

# DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the proposed development of the Padloper Solar PV Facility 4 (i.e., Padloper PV 4), the proposed development of a 132 kV Overhead Power Line between the Padloper PV 4 and the proposed authorised Ishwati Emoyeni Collector Substation (i.e., Padloper EGI 4), and their associated infrastructure, near Murraysburg in the Northern Cape and Western Cape Provinces



## APPENDIX D.3: Archaeology, Palaeontology and Cultural Heritage - Padloper EGI 1-4

**HERITAGE IMPACT ASSESSMENT:  
BASIC ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF A 132 KV  
OVERHEAD POWER LINE AND ASSOCIATED INFRASTRUCTURE BETWEEN THE  
PROPOSED PADLOPER SOLAR 4 AND THE PROPOSED AUTHORISED ISHWATI  
EMOYENI COLLECTOR SUBSTATION (i.e., PADLOPER EGI 4), NEAR  
MURRAYSBURG, MURRAYSBURG MAGISTERIAL DISTRICT, WESTERN CAPE  
AND RICHMOND MAGISTERIAL DISTRICT, NORTHERN CAPE**

Required under Section 38 (8) of the National Heritage Resources Act (No. 25 of 1999)

HWC Case No: HWC22121416CM0209  
SAHRA Case ID: 22169/38.8

*Report for:*

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1<sup>st</sup> draft: 23 August 2023  
Final report: 08 September 2023

# EXECUTIVE SUMMARY

## 1. Site Name

Padloper EGI 4

## 2. Location

- Off farm and local gravel roads, 21-29 km north of Murraysburg
- Farm portions:
  - Portion 2 of Driefontein 26, Western Cape;
  - Portion 3 of Driefontein 26, Western Cape;
  - Portion 4 of Driefontein 26, Western Cape;
  - Portion 6 of Klipplaat 109, Northern Cape;
  - Portion 4 of Klipplaat 109, Northern Cape;
  - Portion 1 of Klipplaat 109, Western Cape;
  - Remainder of Riet Poort 9, Western Cape; and
  - Remainder of Driefontein 8, Western Cape.
- The southeast and northwest ends of the powerline will be at:
  - $S31^{\circ} 52' 59.8'' E23^{\circ} 54' 07.6''$  (at centre of proposed substation); and
  - $S31^{\circ} 42' 24.5'' E23^{\circ} 39' 30.3''$  (at authorised Ishwati Emoyeni Collector Substation).

## 3. Locality Plan



#### 4. Description of Proposed Development

The project will include a 132 kV powerline on monopole or lattice towers, a service/access track and a switching station.

#### 5. Heritage Resources Identified

No fossils were found on site. Many archaeological resources occur in the area with the most significant being a ruined historical farm complex with many individual features. These include a walled graveyard and many graves outside the wall. A small patch of engravings (cross-hatched design), an informal scratched 'engraving', some ephemeral stone artefact scatters and various historical dams were also present. The cultural landscape is also a heritage resource.

#### 6. Anticipated Impacts on Heritage Resources

All significant sites have been avoided and no impacts are currently anticipated, although the line would pass over some historical dams. Note however, that the line will pass through the overall buffer of the historical farm complex and may require that some poplar trees are removed. This is not of much concern since the complex has long been ruined and now has an archaeological character rather than a historical one. Because the final alignment has not been specifically surveyed, there is still a chance of some sites (likely of lower significance) being present. It is likely that impacts will be easily managed through micrositing of pylons and the access track where needed. Impacts to the landscape are unavoidable but, in this case, are deemed within acceptable limits. The placement of the powerline adjacent to an already authorised (but not yet constructed) line is advantageous from a landscape point of view.

#### 7. Recommendations

It is recommended that the proposed Padloper EGI 4 be authorised, but subject to the following recommendations which should be included as conditions of authorisation (note that points applicable to one province only are indicated; the remaining points refer to the entire length of the project):

- The powerline may not be constructed closer than 30 m from the graveyard. It is preferred that no pylons or service track are placed within 50 m of the graveyard, but the cables may span the area between 30 and 50 m from the graveyard.
- WESTERN CAPE ONLY: The graveyards at PL\_06 must be flagged as a No-Go area;
- WESTERN CAPE ONLY: The stone walling at waypoint 016 must be flagged as a No-Go area;
- WESTERN CAPE ONLY: The powerline service track may not go over dam walls;
- A pre-construction archaeological survey must determine whether any further impacts might occur;
- Any further no-go areas must be flagged on site prior to development starting;
- No stones may be removed from any archaeological site;
- The fossil Chance Finds Protocol must be included in the EMP and implemented in the event that fossils are found;
- WESTERN CAPE ONLY: The removal of trees from within the servitude at the historic Driefontein farm complex and on the current Rietpoort farmlands must be minimised;

- WESTERN CAPE ONLY: Lighting mitigation must be employed at the switching station to ensure that light is directed only to where it is needed and, preferably, that it only switches on when needed;
- WESTERN CAPE ONLY: Buildings to be painted in earthy tones where technically feasible; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

## 8. **Author/s and Date**

Heritage Impact Assessment: Jayson Orton, ASHA Consulting (Pty) Ltd, September 2023

Palaeontological Impact Assessment: Elize Butler, Banzai Environmental, August 2023

Visual Impact Assessment: Kerry Lianne Schwartz, SLR Consulting, August 2023

## 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.

**Flake:** a piece of stone intentionally removed from a core. Flakes are identifiable by certain features related to the point at which the core was struck.

**Handaxe:** A bifacially flaked, pointed stone tool type typical of the Early Stone Age.

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

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

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

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

**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.

## 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

**DFFE:** Department of Forestry, Fisheries and the Environment

**EA:** Environmental Authorisation

**ECO:** Environmental Control Officer

**EGI:** Electricity Grid Infrastructure

**EIA:** Environmental Impact Assessment

**EMPr:** Environmental Management Program

**ESA:** Early Stone Age

**GPS:** global positioning system

**HIA:** Heritage Impact Assessment

**HV:** High Voltage

**HWC:** Heritage Western Cape

**LSA:** Later Stone Age

**MSA:** Middle Stone Age

**NCW:** Not Conservation Worthy

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

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

**NID:** Notification of Intent to Develop

**O&M:** Operation and Management

**PHRA:** Provincial Heritage Resources Agency

**PPP:** Public Participation Process

**PV:** Photovoltaic

**REDZ:** Renewable Energy Development Zone

**SAHRA:** South African Heritage Resources Agency

**SAHRIS:** South African Heritage Resources Information System

## Compliance with Appendix 6 of the 2014 EIA Regulations

Requirements of Appendix 6 – GN R326 (7 April 2017)	Addressed in the Specialist Report
1. (1) A specialist report prepared in terms of these Regulations must contain-	Section 1.4 Appendix 1
a) details of-	
i. the specialist who prepared the report; and	
ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page ii (Preliminary Section of this report)
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.3
(cA) an indication of the quality and age of base data used for the specialist report;	Section 3
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Sections 8.6, 8.4 and 8.8
d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 3.2
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 3
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying alternatives;	Sections 1.1.3, 5, 6
g) an identification of any areas to be avoided, including buffers;	Section 13
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Sections 5.7 and 13
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 3.6
j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 5 Section 13
k) any mitigation measures for inclusion in the EMPr;	Sections 8 and 11
l) any conditions for inclusion in the environmental authorisation;	Section 14
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 11
n) a reasoned opinion-	Sections 13.1 and 14
i. whether the proposed activity, activities or portions thereof should be authorised;	
(iA) regarding the acceptability of the proposed activity and activities; and	
ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Section 12
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Not Applicable
q) any other information requested by the competent authority.	Not Applicable
2. Where a government notice gazetted by the Minister provides for any protocol of minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply	Part A of the Assessment Protocols published in Government Notice No. 320 on 20 March 2020 is applicable (i.e. site sensitivity verification requirements where a specialist assessment is required but no specific assessment protocol has been prescribed). See Appendix 3.



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# 1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by African Clean Energy Developments (Pty) Ltd (ACED) to assess the potential impacts to heritage resources that might occur through the proposed development of a 132 kV powerline to be located in the area between Murraysburg, Western Cape and Richmond, Northern Cape (Figures 1 and 2). The study area is between 16 km and 29 km north of Murraysburg. The powerline is intended to connect the proposed Padloper Solar Facility 1 to the national electricity grid. The proposed powerline – referred to as Padloper Electricity Grid Infrastructure (EGI) 4 – will cross the following farm portions (from southeast to northwest):

- Portion 2 of Driefontein 26, Western Cape;
- Portion 3 of Driefontein 26, Western Cape;
- Portion 4 of Driefontein 26, Western Cape;
- Portion 6 of Klipplaat 109, Northern Cape;
- Portion 4 of Klipplaat 109, Northern Cape;
- Portion 1 of Klipplaat 109, Western Cape;
- Remainder of Riet Poort 9, Western Cape; and
- Remainder of Driefontein 8, Western Cape.

A switching substation will also be constructed at the start of the powerline on Portion 2 of Driefontein 26. The southeast and northwestwest ends of the powerline will be at:

- S31° 52' 59.8" E23° 54' 07.6" (at centre of proposed substation); and
- S31° 42' 24.5" E23° 39' 30.3" (at authorised Ishwati Emoyeni Collector Substation).

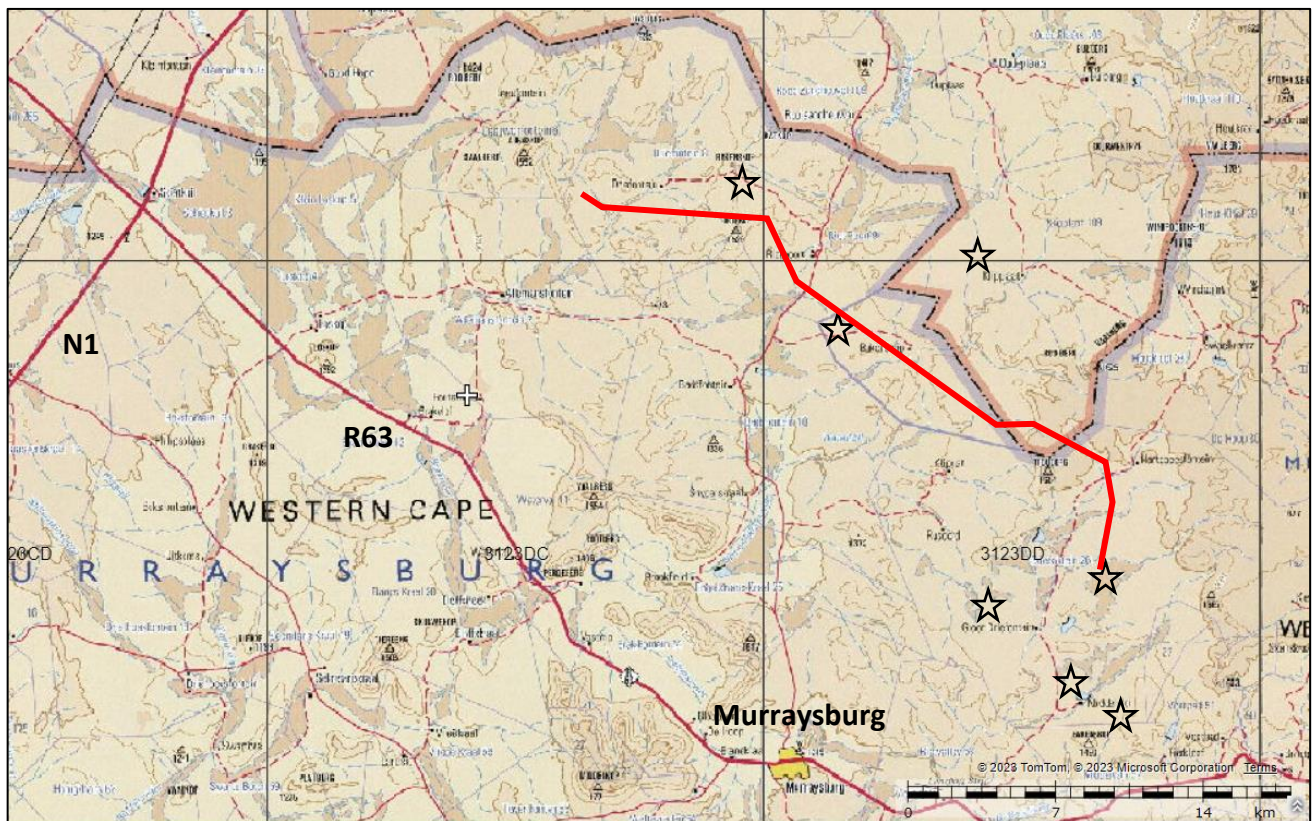
## 1.1. The proposed project

### 1.1.1. Project description

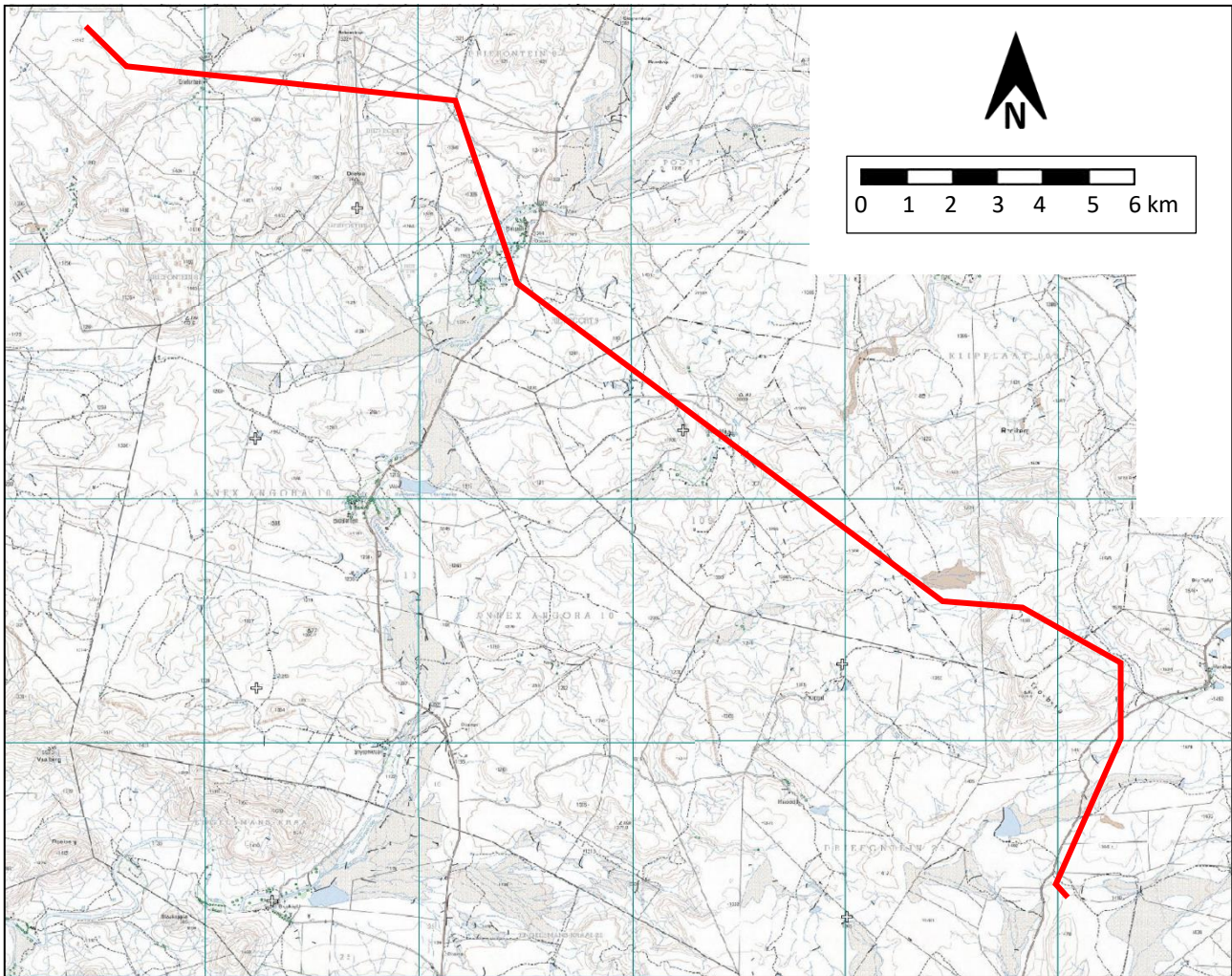
The proposed 132 kV powerline will be approximately 36.1 km long and will consist of the following components:

Infrastructure	Component	Dimensions / Specifications
Overhead power line	Capacity	132 kV
	Foundation	The size of the footprint area will range from 0.6 m x 0.6 m to 1.5 m x 1.5 m. The minimum working area required around a structure position is 20 m x 20 m.
	Pylon	Steel monopole or lattice towers
	Tower type	Self-supporting and Angle Strain towers
	Height	17.4 m – 21 m
	Servitude length	Approximately 36 km
	Servitude width	The registered servitude will be up to 50 m wide or where multiple adjacent power lines occur, in line with guideline and requirements for 132 kV power lines stipulated in the 2011 Eskom Distribution Guide Part 19.  Guideline and requirements for 132 kV power lines (Extracted from Eskom Distribution Guide Part 19, 2011)

Infrastructure	Component	Dimensions / Specifications		
		Voltage	Building restriction on each side of centre line	Separation distance between parallel lines
		132 kV	18 metres (15.5 - 20)	15 metres (21 - 24)
		<p><u>Note</u> that the entire servitude will <u>not</u> be cleared of vegetation. Vegetation clearance within the servitude will be undertaken in compliance with relevant standards and specifications.</p>		
	Proximity to grid connection	This proposed 132 kV overhead power line will facilitate the connection of the proposed Padloper PV 4 to the existing Gamma MTS, via the authorised Ishwati Emoyeni Collector Substation.		
Associated infrastructure				
Service roads	There are a number of existing gravel farm roads (some just jeep tracks) with widths ranging between 4 m and 5 m located around and within the proposed power line assessment corridor. It is anticipated that a service road of approximately 4 m wide (usually only jeep tracks) will be required below the power line.			
Switching station	A 132 kV facility switching substation complex will be located within the site, adjacent to the facility substation, and will have a height of up to 18 m. The area of switching stations relevant to the proposed power lines are as follows:  Area: 2.17 ha			
Construction period	Approximately 18 – 24 months			



**Figure 1:** Extract from 1:250 000 mapsheet 3122 showing the regional context of the Padloper EGI4 (red line). The locations of the seven related solar facilities (stars) are shown for context.



**Figure 2:** Extract from 1:50 000 topographic map 3123DA, DB, DC & DD showing the location of the Padloper EGI4 (red line). Source: Chief Directorate: National Geo-Spatial Information. Website: [www.ngi.gov.za](http://www.ngi.gov.za).

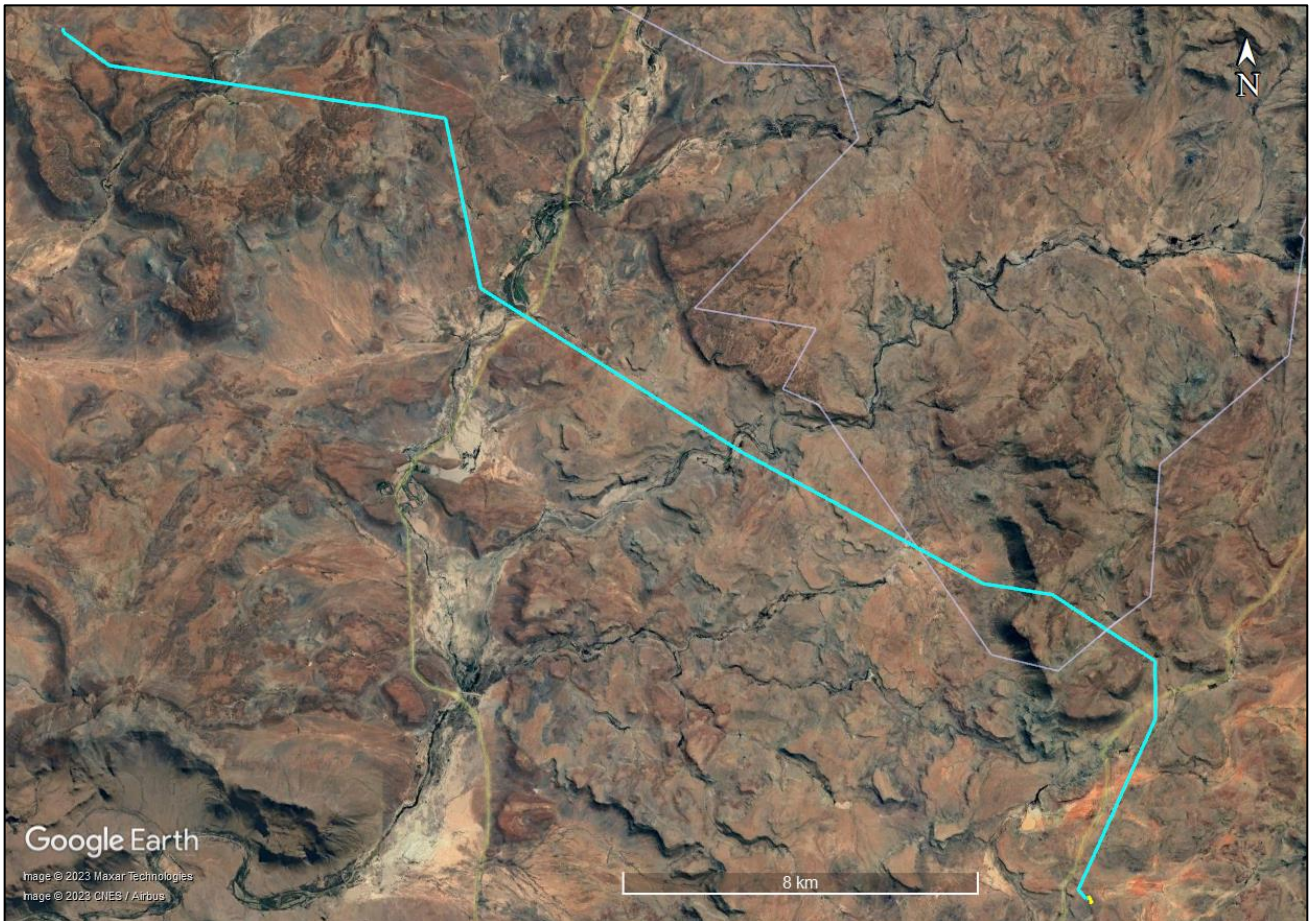
It is important to note that the exact specifications of the proposed project components will only be determined during the detailed engineering phase prior to construction (subsequent to the issuing of an Environmental Authorisation (EA)), should such an authorisation be granted for the proposed project, but that the information provided above is seen as the worst-case scenario. Figure 3 shows the project proposal as assessed in this report.

### 1.1.2. Identification of alternatives

No alternative sites were considered. However, a 400 m wide corridor was provided for assessment with the final alignment, largely within that area, chosen based on sensitivities identified by the specialists. The final footprint was also designed following specialist inputs to reduce impacts.

### 1.1.3. Description of project aspects relevant to the heritage study

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.



**Figure 3:** Aerial view of the study area showing the Padloper EGI 4 route (powerline = turquoise line, yellow square = substation).

## 1.2. Terms of reference

ASHA Consulting was asked to do the following:

- Describe regional and local features of the receiving environment;
- Identify sensitive areas and sites of heritage significance within a 400 m wide corridor;
- Map sensitive features;
- Assess (identify and rate) the potential impacts on the environment within a Heritage Impact Assessment (HIA) report;
- Identify relevant legislation and legal requirements; and
- Provide recommendations on possible mitigation measures, rehabilitation procedures, and management guidelines.

A Notification of Intent to Develop (NID) was submitted to HWC on 15 December 2022 and they responded on 21 February 2023 with the following comment:

**RESPONSE TO NOTIFICATION OF INTENT TO DEVELOP: HERITAGE IMPACT ASSESSMENT REQUIRED**  
**In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999) and the Western Cape**  
**Provincial Gazette 6061, Notice 298 of 2003**

**NOTIFICATION OF INTENT TO DEVELOP: PROPOSED SEVEN SOLAR PHOTOVOLTAIC (PV) FACILITIES WITH A CAPACITY OF BETWEEN 100 AND 350 MW EACH AND THE ASSOCIATED INFRASTRUCTURE, AND SEVEN ASSOCIATED 132 KV OVERHEAD POWER LINES LOCATED ON FARM 9, PORTIONS 2, 3 AND 7 OF FARM 26, MURRAYSBURG, SUBMITTED IN TERMS OF SECTION 38(1) OF THE NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)**

The matter above has reference: HWC22121416CM0209

Heritage Western Cape is in receipt of your application for the above matter received. This matter was discussed at the Heritage Officers Meeting held on 20<sup>th</sup> of February 2023.

You are hereby notified that, since there is reason to believe that the proposed seven Solar Photovoltaic (PV) Facilities with a capacity of between 100 and 350mw each and the associated infrastructure, and seven associated 132 kV overhead power lines on the farms; Rietpoort 9, PV4: Portion 3 of Driefontein 26, PV5: Portion 2 of Driefontein 26, PV6: Portion 7 of Driefontein 26, PV7: Portion 7 of Driefontein 26 in the Murraysburg District and PV3: Klipplaat 109 in the Richmond District, Beaufort West, Western Cape will impact on heritage resources, HWC requires that a Heritage Impact Assessment (HIA) that satisfies the provisions of Section 38(3) of the NHRA be submitted. Section 38(3) of the NHRA provides

(3) *The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): **Provided that the following must be included:***

- (a) *The identification and mapping of all heritage resources in the area affected;*
- (b) *an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;*
- (c) *an assessment of the impact of the development on such heritage resources;*
- (d) *an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;*
- (e) *the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
- (f) *if heritage resources will be adversely affected by the proposed development, The consideration of alternatives; and*
- (g) *plans for mitigation of any adverse effects during and after the completion of the proposed development.*

**(Our emphasis)**

This HIA must in addition have specific reference to the following:

- Visual Impact Assessment on the cultural landscape
- Archaeological Impact Assessment
- Palaeontological Impact Assessment
- Cultural Landscape Assessment including that of the Built Environment

The HIA must have an overall assessment of the impacts to heritage resources which are not limited to the specific studies referenced above.

The required HIA must have an integrated set of recommendations.

The comments of relevant registered conservation bodies; all Interested and Affected parties; and the relevant Municipality must be requested and included in the HIA where provided. Proof of these requests must be supplied.

It must be noted that at the time of submission DFFE had granted permission for combined specialist reporting. This was subsequently changed to allow only certain projects to be combined but, for simplicity, the heritage reports have been separated. All projects contemplated in the NID therefore have the same case number.

### **1.3. Scope, purpose and objectives of the report**

An HIA is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This HIA report aims to fulfil the requirements of the heritage authorities such that a comment can be issued by them for consideration by the National Department of Forestry and Fisheries and Environment (DFFE) who will review the Basic Assessment (BA) and grant or refuse authorisation. The HIA report will outline any management

and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

#### **1.4. 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 1). He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is an accredited heritage practitioner with the Association of Professional Heritage Practitioners (APHP; Member #43) and also holds archaeological accreditation with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

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

A signed specialist statement of independence is included at the front of this specialist assessment.

## **2. LEGISLATIVE CONTEXT**

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

The NHRA protects a variety of heritage resources as follows:

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

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

- Structures: “any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith”;
- Palaeontological material: “any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace”;
- Archaeological material: a) “material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures”; b) “rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation”; c) “wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than



60 years or which SAHRA considers to be worthy of conservation”; and d) “features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found”;

- Grave: “means a place of interment and includes the contents, headstone or other marker of such a place and any other structure on or associated with such place”; and
- Public monuments and memorials: “all monuments and memorials a) “erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government”; or b) “which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual.”

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

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

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list “historical settlements and townscapes” and “landscapes and natural features of cultural significance” as part of the National Estate. Furthermore, Section 3(3) describes the reasons a place or object may have cultural heritage value; some of these speak directly to cultural landscapes.

## **2.2. Approvals and permits**

### **2.2.1. Assessment Phase**

Section 38(8) of the NHRA states that if an impact assessment is required under any legislation other than the NHRA then it must include a heritage component that satisfies the requirements of S.38(3). Furthermore, the comments of the relevant heritage authority must be sought and considered by the consenting authority prior to the issuing of a decision. Under the National Environmental Management Act (No. 107 of 1998; NEMA), as amended, the project is subject to a BA. The present report provides the heritage component. HWC is required to provide comment on the proposed project in order to facilitate final decision making by the National Department of Forestry, Fisheries and the Environment (DFFE).

### 2.2.2. Construction Phase

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

### 2.3. Guidelines

HWC and SAHRA have issued minimum standards documents for HIAs and specialist studies. There is also a Western Cape Provincial guideline for heritage specialists working in an EIA context and which is generally useful. The reporting has been prepared in accordance with these guidelines. The relevant documents are as follows:

- Heritage Western Cape. 2016. Grading: purpose and management implications.
- Heritage Western Cape. 2019. Public consultation guidelines.
- Heritage Western Cape. 2021. Guide for Minimum Standards for Archaeology and Palaeontology reports submitted to Heritage Western Cape.
- Heritage Western Cape. 2021. Notification of Intent to Develop, Heritage Impact Assessment, (Pre-Application) Basic Assessment Reports, Scoping Reports and Environmental Impact Assessments, Guidelines for submission to Heritage Western Cape.
- SAHRA. 2007. Minimum Standards: archaeological and palaeontological components of impact assessment reports. Document produced by the South African Heritage Resources Agency, May 2007.
- Winter, S. & Baumann, N. 2005. Guideline for involving heritage specialists in EIA processes: Edition 1. CSIR Report No ENV-S-C 2005 053 E. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.

### 2.4. Application timeline

The application to DFFE under NEMA is currently in the pre-application phase with submission of the final Basic Assessment Report estimated to be in November 2023.

## 3. APPROACH AND METHODOLOGY

### 3.1. Literature survey and information sources

A survey of available literature was carried out to assess the general heritage context into which the development would be set. The information sources used in this report are presented in Table 1 with relevant dates of each source referenced in the text as needed. Data were also collected via a field survey. The data quality is suitable for the purpose of informing this report.

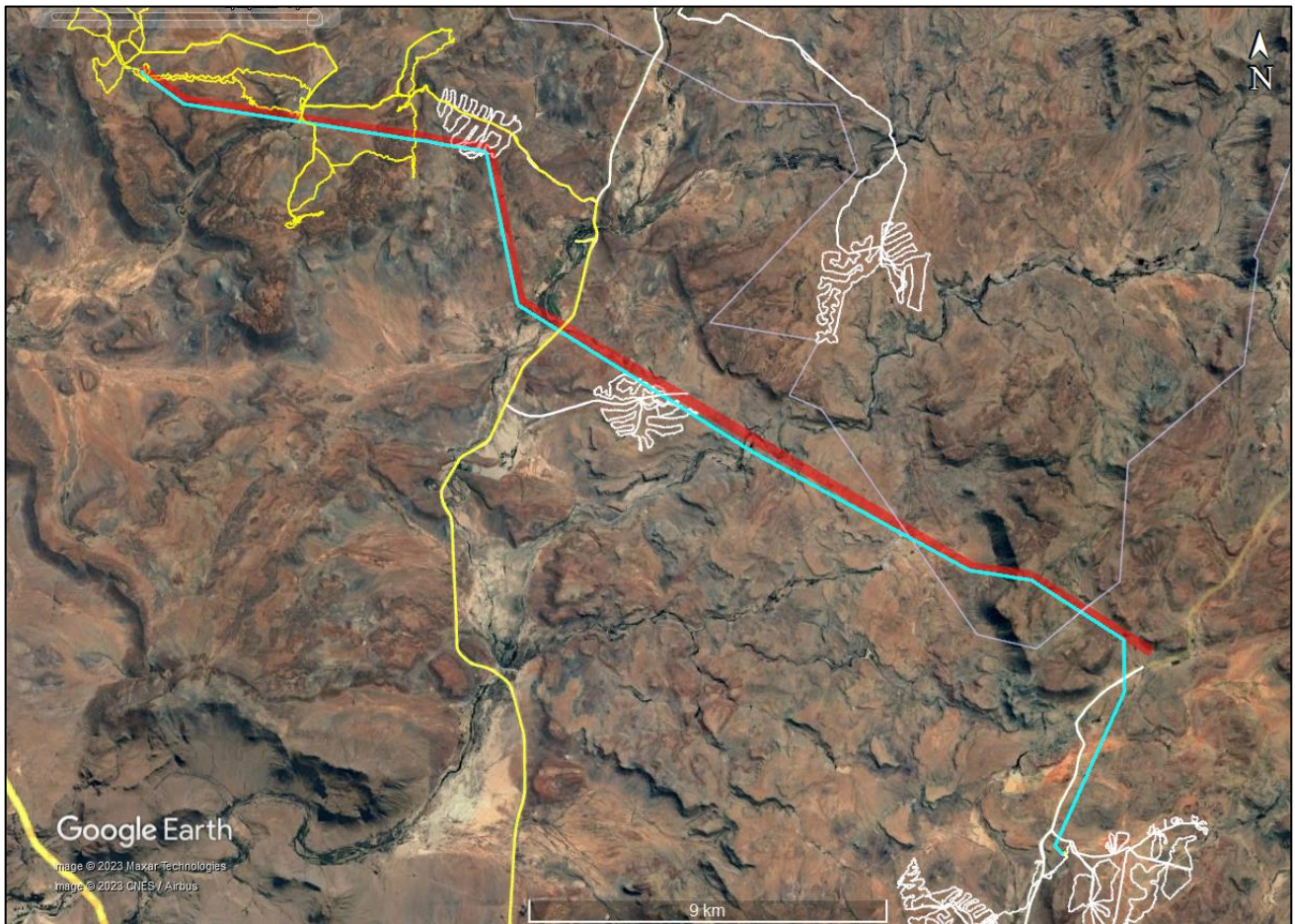
**Table 1: Information sources used in this assessment.**

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
Cadastral data	CapeFarmMapper ( <a href="http://gis.elsenburg.com/apps/cfm/#">http://gis.elsenburg.com/apps/cfm/#</a> )	Current	Spatial	Cadastral boundaries, extents and aerial photography
Background data	South African Heritage Resources Information System (SAHRIS)	Various	Reports	Previous impact assessments for any developments in the vicinity of the study area
Palaeontological sensitivity	South African Heritage Resources Information System (SAHRIS)	Current	Spatial	Map showing palaeontological sensitivity and required actions based on the sensitivity
Background data	Books, journals, websites	Various	Books, journals, websites	Historical and current literature describing the study area and any relevant aspects of cultural heritage
Screening Tool maps	DFFE	Current	Spatial	Potential sensitivity of the study area

### 3.2. Field survey

The powerline route was not specifically surveyed. This is because large parts had been surveyed for other projects. These included primarily the survey by Mann (2022) which covered some 84% of the corridor for another powerline (but note that it was a linear survey and did not cover the full width). Further observations in the area were gathered by Halkett (2014) as well as by the present specialist for the related Padloper Solar Energy Facilities which were surveyed from 18 to 21 September 2022 by three archaeologists, and an adjacent wind energy facility (WEF) which was surveyed from 13 to 15 February 2023 by two archaeologists (all reports in progress). The surveys by the present specialist were during spring and summer but, in this dry area, the season makes no meaningful difference to vegetation covering and hence the ground visibility for the archaeological survey. Other heritage resources are not affected by seasonality. During the surveys the positions of finds and survey tracks were recorded on hand-held Garmin Global Positioning System (GPS) receivers set to the WGS84 datum (Figure 4). Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

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



**Figure 4:** Aerial view of Padloper EGI 4 (turquoise line) showing the accumulated survey tracks of the present specialist (white lines for the Padloper Solar Facilities and yellow lines for the adjacent WEF). The red line indicates the area surveyed by Mann (2022), while Halkett's (2014) survey was in the same area as the yellow lines.

### 3.3. Specialist studies

As per the HWC request, specialist studies of archaeology, palaeontology, cultural landscape and visual impacts were carried out. While archaeology and cultural landscape are included within this report, the other two are appended in full and summarised within the present HIA.

### 3.4. Impact assessment

For consistency among specialist studies, the impact assessment was conducted through application of a methodology supplied by the CSIR.

### 3.5. Grading

Section 7 of the NHRA provides for the grading of heritage resources into those of National (Grade 1), Provincial (Grade 2) and Local (Grade 3) significance. Grading is intended to allow for the

identification of the appropriate level of management for any given heritage resource. Grade 1 and 2 resources are intended to be managed by the national and provincial heritage resources authorities, while Grade 3 resources would be managed by the relevant local planning authority. These bodies are responsible for grading, but anyone may make recommendations for grading.

It is intended 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. Heritage Western Cape (2016), however, uses a system in which resources of local significance are divided into Grade 3A, 3B and 3C. These approximately equate to high, medium and low local significance, while sites of very low or no significance (and generally not requiring mitigation or other interventions) are referred to as Not Conservation Worthy (NCW).

### **3.6. Assumptions, knowledge gaps and limitations**

The field surveys were carried out at the surface only and hence any completely buried archaeological sites would not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. The assessment is limited by the fact that certain areas were not surveyed, but aerial photography provides a good indication of whether obvious heritage resources might be present. It is also assumed that the findings of the surveys would be indicative of the overall pattern on the landscape and can be used to predict the types of heritage that might occur along the unsurveyed sections.

Consolidation of finds from various surveys was undertaken. It is difficult to assign heritage grades to sites recorded by others and, accordingly, the sites recorded by Halkett (2014) were not graded here. It is also noted that heritage grading is subjective with different specialists assigning different grades to similar sites.

Cumulative impacts are difficult to assess due to the variable site conditions that would have been experienced in different areas and in different seasons. Survey quality is thus likely to be variable. As such, some assumptions need to be made in terms of what and how much heritage might be impacted by other developments in the broader area.

### **3.7. Consultation processes undertaken**

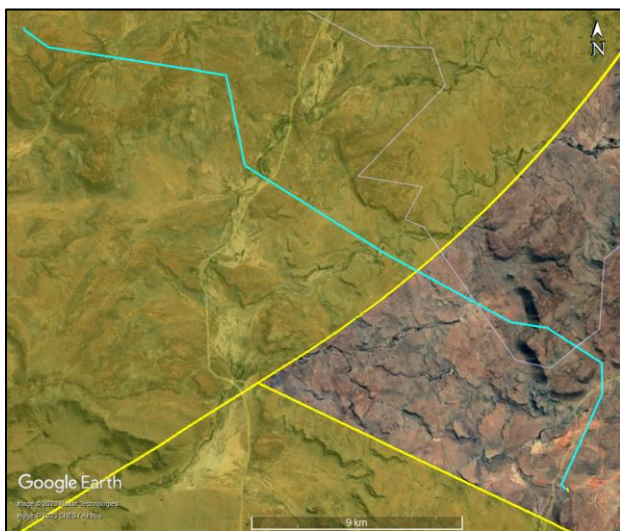
The draft HIA was submitted to relevant interested and affected parties as required by HWC in their response to the NID application (Section 1.2). The report was also included in the main public participation process (PPP) required under NEMA as part of the BA.

## **4. PHYSICAL ENVIRONMENTAL CONTEXT**

### **4.1. Site context**

The powerline is in a very remote, rural area between 16 km and 29 km north of Murraysburg and between 38 km and 51 km south of Richmond. The area is accessed only by local gravel roads. The landscape is largely natural with only occasional signs of livestock farming evident (fences, water tanks, tracks). The proposed powerline route falls partly within the Central Electricity Grid

Infrastructure (EGI) Corridor (Figure 5) and partly within the Beaufort West Renewable Energy Development Zone (REDZ; Figure 6).



**Figure 5:** Map showing the powerline route falling partly within the Central EGI Corridor (yellow shading). The Eastern EGI Corridor lies to the south.



**Figure 6:** Map showing the powerline route falling partly within the Beaufort West REDZ (purple shading).

#### 4.2. Site description

The powerline route traverses an undulating landscape characterised by silty/sandy plains, often with some gravel, and dolerite ridges with valleys in places. Vegetation tends to be low, but mature trees occur at farmsteads, usually in groves. Figures 7 to 12 show the nature of the study area, with specific features highlighted in the captions.



**Figure 7:** View towards the northwest near the north-western end of the route. The authorised substation at which the powerline would terminate lies on this plain. The white dotted line indicates the approximate alignment of the proposed powerline.



**Figure 8:** View towards the north in the west-central part of the assessed corridor. The powerline would pass through this view from right to left in the middle distance. The white dotted line indicates the approximate alignment of the proposed powerline.



**Figure 9:** View towards the northwest in the east-central part of the assessed corridor where the powerline would cross the public gravel road. The white dotted line indicates the approximate alignment of the proposed powerline.



**Figure 10:** View towards the southeast in the east-central part of the assessed corridor where the powerline would cross the public gravel road. The actual alignment is just out of view to the left.





**Figure 11:** View towards the north showing the line coming off high ground towards a public road. The white dotted line indicates the approximate alignment of the proposed powerline.



**Figure 12:** View towards the south towards the southeastern end of the powerline. The white dotted line indicates the approximate alignment of the proposed powerline.



## 5.2. Archaeology

### 5.2.1. Desktop study

The Karoo region has a long history going back to the Early Stone Age (ESA) as testified to by occasional diagnostic artefacts from this period (generally handaxes). Middle Stone Age (MSA) artefacts are generally the most commonly encountered stone age materials in the Karoo and are generally well patinated, indicating their great age. Later Stone Age (LSA) finds are less common but generally of higher significance because of their better contexts (Orton *et al.* 2016). The vast majority of material tends to be what is referred to as background scatter. This can be defined as “widespread isolated artefacts whose distribution results from either primary or secondary causes” (Orton 2016:121). In this dry landscape, LSA archaeological sites are well-known to be focused most strongly on water sources, but dolerite and other rock outcrops, which offer opportunities for shelter and a vantage point to watch for potential prey, are also commonly occupied landscape features. The dolerite also offered surfaces on which to do rock engravings, while small sandstone shelters were sometimes painted. This pattern is well demonstrated by surveys in the wider area (Binneman *et al.* 2011; Halkett 2014; Hart 2016; Orton 2012, 2021a, 2021b, 2021c, 2021d, 2022a, 2022b). Most sites are scatters of stone artefacts, often accompanied by ostrich eggshell fragments and sometimes pottery, but some include fragments of bone and, rarely, archaeological deposits. The latter would normally be found in rock shelters but, due to the nature of the local geology, overhangs are rare. Rock shelters form in sandstone bands, but the rock outcrops in the vicinity of the present study area are mostly of dolerite.

Some distance to the southwest, near Three Sisters, Binneman *et al.* (2011) found MSA and LSA artefacts in various places. Pottery was seen at one LSA site, but ostrich eggshell fragments were more commonly associated with these sites, including some painted rock shelters. The Seacow River Valley, lying some 40 to 140 km east and northeast of the current study area, is one of the best studied parts of South Africa. There, Sampson (1984, 2010; Sampson *et al.* 2015) recorded vast numbers of Stone Age sites with many of them being Khoekhoe sites, including kraals. ESA and MSA sites were also found to occur. Hart’s (2016) study immediately southeast of the present study area located many LSA sites but found ESA and MSA occurrences to be very rare. The LSA sites were mostly stone artefact scatters but some included pottery. A few circular stone-walled features were also recorded. Working in the present study area, Halkett (2014) also documented a number of LSA sites, many containing retouched tools and some with pottery. Near Murraysburg, Tusenius (2012) found background scatters of LSA materials in one area and a background scatter of mixed age materials including an ESA handaxe in another (Tusenius 2015). Nearby, Kaplan (2007) found a scatter of LSA artefacts with occasional MSA artefacts in between. Deacon (2007) worked along the N1 to the west and found background scatter artefacts pertaining to the MSA and LSA and also scratched engravings that he supposed to be from the 20<sup>th</sup> century. They included a horse and rider and an ostrich. Such engravings are relatively common in the central Karoo having been recorded between Three Sisters and Beaufort West (Orton 2010) and also – in very large numbers – some 140 km west of the study area (Orton 2022b). Morris (1988) has reviewed these recent engravings and notes that they have been attributed by Battiss (1948) to Europeans and Griquas and by Fock (1979) to ‘Hottentots’. Morris (1988) suggests that some were almost certainly made by early Baster and Trekboer immigrants and that the tradition continued into the 20<sup>th</sup> century. He also notes the inclusion of wagons and human figures in western clothing.

LSA rock art sites occur in low density through the wider area, and include painted and engraved ‘geometric tradition’ sites as well as painted and engraved ‘fine line’ tradition sites (Binneman *et al.*

2011; Halkett 2014; Hart 2016; Orton 2021a, 2021b, 2021c, 2021d, 2022a, 2022b, in prep.). One of Hart's (2016) sites was considered as being of provincial significance due to the layering of painted imagery on the shelter wall and the very unusual inclusion of engravings on the same surface. Hart (2016) considered it likely that hundreds, if not thousands, of rock art sites occurred in his large study area. Most of those he recorded were engravings on dolerite outcrops with many of them being heavily patinated. However, younger images extending into the recent historical past were also documented. A similar pattern was found to pertain in the present study area by Halkett (2014), but he only found one rock painting which was a small shelter with red finger smears on its back wall. He notes that engravings were commonly found on suitable dolerite surfaces with most being scratched designs. Morris (2006) notes the existence of another rock painting site nearby as do Malherbe *et al.* (2011). Parkington *et al.* (2008) have documented many engravings in the Karoo region. They do not map their work but do provide a historical map of engraving distribution which shows the densest concentration being well to the north around the Kimberley region.

An interesting aspect of Karoo archaeology is rock gongs. These are (usually) dolerite rocks that are naturally perched in such a way that when struck they release a ringing musical note. The gongs are identified by heavily worn patches where they have been repeatedly struck. Parkington *et al.* (2008) have studied a number of gongs from Nelspoort and Vosburg, 70 km to the southwest and 140 km northwest of the present study area respectively, while Orton (2021b) recorded two further examples in the Nuweveld about 120 km to the west of Murraysburg. Both of the latter were surrounded by extensive stone artefact scatters indicating occupation of the area.

Historical stone-walled kraals and features are known to occur in the general area (Binneman *et al.* 2011; Gribble 2020; Halkett 2014; Hart 2016; Orton 2021a, 2021b, 2021c, 2021d, 2022a, 2022b; Tusenius 2012). These are likely mostly from the 19<sup>th</sup> century and represent the material remains of the early European farmers in the area. Such features are usually associated with variable density scatters of historical materials such as glass, ceramics and metal items. A large concentration of such material was recorded in the middle of the present study area at the old farmstead of Driefontein.

#### 5.2.2. Site visit

Finds from the various surveys that fall within 200 m of the powerline route are listed in Table 2 with their locations mapped in Figure 13. All are discussed in further detail in the relevant reports, but a few will be highlighted in the text that follows.

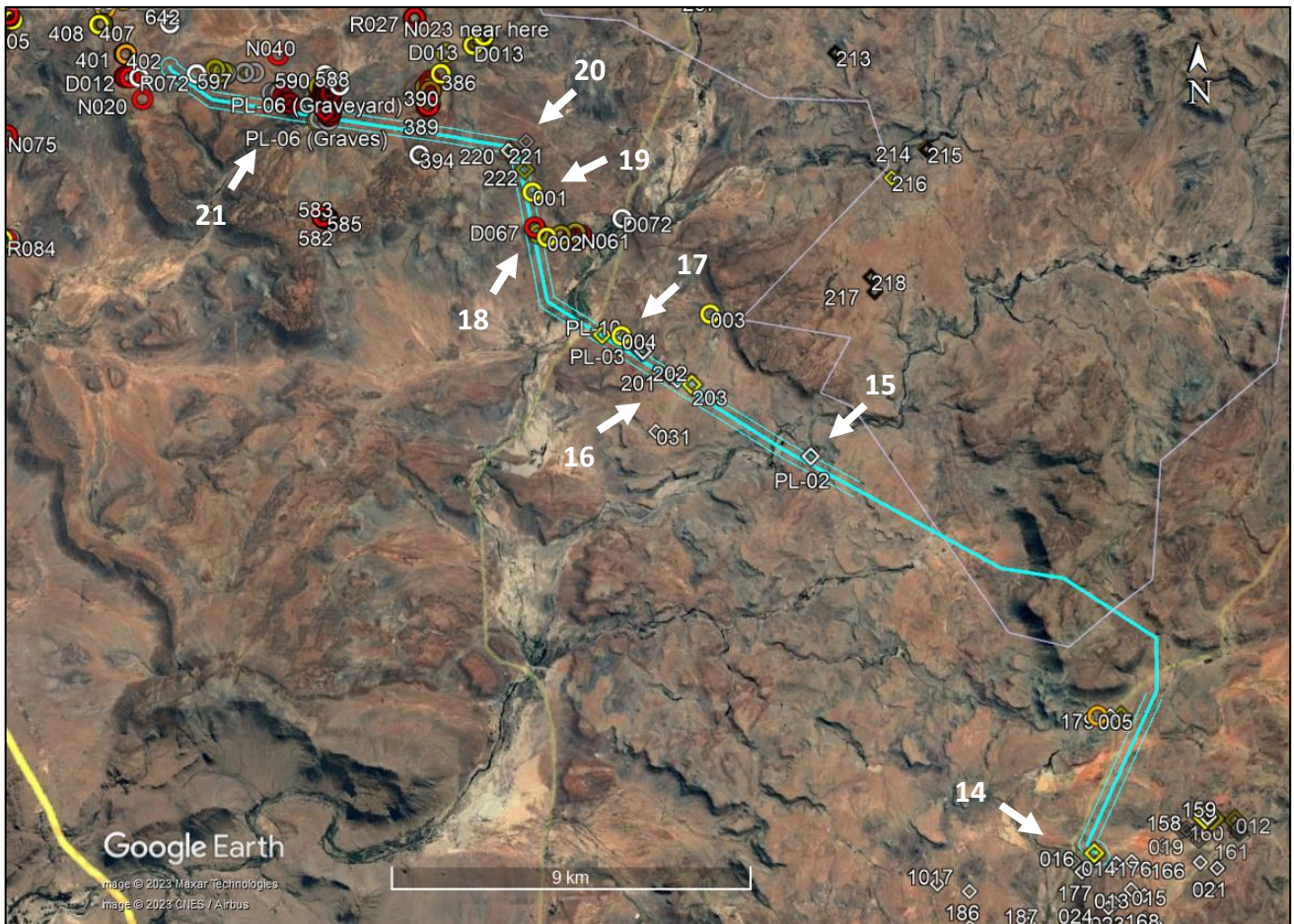
**Table 2:** Consolidated list of finds from the various heritage surveys that have included parts of the corridor. Only sites located within 200 m of the powerline are listed. Descriptions and significance/grade are provided as per the referenced reports. Except in one instance, Halkett (2014) did not provide grades but Low are likely NCW and/or IIIC, Medium are likely IIIC and High are likely IIIA and IIIB resources.

Waypoint	Location	Description	Significance Grade
016	S31 52 59.2 E23 54 04.9	Straight intact stone wall 3 m long, 50 cm thick, 60 cm high. There are no associated artefacts. The two-skins-and-rubble-fill construction method is evident. No discernible function. Orton (in prep. Padloper PV4)	Low IIIC

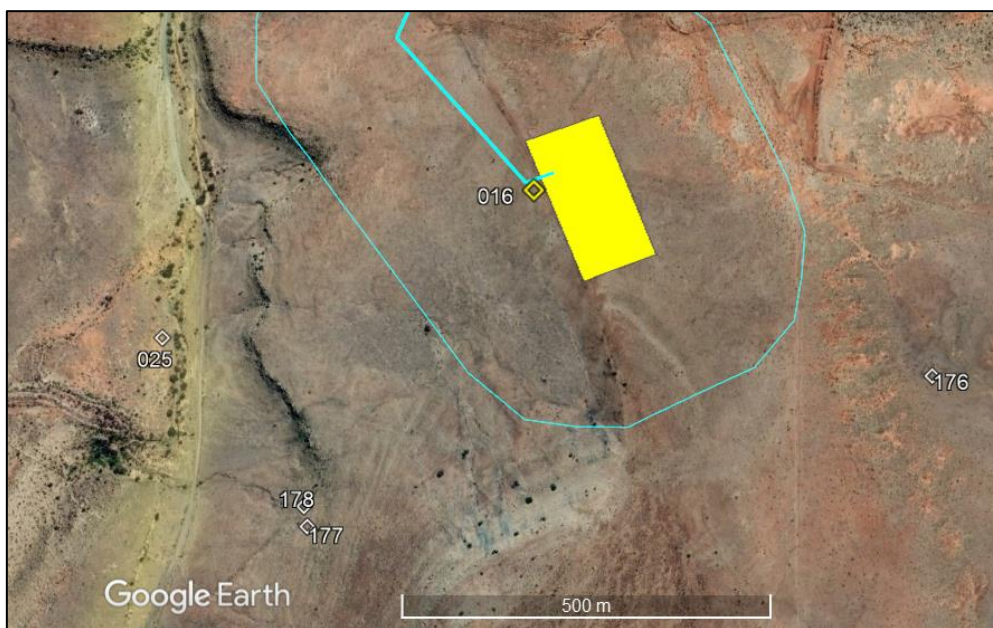
Waypoint	Location	Description	Significance Grade
PL-02	S31 47 39.9 E23 49 37.2	Structure (ruin) located near a non-perennial stream/river. Mann (2022)	NCW
200	S31 46 34.6 E23 47 23.5	A dolerite boulder with scratches on it located on an outcrop overlooking a river. Orton (in prep. Padloper PV3)	Very low NCW
201	S31 46 34.9 E23 47 24.5	An LSA artefact scatter on tuff and located among dolerite boulders overlooking a river. Orton (in prep. Padloper PV3)	Very low NCW
202	S31 46 38.7 E23 47 30.5	A small sandstone cairn built over bedrock. Orton (in prep. Padloper PV3)	Very low NCW
203	S31 46 41.9 E23 47 44.4	A large earth dam with some stone walling around the edge of the spillway on the southern end of the wall. Another dam just further downstream looks modern as it has many large rocks all jumbled as if pushed up by an excavator. There are several more earthen dams upstream but all are outside the study area and none were examined. Orton (in prep. Padloper PV3)	Low IIIC
PL-10		Historical Structure (collapsed) located on the bank of a non-perennial stream. No cultural material observed. Mann (2022)	IIIC
002	S31 44 43.0 E23 45 26.6	Identified from aerial photography. A dam in a watercourse. Grade is precautionary but may be NCW.	IIIC
R063	S31 44 40.0 E23 45 18.7	Small stone tool assemblage. MSA. Halkett (2014)	Low
N057	S31 44 35.8 E23 45 15.7	Top of slope below ridge. LSA hornfels (maybe a couple of MSA) Scrapers, blades, cores and debitage. OES. Facing N. A lot of grey tools on top of ridge. Halkett (2014:63) <u>Additional Note:</u> Elsewhere in his report, Halkett (2014:29) described the following at waypoint N057: "Stone cottage, circular walls over 1m high in some parts. Approx 3m diameter with a front section. Low rock wall 'overhang' in shale band. Scatter of hornfels black and grey. Grey stuff looks older but some used for LSA. Some LSA stuff on hornfels. 3 x adzes, bug end scraper flakes, cores, bladelets and OES"	High
D067	S31 44 34.9 E23 45 15.0	Possible stone packed grave (?) Slight round flat slabs on top. Halkett (2014:63)	High
001	S31 44 06.6 E23 45 13.0	Identified from aerial photography. A dam in a watercourse. Grade is precautionary but may be NCW.	IIIC
PL-05	S31 43 48.1 E23 45 5.8	Stone-packed dam wall located near a non-perennial stream/river. Some sections of the wall have collapsed. Mann (2022)	Medium IIIC
220	S31 43 33.2 E23 44 51.8	A smoothed/ground area on a flat dolerite outcrop. Orton (in prep. Padloper PV2)	Very low NCW

Waypoint	Location	Description	Significance Grade
221	S31 43 32.9 E23 44 50.4	A smoothed/ground area on a flat dolerite outcrop. Orton (in prep. Padloper PV2)	Very low NCW
222	S31 43 34.3 E23 44 52.6	A patch of smoothed rock with faint well-patinated cross-hatching scratched onto it. A second area of similar smoothing and hatching but with a different, and slightly more prominent, design occurs about 60 cm away. Orton (in prep. Padloper PV2)	Medium IIIB
D049	S31 43 09.2 E23 42 0.3	Round stone kraal. Halkett (2014) <u>Additional note:</u> From aerial photography it looks like this site is in fact only the foundation/remnant of a kraal, hence the low significance.	Low
634	S31 43 02.3 E23 42 02.7	A stone house foundation measuring about 4 m by 9 m and located close to the access road. There are also some bricks lying about here. Part of a historical farm complex and grade applies to all sites in the wider complex. Orton (in prep. Ishwati WEF)	IIIA
635	S31 43 04.5 E23 42 01.3	The ephemeral remains of a stone feature. Also some artefacts here, possibly very low density dump. Part of a historical farm complex and grade applies to all sites in the wider complex. Orton (in prep. Ishwati WEF)	IIIA
636	S31 43 05.0 E23 42 02.1	A pile of stones of about 2 m by 3 m and aligned north-south. It is highly unlikely to be a grave. Part of a historical farm complex and grade applies to all sites in the wider complex. Orton (in prep. Ishwati WEF)	IIIA
637	S31 43 05.3 E23 42 00.0	The corner of a stone-walled ruin was just visible through thick bush. It is unknown how large the building was or what its function was. Part of a historical farm complex and grade applies to all sites in the wider complex. Orton (in prep. Ishwati WEF)	IIIA
638	S31 43 04.0 E23 42 01.0	A light scatter of historical material here (including small bone fragments) suggests dumping but there are not many artefacts present. Part of a historical farm complex and grade applies to all sites in the wider complex. Orton (in prep. Ishwati WEF)	IIIA
D062	S31 43 01.0 E23 41 59.7	Driefontein old house. Ash dump and kookskerme/kraal? Halkett (2014) <u>Additional note:</u> This waypoint appears to refer to the house at waypoint 628 along with various other features in the surrounding area. The house is a brick Karoostyle cottage with a hearth and chimney stack on the rear wall.	IIIC
628	S31 43 00.6 E23 41 58.5	Two generations of houses. The younger is listed above as D062. The older one is a stone cottage which is ruined (SW corner has collapsed) but most	IIIA

Waypoint	Location	Description	Significance Grade
		stones are still standing and there are wooden door and window frames in place. It is notable that the ruin was still roofed when photographed by Halkett (2014) and it is possible that the recent roof removal caused the collapse. Part of a historical farm complex and grade applies to all sites in the wider complex. Orton (in prep. Ishwati WEF).	
629	S31 43 02.1 E23 41 59.2	A dump with historical materials on it. Part of a historical farm complex and grade applies to all sites in the wider complex. Orton (in prep. Ishwati WEF).	IIIA
PL-06 (Graveyard)	S31 43 02.2 E23 41 57.5	A historic burial ground. Mann (2022) <u>Additional note:</u> Mann assigned a single waypoint to the entire complex. These co-ordinates were assigned by the present specialist.	IIIA
PL-06 (Graves)	S31 43 03.7 E23 41 57.3	Informal grave sites. Mann (2022) <u>Additional note:</u> Mann assigned a single waypoint to the entire complex. These co-ordinates were assigned by the present specialist.	IIIA
N055	S31 43 08.1 E23 41 51.7	Stone wall, possibly what is left of an old kraal and overlaid by a new one. Halkett (2014)	Low
D061		Stone structure, rectangle 3 x 2 m with a kraal/kookskerme on the one corner. Green glass, clear glass. 19th century. Refined earthen ware. Plain and blue & white. Halkett (2014)	Low-medium

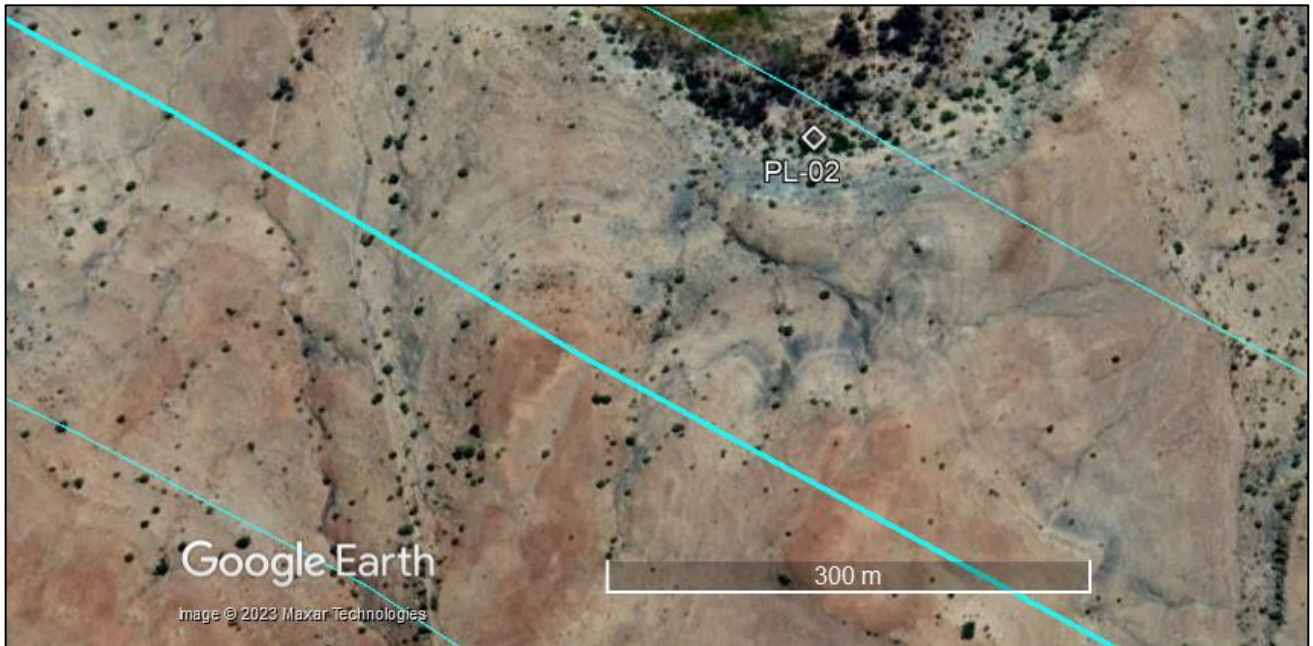


**Figure 13:** Map showing the distribution of finds in the Padloper EGI 4 corridor (the thin blue lines indicate the 200 m limit from the final powerline route). Red symbol = Grade IIIA (High for Halkett 2014), Orange = Grade IIIB, Yellow = Grade IIIC (Medium for Halkett 2014), white = NCW (Low for Halkett 2014). White arrows and numbers indicate the locations of the enlargements in Figures 14 to 21 below.

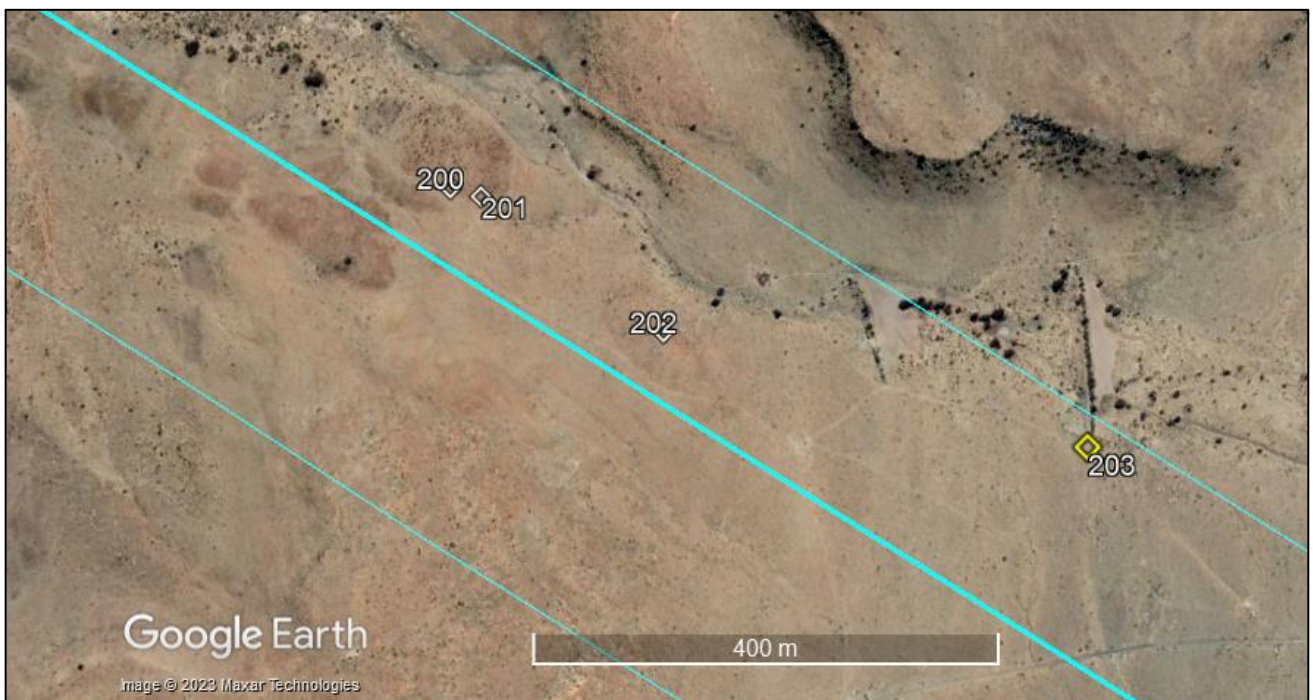


**Figure 14:** Enlargement from Figure 13.

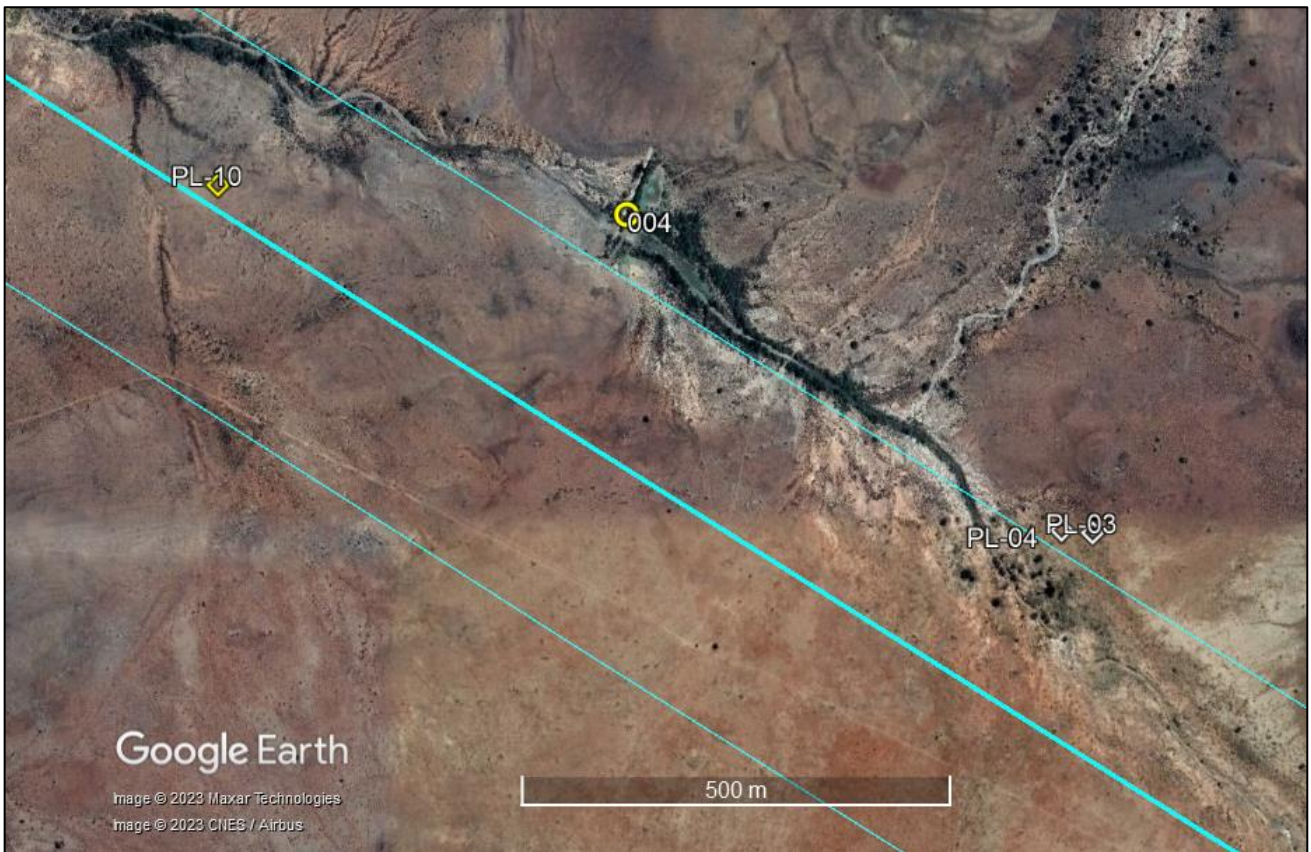




**Figure 15:** Enlargement from Figure 13.



**Figure 16:** Enlargement from Figure 13.



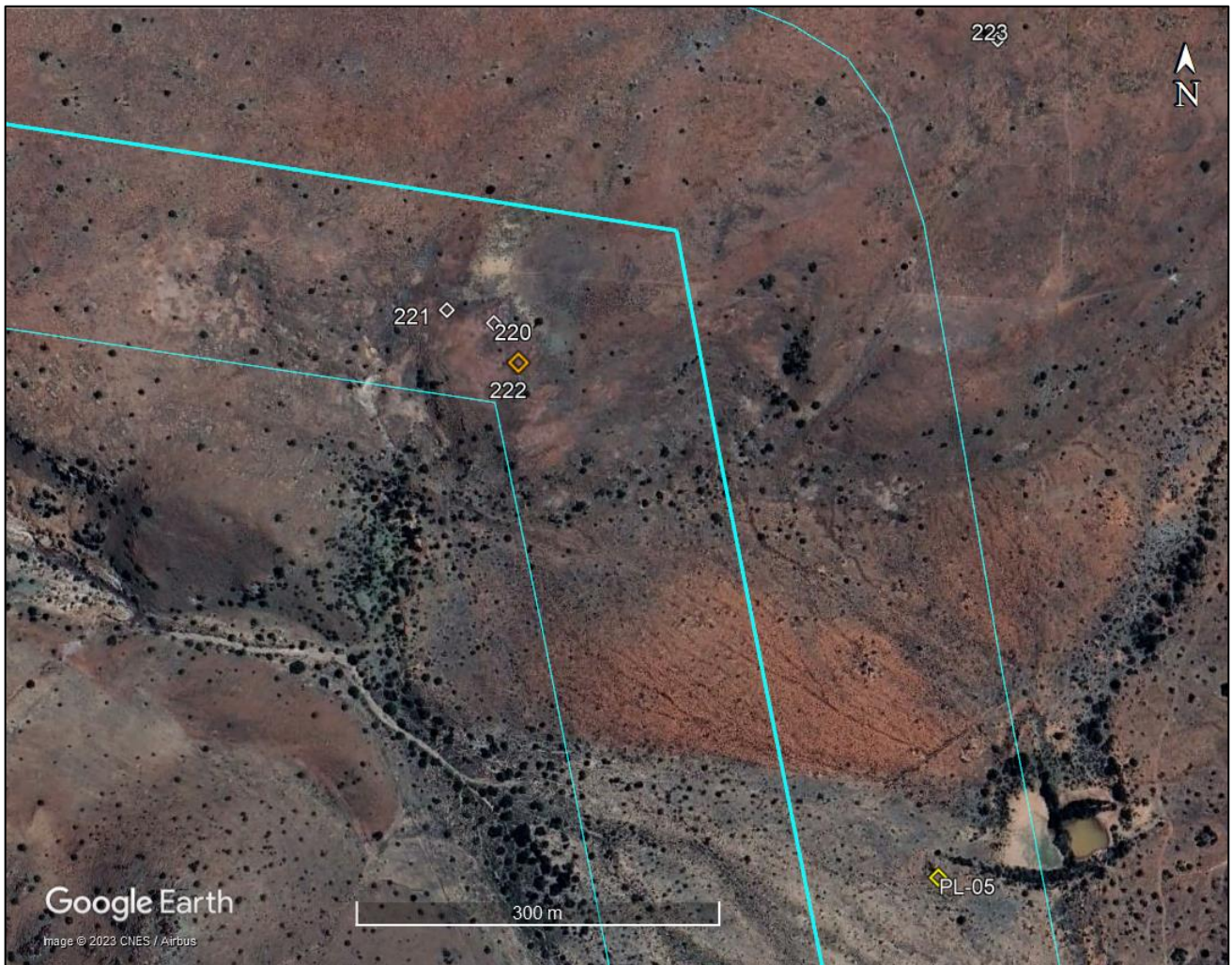
**Figure 17:** Enlargement from Figure 13.



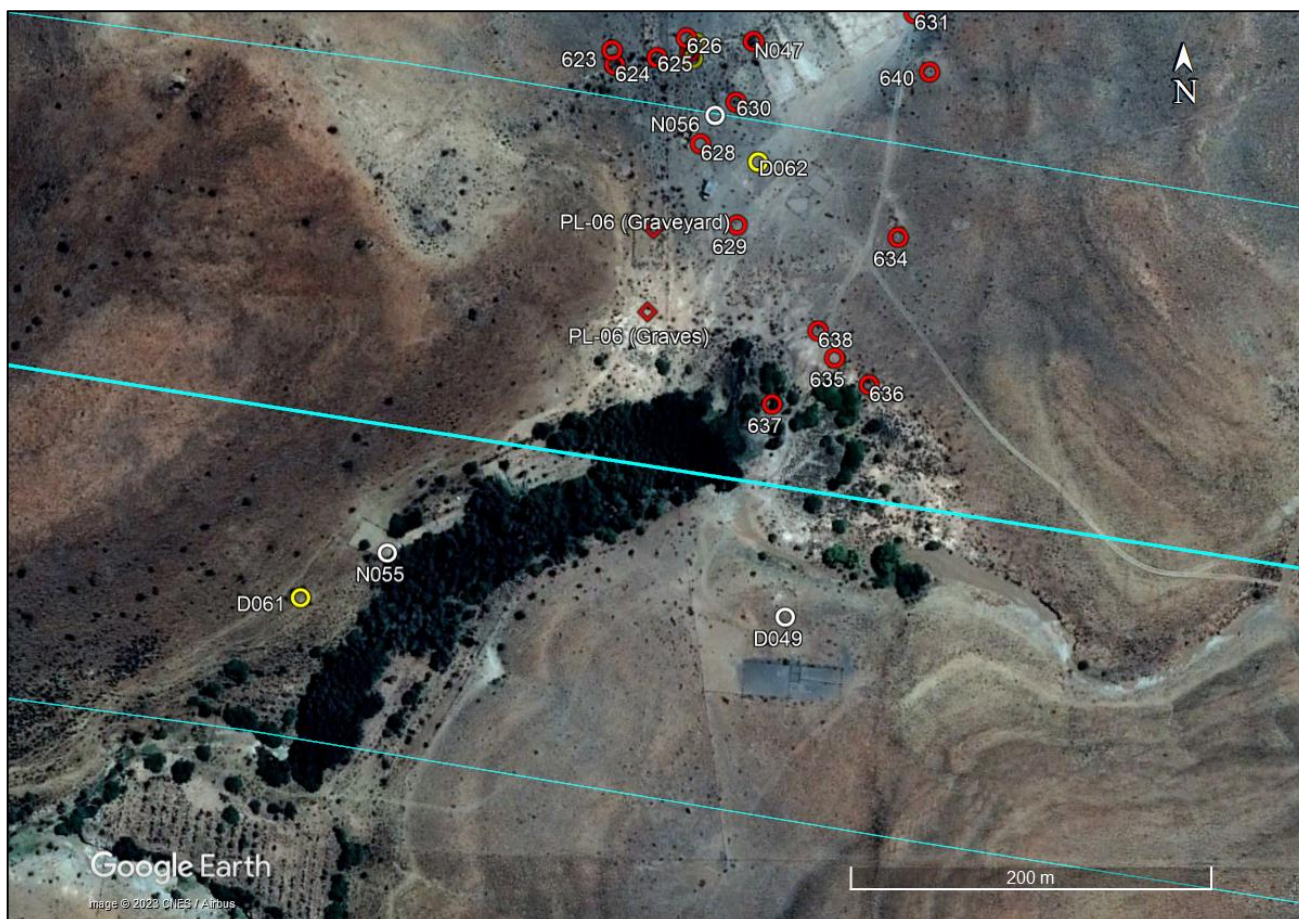
**Figure 18:** Enlargement from Figure 13.



**Figure 19:** Enlargement from Figure 13.



**Figure 20:** Enlargement from Figure 13.



**Figure 21:** Enlargement from Figure 13.

A number of stone artefact scatters were recorded in the wider area, with most being very ephemeral. Some denser scatters occurred at the historical farmstead described below. This association is no doubt due to the availability of water in the area. An ephemeral scattering of LSA artefacts made on tuff was found on a low outcrop of small dolerite boulders overlooking a stream at waypoint 201 (Figure 22). Other scatters reported from the corridor are even more ephemeral.



**Figure 22:** LSA stone artefacts from waypoint 201. Scale = 7 cm.

LSA rock engravings were seen in two places in the corridor, although others are known from outside the corridor in the northwest. One site, located in the southeast at waypoint 200, was only an informally 'scratched' dolerite boulder (Figure 23). In the north, at waypoints 220 to 222, another site was found on the edge of a high-lying area where a patch of exposed dolerite had several anthropogenically smoothed patches (Figure 24). At waypoint 222 there were two separate patches of smoothed rock, both of which had scratched/engraved cross-hatching on them (Figures 25 to 27). One of the patches was more heavily smoothed. The cross-hatched design on the second was clearer owing to the minimal smoothing. It is possible that the smoothing was done after the cross-hatching.



**Figure 23:** Scratched dolerite rock at waypoint 200.



**Figure 24:** View of the dolerite bedrock outcrop with a smoothed and engraved patch in mid-picture (waypoint 222).



**Figure 25:** Close-up of the first smoothed and engraved patch at waypoint 222.



**Figure 26:** The second engraved patch at waypoint 222 which is less smoothed.



**Figure 27:** Close up of the second engraved patch at waypoint 222.

Historical archaeological resources were strongly focused in a single area where a historical farmstead was found. The wider site includes a variety of features scattered over an area measuring about 750 m by 250 m. The site includes ruins, kraals, ash and rubbish middens and many graves. Figure 28 shows a very poorly preserved ruin from which almost all the stones have been removed, presumably for reuse elsewhere on the farm. One stone-walled house ruin was much better preserved with only the roof and most joinery removed. Its walls were almost entirely intact (Figures 29 and 30). While the outer walls were of stone, the two interior dividing walls were of brick suggesting that the structure was originally just a single room.



**Figure 28:** *The remnants of a stone-walled structure at waypoint 634 (Orton in prep.).*



**Figure 29:** *A stone-walled house ruin in the foreground at waypoint 628 (Orton in prep.).*



**Figure 30:** *The façade of the ruin at waypoint 628 (Orton in prep.).*

A number of historical farm dams were also recorded. One of those noted by Mann (2022) was clad in stones (Figure 31). Another dam was earth-walled but its spillway was lined with stones to prevent erosion (Figure 32). A number of other dams were recorded from aerial photography but it is not known whether they include stone-walled components or are simple earthen walls.



**Figure 31:** Stone clad dam wall at PL\_05 (Mann 2022: figure 73).



**Figure 32:** Low earthen dam wall (running away from the viewer) with a section of stone walling lining the spillway at waypoint 203.

A few other historical features were also located. One was a small cairn of rocks whose function could not be determined. It is located at waypoint 202 (Figure 33). Another was a stone wall of indeterminate function at waypoint 016 (Figure 34). It is built using the conventional historical technique of making two stone 'skins' and filling the cavity with small rock fragments (Figure 35). This may be a hunting blind and is quite possibly modern, since many other similar – but generally less formally constructed – examples occurred elsewhere in the surrounding area. Some had rifle modern cartridges associated with them.





**Figure 33:** A small cairn of rocks at waypoint 202.



**Figure 34:** Stone walling at waypoint 016.



**Figure 35:** Cross-section of the stone walling at waypoint 016.

### 5.3. Graves

A number of graves and some possible graves occur in the study area. The main concern is a walled graveyard and an associated unwallied graveyard which lie at PL\_06 (Mann 2022). The graves are covered with stone and have stone head- and/or footstones (Figure 36). The chances of unmarked graves being present within the proposed footprint are extremely low because of the generally rocky nature of the substrate, although it is noted that a pre-colonial grave with a stone mound over it was encountered just outside the corridor. Inside the corridor, Halkett (2014) recorded a cluster of rocks that he thought might be a grave, although this seems unlikely (Figure 37).



**Figure 36:** The graveyard at PL\_06 as recorded by Mann (2022: figure 80).



**Figure 37:** Rocks at waypoint D067 and suspected to be a possible grave by Halkett (2014: plate 50).

## **5.4. Historical aspects and the Built environment**

### **5.4.1. Desktop study**

During the mid-18<sup>th</sup> century the first trekboers from the Cape made their way to the vicinity of the Sneeuberg and found the grazing to be excellent. They were granted loan farms there and very soon came into conflict with the Bushmen who were living in the area. The Bushmen started killing shepherds in the veld, attacking farms and stealing livestock. Malherbe *et al.* (2011) note that in the

two and a half years from July 1786 to December 1788 the Bushmen killed 107 shepherds and stole 17 970 small stock and 6299 large stock. In addition, 99 horses were stolen or killed. The solution arrived at by the Dutch East India Company was to eliminate the Bushmen and between 1786 and 1795 at least 2500 were killed and another 600 captured.

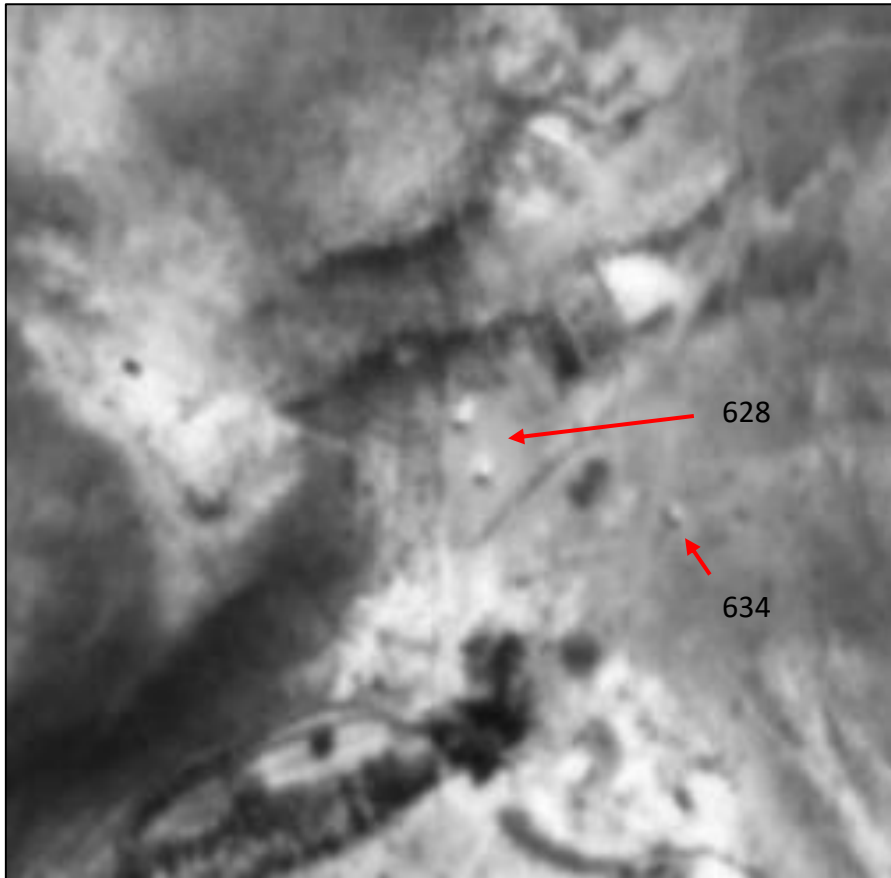
Livestock farming drove the local economy with wool becoming a major product in the early 1800s.

The parish of Richmond was formed in 1843 with Graaff Reinett the next closest. To reduce travel distances, a new town was needed in between and Murraysburg was founded in 1855 on the farm Eenzaamheid. The name Murraysburg derives from Reverend Andrew Murray of Graaff-Reinet and Barend Burger. The proceeds of the plots sold in 1855 were used to build a church and parsonage. An unusual requirement in the sale of the plots was that the new owners were required to plant quince hedges around their boundaries (Fransen 2004). Schoeman (2013) notes that after the Dutch Reformed Church bought Eenzaamheid in 1855 the town remained church property until 1949 when it was bought by the divisional council which had already been established by 1895. Fransen (2004) lists several significant structures in the town, but only two in the surrounding areas – these are to the east and southeast.

During the Anglo-Boer War Murraysburg was the only town in the Cape Colony that had too few men to form a town guard. As a result Boer Commandos roamed the area freely and burned down several buildings in July 1901 (Schoeman 2013). There does not appear to have been any significant war action in the vicinity of Murraysburg.

#### 5.4.2. Site visit

Only one historical structure has been recorded in the proposed powerline corridor. This was at the historical farm complex and it stood alongside the standing ruin. It is a Karoostyle dwelling built of unplastered bricks and cement with a flat corrugated iron roof (background in Figure 29). A hearth and chimney stack are on the rear wall. It does not look very old but aerial photography confirms it to be more than 64 years old (Figure 38).



**Figure 38:** Aerial photograph from 1959 showing the dwelling at waypoint 628 to have already been present. The other structure also still had its roof then, while the structure at waypoint 634 was also still standing.

### 5.5. Cultural landscapes and scenic routes

The term “Cultural Landscape” unites the products of so-called ‘natural’ ecological processes and phenomena on the one hand, and the products emerging from the processes of transformation of the ‘natural’ site by people in constructing their ‘built’ world, on the other. Any area consists of many sites, most of which have been inhabited by people for thousands of years. These places have been moulded, shaped and changed both by natural processes and by people engaged in adapting the environment to their pursuits. Cultural landscapes are what one generation inherits from another: in them are embedded values held dear by those gone by.

The significance of the landscape reflects not just the sum of the individual parts, but rather landscapes as an integral whole. It is the nature of the relationship between features, and between these features and the broader landscape setting (context) that is important. What is also important is an understanding about how these landscapes have been produced. In other words, it is essential that the physical informants and historical events that have given structure and form to the landscape features are understood and appropriately interpreted with regard to heritage significance.

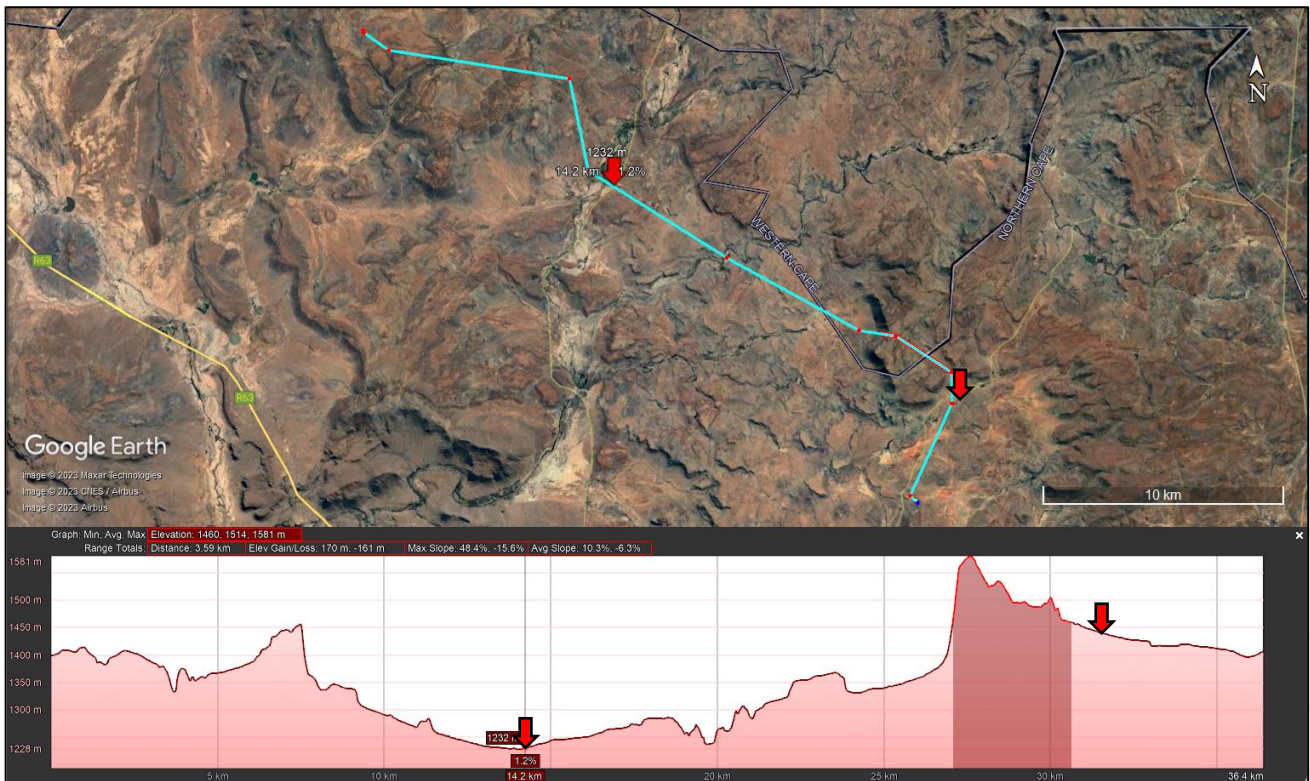
The broader landscape in which the suite of solar facilities would be situated is largely natural, but with enclaves of rural/agricultural character at all the farmsteads where human interventions are evident. The land is largely used for livestock rearing with agriculture only practiced along the rivers where wider floodplains occur. The farmsteads tend to also be close to these areas. Elsewhere, the

only signs of human activity in the landscape are occasional farm tracks, farm fences, wind pumps, small reservoirs and, along the rivers, flood irrigation infrastructure.

According to the Terrestrial Biodiversity and Species Specialist Impact Assessment (Colloty 2023), the 3 sites are situated within the Eastern Upper Karoo (NKu 4) vegetation unit. This unit is considered Least Concern from a conservation status and is characterised by low lying areas separated by a higher lying plateaus and/or inselbergs (koppies). The higher lying areas also contain several areas with rocky outcrops, ridges and or cliffs. While the sites are largely untransformed, current impacts are localised due to grazing and the presence of previously cultivated areas near homesteads and the current road and tracks found. The naturally occurring ridges and outcrops provide certain microclimates for unique species, increasing their conservation status. Along with Aquatic habitats along water courses and rivers, these habitats or corridors associated with these habitats, were mapped (Colloty 2023) as No-Go areas, as they provide habitat variability and unique species assemblages when compared to the grassland areas.

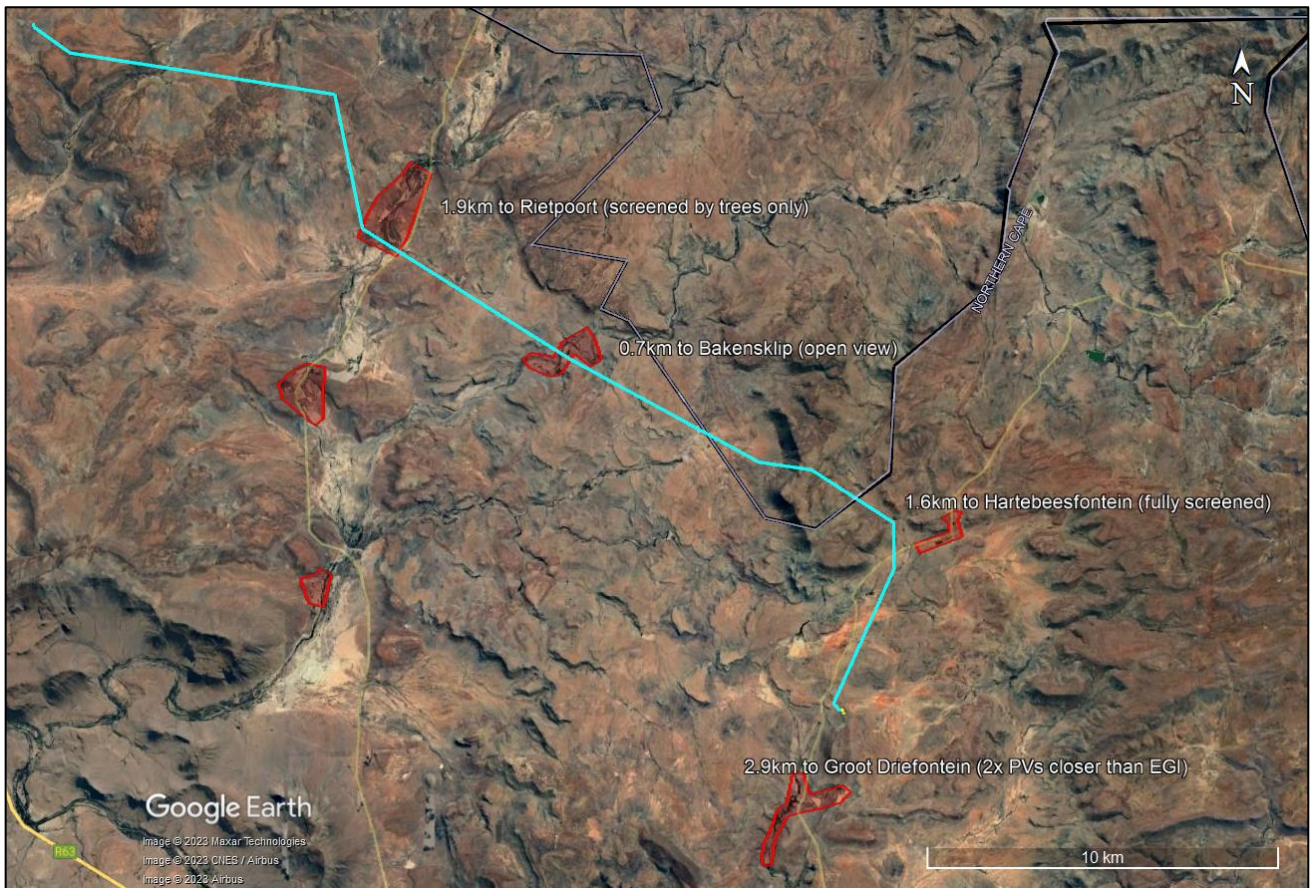
A key aspect of the cultural landscape to consider is the fact that the wider study area falls within a REDZ and two EGI corridors (see Section 4 above) and has approvals in place for wind energy facilities (WEFs; see Section 8.4 below). The REDZs were delineated following a Strategic Environmental Assessment process and are thus landscapes in which the presence of renewable energy facilities is generally acceptable and to be expected.

The Padloper EGI 4 is proposed in a high-lying and undulating area that varies in elevation between 1232 m above sea level and 1573 m (Figure 39). It crosses two public roads. One lies within the wide valley in the north-western part of the corridor, while the other lies in a higher-lying valley in the east. The line is otherwise proposed to be situated in very remote areas with no public access. Its overall visibility in the landscape from publicly accessible areas should be fairly minimal over most of the route with the exception being where it would run adjacent to the eastern road for about 5 km. In this area it will be openly visible in the landscape at distances not exceeding 800 m away. As such, the powerline should not result in a high degree of change to the local sense of place. According to Mucina & Rutherford (2006), the most extensive vegetation type occurring in the study area is Eastern Upper Karoo, interspersed with scattered patches of Upper Karoo Hardeveld. The vegetation cover across the study area is predominantly short and sparse and thus will not provide any significant visual screening.



**Figure 39:** Northwest to southeast cross-section following the route of the Padloper EGI4 powerline. The red shading on the cross-section shows the land above 1460 m and the red arrows mark the position of the two public roads.

The proposed Padloper EGI 4 passes within 3 km of four farmsteads. It lies 0.7 km from Bakensklip, 1.6 km from Hartebeesfontein, 1.9 km from Rietpoort and 2.9 km from Groot Driefontein. The first two were not visited, but the other two were confirmed to include heritage structures. It is assumed that all farmsteads in the area would contain heritage structures. Of these, only Bakensklip would have an unobstructed view of the powerline. Rietpoort is screened by the many mature trees surrounding the complex, Hartebeesfontein is screened by topography and Groot Driefontein would only minimally see the line (if at all) but, in any case, would have two solar facilities closer to it than the powerline. The line would run through the associated lands at Bakensklip and Rietpoort (Figure 40). The only farm likely to have its landscape context somewhat altered by the proposed EGI4 is Bakensklip. It is noted that farmsteads are scattered throughout the wider area (and indeed the entire Karoo region) and almost always contain historical structures.

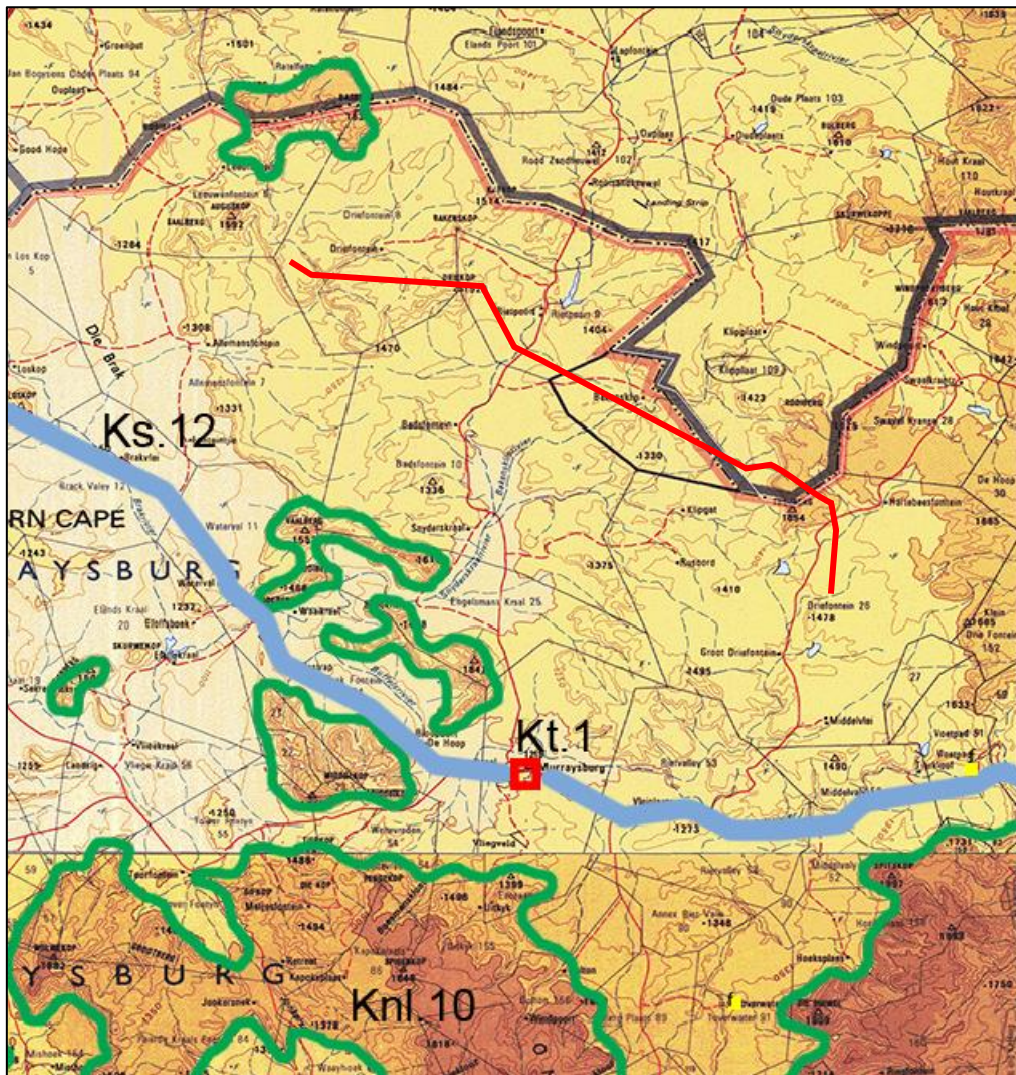


**Figure 40:** Aerial view showing the locations of farmsteads and associated lands and features (red shading) relative to the proposed Padloper EGI4 (turquoise line). Key aspects of the views towards the powerline are indicated for the four closest farmsteads.

It is noted that the power line will pass through the buffer of the ruined historical farm complex and may require that some poplar trees are removed. This is not of much concern since the complex has long been ruined and now has an archaeological character rather than a historical one. Mature trees are far more important to the character of an active farmstead.

The broader landscape is generally quite scenic, but, despite the distinctive dolerite hills that occur, is not unique because the escarpment and its foothills occur in an extensive swathe across the wider area. Towards the west, in the vicinity of Beaufort West, the escarpment is substantially more dramatic with cliffs and steeper topography. The area around Murraysburg does not feature cliffs, but patches of exposed rock do occur on the hills in places.

The physical nature of the landscape is shown in Figures 7 to 12 and it is evident that, with the exception of the farmsteads highlighted in Figure 40, the powerline corridor is largely natural in character with its cultural significance primarily due to its visual amenity. In this regard, the visual resources study by Winter and Oberholzer (2013) identifies no significant resources in the vicinity of the study area. The only significant features they note are in the steeper mountains to the south and southwest with one small area to the northwest (Figure 41).



**Figure 41:** Map showing significant scenic resources identified by Winter and Oberholzer relative to the powerline (red line). Source of map: Winter & Oberholzer (2013).

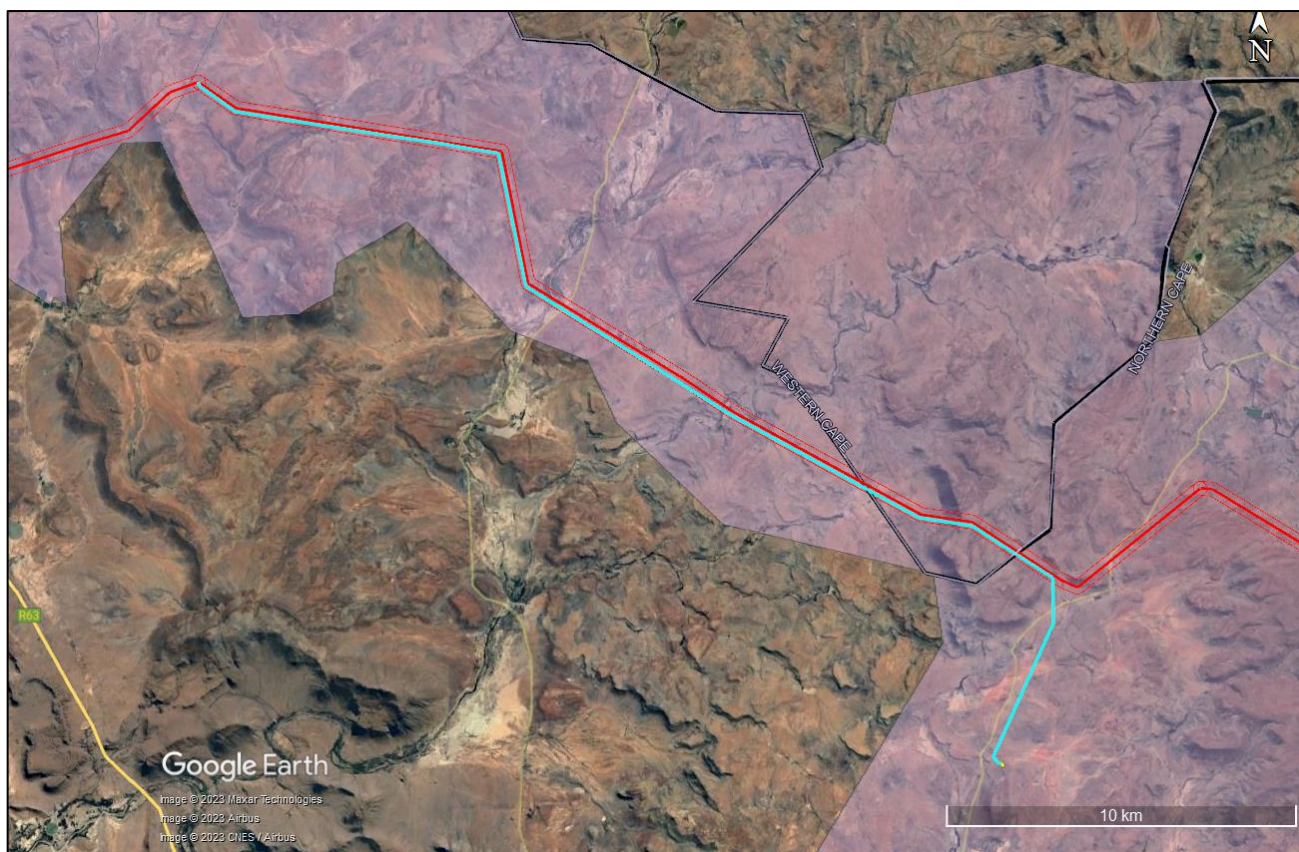
Due to the remoteness of the area and very low density of human habitation, sources of light pollution are rare. This means that the night-time landscape will be dark with picturesque, star-filled skies predominating. The only place that lighting may be needed is at the switching station which is within 600 m of a public road and should be in full sight of the road. It is also 2.9 km from the nearest house (Groot Driefontein).

The R63 that runs well to the south (minimum 10.6 km) of the powerline can be regarded as a scenic route, and was indeed identified as such by Winter and Oberholzer (2013). Due to distance and topography, the powerline will not be visible from the R63. The local gravel roads linking Murraysburg and Richmond, both of which will be crossed by the proposed powerline, are not well enough travelled to be accorded the same status as scenic routes. Schwartz (2023) sees them as only local access routes with no scenic or tourism potential. Owing to the valley setting of the western road and the proximity of the line to the eastern one, a section of the powerline will be visible in the landscape from each road for several kilometres.

An important part of the landscape assessment is that the area has already been approved for inclusion within the Beaufort West REDZ and the Central EGI Corridor (see Section 4.1). As such,



renewable energy facilities and powerlines should be expected within the area. Importantly, the project lies within the boundary of two already approved wind energy facilities (WEFs) and also has been designed to run parallel and adjacent to an approved powerline (Figure 42). WEFs are substantially more visible in the landscape than powerlines and, should they be constructed, they will dominate the local environment. The concentration of renewable energy facilities in the REDZs is desirable, as this avoids a low density proliferation of such facilities that might otherwise occur across the wider landscape. Importantly, unless visual mitigation is strictly controlled, light pollution will become an issue at night. The red aviation warning lights on the top of wind turbines are a particular concern in this regard and would transform and pollute the night-time landscape.

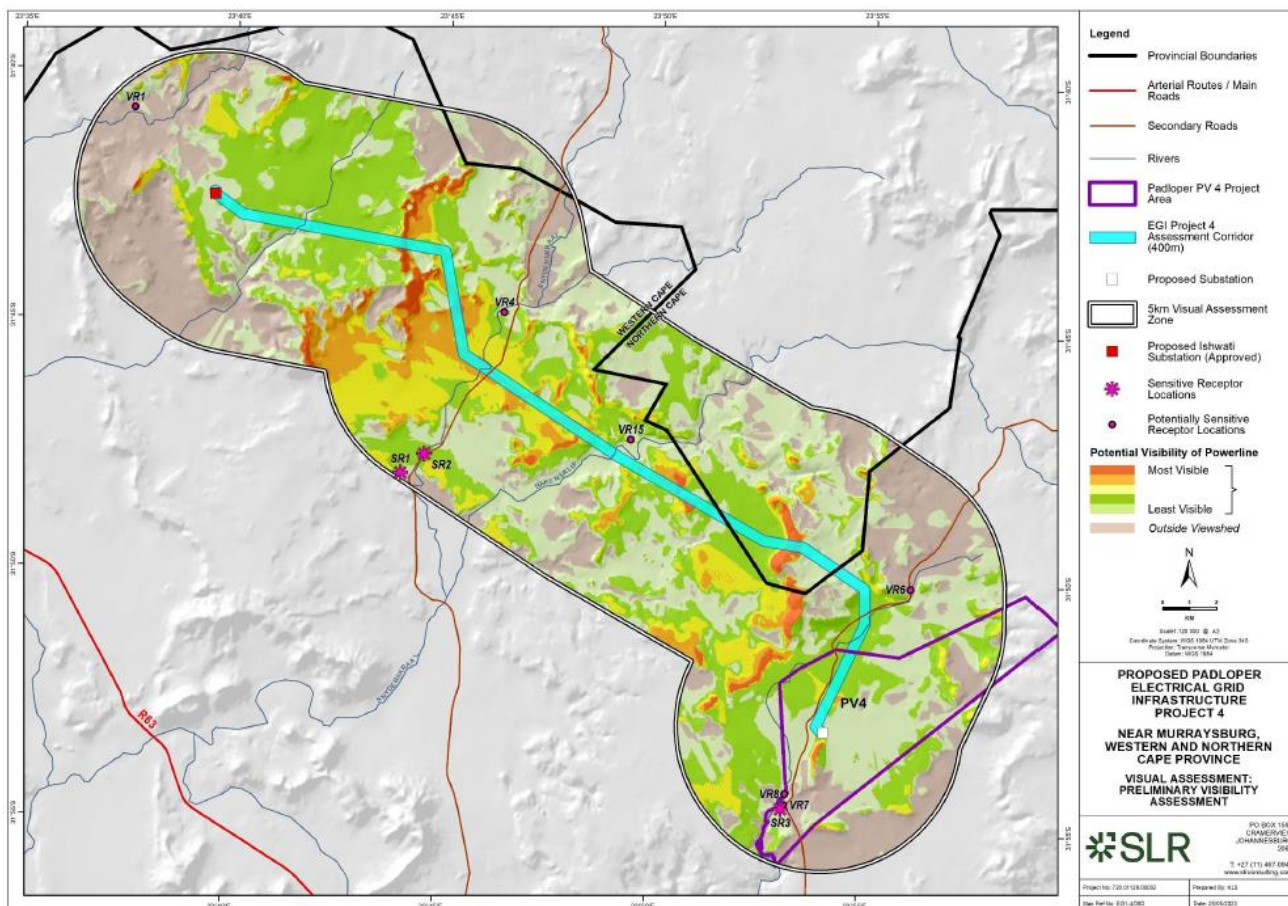


**Figure 42:** Aerial view showing the proposed Padloper EGI4 (turquoise) relative to the land on which WEFs have been approved (pink shading) and an approved powerline (red).

## 5.6. Visual impact assessment

The visual specialist notes the wider landscape to be undulating with distinctive hills and koppies in places and a shallow valley containing the Snyderskraal River (Schwartz 2023). The topography affects views in the landscape with longer/wider views only available from higher-lying areas. Similarly, objects in the landscape have their visibility affected by topography with objects at high elevations being far more visible than objects in valleys and on enclosed plateaus. Agricultural lands are noted to be very sparse due to the climate, with natural vegetation present throughout most of the wider area. Farmsteads are widely spaced, and livestock density is low. Human transformation and visual degradation of the landscape is noted to be minimal. These factors result in the particular sense of place of the area. Schwartz (2023) sees the wider study area as being part of the wider Karoo landscape of western and central South Africa.

Despite the topography, Schwartz (2023) rates the visual absorption capacity of the wider area as low due to the lack of screening vegetation on the landscape. Figure 43 shows the viewshed map created for the Padloper EGI 4. Schwartz (2023) notes that three sensitive and four potentially sensitive visual receptors will be able to see the powerline.



**Figure 43:** Viewshed map for the Padloper EGI 4. Source: Schwartz (2023).

## 5.7. Statement of significance and provisional grading

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

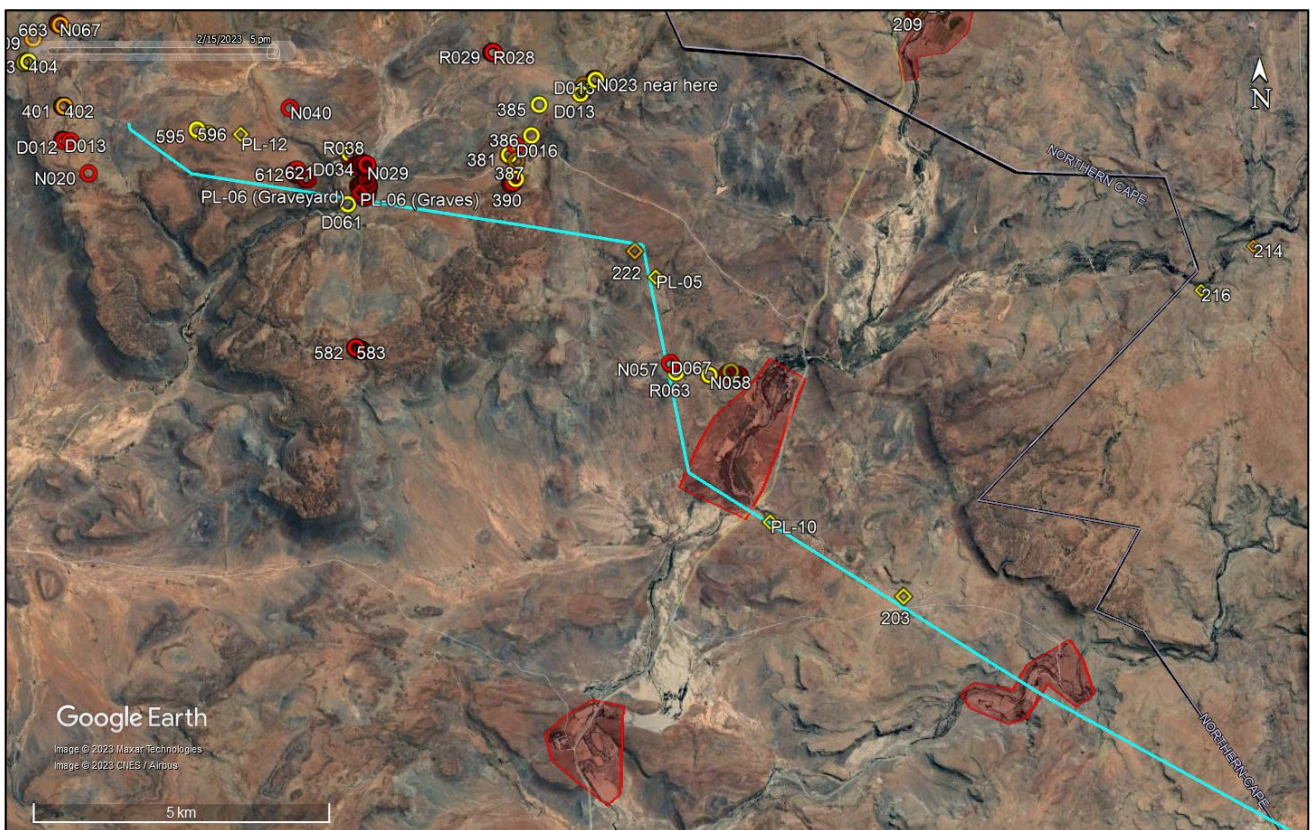
The palaeontological study did not locate any fossils, largely because of the unconsolidated deposits mantling the bedrock. However, fossils are known to occur in the general area and, because of the high sensitivity of the geology, there is a strong possibility that fossils will still be present in the study area. The cultural significance of any such fossils is unknown, but most finds from the area would likely be graded IIIC, or possibly IIIB.

Archaeological resources are present in a number of areas along the corridor. Some are of very low cultural significance and can be graded NCW. Others are more significant and are rated up to IIIA. These include a ruined historical farm complex with a large number of features.

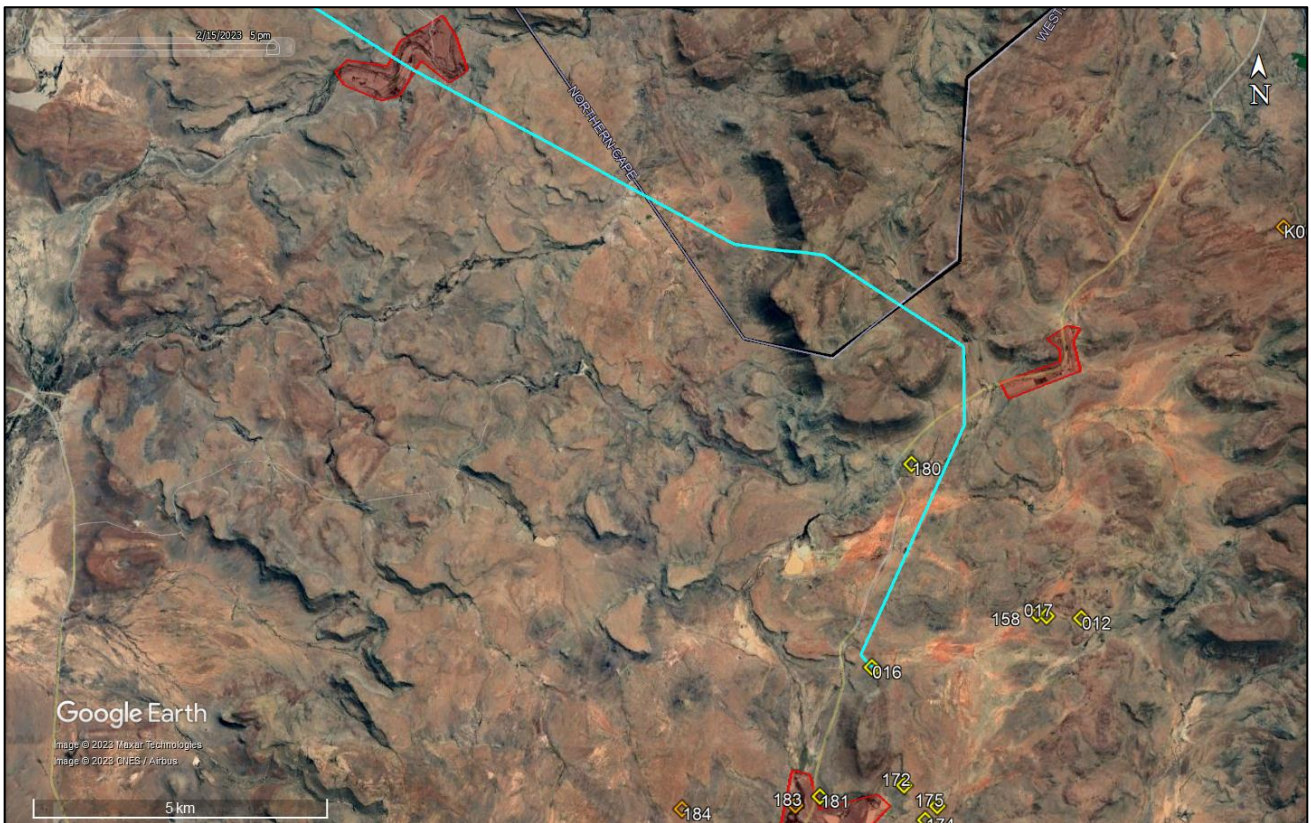
Graves are deemed to have high cultural significance at the local level for their social value. A large graveyard with further graves outside its wall are known from within the corridor. They would be allocated a grade of IIIA.

The cultural landscape is largely a natural landscape with aesthetic value and is rated as having medium cultural significance at the local level. It can be graded IIIB. However, small pockets of agricultural land associated with farmsteads and other related features can be seen as IIIA.

Figures 44 and 45 provides a grade map of the study area. Sites graded NCW are omitted from the map for the sake of clarity. For ease of merging data from multiple projects, the map shows waypoints for all specific sites and polygons for the areas of agricultural/rural cultural landscape.



**Figure 44:** Grade map of the Padloper EGI 4 route (northwest). Red = IIIA; orange = IIIB; yellow = IIIC.



**Figure 45:** Grade map of the Padloper EGI4 route (southeast). Red = IIIA; orange = IIIB; yellow = IIIC.

## 5.8. Summary of heritage indicators

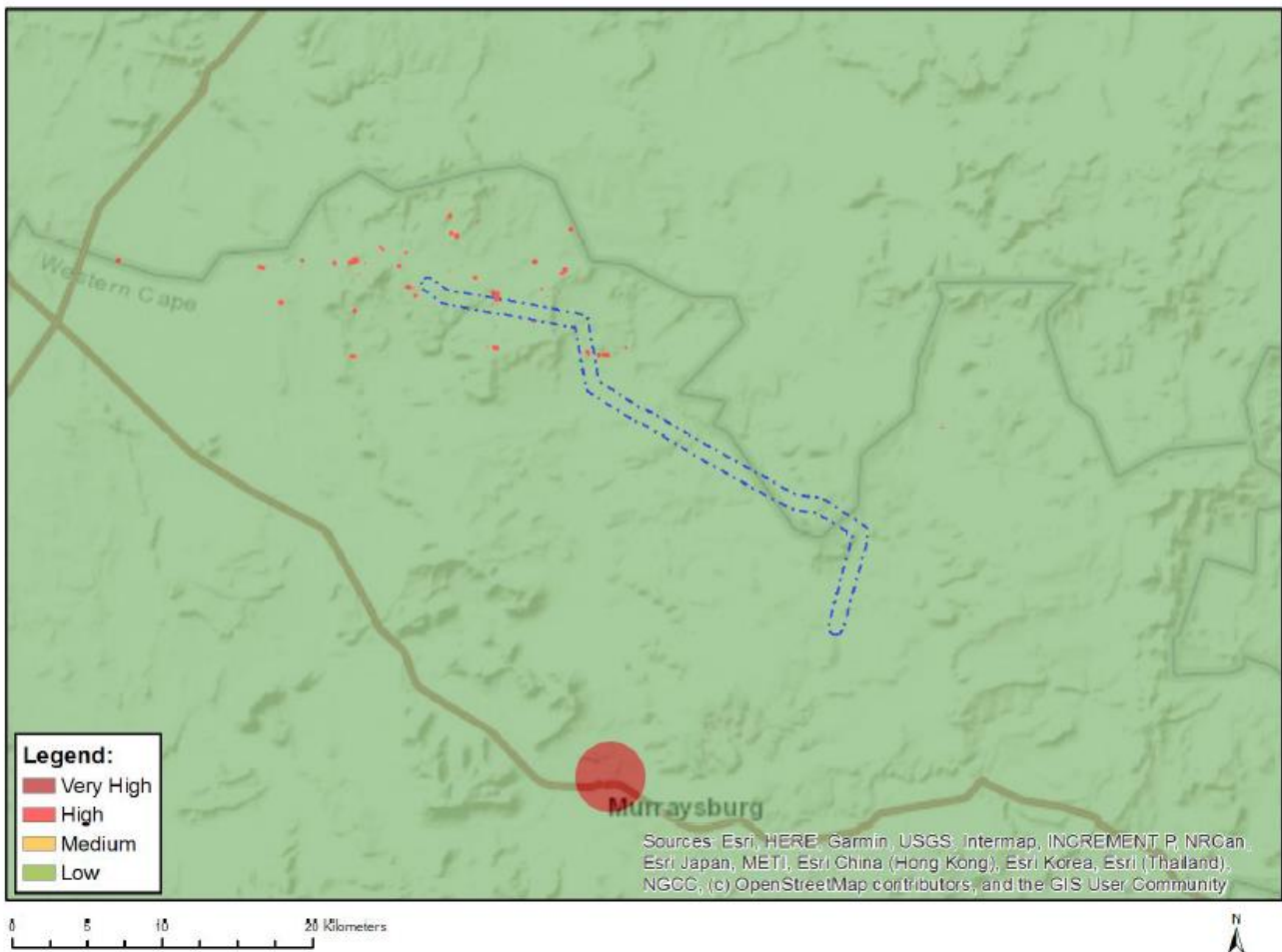
The following indicators are provided:

- Uncontrolled damage to fossils should be minimised as far as possible.
- Archaeological sites should be protected with a buffer of at least 30 m if possible. Reusing of existing roads through the buffers is allowed but any widening must take place away from the site.
- Direct damage to archaeological sites should be avoided as far as possible and, where some damage to significant sites is unavoidable, scientific/historical data should be rescued.

## 6. IDENTIFICATION OF ENVIRONMENTAL SENSITIVITIES

### 6.1. Sensitivities identified by the National Web-Based Environmental Screening Tool

Figure 46 shows the screening tool map for archaeology and cultural heritage. The corridor is indicated as being of generally low sensitivity but with small patches of high sensitivity where heritage resources have been recorded.



**Figure 46:** Screening Tool map of the EGI4 study area.

## 6.2. Specialist Sensitivity Analysis and Verification

The various field surveys have revealed that the powerline corridor and surrounding landscape are of generally low sensitivity, but a number of high sensitivity areas are known where heritage sites have been recorded. The mapping of sensitivity as currently known is shown in Figure 45, but following the prescribed heritage grading system.

## 6.3. Sensitivity Analysis Summary Statement

Some of the surveys drawn on here were done in the past and seem to have their sensitivity data incorporated into the Screening Tool mapping in the north-western part of the corridor. The newer fieldwork conducted by the present specialist supports the previous findings but it is notable that the obviously sensitive farmsteads and associated features have not been mapped as sensitive areas. **The heritage specialist thus disputes the National Screening Tool sensitivity rating.** Heritage resources can still be present in the low sensitivity areas but the probability of resources of high cultural significance being found there is considered to be very low.

## 7. ISSUES, RISKS AND IMPACTS

The potential impacts identified during the assessment are as follows:

### Construction Phase

- Direct impacts to palaeontological resources
- Direct impacts to archaeological resources
- Impacts to graves
- Direct impacts to the cultural landscape.

### Operational Phase

- Direct impacts to the cultural landscape.

### Decommissioning Phase

- Direct impacts to the cultural landscape.

### Cumulative impacts

- Cumulative impacts to palaeontological resources
- Cumulative impacts to archaeological resources
- Impacts to graves
- Cumulative impacts to the cultural landscape.

## 8. IMPACT ASSESSMENT

It should be noted that impacts to palaeontology are addressed in the separate palaeontological specialist study which is appended to this report and are thus not repeated here. Visual impacts are also assessed separately but the conclusions of the visual study are used here to inform the assessment of impacts to the cultural landscape. Each potential impact is discussed below and they are all summarised in Table 3.

### 8.1. Construction Phase

#### 8.1.1. Impacts to archaeological resources

Direct impacts to archaeology would occur during the construction phase when the surface is cleared in preparation for construction of access tracks and powerlines. Because culturally significant sites occur in a number of areas there is a possibility of impacts to unknown sites still occurring (known sites have been avoided) and the consequence is deemed to be moderate. The potential impact significance is rated as **Low negative**. It is likely that the most important sites are already on record but a pre-construction survey should be conducted to determine whether any micro-siting of pylons

and the access track is needed. Because it is anticipated that impacts will be easily avoided, the post-mitigation impact significance will be **Very low negative**.

There are no fatal flaws in terms of construction phase impacts to archaeology.

#### 8.1.2. Impacts to graves

Direct impacts to graves would occur during the construction phase when the surface is cleared in preparation for construction of access tracks and powerlines. Because graves are likely to be very restricted in their distribution, the chances of impacts occurring are extremely unlikely. The consequence is deemed to be extreme, however, because of the very high significance attributed to human remains. The potential impact significance is rated as **Low negative**. A pre-construction survey would serve to confirm the presence or absence of further graves and whether any micrositing of pylons and the access track is needed. Because it is anticipated that impacts will be easily avoided, the post-mitigation impact significance will be **Very low negative**.

There are no fatal flaws in terms of construction phase impacts to graves.

#### 8.1.3. Impacts to the cultural landscape

Direct cultural landscape impacts arise when inappropriate or incompatible structures and equipment are introduced into the rural/natural landscape during the construction phase. The impacts are deemed to be regional because the powerline will be more than 10 km long. Impacts would be medium term. Although the landscape is of medium cultural significance and impacts would definitely occur, the consequence is rated as substantial because of the visual permeability of powerlines and because construction work would never occur along more than a short section at once. The significance before mitigation is **Moderate negative**. The VIA also rates this impact (i.e. visual intrusion in the landscape) as moderate negative. Mitigation will entail minimising the construction duration, minimising all disturbance and scarring of the landscape, ensuring effective rehabilitation of any areas that will not be required during operation of the facility and ensuring that existing farm tracks are reused as much as possible. These measures will reduce the rating to **Low negative** after mitigation. This, too, is in agreement with the VIA rating.

There are no fatal flaws in terms of construction phase impacts to the cultural landscape.

### 8.2. Operation Phase

#### 8.2.1. Potential Impacts to the cultural landscape

Direct cultural landscape impacts are a result of inappropriate or incompatible structures occurring in the rural/natural landscape during the operation phase. The impacts are again deemed to be regional. The operation phase would be long term. Because of the open visibility of the line from two public roads, the consequence is rated as substantial with the impact significance being **Moderate negative**. The VIA also rates this impact (i.e. visual intrusion in the landscape) as moderate negative. Mitigation will not make any meaningful difference to the impacts but, nonetheless, all maintenance vehicles should stay within demarcated areas to avoid impacting undeveloped land, lighting mitigation (downlighters and motion detectors) should be employed at the switching station, buildings should be painted in earthy tones where technically feasible, and existing roads should be reused as far as possible. With mitigation

the significance will remain at the **Moderate negative** level. For operation the VIA also sees the impact as remaining moderate negative after mitigation.

There are no fatal flaws in terms of operation phase impacts to the cultural landscape.

### 8.3. Decommissioning Phase

Direct impacts during the decommissioning phase would be identical in nature to those from the construction phase except that the equipment on site would be uninstalling and removing the powerline from the site. All ratings are the same, with the VIA again being in agreement (i.e. Medium and Low negative before and after mitigation respectively).

### 8.4. Cumulative Impacts

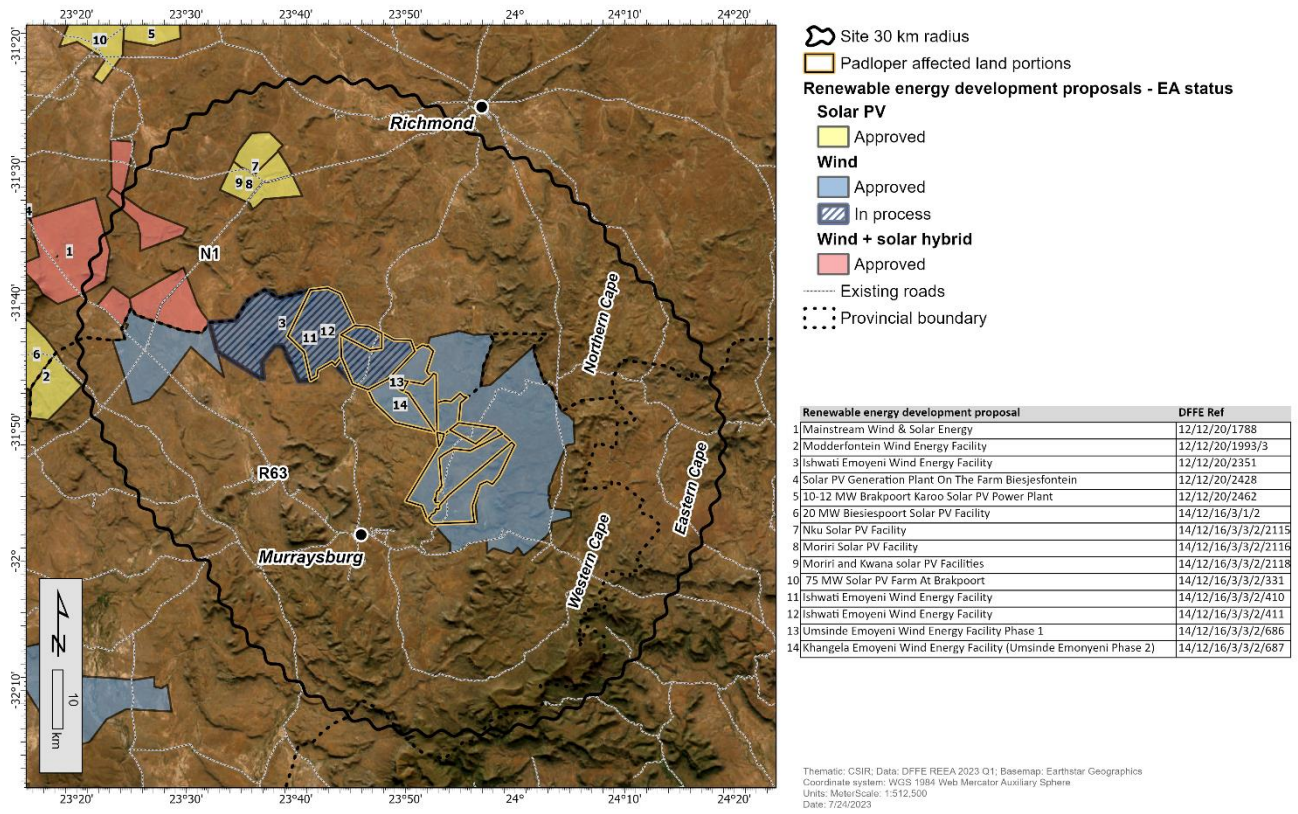
Note that cumulative impacts to palaeontology are considered by the relevant specialist study.

It is impossible to quantify the impacts to heritage resources because comprehensive surveys, especially for wind energy facilities, are impossible and, for various reasons, the reliability of the reported surveys is likely to be variable. Furthermore, cultural significance assessment is variable between practitioners. Although some archaeological sites are likely to be lost during the future construction of other renewable energy facilities and powerlines, it is clear that culturally significant heritage resources are relatively sparsely distributed on the local landscape and often focused on farm complexes (including, in this instance, a ruined and now archaeological farmstead). Also, the individual significance of each site is such that it does not extend beyond the local area. Impacts to buildings and graves would be extremely rare and make almost no contribution to the assessment of cumulative impacts. The Padloper EGI4 corridor overlaps a number of significant archaeological sites but it is anticipated that impacts will be easily avoided during construction because of the small footprint within the corridor. The cumulative contribution of impacts to archaeology should thus be of **Low negative** significance in this case but with project specific mitigation as listed in Table 4 this would drop to **Very low negative** after mitigation.

The construction of other projects in the area will also affect the cultural landscape. It is deemed preferable to cluster renewable energy developments, and hence their powerlines, so that the impacts are kept to one area. In the present instance this has been done as is evident from the map in Figure 47. Importantly, it is noted that all of the Padloper EGI projects (and their associated PV facilities assessed elsewhere) lie within the approved sites for wind energy facilities. Because of the spread out nature of the various projects, the cumulative impacts would be regional in extent and the consequence is rated as being moderate. The impacts are very likely to occur if the projects are constructed. However, because the wind energy facilities will be vastly more prominent in the landscape than the powerlines, the cumulative impact contribution of Padloper EGI 4 will be minimal. The cumulative impacts are deemed to be of **Low negative** significance in this case regardless of project-specific mitigation measures.



# Proposed Padloper Solar Photovoltaic (PV) and Electricity Grid Infrastructure (EGI) cluster near Murraysburg, in the Western Cape and Northern Cape, South Africa



**Figure 47:** Map showing other projects considered in the assessment of cumulative impacts. As a worst case scenario the 30 km radius surrounds all Padloper powerline projects and not just the present one.

**Table 4: Assessment of impacts.**

Impact	Impact Criteria		Significance and Ranking (Pre-Mitigation)	Potential Mitigation Measures	Significance and Ranking (Post-Mitigation)	Confidence Level
<b>Construction Phase</b>						
<b>Damage or destruction of archaeological materials</b>	Status	Negative	Low (4)	<ul style="list-style-type: none"> <li>- Pre-construction survey to check areas not yet covered and advise on need for micrositing of pylons and access track</li> <li>- Sensitive areas must be flagged as No-Go areas;</li> <li>- Report any chance finds</li> </ul>	Very low (5)	High
	Spatial extent	Local				
	Duration	Permanent				
	Consequence	Moderate				
	Probability	Unlikely				
	Irreplaceability	High				
<b>Damage or destruction of graves</b>	Status	Negative	Low (4)	<ul style="list-style-type: none"> <li>- Pre-construction survey to check areas not yet covered and advise on need for micrositing of pylons</li> <li>- Report any chance finds</li> </ul>	Very low (4)	High
	Spatial extent	Local				
	Duration	Long term				
	Consequence	Extreme				
	Probability	Very unlikely				
	Irreplaceability	Moderate				
<b>Intrusion of powerlines and equipment into the landscape</b>	Status	Negative	Moderate (3)	<ul style="list-style-type: none"> <li>- Minimise duration of construction period</li> <li>- Minimise cut-and-fill and landscape scarring in general</li> <li>- Ensure effective rehabilitation of areas not needed during operation</li> <li>- Reuse existing farm tracks as much as possible</li> </ul>	Low (4)	High
	Spatial extent	Regional				
	Duration	Short term				
	Consequence	Substantial				
	Probability	Very likely				
	Irreplaceability	High				
<b>Operational Phase</b>						
<b>Intrusion of powerlines into the landscape</b>	Status	Negative	Moderate (3)	<ul style="list-style-type: none"> <li>- Ensure that all maintenance vehicles stay within designated areas</li> <li>- At switching station make use of motion sensors, downlighters, etc to minimise lighting impacts at night</li> <li>- Paint structures in earthy tones to reduce contrast where technically feasible</li> </ul>	Moderate (3)	High
	Spatial extent	Local				
	Duration	Long term				
	Consequence	Substantial				
	Probability	Very likely				
	Irreplaceability	High				
<b>Decommissioning Phase</b>						
<b>Intrusion of powerlines and equipment into the landscape</b>	Status	Negative	Moderate (3)	<ul style="list-style-type: none"> <li>- Minimise duration of decommissioning period</li> <li>- Ensure effective rehabilitation of all areas disturbed by decommissioning activities</li> </ul>	Low (4)	High
	Spatial extent	Local				
	Duration	Short term				
	Consequence	Substantial				

	Probability	Unlikely				
	Reversibility	High				
	Irreplaceability	Moderate				
<b>Cumulative impacts</b>						
<b>Impacts to archaeology, graves, buildings</b>	Status	Negative	Low (4)	<ul style="list-style-type: none"> <li>- Pre-construction survey to check areas not yet covered and advise on need for micrositing of pylons and access track</li> <li>- Sensitive areas must be flagged as No-Go areas;</li> <li>- Report any chance finds</li> </ul>	Very low (4)	High
	Spatial extent	Local				
	Duration	Permanent				
	Consequence	Moderate				
	Probability	Unlikely				
	Reversibility	Non-reversible				
	Irreplaceability	High				
<b>Intrusion of powerlines and equipment into the landscape</b>	Status	Negative	Low (4)	<ul style="list-style-type: none"> <li>- Minimise duration of construction period</li> <li>- Minimise cut-and-fill and landscape scarring in general</li> <li>- Ensure effective rehabilitation of areas not needed during operation</li> <li>- Reuse existing farm tracks as much as possible</li> <li>- Ensure that all maintenance vehicles stay within designated areas</li> <li>- At switching station make use of motion sensors, downlighters, etc to minimise lighting impacts at night</li> <li>- Paint structures in earthy tones to reduce contrast where technically feasible</li> <li>- Minimise duration of decommissioning period</li> <li>- Ensure effective rehabilitation of all areas disturbed by decommissioning activities</li> </ul>	Low (4)	High
	Spatial extent	Regional				
	Duration	Long term				
	Consequence	Moderate				
	Probability	Very likely				
	Reversibility	High				
	Irreplaceability	Moderate				

## **8.5. Evaluation of impacts relative to sustainable social and economic benefits**

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

The proposed powerline would support a solar energy facility that would, in turn, generate and feed electricity into the national grid. This is something very much needed for economic development in South Africa due to the historical and ongoing problems associated with electricity supply. Economic development has knock-on effects throughout society, but it is also noted that construction phase jobs would be created. These are clear economic and social benefits and, if mitigation is applied as suggested above, then the socio-economic benefits outweigh the residual impacts.

## **8.6. 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 fossils and archaeological materials. Trampling from grazing animals and/or farm/other vehicles could also occur. Impacts to archaeological sites are of no concern and would be of **negligible negative** significance. There are no existing impacts to the cultural landscape and this aspect is thus **neutral**.

## **8.7. The No-Go alternative**

Not constructing the powerline will mean that the study area stays undeveloped and the status quo is retained. It would also mean that the solar energy facility – if constructed – would not be able to evacuate power to the National Grid. The impacts that occur will be as per the existing impacts described above. Importantly, electricity supply would not take place which means that this benefit would be lost to society. This suggests that the No-Go option is less desirable in heritage terms.

## **8.8. 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 linear nature of the proposed development, its visual permeability, and its remote location, such an impact to the landscape is not envisaged.

# **9. IMPACT ASSESSMENT SUMMARY**

The overall impact significance essentially follows the most significant impact in each phase following the implementation of the proposed mitigation measures. These are shown in Table 5.

**Table 5: Overall Impact Significance (Post Mitigation)**

<b>Phase</b>	<b>Overall Impact Significance</b>
Construction	Low
Operational	Moderate
Decommissioning	Low
<b>Nature of Impact</b>	<b>Overall Impact Significance</b>
Cumulative - Construction	Low
Cumulative - Operational	Low
Cumulative - Decommissioning	Low

## **10. LEGISLATIVE AND PERMIT REQUIREMENTS**

This report and the proposed recommendations will need to be approved by HWC. There are no further legislative requirements for the approval process under the NHRA but if archaeological or palaeontological mitigation is needed then the appointed archaeologist or palaeontologist will need to submit a Workplan to HWC to do the work. This must be carried out well in advance of construction to ensure that there is enough time for HWC to approve the mitigation work before construction commences.

## **11. ENVIRONMENTAL MANAGEMENT PROGRAMME INPUTS**

The actions recorded in Table 6 should be included in the environmental management program (EMPr) for the project.

**Table 6: Heritage considerations for inclusion in the EMPr.**

Impact	Mitigation / Management Objectives and Outcomes	Mitigation / Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>Impacts to archaeology, buildings and graves</b>					
Damage or destruction of archaeological sites or graves	Locate sensitive areas before damage occurs and avoid impacts	<u>Construction Phase</u> : Commission pre-construction archaeological survey of final authorised alignment to determine if micro-siting is required.	Ensure that survey report is produced and submitted to HWC	Once-off	Project developer
Damage or destruction of archaeological sites	Locate sensitive areas before damage occurs and avoid impacts	<u>Construction Phase</u> : No-Go signage will need to be placed at sites close to the final alignment. To be determined after pre-construction survey.	Monitoring of No-Go areas (construction period only)	Ongoing basis	Construction Manager or Contractor
				Whenever on site (at least weekly)	ECO
Damage or destruction of archaeological sites or graves	Rescue information, artefacts or burials before extensive damage occurs	<u>Construction Phase</u> : Reporting chance finds as early as possible to HWC or archaeologist, protect <i>in situ</i> and stop work in immediate area.	Inform staff to be vigilant and carry out inspections of new excavations	Ongoing basis	Construction Manager or Contractor
				Whenever on site (at least weekly during construction period only)	ECO
<b>Impacts to the cultural landscape</b>					
Visible landscape scarring	Minimise landscape scarring	<u>Construction Phase</u> : Ensure disturbance is kept to a minimum and does not exceed project requirements. Reuse existing tracks as far as possible. Rehabilitate areas disturbed during construction that are not needed during operation.	Monitoring of surface clearance relative to approved layout	Ongoing basis	Construction Manager or Contractor
				As required	ECO
Intrusion into cultural landscape	Minimise visual intrusion	<u>Operation Phase</u> : Ensure that all maintenance vehicles and operational activities stay within designated areas.	Undertake visual inspections and report non-compliance	As required	Environmental Manager
Intrusion into cultural landscape	Minimise contrast and light pollution	<u>Operation Phase</u> : Paint buildings in earthy colours to reduce contrast. Make use of motion detectors and downlighting to reduce night-time light pollution at switching station.	Monitor that this has been considered in the design and operation of the facility	Once off	Project Developer

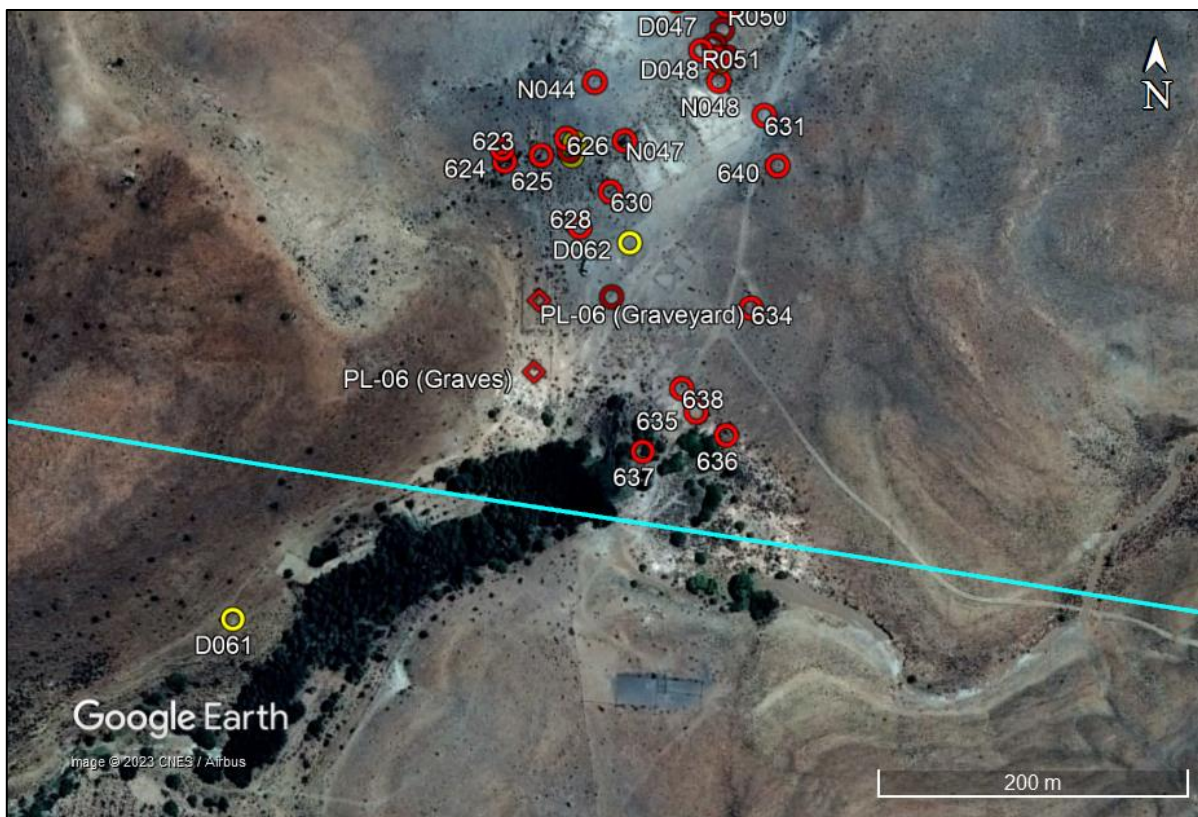
Visible landscape scarring	Minimise landscape scarring	<u>Decommissioning Phase</u> : Ensure all areas are rehabilitated following specialist rehabilitation plan.	Monitor compliance and success of rehabilitation	As required	ECO
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## 12. CONSULTATION WITH HERITAGE CONSERVATION BODIES

As required by HWC in their comment, this report was submitted to the Beaufort West Municipality for comment.

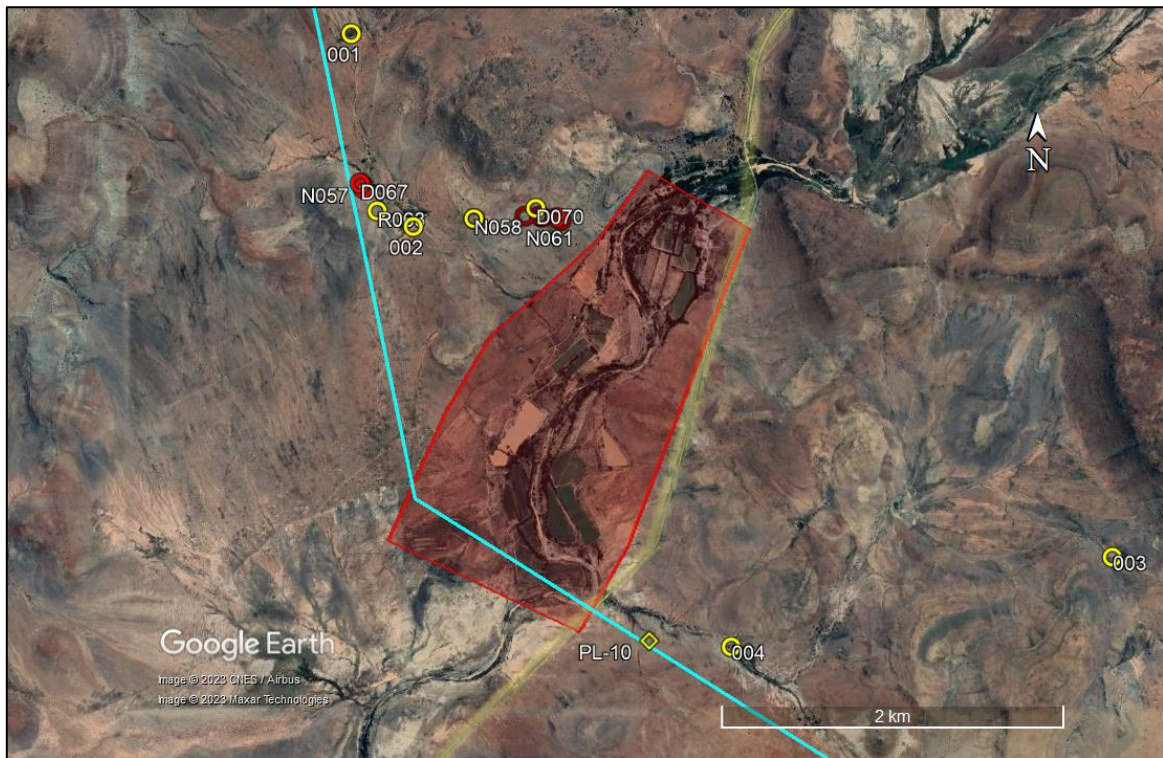
## 13. CONCLUSIONS

The final extent of actual impacts cannot be determined until the final alignment has been surveyed. All known sites have been avoided, including those at the archaeological Driefontein farmstead (Figure 48), although the line would run over some historical dams. Note that the proximity to the Driefontein complex is because of the desire to situate the powerline parallel to another already authorised but not yet constructed powerline that would run to the north of the currently proposed line. The landscape context of the Driefontein complex is not of specific concern because the site is now almost entirely archaeological. The single remaining structure is not of high cultural significance as it is not of great age. The only other minor issue is that two cultural landscape areas have been crossed (Figures 49 and 50). At Rietpoort the crossing is far from the farmstead and is not of concern, but at Bakensklip the line runs through the middle of the lands, not far from the house. Although this latter is not ideal, the line runs adjacent to the already authorised (but not yet constructed) powerline and it is desirable to cluster powerlines rather than have them spread out across the landscape. Table 7 lists the heritage indicators and the project responses.

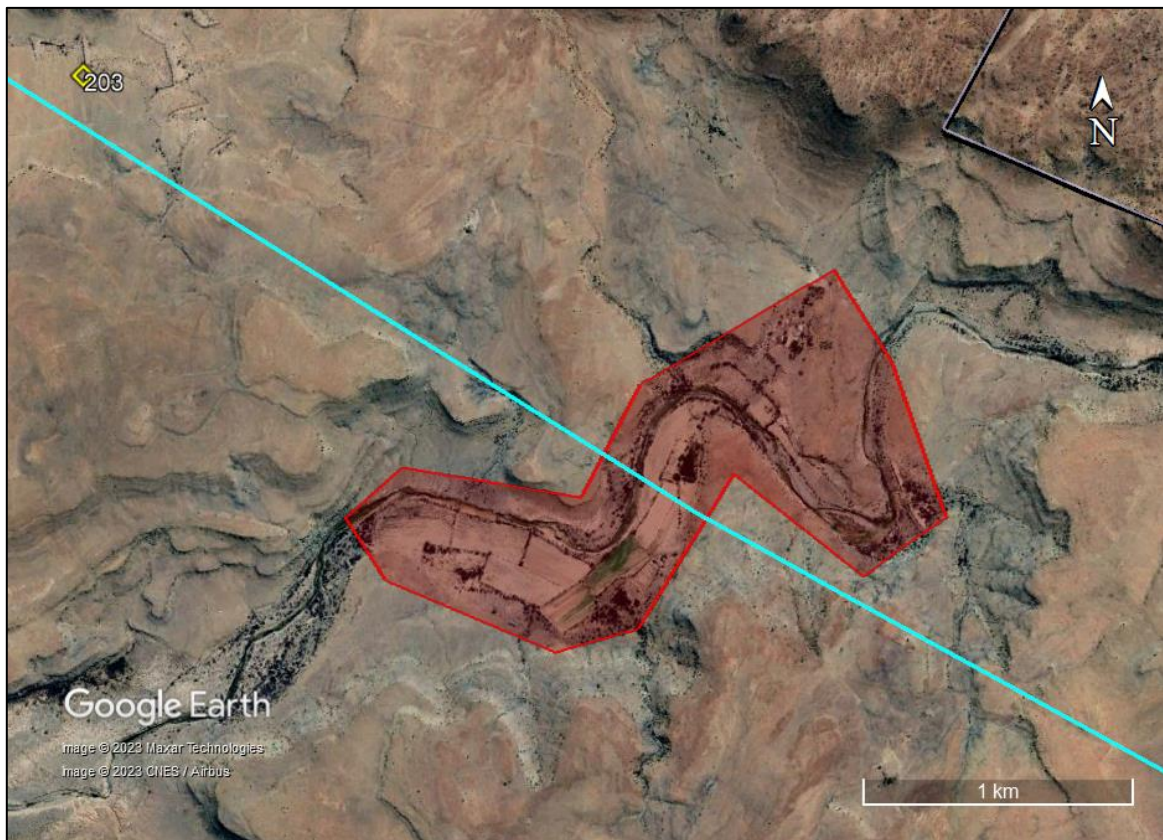


**Figure 48:** Aerial view of the southern part of the archaeological Driefontein farmstead showing that the powerline (blue line) has been designed to avoid the known heritage features.





**Figure 45:** Aerial view of the Rietpoort farmstead showing the powerline running through the southern part of its associated lands. The house is in the north.



**Figure 46:** Aerial view of the Bakensklip farmstead showing the powerline running through the centre of its associated lands. The house is in the northeast.

**Table 7: Heritage indicators and project responses.**

Indicator	Project Response
Uncontrolled damage to fossils should be minimised as far as possible	No impacts are expected but a chance finds procedure will be recommended.
Archaeological sites should be protected with a buffer of at least 30 m if possible. Reusing of existing roads through the buffers is allowed but any widening must take place away from the site.	This has largely been done but any further requirements will be determined during a pre-construction survey. The exceptions are historical dam walls that will be spanned and one short stone wall that will need to be demarcated as a no-go area.
Direct damage to archaeological sites should be avoided as far as possible and, where some damage to significant sites is unavoidable, scientific/historical data should be rescued.	This has been done but any further requirements will be determined during a pre-construction survey.

### 13.1. Statement and reasoned opinion of the specialist

Given the generally low sensitivity of the proposed route and the ease with which any remaining impacts are expected to be managed or mitigated, the heritage specialist is of the opinion that the proposed Padloper EGI 4 may be authorised in full.

## 14. RECOMMENDATIONS

It is recommended that the proposed Padloper EGI 4 be authorised, but subject to the following recommendations which should be included as conditions of authorisation (note that points applicable to one province only are indicated; the remaining points refer to the entire length of the project):

- The powerline may not be constructed closer than 30 m from the graveyard. It is preferred that no pylons or service track are placed within 50 m of the graveyard, but the cables may span the area between 30 and 50 m from the graveyard.
- WESTERN CAPE ONLY: The graveyards at PL\_06 must be flagged as a No-Go area;
- WESTERN CAPE ONLY: The stone walling at waypoint 016 must be flagged as a No-Go area;
- WESTERN CAPE ONLY: The powerline service track may not go over dam walls;
- A pre-construction archaeological survey must determine whether any further impacts might occur;
- Any further no-go areas must be flagged on site prior to development starting;
- No stones may be removed from any archaeological site;
- The fossil Chance Finds Protocol must be included in the EMPr and implemented in the event that fossils are found;
- WESTERN CAPE ONLY: The removal of trees from within the servitude at the historic Driefontein farm complex and on the current Rietpoort farmlands must be minimised;

- WESTERN CAPE ONLY: Lighting mitigation must be employed at the switching station to ensure that light is directed only to where it is needed and, preferably, that it only switches on when needed;
- WESTERN CAPE ONLY: Buildings to be painted in earthy tones where technically feasible; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

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## APPENDIX 1 – Curriculum Vitae



*Curriculum Vitae*

**Jayson David John Orton**

ARCHAEOLOGIST AND HERITAGE CONSULTANT

### Contact Details and personal information:

**Address:** 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 – 2017
Heritage Western Cape APM Committee member	2013 –
UNISA Department of Archaeology and Anthropology Research Fellow	2014 –
Fish Hoek Valley Historical Association	2014 –
Kalk Bay Historical Association	2016 –
Association of Professional Heritage Practitioners member	2016 –

### **Fieldwork and project experience:**

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

#### Feasibility studies:

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

#### Phase 1 surveys and impact assessments:

- Project types
  - Notification of Intent to Develop applications (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, Franschoek, Namaqualand, Bushmanland
- LSA coastal shell middens
  - Melkbosstrand, Yzerfontein, Saldanha Bay, Paternoster, Dwarskersbos, Infanta, Knysna, Namaqualand
- LSA burials
  - Melkbosstrand, Saldanha Bay, Namaqualand, Knysna
- Historical sites
  - Franschoek (farmstead and well), Waterfront (fort, dump and well), Noordhoek (cottage), variety of small excavations in central Cape Town and surrounding suburbs
- Historic burial grounds
  - Green Point (Prestwich Street), V&A Waterfront (Marina Residential), Paarl

### **Awards:**

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



## APPENDIX 2 - Site Sensitivity Verification

As required in Part A of the Government Gazette 43110, GN 320, 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. The details of the site sensitivity verification are noted below:

<b><i>Date of Site Visit</i></b>	18 to 21 September 2022, plus results of other surveys
<b><i>Specialist Name</i></b>	Dr Jayson Orton, assisted by Steve van den Heever & Joseph Matembo
<b><i>Professional Registration Number</i></b>	Association of Southern African Professional Archaeologists (ASAPA): 233 Association of Professional Heritage Practitioners (APHP): 043
<b><i>Specialist Affiliation / Company</i></b>	ASHA Consulting (Pty) Ltd

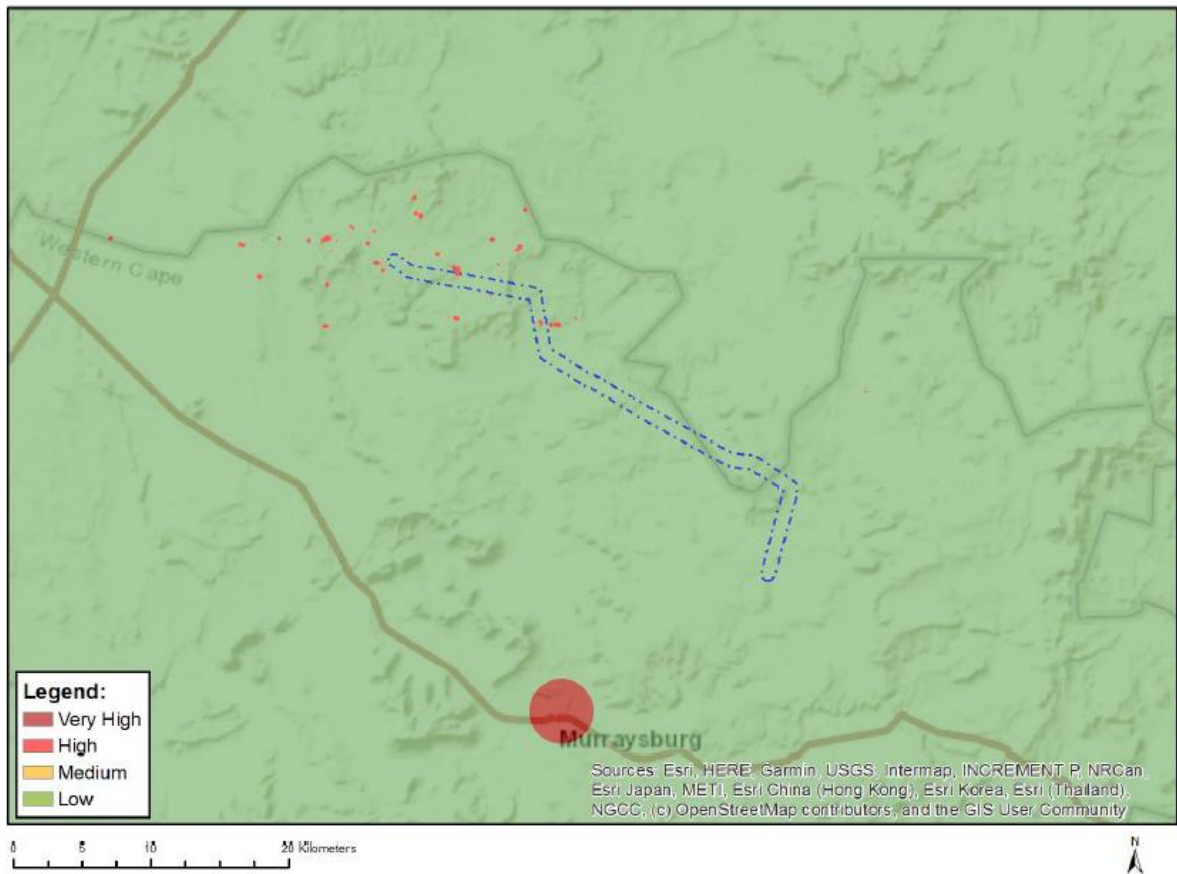
### Method of the Site Sensitivity Verification

Initial work was carried out using satellite aerial photography in combination with the author's accumulated knowledge of the local landscape and the earlier work of others in the same area. This was used to determine sensitive areas. Subsequent fieldwork only covered certain areas of the corridor based on the surveys for the associated PV facilities. Desktop research was also used to inform on the heritage context of the wider area. This information is presented in the report (Sections 5.2.1 and 5.4.1).

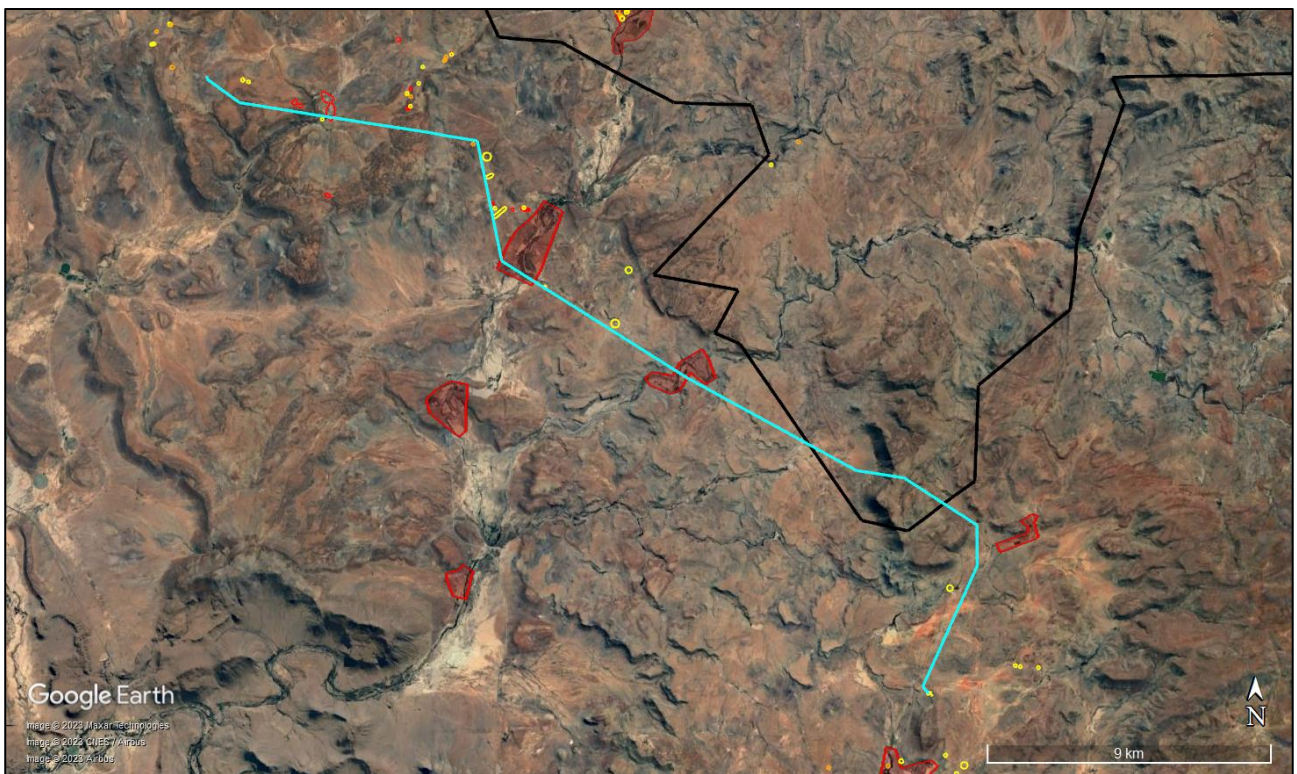
### Outcome

The first map below is extracted from the screening tool report and shows the archaeological and heritage sensitivity to be low on most areas but with patches of high sensitivity where heritage sites are on record. Although the powerline route was not specifically surveyed, the site work carried out in the area shows that the distribution of known highly significant resources is likely to be correct with few other heritage resources likely to be found along the route. An important omission from the Screening Tool map is the cultural landscapes around the farmsteads. The heritage specialist thus disputes the Screening Tool report. The second map below shows the areas considered to be sensitive from a heritage point of view. Photographs and descriptions of all the heritage feature are included in the specialist report.

Sites of Grade IIIA (high cultural significance) and IIIB (medium cultural significance) should be regarded as of high sensitivity. IIIC sites (low cultural significance) can be seen as medium, while NCW (very low significance) are low sensitivity.



Screening tool map for the Archaeology and Cultural Heritage Theme.



Heritage sensitivity map. The red and orange areas can be regarded as high sensitivity, while the yellow areas are medium.

**APPENDIX 3 – Palaeontological study**

**APPENDIX 4 – Visual Impact Assessment**