

HERITAGE IMPACT ASSESSMENT: PROPOSED 33 kV POWERLINE NEAR DEALESVILLE, BOSHOF MAGISTERIAL DISTRICT, FREE STATE

Required under Section 38(8) of the National Heritage Resources Act (No. 25 of 1999)
as part of a Heritage Impact Assessment.

Report for:

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On behalf of:

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SUMMARY

ASHA Consulting (Pty) Ltd was appointed by SLR Consulting (South Africa) (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of a 33 kV powerline just northwest of Dealesville, Free State. The north-eastern and south-western ends of the development are located at $S28^{\circ} 37' 13.5'' E25^{\circ} 44' 17.7''$ and $S28^{\circ} 37' 54.6'' E25^{\circ} 43' 21.8''$ respectively. The powerline would be located on the Remaining Extent of the Farm Walkerville 1031, Portion 1 of Walkerville 1031, Farm Overschot 31 and the Remaining Extent of the Farm Oxford 1030.

The study area is comprised of flat grasslands. Stone artefacts dating to the Middle Stone Age are known from the area and can be expected in very low densities throughout the area. The cultural landscape was also identified as a heritage resource but its significance is low given the large amount of electrical infrastructure in the area. In addition, many other electrical facilities have already been authorised but not yet constructed. The proposed land use will thus not be out of place and the impact to the landscape is acceptable.

It is recommended that the proposed 33 kV powerline should be approved but subject to the following recommendation:

- 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

Acheulean (also Acheulian): An archaeological name for the period comprising the later part of the Early Stone Age. This period started about 1.7-1.5 million years ago and ended about 250-200 thousand years ago.

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

DEA&DP: Department of Environmental Affairs and Development Planning

DFFE: Department of Forestry, Fisheries and the Environment

EA: Environmental Authorisation

ECO: Environmental Control Officer

EGI: Electricity Grid Infrastructure

EIA: Environmental Impact Assessment

EMPr: Environmental Management Program

ESA: Early Stone Age

GP: General Protection

GPS: global positioning system

HIA: Heritage Impact Assessment

LCT: large cutting tool

LSA: Later Stone Age

MSA: Middle Stone Age

MTS: Main Transmission Substation

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

PV: Photo-voltaic

REDZ: Renewable Energy Development Zone

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

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1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by SLR Consulting (South Africa) (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of a 33 kV powerline just northwest of Dealesville, Free State (Figure 1). The north-eastern and south-western ends of the development are located at $S28^{\circ} 37' 13.5'' E25^{\circ} 44' 17.7''$ and $S28^{\circ} 37' 54.6'' E25^{\circ} 43' 21.8''$ respectively. From northeast to southwest, the powerline would be located on the Remaining Extent of the Farm Walkerville 1031, Portion 1 of Walkerville 1031, Farm Overscot 31 and the Remaining Extent of the Farm Oxford 1030.

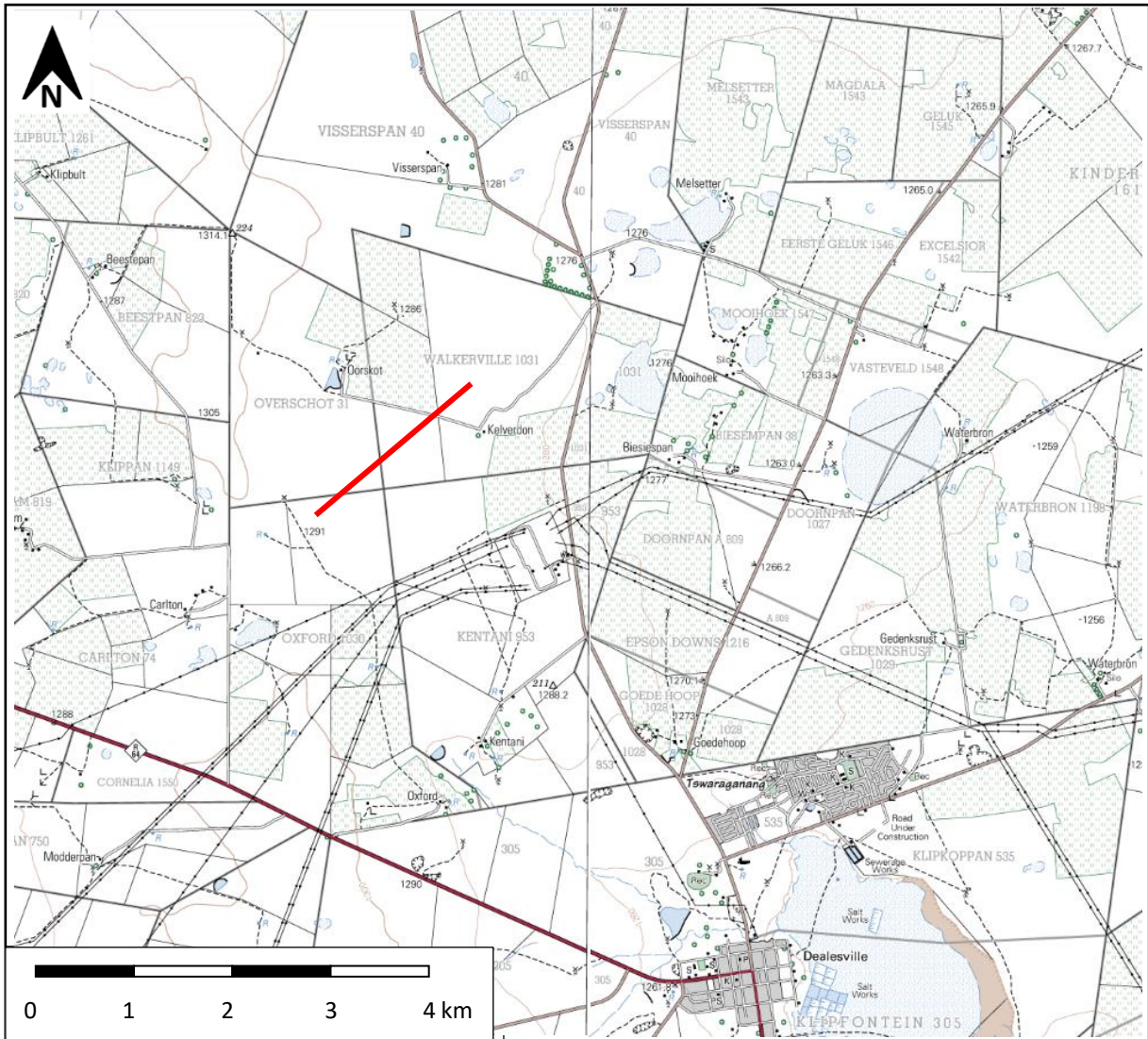


Figure 1: Extract from 1:50 000 topographic map 2825DA & 2825DB showing the location of the proposed powerline (red line) relative to Dealesville. Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: www.ngi.gov.za.

The proposed infrastructure is part of a larger solar energy development consisting of eleven photovoltaic facilities and associated infrastructure which have already been authorised. The newly proposed infrastructure is required to connect the Sonoblomo PV facility to the Kentani PV facility substation, thereby facilitating the former's connection to the national electricity grid.



Figure 2: Aerial view of the development area and surrounds showing the landscape around the site (red line) with Dealesville to the southeast.

1.1. The proposed project

1.1.1. Project description

South Africa Mainstream Renewable Power Developments (Pty) Ltd ('Mainstream') is proposing to add one MTS, a Battery Energy Storage System (BESS) and four powerlines to their authorised Kentani Cluster of solar photovoltaic (PV) developments near the town of Dealesville in the Free State Province. The proposed development will also involve the re-routing of eight already authorised 132 kV powerlines within the grid connection corridor authorised as part of the Kentani Cluster and making provision for this routing in the new proposed MTS. A Basic Assessment (BA) Process is being followed for this proposed development. However, one of the four powerlines does not constitute a listed activity under the National Environmental Management Act (No. 107 of 1998; NEMA) and was therefore not included in the terms of reference for the BA. Being longer than 300 m, it does still trigger the provisions of S.38(1) of the National Heritage Resources Act No. 25 of 1999 (NHRA) and the present report thus assesses the potential heritage Impacts from this powerline on its own.

The 33kv powerline (approx. 2km in length) will connect the authorised 75MW Sonoblomo PV facility (14/12/16/3/3/2/723) to the authorised Kentani on-site substation (14/12/16/3/3/2/724).

A service track within the servitude under the proposed powerline will also be required.

1.1.2. Identification of alternatives

No alternative locations have been identified for the project since the infrastructure is required to support one of a suite of authorised solar energy facilities and other locations and technologies would not provide the required support. However, the no-go alternative will be considered.

1.1.3. 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 provided with the following terms of reference for the study:

- Compile a desktop heritage impact assessment (HIA) that would meet the requirements of the National Heritage Resources Act (No. 25 of 1999) (NHRA).
- Consider all relevant aspects of heritage including archaeology, graves and the cultural landscape. (Palaeontology was to be covered by a separate specialist.)

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 decision can be issued by them. 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 approval.

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. LEGISLATIVE CONTEXT

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

The NHRA 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(1) of the NHRA provides categories of development that require submission of notification to the relevant heritage authorities where they are the consenting authority. Section 38 (2a) states that if there is reason to believe that heritage resources will be affected then an impact assessment report meeting the requirements of S38(3) must be submitted for decision-making. This report fulfils that requirement.

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. The information sources used in this report are presented in Table 1. Data were also collected via a field survey.

Table 1: Information sources used in this assessment.

Data / Information	Source	Date	Type	Description
Maps	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical and current 1:50 000 topographic maps of the study area and immediate surrounds
Aerial photographs	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical aerial photography of the study area and immediate surrounds

Aerial photographs	Google Earth	Various	Spatial	Recent and historical aerial photography of the study area and immediate surrounds
Cadastral data	Chief Directorate: National Geo-Spatial Information	Various	Survey diagrams	Historical and current survey diagrams, property survey and registration dates
Background data	South African Heritage Resources Information System (SAHRIS)	Various	Reports	Previous impact assessments for any developments in the vicinity of the study area
Palaeontological sensitivity	South African Heritage Resources Information System (SAHRIS)	Current	Spatial	Map showing palaeontological sensitivity and required actions based on the sensitivity.
Background data	Books, journals, websites	Various	Books, journals, websites	Historical and current literature describing the study area and any relevant aspects of cultural heritage.

3.2. Field survey

The site was not specifically surveyed, although small parts of it have been covered by the present author during the course of other assessments. These other surveys were on 23rd August 2014 and 2nd October 2021. These were during winter and spring, before the onset of the rainy season. This meant that ground visibility for archaeological resources was good. Other heritage resources are not affected by seasonality. During the surveys the positions of finds and survey tracks were recorded on a hand-held Global Positioning System (GPS) receiver set to the WGS84 datum (Figure 3). 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.



Figure 3: Aerial view of the proposed powerline (red line) showing the survey tracks recorded during surveys for other projects (blue lines).

3.3. Specialist studies

No specialist studies were produced as part of this HIA, but a palaeontological specialist study was commissioned and will be submitted as a free-standing report (Butler 2021) to be read in conjunction with this HIA.

3.4. Impact assessment

The impact assessment was conducted through application of a scale supplied by SLR.

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 resources of local significance but this is generally yet to happen. SAHRA (2007) has formulated its own system¹ 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).

3.6. Assumptions and limitations

The actual footprint was not examined in the field. The very limited quantity of archaeological materials known from the surrounding area and their low significance suggests that the chances of significant resources being present are extremely low. The previous studies were 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. The grass cover over most of the site meant that visibility, although good at close range, was limited to within 2-3 m.

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The development area is in a rural area dominated by the rearing of livestock, although some arable land is also present. The R64 which connects Dealesville and Boshof runs through the southern part of the development area with the proposed MTS being immediately south of the R64. Most visually

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

prominent on the landscape, however, are the very large Eskom Perseus Substation which lies 1.4 km southeast of the proposed powerline (Figure 4) and the many existing high voltage powerlines (both 400 kV and 700 kV) that enter and exit this substation to the south of the study area. The development area lies wholly within the Kimberley Renewable Energy Development Zone (REDZ) and within the Central Electricity Grid Infrastructure (EGI) corridor.



Figure 4: View towards the east from the south-western end of the proposed powerline showing the existing Eskom Perseus Substation and associated powerlines.

4.2. Site description

The site is comprised almost exclusively of grassland. Figures 5 to 8 show views of the development area. The surface is generally sandy with minimal gravel clasts.



Figure 5: View towards the southeast in the south-western end of the study area (23.10.2021).



Figure 6: View towards the south across the route of the proposed powerline in its south-western part. Puddles had formed on the very flat surface after recent rains (23.10.2021).



Figure 7: View towards the north looking towards the proposed powerline (23.10.2021).



Figure 8: View towards the north through the northern part of the proposed powerline alignment (23.08.2014).

5. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources recorded in the development area during the course of the project. Please note that the palaeontological findings are presented in a separate specialist report (Butler 2021).

5.1. Archaeology

5.1.1. Desktop study

Stone Age material occurs widely across southern Africa, while the Iron Age, which only occurred within the last 2000 years, is present only in the eastern parts where summer rainfall allowed for the cultivation of summer crops. Stone-walled settlements dating to the Iron Age have been widely documented in parts of the Free State and adjacent Northern Cape (Maggs 1976a, 1976b) but the Iron Age appears to be absent from the vicinity of Dealesville. Later Stone Age stone-built dwellings are known from along the Riet River about 100 km to the southwest (Humphreys 1972, 2009). With the exception of the rich MSA deposits of Florisbad (Kuman *et al.* 1999) and the MSA and LSA stone artefact assemblages from Erfkroon (Churchill *et al.* 2000), significant archaeological resources appear to be quite rare in this flat, open and well-grassed landscape. Archaeological material is, however, more common along the major rivers where artefacts are revealed in the river terrace gravels.

Webley (2010) surveyed an area to the southeast of the present development area and reported a complete absence of archaeological material. She further noted that stone suitable for the manufacture of flaked tools was not present and that the quantity of other rock available on the surface was insufficient to allow for the construction of stone dwellings. Hutten's (2011) survey of land to the north of Boshoff showed similar results but in that case a pan was present with a large scatter of MSA and LSA artefacts present alongside it. The same applied to a survey immediately west of the present development area where many thousands of artefacts were found adjacent to a pan (Orton 2016a). This demonstrates the preference to settle close to water sources that is prevalent across much of the relatively dry interior of southern Africa. Orton's (2015) survey of large areas surrounding and to the south of the present development area showed heritage resources to be quite common. They included built structures, artefact scatters and a number of rock engravings. The vast majority of resources were located in close proximity to the rock outcrop areas closer to Dealesville, while further south into the grasslands the archaeology dropped off significantly. The majority of artefacts located by Orton (2015) were attributable to Pleistocene-aged Middle Stone Age (MSA) background scatter and were associated with gravel exposures. They did not constitute *in situ* living sites. However, some artefacts dating to the Holocene Later Stone Age (LSA) were also noted. To the north of the present development area, Kaplan (2020, 2021) found similar artefacts ascribable to the MSA, with higher densities being present alongside pans.

Rock engravings occur widely in the interior of South Africa where suitable rock exists. Many sites are located in the Free State with the National Museum, Bloemfontein (2014) listing numerous examples that may be visited by the public. However, no sites seemed to be on record for the Dealesville area prior to Orton's (2015; see also Orton 2016b) survey. He located engravings dating within the last 2000 years and attributable by their geometric style to the Khoekhoe as well as figurative engravings done by the San. The former were found on a small dolerite hill 2 km west of the southern end of the present development area where flaked stone artefacts and ground patches

on the dolerite were also recorded. Dolerite rocks with shallow grinding grooves and ground cupules have also been recorded in the area (Orton 2016a, b).

The remains of a historical stone-walled kraal also occur alongside the engraved outcrop described above (Orton 2015). Another stone-walled kraal and house ruin were recorded by Orton (2016a, b) to the west of the proposed MTS footprint, while Kaplan (2020) found stone-walled ruins to the north of the proposed powerline corridor.

5.1.2. Site visit

The two site visits that covered parts of the powerline did not locate any heritage materials within the footprint. It is clear from aerial photography that no landscape features like rocky hills or outcrops, or groves of trees (or any trees) occur within the proposed footprint and its immediate surrounds. Nevertheless, a few heritage resources are known from the wider area (within 1 km of the proposed footprint) and these are listed and described in Table 2. All are archaeological resources.

Table 2: List of sites recorded during the surveys within 1 km of the proposed powerline. Source: Orton (2015: Appendix 1).

Waypoint	Location	Description	Significance (Grade)
126	S28 37 28.8 E25 44 20.5	Ruined farmhouse of 11 m by 8 m with an external hearth and chimney stack, looks like it was Victorian. The external walls and chimney (which was a later addition) were made of red clay bricks with frogs, while other walls were made from locally manufactured sun-baked bricks made from local soil and organic matter. The house had six rooms. There is plaster rustication around the openings. Barbed wire has been built into the walls for strengthening. The kitchen has a cement floor but the rest of the house would have had a wooden floor. The house has stone foundations under every wall.	Medium (GPA) AVOID
127	S28 37 30.5 E25 44 20.5	Stone foundation with the remains of brick walls above. Structure was 6 m by 8 m. Floor is cement. There are frog bricks present.	
128	S28 37 24.4 E25 44 09.8	Old stock post, twentieth century artefacts present, but the site may have had its roots in the 19 th century. Most artefacts lying about are glass and metal, including parts of an old cast iron single bed.	Very low (GPC)
129	S28 37 21.8 E25 44 08.9	Stone foundation located some 70- 80 m south of the stock post area but probably related to it. Also some Coronation bricks here.	
173	S28 37 53.7 E25 43 05.3	Small dam with walls lined with packed dolerite cobbles and boulders.	Very low (GPC)
174	S28 38 04.4 E25 43 00.9	Scatter of MSA hornfels artefacts eroding out of a farm road.	Very low (GPC)
175	S28 38 01.8 E25 42 56.5	Scatter of MSA hornfels artefacts in a deflated area that has gravel present in it as well.	Very low (GPC)

Stone Age resources were seen in one area (waypoints 174 and 175) and comprised of background scatter artefacts of low density and low significance (Figure 10). Such finds have been widely recorded in the area.



Figure 9: Map showing the locations of finds.



Figure 10: Stone artefacts from waypoint 174.

All other records are of historical features. They include a small dam lined with dolerite cobbles (Figure 11), a ruined farm complex (Figures 12 to 14) and the ephemeral remains of a stock post (Figures 15 and 16). While the dam and stock post are of low significance, the house preserves a number of architectural details (see Table 2) and is of more concern. It is in very poor condition though, having been stripped of its joinery, presumably for reuse elsewhere. None of these finds will be impacted by the proposed powerline.



Figure 11: The small dolerite-lined dam at waypoint 173.



Figure 12: The setting of the farm complex at waypoints 126 and 127.



Figure 13: The farmhouse ruin at waypoint 126.



Figure 14: Stone and brick foundations at waypoint 127.

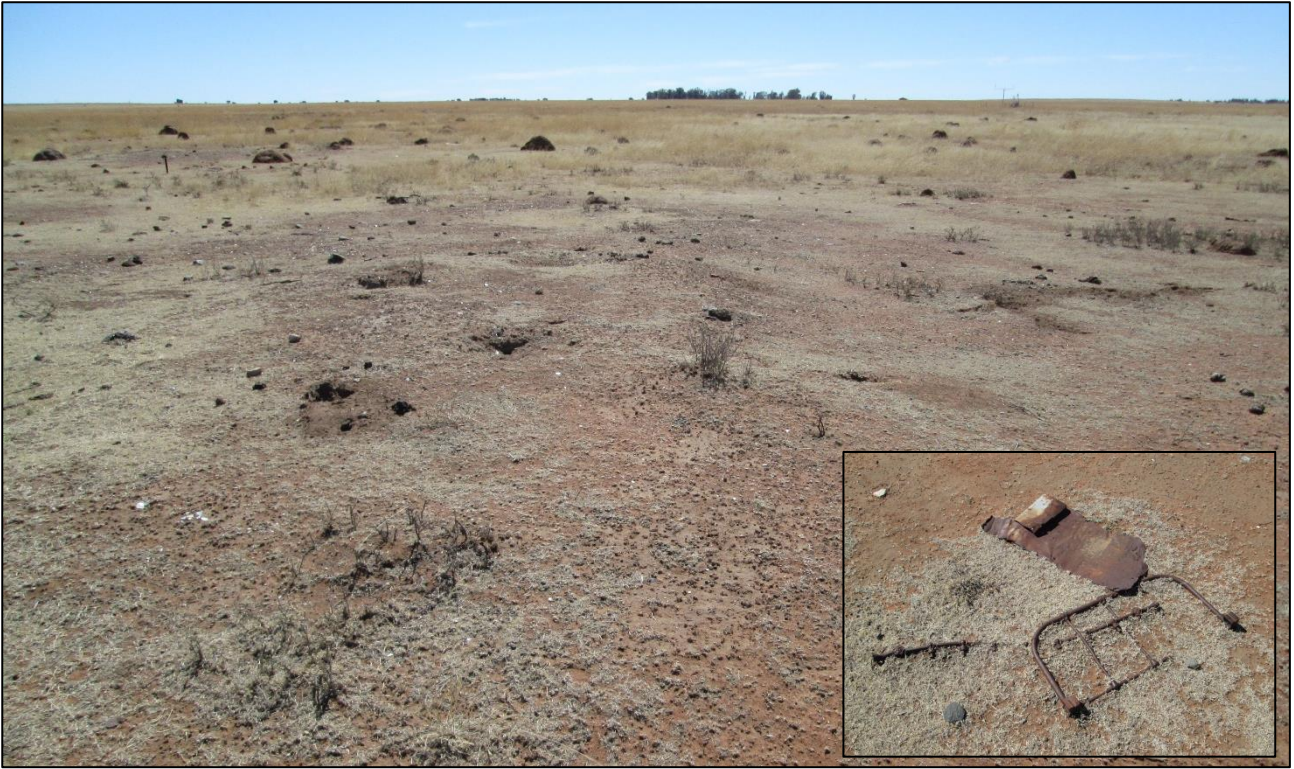


Figure 15: *Very low density artefact scatter at an old stock post at waypoint 128.*



Figure 16: *The ephemeral remains of a structure at waypoint 129.*

5.2. Graves

Orton (2015, 2016a, 2016b) has located several farm graveyards in the wider area as well as one isolated grave. No graves were seen during the survey in the present study area and none are expected to occur.

5.3. Historical aspects and the Built environment

5.3.1. Desktop study

Historical resources will be primarily associated with farmsteads, although most are likely to be fairly recent, perhaps dating to the late 19th or early 20th centuries. Several such resources – buildings, ruins and artefact scatters (the latter two both covered under archaeology with some having been described above) were located in the area by Orton (2015). The town of Dealesville is relatively recent, dating to 1899 (Raper n.d.). It was laid out on the farm Klipfontein belonging to John Henry Deale and was awarded municipal status in 1914.

The second Anglo-Boer War (1899-1902) played a significant role in South African History, particularly in the interior of the country. Many battles were fought between the British and Boer forces. Significant battles in proximity to the present development area include the Battles of Modder River and Magersfontein 100 km to the southwest and west respectively, the Battle of Paardeberg 60 km to the southwest and the Battle of Driefontein just outside Bloemfontein, some 60 km to the southeast. Graves, graveyards and memorials across the central interior of South Africa serve as reminders of the war.

5.3.2. Site visit

Aside from the archaeological materials already described, no historical sites were located in or close to the development area. Dealesville has few, if any, significant historical structures.

5.4. Cultural landscapes and scenic routes

The grasslands of the central interior of South Africa do have a particular character but this landscape type is very widespread and the Dealesville area is not special for any particular reason. In addition, it is noted that the landscape in and around the development area is visually very strongly dominated by electrical infrastructure. The R64 which links (from west to east) Kimberley, Boshof, Dealesville and Bloemfontein is the primary road traversing the area. The road is not a tourist route and, because it does not cross an especially scenic landscape, is not regarded as a scenic route of any significance.

5.5. 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).

Although no significant archaeological resources are known from the study area and a dedicated survey has not been carried out, it is unlikely that anything other than background scatter might be present. Such material would be of no more than low cultural significance at the local level for its scientific value.

The cultural landscape is largely a rural landscape with minimal aesthetic value. It is of low cultural significance at the local level.

5.6. Summary of heritage indicators

Archaeological materials are non-renewable and easily disturbed heritage resources.

- Indicator: Significant archaeological materials should not be disturbed without appropriate study.

The landscape in this instance is dominated by electrical infrastructure. Nevertheless, new infrastructure provides further visual intrusion into the cultural landscape.

- Indicator: The proposed project should not dominate views from multiple directions.

6. ASSESSMENT OF IMPACTS

6.1. Impacts to archaeological resources

Archaeological resources may be damaged during the construction period when grubbing and/or excavations for powerline foundations and the adjoining access track occurs. None are known, but there is a high likelihood that a few background scatter artefacts will be present within the surface soil. The impacts are direct and will occur during the construction phase only. Because of the very low cultural significance of the archaeological materials, the intensity is very low and the extent limited to the site. The calculated impact significance is **low negative** before mitigation (Table 3). Mitigation is not suggested since no significant artefact scatters are known or likely to occur and the project footprint is very minor which will mean only minimal impacts. The post-mitigation impact significance thus remains **low negative**. It should be noted that the ratings are strongly influenced by the permanent duration of the impact and that a significance of very low negative would be more appropriate after mitigation. No other management measures are required and there are no fatal flaws in terms of archaeology.

Table 3: Assessment of archaeological impacts.

Issue	Destruction of archaeological resources	
Description of Impact		
Archaeological resources are damaged, destroyed or moved from their context.		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction	
Criteria	Without Mitigation	With Mitigation
Intensity	Very low	Very Low
Duration	Permanent	Permanent
Extent	Site	Site

Consequence	Low	Low
Probability	Unlikely / improbable	Unlikely / improbable
Significance	Low -	Low -
Degree to which impact can be reversed	Low – archaeological resources are non-renewable and cannot be recreated on site.	
Degree to which impact may cause irreplaceable loss of resources	High - archaeological resources are non-renewable and irreplaceable.	
Degree to which impact can be mitigated	High – mitigation is easy to apply and would effectively capture archaeological data before development proceeds.	
Mitigation actions		
The following measures are recommended:	No mitigation is suggested.	
Monitoring		
The following monitoring is recommended:	None.	
Cumulative impacts		
Nature of cumulative impacts	Direct	
Rating of cumulative impacts	Without Mitigation	With Mitigation
	Very low -	Very Low -

6.2. Impacts to the cultural landscape

Impacts to the cultural landscape relate to the visual intrusion of the new electrical infrastructure into the rural cultural landscape. In this instance, however, it must be noted that a large amount of electrical infrastructure is already present in the landscape. This infrastructure includes many powerlines and two large substations, one of which lies close to the proposed development area. The proposed powerline is substantially smaller than most of those existing. As a result, the intensity of the new impact is rated as very low. The impacts will occur for as long as the powerline remains present (i.e. long term). Because of the small size of the powerline, the extent is rated as site. Before mitigation the impact significance is rated as being **low negative** (Table 4). The proposed infrastructure cannot be meaningfully hidden and the landscape already has much similar infrastructure present. As such, only best practice measures related to minimising disturbance footprint and rehabilitating all areas not required during operation can be suggested. The impacts post-mitigation will remain **low negative**. There are no fatal flaws in terms of the cultural landscape.

Table 4: Assessment of impacts to the cultural landscape.

Issue	Impacts to the cultural landscape	
Description of Impact		
Visual intrusion of electrical infrastructure into the rural cultural landscape.		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction, Operation, Decommissioning	
Criteria	Without Mitigation	With Mitigation
Intensity	Very low	Very low
Duration	Long-term	Long-term
Extent	Site	Site
Consequence	Low	Low

Probability	Definite / Continuous	Definite / Continuous
Significance	Low -	Low -
Degree to which impact can be reversed	High – With removal of all infrastructure and rehabilitation of the site, the current status quo could be recreated.	
Degree to which impact may cause irreplaceable loss of resources	Low – the grasslands of the South African interior are extensive and similar landscapes occur elsewhere.	
Degree to which impact can be mitigated	Low – There is nothing that can be done to hide the powerline.	
Mitigation actions		
The following measures are recommended:	Minimise disturbance footprint. Rehabilitate all areas not required during operation. Minimise size of access track.	
Monitoring		
The following monitoring is recommended:	None	
Cumulative impacts		
Nature of cumulative impacts	Direct	
Rating of cumulative impacts	Without Mitigation	With Mitigation
	Low -	Low -

6.3. Cumulative impacts

Cumulative impacts occur through the implementation of many developments in the surrounding area. This assessment includes all approved electrical facilities within a 30 km radius of the project site. Because of the strongly electrical nature of the area currently, the cumulative impacts are rated as low negative.

6.4. 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 proposed project is intended to connect a solar energy facility to the national electricity grid. The facility will produce electricity for South Africa. With the country having a shortage of reliable electricity supply which leads to frequent load-shedding, any new generation capacity will be a benefit to society. Aside from this obvious benefit, the currently proposed project will provide a small number of jobs during the construction phase. Given the relatively limited heritage impacts, these socio-economic benefits can be seen to outweigh the impacts.

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 the archaeological materials. Trampling from grazing animals and/or farm/other vehicles could also occur. These impacts would be of **negligible negative** significance. The cultural landscape has already been affected by electrical development through the construction of substations and many powerlines. This existing impact is considered to be of **medium negative** significance.

6.6. The No-Go alternative

If the project were not implemented then the site would stay as it currently is. The heritage impacts with implementation are of little to no concern. There would be a loss of socio-economic benefits through not being able to connect the solar energy facility to the national grid. The No-Go option is thus slightly less desirable.

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. Such impacts are not expected. Impacts to the landscape are difficult to quantify but in general a development that visually dominates the landscape from many vantage points is undesirable. The presently proposed powerline is a small one and, in the context of the many existing large powerlines in the area, it will result in negligible change to the visual character of the area.

7. INPUT TO THE ENVIRONMENTAL MANAGEMENT PROGRAM

The actions recorded in Table 5 should be included in the environmental management program (EMPr) for the project².

Table 5: Heritage considerations for inclusion in the EMPr.

Impact	Mitigation / management objectives & outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
Impacts to archaeology and graves					
Damage or destruction of archaeological sites	Avoid impacts (preferred) or sample sites before disturbance	Report any dense concentrations of artefacts discovered during construction	Inform staff and carry out inspections of excavations	Ongoing basis	Project developer
				Whenever on site (at least weekly)	ECO
Damage or destruction of archaeological sites or graves	Rescue information, artefacts or burials before extensive damage occurs	Reporting chance finds as early as possible, protect <i>in situ</i> and stop work in immediate area	Inform staff and carry out inspections of excavations	Ongoing basis	Construction Manager or Contractor
				Whenever on site (at least weekly)	ECO
Impacts to the cultural landscape					
Visible landscape scarring	Minimise landscape scarring	Ensure disturbance is kept to a minimum and does not exceed project requirements. Rehabilitate areas not needed during operation.	Monitoring of surface clearance relative to approved layout	Ongoing basis	Construction Manager or Contractor
				As required	ECO

² This would be the EMPr for the larger project discussed in Section 1.1.1.

8. CONCLUSIONS

The only heritage issues for this project are the potential destruction of archaeological materials and the visual intrusion of the infrastructure into the cultural landscape. However, neither of them is a significant concern for the approval of the project because no known archaeological materials occur – or are expected to occur – on site, and the landscape is now largely an electrical landscape. In conjunction with all the other existing and approved (but not yet constructed) electrical facilities in the immediate area, the new powerline would not be out of place. Table 6 lists the heritage indicators and shows how they are met. There are no remaining heritage issues.

Table 6: Heritage indicators and project responses.

Indicator	Project Response
Significant archaeological materials should not be disturbed without appropriate study.	No significant materials are known or expected to occur within the development footprint.
The proposed project should not dominate views from multiple directions.	The proposed powerline is small and will not be visually prominent in the landscape.

8.1. Reasoned opinion of the specialist

Given that the archaeological material likely to occur within the footprint would be of very low cultural significance, and that the landscape is essentially an electrical one in which the proposed new infrastructure would not be out of place, it is the opinion of the heritage specialist that the proposed project should be approved in full.

9. RECOMMENDATIONS

It is recommended that the proposed 33 kV powerline should be approved but subject to the following recommendation:

- 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:

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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.