APPENDIX G.6:

Heritage Impact Assessment (Archaeology and Cultural Heritage)

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HERITAGE SPECIALIST SCOPING REPORT INPUTS:

Scoping and Environmental Impact Assessment (EIA) Process for the Proposed Development of a Solar Photovoltaic Facility (Kudu Solar Facility 6) and associated infrastructure, near De Aar, Northern Cape Province

Report prepared for:	*Report prepared by:*
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List of Abbreviations

APHP: Association of Professional Heritage Practitioners
ASAPA: Association of Southern African Professional Archaeologists
BA: Basic Assessment
CSIR: Council for Scientific and Industrial Research
CRM: Cultural Resources Management
DEA&DP: Department of Environmental Affairs and Development Planning
DFFE: Department of Forestry, Fisheries and the Environment
DMRE: Department of Mineral Resources and Energy
EA: Environmental Authorisation
ECO: Environmental Control Officer
EGI: Electricity Grid Infrastructure
EIA: Environmental Impact Assessment
EMPr: Environmental Management Program
ESA: Early Stone Age
GPS: global positioning system
GP: General Protection
HA: Hectare
HIA: Heritage Impact Assessment
LSA: Later Stone Age
MSA: Middle Stone Age
NBKB: Ngwao-Boswa Ya Kapa Bokoni
NEMA: National Environmental Management Act (No. 107 of 1998)
NHRA: National Heritage Resources Act (No. 25 of 1999)
REDZ: Renewable Energy Development Zone
SAHRA: South African Heritage Resources Agency
SAHRIS: South African Heritage Resources Information System

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.
Holocene: The geological period spanning the last approximately 10-12 000 years.
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.
Patina: The weathered surface of an artefact which has changed colour and/or texture (patinated, patination).
Pleistocene: The geological period beginning approximately 2.5 million years ago and preceding the Holocene.

HERITAGE SCOPING

This report serves as the HERITAGE Scoping Report input that was prepared as part of the Scoping and Environmental Impact Assessment (EIA) Process for the proposed development of the Kudu Solar Photovoltaic (PV) Facilities and associated infrastructure, near De-Aar, Northern Cape Province.

1. Introduction

1.1 Scope, Purpose and Objectives of this Specialist Input to the Scoping Report

The Kudu project will entail the proposed development of up to 12 Solar PV Facilities, as well as associated infrastructure and EGI. The EGI components would be subjected to a separate Environmental Assessment process.

This report is intended to provide heritage input to the scoping report for the proposed PV projects. The report sets out the potential heritage impacts and identifies sensitive locations that should be avoided if possible. Separate reports have been compiled for each PV facility. This report covers the Kudu Solar Facility 6and associated infrastructure.

1.2 Details of Specialist

This specialist assessment has been undertaken by Dr Jayson Orton of ASHA Consulting (Pty) Ltd. He 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 A). 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.

In addition, a signed specialist statement of independence is included in Appendix B of this specialist input report.

1.3 Terms of Reference

The Terms of Reference (TOR) for the specialist study that will be completed during the EIA Phase of the project are noted in the Plan of Study for the EIA (Chapter 7 of the Scoping Report). The TOR for this Scoping Level Assessment is noted below:

- Describe regional and local heritage features;
- Conduct field survey to search for sensitive areas/sites;
- Map the sensitive features and provide spatial data to the developer;
- Assess the potential impacts on the environment on a high-level;
- Identify relevant legislation and legal requirements; and
- Provide recommendations on possible mitigation measures / management guidelines.

2. Approach and Methodology

The Scoping Inputs were undertaken based on the following approach:

- A site visit was carried out over four days (21, 22, 24 & 25 April 2022) to identify sensitive features that require avoidance or possibly mitigation. All finds were recorded by GPS (Garmin MAP62) and photography. Desktop research was also conducted to inform on the heritage context of the area.
- The site visit was in autumn after a summer of good rain and the grass cover was extensive. This affected ground visibility considerably. However, some bare patches of soil gave windows into the archaeology lying on the surface and general specialist knowledge suggests that these flat grassland environments are unlikely to have many, if any, sensitive sites on them.
- The potential impacts identified in this specialist study have been assessed based on the criteria and methodology outlined in Appendix E of this assessment.

2.1 Information Sources

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	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.

2.2 Assumptions, Knowledge Gaps and Limitations

- The study is carried out at the surface only and hence any completely buried archaeological sites will not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. The dense grass limited visibility of artefacts, but sensitive landscape features (e.g. rocky hills, farmsteads) where most heritage occurs in this landscape could still be easily identified and visited.
- It is assumed that development could be placed anywhere within the identified, assessed farm portions.
- The consideration and assessment of cumulative impacts is based on the list of other approved Wind and Solar PV projects as provided in the Chapter 7 of the Draft Scoping Report. These fall within 30 km of the study area. The assessment of cumulative impacts is limited by the quality and density of other heritage surveys which can be variable. Note that a high-level cumulative impact assessment was undertaken during Scoping, and will be supplemented in the EIA Phase.

2.3 Grading and sensitivity

It is intended under S.7(2) of the National Heritage Resources Act (No. 25 of 1999) (NHRA) that the various provincial authorities formulate a system for the further detailed grading of heritage resources of local significance, but this is generally yet to happen. SAHRA (2007) has formulated its own system[1] for use in provinces where it has commenting authority. In this system sites of high local significance are given Grade IIIA (with the implication that the site should be preserved in its entirety) and Grade IIIB (with the implication that part of the site could be mitigated and part preserved as appropriate) while sites of lesser significance are referred to as having 'General Protection' (GP) and rated as GP A (high/medium significance, requires mitigation), GP B (medium significance, requires recording) or GP C (low significance, requires no further action).

Sensitivity as discussed in this report is in terms of development on the site and is generally one level higher than the cultural significance as prescribed by the NHRA. For example, a heritage resource of medium or higher cultural significance would be seen as of high sensitivity for development, while a resource of low significance would be of medium sensitivity. Sites of very low cultural significance and all intervening areas would then be of low sensitivity for development.

3. Description of Project Aspects relevant to heritage

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

4. Baseline Environmental Description

4.1 Study Area Definition

The study area for all the proposed Kudu Solar Facilities is the full extent of the eight affected farm properties on which the proposed PV Facilities will be constructed. The full extent of these properties has been assessed in this study in order to identify environmental sensitivities and no-go areas. The total **study area** for all the Kudu Solar Facilities is approximately 8 150 hectares (ha).

At the commencement of this Scoping and EIA Process, the **Original Scoping Buildable Areas** were identified by the Project Developer. These **Original Scoping Buildable Areas** were identified following the completion of high-level environmental screening based on the Screening Tool.

As part of this Scoping Phase, the entire study area, which includes the Original Scoping Buildable Areas, have been assessed and considered in this report. The findings of the heritage specialist study are presented in this report.

Following the identification of sensitivities during the Scoping Phase, discussions with landowners and other considerations such as the capacities of the Bidding Window 6, the proposed projects were re-clustered and a total of up to 12 Solar PV Facilities are now being proposed. The Project Developer considered such sensitivities and formulated the **Revised Scoping Buildable Areas**. The **Revised Scoping Buildable Areas** will be used to inform the design of the layout and will be further assessed during the EIA Phase. A statement of the acceptability of the Revised Scoping Buildable Areas is provided in this report.

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

4.2 General Description

Full mapping of the heritage resources described below and listed in Table 1 is contained in Appendix C. Note that palaeontological impacts are considered by a separate specialist and reported on separately.

Table 2: *List of heritage resources recorded during the survey.*

Waypoint	Location	Description	Significance [Grade]
947	S30 11 13.0 E24 23 45.3	Farm complex on Wolwe Kuilen 42/rem. The house is early 20th century and it is in good condition (including inside). There are various outbuildings.	High
948	S30 09 40.1 E24 21 50.3	Gum trees, wind pump and reservoir – part of the cultural landscape	Low
949	S30 08 21.5 E24 22 20.5	Light scatter of well-patinated hornfels Middle Stone Age (MSA) flakes and blades and also one less patinated core located in an eroded area.	Very low [GPC]
950	S30 09 01.2 E24 21 30.2	Light scatter of well-patinated hornfels MSA flakes located in an eroded area.	Very low [GPC]
951	S30 08 34.6 E24 22 39.0	Line of gum trees, a wind pump, an old stone-lined low reservoir (derelict), a square plastered and white-washed reservoir and a newer corrugated iron and cement reservoir – individual heritage resources but also part of the cultural landscape.	Low
952	S30 08 22.9 E24 23 33.5	A cluster of gum trees with a corrugated iron reservoir under them – part of the cultural landscape.	Low
953	S30 08 03.5 E24 24 26.0	A small circular feature made of dolerite rocks and about 1.5 m in diameter. Very close by is a small cairn of dolerite rocks. Also seen here were a few fragments of dark bottle glass, the neck of a small cobalt blue bottle, two fragments of red-painted refined white earthenware and some wire. The site is presumably related to farming activity.	Medium [GPA]
954	S30 08 06.6 E24 24 32.1	A circular stone-walled feature of dolerite rocks and located on a low dolerite hill. The feature is about 2 m in diameter. It lies very close to the kraal at waypoint 955.	Medium [GPA]
955	S30 08 07.1 E24 24 31.9	A rectangular stone-walled feature measuring about 9 m by 20 m. It is very close to the circular feature at waypoint 954.	Medium [GPA]
956	S30 08 07.3 E24 24 31.7	A dolerite rock with a scratched motif on it.	Low [GPB]
957	S30 07 54.5 E24 24 50.2	These two points lie along the southern end of an approximately 5 km long dolerite stone wall that extends northwards along a dolerite dyke on Farm 209 ending at waypoint 959.	High [IIIB]
957B	S30 07 53.8 E24 24 46.2		
958	S30 07 53.8 E24 24 51.8	A lightly scraped geometric engraving. It is almost certainly not part of the geometric tradition rock art but looks quite recent.	Medium [GPA]
959	S30 07 53.1 E24 24 52.6	This point is at the northern end of the wall recorded under waypoint 957.	High [IIIB]
960	S30 07 53.3 E24 24 52.0	A dolerite rock with some scratches on it.	Very low [GPC]
961	S30 07 53.4 E24 24 51.9	Two historical scratched horse engravings and a few other images. The horses are identical in design, but the one is far smaller (and clearer) than the other. There is also a patch of multiple parallel lines that is very well patinated and must be far older.	Medium [IIIB]

Waypoint	Location	Description	Significance [Grade]
962	S30 08 23.9 E24 24 12.8	An isolated dolerite rock that looks like it has been used as a lower grindstone. The surface is lightly concave which presumably invited this use.	Very low [GPC]
963	S30 09 03.6 E24 23 16.6	Light scatter of well-patinated hornfels MSA flakes located in an eroded area.	Very low [GPC]
964A	S30 09 14.1 E24 23 25.6	These waypoints are the four corners of a U-shaped kraal located on the northern foot of a prominent hill. The open side of the kraal faces downhill and the entire structure is 33 m by 33 m.	Medium [GPA]
964B	S30 09 14.9 E24 23 25.6		
964C	S30 09 15.2 E24 23 24.5		
964D	S30 09 14.2 E24 23 24.4		
965	S30 09 16.3 E24 23 25.8	These waypoints represent the corners of two adjoining rectangular stone-walled kraals. The whole feature has ends of about 21 m (north) and 26 m (south), while its sides measure 50 m (west)and 44 m (east). The shared wall in the middle is 26 m long.	Medium [GPA]
965B	S30 09 16.1 E24 23 26.5		
965C	S30 09 16.8 E24 23 26.9		
965D	S30 09 17.1 E24 23 26.0		
965E	S30 09 17.8 E24 23 26.4		
965F	S30 09 17.4 E24 23 27.2		
966	S30 09 15.5 E24 23 25.8	There are two stone-walled features here. One is a small, circular feature less than 2 m across, while the other has two enclosures with the whole feature being about 5 m across. They are assumed to relate to farming activities and are located just north of the kraal at waypoint 965.	Medium [GPA]
967	S30 09 17.5 E24 23 25.4	Two stone-walled enclosures of about 2 m diameter each.	Medium [GPA]
968	S30 09 18.2 E24 23 25.0	A small stone cairn with two fragments of dark bottle glass alongside it.	Medium [GPA]
969	S30 09 18.9 E24 23 25.0	A small stone cairn. Feature apparently related to the Anglo-Boer War (ABW).	Medium [GPA]
970	S30 09 19.6 E24 23 25.1	A small stone cairn. Feature apparently related to the ABW.	Medium [GPA]
971	S30 09 19.7 E24 23 25.1	An elongated pile of stones. Feature apparently related to the ABW.	Medium [GPA]
972	S30 09 20.1 E24 23 25.4	A small stone cairn on a flat dolerite outcrop. Feature apparently related to the ABW.	Medium [GPA]
973	S30 09 20.6 E24 23 25.2	An elongated pile of stones. Feature apparently related to the ABW.	Medium [GPA]
974	S30 09 21.0 E24 23 25.2	An elongated pile of stones. Feature apparently related to the ABW.	Medium [GPA]
975	S30 09 21.2 E24 23 25.5	A small stone cairn. Feature apparently related to the ABW.	Medium [GPA]
976	S30 09 21.2 E24 23 25.1	A small stone cairn. Feature apparently related to the ABW.	Medium [GPA]
977	S30 09 21.7 E24 23 25.1	A small stone cairn. Feature apparently related to the ABW.	Medium [GPA]
978	S30 09 19.1 E24 23 15.0	The overgrown and much degraded remains of an earthen walled dam with a few stones present on the ground at 978 and a slight earth mound present at 978B and 978C.	Very low [GPC]
978B	S30 09 18.5 E24 23 14.2		

Waypoint	Location	Description	Significance [Grade]
978C	S30 09 19.7 E24 23 13.3		
979	S30 09 18.9 E24 23 15.0	Light scatter of moderately well-patinated MSA hornfels flaked stone artefacts.	Very low [GPC]
980	S30 09 48.7 E24 22 15.6	A row gum trees with other older trees and a corrugated iron reservoir nearby. Part of the cultural landscape.	Low
981	S30 09 45.7 E24 22 17.3	Ephemeral scatter of well-patinated hornfels MSA flakes located in an eroded area.	Very low [GPC]
982	S30 11 08.7 E24 21 35.8	Some trees and a reservoir. Part of the cultural landscape.	Low
983	S30 11 22.8 E24 18 16.7	A large farm outbuilding and two ruined labourers' cottages that are likely more than 60 years old. They are on Portion 5 of Graspan 40, outside the study area. There is also one more recent cottage. These are on a neighbouring farm and were not visited.	Medium
984	S30 11 09.9 E24 23 47.8	Light scatter of well-patinated hornfels MSA flakes as well as a few less patinated ones and some quite fresh ones. The latter are LSA. The artefacts are located in an eroded area with plenty of hornfels gravel at the foot of a dolerite hill.	Very low [GPC]
985	S30 11 10.5 E24 23 53.6	The poorly preserved remains of a stone-walled kraal measuring about 18 m by 37 m and located on the foot of a dolerite hill. Although the site was not examined in detail, some glass, ceramics and metal fragments were seen.	Low [GPB]
986	S30 11 11.3 E24 23 55.5	This is the foundation of a small (presumably) house made of dolerite rocks but with a brick and cement portion built on to the southern side. It is located very closer to the kraal at waypoint 985. Although the site was not examined in detail, some glass, ceramics and metal fragments were seen.	Medium [GPA]
987	S30 11 08.2 E24 23 56.3	A scraped engraving on top of a dolerite hill. It looks quite recent and relatively casually done. Might be lettering but cannot tell.	Very low [GPC]
988	S30 11 07.5 E24 23 55.9	A circular enclosure of about 3.5 m by 2.5 m located on the summit of a dolerite hill. It is just a low wall of informally piled stones. No associated artefacts seen so cannot tell if this is historical or precolonial.	Low [GPB]
989	S30 11 07.2 E24 23 55.8	A circular enclosure of about 1 m diameter located on the summit of a dolerite hill. It looks like informally piled stones but could also be badly tumbled. The walling is far more substantial than that at waypoint 988 No associated artefacts seen so cannot tell if this is historical or precolonial.	Low [GPB]
990	S30 11 10.1 E24 24 00.2	Ephemeral scatter of well-patinated hornfels MSA flakes as well as some quite fresh ones. The latter are LSA. The artefacts are located in an eroded area with plenty of hornfels gravel at the foot of a dolerite hill.	Very low [GPC]
991	S30 12 03.3 E24 23 13.1	Some gum trees and a reservoir. Part of the cultural landscape.	Low
992	S30 11 15.1 E24 23 30.6	A rectangular earthen feature measuring 18 m by 24 m. It is barely visible on the ground but is clear on aerial photography. It may have been a low dam but there are no stones on the walls and no wind pump nearby.	Very low [GPC]

Waypoint	Location	Description	Significance [Grade]
993	S30 11 10.7 E24 23 30.0	This is a scatter of patinated MSA hornfels artefacts in a disturbed area. There are heavily patinated and somewhat less patinated artefacts indicating that not all come from the same time.	Very low [GPC]
994	S30 11 20.6 E24 21 49.2	An ephemeral scatter of well-patinated MSA hornfels artefacts located in the jeep track below powerlines.	Very low [GPC]
995	S30 11 48.6 E24 21 23.7	An ephemeral scatter of well-patinated MSA hornfels artefacts located in the jeep track below powerlines.	Very low [GPC]
996	S30 11 49.9 E24 21 59.1	Some gum and Karee trees and a reservoir. Part of the cultural landscape.	Low
997	S30 11 47.4 E24 22 01.2	An ephemeral scatter of well-patinated MSA hornfels artefacts located in a denuded area.	Very low [GPC]
998	S30 11 29.7 E24 22 52.1	This is an area with windrows as well as a fruit orchard (quince, prickly pear and probably peach trees) as well as a grove of Soutbos. There is a stone-lined dam (marked as waypoint 999) and some wind pumps and a corrugated iron reservoir. Part of the cultural landscape.	Low
999	S30 11 28.2 E24 22 50.6	This is the stone-lined dam noted under waypoint 998.	
1000	S30 11 18.4 E24 22 07.5	Ephemeral scatter of well-patinated hornfels MSA flakes located in an eroded area.	Very low [GPC]
1001	S30 13 01.1 E24 21 55.9	Some trees, a corrugated iron reservoir and a wind pump. Part of the cultural landscape.	Low
1002	S30 13 32.8 E24 22 02.6	Some trees and a reservoir. Part of the cultural landscape.	Low
1003	S30 13 55.1 E24 21 30.5	An old prickly pear orchard located very far from any farm buildings. Part of the cultural landscape.	Low
1004	S30 13 52.7 E24 20 48.4	A light scatter of fresh hornfels flaked stone artefacts and some ostrich eggshell fragments at the northern foot of a dolerite hill (Basberg). Unknown how extensive it is due to dense grass. These finds were in a pathway.	Low [GPB]
1005	S30 12 01.4 E24 20 19.0	Some trees, a corrugated iron reservoir and a wind pump. Part of the cultural landscape.	Low
1006	S30 11 53.4 E24 19 44.3	A cluster of gum trees. Part of the cultural landscape.	Low
1007	S30 11 33.2 E24 18 22.3	A farmstead on Portion 5 of Graspan 40, outside the study area. It was not visited. The house looks to be early 20th century.	High
1008	S30 14 30.9 E24 19 35.9	The oldest-looking of a set of three different labourers' cottages. It is in poor condition and is probably early-mid-20th century.	Low
1009	S30 17 32.6 E24 20 50.6	Mixed age hornfels artefacts exposed along the edge of a borrow pit. Some artefacts were seen to have some calcrete adhering and the patination varied from well-patinated red to only lightly patinated grey.	Very low [GPC]
1010	S30 16 13.1 E24 19 54.9	Ephemeral scatter of well-patinated hornfels MSA flakes located in an eroded area.	Very low [GPC]
1011	S30 16 10.6 E24 19 41.7	Ephemeral scatter of well-patinated hornfels MSA flakes located in an eroded area.	Very low [GPC]
1012	S30 16 15.8 E24 19 04.5	Some gum trees, a corrugated iron reservoir and a wind pump. Part of the cultural landscape.	Low
1013	S30 15 28.9 E24 19 35.7	Some trees, a corrugated iron reservoir and a wind pump. Part of the cultural landscape.	Low
1014	S30 15 21.0 E24 20 07.6	A large willow tree, a corrugated iron reservoir and a wind pump. Part of the cultural landscape.	Low

Waypoint	Location	Description	Significance [Grade]
1015	S30 14 35.8 E24 19 46.5	An earthen-walled dam with a few stones along its crest at one point.	Very low
1016	S30 14 36.0 E24 19 49.5	An area of 25 m diameter on a low dolerite hill with many historical/recent engravings. They include indistinguishable scratches and motifs, horses, ostriches and writing. One rock has the date “5 Sep 1926” and the name “Jacobus Grabe (likely) Badenhorst” in cursive writing. It also has “E. ROBINSON” and a large stylised ostrich scratched on it. Another rock has two ostriches, one with a shaded body, while two others have stylised horses scratched on them. The site has been allocated a grade despite the date of 1926, since it is easily possible that the engravings were made over a long period of time and some may be older than 100 years. Either way, the site demonstrates a connection with intangible heritage through its continuation of the engraving tradition. The same applies to all the rock engravings recorded below.	Medium-High [IIIB]
1017	S30 14 37.1 E24 19 50.9	This is another area on the same low hill as waypoint 1016 but it is about 10 m in diameter. It includes a checkered motif made in a cross shape with some squares having an X in them, along with several other geometric and indeterminate scratched motifs.	Medium [GPA]
1018	S30 14 38.1 E24 19 51.3	This is another area on the same low hill as waypoint 1016 but it is about 5 m in diameter. The engravings here include a stylised horse which is somewhat patinated and could be older than the rest, a geometric motif similar to a Nine Men’s Morris board, a set of three columns of 8, 9 and 10 short lines respectively, and some indeterminate scratches/motifs.	Medium-High [IIIB]
1019	S30 14 38.8 E24 19 51.5	Further along the same hill as waypoint 1016, a scratched very stylised horse with several other indeterminate scratches over and around it.	Medium [GPA]
1020	S30 14 39.8 E24 19 52.7	Further along the same hill as waypoint 1016, an indeterminate scratched geometric motif.	Low [GPB]
1021	S30 14 40.3 E24 19 52.7	Further along the same hill as waypoint 1016, an indeterminate scratched motif.	Low [GPB]
1022	S30 14 38.7 E24 19 48.9	Various scratched rocks with one image being an animal with the top of its body drawn far higher than it should be.	Low [GPB]
1023	S30 14 27.5 E24 19 26.2	The Basberg farm complex (on Bas Berg 88) has an assortment of structures of varying age. The main house is in very good condition and looks to be early-mid-20th century. A large barn made from clay bricks is probably a little older, as is a very small structure with two doors and an internal hearth. Right outside it is a pole with several hooks on it (possibly for hanging hunted animals). A werf wall of dolerite cobbles runs round the back of the main house.	Medium-High
1024	S30 14 27.7 E24 19 24.4	A large ash and rubbish midden measuring about 35 m long and about 10-20 m wide. It is on sloping ground. The waypoints are near each end. There is plenty of glass and ceramics as well as various types of metal (iron, copper and a grey metal, possibly pewter) and much bone. There are also rock and brick fragments present. Among the ceramics there is	Medium-High [IIIB]
1024B	S30 14 28.1 E24 19 23.5		

Waypoint	Location	Description	Significance [Grade]
		some stoneware but the vast majority of pieces are refined white earthenware including hand-painted, sponge-printed, transfer printed in various colours, lined industrial). The glass includes various colours (pink, clear, dark green, brown, black) and various forms (wine, medicine). The material probably does not go back beyond the late 19th century. A large scraper on a dolerite flake was also noted.	
Waypoints 1025-1033 are all on the hill immediately behind (south of) the Basberg farm house.			
1025	S30 14 28.2 E24 19 23.3	A poorly preserved and possibly unfinished engraving that looks like a horse. Only the top of the head, neck back and tail and back legs are present.	Medium [GPA]
1026	S30 14 29.6 E24 19 24.2	Some historical scratched engravings on the side of the hill. One rock has a geometric form similar to the one at waypoint 1018 (Nine Men's Morris-like) with "AS 1948" or "1968" scratched over it. A second rock has what looks like a Nine Men's Morris board with another geometric scratched over it. A third rock includes a probable horse (its head is unclear) with some geometric marks over it.	Medium [GPA]
1027	S30 14 31.5 E24 19 25.3	A rock at the top of the hill with some indeterminate historical scratches on it.	Very low [GPC]
1028	S30 14 31.5 E24 19 26.4	A rock with various indeterminate motifs as well as a fair bit of writing. Among the writing can be seen a date of "25 MAY '30" and another with "5 1940" written below the word/name "BABS".	Medium [GPA]
1029	S30 14 31.1 E24 19 26.5	This is a set of rocks at the top of the hill with various mostly scraped initials on various horizontal and vertical faces and also a scraped cross with a backdrop of vertical scratched lines.	Medium [GPA]
1030	S30 14 31.6 E24 19 27.1	Another set of rocks at the top of the hill with various historical and (probably mostly) quite recent scratched names and motifs. Included are the names "ANDRE" and "IAN" as well as "A+D" and a heart.	Medium [GPA]
1031	S30 14 32.6 E24 19 28.2	A rock at the top of the hill with some indeterminate historical scratches on it.	Very low [GPC]
1032	S30 14 32.1 E24 19 28.5	A rock at the top of the hill with some indeterminate historical scratches on it.	Very low [GPC]
1033	S30 14 31.7 E24 19 28.5	A rock on the side of the hill with an indeterminate geometric historical motif on it.	Very low [GPC]
1034	S30 14 30.6 E24 19 32.3	A dolerite cobble and cement kraal with an adjoining shed. The cement is fairly modern so likely early-mid-20th century.	Medium
1035	S30 15 01.9 E24 18 22.9	Ephemeral scatter of well-patinated hornfels MSA flakes located in an eroded area.	Very low [GPC]
1036	S30 15 05.6 E24 18 14.1	Ephemeral scatter of well-patinated hornfels MSA flakes located in an eroded area.	Very low [GPC]
1037	S30 14 25.7 E24 19 20.0	A dolerite rock away from the foot of the hill with some historical scratches on it. There is also a small amount of building rubble in the grass here but no evidence of any foundation or walling.	Very low [GPC]
1038	S30 14 26.7 E24 19 17.1	A heavily overgrown (with grass) graveyard to the west of the Basberg fam complex. It is impossible to count the graves. There is one double grave for "HENDRIK JOHANNES CHRISTIAN HANEKOM" who lived from 1833 to 1907 and his wife "HENDRINA JOHANNA" who died in 1901 (birth date illegible) and	High [IIIA]

Waypoint	Location	Description	Significance [Grade]
		whose maiden name was Badenhorst. These may be the parents of the Badenhorst who left his name at waypoint 1016. Another grave has a stone lying loose on top of it with much cursive writing on it. It is very difficult to read but bears dates that look like 1826 and 1891 near the base. The name “Badenhorst” also appears near the top and at the very base of the stone. There are several graves that only have dolerite cobbles packed over them.	
1039	S30 14 28.5 E24 19 17.7	Occasional fresh hornfels LSA artefacts can be seen in the grass here but it is impossible to determine how extensive or dense the scatter might be.	Low [GPB]
1040	S30 14 32.1 E24 19 17.0	An area at the foot of the hill had many large dolerite flakes of the sort that would be expected from stone dressing. Along this area it is apparent that stones have been moved to the side to create a roadway	Very low [GPC]
1041	S30 14 35.0 E24 19 18.5	This is an engraving of a single animal, likely an eland. It is somewhat stylised with a very small hump and a nose that ends in a point. The rump is also pointing upwards rather than being square. It is somewhat patinated and poorly preserved and lies halfway up the hill.	Medium-High [IIIB]
1042	S30 14 35.5 E24 19 20.2	A rock at the top of the hill with a ground patch and some scratches on it.	Very low [GPC]
1043	S30 14 36.2 E24 19 20.8	A rock at the top of the hill with a ground patch on it.	Very low [GPC]
1044	S30 14 37.8 E24 19 20.7	A boulder right on the edge of the hilltop has a number of scraped engravings on its vertical face that faces onto the hill. The engravings look quite fresh but yet are poorly preserved. There seem to be two ostriches towards the right, but the rest are difficult to tell the species of. A large flake of dolerite on top of the boulder has been used as a rock gong and makes a fairly high-pitched sound.	High [IIIA]
1045	S30 14 38.5 E24 19 21.9	A rock at the top of the hill with a ground patch on it.	Very low [GPC]
1046	S30 14 40.2 E24 19 22.1	A rock at the top of the hill with a ground patch and two pecked areas on it.	Very low [GPC]
1047	S30 14 42.2 E24 19 24.2	A rock at the base of the hill with a ground patch on it.	Very low [GPC]
1048	S30 14 49.2 E24 18 57.8	Ephemeral scatter of well-patinated hornfels MSA flakes located in an eroded area.	Very low [GPC]
1049	S30 14 44.6 E24 18 57.6	A sheep dip made with dolerite and grey cement and likely to date to the early-mid-20th century. There are two square enclosures with the dip in between. The enclosure from which the sheep enter the dip has a stone and cement floor, while the other enclosure has an earth floor.	Low
1050	S30 14 26.2 E24 19 26.1	This is a pair of historical gate posts at the Basberg farm complex and which stand on either side of a public road.	Medium
Waypoints 1051 to 1056 are a historical farm complex. The grass in this area was very dense and it is likely that other features may have been missed. Notably, no graves were found and it seems likely that some must be present.			
1051	S30 11 49.0 E24 17 46.9	An early-mid-20th century ruined building with dressed stone halfway up the walls and red clay bricks above. Grey cement has been used throughout. The brick	Low [GPB]

Waypoint	Location	Description	Significance [Grade]
		section was plastered but much of the plaster has peeled off. The joinery is metal, including the door which has fallen off. The roof is missing.	
1052	S30 11 48.4 E24 17 47.3	Two parallel and conjoined rectangular enclosures. One measures about 8 m by 18 m and is only one stone high. The second one to the east is about 6 m by 18 m. On site only the larger enclosure was seen, such was the density of the grass, with the second identified only from aerial photography. The walls are made from stones (two skins and rubble fill).	Medium [GPA]
1053	S30 11 48.4 E24 17 46.8	This is the remains of a house of about 11 m by 20 m. A dressed stone plinth is present, and a semi-circular cement step has been built onto the eastern side. There are many broken red frog bricks and it is evident that both grey cement and mud mortar were used in the construction. The cement may have been added at a later date.	Medium [GPA]
1054	S30 11 47.1 E24 17 46.8	This is a stone wall of about 100 m length running parallel to the road through the farm complex. The wall is a row of single boulders usually in the order of 0.3 to 0.5 m in diameter.	Medium [GPA]
1054B	S30 11 47.1 E24 17 48.2		
1054C	S30 11 46.8 E24 17 48.1		
1054D	S30 11 48.0 E24 17 44.9		
1055	S30 11 46.7 E24 17 48.6	A long feature of about 22 m with the southern part being about 3 m wide and made of bricks (though no in situ bricks could be seen) and the northern part being 5 m wide and of stone.	Medium [GPA]
1056	S30 11 46.2 E24 17 46.6	A stone kraal complex with maximum length of about 39 m by 19 m. There are three enclosures with two smaller ones to the east and one larger one to the west.	Medium [GPA]
1057	S30 11 46.4 E24 17 44.3	Four boulders on a dolerite hill with various inscriptions as follows: “STEPHANUS”, “CNEL”, an undiscernible name (well preserved but lettering is not clear) with “1898” below it and another illegible name.	Medium-High [IIIB]
1058	S30 11 49.6 E24 17 40.0	A cluster of trees, a corrugated iron reservoir, a wind pump and some wire enclosures. Part of the cultural landscape, but directly associated with the historical farm complex.	Medium
1059	S30 11 41.7 E24 17 38.2	A rock with scratched writing on it. Among other things, it includes “JLVV” and “4de oet 07”	Medium-High [IIIB]
1060	S30 11 31.2 E24 17 16.8	Ephemeral scatter of well-patinated hornfels MSA flakes located in an eroded area.	Very low [GPC]
1061	S30 11 42.8 E24 17 03.1	Three ground rocks on a dolerite outcrop.	Very low [GPC]
1062	S30 11 42.0 E24 17 03.3	A Nine Men’s Morris board has been lightly scratched onto a rock and there is a ground rock here too.	Very low [GPC]
1063	S30 11 41.4 E24 17 03.7	Two ground rocks and a set of five parallel scratched lines that are between 35 and 45 mm long and a few mm apart from each other. The scratches are likely more recent, possibly less than 100 years old.	Low [GPB]
1064	S30 11 40.8 E24 17 04.1	There are several ground rocks on a dolerite outcrop here.	Very low [GPC]
1065	S30 11 40.1 E24 17 04.5	One ground rock on a dolerite outcrop.	Very low [GPC]

Waypoint	Location	Description	Significance [Grade]
1066	S30 11 56.8 E24 17 22.8	A small beacon of dolerite rocks on a small dolerite outcrop.	Very low [GPC]
1067	S30 11 54.0 E24 17 36.5	A 400 m long berm runs from northwest to southeast. Its function could not be ascertained.	Very low [GPC]
1067B	S30 12 02.0 E24 17 48.1		
1068	S30 11 51.8 E24 17 50.1	There are two stone-lined dams here that are built end to end and share a short side. They seem well-preserved but are very overgrown and impossible to photograph. They are directly related to the adjacent historical farmstead.	Low [GPB]
1069	S30 11 51.2 E24 17 47.2	This is a concrete plinth that seems like the foundation for a pump. It is likely mid-20th century in age.	Very low [GPC]
1070	S30 11 51.5 E24 18 35.8	A cluster of gum trees and a corrugated iron reservoir. Part of the cultural landscape.	Low
1071	S30 12 09.4 E24 19 22.5	An ephemeral scatter of hornfels stone artefacts with variable patina were found in a denuded area with exposed calcrete. Included is a large, circular scraper.	Very low [GPC]
1072	S30 14 18.1 E24 19 24.2	Several large pepper trees occur alongside the road just north of the Basberg farm complex. These are part of the cultural landscape.	Medium
1073	S30 14 33.1 E24 19 34.0	Two boulders with pecked and scraped engravings of animals. They look historical/recent.	Low [GPB]
1074	S30 14 33.4 E24 19 33.8	Some stone walling running along just below the summit of a dolerite hill. Its function is indeterminate. There is also a boulder with “AS” scratched onto it as well as what looks like an incomplete Nine Men’s Morris board.	Low [GPB]
1075	S30 18 07.5 E24 21 27.3	These three points are at the ends of three walls that divide two U-shaped kraal enclosures on the side of a dolerite hill. The total kraal measures about 50 m by 76 m. The lowest sides (towards the northeast) have no walls present. A few hornfels flakes (probably LSA), some glass and soe transfer-printed ceramics were also seen here.	Medium [GPA]
1075B	S30 18 08.0 E24 21 28.4		
1076	S30 18 08.6 E24 21 29.8		
1077	S30 18 14.2 E24 21 29.7	These six points outline a kraal with three enclosures. The one is about 36 m by 16 m, while the other two are each about 26 m by 14 m. The latter two share a long side, while the first one shares one of its short sides with the other two.	Medium [GPA]
1077B	S30 18 14.6 E24 21 28.9		
1077C	S30 18 15.4 E24 21 29.3		
1077D	S30 18 15.0 E24 21 30.2		
1077E	S30 18 15.8 E24 21 28.0		
1077F	S30 18 15.4 E24 21 27.8		
1078	S30 18 25.1 E24 21 30.0	This is a small brick cottage that lies outside the study area and was not visited. It looks from a distance to be in ruin.	Medium [GPA]
1079	S30 18 17.8 E24 21 22.3	This is an old road alignment that has a telephone wire strung alongside it. The road is only represented by a slight indentation in the ground.	Very low [GPC]
1080	S30 19 14.9 E24 21 34.6	This is an earthen-walled reservoir and wind pump just outside the study area.	Low

4.2.1 Archaeology

The survey revealed very few significant heritage resources in the flat grasslands, and no Stone Age ones. The only archaeological materials seen here were ephemeral scatters of weathered and patinated hornfels artefacts (e.g. Figures 1 & 2). These would be Pleistocene-aged artefacts that originate in the Middle Stone Age (MSA). These kinds of artefacts are widespread and of very low cultural significance. They are generally regarded as background scatter artefacts rather than originating from a particular occupation site. Some areas had artefacts with variable degrees of patination indicating variable age (e.g. Figures 3 & 4). Fresh, black hornfels artefacts that would date to the Holocene Later Stone Age (LSA) were almost entirely absent. The main exception was an ephemeral scatter of hornfels flakes and ostrich eggshell fragments at the northern foot of the hill known as Basberg (Figure 5). It is highly likely that other LSA scatters do occur in the area but have been concealed by the long grass. They would, however, almost certainly all be associated with landscape features such as hills and water sources. No Early Stone Age (ESA) material was seen.

Figure 1: *Stone artefacts from waypoint 949. Scale = 70 mm.*

Figure 2: *Stone artefacts from waypoint 994. Scale = 70 mm.*

Figure 3: *Artefacts displaying variable patination at waypoint 1071. The inset shows the dorsal surface of the large circular scraper at the left end of the main image. Scale = 70 mm.*

Figure 4: *Artefacts displaying variable patination at waypoint 1009. Scale = 70 mm.*

Figure 5: *LSA artefacts and ostrich eggshell fragments from waypoint 1004. Scale = 70 mm.*

The next type of Stone Age resource is rock engravings. These are commonly found on dolerite boulders and this study area was no exception. There were relatively few definite Stone Age engravings, however, with the bulk being historical. Nevertheless, the latter are rooted in the Stone Age and indicate a continuation of this long-standing tradition.

The most important Stone Age site found during this survey was at waypoint 1044. It is a dolerite outcrop with a fractured boulder. On one face of the boulder there are various animal engravings, while a thin wedge on the top was a rock gong. Rock gongs are rare but persistent sites across the central Karoo. The site is located on the very edge of the top of a low dolerite hill (Figures 6 & 7). This is a typical location. The engravings were done largely in the scraped style, but one image may be pecked. There are at least two, and possibly three, birds as well as three or four other animals, all but one of which face towards the right (Figure 8). The boulder had fractured naturally in such a way as to produce a wedge-shaped section perched on top of the main mass of the boulder. This section produced a good ring when struck on its thin edge. A number of striking points can be seen along this edge (Figure 9). Other engravings thought to be LSA and in variable states of preservation were seen at waypoints 1025, 1041 and 1016 (Figures 10 to 12).

Figure 6: *View of the fractured boulder at waypoint 1044. The engravings are facing the viewer.*

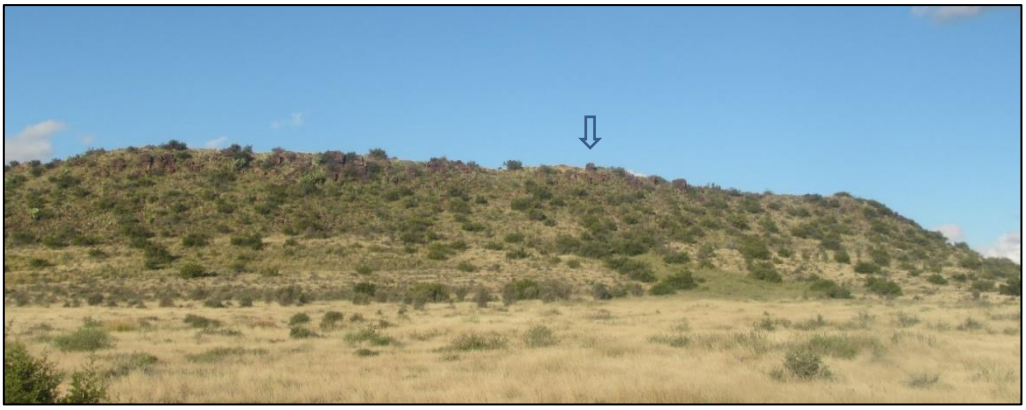


Figure 7: *View towards the east showing the boulder at waypoint 1044 (arrowed) on the western edge of the hill.*

Figure 8: *Rock engravings at waypoint 1044.*

Figure 9: *Rock gong at waypoint 1044.*

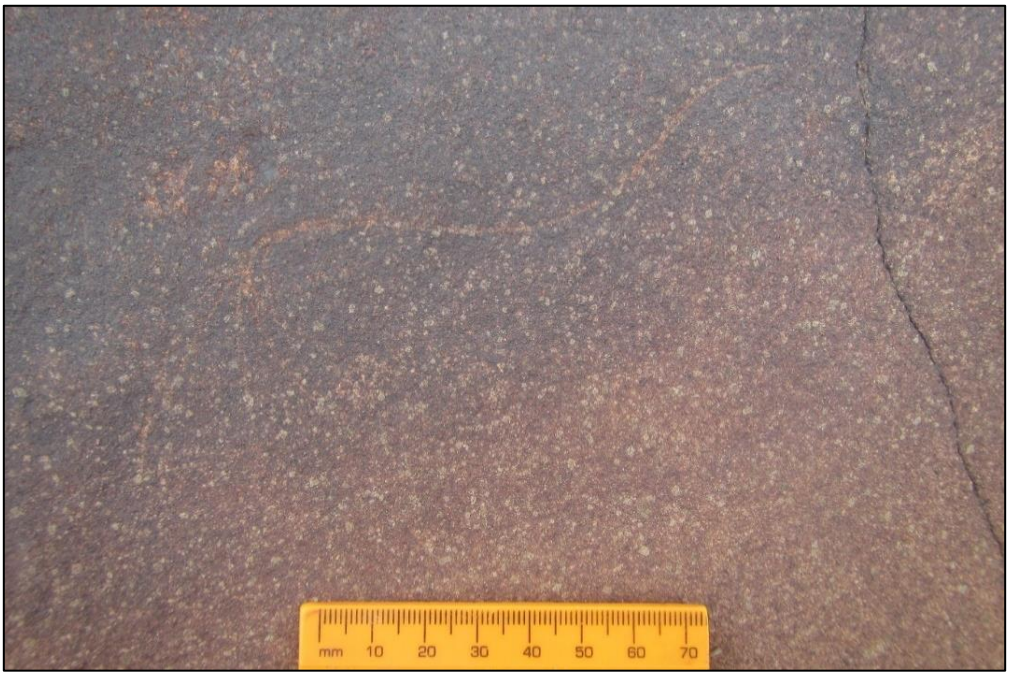


Figure 10: *A fine-line engraving showing a clear spine and tail but little else at waypoint 1025.*

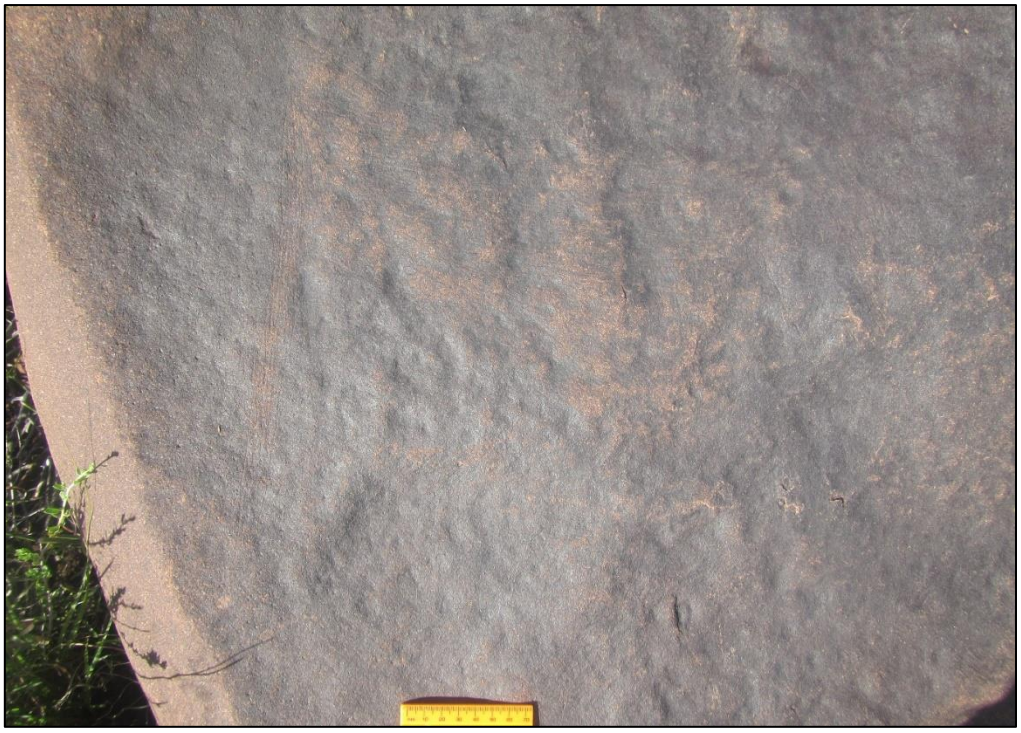


Figure 11: *A scraped and scratched animal engraving at waypoint 1041. Scale = 70 mm.*

Figure 12: *A scraped animal engraving at waypoint 1016. Scale = 70 mm.*

The engraving tradition continued into historical times with horses being a common theme in the central Karoo. Two stylised horses were seen at waypoint 1016 (Figures 13 & 14) along with an ostrich (Figure 15) and various other scratches (Figures 16 to 18). This site also included names such as “Jacobus Grabe” and “BadenHorst” as well as the date “5 Sep 1926”. At another area (waypoint 1057) some names and a date were also inscribed. Clearly legible were “Stephanus”, CNEL” and “1898” (Figure 21). Figures 22 to 27 show a variety of other historical engravings, some of which are certainly younger than 100 years and thus not technically archaeology. They can be considered as places linked with intangible heritage in that they demonstrate the continuation of a long-standing tradition in the Karoo. These sites include further

dates. One says “1948” (waypoint 1026; Figure 23), another rock has “25 May ‘30” and “1940” (waypoint 1028; Figure 25).

Figure 13: *A stylised horse engraving at waypoint 1016. Scale = 70 mm.*

Figure 14: *A stylised horse engraving at waypoint 1016. Scale = 70 mm.*

Figure 15: *An ostrich engraving at waypoint 1016. Scale = 70 mm.*

Figure 16: *Various scratches at waypoint 1016. Scale = 70 mm. Boxed area shown in Figures 19 & 20.*

Figure 17: *Various scratches at waypoint 1016. Scale = 70 mm.*

Figure 18: *Various scratches at waypoint 1016. Scale = 70 mm.*

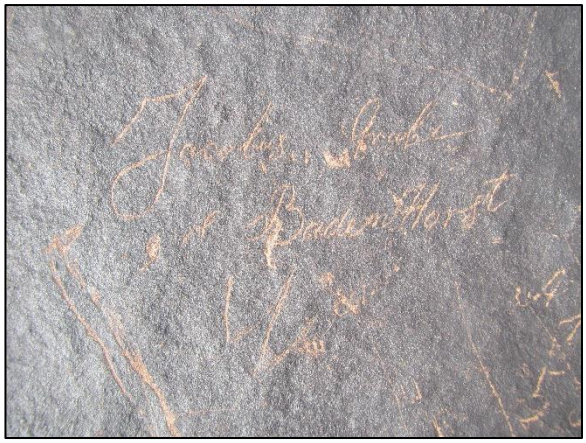


Figure 19: *Names at waypoint 1016.*

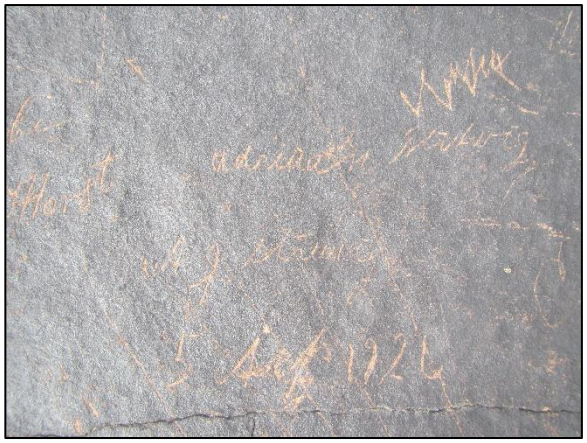


Figure 20: *Names and a date at waypoint 1016.*

Figure 21: *Name and date at waypoint 1057. Scale = 70 mm.*

Figure 22: *Crude scratched image at waypoint 1022. Scale = 70 mm.*

Figure 23: *Initials and date at waypoint 1026. Scale = 70 mm.*

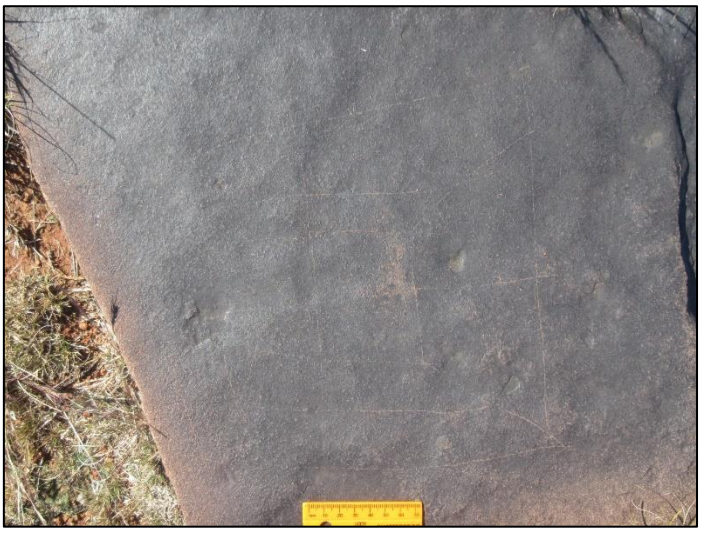


Figure 24: *A Nine Men's Morris board at waypoint 1062. Scale = 70 mm.*

Figure 25: *Rock with many scratches, names and dates at waypoint 1028. Scale = 70 mm.*

Figure 26: *Cross on a background of vertical scratches at waypoint 1029. Scale = 70 mm.*

Figure 27: *Initials at waypoint 1029. Scale = 70 mm.*

Ephemeral stone-built features were also seen in a few places and could date to the LSA. An example was on top of a prominent hill at waypoint 988 (Figure 28), although there were no artefacts present at all to hint at whether this site was LSA or historical. Very nearby on the same hilltop, however, was a far bulkier stone circle which is almost certainly historical but which, again, had no accompanying artefacts (Figure 29). A very unusual feature – because of its location on flat grasslands but with exposed dolerite in close proximity – was a small stone circle at waypoint 953 (Figure 30). This site also had some historical artefacts present to confirm that it was indeed a historical site (Figure 31).

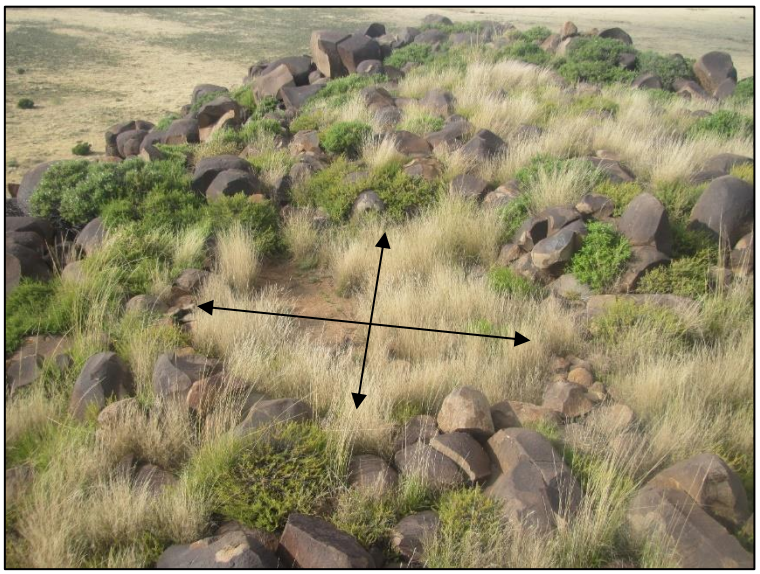


Figure 28: *An ephemeral stone circle (indicated by arrows) on a hill at waypoint 988.*

Figure 29: *A prominent stone circle on a hill at waypoint 989.*

Figure 30: *Stone circle on flat ground at waypoint 953.*

Figure 31: *Refined white earthenware, glass and wire at waypoint 953.*

A low dolerite ridge in the far north-eastern corner of the study area revealed several stone-walled sites. These included the circle at waypoint 953 described above, as well as another small stone circle (no artefacts seen in the very long grass; Figure 32), a kraal (Figure 32) and a very long stone wall that extends

from just inside the study area some 5 km northwards. This must have been a boundary wall in the earliest days of farming here.

Figure 32: *Small stone circle in the foreground at waypoint 954 and a stone-walled kraal in the background at waypoint 955.*

Figure 33: *View along one of the kraal walls at waypoint 955.*

Figure 34: *Stone waling running north along the dolerite ridge at waypoint 957.*

Figure 35: *Stone waling running west at waypoint 957B across the farm boundary.*

Another prominent hill in the northern part of the study area is known locally as *Kaaimanskop*. It is the southernmost expression of the above-mentioned dolerite ridge. This hill is about 30 m high and has many stone-built features on it. Two kraals occur on the lower, northern end of the hill and a smaller site with one small circular enclosure and a second adjoining feature with two small enclosures lies very close by (Figure 36). Scattered over the top of the hill were a number of far smaller features said by the landowner to relate to the Anglo-Boer War. This is indeed a very likely interpretation with the features built to conceal just one or two soldiers (Figures 37 to 39).

Figure 36: *Stone walled features at waypoint 966 on Kaaimanskop.*

Figure 37: *Stone feature at waypoint 968.*

Figure 38: *Stone feature at waypoint 975.*

Figure 39: *Stone feature at waypoint 973.*

Other historical archaeological sites related directly to farmsteads, either long-abandoned and ruined or else, in one case, still in use. Very close to the current Wolwekuil farmstead on the remainder of Farm 42 is a long-abandoned and demolished farmstead at the southern foot of a prominent hill. A stone and brick house foundation is present (Figure 40). The house would have been built of brick. It is possible that the bricks were removed and reused elsewhere on the farm after the house fell into disuse. Alongside the house foundation is a large stone-walled kraal with very few stones left. Once more, it is likely that the stones were removed and reused elsewhere. Another abandoned farm complex lies on Portion 2 of Farm 40. This farmstead is almost entirely archaeological with just a single relatively modern, but ruined, structure being present. All the other features are only present as remnant stone walling, the best preserved of which is a kraal built from dolerite cobbles and boulders (Figure 41). Other features likely including a house with stone plinth and remnants of brick walls (waypoint 1053) and outbuildings (waypoints 1052 & 1055) were present along with two adjoining stone-lined dams (waypoint 1068). The engraved date of 1898 (see Figure 21) is very close to this farmstead.

Figure 40: *House foundation at waypoint 986.*

Figure 41: *Stone-walled kraal at waypoint 1056.*

Another type of historical archaeological site was found at the Basberg farmstead. This was a large ash and rubbish dump and was the only such feature found in the study area. The dump was very large, extending over some 35 m along the base of a dolerite hill (Figure 42). Although not very dense in terms of cultural materials, there are still many such items because of the overall size of the site. Figures 43 to 46 show examples of the artefacts. They are all typical of the latter half of the 19th century and certainly predate the current main farmhouse. In addition to ceramics and glass, there was also metal and bone as well as a stone scraper made on a dolerite flake.

Figure 42: *An ash and rubbish dump at the Basberg farmstead at waypoint 1024.*

Figure 43: *Some refined white earthenwares from the dump at waypoint 1024. Scale = 70 mm.*

Figure 44: *Some refined white earthenwares from the dump at waypoint 1024. Scale = 70 mm.*

Figure 45: *Some glass and ceramics and a metal item from the dump at waypoint 1024. Scale = 70 mm.*

Figure 46: *Some glass and a stone scraper from the dump at waypoint 1024. Scale = 70 mm.*

4.2.2 Graves

Perhaps surprisingly, just one graveyard was seen in the study area. This was at the Basberg farmstead. The graveyard was very heavily overgrown, but its presence was betrayed by a fence (Figure 47). Within the graveyard were a number of graves, but a count was impossible due to the dense vegetation. Most just had stone-packed mounds over them but two more formal graves occurred with headstones. One had two burials dated 1901 and 1907, while the other was a single burial likely dated 1891. All were from the Badenhorst family. It was suspected that graves would occur at the archaeological farmstead on Portion 2 of Farm 40 but none were found. Given the tall grass, poor visibility and age of the site, it remains very likely that there are graves in this area. No isolated graves were seen and the chances of such graves or unmarked graves occurring are considered to be extremely low.

Figure 47: *Fenced graveyard at waypoint 1038 at the Basberg farmstead.*

Figure 48: *Gravestone in the graveyard at waypoint 1038.*

Figure 49: *Gravestone in the graveyard at waypoint 1038.*

4.2.3 Built environment

Just two standing farmsteads occurred within the study area with a third being very close to its boundary. All the structures recorded were in these three places. The Wolwekuil farmstead (on farm 42/RE) in the north of the study area has several historical structures present (Figure 50). The main house and outbuildings seem to be from the early 20th century and are in generally good condition. The Basberg farm complex has several historical structures present. The main house is a later addition to the farm and is from the early-mid-20th century (Figure 51). There are certainly older structures present with a long barn likely to date to the late 19th century (Figure 52). Another smaller structure is likely also late 19th century, while some labourers cottages were not examined closely but were likely 20th century in age (Figure 53). Also of interest at this farmstead are some decorative gateposts and entrance features which add to the historic character of the place (Figure 54). Immediately outside the study area on Farm 40/5 is a farmstead surrounded by trees but with a house that is likely 20th century. A short distance to its north are some other structures/ruins which are probably also from the early 20th century (Figure 55).

Figure 50: *The Wolwekuil farmstead at waypoint 947.*

Figure 51: *The main Basberg farmhouse at waypoint 1023.*

Figure 52: *Outbuilding in the Basberg farm complex at waypoint 1023.*

Figure 53: *One of three labourers' cottages at waypoint 1008.*

Figure 54: *Gateposts and entrance features at the Basberg farmstead at waypoint 1023. The inset shows one of the gateposts in the background.*

Figure 55: *Structures/ruins at waypoint 983.*

Other built features that are not buildings occur away from the farmsteads. Examples include a sheep dip (Figure 56) which was built of stones and cement but with some bricks added to reduce the width of the entrance to the dip (Figure 57) as well as a number of small, square plastered reservoirs (Figure 58).

Figure 56: *Sheep dip with stone walls and paved floor at waypoint 1049.*

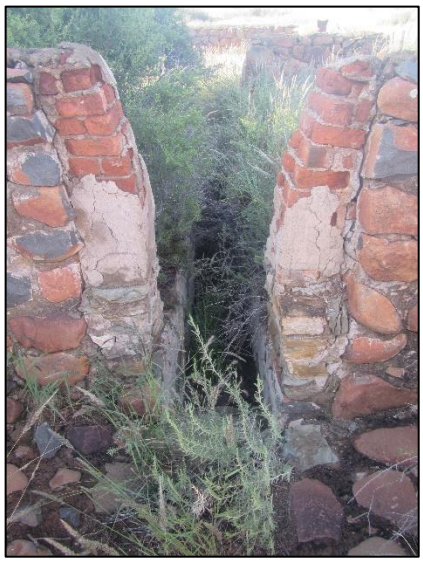


Figure 57: *The entrance to the dip at waypoint 1049.*

Figure 58: *Square reservoir and wind pump at waypoint 951.*

4.2.4 Cultural landscapes and scenic routes

The cultural landscape is a largely natural landscape with a strong feeling of remoteness (Figure 59). The lack of gravel roads and non-agricultural infrastructure (with the exception of a few large powerlines, one of which passes through the study area) emphasise this. The sense of remoteness would also be dominant at night due to the very few light sources on the landscape. However, the landscape is dotted with farmsteads (Figure 60) and livestock watering points, both of which invariably have some trees which allow for greater visibility of these features on the landscape (Figures 61 to 63).

The study area is not within a Renewable Energy Development Zone (REDZ) but does lie within the Central Electricity Grid Infrastructure (EGI) Corridor which means that powerlines might be expected to become more common there.

Figure 59: *Looking north from the top of Basberg showing no visible anthropogenic features.*

Figure 60: *View towards the southwest over the Wolwekuil farmstead (on Farm 42/RE) at waypoint 947.*

Figure 61: *Waterpoint at waypoint 948.*

Figure 62: *Waterpoint at waypoint 952.*

Figure 63: *Waterpoint at waypoint 1014.*

4.3 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 ruins, rock art and archaeological materials. Trampling from grazing animals and/or farm/other vehicles could also occur. These impacts would be of negligible negative significance. There are no existing impacts to the cultural landscape (neutral).

4.4 Levels of acceptable change

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

4.5 Project Specific Description

There are two heritage records in the PV6 study area. They are a set of short, engraved lines alongside two ground patches and a pair of stone-lined reservoirs related to the historical farmstead. While both are of low cultural significance in and of themselves, it is preferred that the reservoirs be avoided due to their connection to the adjacent historical farmstead. The engraved lines are probably quite recent, possibly less than 100 years old.

4.6 Identification of Environmental Sensitivities

4.6.1 Sensitivities identified by the National Web-Based Environmental Screening Tool

Figure 64 shows the screening tool map or the entire study area. It is evident that the entire study area (i.e. affected farm portions for all 12 PV sites) is shown as being of low sensitivity. This is largely correct, but a number of small areas of higher sensitivity were found during the survey.

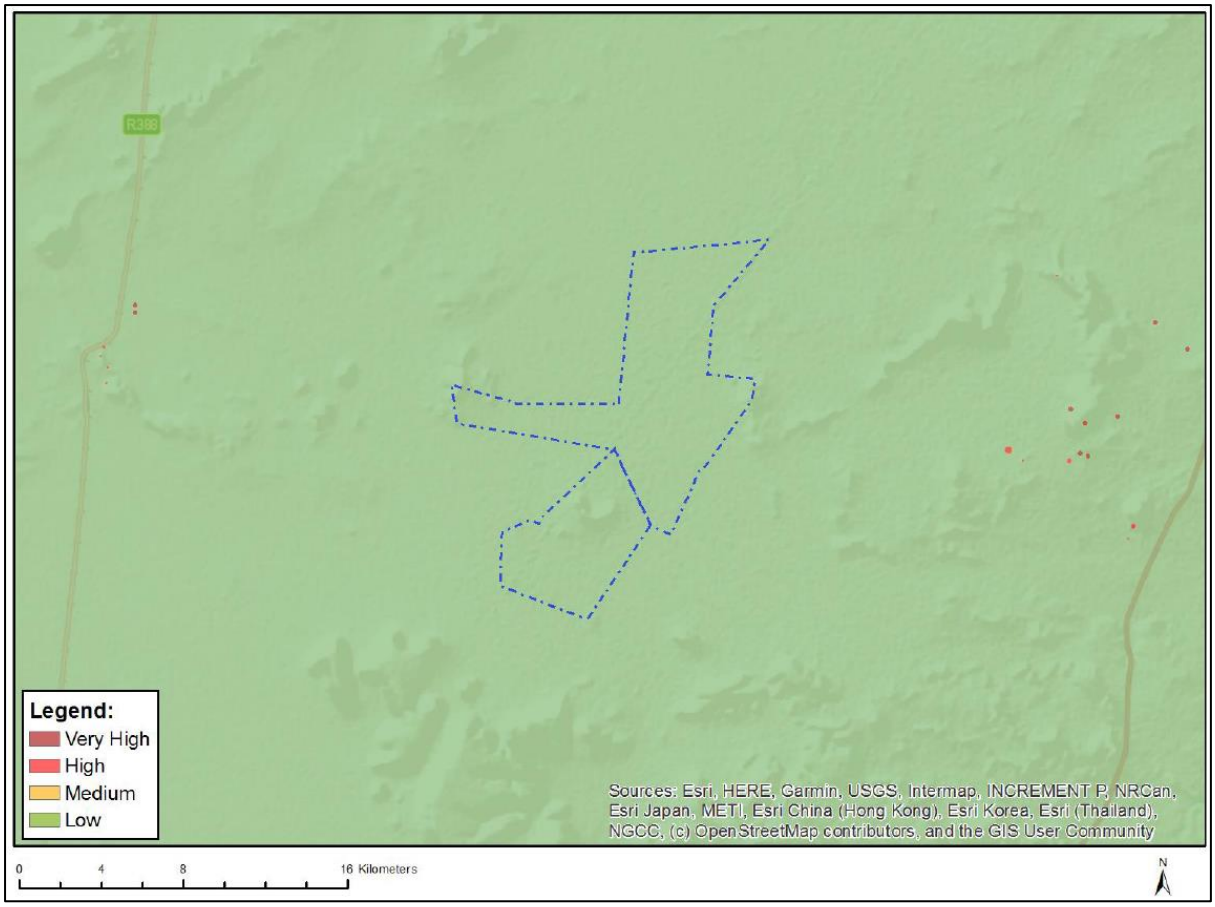


Figure 64: *Screening tool map of archaeological and heritage sensitivity.*

4.6.2 Specialist Sensitivity Analysis and Verification

Cultural sensitivity is mapped in Appendix C in Figures C15 to C19. In all cases the Very High, High and Medium sensitivity areas are located outside of the development footprints (i.e. Original Scoping Buildable Areas). Most resources located within the study areas are cultural landscape components and are of low cultural significance and hence sensitivity. The only exceptions are an engraving consisting of a few small scratches and a pair of stone-lined farm reservoirs, both in PV6 and both also of low sensitivity. It is preferred, however, that the reservoirs be retained because of their relationship with the adjoining ruined farmstead and for this reason they have been included in the medium sensitivity polygon around the farmstead. There are no other areas in any of the PV sites that require avoidance on heritage grounds.

4.6.3 Sensitivity Analysis Summary Statement

Overall, there is general congruence between the screening tool maps and the real sensitivity determined from the site visit within the PV footprints. However, several areas of variably medium to very high sensitivity were found in the broader study area and these do not agree with the screening tool map. A site sensitivity verification report has been included as Appendix D in this report.

4.7 Statement of the Revised Scoping Buildable Areas

As indicated above, following the identification of sensitivities during the Scoping Phase, the Project Developer has considered such sensitivities and formulated the Revised Scoping Buildable Areas, which will inform the design of the layout and will be further assessed during the EIA Phase. The Revised Scoping Buildable Areas are considered suitable from a Heritage perspective, as the

sensitivities identified above have been taken into consideration. The only heritage features are farm water points which form part of the cultural landscape but are of low cultural significance.

5. Issues, Risks and Impacts

The main concerns here are impacts to archaeological resources and impacts to the cultural landscape. Although most of the PV sites do not have any significant archaeology, there is always the chance (albeit very small) that archaeology could occur.

5.1 Identification of Potential Impacts/Risks

Construction Phase
- Potential impacts on palaeontology (discussed in a separate report)
- Potential impacts on archaeology
- Potential impacts on graves
- Potential impacts on the cultural landscape

Operational Phase
- Potential impacts on the cultural landscape

Decommissioning Phase
- Potential impacts on the cultural landscape

Cumulative Impacts
- Potential impacts on palaeontology (discussed in a separate report)
- Potential impacts on archaeology
- Potential impacts on graves
- Potential impacts on the cultural landscape

6. Scoping Level - Impact Assessment

All anticipated impacts are direct impacts. PV1 to PV5 and PV7 to PV12 will all have the same assessment for archaeology with PV6 being different. The other impacts are the same across all facilities. However, as noted above, separate Heritage Scoping Level Assessment reports have been compiled for each PV project. This specific specialist report pertains to PV 6.

6.1 Potential Impacts during the Construction Phase

Archaeological materials may be affected during construction when equipment is brought onto site and grubbing and excavation takes placeFor PV6 there is known archaeological material that might be impacted but its cultural significance is relatively low (Grade GPB). The significance there would be **low negative** without the implementation of mitigation measures, and very low with mitigation measures.

Graves could be impacted almost anywhere but the probability of this happening is extremely unlikely and the significance rating is thus **very low negative** both without and with the implementation of mitigation measures.

The landscape will definitely be affected if the projects go ahead, but because it is of relatively low cultural significance the consequence is rated as moderate and the potential impact as **low negative**.

Table 3: *Construction phase impacts.*

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
CONSTRUCTION PHASE						
Damage to or destruction of archaeological materials	*Status*	*Negative*	*Low (4)*	*Avoid stone dams (waypoint 1068). Report any chance finds to SAHRA and/or an archaeologist.*	*Very Low (5)*	*High*
	Spatial Extent	*Site*				
	Duration	*Permanent*				
	Consequence	*Moderate*				
	Probability	*Very Likely*				
	Reversibility	*Non-reversible*				
	Irreplaceability	*High*				
Damage to or destruction of graves	*Status*	*Negative*	*Very Low (5)*	*None suggested, but report any chance finds to SAHRA and/or an archaeologist.*	*Very Low (5)*	*High*
	Spatial Extent	*Site*				
	Duration	*Permanent*				
	Consequence	*Extreme*				
	Probability	*Extremely unlikely*				
	Reversibility	*Non-reversible*				
	Irreplaceability	*High*				
Alteration of the cultural landscape	*Status*	*Negative*	*Low (4)*	*Minimise disturbance footprint. Rehabilitate all areas not needed during operation.*	*Low (4)*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very Likely*				
	Reversibility	*High*				
	Irreplaceability	*Replaceable*				

6.2 Potential Impacts during the Operational Phase

The only impact during operation will be to the landscape. The impact would definitely occur but because of the relatively low cultural significance the consequence is rated as moderate and the potential impact as **low negative** both without and with the implementation of mitigation measures.

Table 4: *Operational phase impacts.*

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
OPERATIONAL PHASE						
Alteration of the cultural landscape	*Status*	*Negative*	*Low (4)*	*None suggested.*	*Low (4)*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very Likely*				
	Reversibility	*High*				
	Irreplaceability	*Replaceable*				

6.3 Potential Impacts during the Decommissioning Phase

In the event of decommissioning, the landscape will definitely be affected, but because it is of relatively low cultural significance the consequence is rated as moderate and the potential impact as **low negative** both without and with the implementation of mitigation measures.

Table 5: *Decommissioning phase impacts.*

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
DECOMMISSIONING PHASE						
Alteration of the cultural landscape	*Status*	*Negative*	*Low (4)*	*Rehabilitate all areas following approved rehabilitation plan.*	*Low (4)*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very Likely*				
	Reversibility	*High*				
	Irreplaceability	*Replaceable*				

6.4 Cumulative Impacts

Cumulative impacts to archaeology and graves are always difficult to assess due to the variable quality of surveys and reporting on different projects. Nonetheless, the observations made on this project can likely be extrapolated over the broader area and a high degree of congruence seems apparent from an examination of assessments done for other projects. With mitigation an impact significance of low (negative) can be expected. Impacts to the landscape could occur quite extensively if many projects are constructed, especially those with tall components such as powerlines and wind turbines. Simultaneous construction (or decommissioning) would have an even larger impact due to the many large vehicles making constant use of the area. These impacts cannot be fully mitigated, but following the recommendations of visual consultants would likely reduce the impacts from medium to low negative if highly sensitive areas are avoided. Impacts to the landscape are considered to be the main driver of cumulative impacts on heritage resources (Table 5). Other projects considered are shown in the Draft Scoping Report.

Table 6: *Cumulative impacts to all heritage resources.*

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
CONSTRUCTION PHASE						
Impacts to archaeology, graves and the cultural landscape	*Status*	*Negative*	*Low (4)*	*Avoid or mitigate sites as proposed in specialist reports. Report any chance finds. Follow visual consultant recommendations.*	*Low (4)*	*High*
	Spatial Extent	*Site*				
	Duration	*Permanent*				
	Consequence	*Moderate*				
	Probability	*Very Likely*				
	Reversibility	*Non-reversible*				
	Irreplaceability	*High*				
OPERATIONAL PHASE						

Alteration of the cultural landscape	*Status*	*Negative*	*Low (4)*	*None suggested.*	*Low (4)*	*High*
	Spatial Extent	*Site*				
	Duration	*Long term*				
	Consequence	*Moderate*				
	Probability	*Very Likely*				
	Reversibility	*Non-reversible*				
	Irreplaceability	*High*				
DECOMMISSIONING PHASE						
Impact 1 See note above	*Status*	*Negative*	*Low (4)*	*Ensure full rehabilitation following approved plans.*	*Low (4)*	*High*
	Spatial Extent	*Site*				
	Duration	*Permanent*				
	Consequence	*Moderate*				
	Probability	*Very Likely*				
	Reversibility	*Non-reversible*				
	Irreplaceability	*High*				

6.5 No-Go Option

Should the site not be developed then all heritage resources would remain as they are. Aside from natural erosion and weathering which act very slowly, there are no obvious threats to heritage that would be removed with development. The landscape would remain a rural landscape. Aside from the disadvantage that the landscape would be transformed with development, there are no other obvious benefits or disadvantages associated with either the development or No-Go options.

7. Scoping Level Impact Assessment Summary

Table 6 summarises the overall expected impact significance ratings.

Table 7: Overall Impact Significance (Post Mitigation)

Phase	**Overall Impact Significance**
Construction	Low
Operational	Low
Decommissioning	Low
Nature of Impact	**Overall Impact Significance**
Cumulative - Construction	Low
Cumulative - Operational	Low
Cumulative - Decommissioning	Low

8. Legislative and Permit Requirements

The projects will need to have comment from the heritage authorities (Ngwao-Boswa Ya Kapa Bokoni [Heritage Northern Cape] for built environment and cultural landscapes and the South African Heritage Resources Agency [SAHRA] for archaeology and palaeontology). Any comments received from either of these bodies must be considered by the competent authority before issuing an Environmental Authorisation.

There are no permits required for the development to be authorised, but in the event that any archaeological material requires mitigation (whether a known resource or one discovered during construction) then the contracted archaeologist would need to obtain a permit in their own name in order to perform the work. The function of this permit is to allow the heritage authorities to be sure that a

specialist with the necessary skills will undertake the work and that the methodology proposed is appropriate to the site requiring mitigation.

9. Appendices

Appendix A - Specialist Expertise

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.

Appendix B - Specialist Statement of Independence

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

Scoping and Environmental Impact Assessment Process for the Proposed Development of 12 Solar Photovoltaic (PV) Facilities and associated infrastructure (i.e. Kudu Solar Facility 1 - 12), near De Aar, Northern Cape

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	ASHA Consulting (PTY) Ltd			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)		Percentage Procurement recognition	
Specialist name:	Dr Jayson Orton			
Specialist Qualifications:	B.A. (Archaeology, Environmental & Geographical Science) B.A. (Honours) (Archaeology) M.A. (Archaeology) D.Phil. (Archaeology)			
Professional affiliation/registration:	Association of Southern African Professional Archaeologists (ASAPA) membership number: 233 Association of Professional Heritage Practitioners (APHP) membership number: 43			
Physical address:	23 Dover Road, Muizenberg, 7945			
Postal address:	23 Dover Road, Muizenberg			
Postal code:	7945	Cell:	083 272 3225	
Telephone:	(021) 788 1025	Fax:		
E-mail:	jayson@asha-consulting.co.za			

2. DECLARATION BY THE SPECIALIST

I, JAYSON ORTON, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

ASHA CONSULTING (PTY) LTD

Name of Company:

07/11/2022

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, JAYSON ORTOW, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

AJHA CONSULTING (PTY) LTD

Name of Company

07/11/2022

Date

Signature of the Commissioner of Oaths

2022-11-07.

Date

SUID-AFRIKAANSE POLISIEDIENS
COMMUNITY SERVICE CENTRE
MUIZENBERG
07 NOV 2022
COMMUNITY SERVICE CENTRE
MUIZENBERG
SOUTH AFRICAN POLICE SERVICE

Appendix C: Mapping

Note from the Specialist: As indicated above, this report is for Kudu Solar Facility 6. However, for background purposes and comprehensiveness, this appendix provides maps for all the waypoints identified in the study area.

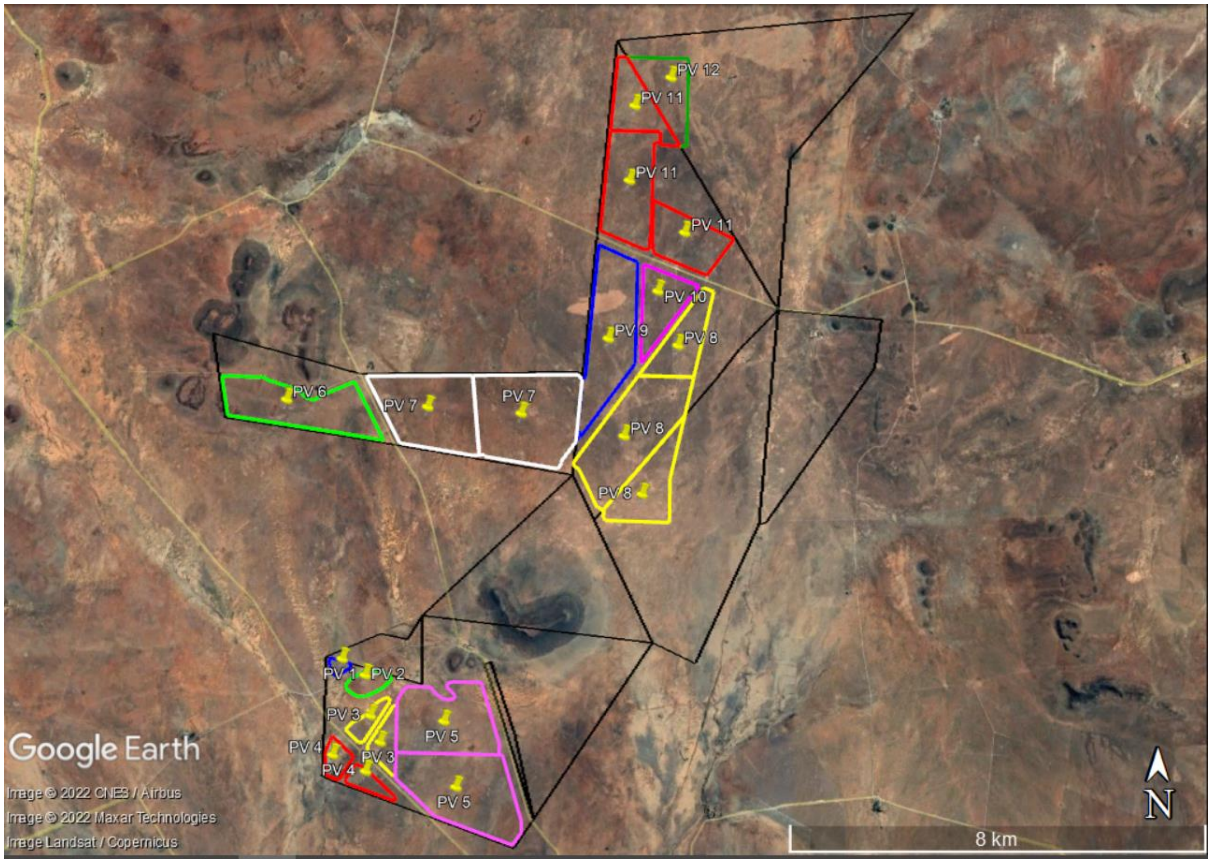


Figure C1: *Map showing the locations of the twelve proposed projects (colour coded polygons and PV labels). This report is for Kudu Solar Facility 6.*

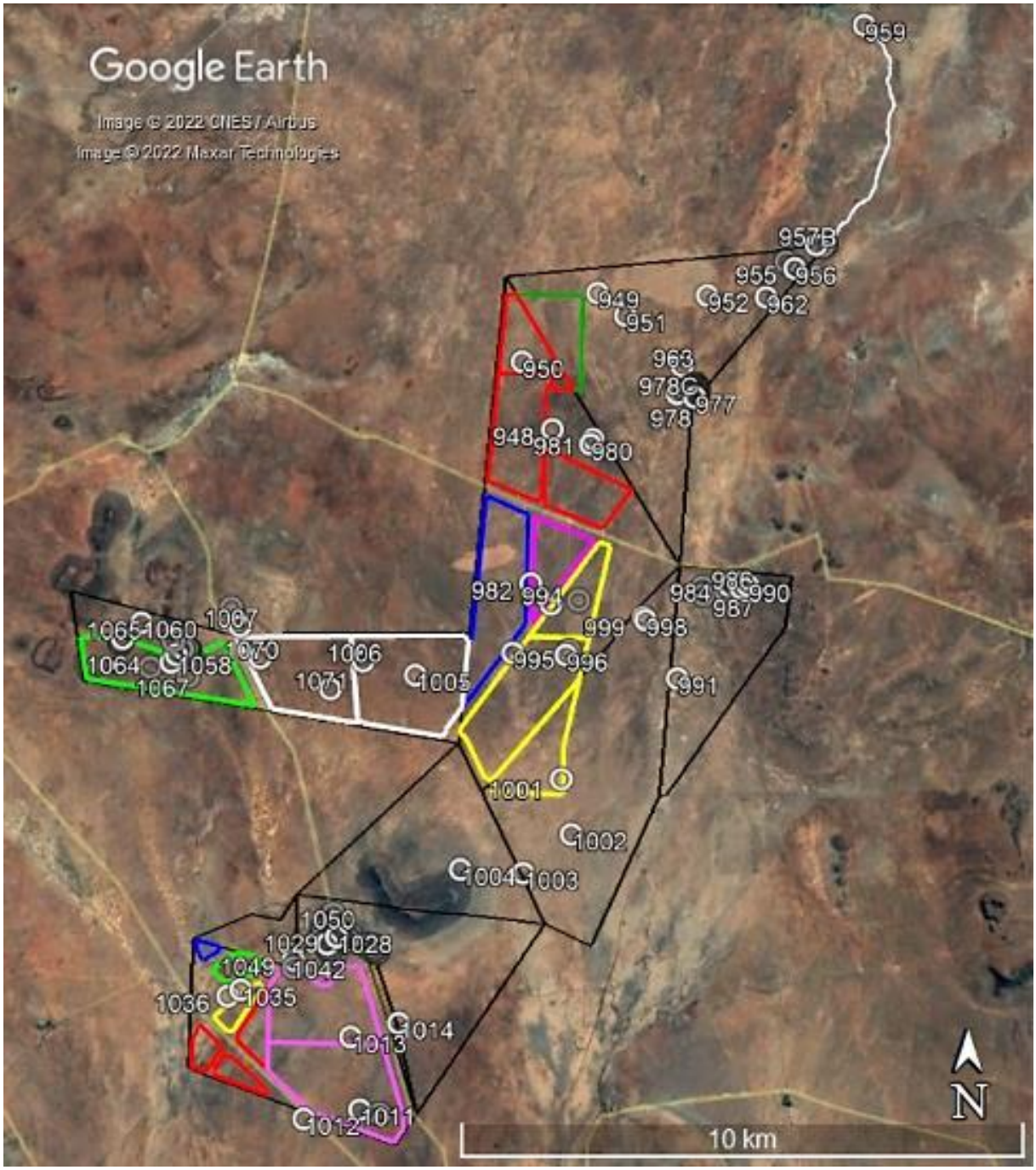


Figure C2: *Map showing the locations of all heritage resources recorded in the study area (white symbols). This report is for Kudu Solar Facility 6.*

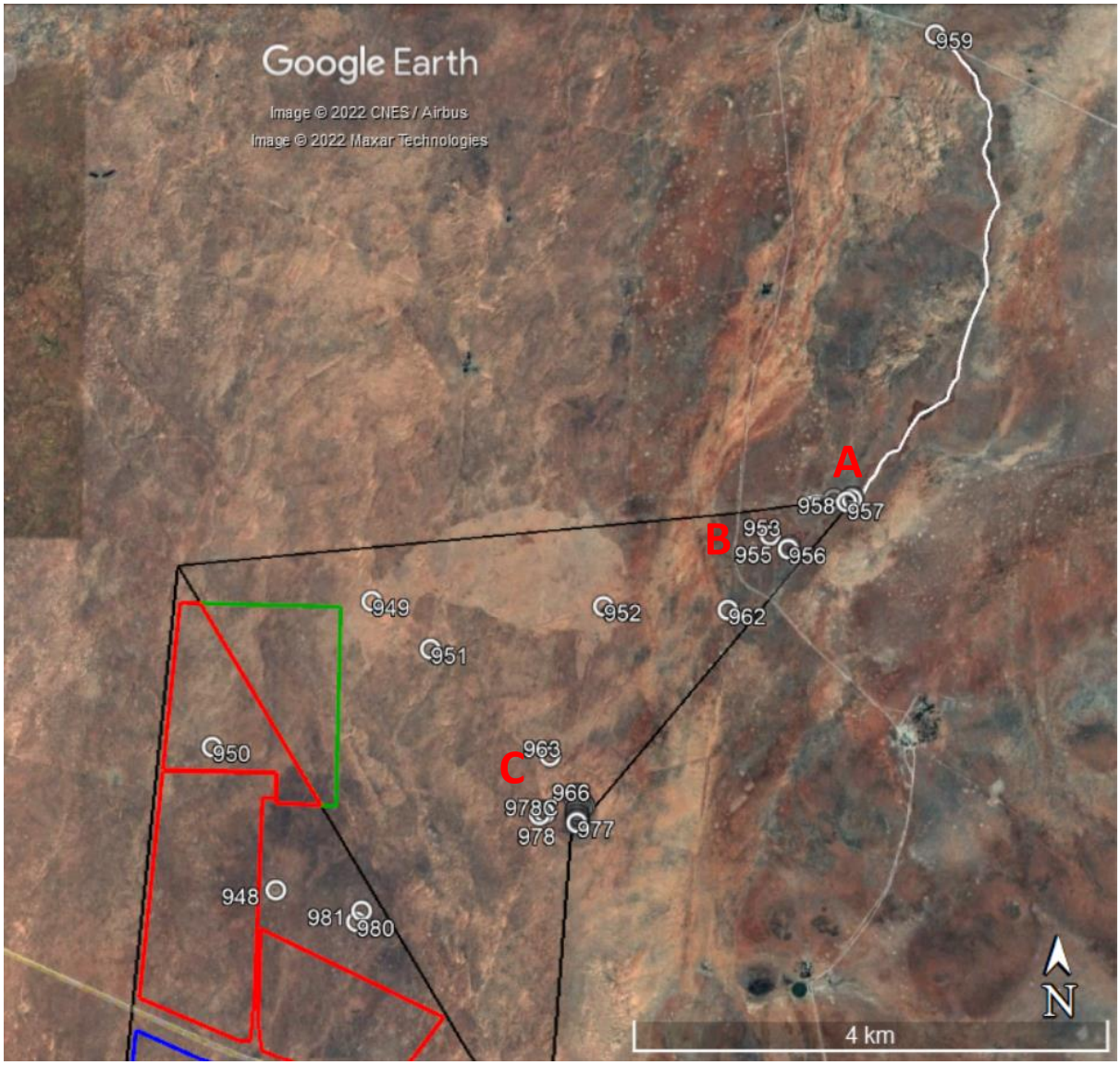


Figure C3: *Map showing the locations of all heritage resources (white symbols) recorded in the northern part of the study area with enlargements labelled in red and shown below. The closest is Kudu Solar Facility 12 (discussed in a separate report).*

Figure C4: *Enlargement A.*

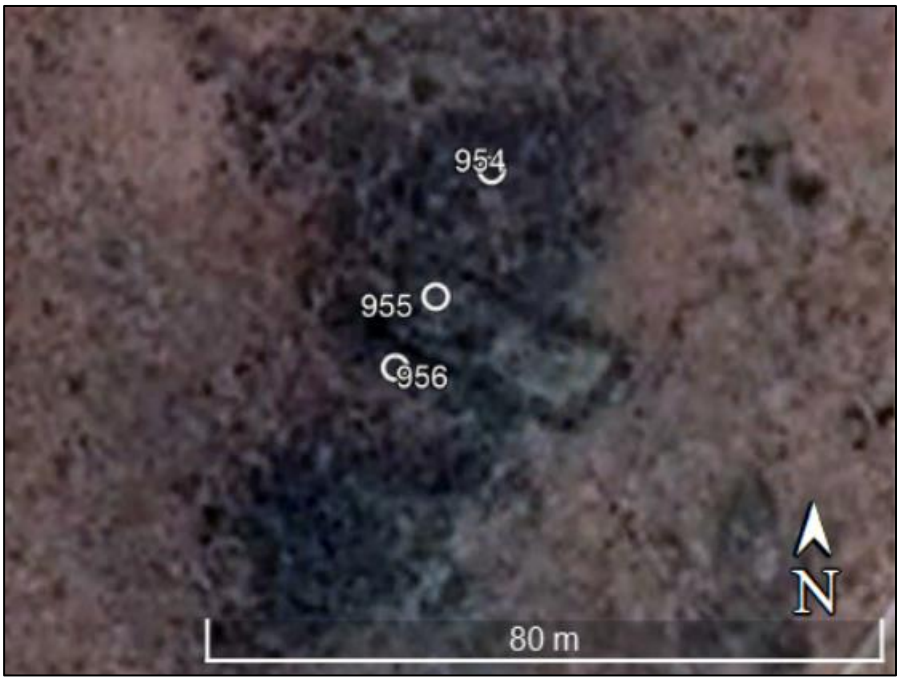


Figure C5: *Enlargement B.*

Figure C6: *Enlargement C.*

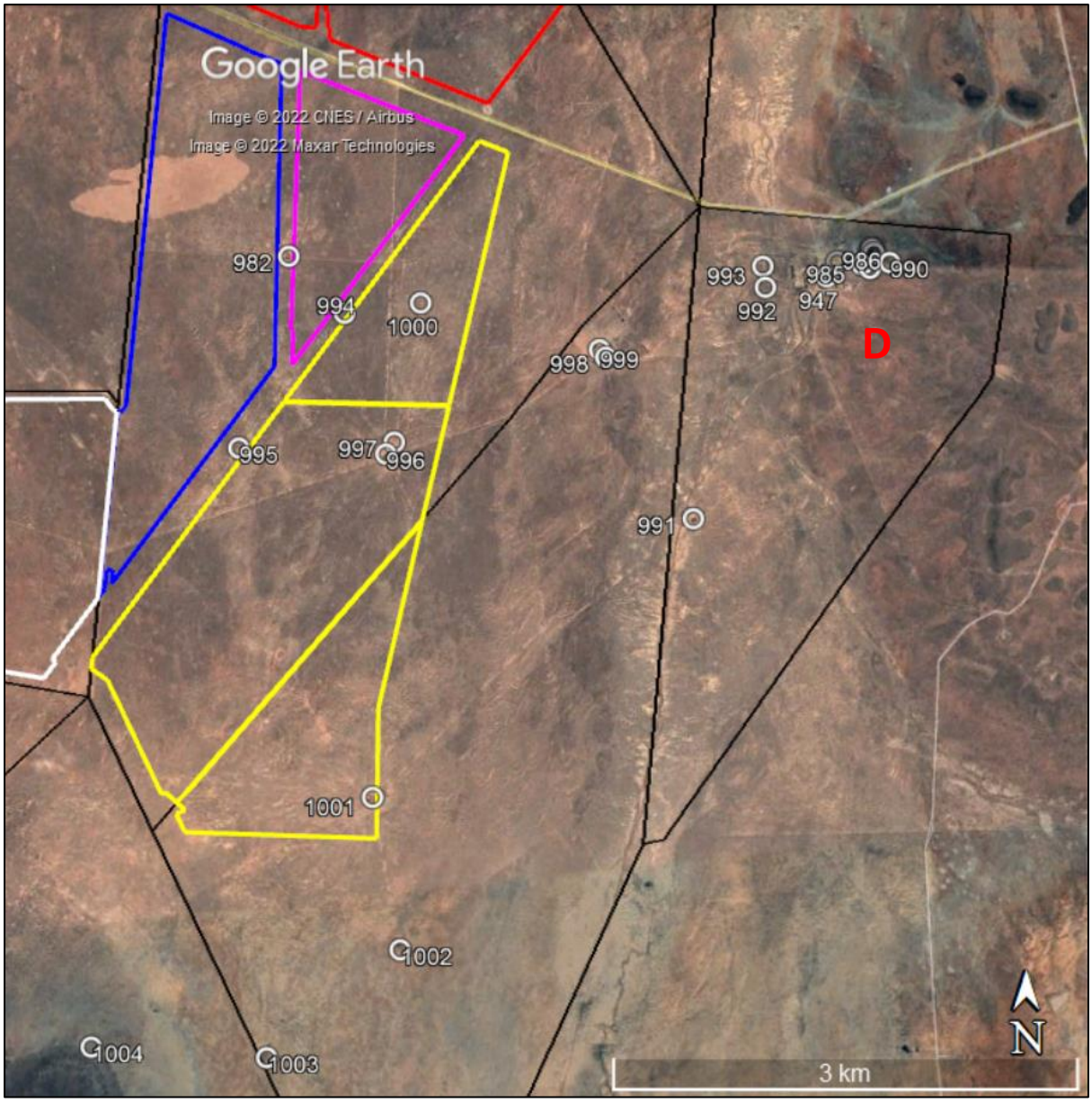


Figure C7: *Map showing the locations of all heritage resources (white symbols) recorded in the central part of the study area with an enlargement labelled in red and shown below. The closest is Kudu Solar Facility 8 (discussed in a separate report).*

Figure C8: *Enlargement D.*

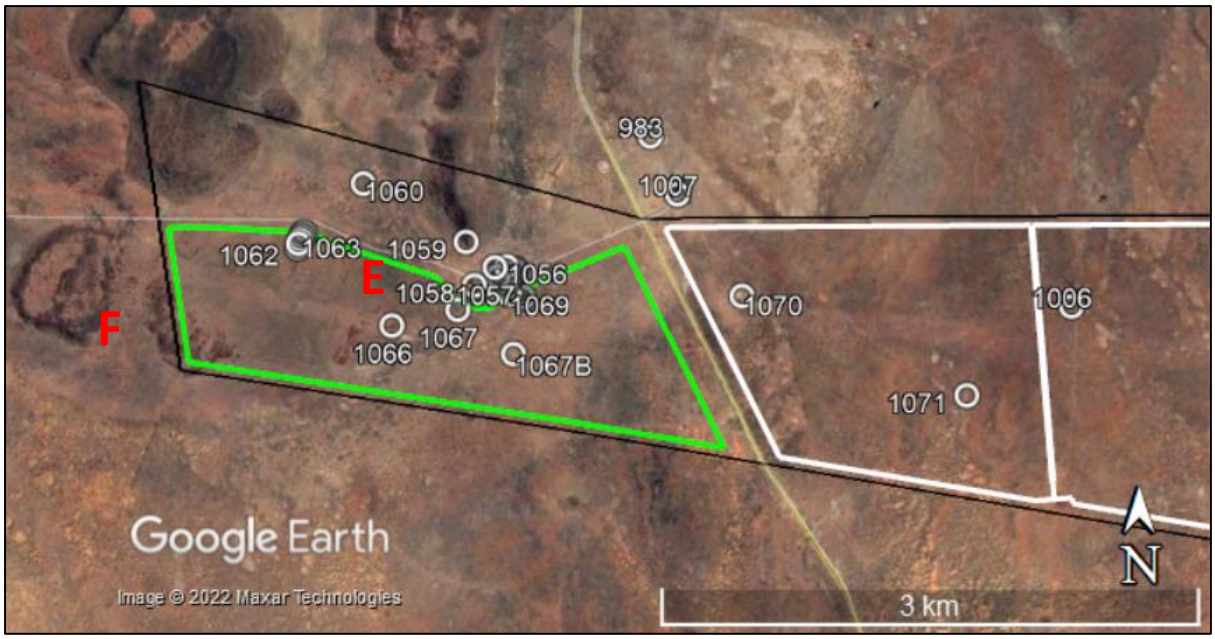


Figure C9: *Map showing the locations of all heritage resources (white symbols) recorded in the western part of the study area with enlargements labelled in red and shown below. The closest is Kudu Solar Facility 7 (discussed in a separate report).*

Figure C10: *Enlargement E.*

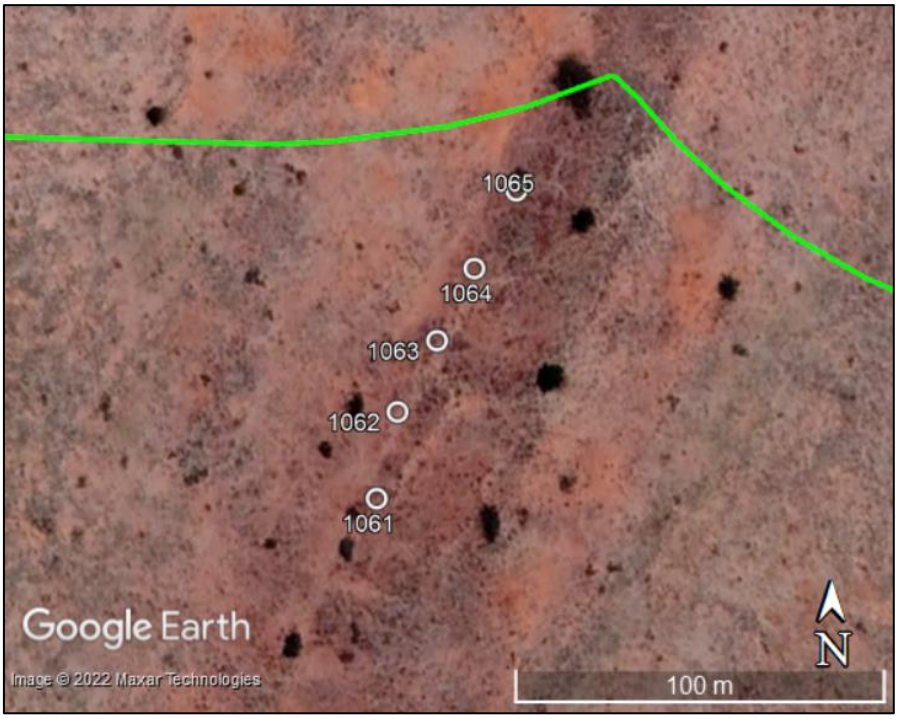


Figure C11: *Enlargement F.*

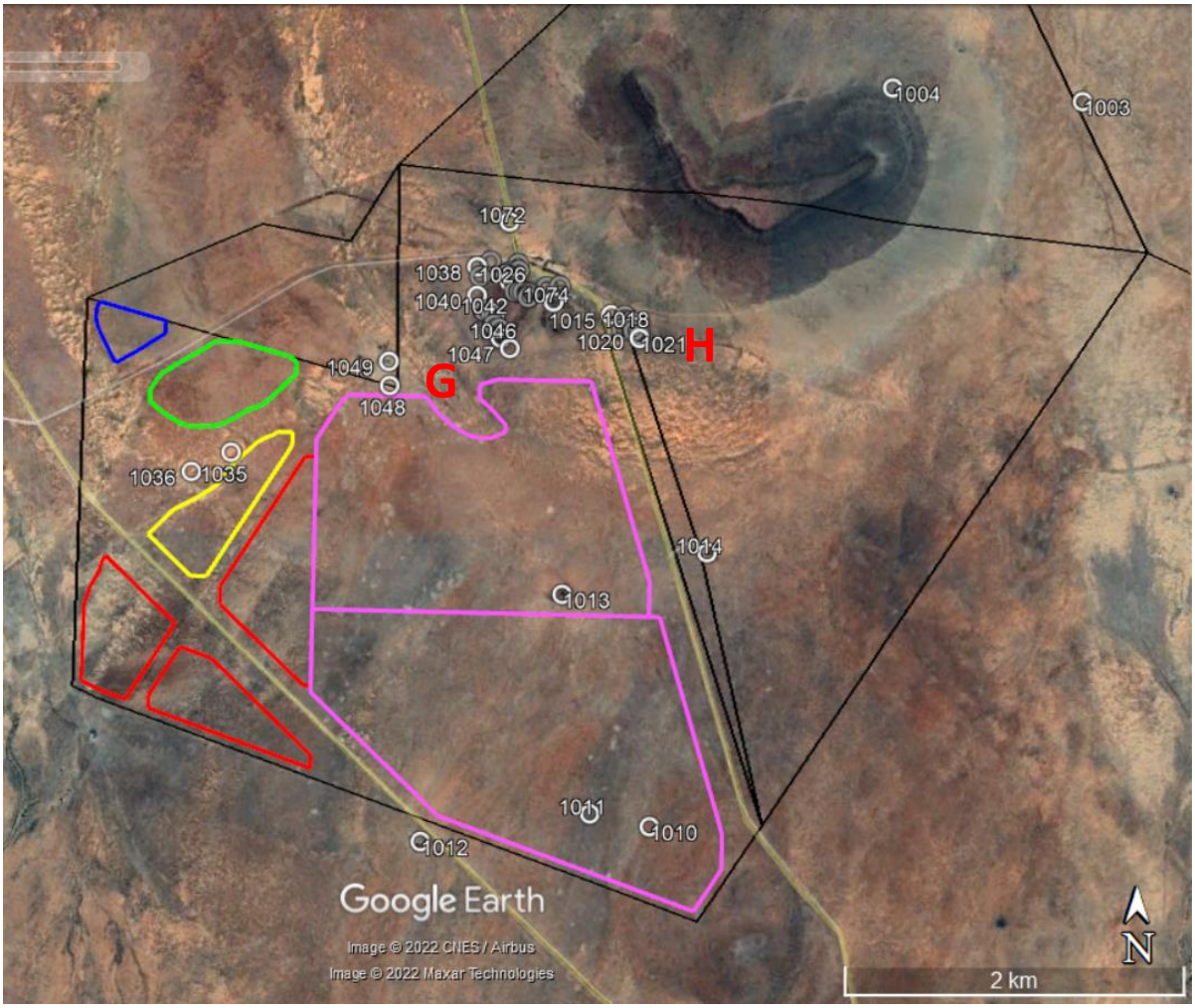


Figure C12: *Map showing the locations of all heritage resources (white symbols) recorded in the southern part of the study area with enlargements labelled in red and shown below. Kudu Solar Facility 1 to 5 are shown in this map extent.*

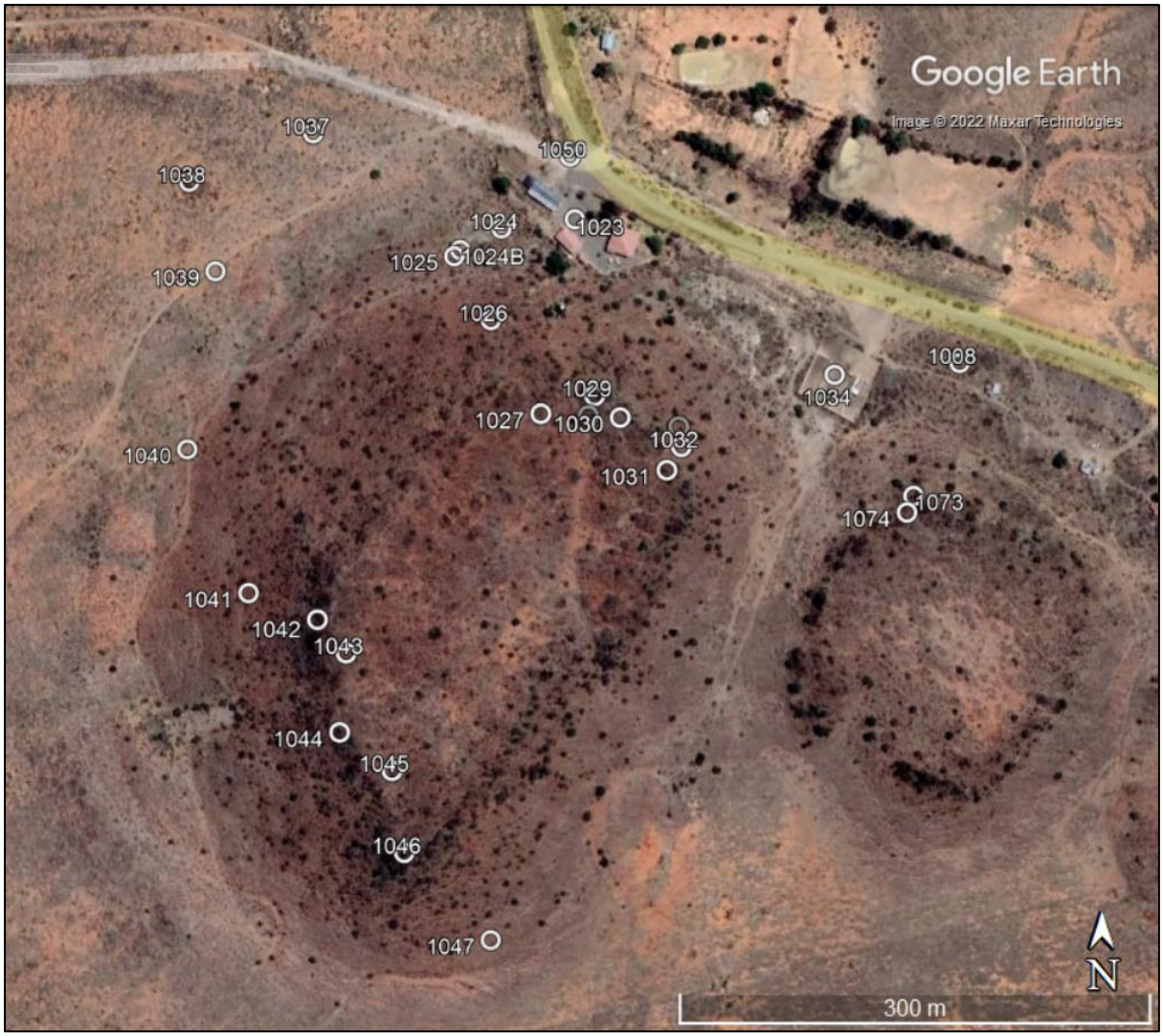


Figure C13: *Enlargement G.*

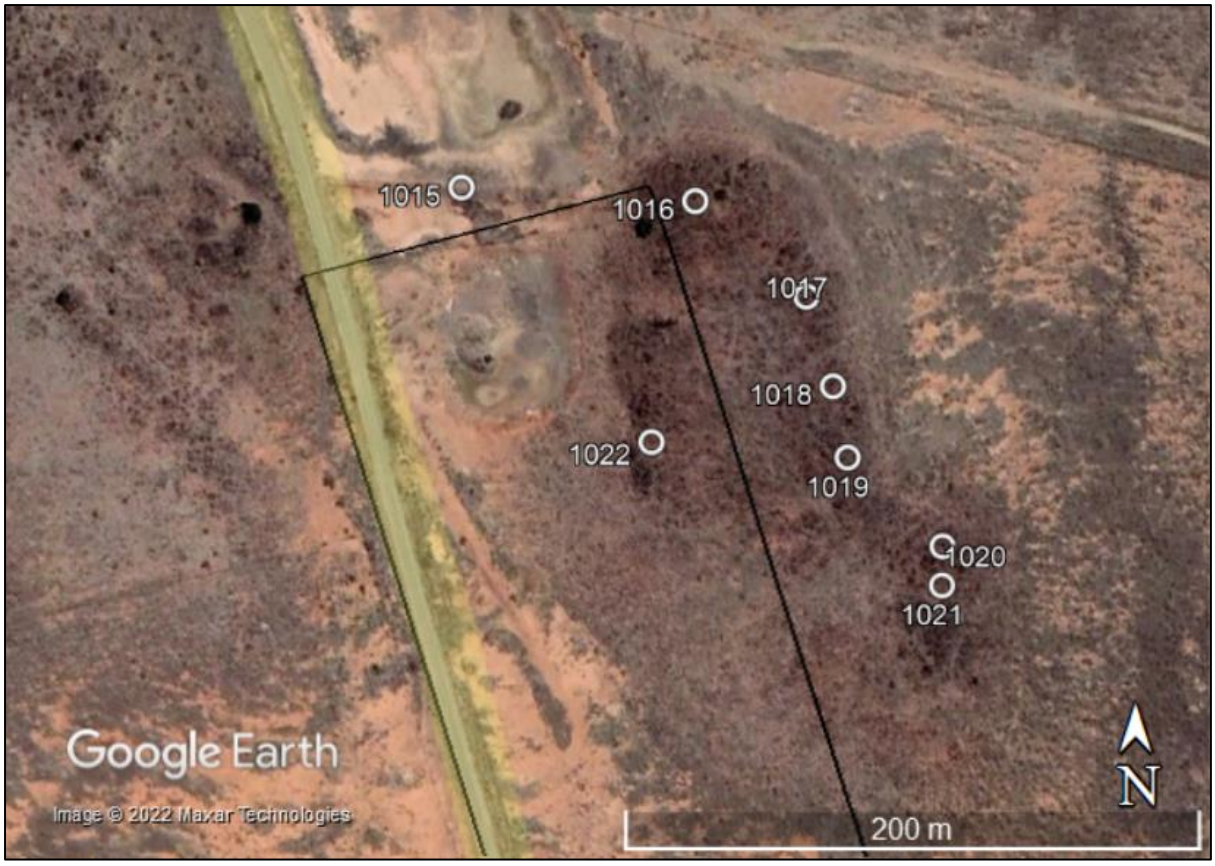


Figure C14: *Enlargement H.*

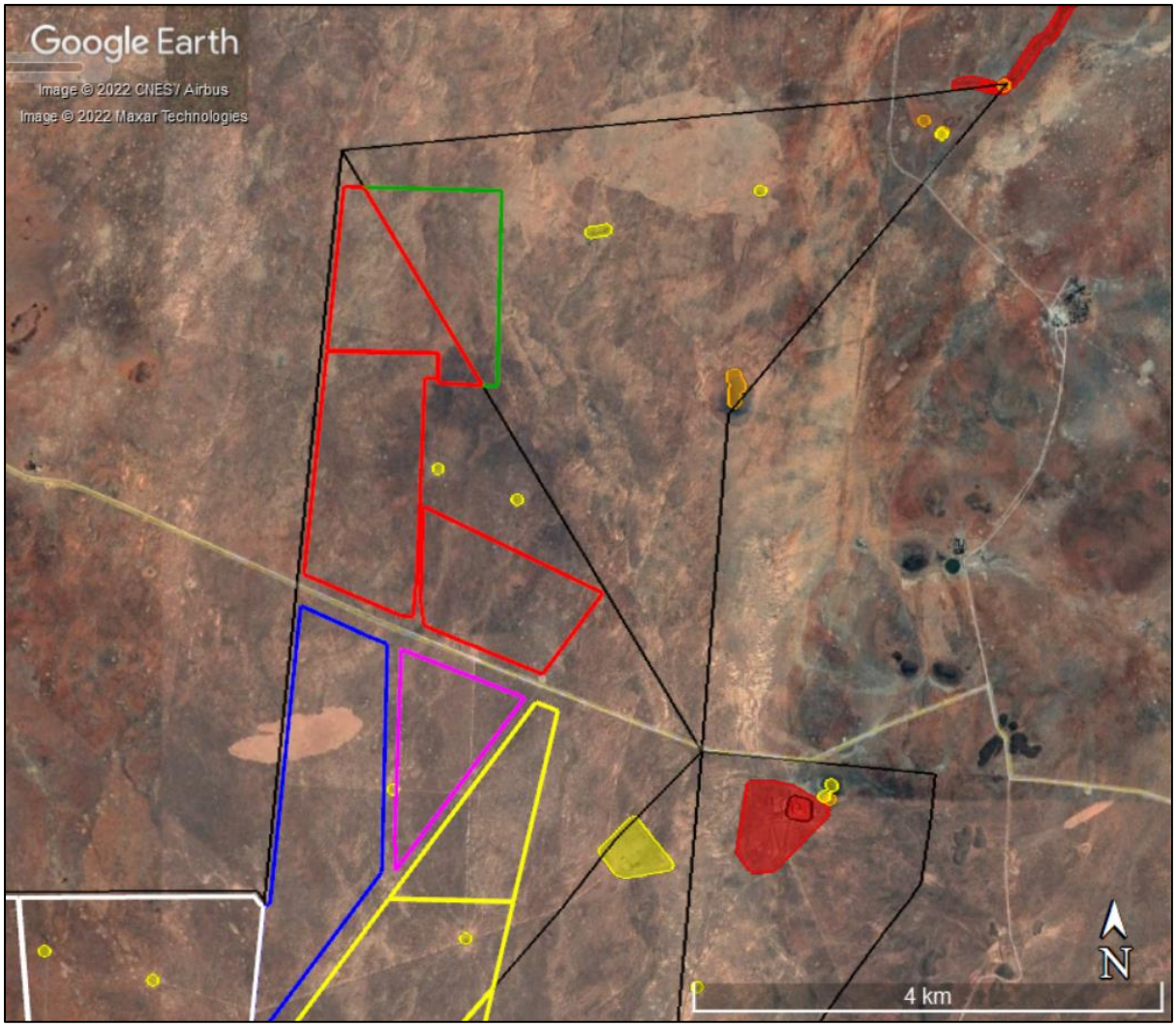


Figure C15: *Sensitivity mapping for the northern part of the study area. Dark Red = Very high, Red = High, Orange = Medium, Yellow = Low.*

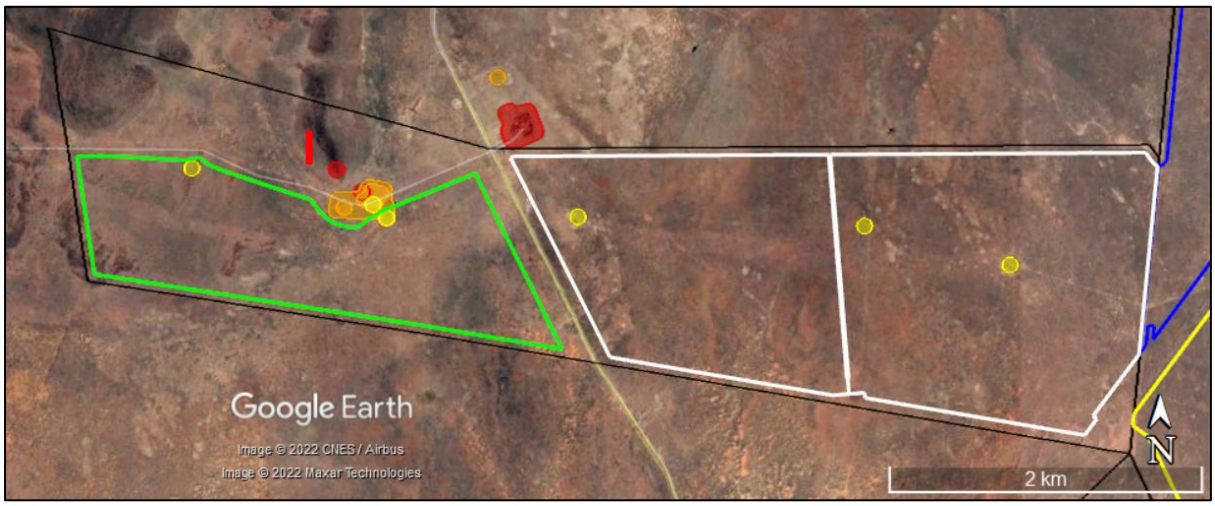


Figure C16: *Sensitivity mapping for the central part of the study area. Dark Red = Very high, Red = High, Orange = Medium, Yellow = Low.*

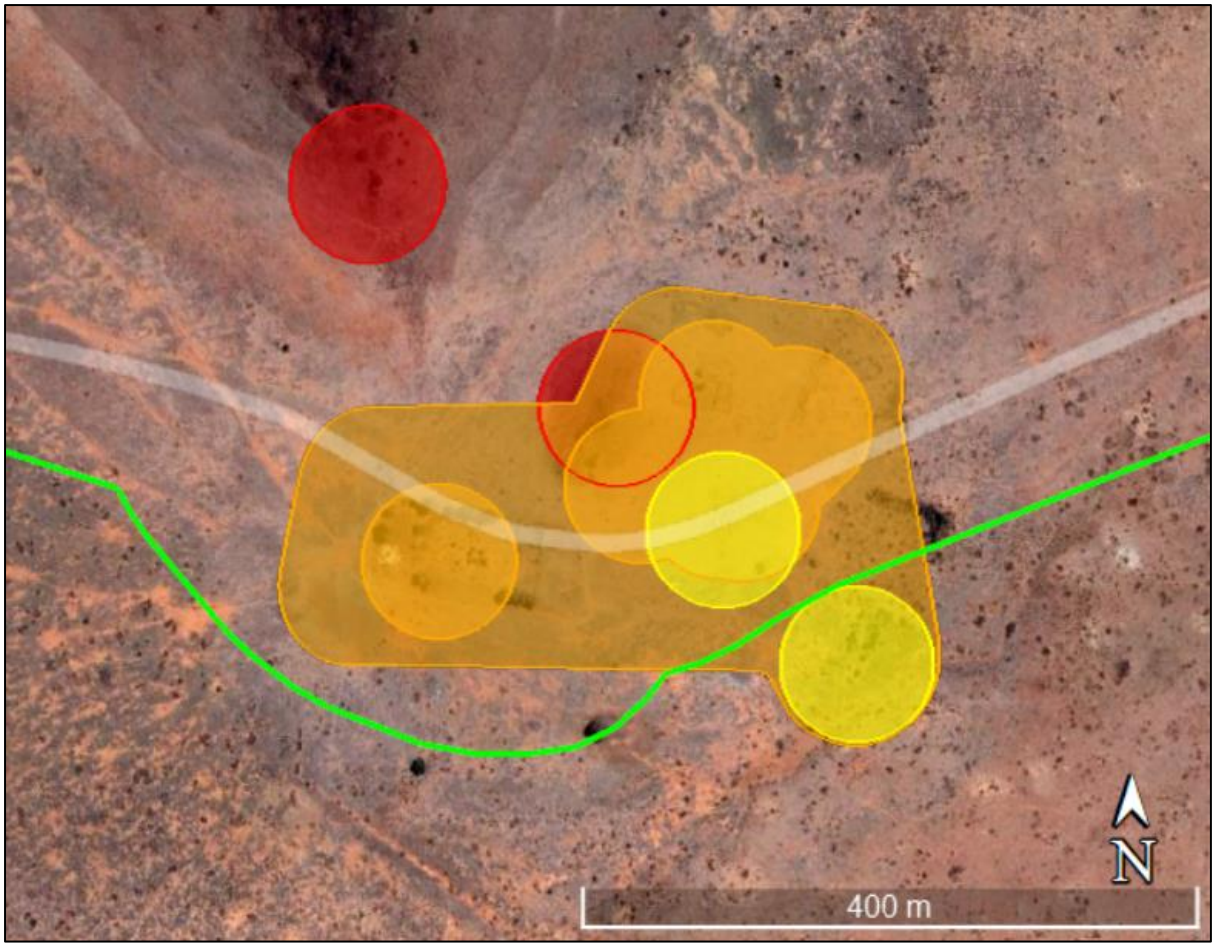


Figure C17: *Enlargement I.*

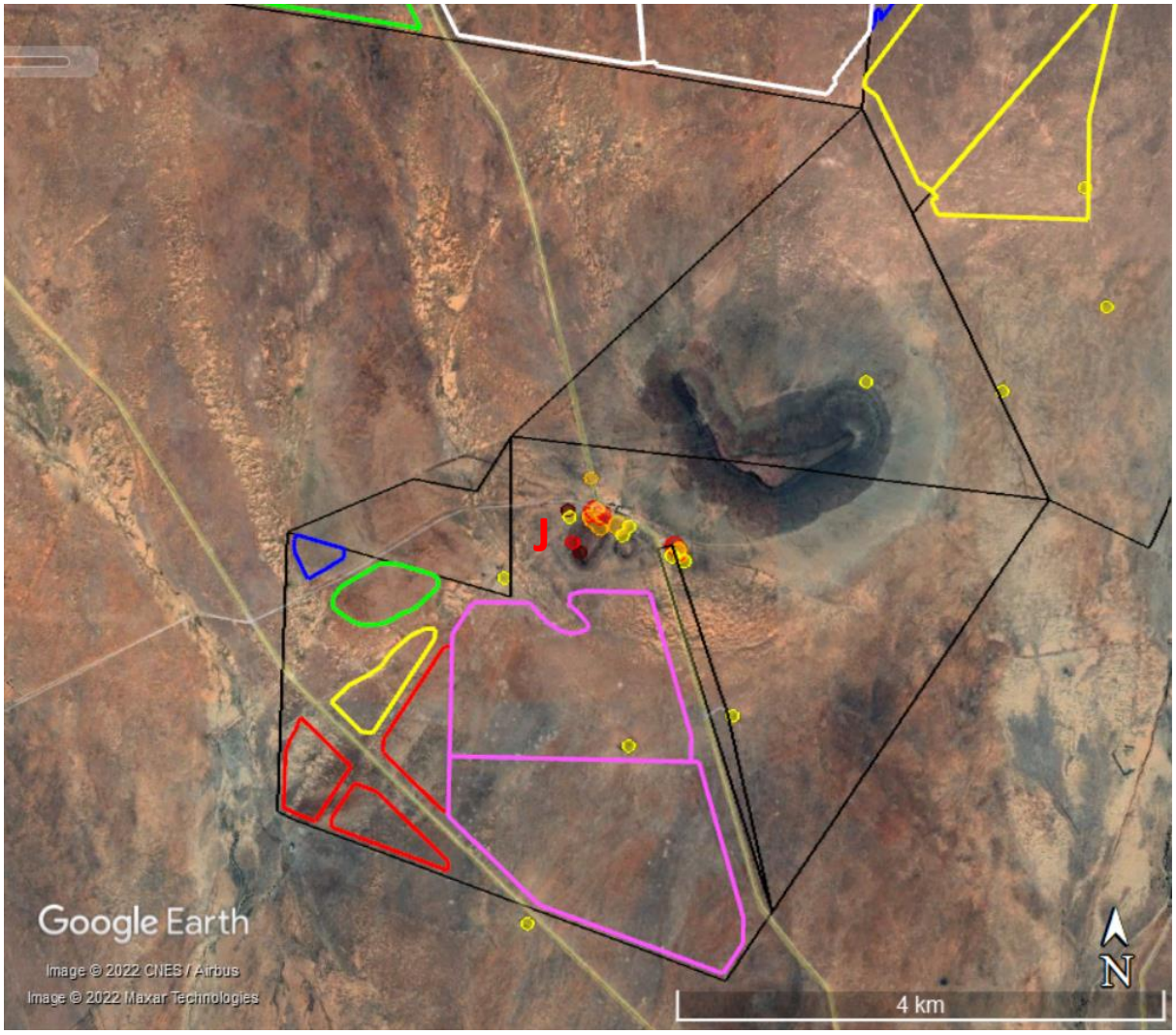


Figure C18: *Sensitivity mapping for the southern part of the study area. Dark Red = Very high, Red = High, Orange = Medium, Yellow = Low.*

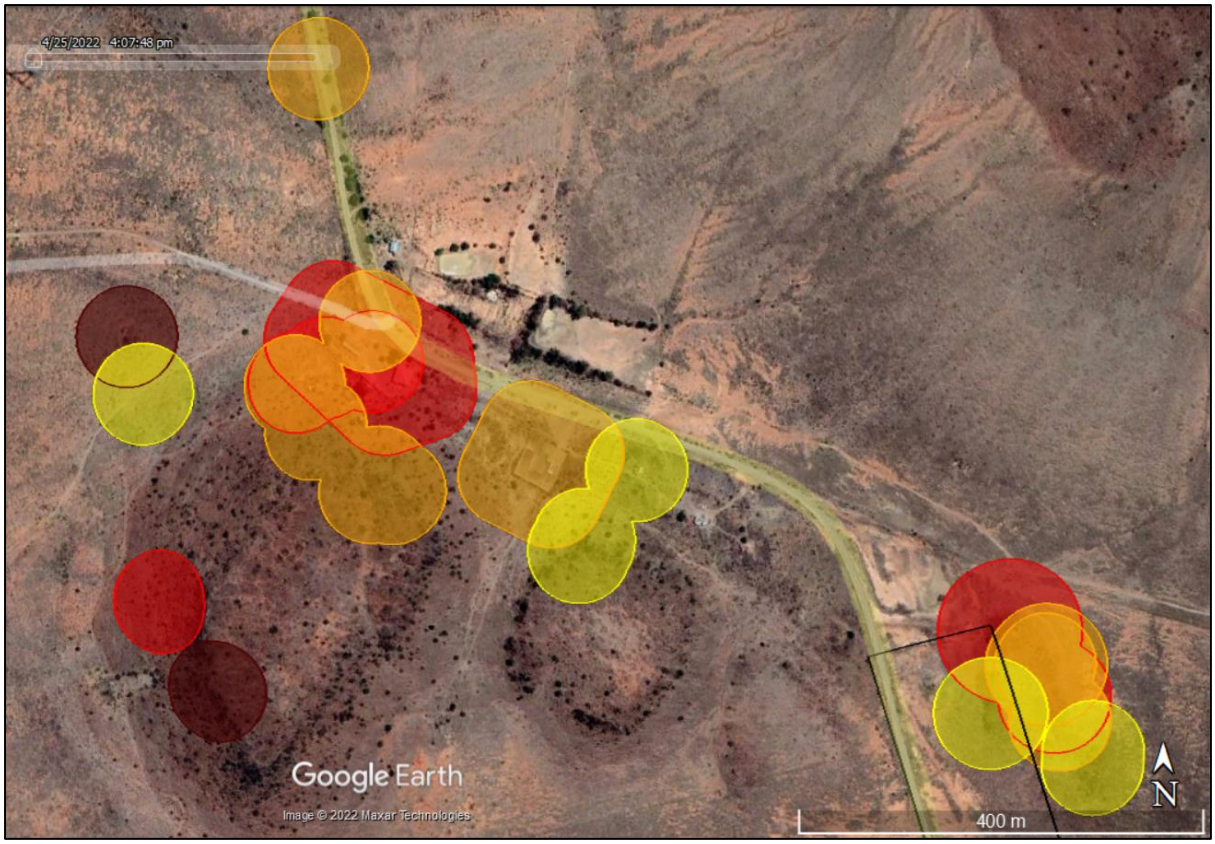


Figure C19: *Enlargement J.*

Appendix D: Site Sensitivity Verification

Prior to commencing with the specialist assessment in accordance with Appendix 6 of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations of 2014, a site sensitivity verification was undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool).

The details of the site sensitivity verification are noted below:

Date of Site Visit	21, 22, 24 & 25 April 2022
Specialist Name	Dr Jayson Orton
Professional Registration Number	Association of Southern African Professional Archaeologists (ASAPA): 233 Association of Professional Heritage Practitioners (APHP): 043
Specialist Affiliation / Company	ASHA Consulting (Pty) Ltd

Initial work was carried out using satellite aerial photography in combination with the author's accumulated knowledge of the wider Karoo landscape. This was used to determine areas most likely to be sensitive and that needed to be targeted during the survey. The subsequent fieldwork served to ground truth the site, including areas identified as potentially sensitive. Desktop research was also used to inform on the heritage context of the area. Although the full desktop study will be provided in the EIA phase report, the findings of the fieldwork are described and illustrated in detail in section 4.2 of the heritage scoping report.

The map below is extracted from the screening tool report and shows the archaeological and heritage sensitivity to be low throughout the study area. The site visit showed that much of the site is indeed of low sensitivity, but several pockets of higher sensitivity were fond to occur. These are places where archaeological and other heritage resources were found and tended to be in close proximity to farmsteads or dolerite outcrops. These areas are considered to be of variably medium to very high sensitivity. The heritage specialist thus disputes the screening tool findings in that a uniform low sensitivity is not applicable to the entire study area. Figure C15 to C19 in Appendix C of this report show the spatial distribution of these higher sensitivity areas, although an equivalent scale map to the screening tool map is shown below for easier comparison.

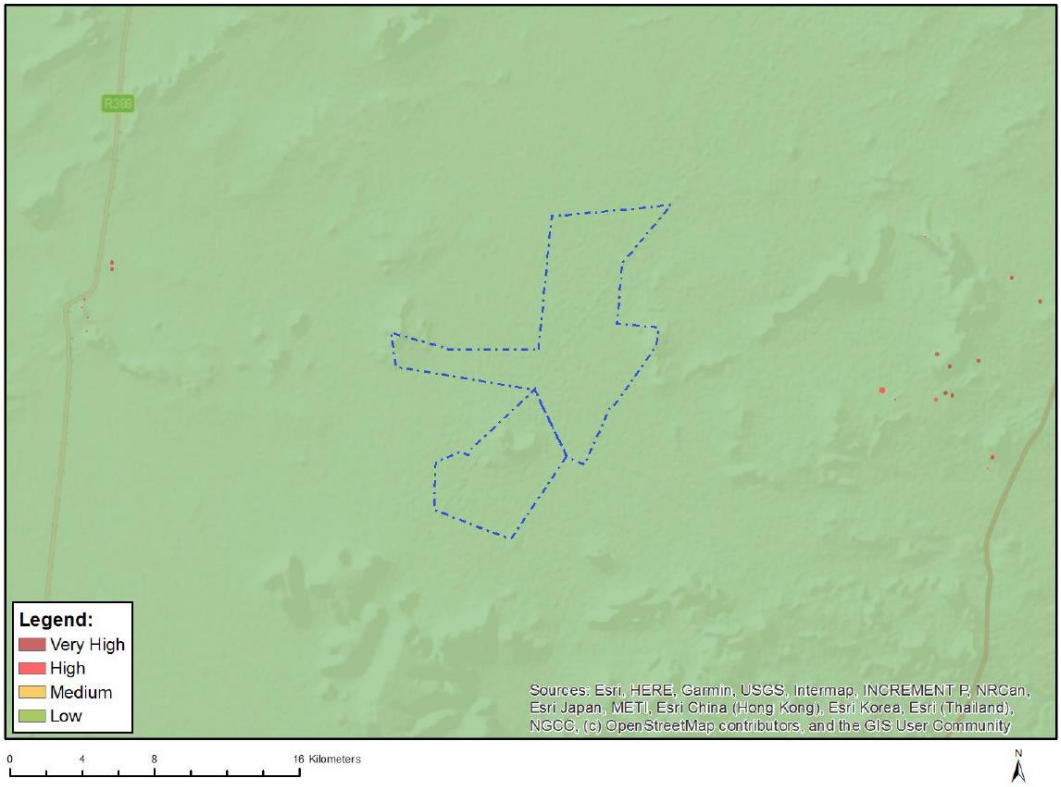


Figure D1: *Screening tool map for archaeology and cultural heritage.*

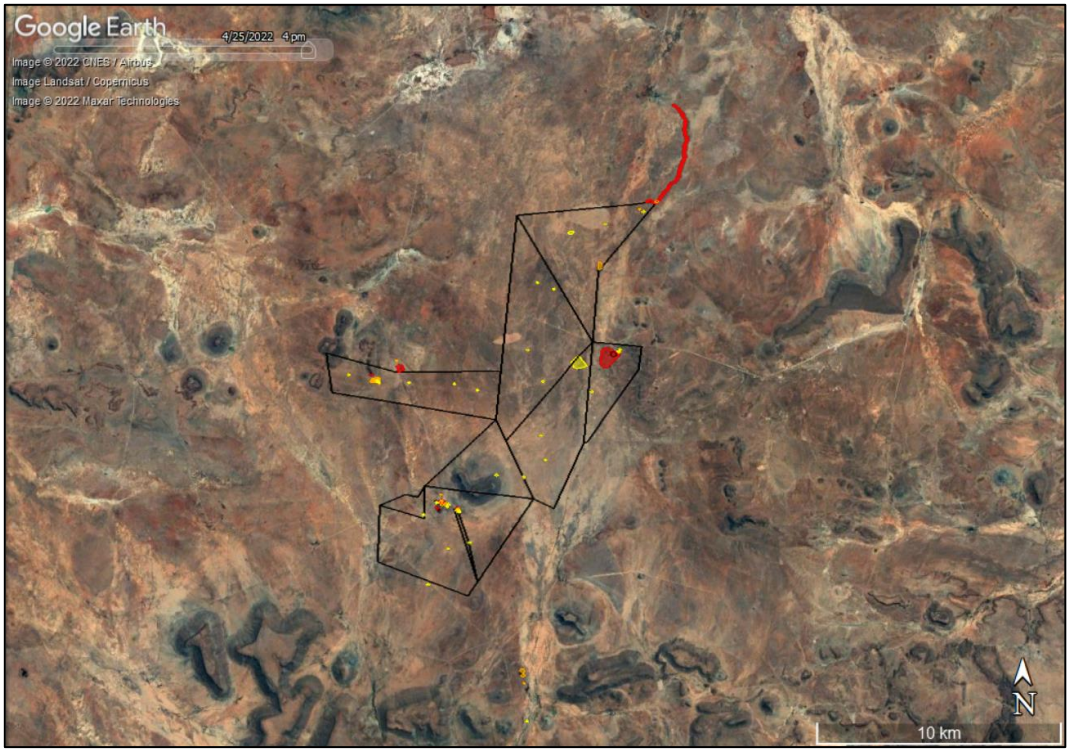


Figure D2: *Archaeology and cultural heritage sensitivity as determined through fieldwork. Dark red = very high, red = high, orange = medium, yellow = low sensitivity heritage resources.*

Appendix E: Impact Assessment Methodology

The impact assessment includes:

- *the nature, status, significance and consequences of the impact and risk;*
- *the extent and duration of the impact and risk;*
- *the probability of the impact and risk occurring;*
- *the degree to which impacts and risks can be mitigated;*
- *the degree to which the impacts and risks can be reversed; and*
- *the degree to which the impacts and risks can cause loss of irreplaceable resources.*

Terminology used in impact assessment can overlap. To avoid ambiguity, please note the following clarifications (that are based on NEMA and the EIA Regulations):

- *The term environment is understood to have a broad interpretation that includes both the natural (biophysical) environment and the socio-economic environment. The term socio-ecological system is also used to describe the natural and socio-economic environment and the interactions amongst these components.*
- *Significance = Consequence x Probability, which means that significance is equivalent to risk.*
- *The impact can have a positive or negative status. The significance of a negative impact may be called a risk, and the significance of a positive impact may be called an opportunity.*

The following principles are to underpin the application of this methodology:

- *Transparent and repeatable process - specialists are to describe the thresholds and limits they apply in their assessment, wherever possible.*
- *Adapt parameters to context (where justified) – the methodology proposes some thresholds (e.g. for spatial extent, in Step 3 below), however, if the nature of the impact requires a different definition of the categories of spatial extent, then this can be provided and described.*
- *Combination of a quantitative and qualitative assessment – where possible, specialists are to provide quantitative assessments (e.g. areas of habitat affected, decibels of noise, number of jobs), however, it is recognised that not all impacts can be quantified, and then qualitative assessments are to be provided.*

As per the DFFE Guideline 5: Assessment of Alternatives and Impacts, the following methodology is applied to the prediction and assessment of impacts and risks. Potential impacts and risks have been rated in terms of the direct, indirect and cumulative:

- *Direct impacts are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.*
- *Indirect impacts of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.*
- *Cumulative impacts are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.*

The impact assessment methodology includes the aspects described below.

- ***Step 1**: **Nature** of impact/risk - The type of effect that a proposed activity will have on the environment.*

- ***Step 2**: **Status** - Whether the impact/risk on the overall environment will be:*
    - *Positive - environment overall will benefit from the impact/risk;*

- *Negative - environment overall will be adversely affected by the impact/risk; or*
- *Neutral - environment overall not be affected.*

- ***Step 3**: **Qualitatively** determine the **consequence** of the impact/risk by identifying the **a) SPATIAL EXTENT; b) DURATION; c) REVERSIBILITY; AND d) IRREPLACEABILITY**.*

  - ***A) Spatial extent** – The size of the area that will be affected by the impact/risk:*
    - *Site specific;*
    - *Local (<10 km from site);*
    - *Regional (<100 km of site);*
    - *National; or*
    - *International (e.g. Greenhouse Gas emissions or migrant birds).*

  - ***B) Duration** – The timeframe during which the impact/risk will be experienced:*
    - *Very short term (instantaneous);*
    - *Short term (less than 1 year);*
    - *Medium term (1 to 10 years);*
    - *Long term (the impact will cease after the operational life of the activity (i.e. the impact or risk will occur for the project duration)); or*
    - *Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient (i.e. the impact will occur beyond the project decommissioning)).*

  - ***C) Reversibility** of the Impacts - the extent to which the impacts/risks are reversible assuming that the project has reached the end of its life cycle (decommissioning phase):*
    - *High reversibility of impacts (impact is highly reversible at end of project life i.e. this is the most favourable assessment for the environment);*
    - *Moderate reversibility of impacts;*
    - *Low reversibility of impacts; or*
    - *Impacts are non-reversible (impact is permanent, i.e. this is the least favourable assessment for the environment).*

  - ***D) Irreplaceability** of Receiving Environment/Resource Loss caused by impacts/risks – the degree to which the impact causes irreplaceable loss of resources assuming that the project has reached the end of its life cycle (decommissioning phase):*
    - *High irreplaceability of resources (project will destroy unique resources that cannot be replaced, i.e. this is the least favourable assessment for the environment);*
    - *Moderate irreplaceability of resources;*
    - *Low irreplaceability of resources; or*
    - *Resources are replaceable (the affected resource is easy to replace/rehabilitate, i.e. this is the most favourable assessment for the environment).*

*Some of the criteria are quantitative (e.g. spatial extent and duration) and some may be described in a quantitative or qualitative manner (e.g. reversibility and irreplaceability). The specialist then combines these criteria in a qualitative manner to determine the **consequence**.*

The consequence terms ranging from slight to extreme must be calibrated per Specialist Study so that there is transparency and consistency in the way a risk/impact is measured. For example, from a biodiversity and ecology perspective, the consequence ratings could be defined according to a reduction in population or occupied area in relation to Species of Conservation Concern (SCC) status, ranging from slight consequence for defined areas of Least Concern, to extreme consequence for defined areas that are Critically Endangered. For example, from a social perspective, a slight

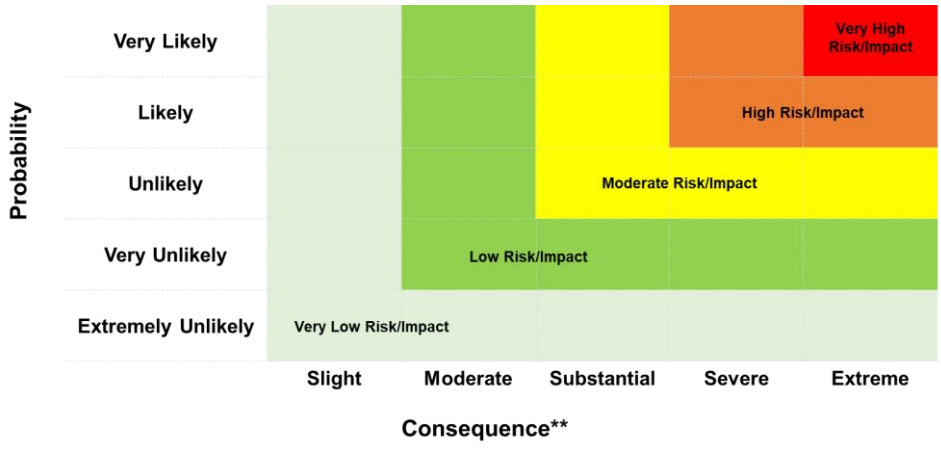
consequence could refer to small and manageable impacts, or impacts on small sections of the community; a moderate consequence could refer to impacts which affect the bulk of the local population negatively or may produce a net negative impact on the community; and an extreme consequence could refer to impacts which could result in social or political violence or institutional collapse.

- ***Consequence** – The anticipated consequence of the risk/impact is generally defined as follows:*
    - *Extreme (extreme alteration of natural or socio-economic systems, patterns or processes, i.e. where environmental or socio-economic functions and processes are altered such that they permanently cease);*
    - *Severe (severe alteration of natural or socio-economic systems, patterns or processes, i.e. where environmental or socio-economic functions and processes are altered such that they temporarily or permanently cease);*
    - *Substantial (substantial alteration of natural or socio-economic systems, patterns or processes, i.e. where environmental or socio-economic functions and processes are altered such that they temporarily or permanently cease;*
    - *Moderate (notable alteration of natural or socio-economic systems, patterns or processes, i.e. where the natural or socio-economic environment continues to function but in a modified manner; or*
    - *Slight (negligible and transient alteration of natural or socio-economic systems, patterns or processes, i.e. where natural systems/environmental or socio-economic functions, patterns, or processes are not affected in a measurable manner, or if affected, that effect is transient and the system recovers).*

- ***Step 4**: Rate the **probability** of the impact/risk using the criteria below:*

    - ***Probability** – The probability of the impact/risk occurring:*
        - *Extremely unlikely (little to no chance of occurring);*
        - *Very unlikely (<30% chance of occurring);*
        - *Unlikely (30-50% chance of occurring)*
        - *Likely (51 – 90% chance of occurring); or*
        - *Very Likely (>90% chance of occurring regardless of prevention measures).*

- ***Step 5**: Use both the **consequence** and **probability** to determine the **significance** of the identified impact/risk (qualitatively as shown in Figure 1). Significance definitions and rankings are provided below:*



[Qualitatively determined based on Spatial Extent, Duration, Reversibility and Irreplaceability]

Figure 1. Guide to assessing risk/impact significance as a result of consequence and probability.

- ***Significance*** *– Will the impact cause a notable alteration of the environment?*
    - *Very low (the risk/impact may result in very minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);*
    - *Low (the risk/impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);*
    - *Moderate (the risk/impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated);*
    - *High (the risk/impact will result in major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making); and*
    - *Very high (the risk/impact will result in very major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making (i.e. the project cannot be authorised unless major changes to the engineering design are carried out to reduce the significance rating)).*

With the implementation of mitigation measures, the residual impacts/risks are ranked as follows in terms of significance:

- *Very low = 5;*
- *Low = 4;*
- *Moderate = 3;*
- *High = 2; and*
- *Very high = 1.*

The specialists must provide a written supporting motivation of the assessment ratings provided.

- ***Step 6****: Determine the* ***Confidence Level*** *– The degree of confidence in predictions based on available information and specialist knowledge:*
    - *Low;*
    - *Medium; or*
    - *High.*