

HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED VELD PV SOUTH SOLAR ENERGY FARM ON THE REMAINDER OF HARAMOEP 53/REM, NAMAKWALAND, NORTHERN CAPE

Report for:

Aurecon South Africa (Pty) Ltd
P.O. Box 494, Cape Town, 8000
Tel: 021 526 6034
Email: Simon.Clark@aurecongroup.com

On behalf of:

Veld Solar One (Pty) Ltd



Dr Jayson Orton
ASHA Consulting (Pty) Ltd
40 Brassie Street, Lakeside, 7945
Tel: (021) 788 1025 | 083 272 3225
Email: jayson@asha-consulting.co.za

1st Draft: 17 July 2019

EXECUTIVE SUMMARY

The Proponent, Veld Solar One (Pty) Ltd, proposes to develop two solar sites on two farms, Naroep (Remainder of Farm no. 45) and Haramoep (Remainder of Farm no.53), approximately 20 km north-west of Aggeneys in the Northern Cape. Two photovoltaic (PV) energy facilities and associated infrastructure are planned; they would have a maximum generation capacity of up to 75 MW each. The two facilities would utilise shared infrastructure where possible to minimise their overall footprint and associated impacts. The Veld PV South project is the subject of this report.

ASHA Consulting (Pty) Ltd was appointed by Aurecon South Africa (Pty) Ltd to conduct a heritage impact assessment of the potential impacts to heritage resources that might occur through the proposed construction of a 75 MW photovoltaic (PV) solar energy facility on the remainder of Haramoep 53 to the north-west of Aggeneys, Northern Cape (Figure 1), known as Veld PV South. The development would fall within the Springbok Renewable Energy Development Zone (REDZ). A centre point for the site is S29° 07' 32" E 18° 39' 37".

The project would entail the construction of numerous arrays of solar panels with internal roads, an on-site substation and an operations and maintenance building. Internal cabling would be laid underground. A new power line would link the project to the Aggeneys Substation to the southeast.

The site is very flat and covered by minimal vegetation, predominantly grass. The surface is sandy throughout, but rocky hills occur to the north, east and south of the site.

Heritage resources are very rare on the development site, with a single low-density scatter of quartz and quartzite artefacts being the only occurrence noted. Palaeontology is not an issue for this site, with the local geological deposits being of either low or zero palaeontological sensitivity. The landscape, which is far more natural than cultural, is also considered a heritage resource, although impacts to it will be of low significance.

It is recommended that, from a heritage point of view, the proposed Veld PV South can be authorised but subject to the following conditions:

- The final layout of the PV facility, access road and grid connection should be considered by an archaeologist and any potentially sensitive areas should be surveyed; 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

Adiagnostic artefacts: Artefacts lacking features that are informative in terms of age or cultural affiliation.

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.

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.

Abbreviations

APHP: Association of Professional Heritage Practitioners

ASAPA: Association of Southern African Professional Archaeologists

BA: Basic Assessment

CRM: Cultural Resources Management

DEA: National Department of Environmental Affairs

EIA: Environmental Impact Assessment

ESA: Early Stone Age

GPS: global positioning system

HIA: Heritage impact assessment

LSA: Later Stone Age

MSA: Middle Stone Age

n.d.: not dated

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

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

PV: Photovoltaic

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

Contents

1. INTRODUCTION	1
1.1. Project description	1
1.1.1. Alternatives	2
1.1.2. Aspects of the project relevant to the heritage study	3
1.2. Terms of reference	3
1.3. Scope and purpose of the report	3
1.4. The author	4
1.5. Declaration of independence	4
2. HERITAGE LEGISLATION	4
3. METHODS	5
3.1. Literature survey and information sources	5
3.2. Field survey	5
3.3. Specialist studies	5
3.4. Impact assessment	5
3.5. Grading	6
3.6. Assumptions and limitations	6
4. PHYSICAL ENVIRONMENTAL CONTEXT	6
4.1. Site context	6
4.2. Site description	7
5. HERITAGE CONTEXT	8
5.1. Archaeological aspects	8
5.2. Historical aspects	8
5.3. Built environment	9
6. FINDINGS OF THE HERITAGE STUDY	9
6.1. Archaeology	11
6.2. Palaeontology	12
6.3. Built environment	13
6.4. Graves	13
6.5. Cultural landscape	13
6.6. Summary of heritage indicators	13
6.7. Statement of significance and provisional grading	13
7. ASSESSMENT OF IMPACTS	14
7.1.1. Archaeology and graves	14
7.1.2. Palaeontology	15
7.1.3. Natural and Cultural landscape	15
8. EVALUATION OF IMPACTS RELATIVE TO SUSTAINABLE SOCIAL AND ECONOMIC BENEFITS	16
9. CONCLUSION	17
9.1. Reasoned opinion of the specialist	17
10. RECOMMENDATION	17
11. REFERENCES	17

APPENDIX 1 – Curriculum Vitae 20
APPENDIX 2 – Palaeontological specialist comment 23

1. INTRODUCTION

The Proponent, Veld Solar One (Pty) Ltd, proposes to develop two solar sites on two farms, Naroep (Remainder of Farm no. 45) and Haramoep (Remainder of Farm no.53), approximately 20 km north-west of Aggeneys in the Northern Cape. Two photovoltaic (PV) energy facilities and associated infrastructure are planned; they would have a maximum generation capacity of up to 75 MW each. The two facilities would utilise shared infrastructure where possible to minimise their overall footprint and associated impacts. The Veld PV South project is the subject of this report.

ASHA Consulting (Pty) Ltd was appointed by Aurecon South Africa (Pty) Ltd to conduct a heritage impact assessment of the potential impacts to heritage resources that might occur through the proposed construction of a 75 MW photovoltaic (PV) solar energy facility on the remainder of Haramoep 53 to the north-west of Aggeneys, Northern Cape (Figure 1), known as Veld PV South. The development would fall within the Springbok Renewable Energy Development Zone (REDZ). A centre point for the site is S29° 07' 32" E 18° 39' 37".

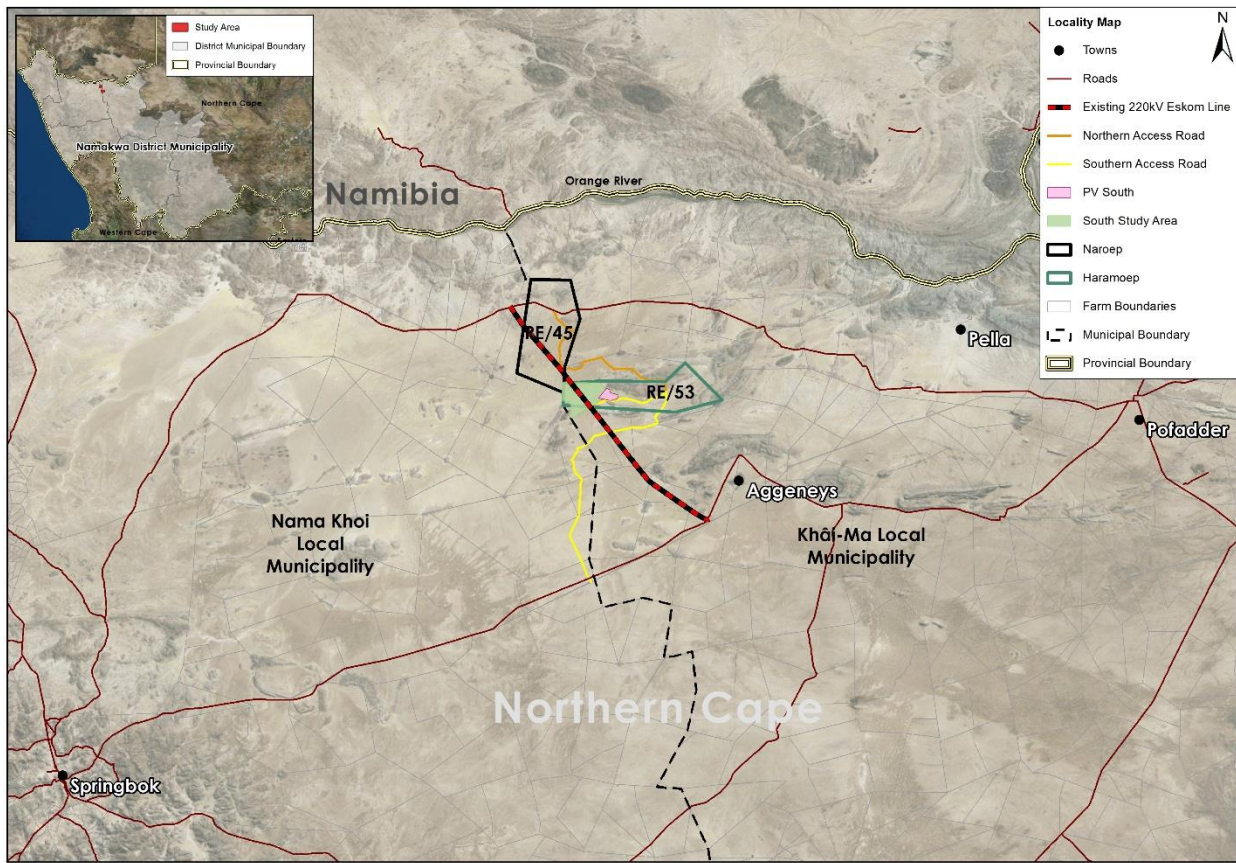


Figure 1: Map showing the location of the site under consideration for the proposed Veld PV South facility. The town of Aggeneys lies 22 km away towards the south-east.

1.1. Project description

Veld PV South (Pty) Ltd (Veld PV South) proposes developing a 75 MW Photovoltaic (PV) solar energy facility on Haramoep (Remainder of Farm 53) in the Namakwa District Municipality approximately 20 km north-west of Aggeneys in the Northern Cape. The development has been designed with the

intention that the Veld PV South solar facility would form part of a consolidated solar development which will consist of the proposed Veld PV South (75 MW) and the proposed Veld PV North (75 MW) PV facilities. These proposed facilities would utilise shared infrastructure where possible to minimise their overall footprint. To evacuate the power generated by the proposed Veld PV North (and South), a grid connection is required between the solar farm project area and the Aggenys substation. This application pertains specifically to Veld PV South and the grid connection proposed by the proponent Veld PV South (Pty) Ltd.

The site was selected as it falls within an area considered to have some of the highest solar resource in South Africa.

The proposed grid connection will consist of a 132 kilovolt (kV) overhead powerline, approximately 25 km in length that would feed into the national electricity grid at the Aggenys substation. A 35m servitude will be required for the construction of the powerline and it will run adjacent to the existing 220 kV powerline that runs past the site, comprising single circuit steel monopoles with bird perches.

The following components would be required for the solar farm and to evacuate the power generated by the proposed Veld PV South:

- **A photovoltaic component**, comprising of numerous arrays of PV solar panels mounted on steel tracking mounts and footings with associated support infrastructure to generate up to 75 MW of renewable energy
- **On-site substations**, including amongst others:
 - **Inverters**, to convert the direct current (DC) generated by the PV modules into alternating current (AC)
 - **Transformers**, to step up the 33-kV power generated by the inverters to 132 kV to connect to the new 132 kV overhead transmission line
- **Internal cabling** laid underground when feasible to connect the PV modules to the on-site substation and inverters
- **Internal access roads** for servicing and maintenance of the site
- **Stormwater infrastructure**
- **Temporary construction areas** for use during construction
- **Buildings**, including an operations and maintenance building, a connection building, control building, guard cabin
- **Weather stations** within and along the fenced perimeter of the site; and
- **Perimeter fencing.**

1.1.1. Alternatives

- The solar panels may be either 'fixed axis PV' (Alternative 1) or 'single axis tracking PV' (Alternative 2); and
- Two alternatives exist for access to the site. One would utilise the existing farm access roads leading northwards from the N14 (Alternative 1), while the second would utilise the existing farm access roads between the proposed project and the Pella-Goodhouse Road (Alternative 2).

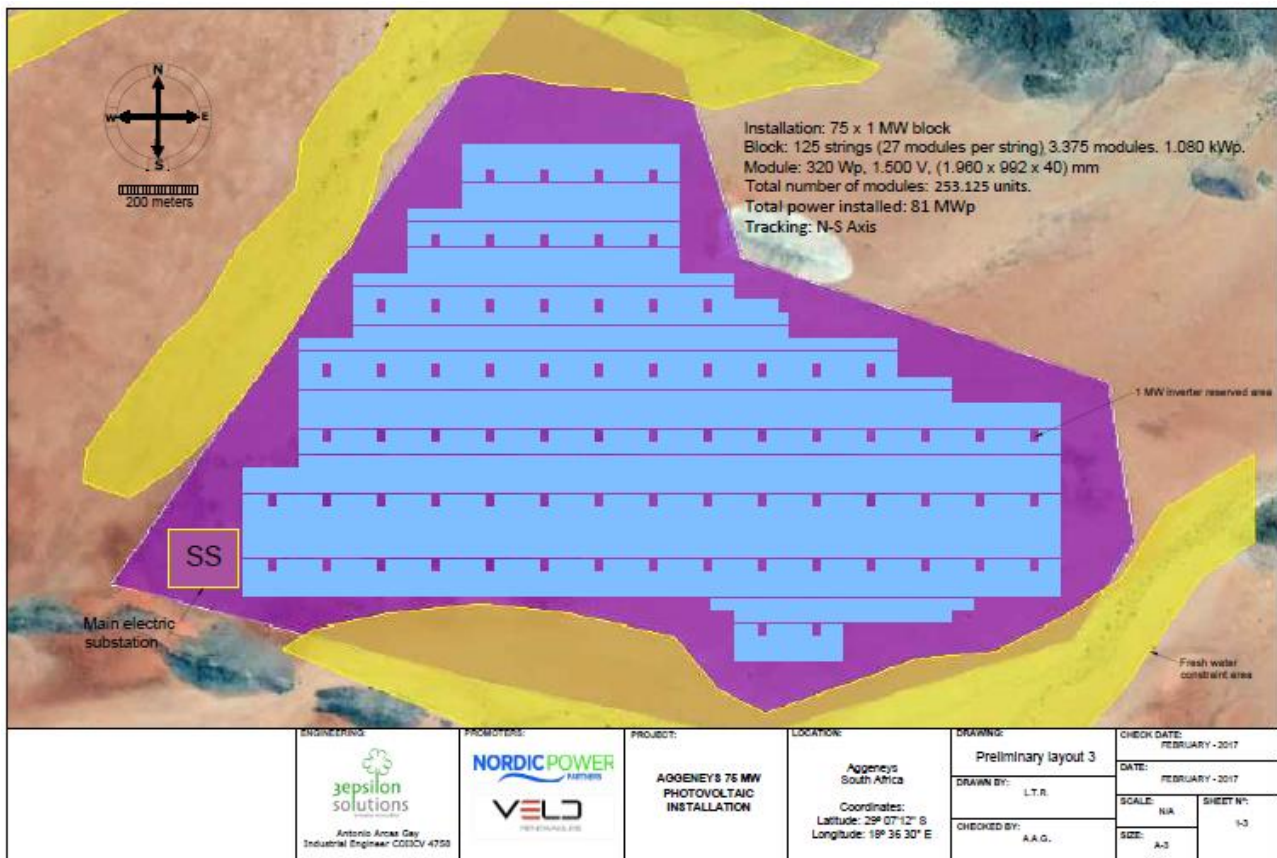


Figure 2: Preliminary layout plan of the proposed facility.

1.1.2. Aspects of the project relevant to the heritage study

All aspects of the proposed development are relevant since excavations for foundations and/or services may impact on archaeological and/or palaeontological remains, while all above-ground aspects create potential visual (contextual) impacts to the cultural landscape and any significant heritage sites that might be visually sensitive.

1.2. Terms of reference

ASHA Consulting was asked to provide a heritage impact assessment for the proposed development. The assessment was to be based on both desktop and field research and was to cover all relevant aspects of heritage as appropriate to the site.

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 National Department of Environmental Affairs (DEA) 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 the Western Cape and Northern Cape provinces of South Africa since 2004 (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) 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: palaeontological, prehistoric and historical material (including ruins) more than 100 years old;
- 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.”

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, Section 3(3) describes the reasons a place or object may have cultural heritage value; some of these speak directly to cultural landscapes.

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). The 1:50 000 map was sourced from the Chief Directorate: National Geo-Spatial Information.

3.2. Field survey

The site was subjected to a detailed foot survey by two archaeologists (Dr Jayson Orton and Chester Kaplan) on the 6th of October 2016. This was in late Spring but, because of the generally dry climate, the season makes little difference to vegetation cover and hence little difference to the visibility of archaeological resources. During the survey, the positions of finds were recorded on a handheld GPS receiver set to the WGS84 datum. Photographs were taken at times in order to capture representative samples of both the affected heritage, as well as the landscape setting of the proposed development.

3.3. Specialist studies

Despite the very low sensitivity of palaeontological heritage in this case, a desktop study has been produced by Dr John Almond of Natura Viva cc and submitted alongside the present report.

3.4. Impact assessment

For consistency, the impact assessment was conducted through application of a scale supplied by Aurecon.

3.5. 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 resources¹ of local significance, but this is generally yet to happen. SAHRA (2007) has formulated its own system 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' and rated with an A (high/medium significance, requires mitigation), B (medium significance, requires recording) or C (low significance, requires no further action).

3.6. Assumptions and limitations

Although a number of applications in the general area have been lodged on SAHRIS, many of these do not have heritage reports associated with them which means that relatively little background information was available for the desktop study from the immediate surrounds of the study area. However, far more was available from the area around Aggeneys, well to the south.

The field study was carried out at the surface only and hence any completely buried archaeological and/or palaeontological sites would not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface.

In one area to the north of the proposed PV site we specifically walked to some longitudinal dunes that had pans between them as this was expected to be a sensitive area. The lack of material there is assumed to indicate that archaeological resources, especially recent sites, are rare in the dune field and surroundings in general.

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The site is located in a very remote area 22 km to the north-west of Aggeneys and 30 km south of the Orange River. It is in a broad valley that is traversed by a 220 kV power line (which runs past the site about 2 km to its west) but lacks any other development aside from farm fences.

¹ The system is intended only for use with archaeological and palaeontological resources.

4.2. Site description

This site lies on a large, very flat plain between rocky hills to the north, east and south (Figures 3 to 5). The western side is open and, after some distance, gives way to large, linear, red sand dunes which lie well beyond the limit of the study area. The surface has minimal vegetation cover with almost all of what there is being tufts of dry grass (Figure 4).



Figure 3: View towards the south across the PV study area from the white quartzite hill that falls immediately outside its northern boundary (see Figure 2).



Figure 4: View towards the west of the surface of the plain as seen from the far eastern end of the study area.



Figure 5: View towards the north from the summit of the line of low hills just outside the southern boundary of the study area.

5. HERITAGE CONTEXT

This section of the report contains the desktop study and establishes what is already known about heritage resources in the vicinity of the study area. What was found during the field survey may then be compared with what is already known in order to gain an improved understanding of the significance of the newly reported resources.

5.1. Archaeological aspects

Because of the very dry nature of the landscape, archaeological sites tend to be sparsely distributed and are usually very closely associated with water sources. A prime example of this is the many small sites found scattered around a large pan 28 km south of the present PV study area (Orton 2016). Morris (2013) found a similar occurrence close to Aggeneys. The general lack of archaeological sites in other areas (e.g. Morris 2011a, 2011b; Smith 2012) does not suggest a lack of occupation, but more likely suggests that people were moving through these areas more quickly and simply did not leave many traces of their passing. It is well-known that the Orange River region was fairly densely occupied by the Bushman and Khoekhoen during historical times (Penn 2005) and in some areas many archaeological sites reflecting this occupation have been found (Beaumont *et al.* 1995).

A small survey by Paleo Field Services (n.d.) in the mountains to the north of Aggeneys failed to yield any heritage resources, but a rock art site is known to occur on a free-standing boulder to the south (Morris 2011a). The painting is a finger painting, likely associated with the Khoekhoen. Similar art is found on granite outcrops throughout Namaqualand and elsewhere in Bushmanland, but in very low densities (Orton 2013). Morris (2014) examined land to the south of the study area and reported scatters of quartz flakes associated with quartz outcrops, a small Later Stone Age (LSA) scatter of stone artefacts and ostrich eggshell on the summit of a hill, as well as a very ephemeral background scatter over some areas.

Some of the place names in the region reflect the living heritage of the Khoekhoen. Ghaamsberg (also Gamsberg), for example, derives from the Khoekhoen word meaning 'grassy spring' (Raper n.d.). This mountain lies some 32 km south-east of the present PV study area and also houses one of the very few rock shelter deposits known from the region (Orton 2014). There are unconfirmed historical reports that a massacre of Bushmen may have occurred in a kloof of the Ghaamsberg (Robinson 1978) but surveys have failed to yield any evidence.

5.2. Historical aspects

Colonial occupation of the area commenced fairly late and, as a result, historical traces tend to be few and far between. Throughout much of the 19th century the region was a colonial frontier with Caucasian small stock farmers moving through the region, but generally not living a settled lifestyle. The earliest settlements were mission stations that were located at springs. The nearest to the study area was at Pella, some 50 km to the east-northeast, which was founded as early as 1814 (Anonymous n.d.). Conflict was frequent as competition for grazing land and access to water sources grew stronger, although this may have been more the case further south where better quality grazing occurs (Penn 2005). It is notable, however, that Robert Moffat (Schaeffer 2008:58) found Wortel (a farm a short distance east of the present study areas) to be "one of the finest grazing places in Namaqualand". Survey diagrams of the area indicate that Haramoep 53 was first surveyed in 1894.

That the majority of activity in the region occurred in proximity to the Orange River is demonstrated by a mid-19th century map on which we see many place names and landscape features close to the river, but a large empty space to the south (Figure 6).

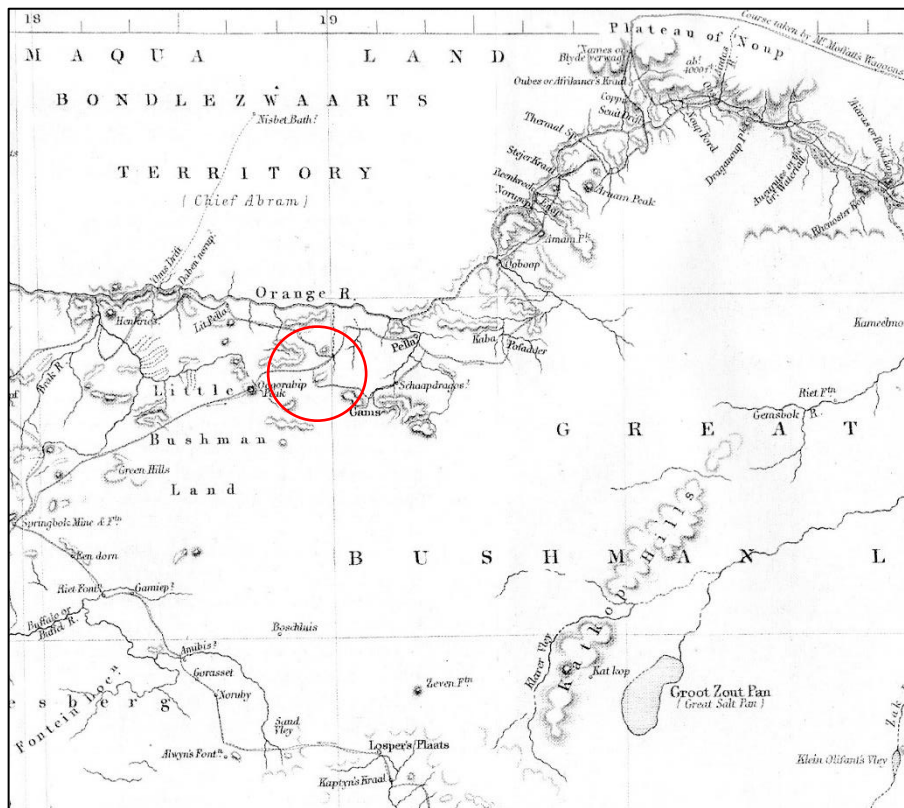


Figure 6: Extract from an 1858 map by Robert Moffat. Source: Schaeffer (2008: opp. p. 38). The present study area is within the red circle.

5.3. Built environment

Because most farms were settled quite late, the majority of structures in the region date to the 20th century. At Pella, however, there were buildings by 1882, for we know from the writings of Bishop John Marie Simon (1959) that at that time the residents of Pella were, under his direction, making lime plaster from local rocks with which to plaster buildings. They also built a ‘cathedral’ in the early 1890s (Anonymous n.d.). Orton (2016) found all structures in his survey area to the south to be 20th century.

6. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources recorded in the study area during the course of the project. They are listed in Table 1 and mapped in Figure 7.

Table 1: List of heritage resources recorded during the survey.

Waypoint	Location	Description	Heritage significance	Suggested grade
PV site				
266	S29 07 15.2 E18 39 42.2	An area where smelting occurred in the relatively recent past (age unknown). There is a collection of slag, an iron object, several strands of steel cable, a patch of mud, and a cluster of black cobbles.	Very low	GP C
303	S29 07 44.0 E18 39 18.5	Low density scatter of adiaagnostic artefacts in a deflated (sand blown away) area. They are likely to be Middle Stone Age (MSA).	Very low	GP C
337	S29 01 35.8 E18 32 16.9	East-facing rock wall with quite a number of artefacts on the talus slope below the wall.	Low	GP C

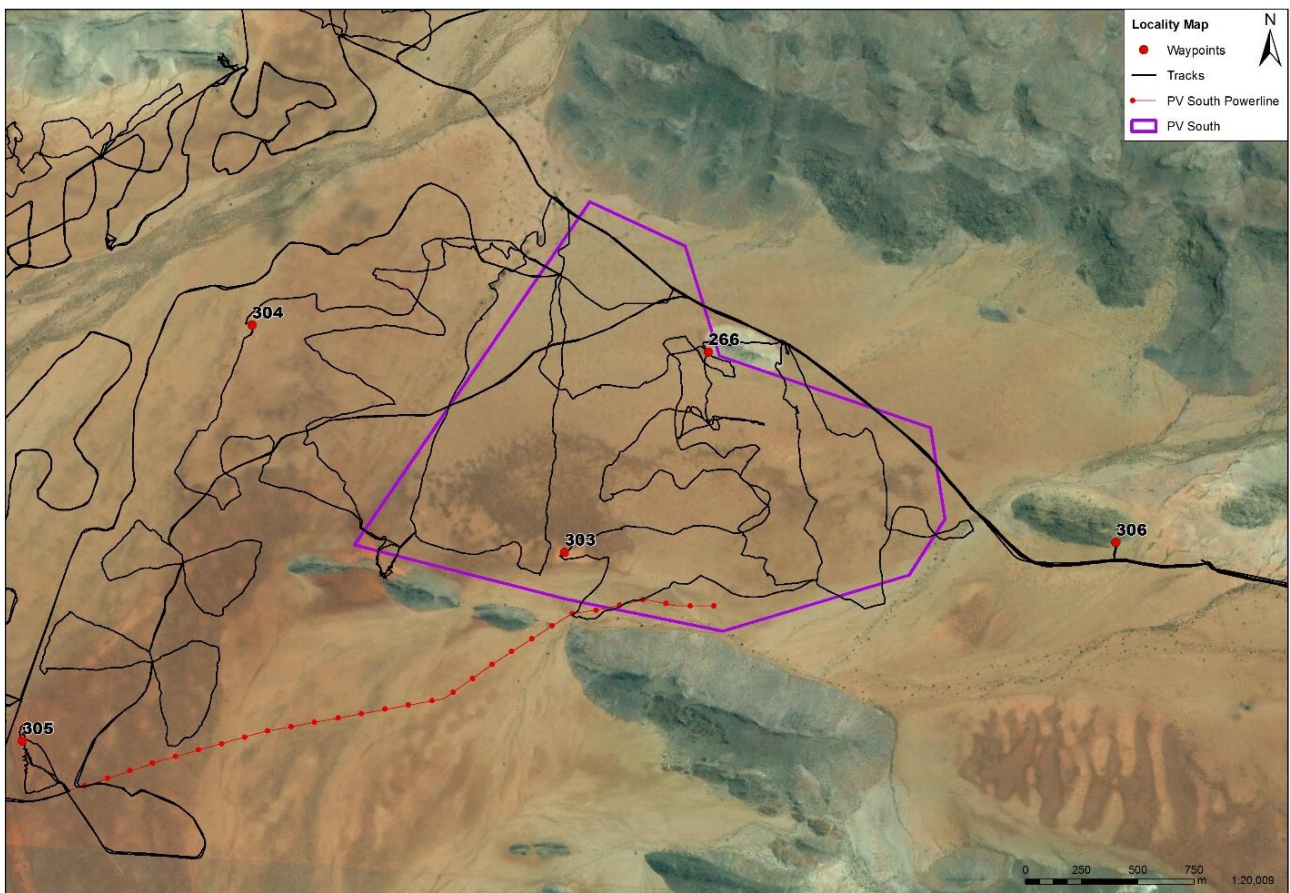


Figure 7: Map of the development footprint (purple polygon) showing the walk- and drive-paths created during the survey (black lines) and the positions of all finds (numbered red symbols).

6.1. Archaeology

This site, being an open sandy plain with no landscape features, was almost completely devoid of archaeological remains. Just one low-density scatter of adiaagnostic artefacts was found within a deflating area, where the uppermost sand has been blown away (Figures 8 and 9). This suggests that further similar artefacts are likely to be present in variable quantities beneath the cover sands. These would be part of what is termed “background scatter”. The majority of the artefacts were in quartz, with just one in quartzite seen. The only other Stone Age item seen was a single fragment of pottery from close to the north-eastern edge of the development footprint.



Figure 8: View of the deflated area at waypoint 303 where a very low density scatter of artefacts was found.



Figure 9: Examples of the kinds of artefacts found in the deflation at waypoint 303. Scale in cm.

An area where some smelting had taken place was also found (Figure 10). It is uncertain how old this is but it is certainly historical (Figure 11). It may not be old enough (i.e. > 100 years) to qualify as archaeology under the definition provided in the NHRA (see Section 2).



Figure 10: View of the area with smelting remains at waypoint 266.



Figure 11: Examples of the kinds of artefacts found at the smelting site (waypoint 266).

6.2. Palaeontology

The entire study area and surrounds are underlain by geological deposits of low or zero palaeontological sensitivity (Figure 10). According to the SAHRIS Palaeosensitivity Map key, no palaeontological specialist studies should be carried out in such areas. Nevertheless, brief comment was sought from Dr John Almond and is included in Appendix 2. Of the local geology and palaeontology, Almond (2019) notes the following:

The entire study area for the proposed Veld PV North and Veld PV South solar facilities near Aggenys, Northern Cape, as well as for the associated 132 kV grid connection to Aggenys Substation, is underlain by unfossiliferous Precambrian basement rocks. The bedrocks are largely covered by Late Caenozoic superficial sediments – alluvial sands and gravels, aeolian sands and calcretes – of low palaeontological sensitivity. Fossiliferous older alluvial deposits of the ancient (Miocene) Koa River Palaeo-valley that once flowed through this region of Bushmanland are unlikely to be impacted by the proposed development since they are probably deeply buried beneath younger sediments.

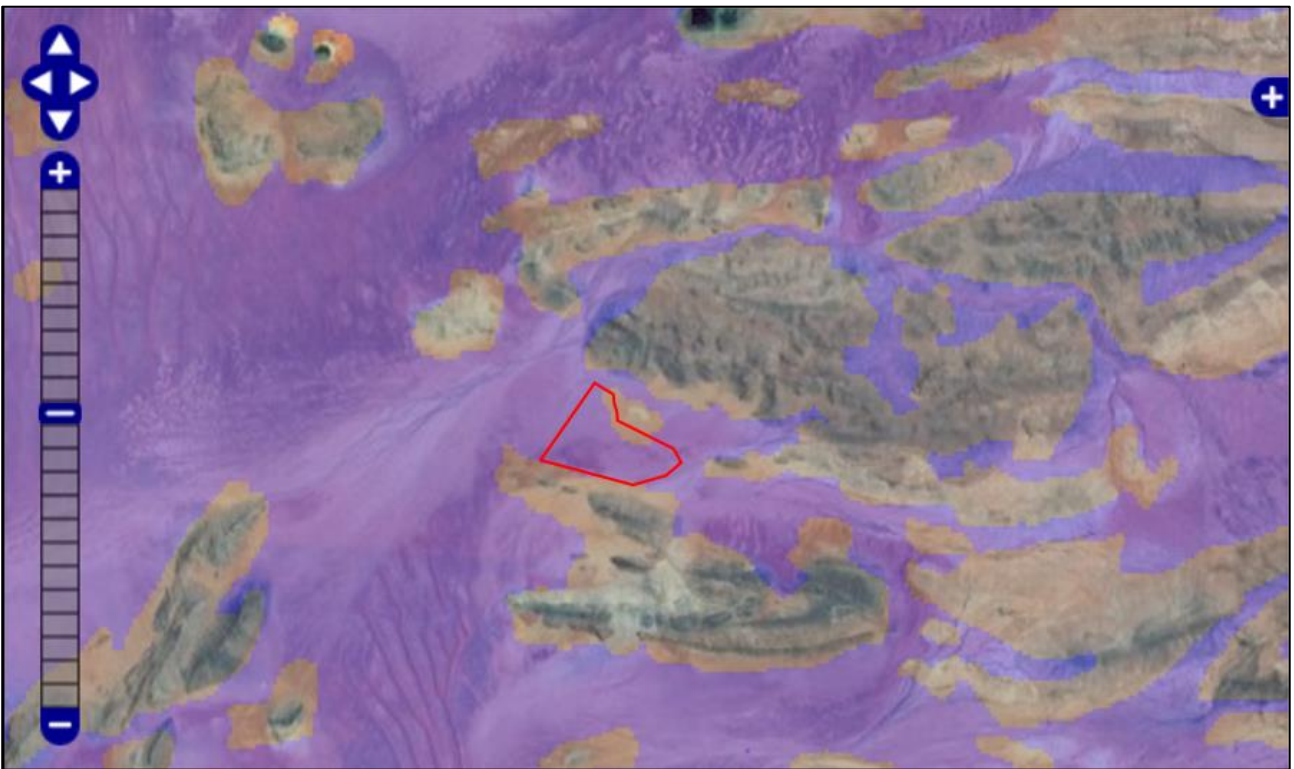


Figure 10: Extract from the SAHRIS Palaeosensitivity map showing the study area (red polygon) to be largely underlain by sediments of low palaeontological sensitivity (blue shading). Some parts of the site alongside the rocky hills are of zero sensitivity (grey shading).

It is clear that palaeontological resources are likely to be extremely rare and/or insignificant in the area and that palaeontology is not an issue for this project. Almond (2019) has suggested that no further work is required in terms of palaeontology but that, for the sake of caution, a chance finds procedure should be included in the EMP for the project.

6.3. Built environment

There are no buildings of any sort on the site. Rare farm houses do occur in the vicinity, but the only one of heritage value that was seen lies 7.5 km to the east and will not be affected in any way by the proposed development.

6.4. Graves

No graves were seen on the PV site, although stone-packed graves were noted in two other areas during the course of the fieldwork. Although fairly unlikely, there is always a small chance that unmarked precolonial graves could be uncovered during development. The locations of such graves cannot be predicted and they would have to be dealt with on a case-by-case basis when discovered.

6.5. Cultural landscape

The site is very remote and not at all visible from any public roads in the wider area. There is virtually no cultural landscape in this area because the landscape is very largely natural with very few anthropogenic interventions. The latter are limited to occasional farm roads and fences. There is no cultivation in the area.

6.6. Summary of heritage indicators

There are no significant heritage indicators occurring within the bounds of the site. The heritage material that was seen on site consists of a single low-density scatter of diagnostic Stone Age artefacts. These artefacts are of no scientific value. The only other heritage aspect is the landscape itself which is largely natural. Because of its general expansiveness, the remote location of the proposed development, the lack of proximate scenic routes and the presence of many hills in the vicinity, contextual/visual impacts to the landscape are of no concern.

6.7. 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 archaeological resources within the development footprint are deemed to have very low cultural significance for their scientific value and are provisionally assigned a grading of ‘Generally Protected C’.

Although palaeontological resources are unlikely to occur, any that may be present are likely to have very low cultural significance for their scientific value.

Graves are deemed to have high cultural significance for their social value and would be graded IIIA. While some are known from the wider area, none were seen on or close to the site.

The broader cultural landscape has low-medium cultural significance for its aesthetic value. The SAHRA grading system does not cover landscapes.

7. ASSESSMENT OF IMPACTS

It should be noted that there are no differences between the technology and access options and the entire project using any options is thus considered in the assessments that follow.

7.1.1. Archaeology and graves

Table 2 provides an assessment of the impacts to archaeological heritage resources and graves. No significant archaeological materials were seen on the preferred site, although a small section of it was not surveyed. The chances of finding graves are extremely small. Archaeological sites are known from the wider area so there is still a small chance of impacts occurring but the magnitude is likely to be low. The low heritage significance of the types of sites typically seen means that the magnitude can be rated as low. The overall significance is considered to be **low negative**.

Mitigation would entail a consideration of the final layout, including the grid connection, and an archaeological survey of areas deemed to be potentially sensitive. Recommendations for mitigation may be forthcoming from this survey. With mitigation the impact significance would be reduced to **very low negative**.

Table 2: Assessment of impacts to archaeology and graves (preferred site).

IMPACT DESCRIPTION: Destruction or damage to archaeological materials and unmarked graves				
Predicted for project phase:	Pre-construction	Construction	Operation	No-Go
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Permanent	More than 10 years (after construction)	Consequence: Moderately detrimental	Significance: Low - negative
Extent	Site-specific	On site or within the boundaries of the property		
Magnitude	Low - negative	Natural and/ or social functions and/ or processes are slightly altered (negatively)		
Probability	Fairly likely	Estimated 5 to 50 % chance of the impact occurring.		
MITIGATION: The final layout must be examined by an archaeologist and any potentially sensitive areas must be checked on site prior to construction (applies mainly to the grid connection).				
POST-MITIGATION				
Duration	Permanent	More than 10 years (after construction)	Consequence: Slightly detrimental	Significance: Very low - negative
Extent	Site-specific	On site or within the boundaries of the property		
Magnitude	Very Low - negative	Natural and/ or social functions and/ or processes are negligibly altered		
Probability	Unlikely	Estimated less than 5 % chance of the impact occurring.		
BROADER CONSIDERATIONS				
Confidence	Certain	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.		
Reversibility	Irreversible	The activity will lead to an impact that is permanent.		
Irreplaceability	High	The resource is irreparably damaged and is not represented elsewhere		

7.1.2. Palaeontology

Table 3 provides an assessment of the impacts to palaeontological heritage resources. The specialist palaeontological assessment has suggested that the chances of finding significant fossils are very low. However, given the rarity of important fossils in the region, an impact could be seen as being of medium magnitude. Because impacts are unlikely to occur, the significance is rated as **very low negative**.

Mitigation involves keeping a watch for fossils during bulk earthworks and ensuring that any that are found get protected, recorded and reported. A chance finds procedure has been provided by the palaeontologist for use in such instances. Because of the rarity of fossils in the area, a find could result in a positive impacts because new information that would not otherwise have been available to science can be gained. The significance after mitigation is this deemed to be **very low positive**.

Table 3: Assessment of impacts to fossils (preferred site)

IMPACT DESCRIPTION: Destruction or damage to palaeontological materials				
Predicted for project phase:	Pre-construction	Construction	Operation	No-Go
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Permanent	More than 10 years (after construction)	Consequence: Highly detrimental	Significance: Very low - negative
Extent	Local	Within a 2 km radius of the centre of the site		
Magnitude	Medium - negative	Natural and/ or social functions and/ or processes are notably altered		
Probability	Unlikely	Estimated less than 5 % chance of the impact occurring.		
MITIGATION: Any fossils found during construction must be protected, recorded and reported using the fossil finds procedure.				
POST-MITIGATION				
Duration	Permanent	More than 10 years (after construction)	Consequence: Highly beneficial	Significance: Very low - positive
Extent	Local	Within a 2 km radius of the centre of the site		
Magnitude	Medium - positive	Natural and/ or social functions and/ or processes are notably altered (positively)		
Probability	Unlikely	Estimated less than 5 % chance of the impact occurring.		
BROADER CONSIDERATIONS				
Confidence	Certain	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.		
Reversibility	Irreversible	The activity will lead to an impact that is permanent.		
Irreplaceability	High	The resource is irreparably damaged and is not represented elsewhere		

7.1.3. Natural and Cultural landscape

Table 4 provides an assessment of the impacts to the natural and cultural landscape. Because the site is in a very remote location and is not accessible to the general public, the project will have a generally low visibility. The magnitude of impacts to the landscape will thus be very low and of local

extent, although they would definitely occur. Mainly because the impacts will occur for the duration of the project and would definitely happen if the project was constructed, the significance is rated as being **moderate negative**.

There is no feasible mitigation that can significantly reduce the impact significance, but because the site is as remote as it is, the usual best practice measures such as minimising ground disturbance, littering and night time lighting with have some effect on the ratings and the significance with mitigation reduces to **low negative**.

Table 4: Assessment of impacts to the natural and cultural landscape (preferred site).

IMPACT DESCRIPTION: Impacts to the cultural and natural landscape				
Predicted for project phase:	Pre-construction	Construction	Operation	No-Go
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Permanent	More than 10 years (after construction)	Consequence: Moderately detrimental	Significance: Moderate - negative
Extent	Local	Within a 2 km radius of the centre of the site		
Magnitude	Very Low - negative	Natural and/ or social functions and/ or processes are negligibly altered		
Probability	Definite	Estimated greater than 95 % chance of the impact occurring.		
MITIGATION: Minimise damage to areas not required during operation. Minimise lighting at night. Minimise litter and keep site tidy.				
POST-MITIGATION				
Duration	Permanent	More than 10 years (after construction)	Consequence: Slightly detrimental	Significance: Low - negative
Extent	Site-specific	On site or within the boundaries of the property		
Magnitude	Very Low - negative	Natural and/ or social functions and/ or processes are negligibly altered		
Probability	Definite	Estimated greater than 95 % chance of the impact occurring.		
BROADER CONSIDERATIONS				
Confidence	Sure	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact.		
Reversibility	Irreversible	The activity will lead to an impact that is permanent.		
Irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere		

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

Section 38(3)(d) requires an evaluation of the impacts on heritage resources relative to the sustainable social and economic benefits to be derived from the development. Given the lack of significant heritage resources located within the study area, the project's social and economic benefits (provision of jobs and electricity) will far outweigh the value of any heritage resources that may be damaged or destroyed.

9. CONCLUSION

It is concluded that no significant impacts to heritage resources are expected.

None of the alternatives (i.e. technology and access) have any bearing on the outcome and either can be used.

9.1. Reasoned opinion of the specialist

Due to the very limited and generally manageable heritage impacts that would occur, it is concluded that the proposed Veld PV South project is feasible. Any of the technology and access alternatives may be used.

10. RECOMMENDATION

It is recommended that, from a heritage point of view, the proposed Veld PV South can be authorised but subject to the following conditions:

- The final layout of the PV facility, access road and grid connection should be considered by an archaeologist and any potentially sensitive areas should be surveyed; 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.

11. REFERENCES

Agenbacht, A.L.D. 2007. The geology of the Pofadder area. Explanation of 1: 250 000 geology sheet 2918. 89 pp. Council for Geoscience, Pretoria.

Almond, J.E. 2019. Recommended exemption from further palaeontological studies: two proposed photovoltaic energy facilities on the farms Naroep (Remainder of Farm No. 45) and Haramoep (Remainder of Farm No. 53) near Aggeneys, Namaqua District Municipality, Northern Cape. Unpublished report prepared for ASHA Consulting (Pty) Ltd.

Almond, J.E. & Pether, J. 2008. Palaeontological heritage of the Northern Cape. Interim SAHRA technical report. Cape Town: Natura Viva cc.

Anonymous. n.d. *Thirstland Epic*. Uppington: Trans Oranje Drukkers.

- Beaumont, P.B., Smith, A.B., & Vogel, J.C. 1995. Before the Einiqua: the archaeology of the frontier zone. In A. B. Smith (ed.) *Einiqualand: studies of the Orange River frontier*. Cape Town: UCT Press.
- Morris, D. 2011a. Black Mountain Concentrated Solar Power Facility Development at Aggeneys, Northern Cape: Heritage Impact Assessment. Unpublished report for SRK Consulting. Kimberley: McGregor Museum.
- Morris, D. 2011b. SATO Energy Holdings Zuurwater Photovoltaic Energy Generation Facility development near Aggeneys, Northern Cape: Heritage Impact Assessment. Unpublished report for SRK Consulting. Kimberley: McGregor Museum.
- Morris, D. 2013. Heritage Impact Assessment for four proposed photovoltaic solar energy facilities on the farm Zuurwater near Aggeneys, Northern Cape Province (expanded survey). Unpublished report for Savannah Environmental (Pty) Ltd. Kimberley: McGregor Museum.
- Morris, D. 2014. AES Solar PV Installation on the property Dabenoris 44 near Aggeneys, Northern Cape: Heritage Impact Assessment (Archaeology and Cultural Heritage). Unpublished report prepared for Environmental Impact Management Systems. Kimberley: McGregor Museum.
- Orton, J. 2013. Geometric rock art in western South Africa and its implications for the spread of early herding. *South African Archaeological Bulletin* 68: 27-40.
- Orton, J. 2014. Final archaeological mitigation report for the Gamsberg Zinc Mine, Aggeneys, Northern Cape. Unpublished report prepared for ERM Southern Africa (Pty) Ltd. Diep River: ACO Associates cc.
- Orton, J. 2016. Heritage Impact Assessment for the proposed Sol Invictus 1 PV Facility, Namakwaland Magisterial District, Northern Cape. Unpublished report prepared for Savannah Environmental (Pty) Ltd. Muizenberg: ASHA Consulting (Pty) Ltd.
- Paleo Field Services. n.d. Phase 1 Heritage Impact Assessment for proposed prospecting drilling in the Big Syncline area on the farm Aggeneys 56 Portion 01, Khai-ma local Municipality, NC Province. Unpublished report prepared for EndemicVision Environmental Consultants. Langenhoven Park: Paleo Field Services.
- Partridge, T.C., Botha, G.A. & Haddon, I.G. 2006. Cenozoic deposits of the interior. In: Johnson, M.R., Anhaeusser, C.R. & Thomas, R.J. (Eds.) *The geology of South Africa*. Marshalltown: Geological Society of South Africa.
- Penn, N. 2005. *The forgotten frontier: colonist and Khoisan on the Cape's northern frontier in the 18th century*. Cape Town: Double Storey Books.
- Raper, P.E. n.d. Dictionary of southern African place names. Accessed online at https://archive.org/stream/DictionaryOfSouthernAfricanPlaceNames/SaPlaceNames_djvu.txt on 19 June 2015.

- Robinson, A.M.L. 1978. *Selected articles from the Cape Monthly Magazine NS, 1870-1876*. Cape Town: Van Riebeeck Society.
- SAHRA. 2007. Minimum Standards: archaeological and palaeontological components of impact assessment reports. Document produced by the South African Heritage Resources Agency, May 2007.
- Schaeffer, A. 2008. *Life and Travels in the Northwest 1850-1899*. Cape Town: Yoshi Publishing.
- Simon, J.M. 1959. *Bishop for the Hottentots*. New York: Benziger Brothers Inc.
- Smith, A.B. 2012. Archaeological Report Proposed 75MW Solar Facility on Farm 62 Zuurwater, Aggeneys, Northern Cape Province. Unpublished report prepared for Cape EAPrac. Rondebosch: University of Cape Town.

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) 788 1025
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, Afrikaans, basic French

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) [First Class]	1998
University of Cape Town	M.A. (Archaeology)	2004
University of Oxford	D.Phil. (Archaeology)	2013

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
- ASAPA 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 – 2017
- 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
 - Heritage Impact Assessments
 - Self-standing assessments under Section 38(1) of the NHRA
 - Assessments under NEMA and Section 38(8) of the NHRA
 - Archaeological specialist studies
 - Strategic assessments
 - 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
 - Agricultural developments
 - Dams and pipe lines
 - Power lines and substations
 - Renewable energy facilities (wind, solar and hydro-electric)

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:

1998: Frank Schweitzer memorial book prize for an outstanding student.

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

APPENDIX 2 – Palaeontological specialist comment

[submitted separately]