

PRECONSTRUCTION ARCHAEOLOGICAL SURVEY OF THE MAINSTREAM KENTANI SUITE PV PROJECTS (LELIEHOEK), DEALESVILLE, FREE STATE

Required as a condition of authorisation.

Report for:

Nala Environmental (Pty) Ltd
Kikuyu Waterfall,
Corner Of Maxwell Drive and Old Pretoria Main Road
Midrand, 2090
Email: arlene@veersgroup.com

On behalf of:

South Africa Mainstream Renewable Power Developments (Pty) Ltd



Dr Jayson Orton
ASHA Consulting (Pty) Ltd
23 Dover Road, Muizenberg, 7945
Tel: (021) 788 1025 | 083 272 3225
Email: jayson@asha-consulting.co.za

1st draft: 19 May 2021
Final report: 13 August 2022

SUMMARY

ASHA Consulting (Pty) Ltd was appointed by Nala Environmental (Pty) Ltd to conduct pre-construction field surveys of six solar PV facilities (known as the Kentani Suite) due to be constructed near Dealesville, Free State. The authorised footprints of the six PV facilities and associated electrical infrastructure were surveyed to determine whether any further as yet undiscovered heritage resources were present within them. The following report will focus on the Leliehoek PV facility and associated powerlines.

A number of archaeological sites were found but none require avoidance. The significant resources on record have all been avoided by the footprints.

There are no further heritage concerns, so long as development remains within the authorised areas.

Glossary

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

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

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

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

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

Iron Age: A prehistoric period characterised by the use of iron, pottery and domestic stock and extending in South Africa from about 400 AD to about 1840 AD.

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

CRM: Cultural Resources Management

DFFE: Department of Forestry, Fisheries and the Environment

EA: Environmental Authorisation

EGI: Electricity Grid Infrastructure

EMPr: Environmental Management Program

ESA: Early Stone Age

GP: General Protection

GPS: global positioning system

HIA: Heritage Impact Assessment

LSA: Later Stone Age

MSA: Middle Stone Age

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

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

REDZ: Renewable Energy Development Zone

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

Contents

Glossary.....	iii
Abbreviations	iii
1. INTRODUCTION	1
1.1. The proposed project	3
1.2. Terms of reference	4
1.3. Scope and purpose of the report	4
1.4. The author	4
1.5. Declaration of independence	4
2. LEGISLATIVE CONTEXT	4
2.1. National Heritage Resources Act (NHRA) No. 25 of 1999	4
2.2. Approvals and permits.....	6
3. METHODS.....	6
3.1. Literature survey and information sources	6
3.2. Field survey.....	7
3.3. Grading	8
3.4. Assumptions and limitations	8
4. PHYSICAL ENVIRONMENTAL CONTEXT	8
4.1. Site context	8
4.2. Site description	8
4.2.1. Leliehoek	8
4.3. Substation and powerlines	9
5. FINDINGS	10
5.1. Desktop study	10
5.2. Site visit.....	11
5.3. Leliehoek.....	12
5.4. Powerline and substation	13
5.5. Statement of significance and provisional grading	15
6. CONCLUSIONS	15
7. RECOMMENDATIONS	16
8. REFERENCES	16
APPENDIX 1 – Curriculum Vitae	19

List of Figures

Figure 1: Extract from 1:50 000 topographic map 2825DA, 2825DB, 2825CD & 2825DD showing the location of the various PV sites. Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: http://www.cdngiportal.co.za/cdngiportal/	2
Figure 2: Aerial view of the area west of Dealesville showing the location of the Kentani Suite. The authorised footprint of the Leliehoek SEF is shown in pink. The green, blue and turquoise lines are powerline routes.....	3
Figure 3: Aerial view of the overall study area (key as per Figure 2) showing the accumulated survey tracks from 2014 (yellow lines), 2021 (orange lines) and 2022 (light blue lines).....	7
Figure 4: View of the substrate at Leliehoek showing an area of moderate visibility	9
Figure 5: View of the substrate at Leliehoek showing an area of poor visibility.....	9
Figure 6: View east across the Leliehoek site showing dense grass.	9
Figure 7: View west on the Constantia portion of the Leliehoek site showing lower density grass.	9
Figure 8: View across the substation site showing active fields.	10
Figure 9: View across the substation site showing an active centre pivot field.	10
Figure 10: View north in the northern part of the powerline route with Perseus Substation visible in the background.	10
Figure 11: View east along the Braklaagte powerline connection.	10
Figure 12: Stone artefacts from waypoint 708. Scale in cm.	13
Figure 13: Stone artefacts from waypoint 709. Scale in cm.	13
Figure 14: View towards the west showing the ruined farm shed at waypoint 720. The main shed is to the left with the smaller room being to the right.....	13
Figure 15: View of the main shed section of the ruined structure at waypoint 720. The smaller section lies to the right of this view.	14
Figure 16: View of the smaller room of the ruined structure at waypoint 720.	14
Figure 17: Remnant of a foundation at waypoint 733.....	14
Figure 18: An old livestock dip at waypoint 729.....	14
Figure 19: Ruined structure at waypoint 728.	14
Figure 20: Stone artefacts at waypoint 722. Scale in cm/mm.....	14
Figure 21: Aerial view of the Leliehoek facility footprint (pink) showing the distribution of finds. IIIA = dark red, IIIB = red, GPA = orange, GPB = yellow and GPC = white.	16

1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by Nala Environmental (Pty) Ltd to conduct pre-construction field surveys of six solar PV facilities due to be constructed near Dealesville, Free State (Figures 1 & 2). Together the six projects are known as the Kentani Suite. The following report will focus on the Leliehoek PV facility. Approximate centre points for the six projects are as shown in Table 1 and the affected farms are listed in Table 2.

Table 1: Approximate central co-ordinates of the six projects under consideration in this report as per their authorised footprints.

Project	Approximate centre point
Kentani	S28° 37' 25" E25° 43' 05"
Sonoblomo	S28° 36' 55" E25° 44' 20"
Klipfontein 1	S28° 40' 00" E25° 44' 30"
Klipfontein 2	S28° 41' 20" E25° 43' 50"
Leliehoek	S28° 40' 55" E25° 42' 20"
Braklaagte	S28° 44' 05" E25° 43' 00"

Table 1: List of farms and solar energy facilities.

Farm name & number	Associated PV facilities
Walkerville 1031/1	Powerlines
Walkerville 1031/rem	Sonoblomo,substation, powerline
Overschot 31	Kentani
Oxford 1030/rem	Kentani, powerline
Kentani 953/rem	Klipfontein, powerline
Constantia 751	Leliehoek
Leliehoek 748	Leliehoek, powerline
Klipfontein 305/rem	Klipfontein 1; Klipfontein 2, powerline
Doornrandjes 546/rem	Klipfontein 2, powerline
Braklaagte 149	Braklaagte
Boschrand 148	Braklaagte

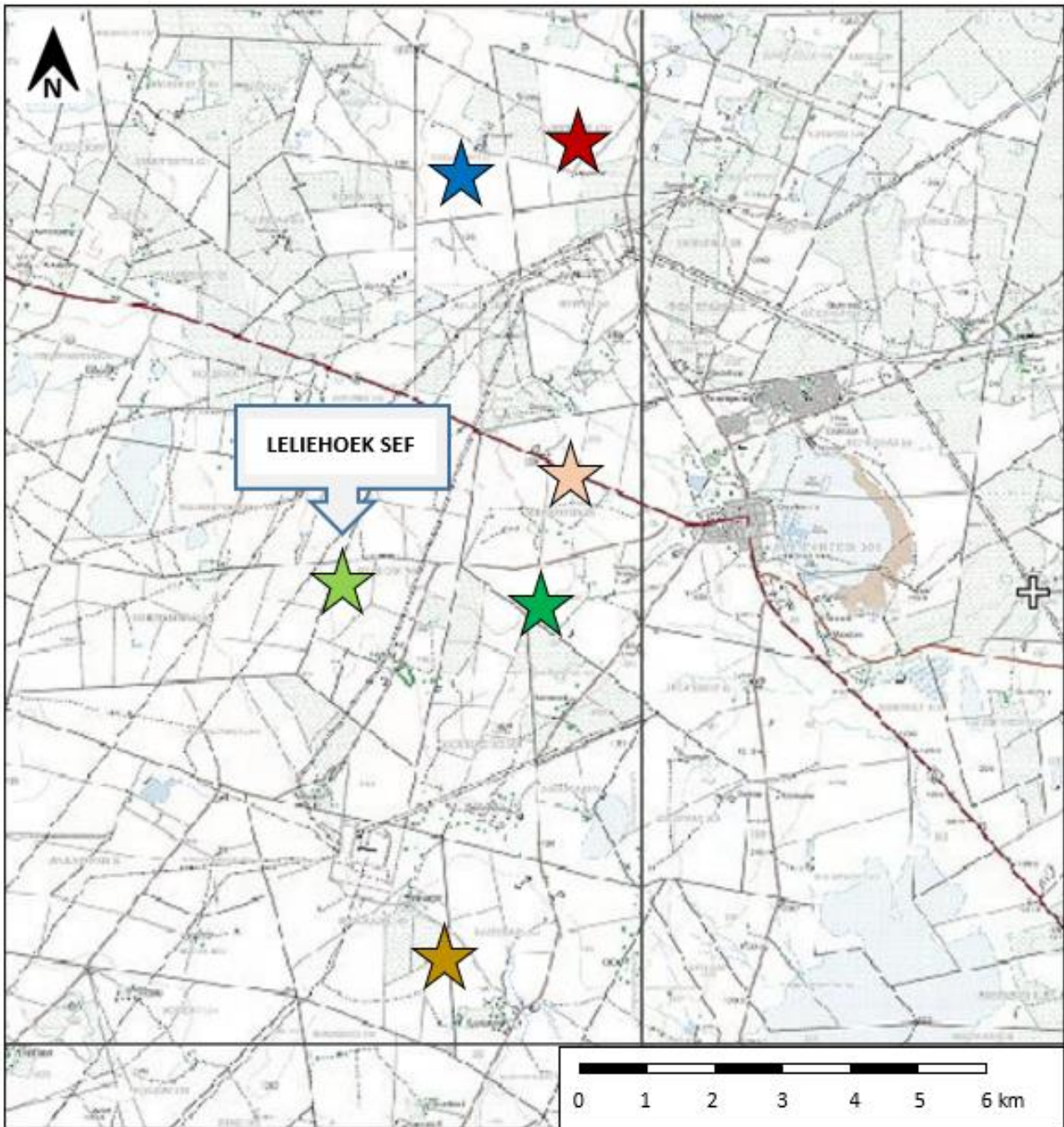


Figure 1: Extract from 1:50 000 topographic map 2825DA, 2825DB, 2825CD & 2825DD showing the location of the various PV sites. Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: <http://www.cdngiportal.co.za/cdngiportal/>.

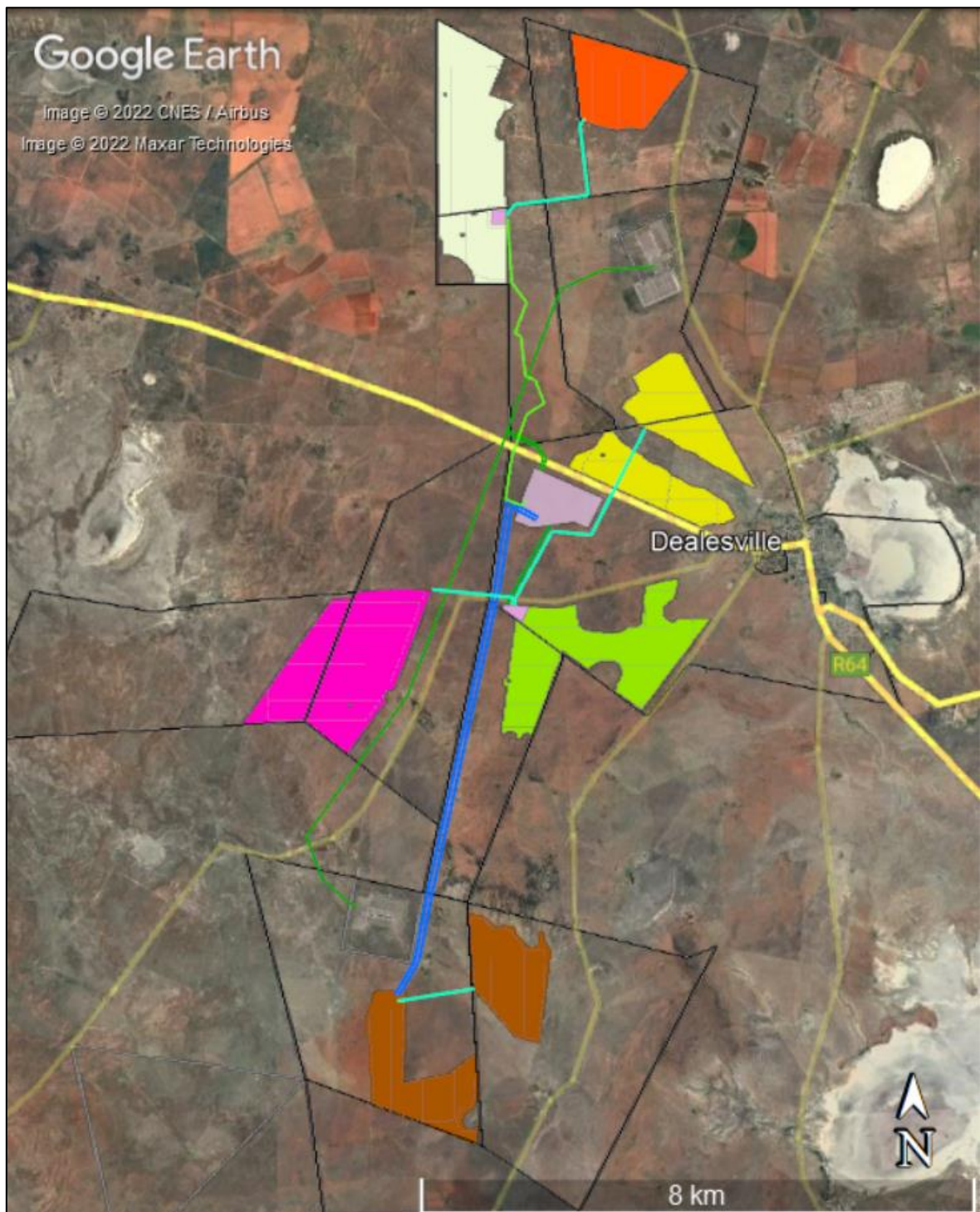


Figure 2: Aerial view of the area west of Dealesville showing the location of the Kentani Suite. The authorised footprint of the Leliehoek SEF is shown in pink. The green, blue and turquoise lines are powerline routes.

1.1. The proposed project

A solar PV facility has been proposed and authorised. This includes solar panels, access roads, substations, buildings and associated electrical infrastructure.

1.2. Terms of reference

ASHA Consulting was asked to survey the authorised footprint of the PV project and all associated powerlines and electrical infrastructure with a view to providing any last sensitivities so that the final project footprint could be designed in such a way as to have the absolute minimum impact on heritage resources. A report was to be prepared indicating where sensitive features lay and, if appropriate, what mitigation measures may still be required prior to construction.

1.3. Scope and purpose of the report

This report is intended to identify any remaining sensitive heritage features within the final project footprint so that final approval for the Environmental Management Programme (EMPr) can be obtained from the National Department of Forestry, Fisheries and the Environment (DFFE). The report will also enable the South African Heritage Resources Agency (SAHRA) to issue a comment on the heritage aspects.

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.

2.2. Approvals and permits

If archaeological or palaeontological mitigation is required prior to construction, then the appointed archaeologist or palaeontologist would need to obtain a permit from SAHRA. This would be issued in their name. This is so that the heritage authority can ensure that the appointed practitioner has proposed an appropriate methodology that will result in the mitigation being done properly. A built environment permit, if required, would need to be obtained from the PHRA.

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 and help understand the significance of any newly reported finds. The information sources used in this report are presented in Table 3 with relevant dates of each source referenced in the text as needed. Data were also collected via a field survey. The data quality is suitable for the purpose of informing this report.

Table 3: Information sources used in this report.

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 entire PV suite, powerlines and substations were subjected to a detailed foot survey by two archaeologists on the 6th to the 11th February 2022. This was during summer and was after good rainfall. This meant that ground visibility for the archaeological survey was heavily restricted by the dense grass. Other heritage resources are not affected by seasonality. During the survey the positions of finds and survey tracks were recorded on a hand-held Garmin Global Positioning System (GPS) receiver set to the WGS84 datum. Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

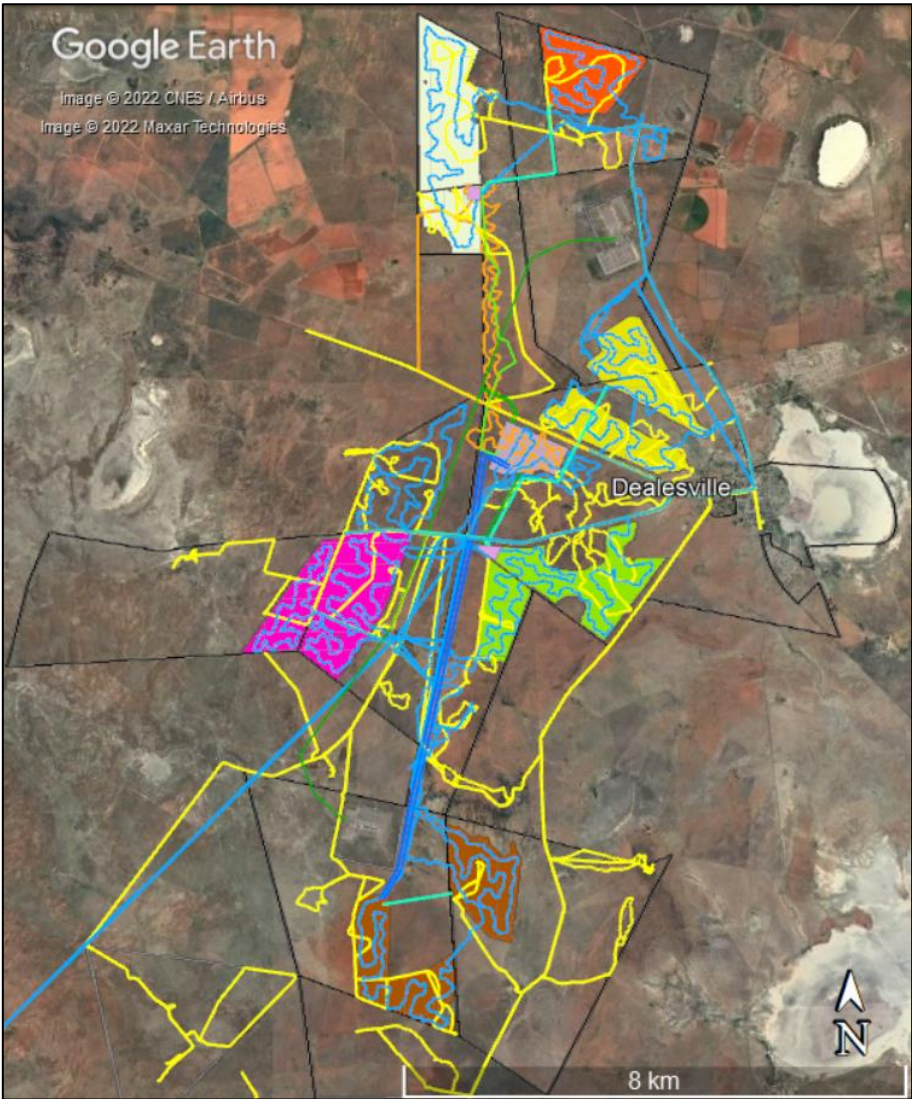


Figure 3: Aerial view of the overall study area (key as per Figure 2) showing the accumulated survey tracks from 2014 (yellow lines), 2021 (orange lines) and 2022 (light blue lines).

3.3. 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).

3.4. Assumptions and limitations

The field study was carried out at the surface only and hence any completely buried archaeological sites would not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. All sites were densely grassed after the good summer rains which made for poor ground visibility. This likely accounts for the smaller number of new finds made now as compared to the 2014 survey when the area was extremely dry (Orton 2015).

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The area is a rural area dominated by livestock farming. However, a significant amount of electrical infrastructure is already present in the area in the form of two large substations and many power lines. The entire study area lies within the Kimberley Renewable Energy Development Zone (REDZ) and within the Central Electricity Grid Infrastructure (EGI) Corridor.

4.2. Site description

4.2.1. Leliehoek

The study area was very flat and grassed with minimal larger vegetation. Dolerite outcrops were rare and largely restricted to ground level exposures of solid rock or low-density gravel. Visibility of the ground was variable. Figure 4 to Figure 7 show views of the Leliehoek study area.

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



Figure 4: View of the substrate at Leliehoek showing an area of moderate visibility



Figure 5: View of the substrate at Leliehoek showing an area of poor visibility.



Figure 6: View east across the Leliehoek site showing dense grass.



Figure 7: View west on the Constantia portion of the Leliehoek site showing lower density grass.

4.3. Substation and powerlines

The study area for the substation and powerlines was quite variable because of its length. The substation site is in the north and includes largely actively farmed land (Figure 9 and Figure 10). In other areas the land is undeveloped (Figure 11).



Figure 8: View across the substation site showing active fields.



Figure 9: View across the substation site showing an active centre pivot field.



Figure 10: View north in the northern part of the powerline route with Perseus Substation visible in the background.



Figure 11: View east along the Braklaagte powerline connection.

5. FINDINGS

5.1. 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 (LSA) 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 Middle Stone Age (MSA) deposits of Florisbad (Kuman *et al.* 1999; Rightmire 1978) 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 among 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. Orton (2021) located an area of artefact scatter also likely attributable to background scatter but including several small handaxes of the type commonly ascribed to the Fauresmith period which occurred at the very beginning of the MSA (Herries 2011; Kuman *et al.* 2020). Further north, 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.

5.2. Site visit

This section describes the archaeological heritage resources recorded in the various study areas during the course of the project. Although the focus is on archaeology, other types of heritage are listed as appropriate. Finds that are not heritage resources (e.g., recent ruins) are also listed for information purposes so that if questions are raised later then there is already a record and recommendation for these places. Table 4 provides a full list of new finds while a selection of these are illustrated below. Note that finds from previous surveys are described in those reports. Mapping appears in Section 6.

Table 4: List of finds made during the 2022 survey of the Leliehoek Solar PV facility site.

PV	Waypoint	GPS	Description	Grade
Leliehoek	708	S28 41 39.1 E25 41 55.4	Scatter of weathered MSA hornfels artefacts. At least 30 artefacts were seen in the area.	GPC
Leliehoek	709	S28 41 25.6 E25 41 52.7	Scatter of weathered MSA hornfels artefacts. At least 40 artefacts were seen in the area.	GPC
Leliehoek	710	S28 41 03.2 E25 42 33.5	A dolerite block with one flake scar and two large flakes nearby. Almost certainly not archaeological.	---
Leliehoek	711	S28 41 06.1 E25 42 33.1	Historical/recent engraving. Indeterminate word/name engraved by pecking on a dolerite boulder. (Also recorded in Orton (2015) as waypoint 066.)	GPC
Powerline & substation	720	S28 39 16.2 E25 44 21.1	Historical ruin with brick and stone (dolerite and calcrete) walls using mud mortar throughout. Most joinery and the roof are gone. The main section is a farm shed and is built of brick. It has a more recent concrete floor. A smaller room to the northwest is probably older. It is built from a mixture of bricks, dolerite and calcrete and its floor is covered with mud and grass.	GPA
Powerline & substation	722	S28 43 22.8 E25 42 40.5	Light background scatter with variable weathering and hence probably variable age. The scatter was associated with a very small area of exposed calcrete.	GPC
Powerline & substation	723	S28 43 38.7 E25 42 37.1	An area that has been informally 'paved' with calcrete and dolerite stones. It is close to a wind pump and dam (c. 230 m away) so must be connected to farming activities.	GPC
Powerline & substation	728	S28 39 30.3 E25 44 15.7	A brick and cement silo or kiln (original function cannot be determined) of about 6 m high and with a small metal opening at about 1.4 m. The base is about 1.8 m diameter but it narrows to about 1.2 m at the top.	GPA
Powerline & substation	729	S28 39 31.4 E25 44 16.8	A brick and cement livestock dip, now partly filled in.	GPC

5.3. Leliehoek

In the southern part of this PV site two patches of fairly dense background scatter artefacts were seen (Figure 12 and Figure 13). These were probably the densest patches of background scatter seen during the survey but still do not have any research value.



Figure 12: Stone artefacts from waypoint 708.
Scale in cm.



Figure 13: Stone artefacts from waypoint 709. Scale in cm.

5.4. Powerline and substation

The most important sites were located along the powerline route and consist of historical ruins. None are likely to be older than the late 19th century. In the north an old, ruined farm shed, and small attached room were seen (Figure 14 to Figure 16). Built with a combination of bricks and stones with mud mortar, these ruins are typical of the older ruins in the area as previously documented (Orton 2015, 2021). Not far away was the ephemeral remnants of a foundation (Figure 17). A little further south a livestock dip (Figure 18) and a tall brick and cement silo or kiln with a small metal entrance was seen (Figure 19). These features could be seen as structures but given they are derelict and in a state of disuse they can be considered under the definition of archaeology as per the NHRA. The only Stone Age material along the route was a background scatter of variably weathered hornfels artefacts associated with an exposed calcrete outcrop in the far south (Figure 20).



Figure 14: View towards the west showing the ruined farm shed at waypoint 720. The main shed is to the left with the smaller room being to the right



Figure 15: View of the main shed section of the ruined structure at waypoint 720. The smaller section lies to the right of this view.



Figure 16: View of the smaller room of the ruined structure at waypoint 720.



Figure 17: Remnant of a foundation at waypoint 733.



Figure 18: An old livestock dip at waypoint 729.



Figure 19: Ruined structure at waypoint 728.



Figure 20: Stone artefacts at waypoint 722. Scale in cm/mm.

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).

The Stone Age archaeological resources are deemed to have low cultural significance at the local level for their scientific value and can be graded GPC. The ruins, however, are ascribed greater value and are seen as of medium significance at the local level for their architectural, historical and social values and are considered to be GPA.

Graves are deemed to have high cultural significance at the local level for their social value. They are allocated a grade of IIIA.

6. CONCLUSIONS

A number of new Stone Age occurrences were documented but all of them are considered to be part of the wider background scatter of artefacts that seems to be present either on or immediately beneath the surface in this area. It is clear that no scientifically significant occurrences were recorded, with the most important ones in the area seemingly all associated with the hill on Klipfontein. Most were recorded in 2014 with this likely being due to (1) the focus on areas most likely to produce archaeology and (2) the substantially better ground visibility due to the drought (Orton 2015). One scatter recorded in 2021 (Orton 2021a) contained small hand axes characteristic of the Fauresmith Period and this scatter is considered the most important on record in the Dealesville area, and the only one with research value. This site will be impacted one of the powerlines but this has been assessed separately (Orton 2021a) and authorised with the requirement for archaeological mitigation.

A few historical archaeological resources were also found but all have been avoided by this project.

There are no other concerns arising from the fieldwork and it can be confirmed that the four archaeological scatters recommended for avoidance or mitigation in 2014 have all been avoided by the authorised footprint.

Although only the 2022 finds are described above, the mapping (Figure 21) includes all resources recorded during all surveys. It is evident that there are no new no-go areas within the Leliehoek PV footprint. There are also no sites requiring mitigation within any of the footprints or along the powerline route. Grade GPC sites are of very low cultural significance and can be ignored from the point of view of layout planning.

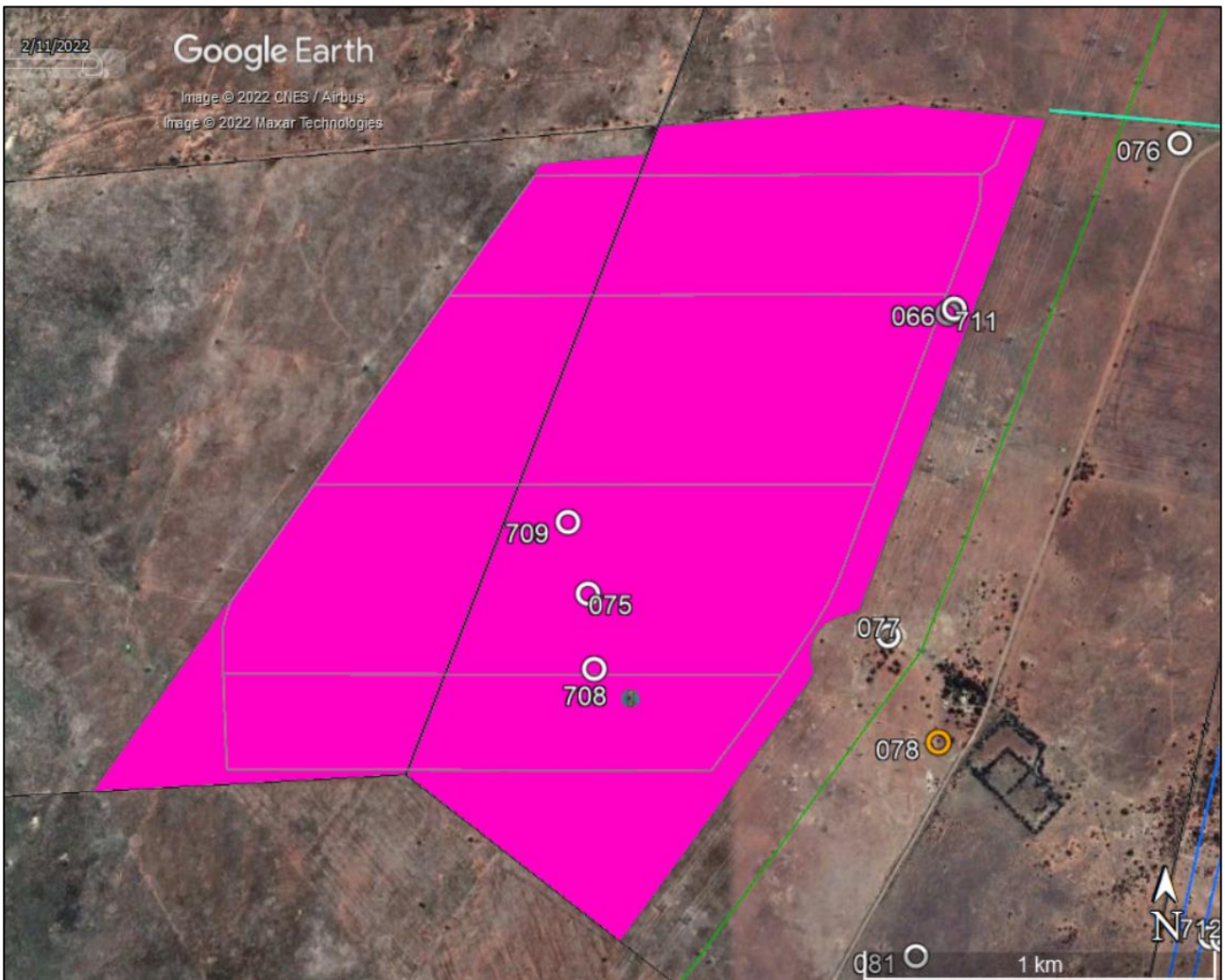


Figure 21: Aerial view of the Leliehoek facility footprint (pink) showing the distribution of finds. IIIA = dark red, IIIB = red, GPA = orange, GPB = yellow and GPC = white.

7. RECOMMENDATIONS

It is recommended that the Leliehoek PV project proceed to construction; there are no further heritage concerns.

The developer is also reminded that 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.

8. REFERENCES

Churchill, S.E., Brink, J.S., Hutchison, R.A., Rossouw, L., Stynder, D., Hancox, P.J., Brandt, D., Woodborne, S., Look, J.C., Scott, L. & Ungar, P. 2000. Erfkroon: a new Florisian fossil locality

from fluvial contexts in the western Free State, South Africa. *South African Journal of Science* 96: 161-163.

- Herries, A.I. 2011. A Chronological Perspective on the Acheulian and its Transition to the Middle Stone Age in Southern Africa: the Question of the Fauresmith. *International Journal of Evolutionary Biology* Volume 2011, Article ID 961401.
- Humphreys, A.J.B. 1972. The Type R settlements in the context of the later prehistory and early history of the Riet River valley. MA thesis, University of Cape Town.
- Humphreys, A.J.B. 2009. A Riet River retrospective. *Southern African Humanities* 21: 157-175.
- Hutten, M. 2011. Heritage Impact Assessment for the Proposed Boshof Solar Park on the farm Rabenthal north of Boshof, Free State Province. Unpublished report prepared for Africa Geo-Environmental Services. Louis Trichardt: Hutten Heritage Consultants.
- Kaplan, J. 2020. Archaeological Impact Assessment: Environmental Impact Assessment for the proposed Visserspan Solar PV Facility on the farm Visserspan No. 40 near Dealesville, Tokologo Local Municipality, Free State Province. Report prepared for Enviroafrica CC. Rondebosch: Agency for Cultural Resource Management.
- Kaplan, J. 2021. Archaeological Impact Assessment: proposed Visserspan Grid Connection on the farms Visserspan No. 40, Mooihoek No. 1547, Vasteveld No. 1548 and Kinderdam No. 1685, near Dealesville, Tokologo Local Municipality, Free State Province. Report prepared for Enviroafrica CC. Rondebosch: Agency for Cultural Resource Management.
- Kuman, K., Inbar, M. & Clarke, R.J. 1999. Palaeoenvironment and cultural sequence of the Florisbad Middle Stone Age Hominid site, South Africa. *Journal of Archaeological Science* 26:1409-1425.
- Kuman, K., Lotter, M.G. & Leader, G.M. 2020. The Fauresmith of South Africa: A new assemblage from Canteen Kopje and significance of the technology in human and cultural evolution. *Journal of Human Evolution* 148 (2020) 102884.
- Maggs, T.M.O'C. 1976a. Iron Age Communities of the Southern Highveld. Occasional Publications of the Natal Museum No 2.
- Maggs, T.M.O'C. 1976b. Iron Age patterns and Sotho history on the southern Highveld: South Africa. *World Archaeology* 7: 318-332.
- National Museum, Bloemfontein. 2014. Public rock art sites. <http://www.nasmus.co.za/departments/rock-art/public-rock-art-sites>. Website accessed 15th August 2014
- Orton, J. 2015. Heritage impact assessment for the proposed construction of twelve solar PV facilities near Dealesville, Boshof Magisterial District, Free State. Unpublished report prepared for CSIR. Muizenberg: ASHA Consulting (Pty) Ltd.

- Orton, J. 2016a. Heritage Impact Assessment: Scoping and Environmental Impact Assessment for the proposed development of the Edison PV 100 MW Photovoltaic Facility near Dealesville, Free State. Unpublished report prepared for CSIR. Muizenberg: ASHA Consulting (Pty) Ltd.
- Orton, J. 2016b. Heritage Impact Assessment: Scoping and Environmental Impact Assessment for the proposed development of the Watt PV 100 MW Photovoltaic Facility near Dealesville, Free State. Unpublished report prepared for CSIR. Muizenberg: ASHA Consulting (Pty) Ltd.
- Orton, J. 2021a. Heritage Impact Assessment: proposed 132kv/400kv on-site Main Transmission Substation (MTS) And Associated Infrastructure near Dealesville, Boshof Magisterial District, Free State. Report prepared for SLR Consulting (South Africa) (Pty) Ltd. Muizenberg: ASHA Consulting (Pty) Ltd.
- Orton, J. 2021b. Heritage Impact Assessment: proposed 33 kv powerline near Dealesville, Boshof Magisterial District, Free State. Report prepared for SLR Consulting (South Africa) (Pty) Ltd. Muizenberg: ASHA Consulting (Pty) Ltd.
- Orton, J. 2022. Heritage Impact Assessment: Proposed Development of the Springhaas Solar PV Facilities Consisting of Nine New Solar PV Facilities and Associated Infrastructure near Dealesville in the Free State Province. Report prepared for ABO Wind renewable energies (Pty) Ltd. Muizenberg: ASHA Consulting (Pty) Ltd.
- Rightmire, P. 1978. Florisbad and Human Population Succession in Southern Africa. *American Journal of Physical Anthropology* 48: 475-486.
- SAHRA. 2007. Minimum Standards: archaeological and palaeontological components of impact assessment reports. Document produced by the South African Heritage Resources Agency, May 2007.
- Webley, L. 2010. Heritage impact assessment: proposed Southdrift Solar Farm, Free State. Unpublished report prepared for Environmental Resource Management. St James: ACO Associates cc.

APPENDIX 1 – Curriculum Vitae



Curriculum Vitae

Jayson David John Orton

ARCHAEOLOGIST AND HERITAGE CONSULTANT

Contact Details and personal information:

Address: 23 Dover Road, Muizenberg, 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 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.