

**HERITAGE IMPACT ASSESSMENT: PROPOSED ESIZAYO 132KV
TRANSMISSION INTEGRATION PROJECT, ON FARMS
STANDVASTIGHEID 210 REMAINDER
AND AURORA 285, WESTERN AND NORTHERN CAPE**

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

Prepared for

WSP Group Africa (Pty) Ltd

On behalf of

BioTherm Energy (Pty) Ltd

Final Report: 1 December 2021



Prepared by

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CONTENTS OF THE SPECIALIST REPORT – CHECKLIST

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	Section of Report
(a) details of the specialist who prepared the report; and the expertise of that specialist to compile a specialist report including a <i>curriculum vitae</i> ;	Preface pages (Page 4) and Appendices 5, 7 & 8
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page 4
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 5: Terms of Reference
(cA) an indication of the quality and age of base data used for the specialist report;	Section 8: Methodology
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 15: Impact Assessment
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 8.3, and Appendices 5 & 7
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 8: Methodology
(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 site alternatives;	Sections 10-14: Heritage Assessments
(g) an identification of any areas to be avoided, including buffers;	Section 15: Impact Assessment
(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;	Figures 6, 7, 8 & 9
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 8.5: Restrictions and Assumptions
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment, or activities;	Sections 10 - 18

(k) any mitigation measures for inclusion in the EMPr;	Section 15: Impact Assessment
(l) any conditions for inclusion in the environmental authorisation;	Section 15: Impact Assessment
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	N/A
(n) a reasoned opinion— i. as to whether the proposed activity, activities or portions thereof should be authorised; iA. Regarding the acceptability of the proposed activity or 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 or Environmental Authorization, and where applicable, the closure plan;	Section 19: Conclusion
(o) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	N/A
(p) any other information requested by the competent authority	N/A
Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	No such gazetted protocol exists for heritage resources. Heritage Western Cape and SAHRA minimum standards for Heritage Impact Assessments have been applied.

DETAILS OF THE SPECIALIST

This study has been undertaken by John Gribble BA Hons, MA (ASAPA) of ACO Associates CC, archaeologists and heritage consultants.

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CONSULTANT DECLARATION OF INDEPENDENCE

I, John Gribble, declare that – general declaration:

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

Signature of the specialist:



Name of company (if applicable): ACO Associates CC

Date: 1 December 2021

EXECUTIVE SUMMARY

1.1 Site Name

Esizayo 132 kV Transmission Integration Project.

1.2 Location

Proposed on the farms Aurora 285 and Standvastigheid 210 Remainder, located in the Western and Northern Cape respectively, approximately 30 km north of Matjiesfontein.

Co-ordinates of the beginning and end of the overhead powerline are:

-32.936659°S / 20.594629°E

-32.992482°S / 20.599089°E.

1.3 Locality Plan

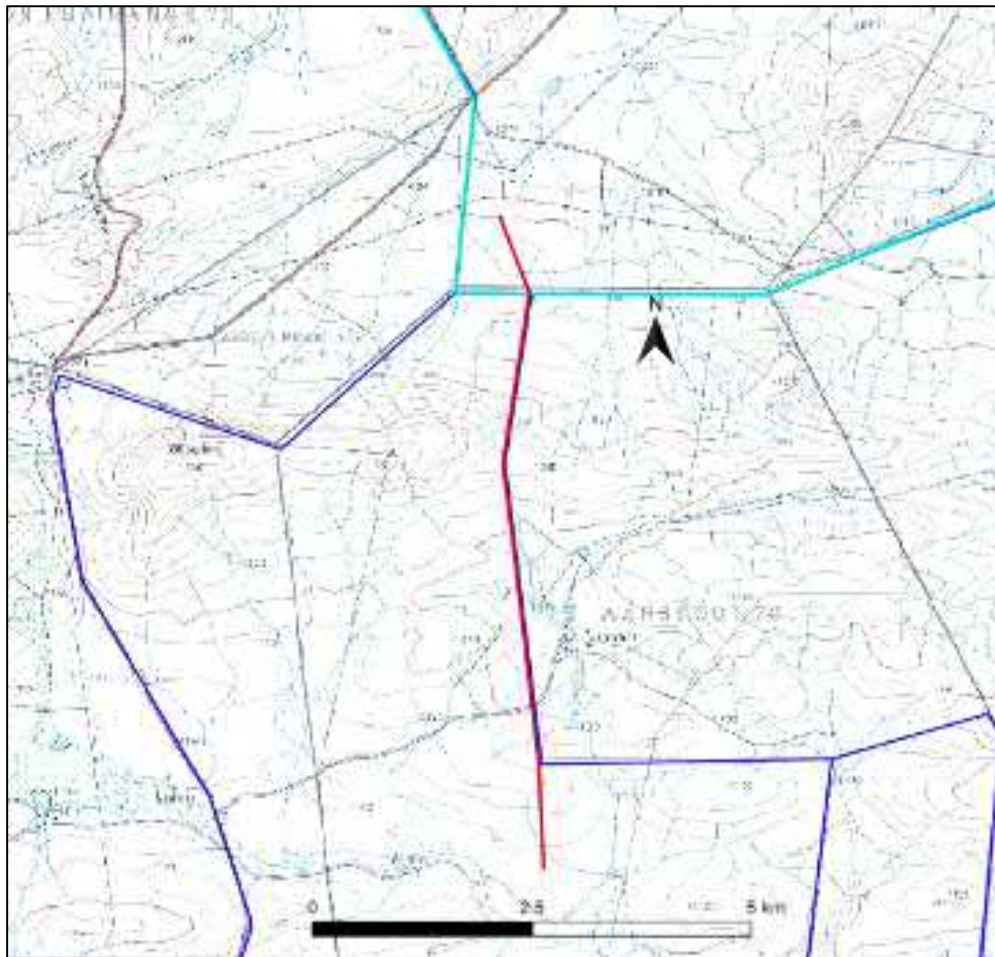


Figure 1: Location of the proposed overhead line route (red line) on the farms Aurora 285 (dark blue) and Standvastigheid 210 Remainder (top). The light blue line is the provincial boundary between the Western and Northern Cape (Source: 1:50 000 chart 3220DC, National Geo-spatial Information, <http://www.ngi.gov.za>).

1.4 Description of Proposed Development

The proposed project comprises the construction of a 132kV overhead power line to connect the authorised Esizayo Wind Energy Facility to the national grid via the existing Eskom Komsberg substation. The proposed powerline is approximately 6.5 km long.

The OHL will be a 132kV steel single or double structure with kingbird conductor with a height of between 15 and 20m above ground level. Standard overhead line construction methodology will be employed and will include drill holes (typically 2 – 3m in depth), plant poles and a string conductor. It is not envisaged that any large excavations and stabilized backfill will be required, however this will only be verified on site part of construction works once the geotechnical assessment has been undertaken at each pole position.

1.5 Heritage Resources Identified

Archaeology – The survey of the proposed OHL route undertaken for this report identified no archaeological sites, although three isolated stone artefacts dating to the Later and Middle Stone Ages were recorded north and east of the WEF substation. This material is not considered conservation-worthy.

Palaeontology – Palaeontological impact assessments by Almond (2011) and Almond (2021) both indicate that the OHL route is underlain by deltaic and continental sediments of the Waterford and Abrahamskraal Formations belonging to the Ecca and Lower Beaufort Groups of the Karoo Supergroup respectively and of Middle Permian age. The bedrocks in this region have yielded scientifically-important fossils but well-preserved fossils are very sparsely distributed.

The majority of the fossils recorded within the Esizayo WEF and grid connection project areas are of widely-occurring taxa that are not considered to be of exceptional scientific or conservation value. Furthermore, none of the fossil sites recorded during the 2016 and 2021 palaeontological site visits lie within the footprint of the OHL route.

Built Environment - The survey of the OHL route identified a gently curving line of at least 38 square, packed stone marker cairns constructed approximately 10-20 m apart along the Aurora / Aanstoot property boundary. These cairns, which are likely to be impacted by the proposed new alignment of the OHL to the Komsberg substation are interspersed in places with the collapsed remains of packed stone walling and in one or two instances are represented by upright blocks of shale, rather than packed stone constructions. This historical built feature as a whole has been given a grading of 3B.

Graves and Cemeteries – no graves or cemeteries have been recorded along the overhead powerline route.

1.6 Anticipated Impacts on Heritage Resources

None of the fossil sites recorded during the field assessments fall within the footprint of the OHL route under consideration and direct impacts on these known fossil sites are therefore not anticipated.

The impact significance of the construction phase of the project is assessed as low, this as a consequence of the paucity of irreplaceable, unique or rare fossil remains within the project area and the extensive superficial sediment cover overlying most potentially-fossiliferous bedrocks.

Impacts due to the construction of a powerline access road will probably be greater than those attributable to excavations for pylon footings. Significant further impacts during the operational and de-commissioning phases of the electrical infrastructure are not anticipated.

Very little archaeological material and no archaeological sites were identified during the walkover survey of the OHL. The material that was identified has been assessed to be of very low significance and has been assigned a grading of Not Conservation-Worthy. Should this material be damaged or destroyed during the construction of the OHL the loss to heritage will not be significant. Potential impacts on archaeological heritage resources arising from the construction of the OHL are thus assessed to be low.

The 2021 walkover survey identified a line of packed stone markers and wall remains along the Aurora / Aanstoot property boundary in close proximity to and, in places, crossed by the proposed OHL. The feature was assessed to have moderate to high local value as evidence of historical land use pattern in the region and was graded 3B. The significance of potential impacts on the boundary marker feature arising from the construction of the OHL are assessed as moderate.

1.7 Recommendations

The following heritage-related recommendation are made in respect of the Esizayo 132 kV transmission integration project:

Palaeontology: Given the scarcity of scientifically-important, unique fossil heritage recorded within the on-site substation and powerline project area, no further specialist palaeontological studies or mitigation are recommended for this development, pending the potential discovery of significant new fossils before or during the construction phase.

The following general palaeontological mitigation measures should, however, apply to the construction phase of the powerline. These recommendations are captured in tabular form in Chance Fossil Finds Protocol in Appendix 5):

- Monitoring of all surface clearance and substantial excavations (>1 m deep) by the Environmental Control Officer (ECO) / Environmental Site Officer (ESO) for fossil material (e.g. bones, teeth, fossil wood) on an on-going basis during the construction phase;
- Safeguarding of chance fossil finds (preferably *in situ*) during the construction phase by the responsible ECO / ESO, followed by reporting of finds to Heritage Western Cape (HWC) for the Western Cape / SAHRA for the Northern Cape;
- Recording and judicious sampling of significant chance fossil finds by a qualified palaeontologist, together with pertinent contextual data (stratigraphy, sedimentology, taphonomy) (Phase 2 mitigation); and
- Curation of fossil material within an approved repository (museum / university fossil collection) and submission of a Phase 2 palaeontological heritage report to HWC / SAHRA by a qualified palaeontologist.

These monitoring and mitigation requirements should be incorporated into the Environmental Management Programme (EMPr) for the proposed OHL and also included as conditions for authorisation of the development.

Please note that:

- All South African fossil heritage is protected by law and fossils cannot be collected, damaged or disturbed without a permit from SAHRA or the relevant Provincial Heritage Resources Agency (HWC);
- The palaeontologist concerned with potential mitigation work will need a valid fossil collection permit from SAHRA/HWC and any material collected would have to be curated in an approved depository (e.g. museum or university collection);
- All palaeontological specialist work should conform to international best practice for palaeontological fieldwork and the study (e.g. data recording fossil collection and curation, final report) and should adhere as far as possible to the minimum standards for Phase 2 palaeontological studies developed by SAHRA (2013).

If these mitigation measures are successfully implemented, the residual impact of the project on palaeontological resources will low.

Archaeology: As stated above, the archaeological material recorded along the OHL route is graded as NCW and is of low heritage significance. No mitigation is proposed in respect of this material.

Should any human remains be encountered at any stage during the construction or earthworks associated with the project, work in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and HWC or SAHRA, depending on where on the OHL alignment the remains are found, must be notified immediately so that a decision can be made on how best to deal with them.

Built Environment: It is recommended that activities related to the construction of the proposed OHL avoid the line of packed stone boundary markers.

This can be accomplished by adjusting the route alignment either slightly westwards or eastwards to ensure that the OHL does not overprint or overlies this feature.

The line of boundary markers must also be demarcated as a no-go area during the construction of the line.

If these mitigation measures are successfully implemented, the residual impact of the project on the historical stone feature will be low to negligible.

Visual: According to the VIA, although there will be visual impacts during the construction and operational life of the OHL, these can be completely reversed after decommissioning, if all the structures are removed and the land suitably rehabilitated.

No specific mitigation measures in respect of the OHL are proposed by Gebhardt (2017) beyond the general recommendations that non-reflective paints and coatings are used on all new structures to minimise visibility and avoid reflectivity and glare, that the construction

footprint is kept as small as possible to avoid unnecessary disruption to the existing vegetation and that the Establishment of vegetative screens /shelterbelts around affected homesteads should be considered in consultation with the owners.

If these mitigation measures are implemented, the residual visual impact of the project will be reduced, but according to Gebhardt will still remain moderate.

In summary, this assessment has found that the area identified for proposed Esizayo OHL is a moderately sensitive heritage environment, and that, impacts on heritage resources arising from the construction of the project can be expected.

It is our considered opinion, however, that provided the mitigation measures set out above are implemented, the overall impact and significance of the proposed OHL on heritage resources will be range from low to moderate, and the proposed activity is acceptable

1.8 Author/s and Date

Heritage Impact Assessment: John Gribble, ACO Associates, 2021

Archaeological Impact Assessment: Lita Webley and David Halkett, ACO Associates, 2017

Palaeontological specialist studies: John Almond, Natura Viva, 2016 and 2021

Visual Impact Assessment: Belinda Gebhardt 2017

GLOSSARY

Archaeology: 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.

Cultural landscape: The combined works of people and natural processes as manifested in the form of a landscape

Early Stone Age: The archaeology of the Stone Age between 700 000 and 2 500 000 years ago.

Fossil: Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

Heritage: That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999.

Late Stone Age: The archaeology of the last 20 000 years associated with fully modern people.

Middle Stone Age: The archaeology of the Stone Age between 20 000-300 000 years ago associated with early modern humans.

National Estate: The collective heritage assets of the Nation.

Palaeontology: 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.

Pleistocene: A geological time period (of 3 million – 10 000 years ago).

Quaternary: The geologic time period that encompasses the most recent 2.6 million years. It comprises the Pleistocene (2.6 Ma – 10,000 years ago) and the Holocene (10,000 years ago to the present) and is characterised by a series of global glacial cycles.

SAHRA: South African Heritage Resources Agency – the compliance authority which protects national heritage.

Structure (historic): 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. Protected structures are those which are over 60 years old.

ACRONYMS

DFFE	Department of Forestry, Fisheries and the Environment
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
HWC	Heritage Western Cape
LSA	Late Stone Age
MSA	Middle Stone Age
NHRA	National Heritage Resources Act
NID	Notice of Intent to Develop
OHL	Overhead powerline
REDZ	Renewable Energy Development Zone
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
WEF	Wind Energy Facility

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2 INTRODUCTION

ACO Associates cc (ACO) was appointed by WSP Group Africa (Pty) Ltd, on behalf of Biotherm Energy (Pty) Ltd (BioTherm), to carry out a heritage impact assessment (HIA) as part of the Basic Assessment (BA) for the proposed Esizayo 132 kV Transmission Integration Project.

The OHL will be located on the farms Aurora 285 and Standvastigheid 210 Remainder, in the Western and Northern Cape respectively (Figure 1, Figure 2 and Figure 3).

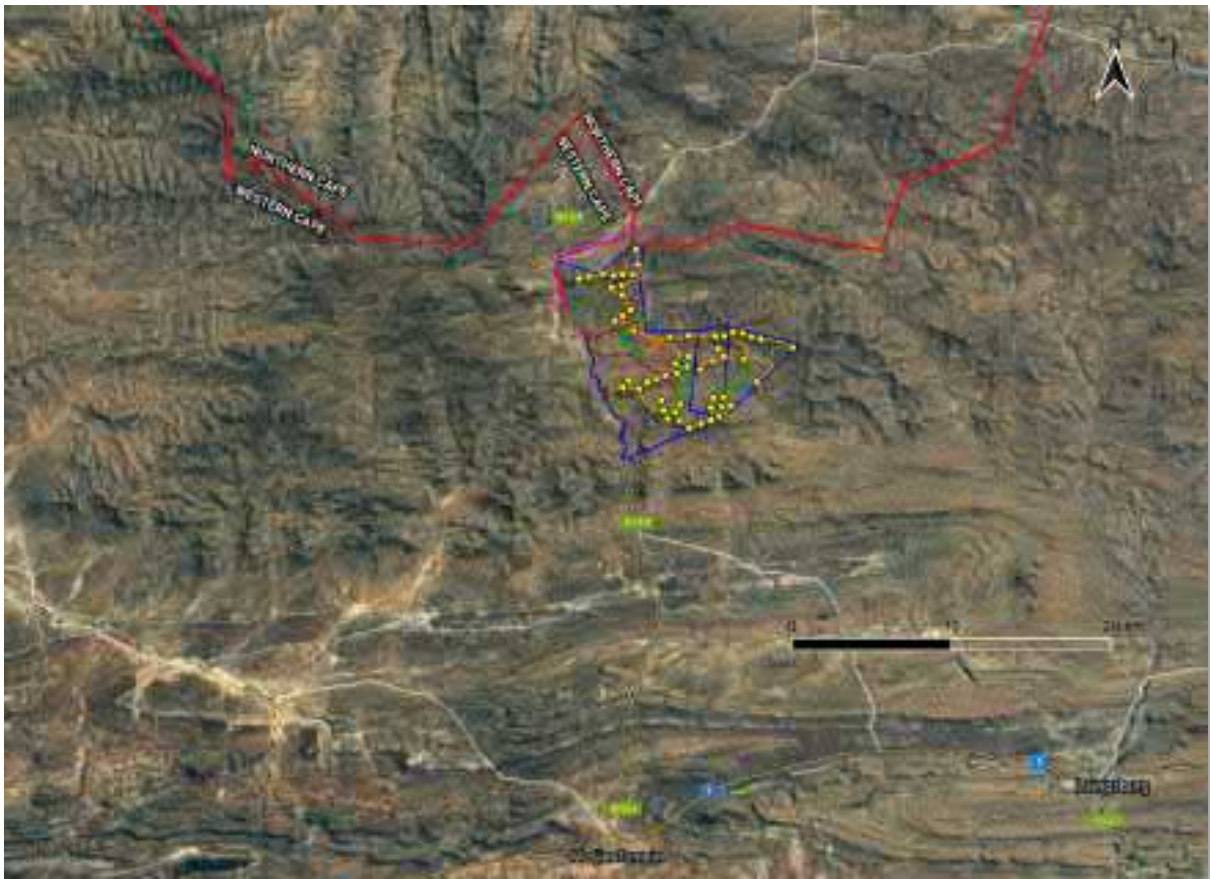


Figure 2: Location and authorised layout of the Esizayo WEF (Source: Google Earth).

3 PROJECT HISTORY

On 1 December 2017, the Department of Environmental Affairs issued an Environmental Authorisation (EA) (DEA reference number: 14/12/16/3/3/1/1775) for the construction of an overhead powerline (OHL) for the authorised Esizayo Wind Energy Facility (WEF). The OHL was located on the farms Aanstoot 72, Aprils Kraal 105 and Standvastigheid 210, north of Matjiesfontein in the Western and Northern Cape (Figure 3).

The authorised Esizayo 132 kV OHL was subject to heritage assessment during the BA process in 2015 and 2016. Dr John Almond conducted a palaeontological impact assessment (PIA) (Almond 2016) as part of that study, which was included in an integrated HIA produced by ACO Associates (Webley & Halkett 2017).

The HIA also included an assessment of the visual impacts of the OHL on the cultural landscape by Ms Belinda Gebhardt.

In addition, although not requested by HWC, to fulfil the requirements of heritage impact assessments as defined in Section 38 of the NHRA, ACO Associates provided brief comments on the built environment.

The HIA considered four OHL route options between two substation locations on the WEF and the Komsberg substation. OHL Option 2 from Substation 1 received environmental authorisation (Figure 4).

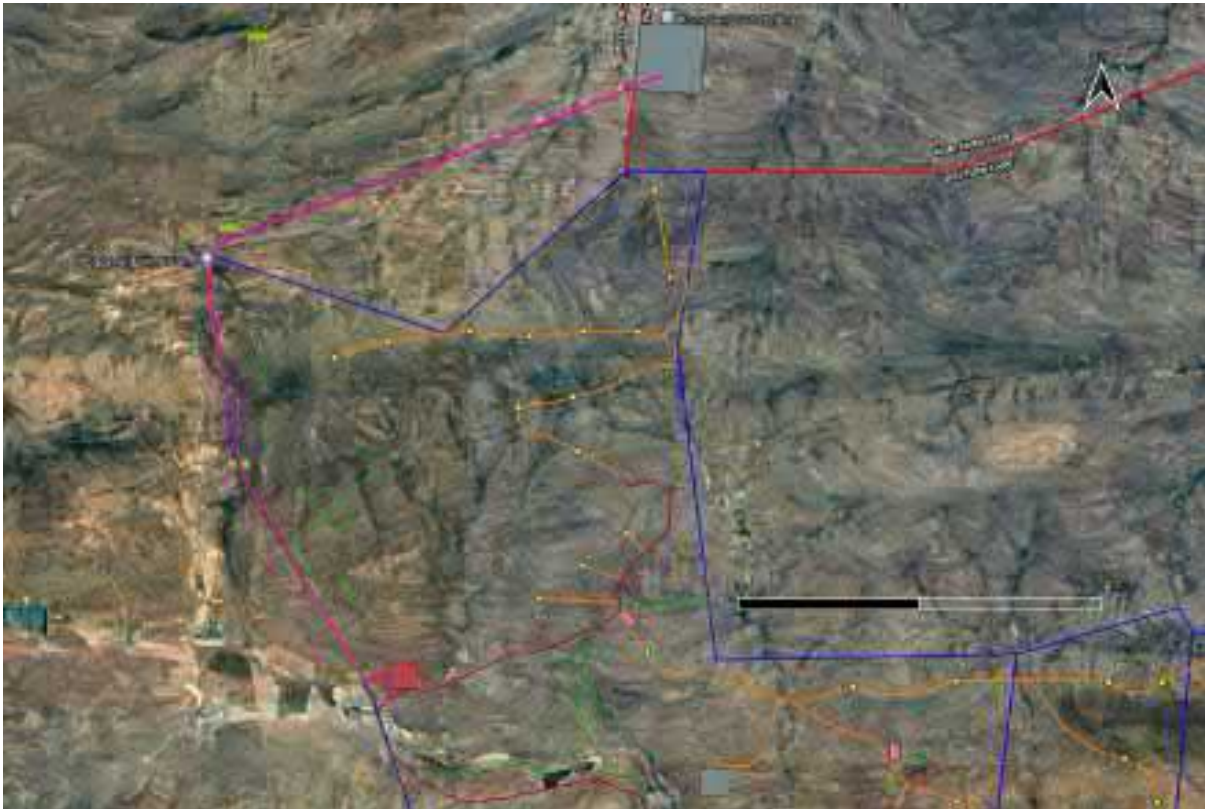


Figure 3: Detail of authorised Esizayo WEF layout, specifically the approved OHL route (purple line) between the onsite substation (red polygon) and Eskom's Komsberg substation (grey polygon) (Source: Google Earth).

4 CURRENT DEVELOPMENT PROPOSAL

Since it was authorised, the WEF layout has been subject to an amendment application which included the change to Substation 2 as the preferred substation option. As a consequence, BioTherm wishes to amend the authorised route of the 132 kV OHL to the Komsberg substation and must conduct a BA for approval by the Department of Forestry, Fisheries and the Environment (DFFE).

The proposed new 132 kV OHL is approximately 6.5 km long, of which 800 m is within the Northern Cape and the remainder in the Western Cape. The project is situated north of Matjiesfontein, in the Laingsburg and Karoo Hoogland Local Municipalities in the Western and Northern Cape Provinces, respectively.

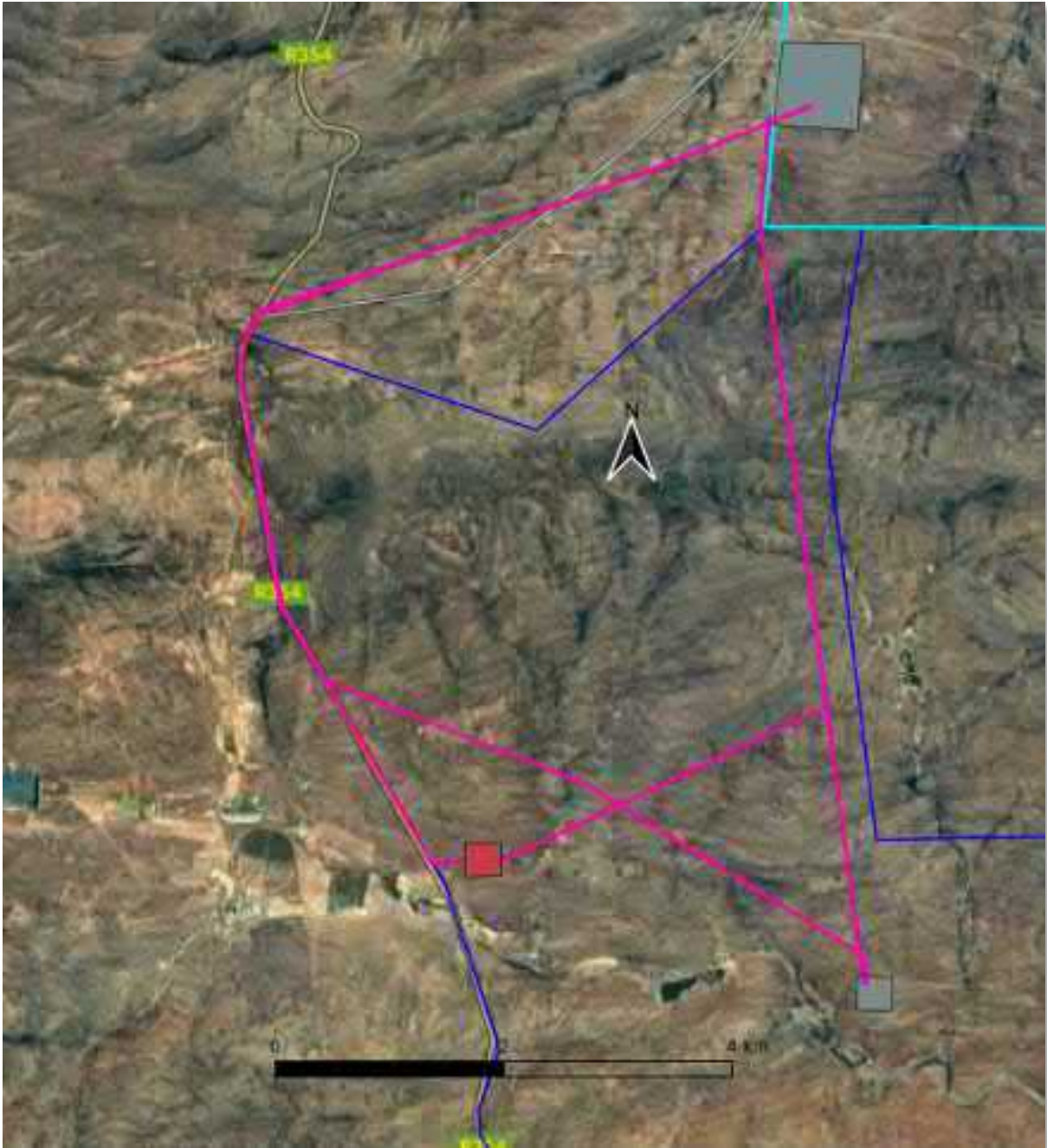


Figure 4: The four Esizayo WEF OHL route options between two onsite substations and the Komsberg substation assessed as part of the 2017 HIA (Source: Google Earth).

The OHL will connect the Esizayo WEF to the national grid via the existing Eskom Komsberg substation. The powerline is routed north from the approved substation on the farm Aurora 285, parallel to the boundary with the farm Aanstoot 72, to connect to the Komsberg substation situated on the farm Standvastigheid 210 Remainder (Figure 5).

The OHL will consist of steel single or double structures with kingbird conductor, between 15 and 20m above ground level. Standard overhead line construction methodology will be employed and will include drill holes (typically 2 – 3m in depth), plant poles and a string conductor. It is not envisaged that any large excavations and stabilized backfill will be

required, however this will only be verified on site part of construction works once the geotechnical assessment has been undertaken at each pole position.

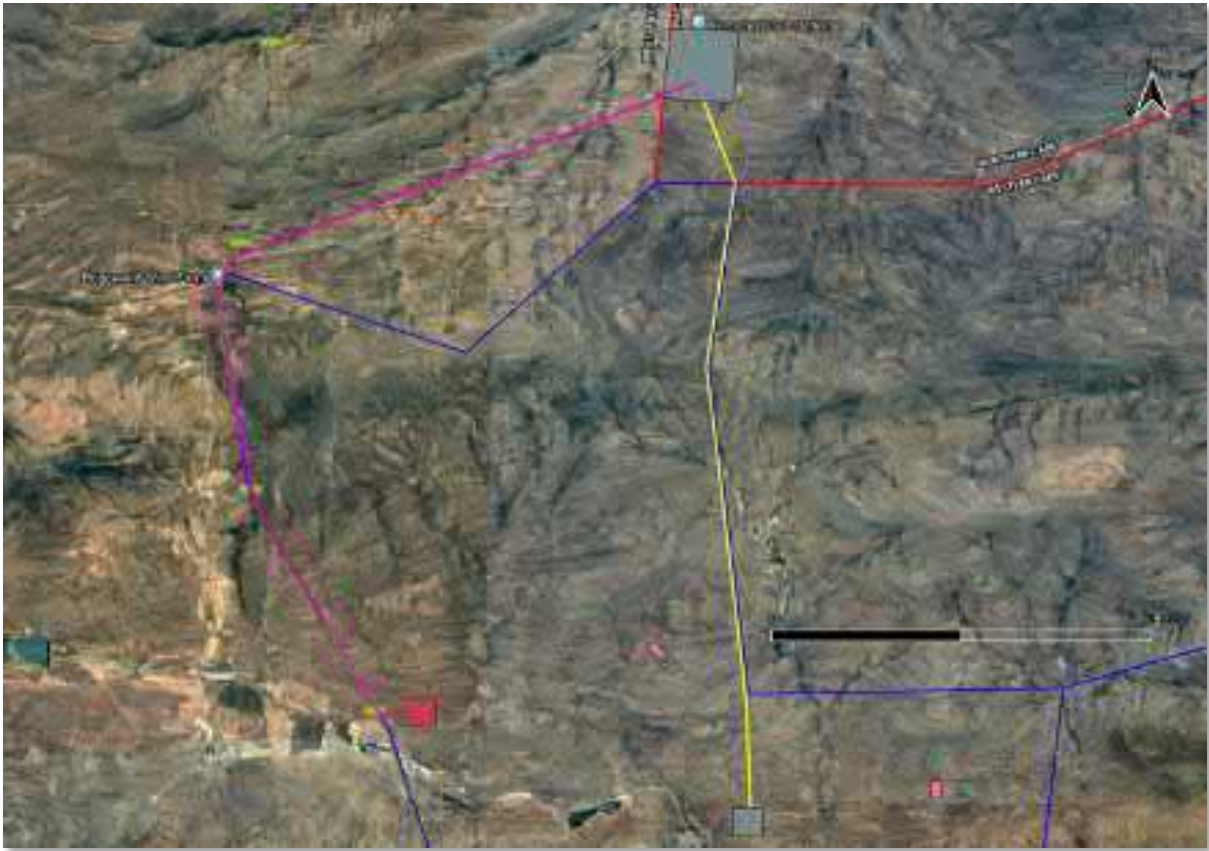


Figure 5: Comparison of the authorised (purple line) and proposed OHL route alignments (yellow line) for the Esizayo WEF (Source: Google Earth).

5 TERMS OF REFERENCE

ACO Associates was commissioned to produce a HIA as part of the BA process for this project.

The report includes the following:

- A desk-top literature review to assess the potential for archaeological, cultural and historic sites on the proposed OHL route;
- The results of a heritage field assessment to identify and document (collect GPS coordinates and photograph) heritage resources that may be affected by the project;
- A palaeontological impact assessment to assess the potential for the occurrence of fossil material on the proposed OHL route; and
- The results of a visual impact assessment.

The results of these studies are integrated in this HIA report along with an assessment of the sensitivity and significance of any identified heritage resources, an evaluation of the potential impacts on these resources of the construction of the OHL, and recommendations for measures to mitigate any negative impacts of the project on them.

This HIA will form part of the BA Report and must be submitted for comment to the South African Heritage Resources Agency (SAHRA), as the statutory heritage commenting body under the National Environmental Management Act (NEMA) for the Northern Cape.

A Notice of Intent to Develop for the proposed OHL was submitted to Heritage Western Cape. Their response (see Appendix 1) indicated that they required no further heritage studies for the OHL required. The HIA need, therefore, not be submitted to them for comment.

6 RELEVANT LEGISLATION

6.1 *National Heritage Resources Act (No 25 of 1999)*

The National Heritage Resources Act (NHRA) came into force in 2000 with the establishment of the SAHRA, replacing the National Monuments Act (No. 28 of 1969 as amended) and the National Monuments Council as the national agency responsible for the management of South Africa's cultural heritage resources.

The NHRA reflects the tripartite (national/provincial/local) nature of public administration under the South African Constitution and makes provision for the devolution of cultural heritage management to the appropriate, competent level of government. In the Western Cape this is Heritage Western Cape and in the Northern Cape, SAHRA acts on an agency basis for the Northern Cape Provincial Heritage Resources Authority, Ngwao Boswa jwa Kapa Bokone.

The NHRA gives legal definition to the range and extent of what are considered to be South Africa's heritage resources. According to Section 2(xvi) of the Act a heritage resource is "any place or object of cultural significance". This means that the object or place has aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

In terms of the definitions provided in Section 2 of the NHRA, heritage resources potentially relevant to this assessment are:

- Material remains of human activity which are in a state of disuse and are in or on land [which includes land under water] and which are older than 100 years, including artefacts, human and hominid remains and artificial features;
- 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;
- 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;
- Any movable property of cultural significance which may be protected in terms of any provisions of the NHRA, including any archaeological artefact or palaeontological specimen; and
- Intangible heritage such as traditional activities, oral histories and places where significant events happened.

As per the definitions provided above, these cultural heritage resources are protected by the NHRA and a permit from either HWC or SAHRA is required to destroy, damage, excavate, alter, deface or otherwise disturb any such site or material.

It is also important to be aware that in terms of Section 35(2) of the NHRA, all archaeological objects and palaeontological material is the property of the State and must, where recovered from a site, be lodged with an appropriate museum or other public institution.

Section 38 of the NHRA requires a HIA for certain kinds of development. In relation to this project, the relevant activities are:

- The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier over 300m in length (Section 38(1)(a)); and
- A development which will change the character of a site exceeding 5000 m² in extent (Section 38(1)(c)(i)).

6.1.1 Grading of Heritage Resources

The South African heritage resources management system is based on grading, which provides for assigning the appropriate level of management responsibility to a heritage resource.

Grading, according to Winter & Oberholzer (2014) is “generally based on the intactness, rarity and representivity of the resource, as well as its role in the larger landscape or cultural context”.

Heritage resources are graded according to criteria specified in Section 3 of the NHRA which suggests the following criteria for assigning heritage significance:

- Importance in the community or pattern in South Africa’s history;
- Possession of uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage;
- Potential to yield information that will contribute to an understanding of South Africa’s natural or cultural heritage;
- Importance in demonstrating the principal characteristics of a particular class of South Africa’s natural or cultural places or objects;
- Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Importance in demonstrating a high degree of creative or technical achievement during a particular period;
- Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- Significance in relating to the history of slavery in South Africa.

The generally accepted heritage resource grades are shown in Table 1 below.

Table 1: Grading of heritage resources (Source: Baumann & Winter 2005: Box 5).

Grade	Level of significance	Description
1	National	Of high intrinsic, associational and contextual heritage value within a national context, i.e. formally declared or potential Grade 1 heritage resources.
2	Provincial	Of high intrinsic, associational and contextual heritage value within a provincial context, i.e. formally declared or potential Grade 2 heritage resources.
3A	Local	Of high intrinsic, associational and contextual heritage value within a local context, i.e. formally declared or potential Grade 3A heritage resources.
3B	Local	Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources.
3C	Local	Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources.

6.2 National Environmental Management Act (No 107 of 1998)

The National Environmental Management Act (NEMA) provides a framework for the integration of environmental issues into the planning, design, decision-making and implementation of plans and development proposals that are likely to have a negative effect on the environment.

Regulations governing the environmental authorisation process have been promulgated in terms of NEMA and include the EIA Regulations, 2014 as amended (GNR R326/2017) and Listing Notices 1 – 3 (GNR 324, 325 and 327/2017). These regulations were amended in April 2017 by Government Notices 324, 325, 326 and 327.

The proposed Esizayo OHL triggers a number of activities in the Listing Notices and, in terms of GNR 325 therefore, the project will be subject to a BA process and will be required to obtain a positive environmental authorisation from the Department of Forestry, Fisheries and the Environment (DFFE) prior to commencement of the proposed activities.

7 PUBLIC PARTICIPATION

As required by NEMA, a public participation exercise is being undertaken as part of the BA process. A database of stakeholders and interested and affected parties (I&APs) has been compiled and there will be a 30 day period for public comment on the draft Basic Assessment Report.

Local conservation bodies registered with HWC and the relevant the local and regional municipalities will be approached for comment as part of this process.

Any heritage-related comments generated during the PP process will be addressed in the revised HIA in the final BAR.

8 METHODOLOGY

8.1 Palaeontological Assessment

Combined field-based and desktop palaeontological assessments (PIAs) covering most of the substation and powerline footprints have already been submitted by Almond (2015b, 2015c, 2016f, 2016g), as well as PIAs for several adjoining WEF project areas.

This assessment is based on the previous field-based palaeontological heritage assessment of the Esizayo WEF project area by Almond (2016f), supplemented by a recent two-day palaeontological site visit focussing on the revised grid connection and on-site substation project areas, and the desktop review of the recent palaeontological field surveys within adjoining WEF project areas mentioned above.

8.2 Archaeological Desktop Review

This study includes a review of published material and unpublished reports, including those generated for a number of previous archaeological assessments and studies that have been conducted in the vicinity of the proposed OHL.

The proposed OHL falls within the area for which HIAs were produced for the Esizayo WEF and its authorised OHL (Webley and Halkett 2017a, 2017b) and these reports have provided important detail for this HIA.

In addition, the following reports, available on the SAHRIS online platform (<https://sahris.sahra.org.za>), in ACO's project archive, or from other archaeologists were reviewed and their findings have contributed to this assessment:

- The Suurplaat Wind Energy facility (Hart et al. 2010)
- The Roggeveld Wind Energy facility (Hart & Webley 2011, 2013)
- The Sutherland WEF facility (Halkett & Webley 2011 & 2016)
- The Kareebosch Wind Energy facility (Roggeveld Phase 2) (Hart & Kendrick 2014)
- The Hidden Valley Wind Energy facility (Phases 1, 2 & 3) (Booth 2012)

The 1:50 000 maps sheets for the area and Google Earth aerial images were interrogated for evidence of sites and heritage resources.

8.3 Archaeological Field Assessment

As part of the current BA process a physical survey of the accessible portions of the proposed OHL route was undertaken by John Gribble and Gail Euston-Brown of ACO Associates on 24 and 25 August 2021. The survey targeted the lower elevations of the route and the areas with the greatest potential for containing heritage resources, such as river and stream valleys and rocky outcrops adjacent to the route.

The proposed OHL route and other data, such as the location of previously recorded heritage sites, were loaded onto hand-held GPS receivers (on the WGS84 datum) carried by each member of the field team. Travelled tracks were logged and the positions of any new heritage resources located during the survey were recorded as GPS waypoints (Figure 6 and Appendix 2). Photographs were taken of finds and they were graded according to the

Baumann and Winter (2005) system set out in the guidelines for involving heritage practitioners in EIAs.

The field team was suitably qualified and experienced to roughly date and characterise any heritage resources encountered during the survey.

No archaeological material was removed from the project area, and all observations were based on visible surface material.

8.4 Visual Assessment

A visual impact assessment (VIA) for the proposed Esizayo WEF and authorised OHL was conducted by Belinda Gebhardt in 2017. The close proximity to each other of the OHLs assessed in that VIA and the current proposed OHL alignment, mean that the existing VIA can be applied to this study. This assessment is less than five years old and, according to HWC's policy on reports, thus still valid.

The study comprised a field-based baseline survey of visual characteristics of the landscape, a process of defining the visual resources and sense of place of the area, the identification and mapping of existing sensitive receptors, buffers, important viewpoints and view corridors, the identification and screening of potential visual concerns, and the provision of recommendations for the impact assessment phase.

The VIA is attached to this report as Appendix 6.

8.5 Restrictions and Assumptions

The proposed OHL route was easily accessible from only two points, which limited the extent to which it could be walked for the survey. The mountainous nature of the terrain, particularly on the northern half of the route also limited access to that area.

However, much of the southern half of the route was surveyed and here vegetation cover was such that surface visibility was generally good for the purposes of the archaeological survey.

Numerous heritage impact assessments in the Karoo indicate that significant archaeological resources do not generally occur on the high lying ridges such as that to be traversed by the OHL. The fact that this portion of the route could not be accessed is therefore not considered to be an issue.

With respect to palaeontology, Almond (2021) notes that since most fossils are buried beneath the surface, their nature and distribution cannot be directly assessed during field surveys of the development footprint. Palaeontological assessments therefore rely on extrapolating palaeontological sensitivities within the footprint from desktop data and field surveys of well-exposed sedimentary rocks, mostly from sites *outside*, and often well away from, the footprint itself. This approach assumes that the rock exposures seen are

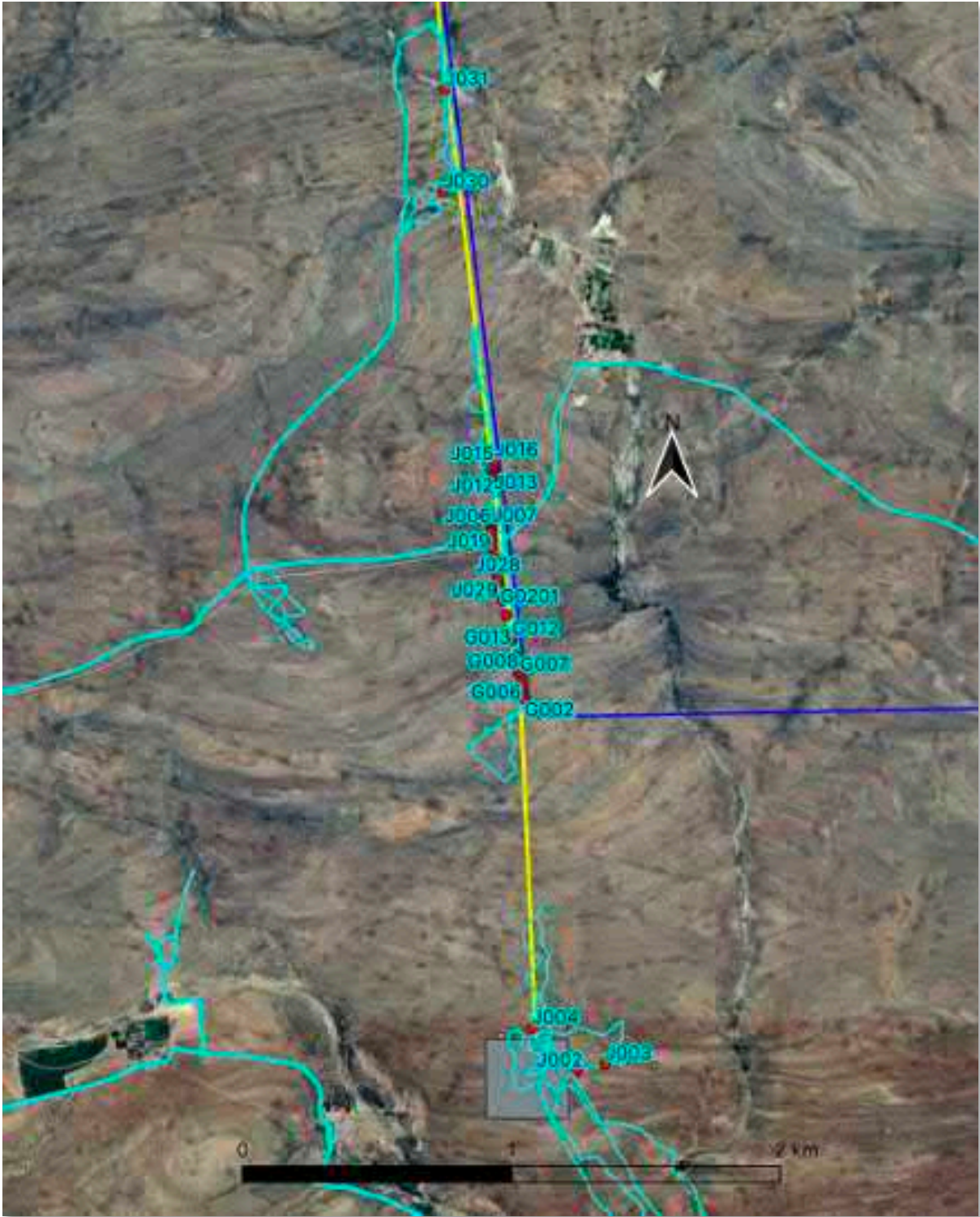


Figure 6: Trackplots (pale blue lines) and positions of heritage resources recorded during the recorded during the 2021 survey of the proposed new OHL route (Source: Google Earth).

representative - in palaeontological terms - of the rock units (formations, members etc) that will be impacted by the proposed development.

9 RECEIVING ENVIRONMENT

The OHL will be installed some 30 km north of Matjiesfontein, below the Great Escarpment and to the west of the R354 between Matjiesfontein and Sutherland.

Numerous streams cross the farm Aurora, and all drain into the Roggeveld River which runs roughly east-west across the centre of the farm. The proposed OHL is located on the southern slope of the Skaapberg, north of the river, and crosses a neck to the east of the peak before dropping down to the Komsberg substation on the northern side of the mountain.

The terrain on which the OHL will be installed slopes up gently towards the Skaapberg from the WEF substation and is characterised by hillsides covered in a soft reddish colluvium, broken by horizontal bands of sandstone and shale.

The modern human settlement of this area is sparse, with historical farm settlements in the area focused on the water resources and along river valleys. As an example, the farm complex on Aurora lies next to the Roggeveld River and the numerous historical stone-built kraals and ruined dwellings identified on the farm tend to be near water and often built against the rocky ridgelines along the valley sides.

10 PALAEOLOGY

A palaeontological impact assessment (PIA) of the OHL route was commissioned for BioTherm Energy (Pty) Ltd and the full report is attached separately as Appendix 5 (Almond 2021). In summary, the PIA found the following.

The Esizayo 132 kV Transmission Integration Project is largely underlain by deltaic and continental (fluvial / lacustrine) sediments of the Waterford and Abrahamskraal Formations. These rocks belong respectively to Ecca and Lower Beaufort Groups of the Karoo Supergroup and are of Middle Permian age. The Middle Permian Ecca and Beaufort Group bedrocks in this region have yielded scientifically-important fossils of petrified wood, rich vascular plant and insect assemblages, tetrapod (terrestrial vertebrate) burrows and trackways as well as extremely rare tetrapod skeletal remains (amphibians and therapsids) of the *Eodicynodon* Assemblage Zone. However, well-preserved fossils are very sparsely distributed here (Almond 2021).

The great majority of the fossils recorded so far within the Esizayo WEF and grid connection project areas are of widely-occurring taxa (sphenophyte ferns, lungfish burrows, low diversity invertebrate trace fossils) that are not considered to be of exceptional scientific or conservation value. Furthermore, none of the fossil sites recorded during the 2016 and 2021 palaeontological site visits lie within the footprint of the OHL route.

11 ARCHAEOLOGY

There are very few Early or Middle Stone Age sites in the study area. Halkett & Webley (2011) in their survey for the proposed Sutherland WEF observed Middle Stone Age (MSA) artefacts including scatters of polished/patinated stone chunks, flakes and cores, with occasional denticulated or notched pieces noted. Distinctive bifaces representative of the ESA were only seen on one site.

Halkett & Webley (2011) recorded only a handful of well-defined LSA sites, some associated with indigenous ceramics, generally located in proximity to water sources, near springs or on riverbanks. The LSA stone artefact assemblages included thumbnail scrapers and the raw material included a grey chert. Large flakes on indurated shale or hornfels were also common. In addition, they identified the presence of “open Khoekhoen encampments” along the dry riverbeds in the bottom of valleys.

One of the most common type of pre-colonial sites found in the Roggeveld area are stone kraals or stone structures (Halkett & Webley 2011). These typically consist of dry-stone walled enclosures in a roughly circular configuration, sometimes interlocking but not more than half a metre high and ranging from 3 – 4 meters in diameter. It is believed that many of these stone structures represent the “kraals” for small stock such as fat-tailed sheep and goats.

Elsewhere in wider vicinity of the Esizayo WEF Lloyd Evans et al. (1985) excavated a small rock shelter containing a Later Stone Age assemblage on the grounds of the South African Astronomical Observatory outside Sutherland. They comment (1985: 108) that the presence of the shell beads points to cultural ties with people along the Cape coast while the small scrapers found can be assigned to the Wilton industry.

Also near Sutherland, Hart (2005) reported finding a dense artefact scatter associated with a shallow rock shelter while doing a survey for a golf course to the south of the town. The study indicated that archaeological sites can be expected in areas that were sheltered from the wind.

11.1 Survey Results

The farm Aurora was extensively surveyed in both 2011 and 2016 for the proposed Sutherland WEF and the Esizayo WEF and OHL respectively (Halkett and Webley 2011, Webley and Halkett 2017a & b) (Figure 7). A handful of pre-colonial sites or materials were recorded, including two small shelters with rock paintings and associated artefacts. A further rock art site was reported by Mr Hanekom from the farm Saaiplaas north-east of the Komsberg substation (Halkett & Webley 2011, Webley and Halkett 2017a & b).

A few “pastoralist settlements” containing Later Stone Age (LSA) artefacts, ceramics and grindstones were located along dry river beds in the bottom of valleys on the farm.

Numerous roughly packed, circular enclosures of dry-stone walling, which may represent either pre-colonial and colonial era stone kraals were found distributed along the lower slopes of small koppies, and close to streams or fountains across the study area. Appendix 4 contains a full list and descriptions of the sites identified in 2016/2017.

No significant archaeological resources were identified on the high lying ridges which will accommodate the wind turbines.

The 2021 survey of the proposed OHL route undertaken for this report identified no new archaeological sites although three isolated stone artefacts dating to the Later and Middle Stone Ages (J002-J004) were recorded north and east of the WEF substation (Figure 8, Plate 1, Appendix 3) but these are not considered conservation-worthy.

12 HISTORICAL SITES

Schoeman (1986) has described the early colonial era settlement of the Roggeveld and Sutherland area which commenced around 1750. The first recorded loan farms in the Roggeveld date to 1743, and by 1750 there were 31 registrations (Penn 2005).

The early farmers found the escarpment, which enjoys the highest rainfall, particularly suitable for small stock farming during the summer months but they moved down into the valleys and plains of the Karoo to escape the extreme winters. Each Trekboer usually had in addition to a loan farm on the plateaux, a farm in the Karoo known as a legplaats or leenplaas (outpost or loan farm).



Plate 1: J002, a LSA chert core and J004, an extremely worn and patinated MSA flake (Photo: J Gribble).

Initially, the population of the area remained small, because many of the early loan farms were merely “stock posts” and the owners lived elsewhere. Drought, poor grazing and attacks by the San caused many farms to be abandoned. According to Penn (2005), in the 18th century there were numerous independent Khoekhoen kraals located amongst the Trekboer farms in the Roggeveld.

Resistance to the Trekboers in the Roggeveld came initially from the San who resisted fiercely throughout the great Karoo, at times beating back the vanguard of Trekboer farmers. In 1754, attacks from the Khoisan are reported to have increased and flocks of sheep and herds of cattle belonging to the Trekboers were driven out of the area. This increased to the extent that it is described by Schoeman (1986) as a type of guerrilla warfare. Livestock was stolen, Khoisan herders and slaves killed, and Trekboer farms attacked. The colonists fought back by establishing the Kommando system.

There was apparently a massacre of 186 San in the Roggeveld in 1765 and both Penn (2005) and Schoeman (1986) refer to mass grave on the farm Gunsfontein (to the west of Schieffontein (Scholtzenhof) - and now part of a private nature reserve), possibly dating to the rebellion of the 1770's. The Khoisan were gradually driven from the Roggeveld northward to the extent that by 1809 there is reported to have been only one settled “Bushmen” kraal left in the area.

Schoeman (1986) notes that during the early years of settlement in the Roggeveld, many of the Trekboers lived in grass huts or *matjieshuise* (mat covered houses), and in tents and some travellers found farmers living in such dwellings as late as 1839. Attempts at constructing more permanent structures were inhibited by the lack of suitable wood for roofs.

The survey by Webley and Halkett (2017a & b) for the Esizayo WEF and OHL identified a spread of early 20th century historical material, in association with several stone enclosures (fortifications) on the lower slopes of two koppies on the opposite (eastern) side of Aurora to

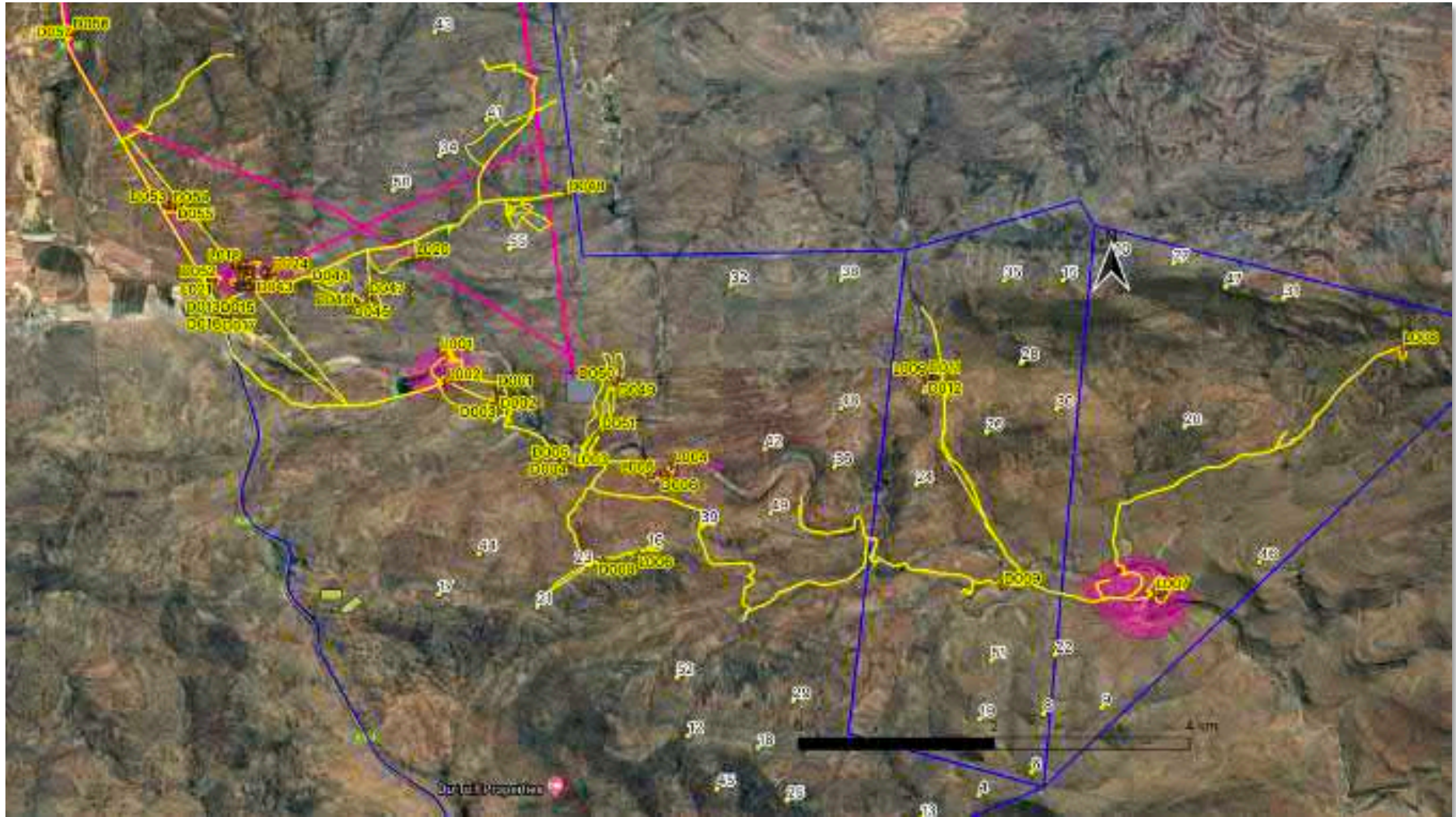


Figure 7: Survey trackplots (yellow lines) and heritage resources recorded during the fieldwork undertaken by ACO Associates for the 2017 HIA for the Esizayo WEF. The majority of the sites recorded were concentrated in the Roggeveld River valley. The collection of South African War sites is the cluster of waypoints on the left of the image (Source: Google Earth).



Figure 8: Locations of the three isolated stone artefacts dating to the Middle and Later Stone Ages (J002-J004) recorded north and east of the WEF substation during the 2021 OHL field survey (Source: Google Earth).

the area proposed for the OHL. This material and structures may be the debris from the South African War (Figure 7).

12.1 Historical Built Environment

Aside from the packed stone structures described above and the historical Aurora farmhouse, none of which are close to the proposed OHL route, no other historical buildings were recorded on the farm.

The 2021 survey for this report did, however, identify a line of packed stone markers and wall remains along the Aurora / Aanstoot property boundary (Figure 9) which are likely to be impacted by the proposed new alignment of the OHL to the Komsberg substation.

One of these markers (D048) (see Figure 9) was identified previously by Webley and Halkett (2017), but the recent survey indicated the presence of a gently curving line of at least 38 square, packed stone marker cairns constructed approximately 10-20 m apart. The cairns are roughly 1 x 1m square and up to 70 cm high (Plate 2, Appendix 3).

They are interspersed in places with the collapsed remains of packed stone walling and in one or two instances are represented by upright blocks of shale, rather than packed stone constructions. This historical built feature has been given a grading of 3B.

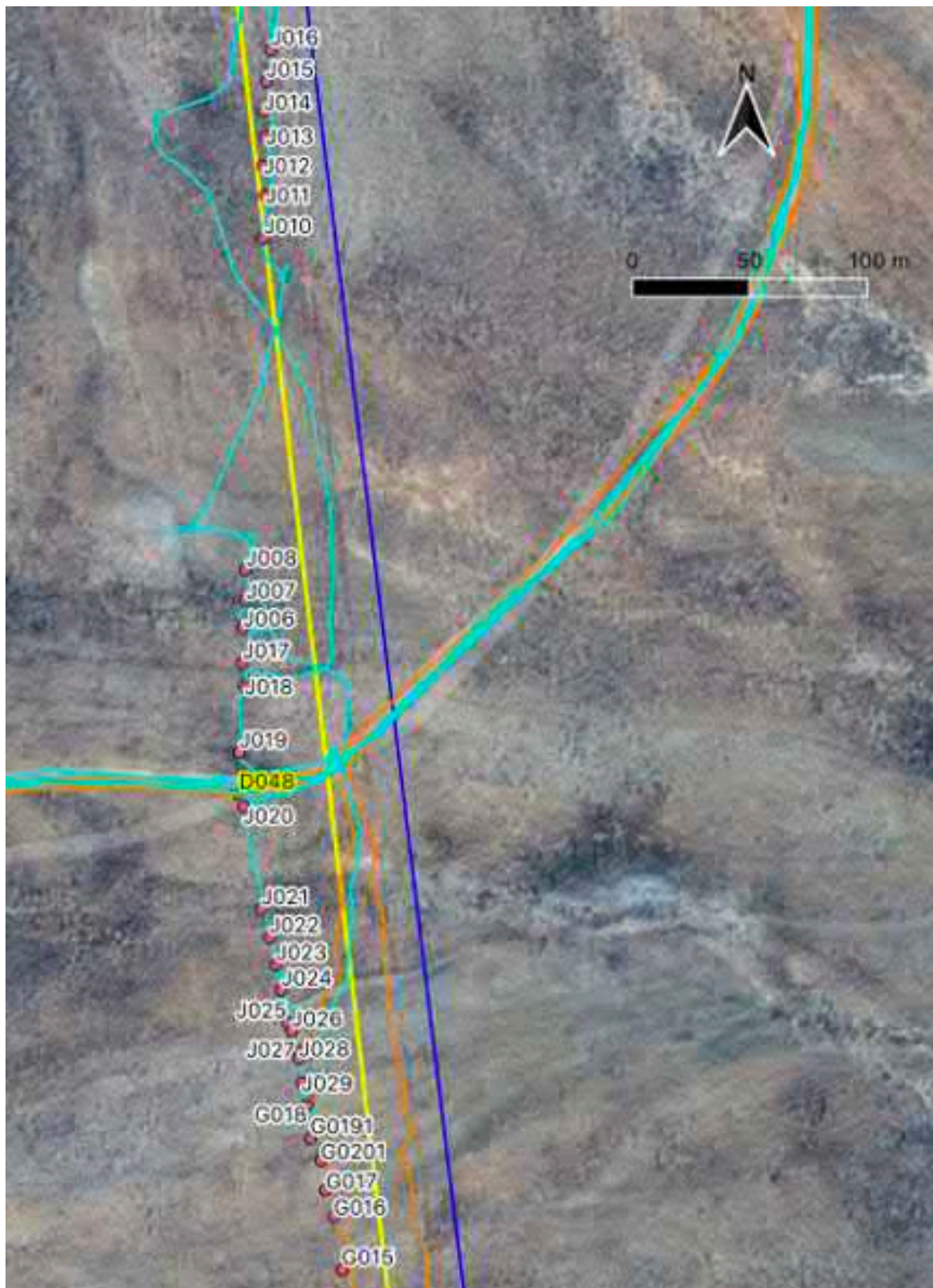


Figure 9: Line of stone boundary markers identified between the farms Aurora and Aanstoot in the east of the

WEF during the 2021 OHL survey (Source: Google Earth).



Plate 2: Examples of the packed stone markers recorded during the 2021 OHL walkdown survey (Photo: J Gribble / G Euston-Brown).

12.2 Cemeteries And Graves

The 2016 survey for the Esizyo WEF and OHL identified a historical cemetery next to the R345 on the far western border of Aurora that contains the graves of several families associated with the farm Nuwerus which is on the opposite side of the road (Webley and Halkett 2017 a & b).

A number of rock cairns which may be graves were also identified in the study area, but neither the graveyard or any of the potential grave cairns are in any way proximate to the proposed OHL route.

No cemeteries or graves were found on the proposed OHL route area during the recent ACO survey.

13 CULTURAL LANDSCAPE AND VISUAL

The concept of “cultural landscapes” finds expression in Article 1 of the World Heritage Convention 1972 where it is defined as a category of cultural heritage site which is representative of the “combined works of nature and of man”. Although not referenced in the NHRA, a consideration of any proposed development within the context of the cultural landscape within which it is proposed has become a standard requirement of HIA’s in South Africa.

The term “cultural landscape” embraces a diversity of manifestations of the interaction between humankind and its natural environment. Cultural landscapes are thus illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal (<https://whc.unesco.org/en/culturallandscape/#1>).

In respect of the landscape within which the OHL will be constructed, the VIA (Gebhardt 2017:20) (see Appendix 6) notes that the “climate of the area together with its geology, has resulted in rugged landforms with low-growing, Karoo shrub extending over an expansive, undulating landscape. The uninhabited nature of the wide-open spaces gives a feeling of remoteness and isolation” to the OHL route.

Furthermore, the land-use in the surrounding area “does not significantly alter the natural visual character. The study area is remote and sparsely populated. The patterns created by the winding power lines, fences and roads, with few dwellings or other man-made structures add to the sense of wilderness and isolation” (Gebhardt 2017:20).

Winter & Oberholzer (2013), have identified the R354 between Matjiesfontein and Sutherland, which crosses the Klein Roggeveld Mountains and passes the farm Aurora to the west, as an area of high scenic and rural value. It is an important tourism route to the Sutherland Observatory and is considered of Route III significance.

The proposed Esizayo OHL will thus be constructed in an area with a largely natural, untransformed visual character – an organically evolved landscape, as defined in the *Operational Guidelines* (2008) of the World Heritage Convention. Its construction will, as a result, alter the visual character of this rural landscape and contrast with the typical land use and historical form of human elements that are present in the landscape.

As Gebhardt (2017) notes, however, the level of contrast will be reduced by the presence in the surrounding area of a number of other WEFs (for example, Roggeveld, Karusa, Soetwater) and their associated power line infrastructure that are under construction to the north of the Esizayo WEF and OHL as part of the development of this area as the designated Komsberg Renewable Energy Development Zone (REDZ) and the Central Strategic Transmission (EGI) Corridor. The character of the landscape is thus changing with the turbines and associated WEF infrastructure such as OHLs introducing a more modern character to the landscape which may dominate the immediate visual landscape and cause a change to the cultural landscape.

14 SUSTAINABLE SOCIAL AND ECONOMIC BENEFITS

Section 38(3)(d) of the NHRA requires that a heritage impact assessment must “evaluate the impact of [a] development on heritage resources relative to the sustainable social and economic benefits to be derived from the development”.

The proposed construction of the OHL has the potential to impact one of the built environment resources (the line of stone boundary markers) described above, although if the mitigation measures proposed below are implemented this impact can be avoided.

Thus, while there may be impacts on heritage resources arising from the construction of the OHL, it is likely that the sustainable social and economic benefits accruing from the contribution this facility will make to the development of a sustainable energy supply for South Africa and the Western Cape will outweigh any possible impacts to heritage resources.

15 IMPACT ASSESSMENT

The construction phase of the proposed 132 kV powerline will entail extensive surface clearance for access roads and pylon footings, as well as excavations into the superficial sediment cover and possibly also into the underlying bedrock, albeit to a limited extent. The development may thus adversely affect heritage resources within its footprint.

The operational and de-commissioning phases of the transmission integration infrastructure are unlikely to involve further adverse impacts on local heritage resources and are therefore not separately assessed here.

Based on experience with WEFs currently under construction, the main source of potential impacts on heritage resources arising from grid connection projects is the construction of new access roads, especially in hilly terrain.

15.1 Methodology

The following impact assessment methodology, supplied by WSP, has been applied to this HIA.

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct, indirect, secondary as well as cumulative impacts.

Direct impacts are those that arise directly from activities that form an integral part of the Project, indirect impacts arise indirectly from activities not explicitly forming part of the Project and secondary or induced impacts are caused by a change in the Project environment. Cumulative impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e. residual impact). The significance of environmental aspects is determined and ranked by considering the criteria presented in Table 2.

Table 2: Impact Assessment Criteria and Scoring System

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
IMPACT SIGNIFICANCE RATING					
Total Score	4 to 15	16 to 30	31 to 60	61 to 80	81 to 100
Environmental Significance Rating (Negative (-))	Very low	Low	Moderate	High	Very High
Environmental Significance Rating (Positive (+))	Very low	Low	Moderate	High	Very High

15.1.1 Impact Mitigation

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains

following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

The mitigation sequence/hierarchy is shown in Figure 10 below

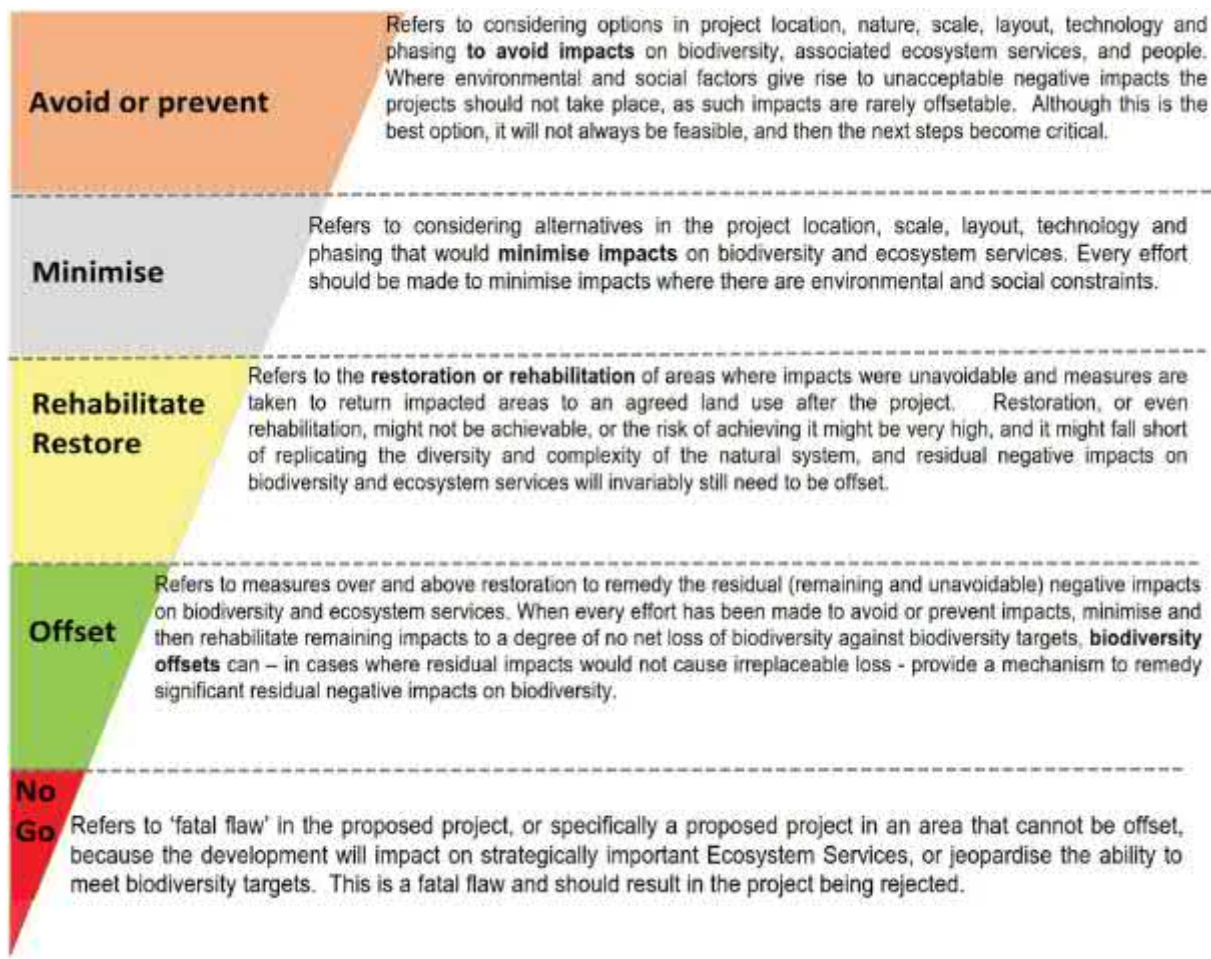


Figure 10: Mitigation Sequence/Hierarchy

15.2 Palaeontology

None of the fossil sites recorded during the field assessments for this and the surrounding renewable energy projects referred to above fall within the footprint of the OHL route under consideration. Direct impacts on these known fossil sites are therefore not anticipated and no mitigation is recommended in regard to them.

The impact significance of the construction phase of the project is assessed as low (negative) in terms of palaeontological heritage resources. This is a consequence of the paucity of irreplaceable, unique or rare fossil remains within the project area and the extensive superficial sediment cover overlying most potentially-fossiliferous bedrocks.

Impacts due to the construction of a powerline access road will probably be greater than those attributable to excavations for pylon footings. Significant further impacts during the operational and de-commissioning phases of the electrical infrastructure are not anticipated. The no-go alternative (*i.e.* no development) will probably have a low (neutral) impact on palaeontological heritage.

Potential impacts on palaeontological resources arising from the construction of the OHL are assessed as follows:

Table 3: Assessment of project impacts on palaeontological resources

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M)		Low			
Impact Extent (E)	Site				
Impact Reversibility (R)					Irreversible
Impact Duration (D)					Permanent
Probability of Occurrence (P)		Low Probability			
Significance (S)	$(2 + 1 + 5 + 5) \times 2 = 26$				
IMPACT SIGNIFICANCE RATING					
Total Score	16 to 30				
Environmental Significance Rating (Negative (-))	Low				
Environmental Significance Rating (Positive (+))	Low				

15.3 Archaeology

Based on the walkover survey of the OHL, very little archaeological material and no archaeological sites have been identified on the route. The material that was identified has been assessed to be of very low significance and has been assigned a grading of Not Conservation Worthy. Should this material be damaged or destroyed during the construction of the OHL the loss to heritage will not be significant.

Significant impacts during the operational and de-commissioning phases of the electrical infrastructure are not anticipated but potential impacts on archaeological heritage resources arising from the construction of the OHL are assessed as follows:

Table 4: Assessment of project impacts during construction, operation and decommissioning on archaeological resources

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M)		Low			
Impact Extent (E)	Site				
Impact Reversibility (R)					Irreversible
Impact Duration (D)					Permanent
Probability of Occurrence (P)		Low Probability			
Significance (S)	$(2 + 1 + 5 + 5) \times 2 = 26$				
IMPACT SIGNIFICANCE RATING					
Total Score	16 to 30				
Environmental Significance Rating (Negative (-))	Low				
Environmental Significance Rating (Positive (+))	Low				

15.4 Built Environment

The 2021 walkover survey for this report identified a line of packed stone markers and wall remains along the Aurora / Aanstoot property boundary in close proximity to and, in places, crossed by the proposed OHL. The feature was assessed to have moderate to high local value as evidence of historical land use pattern in the region and was graded 3B.

The significance of potential impacts on the boundary marker feature arising from the construction of the OHL are assessed thus as follows:

Table 5: Assessment of project impacts during construction, operation and decommissioning on the historical built

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M)			Medium		
Impact Extent (E)	Site				
Impact Reversibility (R)					Irreversible
Impact Duration (D)					Permanent
Probability of Occurrence (P)			Probable		
Significance (S)	(3 + 1 + 5 + 5) x 3 = 42				
IMPACT SIGNIFICANCE RATING					
Total Score	31 to 60				
Environmental Significance Rating (Negative (-))	Moderate				
Environmental Significance Rating (Positive (+))	Moderate				

15.5 Other Heritage Resources

No other heritage resources were identified as being at risk from impacts arising from the construction of the OHL.

15.6 Cultural Landscape and Visual

The assessment below of the visual impacts of the Esizayo WEF project as a whole, including infrastructure like the OHL, on heritage resources, the sense of place and the rural landscape is taken from Gebhardt (2017).

The proposed project is situated in a remote karoo landscape of high visual value with a relatively good visual absorption capacity primarily due to the undulating nature of the topography. The area is remote and viewer numbers are low but inhabitants generally have a great affinity for the land and landscape.

As with all natural resource evaluations, decisions regarding the project's appropriateness are complex, requiring the balancing of competing interests and values. Although the no-go option is preferred from a visual perspective, the visual impacts can be mitigated to an acceptable degree and the significance of the visual impacts is assessed to be moderate (Gebhardt 2017).

Table 6: Assessment of visual impacts of the project on heritage resources, sense of place and rural landscape during construction, operation and decommissioning (After Gebhardt 2017)

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M)				High	
Impact Extent (E)		Local			
Impact Reversibility (R)	Reversible				
Impact Duration (D)				Long term	
Probability of Occurrence (P)				Highly Probability	
Significance (S)	(4 + 2 + 1 + 4) x 4 = 44				
IMPACT SIGNIFICANCE RATING					
Total Score	31 to 60				
Environmental Significance Rating (Negative (-))	Moderate				
Environmental Significance Rating (Positive (+))	Moderate				

16 CUMULATIVE IMPACTS

Cumulative impacts or effects can be described as “changes to the environment that are caused by an action in combination with other past, present and future human actions”. They are the result of multiple activities whose individual direct impacts may be relatively minor but which, in combination with others result are significant environmental effects (DEAT 2004:5).

There are a number of environmental authorisations either issued or in progress within area around the proposed OHL route, which is located within the Komsberg REDZ and is therefore considered to be located within the renewable energy hub that is intended for the Komsberg area.

In respect of potential cumulative impacts on palaeontological resources of the installation of the OHL, these are anticipated to be moderate (negative). Provided that the proposed monitoring and mitigation recommendations made for all these various projects are followed through their significance would probably fall to low (negative). These anticipated levels of change are *acceptable*.

Table 7: Assessment of cumulative impacts on palaeontological heritage

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M)			Medium		
Impact Extent (E)	Site				
Impact Reversibility (R)					Irreversible
Impact Duration (D)					Permanent
Probability of Occurrence (P)			Probable		
Significance (S)	(3 + 1 + 5 + 5) x 3 = 42				
IMPACT SIGNIFICANCE RATING					
Total Score	31 to 60				
Environmental Significance Rating (Negative (-))	Moderate				
Environmental Significance Rating (Positive (+))	Moderate				

Archaeological material and the historical built environment is potentially at greater risk from cumulative impacts, given its widespread occurrence and exposure across the region.

Multiple human activities in the surrounding landscape, of which the construction of the OHL is the latest, can erode the integrity of these heritage resources through their physical damage or destruction. At an individual project level these impacts may not appear to be significant, but the cumulative effects of multiple developments on archaeological and built environment heritage resources are expected to be moderate (negative). The implementation of measures at individual project level can, however, do much to mitigate and reduce cumulative impacts to low (negative).

Table 8: Assessment of cumulative impacts on archaeological resources

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M)			Medium:		
Impact Extent (E)	Site				
Impact Reversibility (R)					Irreversible
Impact Duration (D)					Permanent
Probability of Occurrence (P)			Probable		

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Significance (S)	(3 + 1 + 5 + 5) x 3 = 42				
IMPACT SIGNIFICANCE RATING					
Total Score	31 to 60				
Environmental Significance Rating (Negative (-))	Moderate				
Environmental Significance Rating (Positive (+))	Moderate				

In respect of the cultural landscape and visual impacts, the proposed OHL will add to the existing power generation infrastructure in the area. Although Gebhardt (2017) points out that it is not possible to accurately estimate the significance of the cumulative impacts as not all facilities granted environmental approval will be constructed, she does indicate that it is reasonable to assume that the cumulative impact of any combination of the projects that are built within the Komsberg REDZ will have a high visual impact on the landscape.

There are not many mitigation measures that can significantly reduce the cumulative visual impact of the introduction of renewable energy projects into a rural landscape, but the consistent implementation of mitigation measures across all projects can help to reduce visual impact to some extent. Additionally the dissected nature of the topography that comprises the Komsberg REDZ breaks up views and will partially obscure developments from viewpoints.

17 THE NO-GO ALTERNATIVE

This assessment found no fatal flaws in the proposed project with regard to heritage resources that would require the implementation of the No-Go option in respect of the proposed construction of the OHL.

18 PROPOSED MITIGATION MEASURES

The following measures are proposed to mitigate potential impacts on heritage resources:

Palaeontology:

Given the scarcity of scientifically-important, unique fossil heritage recorded within the on-site substation and powerline project area, no further specialist palaeontological studies or mitigation are recommended for this development, pending the potential discovery of significant new fossils before or during the construction phase.

The following general palaeontological mitigation measures should, however, apply to the construction phase of the powerline. These recommendations are captured in tabular form in Chance Fossil Finds Protocol in Appendix 5):

- Monitoring of all surface clearance and substantial excavations (>1 m deep) by the

Environmental Control Officer (ECO) / Environmental Site Officer (ESO) for fossil material (e.g. bones, teeth, fossil wood) on an on-going basis during the construction phase;

- Safeguarding of chance fossil finds (preferably *in situ*) during the construction phase by the responsible ECO / ESO, followed by reporting of finds to Heritage Western Cape (HWC) for the Western Cape / SAHRA for the Northern Cape;
- Recording and judicious sampling of significant chance fossil finds by a qualified palaeontologist, together with pertinent contextual data (stratigraphy, sedimentology, taphonomy) (Phase 2 mitigation); and
- Curation of fossil material within an approved repository (museum / university fossil collection) and submission of a Phase 2 palaeontological heritage report to HWC / SAHRA by a qualified palaeontologist.

These monitoring and mitigation requirements should be incorporated into the Environmental Management Programme (EMPr) for the proposed OHL and also included as conditions for authorisation of the development.

Please note that:

- All South African fossil heritage is protected by law and fossils cannot be collected, damaged or disturbed without a permit from SAHRA or the relevant Provincial Heritage Resources Agency (HWC);
- The palaeontologist concerned with potential mitigation work will need a valid fossil collection permit from SAHRA/HWC and any material collected would have to be curated in an approved depository (e.g. museum or university collection);
- All palaeontological specialist work should conform to international best practice for palaeontological fieldwork and the study (e.g. data recording fossil collection and curation, final report) and should adhere as far as possible to the minimum standards for Phase 2 palaeontological studies developed by SAHRA (2013).

If these mitigation measures are successfully implemented, the residual impact of the project on palaeontological resources will low.

Archaeology: As stated above, the archaeological material recorded along the OHL route is graded as NCW and is of low heritage significance. No mitigation is proposed in respect of this material.

Should any human remains be encountered at any stage during the construction or earthworks associated with the project, work in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and HWC or SAHRA, depending on where on the OHL alignment the remains are found, must be notified immediately so that a decision can be made on how best to deal with them.

Built Environment: It is recommended that activities related to the construction of the proposed OHL avoid the line of packed stone boundary markers.

This can be accomplished by adjusting the route alignment either slightly westwards or eastwards to ensure that the OHL does not overprint or overlies this feature.

The line of boundary markers must also be demarcated as a no-go area during the construction of the line.

If these mitigation measures are successfully implemented, the residual impact of the project on the historical stone feature will be low to negligible.

Visual: According to the VIA, although there will be visual impacts during the construction and operational life of the OHL, these can be completely reversed after decommissioning, if all the structures are removed and the land suitably rehabilitated.

No specific mitigation measures in respect of the OHL are proposed by Gebhardt (2017) beyond the general recommendations that non-reflective paints and coatings are used on all new structures to minimise visibility and avoid reflectivity and glare, that the construction footprint is kept as small as possible to avoid unnecessary disruption to the existing vegetation and that the Establishment of vegetative screens /shelterbelts around affected homesteads should be considered in consultation with the owners.

If these mitigation measures are implemented, the residual visual impact of the project will be reduced, but according to Gebhardt will still remain moderate.

19 CONCLUSION

This assessment has found that the area identified for proposed Esizayo OHL is a moderately sensitive heritage environment, and that, impacts on heritage resources arising from the construction of the project can be expected.

It is our considered opinion, however, that provided the mitigation measures set out above are implemented, the overall impact and significance of the proposed OHL on heritage resources will be range from low to moderate, and the proposed activity is acceptable.

20 REFERENCES

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20.1 Online Resources

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- Cultural Landscape Categories and Subcategories (Accessed online on 25 September 2021) <https://whc.unesco.org/en/culturallandscape/#1>.
- National Geo-Spatial Information (Accessed online on 25 September 2021) www.ngi.gov.za
- Operational Guidelines (2008) of the World Heritage Convention (Accessed online on 25 September 2021) <https://whc.unesco.org/archive/opguide08-en.pdf#annex3>.
- South African Heritage Resources Information System (Accessed online on 25 September 2021). <http://www.sahra.org.za/sahris>.

SAHRA Palaeo-sensitivity Map (Accessed online on 10 February 2021)
<https://sahris.sahra.org.za/map/palaeo>

APPENDIX 1: HERITAGE WESTERN CAPE NID RESPONSE

Our Ref: IWM- CENTRAL KAROO/ LAINGSBURG/
ESIZAYO WEF OHL ON FARM 285
Case No: 210913115B1021E
Enquiries: Stephanie-Anne Barnard
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Warner Engelbrecht
soverby@adept.co.za; accounts@soverby.co.za; esadmin@biothermenergy.com

RESPONSE TO NOTIFICATION OF INTENT TO DEVELOP: FINAL
In terms of Section 38(1) 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 NEW POWERLINE ALIGNMENT FOR ESIZAYO WEF OHL ON FARM 285, LAINGSBURG, CENTRAL KAROO, SUBMITTED IN TERMS OF SECTION 38(8) OF THE NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)

CASE NUMBER: 210913115B1021E

The matter above has reference:

Heritage Western Cape is in receipt of the above application. This matter was discussed at the Heritage Officers meeting held on 4 November 2021.

You are hereby notified that, since there is no reason to believe that the proposed new powerline alignment for Esizayo WEF OHL on Farm 285, Laingsburg, Central Karoo will impact on heritage resources, no further action under Section 38 of the National Heritage Resources Act (Act 25 of 1999) is required.

However, should any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material be discovered during the execution of the activities above, all works must be stopped immediately, and Heritage Western Cape must be notified without delay.

This letter does not exonerate the applicant from obtaining any necessary approval from any other applicable statutory authority.

IWC reserves the right to request additional information as required.

Should you have any further queries, please contact the official above and quote the case number.

Yours faithfully

Colette M Scheemeyer
Deputy Director

www.westerncape.gov.za/ico

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APPENDIX 2: EVIDENCE OF PUBLIC PARTICIPATION – COMMENTS AND RESPONSE REPORT

(To be inserted once available)

APPENDIX 3: ARCHAEOLOGICAL SITES (AND BUILT ENVIRONMENT) RECORDED DURING THE 2021 FIELD SURVEY FOR ESIZAYO OHL

Site	Lat S	Lon E	Type	Description	Significance
J002	-32.993376°	20.600499°	Stone artefact	Isolated chert core. Approx. 3x3 cm in size. MSA?	NCW
J003	-32.993193°	20.601436°	Stone artefact	Isolated heavily patinated grey chert flake. MSA. Edge damage / possible retouch?	NCW
J004	-32.992185°	20.598992°	Stone artefact	Isolated heavily patinated hornfels flake. MSA. Edge damage / possible retouch?	NCW
J006	-32.978117°	20.597627°	Boundary markers	Stone cairn. Lichened and well-packed. Circular ± 1 m across and 70 cm high. Lines of rocks run between J006 and J007. May be remnants of old walls?	IIC
J007	-32.978028°	20.597637°	Boundary marker	Stone cairn	IIC
J008 & J009	-32.977932°	20.597637°	Boundary marker	Stone cairns with line of rock between. J009 is ephemeral and broken up	IIC
J010	-32.976868°	20.597706°	Boundary marker	Stone cairn	IIC
J011	-32.976730°	20.597711°	Boundary marker	Stone cairn	IIC
J012	-32.976636°	20.597703°	Boundary marker	Stone cairn	IIC
J013	-32.976542°	20.597713°	Boundary marker	Stone cairn	IIC
J014	-32.976462°	20.597705°	Boundary marker	Stone cairn	IIC
J015	-32.976366°	20.597715°	Boundary marker	Stone cairn	IIC

J016	-32.976264°	20.597732°	Boundary marker	Stone cairn. After J016 the line of cairns continues up the slope but on the other side of the modern farm boundary fenceline.	IIIC
J017	-32.978230°	20.597625°	Boundary marker	First in a line of stone cairns on southern side of farm access road.	IIIC
J018	-32.978306°	20.597633°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
J019	-32.97864798	20.59761199	Boundary marker	Upright stone – previously recorded as D048. Part of the line of boundary markers	IIIC
J020	-32.978690°	20.597627°	Boundary marker	Stub of stone walling between cairns	IIIC
J021	-32.979019°	20.597697°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
J022	-32.979109°	20.597727°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
J023	-32.979197°	20.597753°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
J024	-32.979279°	20.597774°	Boundary marker	Stub of stone walling between cairns	IIIC
J025	-32.979382°	20.597795°	Boundary marker	Stub of stone walling between cairns	IIIC
J026	-32.979410°	20.597812°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
J027	-32.979469°	20.597826°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
J028	-32.979497°	20.597840°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
J029	-32.979577°	20.597851°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC

J030	-32.968728°	20.596012°	Stone walling	Possible packed stone berm along eroding stream gully.	IIIC
J031	-32.965844°	20.596083°	Historical artefact	Isolated iron ploughshare next to large boulder.	NCW
G002	-32.982934°	20.598733°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
G003	-32.982767°	20.598687°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
G004	-32.982691°	20.598682°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
G005	-32.982607°	20.598663°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
G006	-32.982442°	20.598634°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
G007	-32.982275°	20.598572°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
G008	-32.982193°	20.598540°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
G009	-32.982104°	20.598525°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
G010	-32.981919°	20.598485°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
G011	-32.981756°	20.598444°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
G012	-32.981278°	20.598321°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC
G013	-32.981205°	20.598288°	Boundary marker	Stone cairn on southern side of farm access road.	IIIC

G014	-32.980610°	20.598126°	Boundary marker	Stone cairn on southern side of farm access road.	IIC
G015	-32.980174°	20.598004°	Boundary marker	Stone cairn on southern side of farm access road.	IIC
G016	-32.980004°	20.597973°	Boundary marker	Stone cairn on southern side of farm access road.	IIC
G017	-32.979921°	20.597943°	Boundary marker	Stone cairn on southern side of farm access road.	IIC
G018	-32.979647°	20.597873°	Boundary marker	Stone cairn on southern side of farm access road.	IIC
G0191	-32.979754°	20.597884°	Boundary marker	Stone cairn on southern side of farm access road.	IIC
G0201	-32.979825°	20.597924°	Boundary marker	Stone cairn on southern side of farm access road.	IIC

APPENDIX 4: ARCHAEOLOGICAL SITES (AND BUILT ENVIRONMENT) RECORDED DURING THE 2016 FIELD SURVEYS FOR ESIZAYO WEF

NCW = No research potential or other cultural significance

Site	Lat S	Lon E	Type	Description	Significance
L001	-32.99082496	20.58594799	"Kraal"	Rectangular stone structure (kraal?), skin walling with inner rubble, about 1m high in one corner. Size 2.5m x 2.5m, associated with white refined earthenware and green glass. Against small koppie, overlooking stream	IIIC
L002	-32.99313200	20.58651301	Homestead	Aurora farmhouse, older core with "solder" outside and old kitchen hearth. But with many additions, including red brick. A large stone kraal next to the house, between it and the river.	IIIC
L003	-32.99972797	20.59818104	"Kraal" or shepherd hut	At base of small koppie, a small square structure, about 2m x 3m. Stone packed walling with outer skin and inner rubble. A small stone semi-circle attached to the back – a kookskerm? About 5 m from a small stream, across the stream old dump with ash, burnt bone, clear glass and <i>Patella miniata</i> shell.	IIIC
L004	-32.99954298	20.60734699	Cave with paintings and stone artefacts	Small overhang on edge of long kloof. Finger paintings (daubs in red). In groups on all the flat surfaces, 7, 6, 6, 6, 5, 3. Down along the talus slope are artifacts, oes and one modified cartridge case. Two cores (chert & hornfels), 2 large hornfels flakes, 1 hornfels bladelet, 7 chert flakes, 1 quartz crystal flake, 1 ccs backed bladelet, 1 tiny thumbnail chert scraper.	IIIA
L006	-33.00654598	20.60408399	Stone scatter	Small scatter of quartz flakes and chips over small area near test mast. Quartz has grainy appearance.	NCW
L007	-33.00929097	20.65162498	Homestead	Die Bron, abandoned house. Shed, including stone shed. Small stone rondavel with reed roof, cement lined square reservoir, stone kraal behind house, near a large dam/weir.	IIIC
L008	-32.99033102	20.67439601	Stone artefact scatter	6 quartz chunks, chips and flakes, over a small area. Grainy quartz.	NCW
L009	-32.99274299	20.63053703	Stone artefact scatter	Along sandy banks of river, a single slug (Wesley Richards?), an indurated shale core and one chert adze/reduced core?	NCW
L010	-32.98570303	20.56940203	Boer War scatter	Historic (Boer War?) tin cans (round with lead dot on base), spread of aqua glass	IIIC
L011	-32.98538502	20.56866501	Boer War scatter	Extension of above	

L012	-32.98462403	20.56828396	Boer War scatter	As above, four tin cans and some purple glass, on the koppie, near L013	IIIC
L013	-32.98462504	20.56777501	Stone kraal/ fortification	A roughly rectangular shaped stone wall structure, on the edge of the koppie. 6m x 3m. Roughly packed. Plus some broken glass and a tin can nearby.	IIIC
L014	-32.98476996	20.56762900	Stone kraal/ fortification	A circular stone structure below the koppie (2mx3m), it has a small annex in stone (2mx3m). Dense accumulation of metal, and glass (20 th Century).	IIIC
L015	-32.98489803	20.56755398	Historic midden	Large spread of 20 th century midden material	NCW
L016	-32.98426403	20.56717101	Stone kraal/ fortification	Semi-circle of stone, on the edge of a little ridge, overlooking the road (R354). 3mx4m. Packed rubble, there does not appear to be any associated historic rubbish	IIIC
L017	-32.98410896	20.56703699	Stone kraal/ fortification	4 th stone structure on the koppie. A stone circle looking up the R354 toward the pass. 3mx4m. Roughly packed, no historic rubbish	IIIC
L018	-32.98398198	20.56747201	Stone kraal/ fortification	5 th stone structure. A long oval extent, about 7m x 3m. But the ends of the oval are better packed than the central sections. 1 sardine can.	IIIC
L019	-32.98404601	20.56775196	Stone kraal/ fortification	A structure on the koppie which seems to have collapsed in onto itself. 2m x 3m. No historic material nearby.	IIIC
L020	-32.98354000	20.58362704	Stone walling	A short section of stone walling in front of a shelter next to a small waterfall. No associated material.	NCW
L021	-32.98551897	20.56485501	Stone ruins	Next to the road, a square building, only one course of rough stones left. About 3mx3m. Associated with ceramics, glass, metal and wire.	IIIC
D001	-32.99366903	20.59116698	Stone walling	Stone alignment /walling -possible kraal?	NCW
D002	-32.99428602	20.59135297	Stone walling	Rock ledge with crude stone walling	NCW
D003	-32.99495799	20.59101200	Stone artefact	Isolated chert bladelet core - LSA	NCW
D004	-32.99922799	20.59706398	Stone Scatter	Small artefact scatter on rocky outcrop – quartzitic material, mostly flakes, some large. 1 small grey chert bladelet. Nearby is a place where large slabs of rock have been quarried for boundary markers.	IIIC

D005	-32.99918097	20.59721301	Graves?	Possible graves x3	IIIB
D006	-33.00043900	20.60658096	Stone walling	Isolated section straight (boundary?) walling separated by a gap from D007	NCW
D007	-33.00027204	20.60639002	Stone walling	Isolated section straight (boundary?) walling separated by a gap from D006	NCW
D008	-33.00696901	20.60080399	Stone artefact	Isolated very weathered MSA flake	NCW
D009	-33.00887103	20.63765201	Stone scatter	Scatter of ESA artefacts near quarried lens of material – flakes/cores	IIIC
D011	-32.99261701	20.63075596	Stone scatter	Isolated lower grindstones x2 next to stream. Lita notes a few flakes, 1 core, 1x adze (chert)	IIIB
D012	-32.99297802	20.63066502	Grindstone	Lower grindstone on slab	NCW
D013	-32.98780496	20.56562204	Cemetery	Cemetery – fenced. Some headstones and crosses	IIIA
D014	-32.98781502	20.56604700	Cemetery		IIIA
D015	-32.98801300	20.56603200	Cemetery		IIIA
D016	-32.98802197	20.56572204	Cemetery		IIIA
D017	-32.98817502	20.56578699	Cemetery	Area outside formal cemetery containing “informal graves – stones. 1x LGS found on one of the graves.	IIIA
D018	-32.98812700	20.56606402			
D019	-32.98800998	20.56604298			
D020	-32.98801702	20.56608899	Cemetery	Outlier grave and few hornfels artefacts scattered about	IIIA
D021	-32.98796003	20.56639401	Grave?	Possible grave	IIIC
D022	-32.98554101	20.56949699	Grave ?	Isolated grave – foot/head stones	IIIC
D023	-32.98548401	20.56980000	Boer War scatter	Area containing a number of Anglo-Boer era tin cans, some glass	IIIB
D024	-32.98464398	20.57044096	Stone fortification	Large stone walled enclosure on top of prominent low koppie. Walling covers most of the top of the koppie. Suspect this is a military feature (lookout/fortification. A few green glass fragments, and occasional isolated MSA artefacts.	IIIB
D025	-32.98464700	20.56975901	Boer War scatter	Tin can	IIIB
D026	-32.98465798	20.56965801	Boer War scatter	Tin can	IIIB

D027	-32.98449897	20.56850499	Boer War scatter	Iron chunk	IIIB
D028	-32.98456200	20.56814399	Boer War scatter	Tin can	IIIB
D029	-32.98458899	20.56794399	Boer War scatter	Tin can, small stone structure	IIIB
D030	-32.98460802	20.56792002	Boer War scatter	Tin can	IIIB
D031	-32.98566297	20.56729096	Boer War scatter	Tin can lid, glass	IIIB
D032	-32.98571401	20.56744703	Boer War scatter	Tin can	IIIB
D033	-32.98574503	20.56766496	Boer War scatter	Concentration of tin cans. Also some glass and other metal frags	IIIB
D034	-32.98579498	20.56781801	Boer War scatter	Tin can	IIIB
D035	-32.98580403	20.56790099	Grave?	Possible grave. Tightly packed stone mound, semi-circular. A number of tin cans scattered about.	IIIC
D036	-32.98583102	20.56784400	Grave ?	Possible grave	IIIC
D037	-32.98582398	20.56779203	Grave?	Possible grave	IIIC
D038	-32.98582499	20.56776001	Grave?	Possible grave	IIIC
D039	-32.98581501	20.56798096	Grave?	Possible grave	IIIC
D040	-32.98582197	20.56820903	Grave?	Possible grave??	IIIC
D041	-32.98571804	20.56867397	Stone kraal	Small stone enclosure – single stone high	IIIC
D042	-32.98577604	20.56886299	Boer War scatter	Tin cans, few ceramics (white glassy material)	IIIB
D043	-32.98578501	20.56896399	Boer War scatter	Tin can	IIIB
D044	-32.98556004	20.57411098	Boer War scatter	Tin can	IIIB
D045	-32.98709996	20.57789398	Stone kraal	Stone enclosure – crescent-shaped, 1x tin can on turbine road	
D046	-32.98616404	20.57734204	Stone kraal/ fortification	Stone enclosure where the centre has been dug down marginally. Looks like hole dug first and soil piled around then walling placed on top of the surrounding mound. Suspect this is military?	IIIB
D047	-32.98654600	20.57931899	Stone kraal?	small circular stone enclosure approx. 1.5 meter diam. Views obscured by hilly ground so not sure if military?	IIIC

D048	-32.97864798	20.59761199	Boundary markers	Line of boundary markers of local stone slabs	NCW
D049	-32.99312102	20.60226504	Stone artefact	Isolated weathered MSA chert flake with retouch	NCW
D050	-32.99309797	20.60188802	Stone scatters	Small number of very weathered Hornfels artefacts, all likely to be MSA. 1x chert blade.	IIIC
D051	-32.99694300	20.60070299	Stone artefact	Isolated weathered Hornfels flake MSA?	NCW
D052	-32.98524597	20.56486197	Stone kraal	semi-circular stone enclosure built up against an outcropping ridge approx. 3m long. One wall collapsed inward. 1x frag telephone insulator, 1x frag refined earthenware. Unsure of age.	IIIC
D053	-32.97944401	20.56067697	Stone wall	Three points on a stone boundary wall partially destroyed by borrow pit. The wall is mostly on the property to the west of the road but makes a right angle on this farm. Clearly visible on Google Earth.	NCW
D054	-32.97950604	20.56126596			
D055	-32.97955298	20.56170098			
D056 D057	-32.96614897 -32.96616096	20.55210597 20.55195400	Cave with paintings and stone artefacts	Shallow overhang in rockface with rock paintings. Small level floor with shallow deposit. Numerous LSA artefacts on talus, including pottery, oes. A few Adzes, backed scraper, side scraper, flakes, chunks, predominantly on grey chert, others on quartzitic material. Possible re-use of older MSA flakes for adzes. Two painted panels at left – 2x distinct human figures (fl) one appears to have tassles from bag? At far left – lines with cross hatching. 3-4 meters to right, 10 finger daubs. Also several dubs and smudges. All paint red.	IIIA

APPENDIX 5: PALAEOONTOLOGICAL IMPACT ASSESSMENT

(See separate PDF file)

APPENDIX 6: VISUAL IMPACT ASSESSMENT

(See separate PDF file)

APPENDIX 7: CURRICULUM VITAE: JOHN GRIBBLE

Name: John Gribble
Profession: Archaeologist (Maritime)
Date of Birth: 15 November 1965
Parent Firm: ACO Associates cc
Position in Firm: Senior Archaeologist
Years with Firm: 3+
Years of experience: 30
Nationality: South African
HDI Status: n/a

Education:

1979-1983 Wynberg Boys' High School
1986 BA (Archaeology), University of Cape Town
1987 BA (Hons) (Archaeology), University of Cape Town
1990 Master of Arts, (Archaeology) University of Cape Town

Employment:

- September 2017 – present: ACO Associates, Senior Archaeologist and Consultant
- 2014-2017: South African Heritage Resources Agency, Manager: Maritime and Underwater Cultural Heritage Unit
- 2012-2018: Sea Change Heritage Consultants Limited, Director
- 2011-2012: TUV SUD PMSS (Romsey, United Kingdom), Principal Consultant: Maritime Archaeology
- 2009-2011: EMU Limited (Southampton, United Kingdom), Principal Consultant: Maritime Archaeology
- 2005-2009: Wessex Archaeology (Salisbury, United Kingdom), Project Manager: Coastal and Marine
- 1996-2005: National Monuments Council / South African Heritage Resources Agency, Maritime Archaeologist
- 1994-1996: National Monuments Council, Professional Officer: Boland and West Coast, Western Cape Office

Professional Qualifications and Accreditation:

- Member: Association of Southern African Professional Archaeologists (ASAPA) (No. 043)
- Principal Investigator: Maritime and Colonial Archaeology, ASAPA CRM Section
- Field Director: Stone Age Archaeology, ASAPA CRM Section
- Class III Diver (Surface Supply), Department of Labour (South Africa) / UK (HSE III)

Experience:

I have more than 30 years of professional archaeological and heritage management experience. After completing my postgraduate studies and a period of freelance archaeological work in South Africa and abroad, I joined the National Monuments Council (NMC) (now the South African Heritage Resources Agency (SAHRA)) in 1994. In 1996 I became the NMC's first full-time maritime archaeologist and in this regulatory role was responsible for the management and protection of underwater cultural heritage in South Africa under the National Monuments Act, and subsequently under the National Heritage Resources Act.

In 2005 I moved to the UK to join Wessex Archaeology, one of the UK's biggest archaeological consultancies, as a project manager in its Coastal and Marine Section. In 2009 I joined Fugro EMU Limited, a marine geosurvey company to set up their maritime archaeological section. I then spent a year at TUV SUD PMSS, an international renewable energy consultancy, where I again provided maritime archaeological consultancy services to principally the offshore renewable and marine aggregate industries.

In August 2012 I established Sea Change Heritage Consultants Limited, a maritime archaeological consultancy. Sea Change traded until 2018, providing archaeological services to a range of UK maritime sectors, including marine aggregates and offshore renewable energy. Relevant experience includes specialist archaeological consultancy for more than two dozen offshore renewable energy projects and aggregate extraction licence areas in UK waters including:

- Lynn and Inner Dowsing OWF;
- Humber Gateway OWF;
- Sheringham Shoal OWF;
- Race Bank OWF;
- Docking Shoal OWF;
- Triton Knoll OWF;
- Neart na Gaoithe OWF;
- Dogger Bank OWF;
- Hornsea OWF;
- Navitus Bay OWF;
- Aggregate Area 392/393, Hilbre Swash;
- Area 478, East English Channel;
- Area 372/1, North Nab;
- Areas 401 & 2;
- Area 466, North West Rough; and

- Area 447, Cutline.

In the UK I was also involved in strategic projects which developed guidance and best practice for the UK offshore industry with respect to the marine historic environment. This included the principal authorship of two historic environment guidance documents for COWRIE and the UK renewable energy sector (*Historical Environment Guidance for the Offshore Renewable Energy Sector* (2007) and *Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector* (2010)). I was also manager and lead author in the development of the archaeological elements of the first Regional Environmental Assessments for the UK marine aggregates industry, and in the 2009 *UK Continental Shelf Offshore Oil and Gas and Wind Energy Strategic Environmental Assessment* for Department of Energy and Climate Change. More recently I undertook a review of the potential impacts of marine mining on South Africa's palaeontological and archaeological heritage resources for the Council for Geoscience, on behalf of the Department of Mineral Resources. In 2013-14 I was lead author and project co-ordinator on *The UNESCO Convention on the Protection of the Underwater Cultural Heritage 2001: An Impact Review for the United Kingdom* and in 2016 I was co-author of a Historic England / Crown Estate / British Marine Aggregate Producers Association funded review of marine historic environment best practice guidance for the UK offshore aggregate industry.

I returned to South African in mid-2014 where I was re-appointed to my earlier post at SAHRA: Manager of the Maritime and Underwater Cultural Heritage Unit. In July 2016 I was appointed as Acting Manager of SAHRA's Archaeology, Palaeontology and Meteorites Unit.

I left SAHRA in September 2017 to join ACO Associates as Senior Archaeologist and Consultant. Since being at ACO I have carried out a number of offshore impact assessments (see list of recent projects below) and authored a review of the potential impacts of marine mining on South Africa's palaeontological and archaeological heritage for the Council for Geoscience, on behalf of the Department of Mineral Resources.

I have been a member of the Association of Southern African Professional Archaeologists (No. 043) for more than twenty years and am accredited by ASAPA's Cultural Resource Management section.

I have been a member of the ICOMOS International Committee for Underwater Cultural Heritage since 2000 and served as a member of its Bureau between 2009 and 2018.

Since 2010 I have been a member of the UK's Joint Nautical Archaeology Policy Committee.

I am a member of the Advisory Board of the George Washington University / Iziko Museums of South Africa / South African Heritage Resources Agency / Smithsonian Institution 'Southern African Slave Wrecks Project' and serve on the Heritage Western Cape Archaeology, Palaeontology and Meteorites Committee.

Selected Project Reports:

Gribble, J. 2017. *Archaeological Assessment of Farm No 8/851, Drakenstein*. Unpublished report prepared for Balwin Properties Pty Ltd. ACO Associates.

- Gribble, J. 2017. *Archaeological Assessment of Bosjes Phase 2, Farm 218 Witzenberg*. Unpublished report prepared for Farmprops 53 (Pty) Ltd. ACO Associates.
- Gribble, J. 2017. *Canal Precinct, V&A Waterfront: Heritage Impact Assessment*. Unpublished report prepared for Nicolas Baumann Urban Conservation and Planning. ACO Associates.
- Gribble, J. 2017. *Archaeological Assessment of the proposed dam on the farm Constantia Uitsig, Erven 13029 and 13030, Cape Town*. Unpublished report prepared for SLR Consulting (South Africa) (Pty) Ltd. ACO Associates.
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- Hart, T.G., Gribble, J. & Robinson, J. 2017 *Heritage Impact Assessment for the Proposed Phezukomoya Wind Energy Facility to be Situated in the Northern Cape*. Unpublished report prepared for Arcus Consulting. ACO Associates.
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- Gribble, J. 2018. *Integrated Heritage Impact Assessment of the Peter Falke Winery on Farm 1558 Groenvlei, Stellenbosch*. Unpublished report prepared for Werner Nel Environmental Consulting Services. ACO Associates.
- Gribble, J. & Halkett, D. 2018. *Heritage Impact Assessment for a Proposed Extension of the Kaolin Mine on Portion 1 of the Farm Rondawel 638, Namaqualand District, Northern Cape*. Unpublished report prepared for Rondawel Kaolien (Pty) Ltd. ACO Associates.
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- Gribble, J. 2018. *Archaeological Assessment: Erven 11122, 11123, 11124, 11125, 11126, 11127 and Re 11128, Corner Frere Street and Albert Road, Woodstock, Cape Town.* Unpublished report prepared for Johan Cornelius. ACO Associates.
- Gribble, J. 2018. *Maritime Heritage Impact Assessment: Expansion of Diamond Coast Aquaculture Farm on Farm 654, Portion 1, Kleinzee, Northern Cape.* Unpublished report prepared for ACRM. ACO Associates.
- Gribble, J. 2018. *Heritage Impact Assessment: Ship Repair Facility, Port of Mossel Bay.* Unpublished report prepared for Nemaï Consulting. ACO Associates.
- Gribble, J. 2018. *Archaeological Assessment: Sites B and C, Portswood Ridge Precinct, V&A Waterfront.* Unpublished report prepared for Urban Conservation. ACO Associates.
- Gribble, J. 2018. *Heritage Impact Assessment: Zandrug, Farm Re 9/122, Cederberg.* Unpublished report prepared for Cederberg Environmental Assessment Practice. ACO Associates.
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