HERITAGE IMPACT ASSESSMENT:

PROPOSED ACCESS ROAD ON THE REMAINDER AND PORTION 4 OF THE FARM ONDER RUGZEER 168, KENHARDT MAGISTERIAL DISTRICT, NORTHERN CAPE PROVINCE

Report for:

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SUMMARY

ASHA Consulting (Pty) Ltd was appointed by Scatec Solar SA 330 (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of a new access road on the remainder and portion 4 of the farm Onder Rugzeer 168/remainder, located some 17 km northeast of Kenhardt, Northern Cape. The start and end points of the preferred alternative (Option C) are at 29°16'28.36"S; 21°18'53.22"E and 29°11'11.12"S and 21°18'15.19"E.

The study area for Options B and C is generally very flat, almost devoid of vegetation and crossed by many ephemeral drainage lines. Towards the east, the drainages become larger and join a larger stream bed that lies east of Option B. Bedrock outcrops are rare and tend to only protrude no more than about 15 cm above ground level. Rare quartz outcrops and small pans also occur in the landscape.

The survey revealed background scatter stone artefacts to be present all over the study area. Denser scatters of artefacts were rare, but three were noted along Option C. All are of low to very low cultural significance. No graves were seen and the chances of graves occurring are considered to be negligible. The cultural landscape is weakly developed and centred on small stock farming. It is of low cultural significance. No significant impacts are expected through implementation of any of the three alternatives, but, from a heritage point of view, Option A is slightly preferred. If for other reasons either Option B or C is found to be the most preferred, then there is no heritage objection to one of those being implemented. There are no fatal flaws for any alternative.

It is recommended that the proposed road development be authorised but with the following conditions:

- All gates and fencing along the new road are to be in keeping with the nature of farm fences;
- No mature trees may be removed from the southern end of Option B; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Glossary

Background scatter: Artefacts whose spatial position is conditioned more by natural forces than by human agency.

Early Stone Age: Period of the Stone Age extending approximately between 2 million and 200 000 years ago.

Handaxe: A bifacially flaked, pointed stone tool type typical of the Early Stone Age Acheulian Industry. It is also referred to as a large cutting tool.

Holocene: The geological period spanning the last approximately 10-12 000 years.

Hominid: a group consisting of all modern and extinct great apes (i.e. gorillas, chimpanzees, orangutans and humans) and their ancestors.

Later Stone Age: Period of the Stone Age extending over the last approximately 20 000 years.

Middle Stone Age: Period of the Stone Age extending approximately between 200 000 and 20 000 years ago.

Pleistocene: The geological period beginning approximately 2.5 million years ago and preceding the Holocene.

Abbreviations

APHP: Association of Professional Heritage Practitioners

ASAPA: Association of Southern African Professional Archaeologists

BA: Basic Assessment

CRM: Cultural Resources Management

DEFF: Department of Environment, Forestry and Fisheries

DENC: Northern Cape Department of Environment and Nature Conservation

EA: Environmental Authorisation

ESA: Early Stone Age

GP: General Protection

GPS: global positioning system

HIA: Heritage Impact Assessment

LSA: Later Stone Age

MSA: Middle Stone Age

NBKB: Ngwao-Boswa Ya Kapa Bokoni

NEMA: National Environmental Management Act (No. 107 of 1998)

NHRA: National Heritage Resources Act (No. 25) of 1999

PPP: Public Participation Process

REDZ: Renewable Energy Development Zone

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

Contents

1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by Scatec Solar SA 330 (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of a new access road on the remainder and portion 4 of the farm Onder Rugzeer 168/remainder, located some 17 km northeast of Kenhardt, Kenhardt Magisterial District, Northern Cape (Figure 1). The end points of the preferred alternative (Option C) are at29°16'28.36"S; 21°18'53.22"E and 29°11'11.12"S and 21°18'15.19"E.

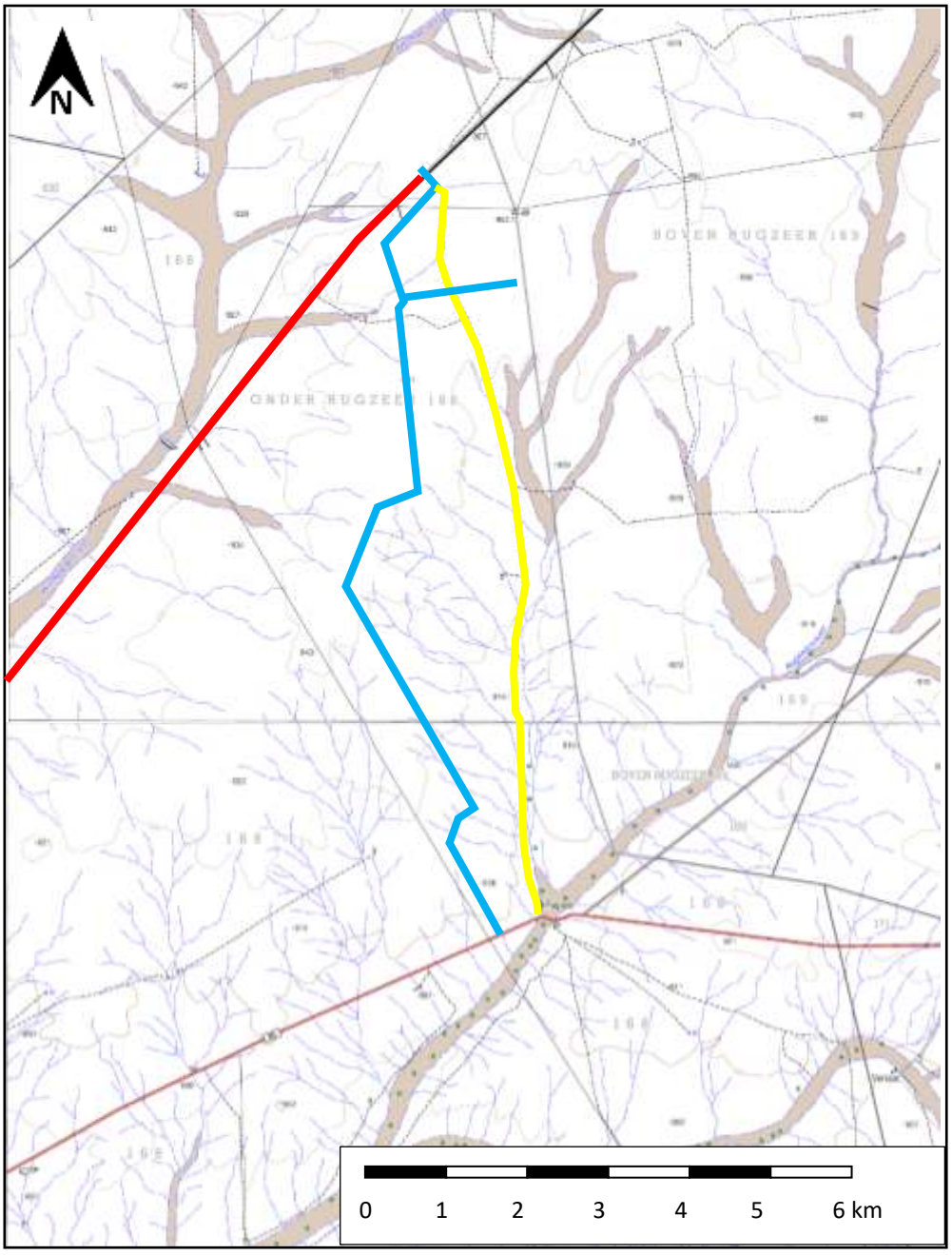

Figure 1: *Extract from 1:50 000 topographic map 2921AB & 2921AD showing the location of the preferred alternative (Option C) in light blue along with Options A (red) and B (yellow). Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: www.ngi.gov.za.*

The road is to serve as an access road to a suite of photo-voltaic solar energy facilities that have already been authorised in the area. This heritage assessment forms part of a Basic Assessment process.

1.1. The proposed project

1.1.1. Project description

It is proposed to construct a gravel road of up to 12 m maximum width and 14.7 km length for the preferred alternative. The proposed width includes space for side drains and gravel embankment as might be needed along the road edges. The road would be accommodated within a 15 m wide servitude. Most of the length is likely to have a surfaced width of about 7 m and a schematic cross-section is shown in Figure 2.

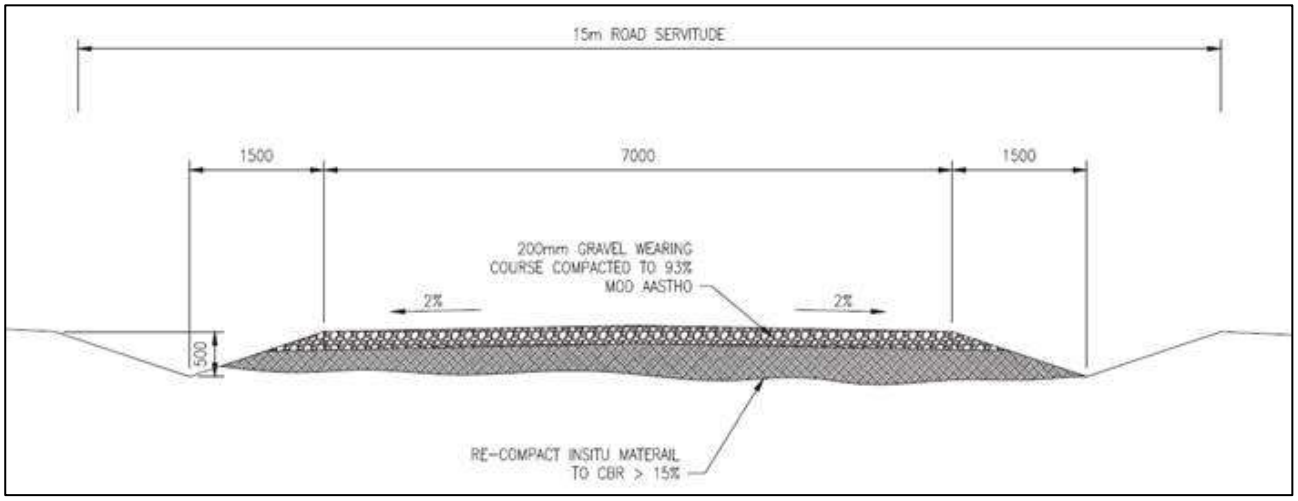

Figure 2: *Schematic cross-section through the proposed road.*

1.1.2. Identification of alternatives

Three alternatives were identified. They are mapped in Figure 3 and described as follows.

Option A: this would follow the existing Transnet service road from the R27 to the site. It is approximately 23 km long. From the turnoff into the site the already approved internal road network for the PV projects and powerline would be followed. Although the Transnet road is already existing, it would have to be upgraded, including widening, change of horizontal alignments and the formalisation of multiple watercourse crossings. This alternative is not the preferred access for the following reasons:

1. The ownership of the land is as part of a Transnet servitude over multiple properties.
2. The road is excessively long.
3. The road is currently utilised by Transnet as a service road for the Sishen - Saldanha railway line. Additional traffic generated during construction may not be supported by Transnet.
4. The entrance point into Kenhardt PV2 will have to cross the Sishen – Saldanha railway line, meaning that all construction vehicles for 5 of the projects will have to cross this railway line. It is possible that this will not be supported by Transnet.

5. Should the outcome of any future bidding necessitate the construction of Kenhardt PV2 prior to the other projects, it would mean that all construction traffic to the southern projects would have to be diverted through operational site/s.
6. The upgrade of this road would necessitate the construction of multiple watercourse crossings, increasing the overall environmental impact of the road.

Option B: This option leads from the existing R383 public road in the south and follows an existing farm track along the western flanks of a riverbed and crossing a large number of small tributaries on its way to the Transnet service road in the north. Although this road is existing, it would have to be significantly upgraded from its current status as a farm track (upgrades would include the widening, change of horizontal alignments and the formalisation of multiple watercourse crossings). This alternative is not the preferred access for the following reasons:

1. It crosses multiple sensitive drainage lines;
2. The southern portion falls within the floodplain of the major watercourse; and
3. If PV 2, 3 and 4 are constructed first, then construction access to the remaining projects would be cut off because this track runs through their footprints.

Option C: Access road alternative C is proposed to start at a new access point along the R383. From there it runs along the southern and eastern boundary of Kenhardt PV6 and between Kenhardt PV 5 and PV 4, 3 and 2 before crossing the Transnet service road to access Kenhardt PV 1. It also includes a short lateral link to access the substation on Kenhardt PV 3. Access road alternative C is the preferred access for the following reasons:

1. It provides access to all 6 project sites, without the need to cross the PV fields;
2. It avoids all sensitive watercourses, including the main watercourse and secondary drainage lines;
3. Other than the point where it crosses the Transnet service road, it remains within the affected property; and
4. The same access can be utilised for both the construction and operational access of the area.

1.1.3. Aspects of the project relevant to the heritage study

All aspects of the proposed development are relevant since the grubbing of the surface in preparation for road construction and any excavations made for foundations (e.g. for culverts) may impact on archaeological and/or palaeontological remains.

1.2. Terms of reference

ASHA Consulting was asked to prepare a heritage impact assessment (HIA) that would meet the requirements of both the South African Heritage resources Agency (SAHRA) and the Department of Environment, Fisheries and Forestry (DEFF). The assessment was to include both a desktop analysis and fieldwork. All relevant aspects of heritage were to be included with the exception of palaeontology which was to be considered by another specialist.

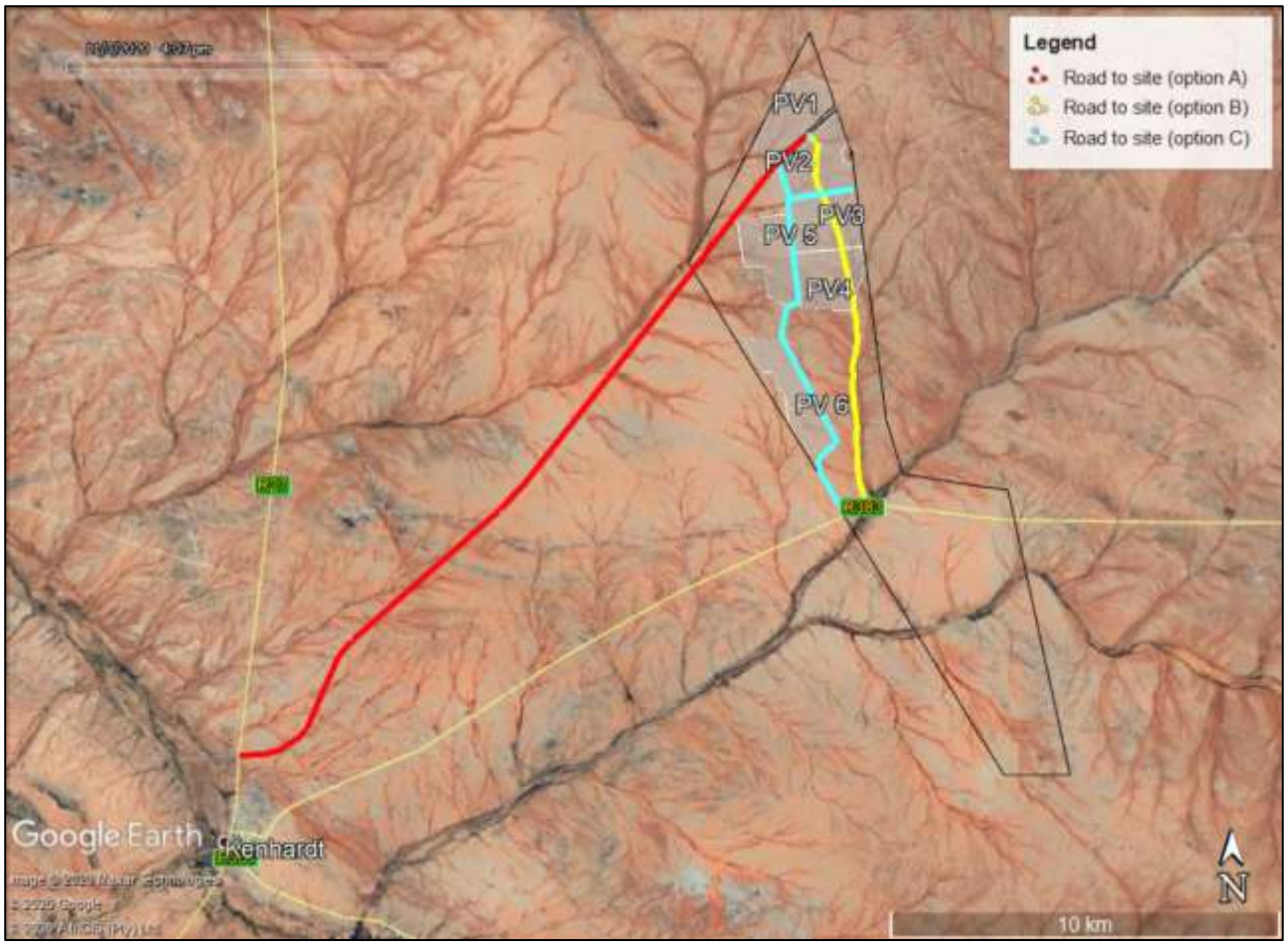

Figure 3: *Aerial view of the study area (Farm 168/rem is outlined in black) showing the proposed alignment options and the locations of the authorised PV 1-6.*

1.3. Scope and purpose of the report

An HIA is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This HIA report aims to fulfil the requirements of the heritage authorities such that a comment can be issued by them for consideration by the Northern Cape Department of Environment and Nature Conservation (DENC) who will review the Basic Assessment (BA) and grant or refuse authorisation. The HIA report will outline any management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

1.4. The author

Dr Jayson Orton has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting Heritage Impact Assessments and archaeological specialist studies in South Africa (primarily in the Western Cape and Northern Cape provinces) since 2004 (please see curriculum vitae included as Appendix 1). He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is an accredited heritage practitioner with the Association of Professional Heritage Practitioners (APHP; Member #43) and

also holds archaeological accreditation with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

- Principal Investigator: Stone Age, Shell Middens & Grave Relocation; and
- Field Director: Colonial Period & Rock Art.

1.5. Declaration of independence

ASHA Consulting (Pty) Ltd and its consultants have no financial or other interest in the proposed development and will derive no benefits other than fair remuneration for consulting services provided.

2. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA) No. 25 of 1999 protects a variety of heritage resources as follows:

- Section 34: structures older than 60 years;
- Section 35: prehistoric and historical material (including ruins) more than 100 years old as well as military remains more than 75 years old, palaeontological material and meteorites;
- Section 36: graves and human remains older than 60 years and located outside of a formal cemetery administered by a local authority; and
- Section 37: public monuments and memorials.

Following Section 2, the definitions applicable to the above protections are as follows:

- Structures: “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”;
- Palaeontological material: “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”;
- Archaeological material: a) “material remains resulting from human activity which are 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”; b) “rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation”; c) “wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation”; and d) “features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found”;
- Grave: “means a place of interment and includes the contents, headstone or other marker of such a place and any other structure on or associated with such place”; and
- Public monuments and memorials: “all monuments and memorials a) “erected on land belonging to any branch of central, provincial or local government, or on land belonging to

any organisation funded by or established in terms of the legislation of such a branch of government"; or b) "which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual."

Section 3(3) describes the types of cultural significance that a place or object might have in order to be considered part of the national estate. These are as follows:

a) its importance in the community, or pattern of South Africa's history;
b) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
c) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
d) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;
g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
i) sites of significance relating to the history of slavery in South Africa.

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list "historical settlements and townscapes" and "landscapes and natural features of cultural significance" as part of the National Estate. Furthermore, some of the points in Section 3(3) speak directly to cultural landscapes.

Section 38(8) of the NHRA states that if an impact assessment is required under any legislation other than the NHRA then it must include a heritage component that satisfies the requirements of S.38(3). Furthermore, the comments of the relevant heritage authority must be sought and considered by the consenting authority prior to the issuing of a decision. Under the National Environmental Management Act (No. 107 of 1998; NEMA), as amended, the project is subject to an BA. The present report provides the heritage component. Ngwao-Boswa Ya Kapa Bokoni (Heritage Northern Cape; for built environment and cultural landscapes) and the South African Heritage Resources Agency (SAHRA for archaeology and palaeontology) are required to provide comment on the proposed project in order to facilitate final decision making DENC.

3. METHODS

3.1. Literature survey and information sources

A survey of available literature was carried out to assess the general heritage context into which the development would be set. This literature included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources

Information System (SAHRIS). These included the previous reports for the PV facilities on the same farm. The 1:50 000 maps were sourced from the Chief Directorate: National Geo-Spatial Information. Data were also collected via a field survey.

3.2. Field survey

The site was subjected to a detailed foot survey on 7th December 2020. This was during summer but, in this very dry area, the season makes no meaningful difference to vegetation covering and hence the ground visibility for the archaeological survey. Other heritage resources are not affected by seasonality. During the survey the positions of finds and survey tracks were recorded on a hand-held Global Positioning System (GPS) receiver set to the WGS84 datum. Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

It should be noted that amount of time between the dates of the field inspection and final report do not materially affect the outcome of the report.

3.3. Specialist studies

Only one other heritage specialist was involved. Dr John Almond was commissioned to conduct a palaeontological study. His study is contained in a separate report that should be read alongside the present HIA.

3.4. Grading

S.7(1) of the NHRA provides for the grading of heritage resources into those of National (Grade I), Provincial (Grade II) and Local (Grade III) significance. Grading is intended to allow for the identification of the appropriate level of management for any given heritage resource. Grade I and II resources are intended to be managed by the national and provincial heritage resources authorities respectively, while Grade III resources would be managed by the relevant local planning authority. These bodies are responsible for grading, but anyone may make recommendations for grading.

It is intended under S.7(2) that the various provincial authorities formulate a system for the further detailed grading of heritage resources of local significance but this is generally yet to happen. SAHRA (2007) has formulated its own system[1] for use in provinces where it has commenting authority. In this system sites of high local significance are given Grade IIIA (with the implication that the site should be preserved in its entirety) and Grade IIIB (with the implication that part of the site could be mitigated and part preserved as appropriate) while sites of lesser significance are referred to as having 'General Protection' (GP) and rated as GP A (high/medium significance, requires mitigation), GP B (medium significance, requires recording) or GP C (low significance, requires no further action).

3.5. Consultation

The NHRA requires consultation as part of an HIA but, since the present study falls within the context of an EIA which includes a public participation process (PPP), no dedicated consultation was

[1] The system is intended for use on archaeological and palaeontological sites only.

undertaken as part of the HIA. Interested and affected parties would have the opportunity to provide comment on the heritage aspects of the project during the PPP.

3.6. Assumptions and limitations

The field study was carried out at the surface only and hence any completely buried archaeological sites would not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. Given the generally eroding nature of the surface, however, it is assumed that almost all archaeological materials would, in fact, be lying on the present surface.

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The study area is in a very remote location generally used only for the rearing of small stock. A large ESKOM Substation has recently been built to the northeast of the study area and the Sishen-Saldanha Railway Line passes through its northern end. The entire study area falls within the Upington Renewable Energy Development Zone (REDZ).

4.2. Site description

The study area is generally very flat with a coarse sandy to lightly gravelly surface. There is only very minimal sand accretion around the bases of bushes. Bedrock exposure is minimal with most exposed rock, including quartz outcrops, having weathered to gravel. Solid quartz is evident on some outcrops but the proposed road does not cross any of these areas. A number of ephemeral stream beds occur and a small pan lies in the far north about 70 m outside of the Option C corridor. Vegetation is very sparse and limited to small bushes and clumps of grass. Figures 4 to 13 show aspects of the study area.

Figure 4: *View towards the southwest along the existing Transnet service road (Option A) from the point at which access would be provided to the PV sites. PV1 lies to the right, PV2-6 lie to the left.*

Figure 5: *View towards the north across the existing level crossing where all access road options would cross the Transnet railway line. The Transnet service road is on the north side of the railway line.*

Figure 6: *View towards the north along the southern part of Option C.*

Figure 7: *Looking northwards along Option C showing one of the small water course crossing points.*

Figure 8: *Looking towards the southeast over the largest bedrock outcrop seen. It has a hollow that has accumulated rainwater. The Option C alignment passes across this view in the background a short distance beyond this outcrop.*

Figure 9: *Looking north along Option C near the point where the substation access road branches eastwards. The alignment passes east (right) of the quartz-covered hill in the background.*

Figure 10: *View towards the west along the substation access road (Option C).*

Figure 11: *View towards the south along the central part of the existing farm track (Option B).*

Figure 12: *Looking southwards along the existing farm track (Option B) with the farmstead visible in the distance (arrowed).*

Figure 13: *View towards the south where the farm track enters the farm complex. Option B would leave the track and pass just to the west (right) of the trees in order to not go through the farm complex.*

5. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources recorded in the study area during the course of the project. All finds are listed in Table 1. The finds are mapped in Appendix 2.

Table 1: *Heritage resources recorded during the survey. Archaeological finds are graded as per the SAHRA grading guidelines for archaeology and palaeontology.*

Waypoint	Location	Description	Significance (grade)
864	S29 16 23.6 E21 19 00.4	There is a widespread but very low density scatter of historical glass and metal fragments across this general area.	Very low (GPC)
865	S29 15 21.7 E21 18 42.8	A scatter of quartz artefacts located in between two stream beds. Although the scatter is low density, it is spatially distinct over an area of about 20 m diameter. The artefacts consisted of adiagnostic flakes and a few cores.	Very low (GPC)
866	S29 14 01.5 E21 17 52.9	A scatter of stone artefacts between a stream bed and a very low (*c*. 15 cm high) bedrock outcrop. Most artefacts are on quartz with the majority of that being clear quartz. Other materials included CCS (two artefacts), quartzite (two artefacts), banded iron formation (one artefact) and a green igneous rock that looks like a porphyry (four artefacts). The scatter is about 40 m in diameter. It probably relates to the LSA. In addition, occasional weathered artefacts of far greater age were also seen. The scatter is of low density and would require an extensive area to be sampled in order to get a meaningful assemblage. For this reason, no mitigation has been suggested.	Low (GPB)
867	S29 14 00.6 E21 17 50.5	A bedrock outcrop (*c*. 15 cm high) with a hole that has accumulated rain water in it. This may be the reason for the LSA scatter at waypoint 866. There are several fragments of glass and a tin here but very few stone artefacts. This point is about 60 m from the centre of the waypoint 866 scatter.	Very low (GPC)
868	S29 13 59.3 E21 17 50.6	A bedrock outcrop (*c*. 15 cm high) with a possible ground patch on it. The rock is weathering and exfoliating so the preservation of the potentially ground surface is poor. There is a widespread, low density scatter of artefacts in the area. Most are on quartz but some quartzite and the green igneous rock noted above were also present.	Very low (GPC)
869	S29 12 04.9 E21 18 04.3	An area with widespread, low density artefact scatter alongside a wide, shallow water course. The artefacts are on quartz and comprise of adiagnostic flakes and rare cores.	Very low (GPC)
870	S29 11 36.2 E21 17 57.9	A scatter of quartz artefacts around a pan. This site was recorded previously by Orton (2015b) as follows: “LSA artefact scatter along the north-western margin of a pan. Mostly quartz but quartzite, silcrete and crypto-crystalline silica (CCS) are also present. A partially made clear quartz backed bladelet was noted.” It is outside the Option C corridor and needs no further attention here.	Medium (GPA)
871	S29 16 15.3 E21 19 12.6	The Rugseer farm complex. The main house is a large thatch house with some mid-2oth century features. The overall house is not typical of the period which means it may have been designed by an architect for the owner. A barn located to the north of the house has a date on its gable of “6 SEP 1945”. There are a number of mature trees around the farmstead, including a line of gum trees along the driveway from the R383.	Medium-High

5.1. Palaeontology

The SAHRIS Palaeosensitivity map shows that the study area is of moderate palaeontological sensitivity which means that a desktop study is required (Figure 14). Please see the separate palaeontological report compiled by Dr John Almond.

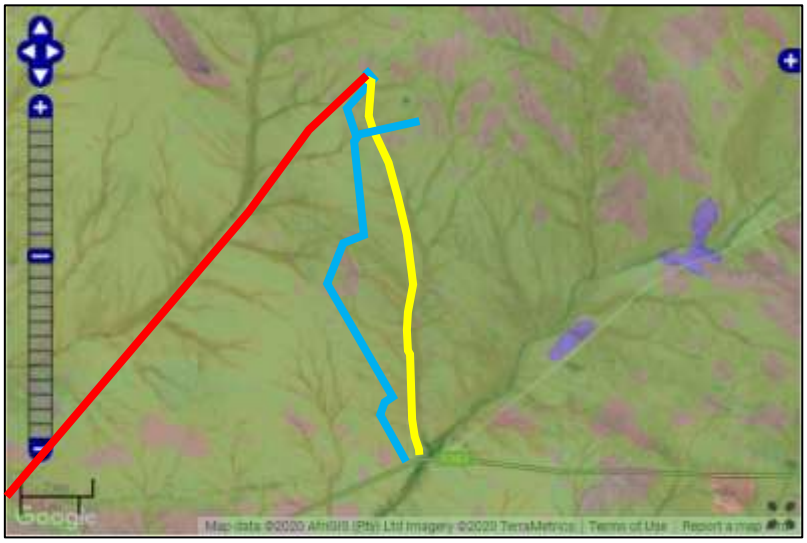

Figure 14: *Extract from the SAHRIS Palaeosensitivity map showing the study area to be of largely medium palaeontological sensitivity.*

5.2. Archaeology

5.2.1. Desktop study

Bushmanland is well known for the vast expanses of gravel that occur in places and which frequently contain stone artefacts in varying densities (Beaumont *et. al* 1995). Such material is referred to as 'background scatter' and is invariably of very limited significance. At times, however, the scatter can become very dense and mitigation work is occasionally called for. The artefacts located in these contexts largely date to the Pleistocene and originate in the Early Stone Age (ESA) and Middle Stone Age (MSA). They are not associated with any other archaeological materials, since these would have long since decomposed and disappeared. Previous experience in the vicinity of the study area suggests that such dense accumulations of artefacts are unlikely to occur in this area.

Of potentially more significance, however, are Holocene-aged Later Stone Age (LSA) sites which are commonly located along the margins of water features in Bushmanland. These features include both pans, sometimes with exposed bedrock in them, and ephemeral drainage lines. Some such sites have been identified in the area before, including on farm 168/remainder. Sites associated with small pans tend to be more common than those along the streams (Orton 2014a, b, c, 2015a, 2b, 5c, 2016a, b, c, d, e, f, g, 2018a, b, c, d, 2019a, b, c). One highly significant pan site has been found in the vicinity of the study area, about 16 km northeast of the Nieuwehoop Substation (Orton 2018a). This site included artefacts from the ESA, MSA and LSA and there is a possibility that buried stratified deposits may be present. LSA sites in the area typically contain mostly stone artefacts, but fragments of ostrich eggshell (used as water containers and also as a food source) and pottery are also found at times, while bone is rare and likely confined to sites that are very recent. Similar LSA sites can also be found in association with rocky outcrops. An unusual LSA artefact that was found on its own and is thus part of the background scatter is half of a bored stone (Orton 2019a, b, c). It was some 200 m west of the proposed Option C road alignment. These stones were used as digging stick weights.

Orton (2016c) documented a suite of LSA/historical sites along a section of riverbank along the Rugseersrivier some 11.5 km south of the Nieuwehoop Substation and some 2.2 km east of the proposed Option B road alignment. These appeared to be contact period sites and one of them included a rusted pen knife handle with the portrait and name of Paul Kruger on it. This may indicate that a Boer commando had camped there during the Anglo-Boer War.

Another kind of archaeological site fairly commonly encountered in Bushmanland is small rock outcrops that have been quarried as a source of stone material for making stone tools. Such occurrences have frequently been recorded in the area, including in close proximity to the present study area (Orton 2019a, b, c).

Rock engravings are known from the broader area (Louw Roux Bushmanland 2013). From the limited information available, these appear to be naturalistic images produced by the Bushmen. Geometric images, produced by the Khoekhoen, are not well known from the area (Orton 2013), although David Morris (pers. comm. 2015) has seen examples in the region. Painted art is also very rare but again, examples are known with one being about 14 km northeast of the present study area (Orton 2016f) and another lying along the Sak River near Kenhardt (Orton, personal observation 2017). Both are of geometric images.

Historical resources tend to be rarer than Stone Age ones. Orton (2018d) located an old farmstead that is now purely archaeological in nature having been raised to the ground. It is the only such site known from the area and included an ash midden with many glass and ceramic artefacts. It lies some 12 km north of the northern end of the present study area. Isolated fragments of glass and ceramics are occasionally seen in the wider area.

5.2.2. Site visit

The survey revealed that isolated background scatter artefacts – largely made on quartz – occur widely. Their density is far too low to be meaningful. Very few diagnostic artefacts were seen, but it can be assumed that the vast majority of these artefacts are MSA in origin. Figure 15 shows a few background scatter finds that might be MSA, while Figure 16 shows a bifacial artefact that might be MSA or ESA. The artefact resembles a handaxe which is a typical ESA artefact type, but it is very small for a handaxe.

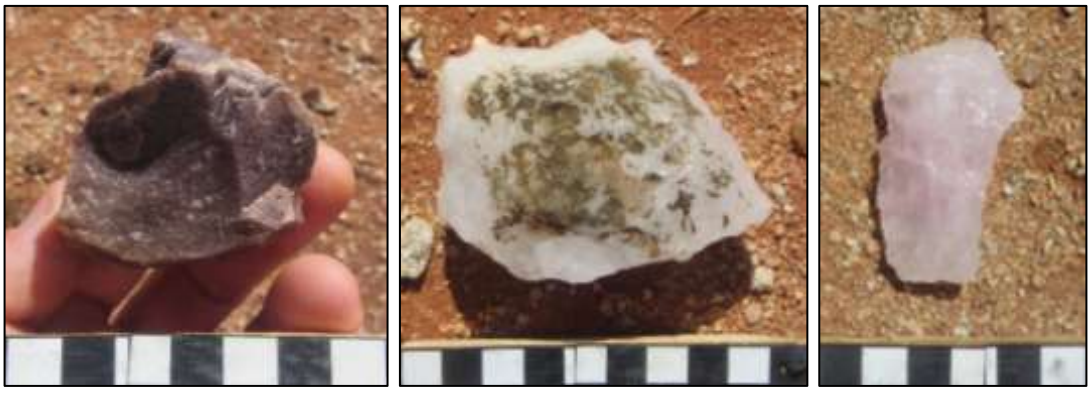

Figure 15: *A quartzite core (left), a quartz core (centre) and a quartz blade (right). All are likely to be MSA artefacts. Scales in cm.*

Figure 16: *Both faces of a bifacially worked artefact. Scales in cm.*

A few sites were recorded where the artefact scatters were dense enough. None of them were of high significance though. The best scatter (waypoint 866) was located not far from a small bedrock water source (waypoint 867; Figure 9) which may, in fact, have been the reason for the location of the site. In Bushmanland it is common to find archaeological sites located around such water sources. This and the other scatters seen were exclusively of stone artefacts with no other associated finds. Their density was very low. Only one isolated fragment of ostrich eggshell was seen during the survey. Figures 17 and 18 show the surface of the sites at waypoints 865 and 866.

Figure 17: *The surface of the site at waypoint 865.*

Figure 18: *The surface of the site at waypoint 866.*

Both near the water source and in the far south of the study area (but between Options B and C) there were a number of glass and metal fragments. Those in the south were present over a wide area several hundred meters away from the farmhouse. There was no sign of a dump.

5.3. Graves

Isolated graves, or features thought to be graves, are widespread across the dry interior of South Africa and may relate to either precolonial occupation, early colonial farmers (trekboers) or to the

Anglo-Boer War. No graves or possible graves were found in the present study area but one potential grave was recorded between Options B and C by Orton (2015b).

5.4. Historical aspects and the built environment

5.4.1. Desktop study

The Anglo-Boer War was fought across much of the Northern Cape interior, but information on the role of Kenhardt appears difficult to locate. The town was occupied by the Boers in late February 1900 after they convinced the magistrate that they had a large gun and would fire on the town if it did not surrender. They later surrendered to the British who occupied the town on 31st March 1900. By mid-1900 there were perhaps 100 Cape Rebels detained in a camp outside of Kenhardt (Grobler 2004). The British raised a local force known as the Border Scouts in Upington in May 1900. Many were mixed-race individuals, some local farmers, others Kalahari hunters, but all disliked the Boers. The scouts were responsible for a large area of the north-western Cape Colony centred on Upington and Kenhardt. They eventually numbered 786 by January 1901 and were under the command of Major John Birbeck (AngloBoerWar.com 2015; Rodgers 2011). At the beginning of 1902 there were 150 Border Scouts stationed at Kenhardt. Two boers, H.L. Jacobs and A.C. Jooste, were accused of treason and executed in the town on 24 July 1901 (Grobler 2004). A memorial stands there to their honour (Green Kalahari n.d.). Events around Kenhardt were likely not that important and this execution does not even feature in the Boer War timeline provided by Packenham (1993: 291-294). No major action appears to have taken place around Kenhardt, although the Boers are known to have attacked a patrol on 17th May 1901, while the British attacked a Boer position on 25th June 1901 (AngloBoerWar.com 2015).

The only material remains possibly related to occupation around the time of the Boer War are the series of contact period riverbank scatters mentioned above.

The farm complexes of the area all appear to be 20th century in age with the only older one known being the ruined and largely raised one noted above (Orton 2018d).

The Onder Rugzeer Farm dates back to 1883 but three portions were subdivided off in 1928 and 1929. Portion 4 was subdivided off for the railway line in 1991 leaving the current remainder.

5.4.2. Site visit

Aside from the few historical artefacts seen and mentioned above, the only historical resource was the farm complex. The complex appears to date to the mid-20th century (Figure 19 & 20) and is thus not very old. It is unknown whether any earlier structures were ever present on the farm. The house lies within a planted landscape of many trees including a line of gums alongside the driveway (Figure 21). The Option B road alignment has been designed to avoid the farmstead and its surrounding trees.

Figure 19: *View of the large, thatched farmhouse.*

Figure 20: *View of the barn with the '6 SEP 1945' inscription being on the raised cement circle above the doors.*

Figure 21: *View down the driveway showing the gum and other trees.*

5.5. Cultural landscapes and scenic routes

The cultural landscape is rather weakly developed and relates to the keeping of small stock in the region. The landscape is characterised by wide open space with occasional fence lines, farm tracks and wind pumps and is rather more natural than cultural in nature. Farmsteads are very sparsely distributed, but when they occur they often have associated clumps of trees, as is the case with Rugseer, the farmstead on the subject property and located at the southern end of Option B. In the vicinity of the study area it is compromised by the presence of the railway line, power lines and substation. The site is located well away from the R27 which may be considered a scenic route. Nevertheless, the landscape is seen as a heritage resource. Given that (1) the PV facilities that the road is intended to service have already been authorised and (2) the road would not be constructed if the PV facilities are not constructed, it seems appropriate to consider the road within the context of a new electrical 'layer' that would be added to the cultural landscape if one or more PV facilities are built.

5.6. Statement of significance and provisional grading

Section 38(3)(b) of the NHRA requires an assessment of the significance of all heritage resources. In terms of Section 2(vi), ''cultural significance'' means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. The reasons that a place may have cultural significance are outlined in Section 3(3) of the NHRA (see Section 2 above).

The archaeological resources are deemed to have low cultural significance for their scientific value.

Graves are deemed to have high cultural significance for their social value but none were located.

The cultural landscape as it presently stands has low cultural significance for its aesthetic value.

5.7. Summary of heritage indicators

Archaeological sites, fossils and graves are fragile, non-renewable resources that can provide information about people who used the area in the past.

- Indicator: No significant archaeological sites, fossils or graves should be damaged or destroyed by the proposed development.

The cultural landscape is largely natural and, given its flatness and lack of natural screening opportunities, is sensitive to visual intrusion.

- Indicator: The proposed development should not visually dominate the landscape from any accessible public viewpoints.

6. ASSESSMENT OF IMPACTS

Palaeontological impacts have been assessed by Dr John Almond in a separate report and are not considered here. Of relevance to the present study are impacts to archaeology, graves and the cultural landscape. Please note that Option A is not formally assessed because no heritage impacts of any sort are anticipated. This is because it would be an *in situ* upgrade within an already disturbed

corridor and would not result in any change in character. Option A impacts can thus be considered to be of very low significance and of neutral status.

6.1. Impacts to archaeological resources

Direct impacts to archaeological resources would occur during the construction phase only. The materials identified are of low cultural significance which means that the impacts are expected to be of low intensity. As yet undiscovered sites of higher cultural significance are not expected to occur within the proposed alignments. The significance of the impacts is considered to be **low negative** before mitigation and, because of the low cultural significance, no mitigation measures are proposed. It would, however, be required of the contractor to stop work and report any potential heritage finds made during development. Because of the nature of the landscape, the chances of buried archaeology being present are considered to be virtually zero. Although only background scatter artefacts were seen along the margins of the existing farm track that is Option B, all impacts for Options B and C are of low intensity so the assessment in Table 2 applies equally to both options B and C. There are no fatal flaws.

Table 2: *Assessment of archaeological impacts for Options B and C.*

	Before mitigation	**After mitigation**
Extent of impact	Local	Local
Intensity of impact	Low	Low
Duration of impact	Permanent	Permanent
Probability of impact occurring	Highly probable	Highly probable
Significance	Low	Low
Status	Negative	Negative
Reversible	No	
Replaceable	No	
Degree to which impact can be mitigated	High, but not required.	
Residual impacts	Regardless of mitigation measures, some sites and many isolated artefacts may be damaged or destroyed by the proposed road. Their low cultural significance means that residual impacts would be of low significance.	

6.2. Impacts to graves

Direct impacts to graves might occur during the construction phase only. No graves were seen during the survey but it remains possible that some graves could exist on the landscape. Graves are always of high cultural significance which means that any impacts would be of high intensity. Although there is more new ground to be disturbed by Option C, Option B lies closer to the river where graves may be more likely but there is already a small farm road in place. Nevertheless, the chances of impacts occurring on either route are improbable (in practice, negligible). The significance is thus considered to be **low negative** before mitigation. No mitigation measures are proposed but, if a grave is found during construction, it would be required of the contractor to stop work and report the find. The assessment in Table 3 applies equally to both options B and C. There are no fatal flaws.

Table 3: *Assessment of impacts to graves for Options B and C.*

	Before mitigation	**After mitigation**
Extent of impact	Local	Local
Intensity of impact	High	High
Duration of impact	Permanent	Permanent
Probability of impact occurring	Improbable	Improbable
Significance	Low	Low
Status	Negative	Negative
Reversible	No	
Replaceable	No	
Degree to which impact can be mitigated	High, but not required unless graves are found during construction.	
Residual impacts	Regardless of mitigation measures, graves may be damaged or destroyed without being seen. The probability, however, is extremely small and residual impacts are thus of low significance.	

6.3. Impacts to the cultural landscape

Direct impacts to the cultural landscape would occur during the construction phase, largely because of the construction activity. Once the road is completed it would be little different to other gravel regional roads and would not present significant impacts to the landscape. Nevertheless, very minor impacts (too minor to be of any concern) would last throughout the project lifetime. The cultural landscape is considered to be of low cultural significance which means that any impacts would be of low intensity. Although there is more new ground to be disturbed by Option C, Option B lies closer to the river and may require more extensive roadworks (e.g. culverts, drainage measures). The significance for both options is thus considered to be **low negative** before mitigation. Because of the flatness of the landscape which will result in very low visibility of the road from a distance, no construction-related mitigation measures (e.g. minimising cut-and-fill) are proposed. However, it is suggested that all gates and fencing should be in keeping with the nature of farm fences and no trees at the farmstead should be removed (Option B only). With mitigation, the impacts would still be rated **low negative**. The assessment in Table 4 applies equally to both options B and C. There are no fatal flaws.

Table 4: *Assessment of impacts to the cultural landscape for Options B and C.*

	Before mitigation	**After mitigation**
Extent of impact	Local	Local
Intensity of impact	Low	Low
Duration of impact	Long term	Long term
Probability of impact occurring	Definite	Definite
Significance	Low	Low
Status	Negative	Negative
Reversible	Yes, with full rehabilitation of the alignment.	
Replaceable	No, but the landscape is vast with many similar-looking areas.	
Degree to which impact can be mitigated	High	
Residual impacts	None expected.	

6.4. The No-Go alternative

With implementation of the No-Go alternative, the landscape would remain exactly as it is and no changes to any heritage resource would be expected. The assessment of this option would be very low significance with neutral status.

6.5. Existing impacts to heritage resources

There are currently no obvious threats to heritage resources on the site aside from the natural degradation, weathering and erosion that will affect archaeological materials. Trampling/damage from grazing animals and/or farm vehicles may also occur.

6.6. Cumulative impacts

Because of the very low cultural significance of the archaeological materials found on site and the expected low significance of impacts, cumulative impacts are of no further concern.

6.7. Levels of acceptable change

Any impact to an archaeological or palaeontological resource or a grave is deemed unacceptable until such time as the resource has been inspected and studied further if necessary. Impacts to the landscape are difficult to quantify but in general a development that visually dominates the landscape from many vantage points is undesirable. Because of the height of the proposed development, such an impact is not envisaged.

7. INPUT TO THE ENVIRONMENTAL MANAGEMENT PROGRAM

The only management measure that should be included in the Environmental Management Program (EMPr) is that workers on site should be aware of the possibility of locating heritage resources and should report anything that seems suspicious to their superior. Photographs could then be sent to an archaeologist in order to determine whether any further actions are likely.

8. EVALUATION OF IMPACTS RELATIVE TO SUSTAINABLE SOCIAL AND ECONOMIC BENEFITS

Section 38(3)(d) of the NHRA requires an evaluation of the impacts on heritage resources relative to the sustainable social and economic benefits to be derived from the development.

The road itself will not result in significant social or economic benefits other than the provision of short term labour opportunities during the construction phase. The project is linked to the six solar energy facilities proposed and authorised on farm 168/remainder and there will thus be indirect benefits derived from the development if the solar facilities are constructed. The benefits listed here are considered to outweigh the very minor impacts to heritage resources that might occur.

9. CONCLUSIONS

The survey has revealed that culturally significant archaeological resources are absent from the study area and that impacts are expected to be very minor. There are no significant heritage concerns for the proposed road. Option A, which upgrades an existing road, is preferred but, because of the low impact significance of Options B and C, one of these may also be implemented if for other reasons it is deemed most desirable.

Table 5: *Heritage indicators and project responses.*

Indicator	Project Response
No significant archaeological sites, fossils or graves should be damaged or destroyed by the proposed development.	None required because significant resources were not found.
The proposed development should not visually dominate the landscape from any accessible public viewpoints.	Because the road will be built at ground level, such impacts are not expected.

9.1. Reasoned opinion of the specialist

Given the very limited and easily manageable impacts to heritage resources that are expected to occur, it is the opinion of the heritage specialist that the proposed road development should be authorised in full. Any of the three options may be implemented but, from a heritage point of view, Option A is slightly favoured.

10. RECOMMENDATIONS

It is recommended that the proposed road development be authorised but with the following conditions:

- All gates and fencing along the new road are to be in keeping with the nature of farm fences;
- No mature trees may be removed from the southern end of Option B; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

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APPENDIX 1 – Curriculum Vitae

Curriculum Vitae

Jayson David John Orton

ARCHAEOLOGIST AND HERITAGE CONSULTANT

Contact Details and personal information:

Address: 40 Brassie Street, Lakeside, 7945
Telephone: (021) 789 0327
Cell Phone: 083 272 3225
Email: jayson@asha-consulting.co.za

Birth date and place: 22 June 1976, Cape Town, South Africa
Citizenship: South African
ID no: 760622 522 4085
Driver's License: Code 08
Marital Status: Married to Carol Orton
Languages spoken: English and Afrikaans

Education:

SA College High School	Matric	1994
University of Cape Town	B.A. (Archaeology, Environmental & Geographical Science)	1997
University of Cape Town	B.A. (Honours) (Archaeology)*	1998
University of Cape Town	M.A. (Archaeology)	2004
University of Oxford	D.Phil. (Archaeology)	2013

*Frank Schweitzer memorial book prize for an outstanding student and the degree in the First Class.

Employment History:

Spatial Archaeology Research Unit, UCT	Research assistant	Jan 1996 – Dec 1998
Department of Archaeology, UCT	Field archaeologist	Jan 1998 – Dec 1998
UCT Archaeology Contracts Office	Field archaeologist	Jan 1999 – May 2004
UCT Archaeology Contracts Office	Heritage & archaeological consultant	Jun 2004 – May 2012
School of Archaeology, University of Oxford	Undergraduate Tutor	Oct 2008 – Dec 2008
ACO Associates cc	Associate, Heritage & archaeological consultant	Jan 2011 – Dec 2013
ASHA Consulting (Pty) Ltd	Director, Heritage & archaeological consultant	Jan 2014 –

Professional Accreditation:

Association of Southern African Professional Archaeologists (ASAPA) membership number: 233
CRM Section member with the following accreditation:

- Principal Investigator: Coastal shell middens (awarded 2007)
  Stone Age archaeology (awarded 2007)
  Grave relocation (awarded 2014)
- Field Director: Rock art (awarded 2007)
  Colonial period archaeology (awarded 2007)

Association of Professional Heritage Practitioners (APHP) membership number: 43

- Accredited Professional Heritage Practitioner

➢ *Memberships and affiliations:*

South African Archaeological Society Council member	2004 – 2016
Assoc. Southern African Professional Archaeologists (ASAPA) member	2006 –
UCT Department of Archaeology Research Associate	2013 –
Heritage Western Cape APM Committee member	2013 –
UNISA Department of Archaeology and Anthropology Research Fellow	2014 –
Fish Hoek Valley Historical Association	2014 –
Kalk Bay Historical Association	2016 –
Association of Professional Heritage Practitioners member	2016 –

Fieldwork and project experience:

Extensive fieldwork and experience as both Field Director and Principle Investigator throughout the Western and Northern Cape, and also in the western parts of the Free State and Eastern Cape as follows:

Feasibility studies:

- Heritage feasibility studies examining all aspects of heritage from the desktop

Phase 1 surveys and impact assessments:

- Project types
  - Notification of Intent to Develop applications (for Heritage Western Cape)
  - Desktop-based Letter of Exemption (for the South African Heritage Resources Agency)
  - Heritage Impact Assessments (largely in the Environmental Impact Assessment or Basic Assessment context under NEMA and Section 38(8) of the NHRA, but also self-standing assessments under Section 38(1) of the NHRA)
  - Archaeological specialist studies
  - Phase 1 archaeological test excavations in historical and prehistoric sites
  - Archaeological research projects
- Development types
  - Mining and borrow pits
  - Roads (new and upgrades)
  - Residential, commercial and industrial development
  - Dams and pipe lines
  - Power lines and substations
  - Renewable energy facilities (wind energy, solar energy and hydro-electric facilities)

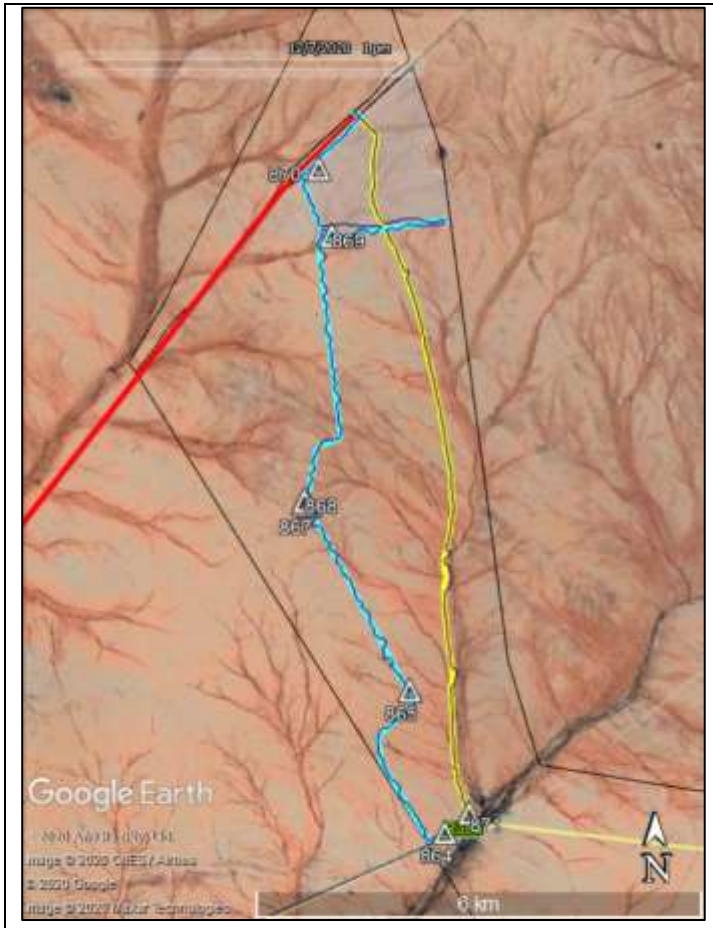
Phase 2 mitigation and research excavations:

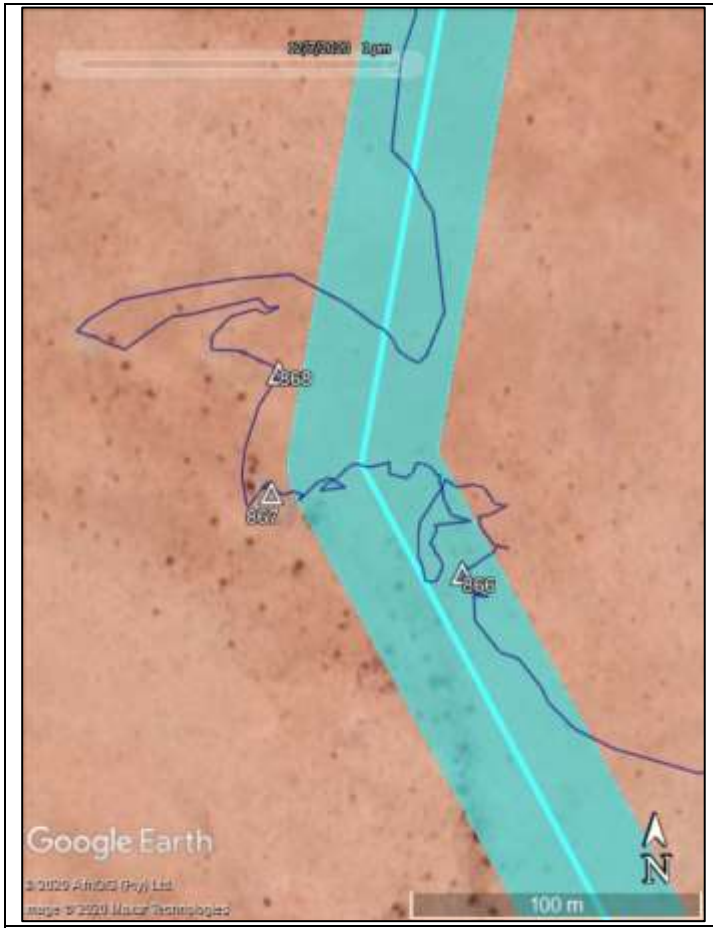
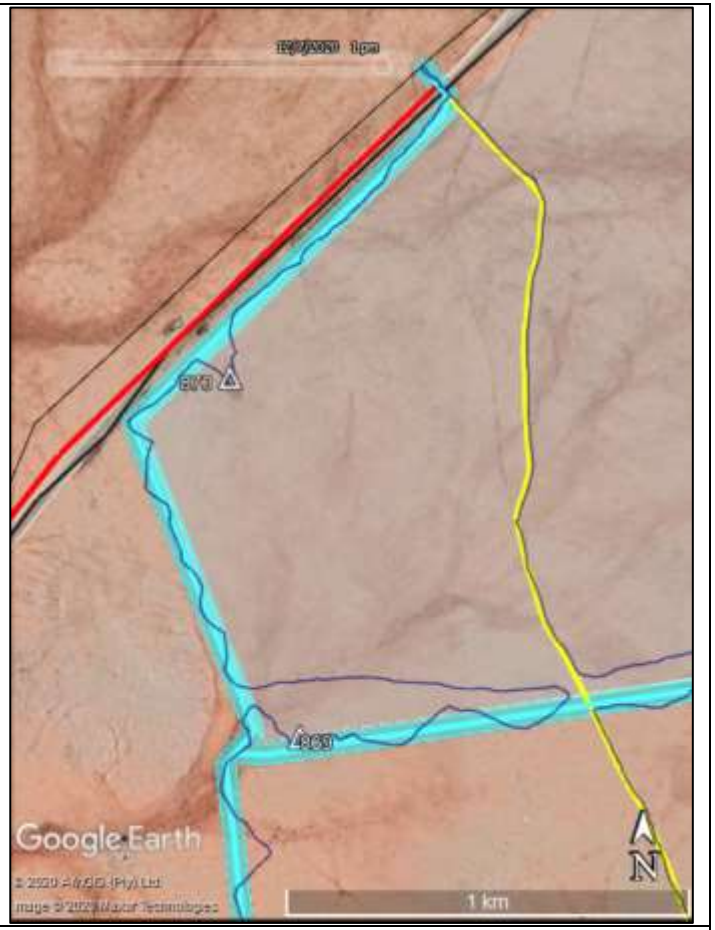
- ESA open sites
  - Duinefontein, Gouda, Namaqualand
- MSA rock shelters
  - Fish Hoek, Yzerfontein, Cederberg, Namaqualand
- MSA open sites
  - Swartland, Bushmanland, Namaqualand
- LSA rock shelters
  - Cederberg, Namaqualand, Bushmanland
- LSA open sites (inland)
  - Swartland, Franschhoek, Namaqualand, Bushmanland
- LSA coastal shell middens
  - Melkbosstrand, Yzerfontein, Saldanha Bay, Paternoster, Dwarskersbos, Infanta, Knysna, Namaqualand
- LSA burials
  - Melkbosstrand, Saldanha Bay, Namaqualand, Knysna
- Historical sites
  - Franschhoek (farmstead and well), Waterfront (fort, dump and well), Noordhoek (cottage), variety of small excavations in central Cape Town and surrounding suburbs
- Historic burial grounds
  - Green Point (Prestwich Street), V&A Waterfront (Marina Residential), Paarl

Awards:

Western Cape Government Cultural Affairs Awards 2015/2016: Best Heritage Project.

APPENDIX 2 – Mapping

	
Map showing the survey tracks (thin, dark blue lines) and heritage finds (numbered triangles). Please see details below.	The southern part of the study area. Note that a 50 m wide corridor is shown for Option C (turquoise).

	
Sites in the central part of the Option C corridor.	Sites in the northern part of the Option C corridor.

APPENDIX 3 – Site Sensitivity Verification

A site sensitivity verification was undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area. The details of the site sensitivity verification are noted below:

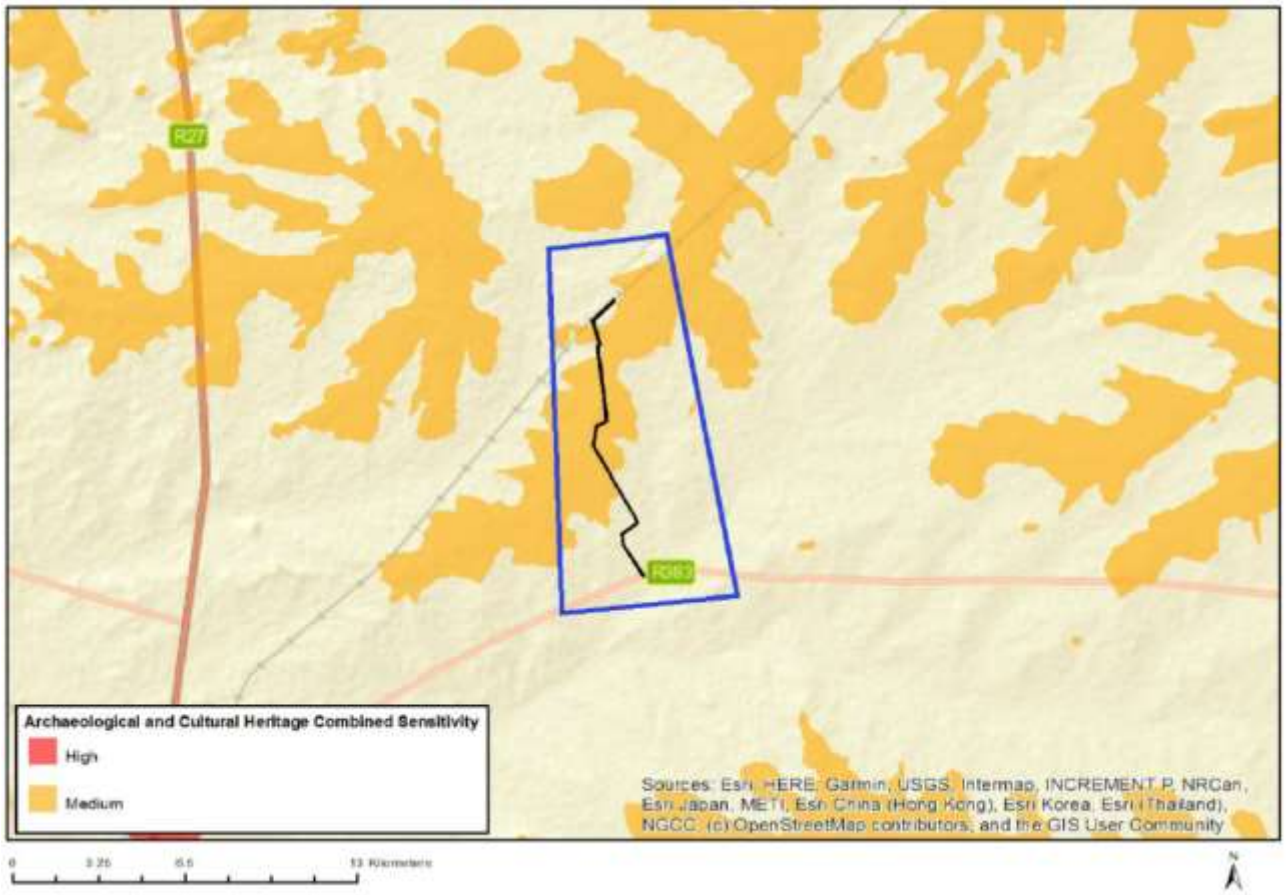
Date of Site Visit	7th December 2020
Specialist Name	Dr Jayson Orton
Professional Registration Number	ASAPA: 233; APHP: 043
Specialist Affiliation / Company	ASHA Consulting (Pty) Ltd

- Provide a description on how the site sensitivity verification was undertaken using the following means:
(a) desk top analysis, using satellite imagery;
(b) preliminary on -site inspection; and
(c) any other available and relevant information.

Initial work was carried out using satellite aerial photography in combination with the author's accumulated knowledge of the local landscape. Fieldwork then served to ground truth the site, including areas identified as potentially sensitive. Desktop research was also used to inform on the heritage context of the area. This information is presented in the report (Section 5).

- Provide a description of the outcome of the site sensitivity verification in order to:
(a) confirm or dispute the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.; and
(b) include a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.

The map below is extracted from the screening tool report and shows the archaeological and heritage sensitivity to be medium to low. The site visit showed that in fact the entire study area corridor is of low sensitivity. Those archaeological resources found within the study area were all of low to very low significance which means those areas are considered low sensitivity. A photographic record and description of the relevant heritage resources are contained within the impact assessment report. It is unclear how the medium sensitivity rating on the screening tool map was derived. It appears that areas between water courses are accorded medium sensitivity with the rest low. This rating should be reversed with the water courses being medium and the intervening areas low. The specialist therefore disputes the screening tool outcome and considers the whole site to be of low sensitivity.



The screening tool report contains no palaeontological map which indicates 100% low sensitivity. This is in line with the specialist study conducted during the impact assessment phase to satisfy SAHRA requirements.