Construction of PV Facility and infrastructure - Heritage**

| Possible Impact or Risk for Alternative 1: | Clearing and levelling the ground for solar panels, access roads, cabling, substation and powerlines may impact archaeological resources. |

**ANTICIPATED SCOPING IMPACTS TO BE SCOPED OUT OR INVESTIGATED FURTHER**

<table>
<thead>
<tr>
<th>Extent</th>
<th>Duration</th>
<th>Intensity</th>
<th>Status</th>
<th>Significance</th>
<th>Probability</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without Mitigation</td>
<td>L</td>
<td>H</td>
<td>L-</td>
<td>Negative</td>
<td>Medium</td>
<td>M</td>
</tr>
<tr>
<td>With Mitigation</td>
<td>L</td>
<td>M</td>
<td>L-</td>
<td>Positive</td>
<td>Low</td>
<td>M</td>
</tr>
</tbody>
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- **Can the impact be reversed?**
  - NO – physical heritage resources are generally non-renewable
- **Will impact cause irreplaceable loss or resources?**
  - Yes – If there is no mitigation then there could be irreversible losses of heritage. Loss of some resources can be entertained if they are of low heritage significance (common) or out of context through disturbance
- **Can impact be avoided, managed or mitigated?**
  - Yes – We anticipate that heritage resources in the Solar areas will be limited and probably manageable through avoidance or physical mitigation

Mitigation measures to reduce residual risk or enhance opportunities:
1. Determine the extent and significance of any pre-colonial archaeological resources. Determine if avoidance or physical mitigation is the preferred management option, or if no further action is required.
2. Establish buffer zones around graveyards to ensure that they are not accidentally damaged during the construction process.

**Impact to be addressed/further investigated and assessed in Impact Assessment Phase?**
- Yes

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### 8.4 Impacts on Pre-Colonial Archaeology

Archaeological surveys by Orton & Webley (2013a & b), Kaplan & Wilshire (2011) and Van der Walt (2013) on farms adjoining Humansrus indicates that there are ephemeral scatters of stone artefacts of medium-low significance and these do not need further mitigation.

However, there are concentrations of MSA and LSA material on the farms Hoeklaas (Orton & Webley 2013a), on the farm Klipgats Pan (Orton & Webley 2013b), Vogelstruis Bult (Kaplan & Wiltshire 2013) and Bosjesmansberg (Van der Walt 2013) adjoining the proposed PV facility that have been graded as potentially of very high research value and the “No-Go” option has been recommended.

These artefact concentrations are found on small hills with outcrops of quartzite/quartz as well as pans in the general area of Humansrus and they tend to have the highest concentrations of stone artefacts and tend to have the greatest research potential. In general these areas need to be avoided.

### 8.5 Impacts on Colonial Period Heritage

There are no farm buildings or structures on the land identified for the solar facility. In the absence of any residential structures, it seems unlikely that any farm graveyards will be present. However, the possibility of unmarked archaeological and/or historical graves cannot be excluded.
8.6 Impacts to Living Heritage

Living or intangible heritage (defined in the Act as including cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships) is given also protection under the National Heritage Resources Act, No 25 of 1999.

Close association with the land, such as that experienced by farm owners and farm workers, may result in certain features on the landscape enjoying particular social or ritual significance. This information is difficult to obtain unless there is a possibility of conducting oral interviews with the inhabitants of the property. However, it is not thought likely that any significant intangible heritage values would be attached to the particular terrain in question.

9. CUMULATIVE IMPACTS

Of concern, however, is the increasing number of solar facilities increase in this area (Figure 4). The cumulative impacts of the developments will result in widespread destruction of pre-colonial sites. Although many of these sites have, individually, been rated as having low significance, the cumulative impact of the removal of all archaeological material will result in the destruction of large areas of archaeology and could be considered significant. This will be assessed in the EIA Phase.

![Figure 4: The location of both solar facilities (both approved and proposed) in proximity to Humansrus 4.](image-url)
10. PROPOSED METHODOLOGY FOR THE HIA STUDY

The EIA phase study needs to fulfill the requirements of heritage impact assessment as defined in section 38 of the NHRA. This means that the assessment has to cover the full range of potential cultural heritage resources as defined in the National Heritage Resources Act 25 of 1999.

The aim of the EIA would be to identify and assess the significance of all heritage resources on the property, to determine the potential impacts on the resources, and where appropriate to recommend ‘no-go’ areas and to propose mitigation if avoidance is not possible.

- The proposed study area, including proposed routes of linear infrastructure (access roads, underground services, power lines) have already been subject to a detailed survey by the heritage practitioner/archaeologist. They have walked a pattern of transects over the site recording details and locations of any heritage material found;
- The significance of each find will need to be assessed along with the impacts of the proposed activity;
- In the case of impacts to significance heritage resources, the proposed mitigation measures may include the “No-Go” alternative, avoidance, archaeological excavations or monitoring during earthworks;
- The archaeologist should consider the cumulative impact of a number of solar facilities in the Copperton area on the archaeology of the study area and make recommendations for mitigation.

Based on the archaeology of the adjoining areas, the terrain on which the proposed Humansrus 4 Solar Facility will be located is likely to contain at least some archaeological sites of high significance.

10.1 Assumptions and Constraints

- Our assumptions about the spread and density of archaeological resources is based on archaeological fieldwork conducted on Humansrus in October 2014, as well as on assessments undertaken by other specialists on adjoining properties;
- It is assumed that, given the sparse vegetation of the study area, the presence of archaeological resources should be readily apparent from a surface survey and that test pit excavations will not be necessary to establish the potential of sub-surface archaeology.
- We do not have the comments from the broader local community with respect to the proposed development.

If however, archaeological features or sites (such as burials, ostrich eggshell water flasks, high stone artefact concentrations) are uncovered during construction, then work will have to cease in that area and SAHRA must be notified.

These provisos should be included in the EMP.

11. CONCLUSION

Indications are that in terms of archaeological heritage and built environment the proposed activity is viable, impacts are expected to be limited and controllable. In terms of the information available at this time, no fatal flaws are anticipated.
REFERENCES


Orton & Halkett 2011. Heritage impact assessment for the proposed photovoltaic solar energy facility on the remainder of farm Jakhalsvalley 99, Sutherland Magisterial District, Northern Cape.


