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Date: 28 November 2022

Ms N Holland  
Holland & Associates Environmental Consultants  
P O Box 31108  
Tokai, 7966,

Dear Ms Holland

**MULILO DE AAR 2 SOUTH WIND ENERGY FACILITY: PART 1 ENVIRONMENTAL AUTHORISATION AMENDMENT APPLICATION: HERITAGE SPECIALIST IMPACT STATEMENT**

Mulilo Renewable Energy (Pty) Ltd (later updated to Mulilo De Aar 2 South (Pty) Ltd, the current holder of the Environmental Authorisation) applied for Environmental Authorisation from the then Department of Environmental Affairs (now DFFE) in 2011 to establish a wind energy facility (WEF) and associated infrastructure on the eastern plateau of De Aar. Environmental Authorisation (EA) for the project, to be known as the Mulilo De Aar 2 South WEF, was granted on 1 March 2013.

The original EA for the project authorised 103 wind turbines with a potential capacity of 155 – 258 MW and associated infrastructure. Eight amendments to the EA have since been applied for by the Applicant and granted by DFFE, in 2013, 2014, 2016, 2018, 2019, 2020 and 2021. These have included a change in the name of the holder of the EA, extensions of the EA validity period, amendments to Conditions of the EA, amendments to the project description and amendments to the turbine specifications.

The currently authorised project description is for up to 61 turbines each with a maximum hub height of 120 m, rotor diameter of 165 m and foundation surface diameter and depth of 10.4 m and 3,5 m respectively. The maximum WEF output is currently authorized at 140 MW.

Mulilo De Aar 2 South (Pty) Ltd is proposing the following amendments to the authorised project description:

- **Extension of the EA validity period:** The EA currently expires on 1 March 2023 and the Applicant wishes to extend this by two (2) years, to 1 March 2025.
- **Add a Listed Activity into the EA:** The Applicant wishes to include Activity 15 of GN R. 545 (Listing Notice 2), which relates to the physical alteration and transformation 20 ha or more, into the EA. This Listed Activity was previously erroneously omitted from the EA application, but did form part of the assessments for the 2012 EIA process and subsequent Part 2 EA amendment process in 2015.
- **Addition of Portion 7 of Farm Vendussie Kuil No. 165 into the EA:** A section of a proposed road will cross the corner of this farm, which is currently not included in the EA. This property was, however, included and assessed in the combined EIA process and reporting for the De Aar 2 South WEF and De Aar 2 North WEF in 2012- 2013, and was included in the Final Layout

that was subject to a heritage assessment in 2022 for the update of the EMP and for the Final Layout Plan process that is currently in progress.

- **Number of turbines:** Change from the authorised maximum of 61 WTGs to “up to 26”.
- **Turbine Capacity:** Removal of the MW designation per turbine (generation capacity per turbine).
- Inclusion of the words “up to” in front of the currently authorised turbine specifications for hub height and rotor diameter to allow for smaller turbines to be installed, if required, due to suppliers.
- **Internal roads (widths):** New roads and upgraded sections of existing roads: increasing the width from the authorised 4 m to 6 m.
- **WTG Foundations:** Change the lowest point and surface (visible) diameter of the 26 WTG foundations from 18,4 m and 10,6 m to a 24 m diameter maximum lowest point and up to 12 m surface diameter respectively.
- **Hardstands:** Change the size of the 26 WTG hardstands from the authorized area of approximately 50 m x 40 m (0.2 ha) to a complex geometry with approximate footprint of up to 0.47 ha per WTG.
- **Internal reticulation:** Change from the authorised 22 kV internal reticulation to 33 kV reticulation.
- **IPP Substation Control and O&M building:** No changes to development footprint proposed but the co-ordinates of substation in EA to be amended.
- **Temporary Laydown Areas:** No changes proposed, but further detail provided (WTG component laydown, concrete batching plant, office yard).

Mulilo De Aar 2 South (Pty) Ltd has confirmed that the proposed amendments will not result in an increase in the overall development footprint of the authorised WEF and that the total footprint of the authorized WEF will remain the same or be reduced.

As part of the EA amendment application ACO Associates was asked to compile this specialist statement to:

- Address the implications of the proposed amendments, if any, in terms of the potential impacts on heritage resources; and
- Indicate whether or not the proposed amendments will result in an increased level, or change in the nature of the impacts, to those assessed and considered when application was made for the environmental authorization and subsequent Part 2 EA amendment process in 2015 – 2016.

The Terms of Reference was updated in November 2022 to include the following:

- Describe the status (baseline) of the environment that was assessed during the initial assessment.
- Confirm the current status of the assessed environment.
- A description and assessment of any changes to the environment that has occurred since the initial EA was issued, if any.
- Site sensitivity verification – Undertake and report on site sensitivity verification (see DFFE Screening Tool Report) and refer to your recent site visits and/or assessments undertaken within the project area/ knowledge of the area if a site investigation is not required (or has recently been undertaken).
- Indicate if the impact rating as provided in the initial assessment remains valid; if the mitigation measures provided in the initial assessment are still applicable; or if there

are any new mitigation measures which need to be included into the EA, should the request to extend the commencement period be granted by the Department.

- An indication if there are any new assessments and/or guidelines which are now relevant to the authorised development which were not undertaken as part of the initial assessment, must be taken into consideration and addressed in the report (or indicate if such new assessments/ guidelines were already addressed during your recent studies for the EMPr and Layout Plan finalisation process in 2022).
- A description and an assessment of the surrounding environment, in relation to new developments or changes in land use which might impact on the authorised project, the assessment must consider the following:
  - Similar developments within a 30km radius.
  - Identified cumulative impacts must be clearly defined, and where possible the size of the identified impact must be quantified and indicated, i.e., hectares of cumulatively transformed land.
  - Detailed process flow and proof must be provided, to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project.
  - The cumulative impacts significance rating must also inform the need and desirability of the proposed development.
  - A cumulative impact environmental statement on whether the proposed development must proceed.
- The study must conclude the following:
  - Has the baseline status of the receiving environment changed since the original EIA in 2012?
  - Is the initial impact rating undertaken during the initial assessment still valid?
  - Are the mitigation measures provided in the initial assessment (or subsequent updated assessments) still applicable?
  - Are there any new mitigation measures that should be added to the EA/ EMPr if the DFFE decides to approve the amendments?
  - Describe any update/new mitigations (or refer to them in the appropriate walkthrough/EMPr update report), where relevant.
  - Are the proposed amendments, including proposed extension of the validity period, acceptable (relative to your area of expertise)?

Please note that a separate impact statement has been produced for palaeontology, so this heritage receptor is not included in this statement.

The integrated heritage impact assessment (HIA) produced by ACO Associates as part of the EIA process in 2011 (Webley & Orton, 2011), a subsequent heritage Addendum report (Webley & Halkett, 2015) and a HIA for grid connection for the WEF (Gribble & Euston-Brown, 2020) considered archaeological heritage resources, cemeteries, the historical built environment, and cultural landscape of the WEF site.

The findings of the HIA were:

- Archaeology: The archaeological impact assessment recorded a widespread occurrence of Middle Stone Age (MSA) artefacts of patinated hornfels across the plateau. In general, these artefacts do not appear to represent in situ sites and are of low significance. This, and the

sheer volume of scattered artefacts on this vast landscape means that the combined overall impact of the WEF and its infrastructure on MSA archaeology is, in terms of the broader picture, also relatively small.

A few discrete Later Stone Age (LSA) sites were recorded, and these are of medium to high significance as they are generally in primary context and represent either a pre-ceramic interior variant of the Wilton lithic industry or the later Smithfield lithic industry, about either of which very little is known. The HIA recommended that known archaeological materials should either be avoided during the placement of WTGs and associated infrastructure and an archaeologist should be involved during the site-specific EMP phase, specifically where sensitive areas have been identified, or that sensitive sites will require sampling (archaeological testing) prior to construction.

- Cemeteries and Graves: No cemeteries or graves were identified on the plateau, but the HIA recommended that if any human remains are uncovered during the construction phase, work in that area should stop immediately and SAHRA should be notified.
- Historical Built Environment: Several stone kraal complexes that may represent seasonal utilisation of the “winterveld” on top of the plateau during the late 19th and early 20th century were recorded and discussed in the HIA. They complexes represent an unrecorded aspect of the 19th century farming settlement pattern in this part of the Karoo and are of medium significance. The HIA recommended that identified kraal complexes must be avoided by the WEF.

Most of the permanent farmsteads in the area are located below the plateau, but there are some farm buildings in the WEF. While the HIA determined that none of these were of high significance, some buildings at the Vendussie Kuil and Kranskop farmsteads are older than 60 years and thus protected in terms of the NHRA. These farmsteads are abandoned and vulnerable to both destruction and vandalism. Negative impacts may be expected unless measures are taken to conserve them. The HIA recommended:

- Re-routing of access roads to avoid passing in close proximity (less than 500 m) to farmsteads and associated farm buildings older than 60 years.
  - A 500 m buffer around farmsteads, particularly if the farm buildings are older than 60 years. This buffer can be reduced if the building contains no elements of heritage significance.
  - Fencing ruined sheds, kraals, etc. which are in close proximity to turbines, substations etc, to avoid vandalism.
  - The archaeological review of proposed road alignments, infrastructure and near-final turbine positions during the detailed planning phase of the project. Micro-adjustment of alignments and turbine positions is likely to be sufficient to achieve adequate mitigation.
- Cultural Landscape: The cultural landscape around De Aar is representative of the great Karoo. It is a natural landscape with some vestiges of agricultural activities in the form of isolated farmhouses, fences, and wind pumps. The HIA found that within the vast area that is the Karoo, the development of a portion of it for the WEF will not result in a significant loss of the Karoo cultural landscape.

#### Heritage Specialist Impact Statement:

This heritage impact statement is informed by a heritage walkdown survey conducted for the final WEF layout in August 2022 (Gribble, 2022a). The walkdown report is attached to this statement as Appendix A. Also in 2022, a heritage specialist impact statement was produced for the EMPr and site layout plan finalization (Gribble 2022b).

ACO Associates used the walkdown survey to assess whether the proposed final layout plan addresses the recommendations in the 2011 HIA and 2015 heritage Addendum report, and that it complies with relevant conditions in the Environmental Authorization, as well as the requirements stipulated by SAHRA.

As was the case with the 2011 survey for the HIA, areas identified for the revised placement of the turbines and infrastructure were accessible during the 2022 survey and there were no significant limitations to the survey or its results.

The Screening Tool report for the De Aar 2 South WEF, generated on 18 November 2022, ascribes a low sensitivity to the Archaeological and Cultural Heritage Theme. The heritage assessments and field surveys conducted for this project (Webley & Orton, 2011; Webley & Halkett, 2015; Gribble, 2022a), however, indicate that the low archaeological and cultural heritage sensitivity rating is not an accurate reflection of the sensitivity of the development site, and that the sensitivity rating would be more appropriately pegged at moderate, with some areas of high sensitivity. As is often the case with the Screening Tool, the results it provides reflect the fact that relatively small areas of South Africa have been subject to comprehensive archaeological survey, and that primary site data to populate the Screening Tool is generally very limited. In other words, areas are indicated to be of low sensitivity, not because there is no archaeology there, but because they have not been surveyed and there is thus no data available about their archaeological potential.

The heritage assessments for the De Aar 2 South WEF comply with SAHRA's minimum standards for such assessments. In the absence of published Environmental Theme Protocols applicable to cultural heritage resources in the *Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes* published by the Minister of Environment, Forestry and Fisheries on 20 March 2020, these assessments also comply with the requirements of Appendix 6 of the EIA Regulations. There are no new guidelines which are now relevant to the authorised development which were not considered or addressed in the existing reports.

The proposed amendments to the EA in the current amendment application which may affect heritage resources are those that manifest themselves physically on the ground: i.e. the increase in the footprint of the WTG hardstands and in the access road widths. Larger hardstands and wider access roads increase the potential for impacts to heritage resources, particularly archaeological sites and materials, simply because of their larger footprints.

However, although the proposed hardstands are larger than those currently authorized, the reduction in the number of WTGs from 61 to a maximum of 26 means that the hardstand land-take remains approximately 12,2 hectares in total. Similarly, although wider access roads than what is currently authorized are proposed, the reduction in the total length of roads within the WEF resulting from the reduction in the number of WTGs will result in a reduction in the amount of land affected. Overall, the proposed EA amendments will result in a reduction in the physical WEF footprint and, therefore, in the potential for impacts to heritage resources.

Larger hardstands and wider roads may, in places, result in limited and minor impacts to archaeological resources in their proximity. Provided these impacts are mitigated according to the ACO Associates cc. Company Reg: CK 2008/234490/23 VAT Reg: 4160257996  
Members: D Halkett & T Hart

measures recommended by Gribble (2022a) (see Appendix A), which replace those in the HIA (2011) and Addendum report (2015) and are included in the amended EMPr for the project (that is currently undergoing a public participation process), it is our reasoned opinion that the proposed amendments will not result in an increased level, or change in the nature of the impacts, to those previously assessed in 2011 and 2015.

In this regard, the recommendation by the avifaunal specialist that one of the blades of each turbine be painted, as an avifaunal mitigation measure, was addressed in a heritage comment by ACO on 16 September 2022 (see [Appendix B](#)). ACO concluded that the overall visual impact significance ratings for the proposed WEF would not change as a result of the painted turbine blades, and the proposed painting of the blades is considered acceptable from a visual impact perspective.

With respect to the proposed extension of the EA validity period, the heritage baseline environment has not changed significantly since the original assessment and the proposed amendment will not result in an increased level or change in the nature of the impact which was initially assessed and considered when application was made for the environmental authorisation and subsequent Part 2 EA amendment in 2015 - 2016. The 2022 walkdown survey noted no obvious changes to the heritage environment since the site assessment undertaken for the 2011 HIA.

With respect to the cumulative impacts of this project and other similar projects in the area on heritage resources, the HIA stated that, the construction of a number of wind energy facilities on the same plateau as the De Aar 2 South WEF could result in the cumulative loss of heritage resources, which could have a moderate to high significance if no mitigation occurs. With mitigation, the cumulative impacts are likely to be low.

There is currently a mix of 30 approved wind and solar energy projects within a 30 km radius of the De Aar 2 South WEF (according to the DFFE Screening Tool Report (November 2022)). Together, these projects, should they all proceed to construction (which is unlikely), will have a cumulative impact on the heritage resources of the area.

However, in assessing the significance of this cumulative impact, it is important to consider that although the combined cadastral footprint of these projects is substantial, the real physical footprints of the wind and solar facilities are relatively small. It must also be assumed that each of these projects has been subject to an EIA or BA process, as part of which a heritage assessment has been conducted. As part of those processes, the results of archaeological surveys and heritage assessments will have informed project layouts, and recommendations for measures to mitigate any remaining impacts on heritage resources will have been made.

Archaeological and heritage best practice demands the in situ preservation of significant heritage resources as the first option. Recommended mitigation thus always strives to ensure that significant sites or materials are avoided, and thus preserved, as part of the development process. Where avoidance is not possible, the recording, collection, and/or excavation of sites or material ensures that although the site may be damaged or destroyed by the development, the information it contains is saved and safely curated and can contribute to our understanding and knowledge of the heritage of an area.

Therefore, provided the heritage mitigation measures recommended for each project are fully and properly implemented as part of individual project EMPs, it is our opinion that the cumulative impacts on archaeological and other heritage resources arising from the construction of the De Aar 2 South WEF and the other facilities in the area is likely to be low.

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Provided the mitigation measures recommended in the Walkdown Report (Gribble, 2022a) (see Appendix A attached) are implemented, the overall impact of the construction of the Mulilo De Aar 2 South WEF according to the layout proposed in this EA amendment application is acceptable and generally of low significance.

From a heritage perspective, therefore, the proposed amendments are considered acceptable.

Yours sincerely



John Gribble  
Senior Archaeologist and Heritage Consultant

References:

Almond, J. 2012c. *Palaeontological Specialist Study - Combined Desktop and Field-based Assessments: Two wind energy facilities on the Eastern Plateau near De Aar, Northern Cape Province proposed by Mulilo Renewable Energy (Pty) Ltd.* Unpublished report prepared for Mulilo Renewable Energy (Pty) Ltd. Natura Viva cc.

Gribble, J. 2022a. *Heritage Walkdown Survey Report for the Final Layout of the Mulilo De Aar 2 South Wind Energy Facility, Northern Cape Province.* Unpublished report prepared for Holland & Associates Environmental Consultants. ACO Associates.

Gribble, J. 2022b. *Mulilo De Aar 2 South Wind Energy Facility EMPr and Site Layout Plan Finalization: Heritage Specialist Statement.* Unpublished statement prepared for Holland & Associates Environmental Consultants. ACO Associates.

Gribble, J. and Euston-Brown, G.L. 2020. *Heritage Impact Assessment: Proposed Grid Connection for the De Aar 2 South Wind Energy Facility, De Aar, Northern Cape.* Unpublished report prepared for Arcus. ACO Associates.

Sampson, C.G. 1988. *Stylistic Boundaries Among Mobile Hunter-Foragers.* Smithsonian Institution Press, Washington.

Webley, L. and Halkett, D. 2015. *Addendum: Proposed Wind Energy Facility situated on the Eastern Plateau (South) near De Aar, Northern Cape Province.* Unpublished report prepared for Holland and Associates Environmental Consultants. ACO Associates.

Webley, L. and Orton, J. 2011. *Proposed De Aar Wind Energy Facility on the North and South Plateau, Northern Cape Province.* Unpublished report prepared for Aurecon South Africa (Pty) Ltd. Archaeology Contracts Office.

**Appendix A: 2022 Heritage Walkdown Survey Report for the Final Layout of the Mulilo De Aar 2 South Wind Energy Facility**

(See separate pdf file)



# HERITAGE WALKDOWN SURVEY REPORT FOR THE FINAL LAYOUT OF THE MULILO DE AAR 2 SOUTH WIND ENERGY FACILITY, NORTHERN CAPE PROVINCE

(Assessment conducted under Section 38 (8) of the National Heritage Resources Act as part  
of an EIA.)

Prepared for

**Holland & Associates Environmental Consultants**

On behalf of

**Mulilo De Aar 2 South (Pty) Ltd**

Final: August 2022



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Archaeology and Heritage Specialists

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## EXECUTIVE SUMMARY

ACO Associates cc were appointed by Mulilo De Aar 2 South (Pty) Ltd to undertake a heritage walkdown survey of the final layout of the Mulilo De Aar 2 South Wind Energy Facility (WEF) (Figure 1), and to recommend any specific mitigation measures to be included in the updated EMPr.

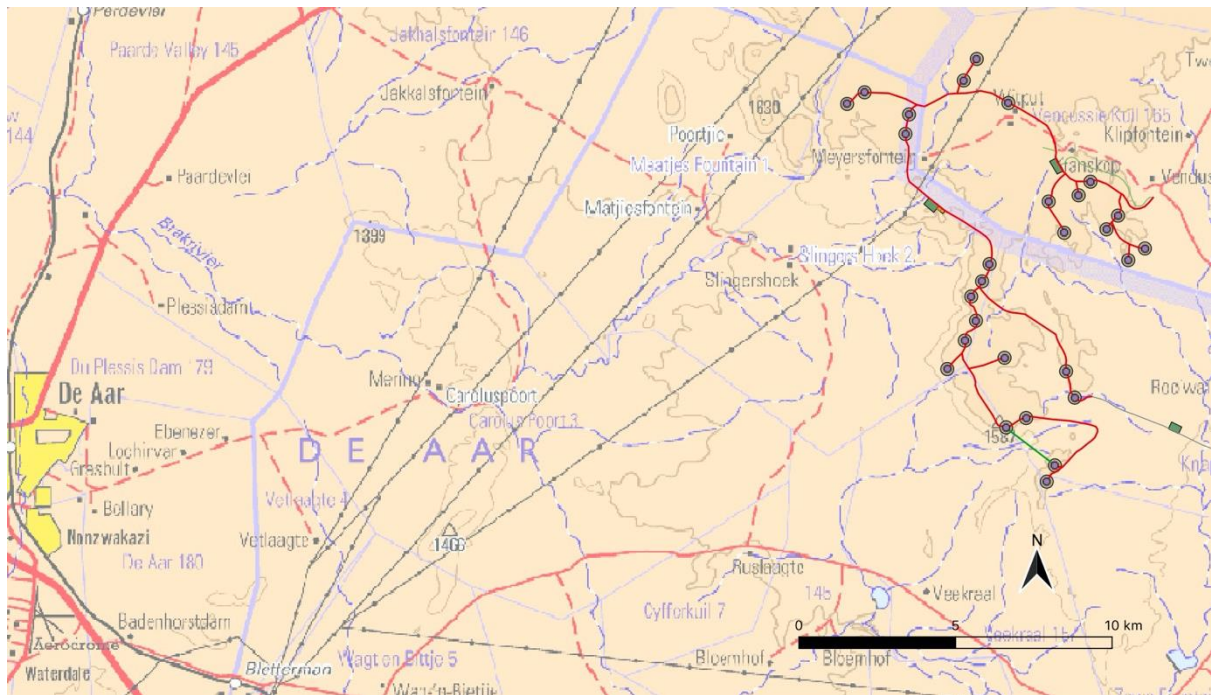


Figure 1: 250,000 topographic map showing the final layout plan of the Mulilo De Aar 2 South WEF, east of De Aar (Source: 1:250,000 chart 3024: De Aar, National Geo-spatial Information, <http://www.ngi.gov.za>).

The walkdown survey was conducted by ACO Associates in July-August 2022. Previous surveys within the WEF area conducted in 2011, 2015 and 2020 also informed this report.

As part of the walkdown survey report, ACO was asked to confirm that the proposed final layout plan addresses the recommendations in the 2011 Heritage Impact Assessment (HIA) and 2015 Heritage Addendum report, and complies with relevant conditions in the Environmental Authorization, as well as the requirements stipulated by the South African Heritage Resources Agency (SAHRA).

## Findings

The walkdown survey noted the same widespread occurrence of MSA material of relatively low significance across much of the WEF as the previous surveys and concluded that the overall impacts to this material arising from the construction of the WEF will be relatively low. Furthermore, the sheer volume of scattered artefacts on this vast landscape means that the combined overall impact of roads, turbines and infrastructure is low, in terms of the broader picture.

Three archaeological sites identified in the 2011 HIA as requiring mitigation (J093-J096, 043/J089 and 064-066) will not be impacted by the proposed final layout plan and the requirement to sample them can fall away.

However, four sites located during the walkdown survey (G110, G113, J104 and J134) are likely to be impacted by the final layout plan and must either be buffered and avoided, or subject to archaeological sampling prior to construction. If the mitigation of any of these sites is chosen, a permit for the work will need to be obtained from SAHRA by a suitably qualified archaeologist and the work must be carried out prior to construction commencing.

The historic kraal complexes identified at various places within the WEF represent an unrecorded slice of the 19<sup>th</sup> century farming settlement pattern in this part of the Karoo. These kraal complexes have not been studied or described and their destruction would result in a loss of heritage. All the known kraal complexes are avoided by the final layout plan but must also be demarcated and labelled as no go areas during construction to ensure that there is no impact to them.

There is always the chance that buried archaeological material will be exposed during earthworks for the WEF. All archaeological material over 100 years of age is protected and may only be altered or removed from its place of origin under a permit issued by SAHRA. In the event of any new finds of significant archaeological material, the project archaeologist and SAHRA must be notified and consulted immediately so that mitigatory action can be determined and be implemented, if necessary. Mitigation is at the cost of the developer, while time delays and diversion of machinery/plant may be necessary until mitigation in the form of conservation or archaeological sampling is completed.

In the absence of clearly established guidelines in the Northern Cape for the minimum distance between wind turbine generators (WTGs) and buildings/structures older than 60 years, the 2011 HIA relied on the guidelines of the Western Cape Provincial Government. These recommend that WTGs are placed at least 500 m from occupied farm buildings. This buffer may be reduced if the building is unoccupied.

The walkdown survey found that the portions of access road within the 500 m buffers around the farm complexes at Kranskop or Vendussie Kuil will result in no direct impacts to the historical buildings. In the case of Vendussie Kuil, however, the construction of a new access road parallel to and within 70 m of the existing road past the farm complex is likely to result in an unnecessary and avoidable visual impact. Given the low heritage significance of the Vendussie Kuil farm complex, the fact that it is unoccupied, and the unnecessary changes to the surrounding landscape that the proposed new access road in the final layout plan would cause, we are of the opinion that:

- The access road should be permitted to cross the 500 m buffer; and
- Instead of constructing a new road, the existing farm road should be upgraded, within the buffer zone, thereby limiting the impacts of the WEF on the farm complex.

The overlap of the laydown area near the Kranskop farm werf with the 500 m buffer in place around this complex will have no impact on the farm werf, which is located on the far side of an intervening hill, and it is recommended that this overlap be permitted.

Except for the pair of modern graves at Kranskop (which do not fall within the ambit of the NHRA), no other graves or cemeteries have been identified within the footprint of the Mulilo De Aar 2 South (DA2S) WEF.

Furthermore, the buffering of the historical farm werfs and the avoidance of all identifiable kraal complexes effectively removes those places most likely to have historical burials associated with them from potential impact by the WEF. Impacts to historical graves and

burials arising from the construction of the WEF are thus unlikely.

Unmarked, pre-colonial graves may occur within the WEF, but they are likely to be located along river courses and within valleys where there is soft soil suitable for interment. These areas are generally avoided by the final layout plan and impacts to pre-colonial burials are unlikely.

In the event that any human remains be disturbed or uncovered during excavations and earthworks for the WEF, work in the vicinity must cease, the remains made secure, preferably in situ and the project archaeologist and SAHRA notified immediately. Buried remains should not be removed until inspected by an archaeologist.

## **Conclusion and Recommendations**

In terms of the acceptability of the proposed final WEF layout to heritage resources, and as recommended by the 2011 HIA and 2015 Addendum report, the following can be stated:

- Access roads in the final layout plan generally avoid the lower slopes of valleys and riverbanks thereby reducing the overall potential risk to kraal complexes.
- All identified stone-walled kraals have been avoided by the final layout plan.
- The final layout plan avoids the three archaeological sites identified in the 2011 HIA. None of these sites will thus be impacted by the final layout plan and the requirement that they are archaeologically sampled can fall away.
- Buffers have been implemented around the Kranskop and Vendussie Kuil farm werfs.

The 2022 walkdown survey of the final WEF layout identified several new archaeological sites and occurrences, most of which are of low heritage significance.

Of the sites identified, it is recommended that four (G110, G113, J1G04 and JG134) require either buffering and avoidance during construction or pre-construction archaeological sampling.

The small overlap of the laydown area and access road with the Kranskop buffer is not considered significant and it is recommended it be permitted.

It is recommended that the access road within the Vendussie Kuil buffer is permitted, but that instead of constructing a new road within a short distance of the farm complex, the section of the existing farm road within the buffer is upgraded to serve as the access road, thereby limiting the impacts of the WEF on the farm complex.

Although there remains some potential for impacts to heritage resources arising from the construction of the WEF according to the final site layout plan, these impacts are not likely to be significant given the overall nature of archaeological and palaeontological resources in the area.

It is our reasoned opinion, therefore, that the final site layout plan has avoided and excluded most identified heritage resources and, as a result, there is neither an increase in the level of impacts or change in the nature of the impacts expected to arise from the construction of the final layout of the WEF.

Provided the mitigation measures set out above are included in the EMP and effectively implemented before and during construction, the final site layout plan is considered acceptable from a heritage perspective and development can proceed.

## DECLARATION OF SPECIALISTS' INDEPENDENCE

I, John Gribble, as the appointed independent specialist hereby declare that I:

- acted as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.

Signature of the specialist:



Name of company: ACO Associates cc

Date: 31 August 2022

John Gribble is an independent specialist consultant who is in no way connected with the proponent, other than delivery of consulting services.

He is an archaeologist with nearly 30 years of working experience in heritage management in South Africa and the United Kingdom. He joined ACO Associates in 2017 and is accredited with Principal Investigator status by the Association of Professional Archaeologists of Southern Africa.

ACO Associates have considerable experience in assessing the impacts of renewable energy projects on heritage, having completed the specialist studies for numerous 25 renewable energy projects in the Eastern, Northern and Western Capes.

## GLOSSARY

**Archaeology:** Remains resulting from human activity which is 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.

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

**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).

**Hornfels:** A type of indurated shale used in the production of stone tools in the Karoo.

**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.

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

**Smithfield:** This term was coined in 1929 for a number of interior stone tools assemblages, made on indurated shale, and dating to the last 2000 years of the Later Stone Age. Various variants have been identified in different parts of the country but the term has not been clearly defined.

**Wilton:** A Late Stone Age microlithic industry dating to between 6000 and 4000 years ago.

## **ACRONYMS**

<b>DA2S WEF</b>	Mulilo De Aar 2 South Wind Energy Facility
<b>DFFE</b>	Department of Fisheries, Forestry and the Environment
<b>EA</b>	Environmental Authorization
<b>EIA</b>	Environmental Impact Assessment
<b>ESA</b>	Early Stone Age
<b>GPS</b>	Global Positioning System
<b>HIA</b>	Heritage Impact Assessment
<b>LSA</b>	Late Stone Age
<b>MSA</b>	Middle Stone Age
<b>NHRA</b>	National Heritage Resources Act
<b>SAHRA</b>	South African Heritage Resources Agency
<b>WEF</b>	Wind Energy Facility



## Table of Contents

<b>EXECUTIVE SUMMARY</b> .....	<b>2</b>
Findings .....	2
Conclusion and Recommendations .....	4
<b>DECLARATION OF SPECIALISTS' INDEPENDENCE</b> .....	<b>5</b>
<b>GLOSSARY</b> .....	<b>7</b>
<b>ACRONYMS</b> .....	<b>8</b>
<b>1 INTRODUCTION</b> .....	<b>12</b>
<b>2 LEGISLATION</b> .....	<b>13</b>
<b>3 METHODOLOGY</b> .....	<b>13</b>
3.1 Limitations and Assumptions .....	13
<b>4 BACKGROUND AND PREVIOUS SURVEY RESULTS</b> .....	<b>14</b>
4.1 The Archaeological Context .....	14
4.1.1 Archaeology within the WEF.....	14
4.2 The Historical Context .....	15
4.2.1 Historical Sites within the WEF .....	15
4.3 Cemeteries and Graves.....	15
4.3.1 Cemeteries and Graves within the WEF .....	15
<b>5 WALKDOWN SURVEY</b> .....	<b>16</b>
5.1 Previous Heritage Recommendations and EA Conditions .....	16
5.1.1 2011 HIA Recommendations .....	16
5.1.2 2015 Addendum Report Recommendations .....	16
5.1.3 EA Conditions 59 and 60.....	17
5.2 Compliance of Final Layout Plan with Heritage Recommendations and EA Conditions... 17	
5.3 Walkdown Survey Results .....	22
5.3.1 Turbines .....	22
5.3.2 Access Roads and Internal Project Roads .....	26
5.3.3 Construction Laydown Areas and On-site Substation .....	28
<b>6 IMPACTS DURING CONSTRUCTION PHASE</b> .....	<b>29</b>
6.1 Impacts to Pre-Colonial and Colonial Archaeology.....	33
6.2 Impacts to the Built Environment .....	33
6.3 Impacts to Cemeteries and Graves.....	34
<b>7 IMPACTS DURING THE OPERATIONAL PHASE</b> .....	<b>34</b>
<b>8 MITIGATION MEASURES RECOMMENDED FOR INCLUSION IN THE REVISED EMPR....</b>	<b>34</b>

<b>9</b>	<b>CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>35</b>
<b>10</b>	<b>REFERENCES.....</b>	<b>37</b>
<b>11</b>	<b>APPENDIX 1: LIST OF HERITAGE SITES RECORDED IN 2022 WALKDOWN SURVEY.....</b>	<b>38</b>

Figure 1: 250,000 topographic map showing the final layout plan of the Mulilo De Aar 2 South WEF, east of De Aar (Source: 1:250,000 chart 3024: De Aar, National Geo-spatial Information, <a href="http://www.ngi.gov.za">http://www.ngi.gov.za</a> ). .....	2
Figure 2: Final layout plan of the Mulilo De Aar 2 South WEF east of De Aar, showing WTG positions and hardstand buffers (numbered dots), internal roads (red lines), 33 kV internal reticulation (green line), construction laydown areas (green polygons) and on-site substation (yellow polygon).....	12
Figure 3: Positions of the kraal complex (blue circle) and river crossing (blue arrows) on the former access road/s (yellow line) between former WTG5 and WTG10. These sites will not be impacted by WTGs or access roads in the final layout plan (WTG1, WTG2 and access road (red line)). .....	18
Figure 4: Location of possible kraals (blue circles) in relation to former proposed access road (yellow line) between former WTG46 and WTG47. Note the additional distance of the access road to WTG24 in the final layout plan (red line) from the kraals at lower left. No evidence of kraals was found during the walkdown survey in the area circled at top right. Survey tracks: 2011 = blue line; 2022 = pink line.....	19
Figure 5: Access roads (yellow = previous; red = final layout plan) in proximity to kraal complex (blue polygon). Note the similar alignment and approximate distance from the kraals. 2022 walkdown survey tracks = pink line. ....	20
Figure 6: Access roads (yellow = previous; red = final layout plan) in proximity to kraal complex (blue polygon) between former WTG21 and WTG60. The road in the final layout plan has been shifted an additional ±40 m away from the kraal. ....	21
Figure 7: Archaeological survey coverage for DA2S WEF. 2022 Walkdown survey = pink tracks / white numbered points; 2011 HIA survey = blue tracks and numbered points; 2020 Grid Connection survey = green tracks and numbered points. ....	22
Figure 8: Location of MSA quarry (G113) just outside the WTG26 hardstand buffer. The green shaded area is the recommended 30 m buffer around the site. 2022 survey track = pink line.....	23
Figure 9: Extensive pre-colonial quarry across hillside at WTG24 (JG118, JG120 & JG121). JG119 is the ephemeral MSA lithic scatter on the hilltop. ....	25
Figure 10: LSA scatter within the WTG24 hardstand buffer. The green shaded area is the extent of the recommended 60 m buffer. The lithic scatters (J079 and J080) recorded in 2011 are shown at the bottom of the image. ....	25
Figure 11: Proposed 20 m buffer (green shading) around LSA scatter JG104. The red line is the access road between WTG24 and WTG28. ....	26
Figure 12: Location of historical ashheap (JG134) adjacent to Vendussie Kuil farm complex (JG133).....	27
Figure 13: 500 m buffers around the Kranskop (left) and Vendussie Kuil (right) farm complexes (orange circles). The red lines in each image represent proposed access roads in the final layout plan which fall within each buffer zone. The green polygon in the image on the left is the construction laydown area west of Kranskop. ....	30
Figure 14: Detail of the overlap of the proposed construction laydown area (green polygon)	

with the 500 m buffer around the Kranskop farm complex (JG130), which is acceptable from a heritage perspective..... 31

Figure 15: Sites located in 2011 and 2020 on and around the proposed onsite substation. 2011 survey = blue lines and numbering; 2020 survey = green lines and numbering..... 32

Plate 1: Large flakes in quarry at G113 (Photo: G Euston-Brown)..... 24

Plate 2: Site JG104 in exposed area (left) and examples of lithics (right) (Photos: J Gribble).  
..... 27

# 1 INTRODUCTION

ACO Associates cc were appointed by Mulilo De Aar 2 South (Pty) Ltd to undertake a heritage walkdown survey of the final layout of the approved Mulilo De Aar 2 South Wind Energy Facility (DA2S WEF), and to recommend any specific mitigation measures to be included in the updated EMP. The project is located some 20km east of De Aar, Northern Cape Province (Figure 1 and Figure 2).



Figure 2: Final layout plan of the Mulilo De Aar 2 South WEF east of De Aar, showing WTG positions and hardstand buffers (numbered dots), internal roads (red lines), 33 kV internal reticulation (green line), construction laydown areas (green polygons) and on-site substation (yellow polygon).

Previous fieldwork, based on an earlier draft layout of the proposed wind energy facility was undertaken in November 2011 and the Heritage Impact Assessment (HIA) component of the Environmental Impact Assessment (EIA) completed in December 2011 (Webley & Orton

2011). In 2015, ACO Associates produced an addendum to their original HIA to inform an application to amend the Environmental Authorization (EA) for the WEF (Webley & Halkett, 2015). The addendum report was a desktop study using Google Earth.

More recently, the HIA produced by ACO Associates in 2020 for the Grid Connection for the WEF covered the portion of the WEF site where the on-site substation and one of the laydown areas will be located (Gribble & Euston-Brown, 2020).

The background information to this walkdown report is derived from these previous reports.

## **2 LEGISLATION**

The basis for all heritage impact assessment is the National Heritage Resources Act 25 (NHRA) of 1999. The Act has defined certain kinds of heritage as being worthy of protection, by either specific or general protection mechanisms.

In South Africa the law is directed towards the protection of human made heritage, although places and objects of scientific importance, such as palaeontology, are also included. The NHRA also protects intangible heritage such as traditional activities, oral histories and places where significant events happened. Generally protected heritage which must be considered in any heritage assessment includes:

- Buildings and structures (older than 60 years of age)
- Archaeological sites (older than 100 years of age)
- Palaeontological sites and specimens
- Shipwrecks and aircraft wrecks
- Graves and graveyards
- Cultural Landscape.

## **3 METHODOLOGY**

The information in this report is based on:

- published archaeological reports and unpublished impact assessments for the general area; and
- the results of the 8-day field trip undertaken by Webley and Orton in November 2011, the 2020 survey work by Gribble and Euston-Brown, and the most recent walkdown survey conducted in July-August 2022.

In all these surveys, heritage sites were recorded, mapped and photographed and each site was given a significance rating and assessed in terms of whether it required further mitigation.

No archaeological material was removed from the project area but was, instead, recorded and photographed *in situ*.

### **3.1 Limitations and Assumptions**

The terrain of the WEF is mountainous, remote and difficult to access by vehicle so most of the survey of the turbine locations, access roads and electrical reticulation was undertaken on foot.

During the August 2022 walkdown survey, personal injury to one of the field team (a

dislocated ankle after stepping in an animal burrow) meant that only three of the planned five days of survey were possible. Despite fewer days available for surveying, however, the coverage of the WEF site is deemed comprehensive and adequate.

Given the substantial body of spatial archaeological information generated by the various surveys of the WEF area, we are confident that we have identified the significant heritage issues and proposed suitable mitigation measures for inclusion in the updated EMP, and that no further heritage survey is deemed necessary.

## **4 BACKGROUND AND PREVIOUS SURVEY RESULTS**

This part of the Northern Cape is characterised by wide open plains interspersed with koppies. The WEF is to be constructed on a large flat plateau to the east of De Aar. The plateau rises at least 100 m above the surrounding plains and is generally flat and covered in typical Karoo scrub and grasses, but there are more dense clusters of trees in some of the deeply incised valleys. The area is also bisected by numerous seasonal stream beds which flow periodically after summer rains.

### **4.1 The Archaeological Context**

The following description of the archaeological background of the area is based in Webley & Orton (2011).

A major archaeological survey project undertaken in the Zeekoe River Valley (Seacow River Valley), about 30 km to the west of the WEF, indicates that the full range of Early, Middle and Later Stone Age material may be expected in this area of the Karoo (Sampson 1985 & 1992).

Middle Stone Age (MSA) artefacts make up the bulk of the archaeological material and can be expected widely across the landscape, in the form of ancient 'litter', most frequently on the edges of pans, streams and at the base of small hills or koppies.

Sampson (1985) also recorded thousands of Later Stone Age sites (LSA) which are attributed to the ancestors of the San peoples and after 2000 years ago, to Khoekhoen pastoralists.

San rock engravings can occur on dolerite boulders in the area.

#### **4.1.1 Archaeology within the WEF**

Within the DA2S WEF both pre-colonial and colonial archaeological material has been documented by the surveys that have been undertaken since 2011.

No Early Stone Age artefacts have been noted anywhere in the project area, but Middle Stone Age lithics are widely and often densely present and are the dominant pre-colonial archaeological material. The MSA artefacts are almost exclusively made from heavily patinated, weathered indurated shale (hornfels) and it is possible that the sheer volume of MSA lithics on the plateau is linked to sources of hornfels (associated with the dolerite that comprises much of the plateau area), which were used as quarries for tool-making raw material.

The surveys identified smaller numbers of LSA archaeological sites, with lithic artefact assemblages also generally made on hornfels. These sites were generally quite discrete,

spatially, some contained other artefact categories like bone and ostrich eggshell, and they are typical of either the interior Wilton or the later “Smithfield Industry” (Sampson 1985).

No San rock engravings were identified within the WEF area.

## **4.2 The Historical Context**

The most recent archaeological layer in the Karoo landscape relates to the historical occupation of the area by stock farmers of European descent from the late 18<sup>th</sup> century, but is a layer which is not well-documented. These European pastoralists, were highly mobile – hence the name trekboers – moving between winter and summer grazing on and off the Great Escarpment.

Land ownership was informal and only became regulated after the implementation of the quitrent system of the 19<sup>th</sup> century used by the Government to control the lives and activities of the farmers. However, judging by the kinds of artefacts and structures found on the landscape, many of the farms in the Upper Karoo are likely to have been used before land was formally granted or loaned in the early 19<sup>th</sup> century (Sampson et al, 1994).

The town of De Aar was established on the farm of that name at the site of an important railway junction created by the Cape Government Railways in the last two decades of the 19<sup>th</sup> century on the line between the Kimberley diamond fields and Cape Town. In 1899 the Friedlander brothers, who ran a trading store and hotel at the junction, purchased the farm and after the end of the South African War surveyed the land for the establishment of a town. The municipality was created a year later ([https://en.wikipedia.org/wiki/De\\_Aar](https://en.wikipedia.org/wiki/De_Aar)).

### **4.2.1 Historical Sites within the WEF**

During the Webley and Orton (2011) survey, several late 19<sup>th</sup> century and early 20<sup>th</sup> century farm building complexes (older than 60 years) were identified on the plateau, two of which, at Kranskop and Vendussie Kuil on the farm Vendussie Kuil 165 are relevant to this report.

The Webley and Orton (2011) also recorded several historic stone kraal complexes on the plateau, some associated with small, ruined shepherd’s huts, also built of stone. The kraal complexes were situated in valleys, in extremely isolated localities, and they were difficult to date because of an absence of associated occupational debris although a few had associated historic material such as 19<sup>th</sup> century and early 20<sup>th</sup> century ceramics, glass and metal. Most of the kraals were rectangular or square, which suggests they date to the historical period, an assessment supported by the construction of the walls which consisted of packed stone inner and outer skins with rubble infill.

A few circular (or oblong) kraals were recorded on the plateau, and it is possible that they may date to the pre-colonial period although there is little substantive evidence, in the form of associated artefacts, for this.

## **4.3 Cemeteries and Graves**

No historical farm graveyards or isolated graves were recorded during the previous surveys of the WEF area, although any farms which have been settled for 150 years are likely to contain the graves of the farm owners and their family, as well as those of farm workers.

### **4.3.1 Cemeteries and Graves within the WEF**

Two modern graves (dating from 2011 and 2016) with the names Venter on the headstones were noted near the Kranskop farm complex during the 2022 walkdown survey.

## **5 WALKDOWN SURVEY**

### **5.1 Previous Heritage Recommendations and EA Conditions**

As part of the walkdown survey report, ACO was asked to confirm that the final layout plan addresses the following recommendations in the 2011 HIA and 2015 Addendum report, and complies with relevant conditions in the EA:

#### **5.1.1 2011 HIA Recommendations**

The HIA (Webley & Orton 2011) made the following site-specific recommendations:

- Two alternative archaeological mitigation measures were proposed. Either an archaeologist should be involved with the placement of the turbines and associated infrastructure during the site-specific EMP phase or selective sampling of one MSA factory site (064-066) and two LSA sites (J093-J096 and 043/J089) was recommended.
- The stone kraal complexes identified in the HIA survey must be avoided, with access roads re-routed to ensure they are not damaged. Furthermore, since kraal complexes are generally found in valleys, WEF infrastructure in valley bottoms should be kept to a minimum.
- Re-routing of access roads to avoid passing in close proximity to farmsteads and associated farm buildings older than 60 years, must also be implemented. In general, a 500 m buffer should be implemented around farmsteads, particularly if the buildings are older than 60 years. The HIA indicated that this buffer can be reduced if the building contains no elements of heritage significance.

#### **5.1.2 2015 Addendum Report Recommendations**

The Addendum report (Webley & Halkett, 2015) addressed an amended WEF layout and indicated that there were four areas where there could be negative impacts on heritage resources. These were:

- At the proposed 132 kV substation where the construction of the access road from WTG 10 to WTG 5 will cross the dry riverbed in a rocky area with a possible cliff face where the possibility exists for there to be small rock shelters with archaeological deposit and/or rock paintings present. The road also ran near to a series of stone kraals identified in the 2011 survey (J068-J074).
- Google Earth satellite imagery indicated the presence circular features on the landscape in proximity to the access road connecting WTG47 with WTG46. It was suggested that these stone “circles” reflect pre-colonial stone kraals. It was also possible that they were natural phenomena.
- The access road connecting WTG45 with WTG37 ran within 90 m of a collection of at least three kraals. The age of these kraals was not possible to determine from satellite imagery. The Addendum report recommended that the proposed access road was acceptable but if it was moved any closer to the kraals, then a walk down must be undertaken to assess this feature.



- The access road linking WTG21 with WTG 60 ran 200 m from a square kraal, overlooking a dry river. Its age could only be determined by a field assessment.

The Addendum report recommended that the final layout plan addressed these potential impacts on heritage resources.

### **5.1.3 EA Conditions 59 and 60**

Two EA conditions are specific to heritage resources:

- Condition 59 of the EA requires the implementation of a 500 m buffer zone around farm buildings which are older than 60 years.
- Condition 60 requires the demarcation and labelling of all rock kraals on site as no go areas and states that no WTG may be erected within a kraal.

## **5.2 Compliance of Final Layout Plan with Heritage Recommendations and EA Conditions**

With respect to the re-routing of internal roads to avoid heritage sites, recommended in both the HIA (2011) and Addendum report (2015), we can confirm the following:

- WEF infrastructure in the final layout plan has been kept away from valley bottoms as far as possible, thereby reducing the overall potential risk to kraal complexes.
- The position of the on-site substation has changed since 2015, as has the WTG layout (including a reduction in the number of turbines from 61 to a maximum of 26). The kraal complex and river crossing identified as being of concern in the Addendum report (2015), in proximity to the substation site and former access road between former WTG10 and WTG5 is now outside of WEF development footprint. The nearest WTG (WTG1) is at least 820 m from the kraal complex and 630 m from the river crossing (Figure 3).

**No impacts to these resources from the final layout plan are anticipated.**

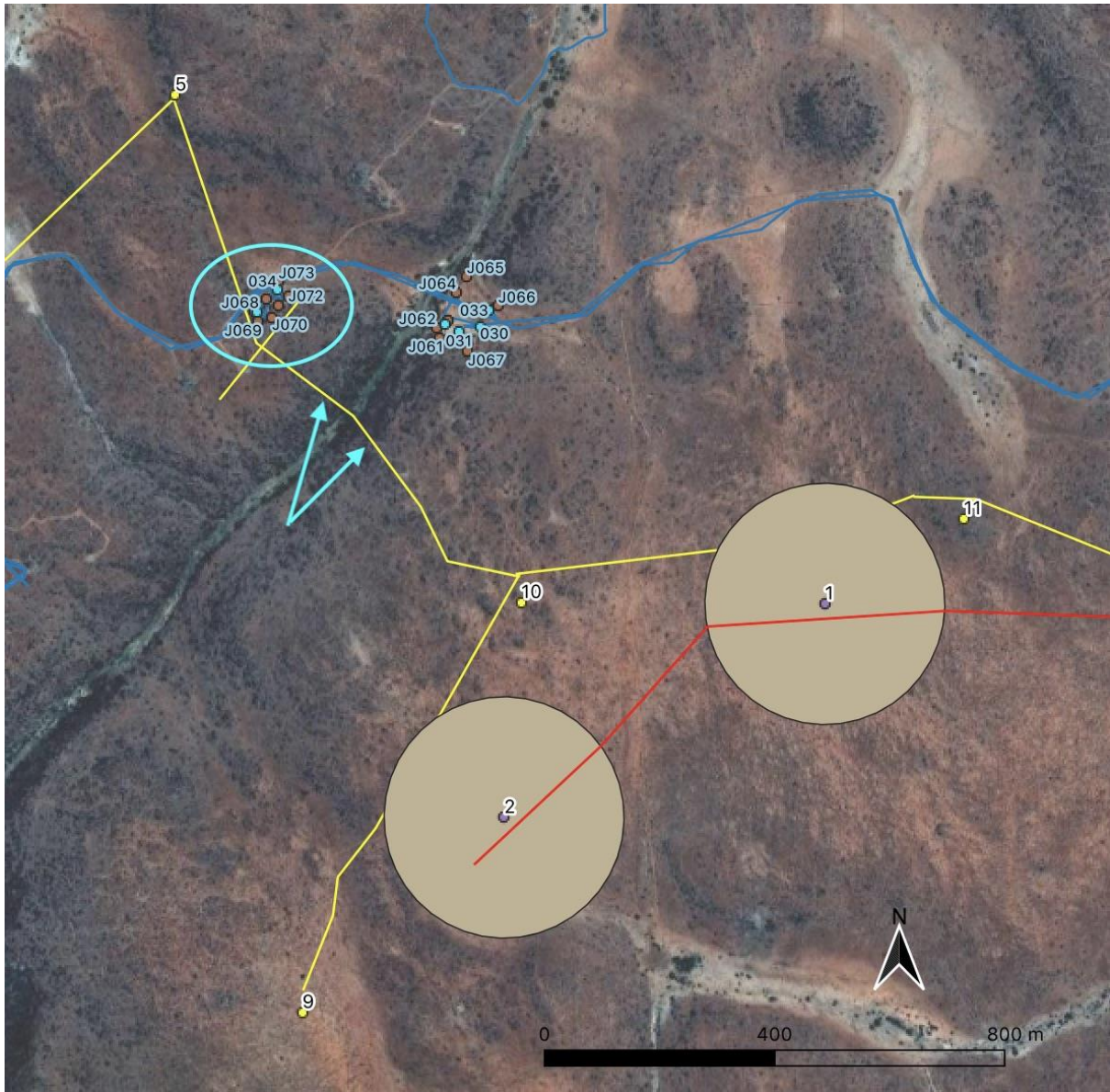


Figure 3: Positions of the kraal complex (blue circle) and river crossing (blue arrows) on the former access road/s (yellow line) between former WTG5 and WTG10. These sites will not be impacted by WTGs or access roads in the final layout plan (WTG1, WTG2 and access road (red line)).

- Turbines are no longer proposed at the previous positions of WTG47 or WTG46 in the final layout plan and the internal road linking these WTGs that previously passed within  $\pm 90$  m of the stone kraals identified in 2015 is now an additional  $\pm 100$  m north-west of these features.

**Any potential for impact to these kraals from the road is thus further reduced and can be discounted (Figure 4).**

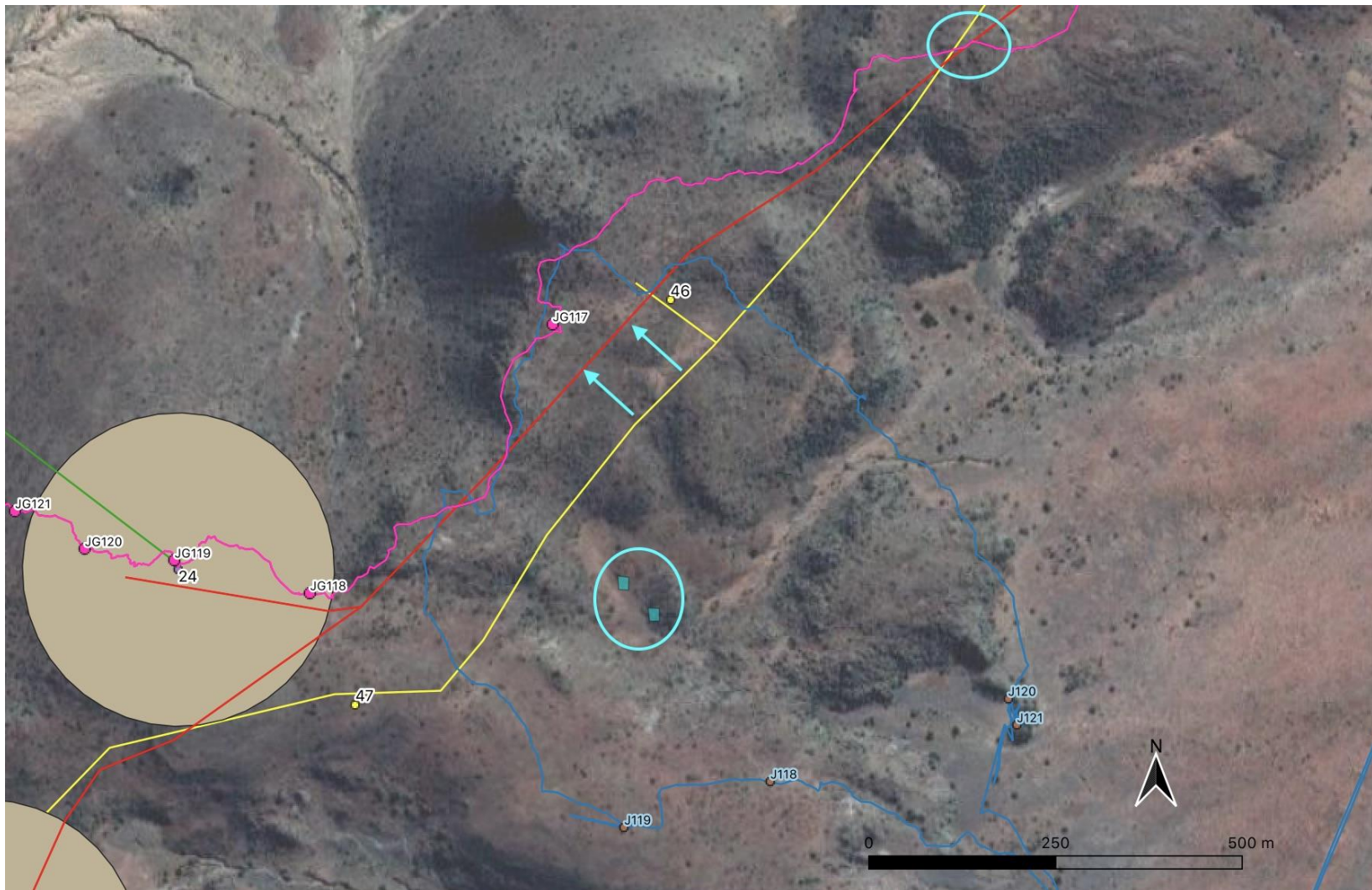


Figure 4: Location of possible kraals (blue circles) in relation to former proposed access road (yellow line) between former WTG46 and WTG47. Note the additional distance of the access road to WTG24 in the final layout plan (red line) from the kraals at lower left. No evidence of kraals was found during the walkdown survey in the area circled at top right. Survey tracks: 2011 = blue line; 2022 = pink line.

- A possible second stone kraal, identified from Google Earth in 2015, roughly 30 m from the access road between WTG47 or WTG46 (old locations), could not be located on the ground during the walkover survey and it is likely that the feature is natural (see Figure 4 above).

**It can be discounted as a heritage issue.**

- The access road between former turbine positions WTG45 and WTG37 remains in the final layout plan. Its alignment differs slightly from that previously proposed, but it remains, on average, the same distance (at least 120 m) from the stone kraal complex identified to the south of it. Since there was no substantive change to the position of this access road the kraals were not visited during the walkdown survey as **any potential for impact to them from this access road is so low that it can be discounted** (Figure 5).



Figure 5: Access roads (yellow = previous; red = final layout plan) in proximity to kraal complex (blue polygon). Note the similar alignment and approximate distance from the kraals. 2022 walkdown survey tracks = pink line.

- Turbines are no longer proposed at the positions of either WTG21 or WTG60 and the internal road that previously passed within  $\pm 260$  m of a stone kraal identified in 2015 has been shifted an additional  $\pm 40$  m away from the kraal. This feature was thus not visited during the walkdown survey and **any potential for impact to this feature from the road is hereby further reduced and can be discounted** (Figure 6).

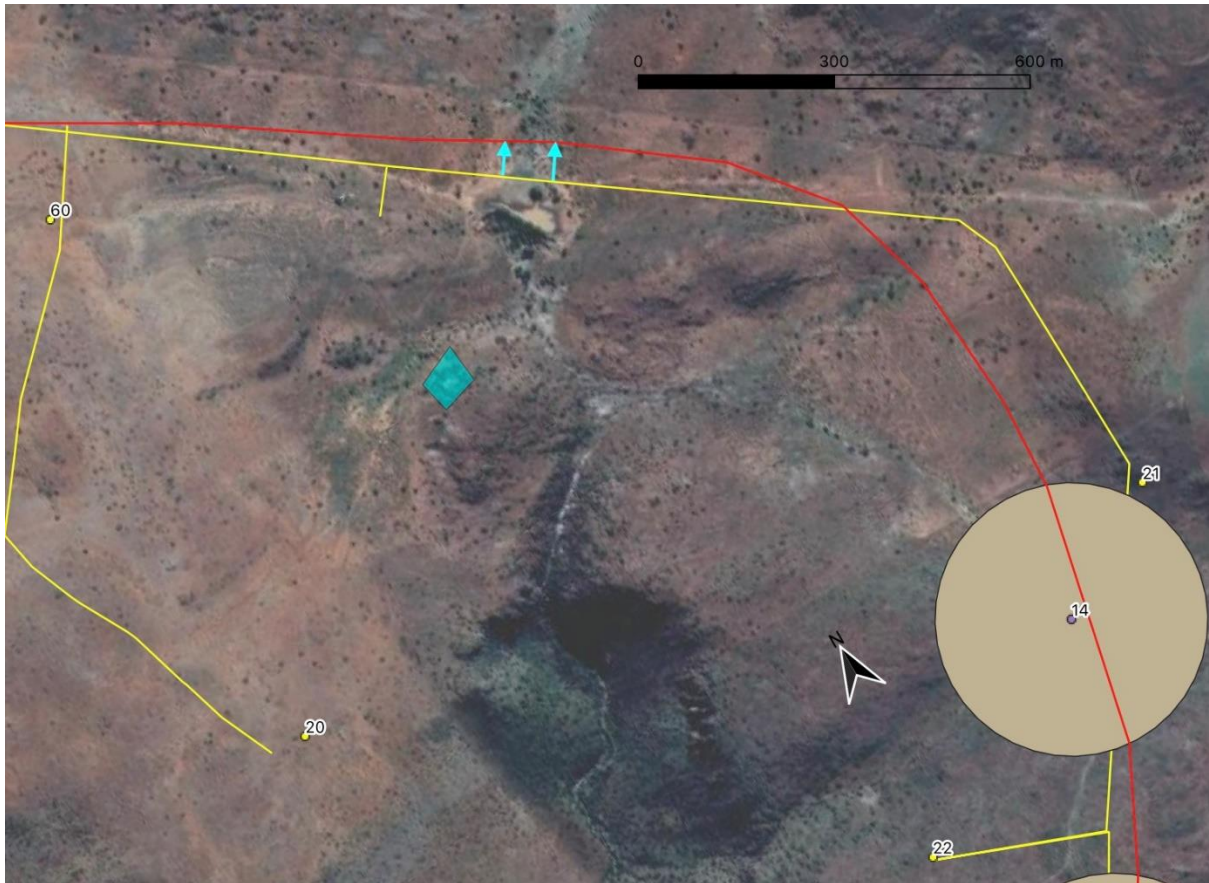


Figure 6: Access roads (yellow = previous; red = final layout plan) in proximity to kraal complex (blue polygon) between former WTG21 and WTG60. The road in the final layout plan has been shifted an additional  $\pm 40$  m away from the kraal.

- Lastly, and in compliance with Condition 60 of the EA, the positions of all known kraals within the WEF have captured and **they must be demarcated, and their positions made known to contractors as no-go areas during construction.**

Regarding the three archaeological sites identified in the 2011 HIA and the mitigation recommended, the placement of WTGs and other infrastructure in the final layout plan means that:

- Site J093-J096 is now more than 400 m from the nearest WTG hardstand buffer (WTG20), and approximately 600 m from the position of WTG20 and the nearest access road.
- In the case of Site 043/J089, the existing farm road will not be upgraded or used in the construction of operation of the WEF, and this site is thus no longer threatened.
- The large MSA factory site (Site 064-066) is now more than 320 m from the nearest WTG hardstand buffer (WTG25) and between 475 and 500 m from WTG25 and the **nearest access road.**

**None of these sites will thus be impacted by the final layout plan and the requirement that they are archaeologically sampled can fall away.**

### 5.3 Walkdown Survey Results

The survey tracks and archaeological sites recorded during the 2022 walkdown survey are shown on Figure 7 and a list of sites recorded is attached as Appendix 1.

Figure 7 also shows the survey trackplots and sites recorded during the 2011 and 2020 surveys in the area.

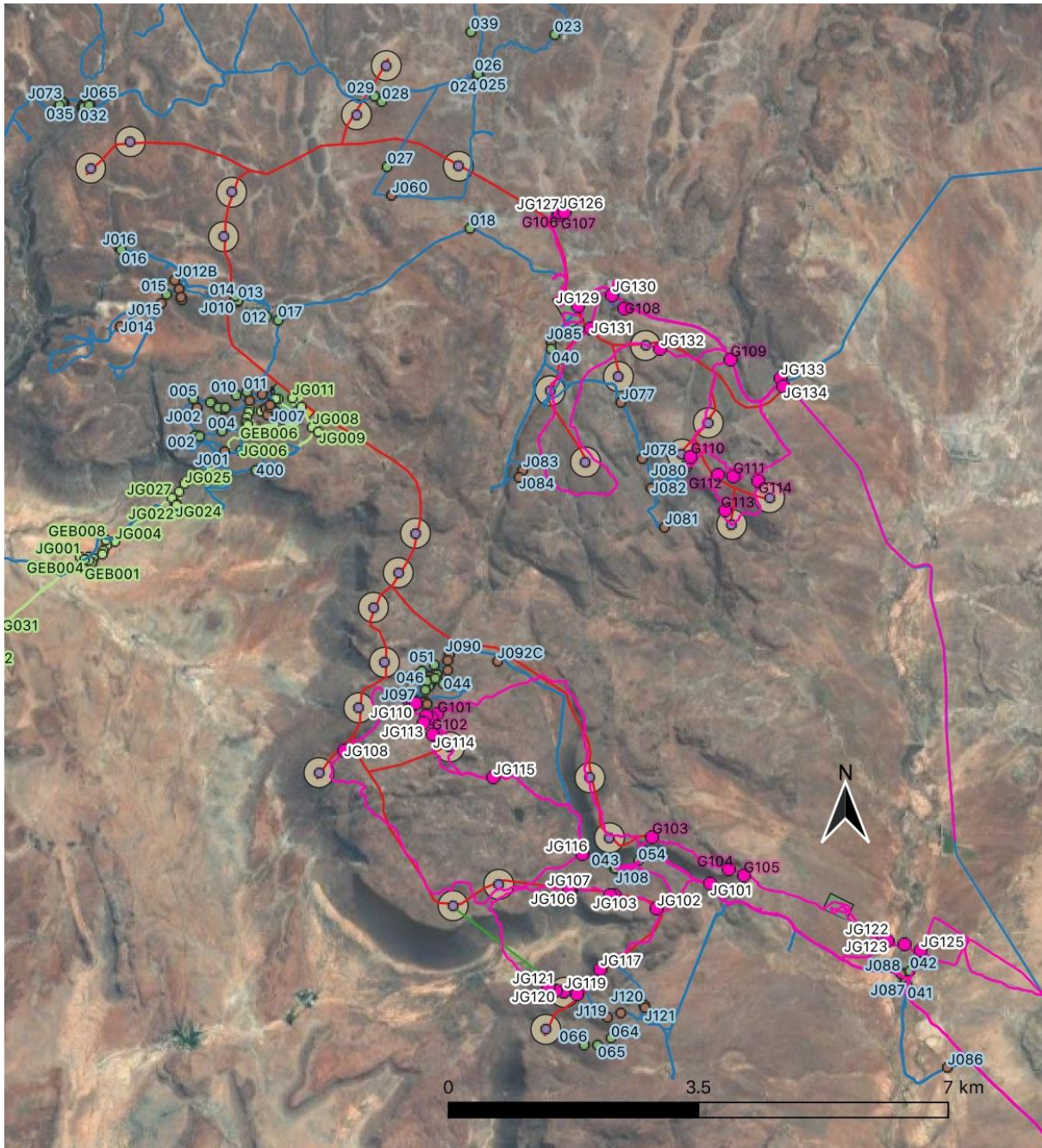


Figure 7: Archaeological survey coverage for DA2S WEF. 2022 Walkdown survey = pink tracks / white numbered points; 2011 HIA survey = blue tracks and numbered points; 2020 Grid Connection survey = green tracks and numbered points.

#### 5.3.1 Turbines

No new significant issues were identified at potential WTG positions during the walkdown

survey. Isolated MSA lithics and scatters of MSA artefacts of varying densities, all on weathered hornfels were found very widely across the landscape but this material is generally considered to be of very low significance.

Two MSA quarry and factory sites were identified at WTG locations which unlike the ubiquitous MSA artefact “litter”, are indicative of a particular human activity and have higher information value than the general artefact scatters. These sites have low to medium archaeological significance.

- MSA quarry at G113 was identified just outside the hardstand buffer around WTG26 (see Figure 8). The site is located on an exposure of good quality hornfels and contains a high percentage of cores, chunks and very large flakes (see Plate 1).

**It is recommended that the G113 is buffered by 30 m and avoided during construction.**

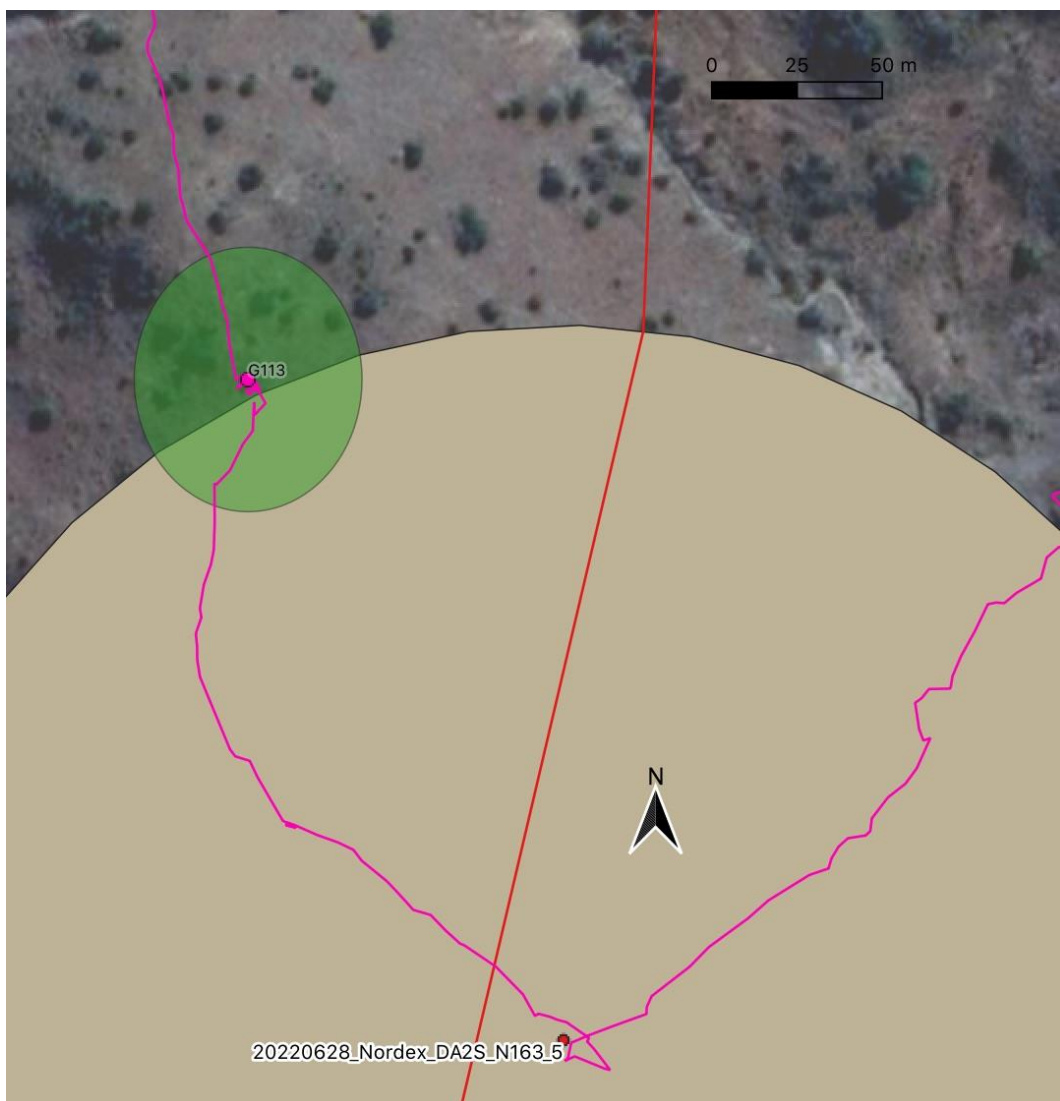


Figure 8: Location of MSA quarry (G113) just outside the WTG26 hardstand buffer. The green shaded area is the recommended 30 m buffer around the site. 2022 survey track = pink line.



Plate 1: Large flakes in quarry at G113 (Photo: G Euston-Brown).

- A similar, extensive quarry site (J118, J120, J121), although with a lower concentration of artefacts than G113, was located within and around the hardstand buffer for WTG 24 (Figure 9). This quarry is sited on a hornfels outcrop on opposite slopes of the hill where WTG 24 is located.

**No mitigation is required as only a portion of this extensive factory site will be impacted and there will be considerable areas left untouched.**

- J119, on the summit of the same hill on Figure 9 is an ephemeral scatter of patinated MSA lithics and is not considered to be significant.

**No mitigation of J119 is required.**





Figure 9: Extensive pre-colonial quarry across hillside at WTG24 (JG118, JG120 & JG121). JG119 is the ephemeral MSA lithic scatter on the hilltop.

- A LSA stone scatter (G110) was recorded within the WTG 24 hardstand buffer (Figure 10). This site covers an area of roughly 50 m<sup>2</sup> and comprises an occurrence of fresh hornfels lithics with up to 50 pieces / m<sup>2</sup> in the densest areas of the site.

**It is recommended that G110 is buffered by 50 m and avoided during construction or that archaeological sampling of the site takes place prior to construction.**

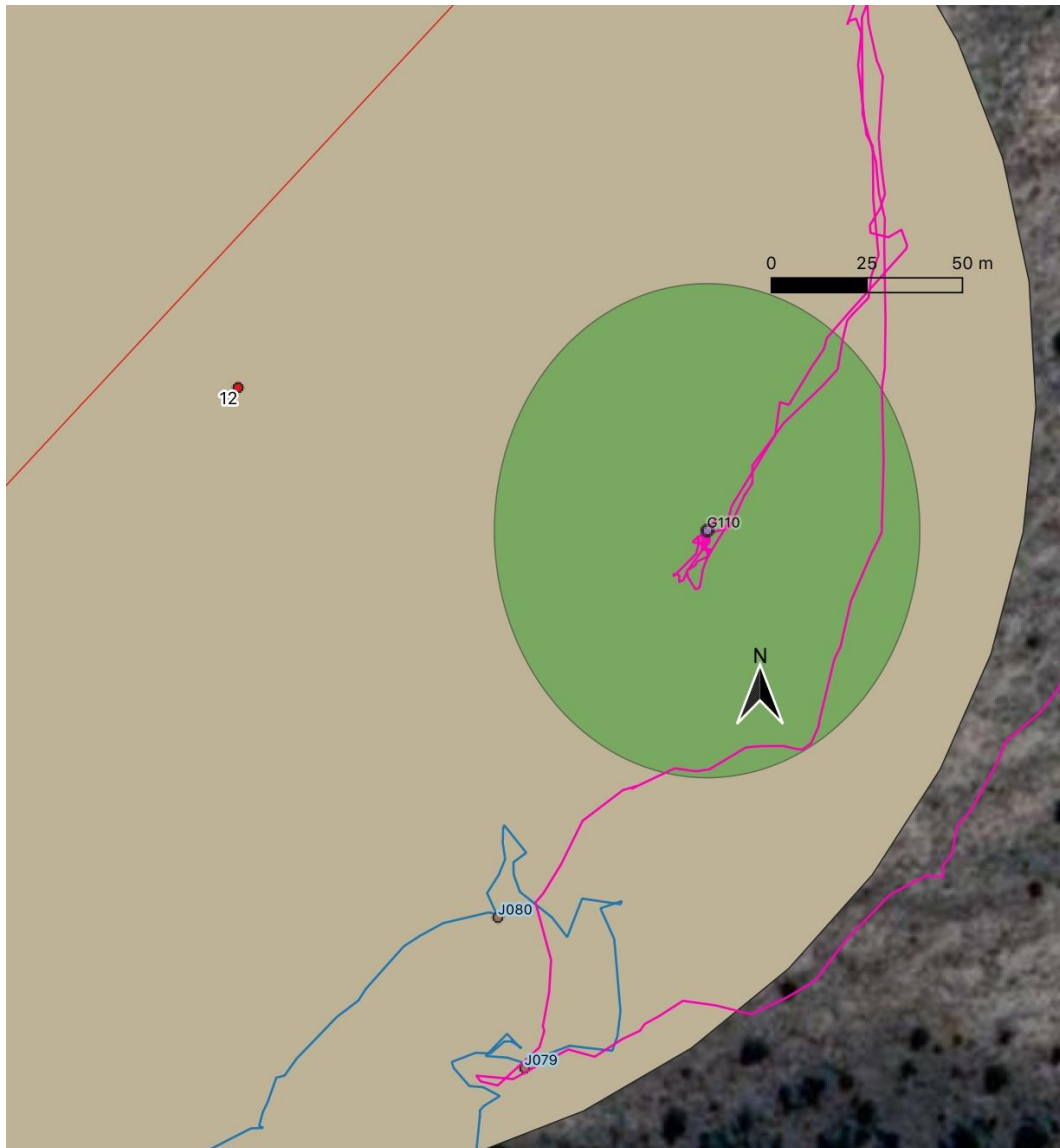


Figure 10: LSA scatter within the WTG24 hardstand buffer. The green shaded area is the extent of the recommended 60 m buffer. The lithic scatters (J079 and J080) recorded in 2011 are shown at the bottom of the image.

- Two lithics scatters, one MSA (J079) and the other a mixed MSA and LSA (J080) identified in the 2011 fieldwork by ACO are also located within the WTG 24 hardstand buffer (**Error! Reference source not found.**) but neither of these sites was assessed to be significant.

**No mitigation of these scatter is required, therefore no mitigation associated**

with the two lithic scatters need to be included in the updated EMPr.

### 5.3.2 Access Roads and Internal Project Roads

As well as visiting WTG positions, the walkdown survey addressed access and internal roads in the final site layout plan. As many of these road alignments as was possible were walked during the survey and MSA lithics of the type widely seen in the WEF area were noted at various places on or near the routes.

Only two archaeological sites of any significance were recorded:

- JG104 is a small, dense LSA hornfels scatter (Figure 11/ Plate 2) located approximately 20 m from the proposed road alignment between WTGs 28 and 24.

**It is recommended that JG104 is buffered by 20 m and avoided during construction or that archaeological sampling of the site takes place prior to construction.**



Figure 11: Proposed 20 m buffer (green shading) around LSA scatter JG104. The red line is the access road between WTG24 and WTG28.



Plate 2: Site JG104 in exposed area (left) and examples of lithics (right) (Photos: J Gribble).

- The second site is a historical ashheap (JG134) located near the Vendussie Kuil farm complex near the start of Access Road A (Figure 12).

**It is recommended that this midden is either avoided (with a suggested buffer of 20 m) or subject to archaeological sampling prior to construction.**



Figure 12: Location of historical ashheap (JG134) adjacent to Vendussie Kuil farm complex (JG133).

The walkdown survey confirmed that two portions of internal road within the final layout plan are located inside the 500 m buffers around the historical Kranskop and Vendussie Kuil farm

complexes (Figure 13).

Both farm complexes are unoccupied, and the buildings at Vendussie Kuil are falling into disrepair with vandalism of particularly the 1970s era main house evident. The HIA (Webley & Orton, 2011) determined that neither of these werfs is of high significance and suggested a grading of 3C for both. This grading was confirmed by the walkdown survey site visits in 2022.

In the absence of clearly established guidelines in the Northern Cape, the 2011 HIA supported the guidelines of the Western Cape Provincial Government (2006) that recommend that turbines are placed at least 500 m from occupied farm buildings. The HIA recommendation also allows discretion to reduce this buffer if the building contains no elements of heritage significance or is unoccupied.

A similar recommendation is made in the Addendum report (Webley & Halkett, 2015), this time specifically in respect of access roads and historical buildings. Here the proposed buffer is 400 m and the recommendation again includes the same discretion to reduce the buffer if the buildings contain no elements of heritage significance.

However, these recommendations have been translated in EA Condition 59 into a single requirement for a 500 m buffer around all historical buildings which takes no account of the two recommended buffer sizes for different WEF infrastructure elements and omits the discretion of the heritage specialist to reduce the buffer if a building contains no elements of heritage significance or is unoccupied.

Historic structures are sensitive to physical damage through neglect, vandalism and demolition. They are also context sensitive, in that changes to the surrounding landscape will affect their significance.

In this regard the walkdown survey found that despite passing through the 500 m buffers, neither portion of access road within the buffers around the farm complexes at Kranskop and Vendussie Kuil will result in direct impacts to the historical buildings. All turbine locations are well outside the 500 m buffers.

In the case of Vendussie Kuil, however, the construction of a new access road parallel to and within 70 m of the existing road past the farm complex is likely to result in an unnecessary visual impact, this in addition to the direct impact it will have on the ashheap (JG134).

Given the low heritage significance of the Vendussie Kuil farm complex, the fact that it is unoccupied, and the unnecessary changes to the surrounding landscape rerouting the proposed new access road outside the 500 m will cause, we are of the opinion that:

- **The access road should be permitted to cross the 500 m buffer; and**
- **Instead of constructing a new road within the buffer, the existing farm road should, if possible, be upgraded, within the buffer zone, thereby limiting the impacts of the WEF on the farm complex.**

### **5.3.3 Construction Laydown Areas and On-site Substation**

The locations of the two proposed construction laydown areas and the on-site substation within the WEF are shown on Figure 2. A third laydown area is located on the southern access road (Access B) on the farm Knapdaar.

The survey of the laydown area on the farm Vendussie Kuil 165 identified occasional, isolated and patinated MSA lithics of the type found widely across the WEF site. Freshly broken hornfels was noted on the existing farm road at J129 adjacent to the laydown area, but no identifiable artefacts were recorded, and the exposure was assessed to be non-archaeological.

The walkdown survey confirmed that the eastern edge of the laydown area near the Kranskop farm werf overlaps by roughly 50 m with the 500 m buffer in place around this farm complex (Figure 14). This will have no impact on the farm werf, which is located on the far side of an intervening hill, and the location of the laydown area is therefore acceptable from a heritage perspective.

**It is recommended that this minor overlap be permitted.**

Based on the surveys undertaken at the laydown area and the adjacent on site substation, it is possible to make the following archaeological assessment:

- Patinated, low-density scatters of MSA lithics of the type found widely across the WEF area. A single scatter of hornfels LSA lithics, JG013, was recorded. These sites were all assessed to be of low archaeological significance.

**No mitigation was or is suggested for them.**

## **6 IMPACTS DURING CONSTRUCTION PHASE**

The following physical impacts to the landscape can be expected:

- Establishment of three construction laydown areas.
- Bulldozing of internal roads to WTG sites with a possibility of cut and fill operations in places.
- Upgrading of some existing farm roads and tracks.
- Creation of hard standing of compacted gravel with approximate footprint up to 0.47 Ha per WTG, adjacent to and surrounding each WTG.
- Excavation of foundations for each WTG.
- Excavation of linear trenches for underground cables.
- Erection of a 33 kV power line between WTG 21 and WTG 24.
- Construction of an on-site substation, and Control and O&M buildings.

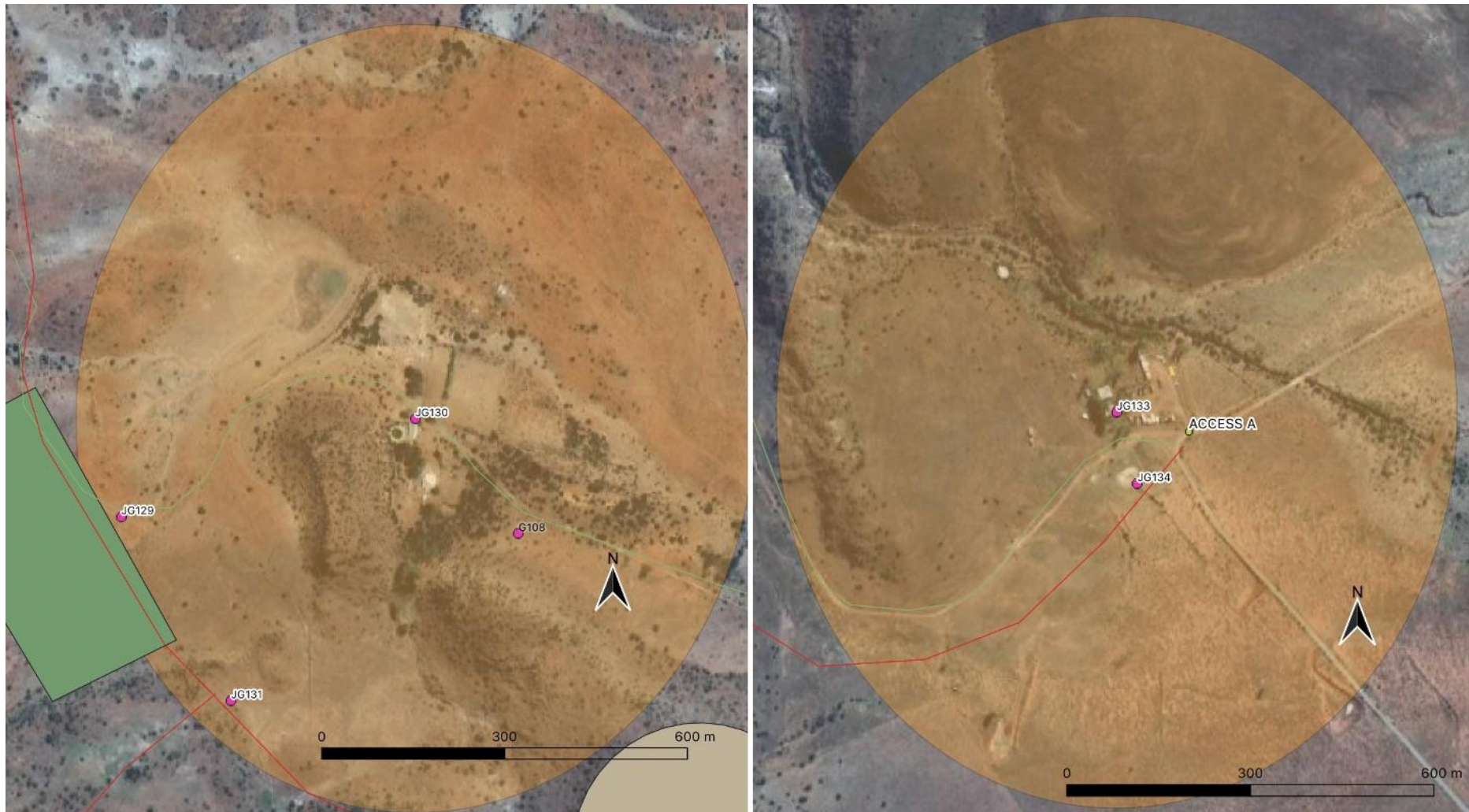


Figure 13: 500 m buffers around the Kranskop (left) and Vendussie Kuil (right) farm complexes (orange circles). The red lines in each image represent proposed access roads in the final layout plan which fall within each buffer zone. The green polygon in the image on the left is the construction laydown area west of Kranskop.

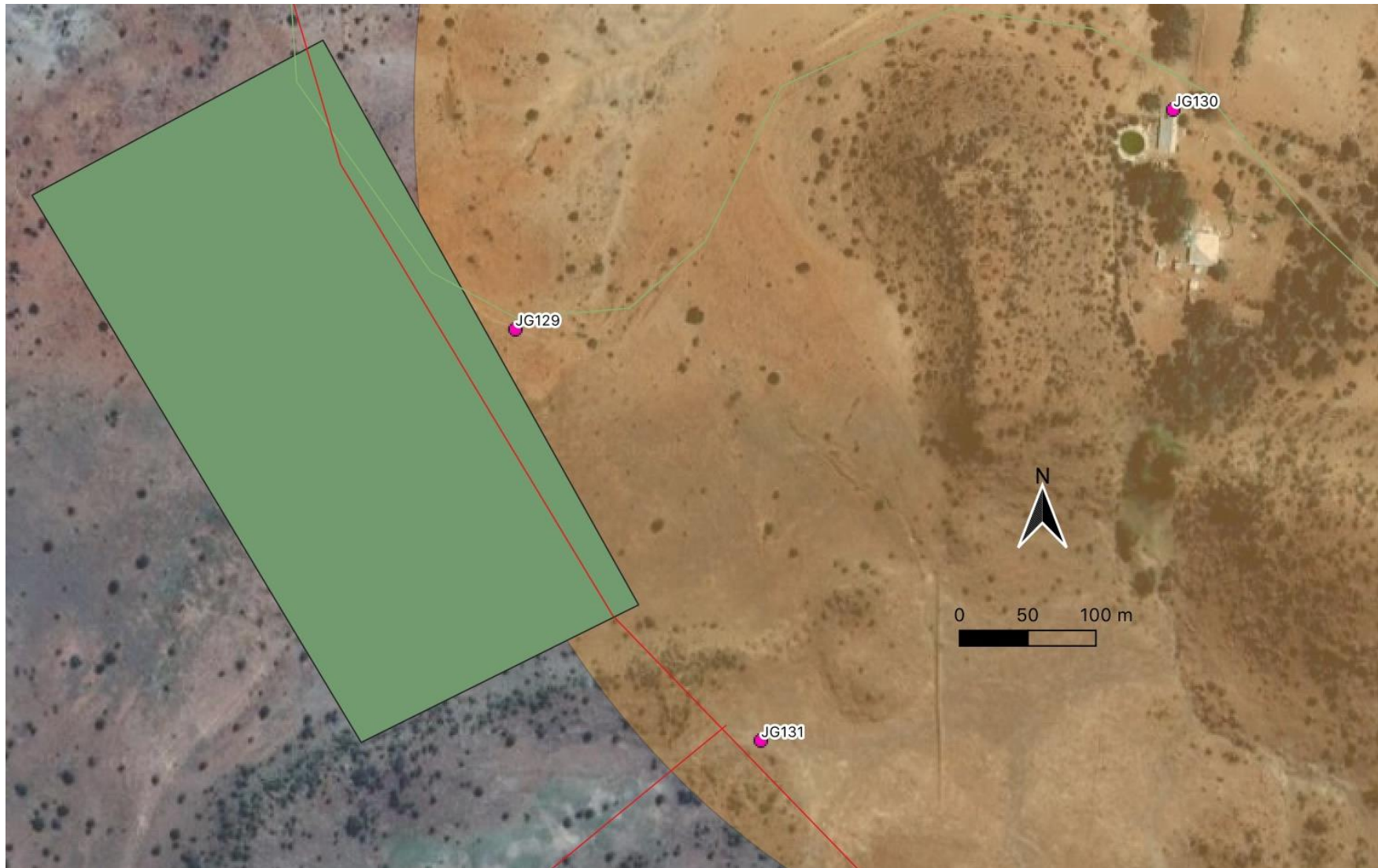


Figure 14: Detail of the overlap of the proposed construction laydown area (green polygon) with the 500 m buffer around the Kranskop farm complex (JG130), which is acceptable from a heritage perspective.

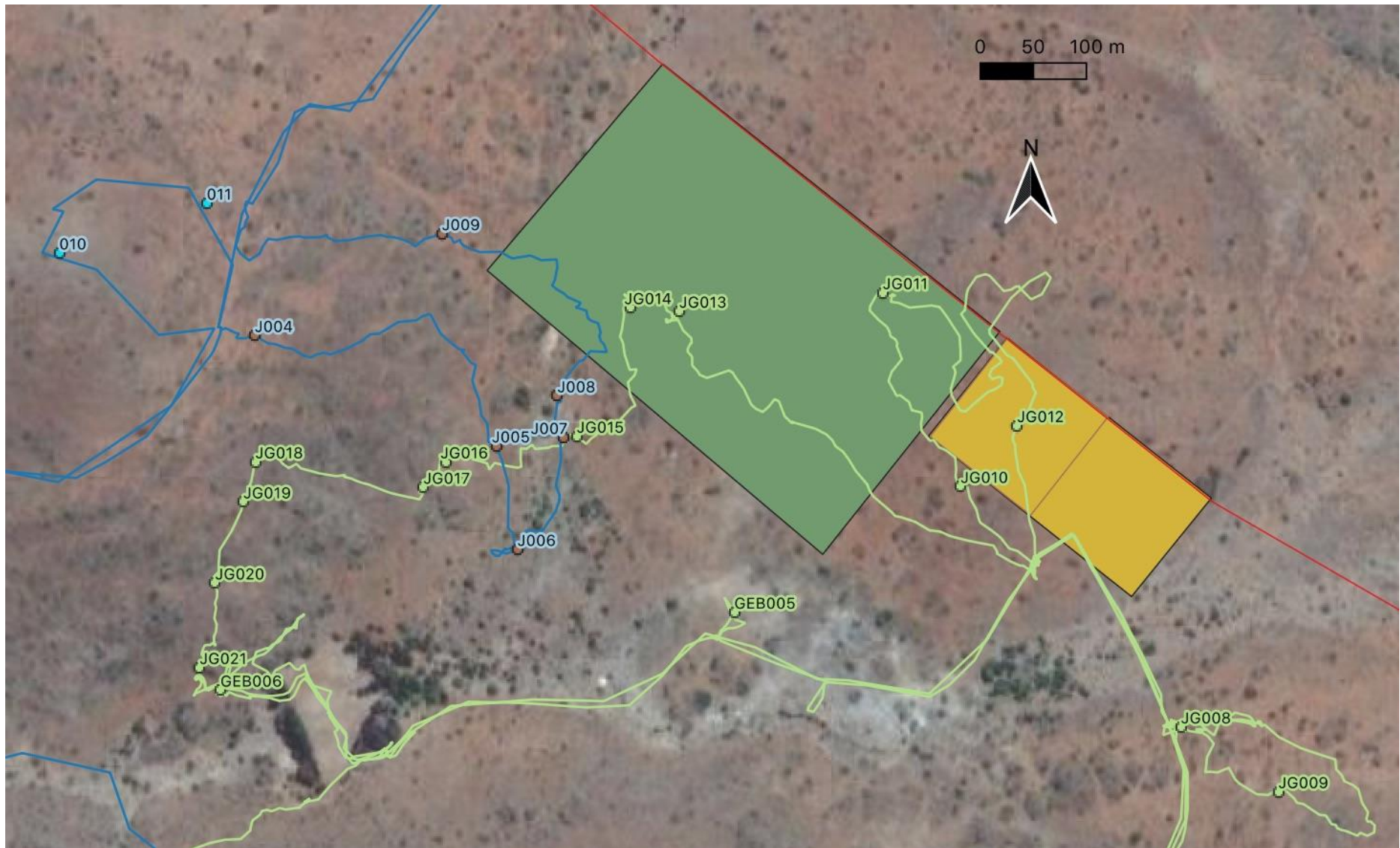


Figure 15: Sites located in 2011 and 2020 on and around the proposed onsite substation. 2011 survey = blue lines and numbering; 2020 survey = green lines and numbering.



## **6.1 Impacts to Pre-Colonial and Colonial Archaeology**

The fieldwork which was undertaken during the walkdown has confirmed the widespread occurrence of MSA material of relatively low significance across much of the WEF and the overall impacts to this material arising from the activities listed above will be relatively low.

Furthermore, the sheer volume of scattered artefacts on this vast landscape means that the combined overall impact of roads, turbines and infrastructure is, in terms of the broader picture, low.

None of the three archaeological sites identified in the 2011 HIA as requiring mitigation (J093-J096, 043/J089 and 064-066) will be impacted by the final layout plan and the requirement to sample them can fall away and, therefore, does not need to be included in the updated EMPr for the project).

However, four sites located during the walkdown survey and described above (G110, G113, J104 and J134) are likely to be impacted by the final layout plan and must either be buffered and avoided, or subject to archaeological sampling prior to construction. If mitigation in respect of any of these sites is required, a permit for the work will need to be obtained from SAHRA by a suitably qualified archaeologist and the work carried out prior to construction commencing.

The historic kraal complexes identified at various places within the WEF represent an unrecorded slice of the 19<sup>th</sup> century farming settlement pattern in this part of the Karoo. These kraal complexes have not been studied or described and their destruction would result in a loss of heritage. All the known kraal complexes are avoided by the final layout plan but must also be demarcated and labelled as no go areas during construction to ensure that there is no impact to them.

There is always the chance that buried archaeological material will be exposed during earthworks for the WEF. All archaeological material over 100 years of age is protected and may only be altered or removed from its place of origin under a permit issued by SAHRA.

In the event of anything unusual being encountered, the project archaeologist and SAHRA must be notified and consulted immediately so that mitigatory action can be determined and be implemented, if necessary. Mitigation is at the cost of the developer, while time delays and diversion of machinery/plant may be necessary until mitigation in the form of conservation or archaeological/palaeontological sampling is completed.

## **6.2 Impacts to the Built Environment**

In the absence of clearly established guidelines in the Northern Cape for the minimum distance between WTGs and buildings/structures older than 60 years, the 2011 HIA relied on the guidelines of the Western Cape Provincial Government. These recommend that WTGs are placed at least 500 m from occupied farm buildings. This buffer may be reduced if the building is unoccupied.

The walkdown survey found that the portions of access road within the 500 m buffers around the farm complexes at Kranskop or Vendussie Kuil will result in no direct impacts to the historical buildings. In the case of Vendussie Kuil, however, the construction of the access road parallel to and within 70 m of the existing road past the farm complex is likely to result in an unnecessary and avoidable visual impact. Given the low heritage significance of the

Vendussie Kuil farm complex, the fact that it is unoccupied, and the unnecessary changes to the surrounding landscape the access road in the final layout plan will cause, we are of the opinion that:

- The access road should be permitted to cross the 500 m buffer; and
- Instead of constructing a new road, the existing farm road should, if possible, be upgraded, within the buffer zone, thereby limiting the impacts of the WEF on the farm complex.

The overlap of the laydown area near the Kranskop farm werf with the 500 m buffer in place around this complex will have no impact on the farm werf, which is located on the far side of an intervening hill, and it is recommended that this overlap be permitted.

### **6.3 Impacts to Cemeteries and Graves**

Except for the pair of modern graves at Kranskop (which do not fall within the ambit of the NHRA), no other graves or cemeteries have been identified within the footprint of the DA2S WEF.

Furthermore, the buffering of the historical farm werfs and the avoidance of all identifiable kraal complexes effectively removes those places most likely to have historical burials associated with them from potential impact by the WEF. Impacts to historical graves and burials arising from the construction of the WEF are thus unlikely.

Unmarked, pre-colonial graves may occur within the WEF, but they are likely to be located along river courses and within valleys where there is soft soil suitable for interment. These areas are generally avoided by the final layout plan and impacts to pre-colonial burials are unlikely.

In the event that any human remains be disturbed, exposed or uncovered during excavations and earthworks for the WEF, work in the vicinity must cease, the remains made secure, preferably in situ and the project archaeologist and SAHRA notified immediately. Buried remains should not be removed until inspected by an archaeologist.

## **7 IMPACTS DURING THE OPERATIONAL PHASE**

During the operational life of the wind farm, it is expected that physical impacts to heritage will diminish or cease.

Impacts to intangible heritage are expected to occur. Such impacts relate to changes to the feel, atmosphere and identity of a place or landscape. Such changes are evoked by visual intrusion, noise, changes in land use and population density.

## **8 MITIGATION MEASURES RECOMMENDED FOR INCLUSION IN THE REVISED EMPR**

The following site specific mitigation measures included in this report for the final layout must be included in the updated EMPr for the project. These mitigation measures replace those included in the HIA (2011) and Addendum report (2015).

- Four archaeological sites located in 2022 in proximity to access roads to WTGs require either avoidance or mitigation in the form of archaeological sampling. These are:
  - JG104 – 20 m buffer or mitigate;
  - G110 – 60 m buffer or mitigate;
  - G113 – 30 m buffer or mitigate; and
  - JG134 – (historical ashheap near the Vendussie Kuil farm complex that is crossed by Access Road) - 20 m buffer or mitigate.

If the mitigation of any of these sites is chosen, a permit for the work will need to be obtained from SAHRA by a suitably qualified archaeologist and the work must be carried out prior to construction commencing.

- Any new finds of significant archaeological material must be reported immediately to the project archaeologist and SAHRA so that mitigatory action can be determined and be implemented, if necessary. Mitigation is at the cost of the developer, while time delays and diversion of machinery/plant may be necessary until mitigation in the form of conservation or archaeological sampling is completed.
- All identified stone-walled kraals must be avoided during construction. ACO has provided the locations of these kraals for inclusion in the Environmental Sensitivity Map for the final layout plan and the kraal complexes must be demarcated prior to construction and labelled as no go areas during construction.
- The 500 m buffers in place around the Kranskop and Vendussie Kuil farm werfs will remain although:
  - The small overlap of the laydown area and access road with the Kranskop buffer is permitted; and
  - The access road within the Vendussie Kuil buffer is permitted, but that instead of constructing a new road within a short distance of the farm complex, the section of the existing farm road within the buffer is upgraded to serve as the access road, thereby limiting the impacts of the WEF on the farm complex.
- Should any human remains be disturbed or uncovered during excavations and earthworks for the WEF, work in the vicinity must cease, the remains made secure, preferably in situ and the project archaeologist and SAHRA notified immediately. Buried remains should not be removed until inspected by an archaeologist.

## 9 CONCLUSIONS AND RECOMMENDATIONS

In terms of the acceptability of the proposed final WEF layout to heritage resources, and as recommended by the 2011 HIA and 2015 Addendum report, the following can be stated:

- Access roads in the final layout plan generally avoid the lower slopes of valleys and riverbanks thereby reducing the overall potential risk to kraal complexes.
- All identified stone-walled kraals have been avoided by the final layout plan.
- The final layout plan avoids the three archaeological sites identified in the 2011 HIA. None of these sites will thus be impacted by the final layout plan and the requirement that they are archaeologically sampled can fall away.
- Buffers have been implemented around the Kranskop and Vendussie Kuil farm werfs.

The 2022 walkdown survey of the final WEF layout identified several new archaeological sites and occurrences, most of which are of low heritage significance.

Of the sites identified, it is **recommended** that four (G110, G113, J1G04 and JG134) require either buffering and avoidance during construction or pre-construction archaeological sampling.

The small overlap of the laydown area and access road with the Kranskop buffer is not considered significant and it is **recommended** it be permitted.

It is **recommended** that the access road within the Vendussie Kuil buffer is permitted, but that instead of constructing a new road within a short distance of the farm complex, the section of the existing farm road within the buffer is upgraded to serve as the access road, thereby limiting the impacts of the WEF on the farm complex.

Although there remains some potential for impacts to heritage resources arising from the construction of the WEF according to the final site layout plan, these impacts are not likely to be significant given the overall nature of archaeological and palaeontological resources in the area

It is our reasoned opinion, therefore, that the final site layout plan has avoided and excluded most identified heritage resources and, as a result, there is neither an increase in the level of impacts or change in the nature of the impacts expected to arise from the construction of the WEF.

Provided the mitigation measures set out above are included in the EMPr and effectively implemented before and during construction, the final site layout plan is considered acceptable from a heritage perspective and development can proceed.

## 10 REFERENCES

- Gribble, J. and Euston-Brown, G.L. 2020. *Heritage Impact Assessment: Proposed Grid Connection and Switching Station for the De Aar 2 South Wind Energy Facility, De Aar, Northern Cape*. Unpublished report prepared for Arcus Consultancy Services South Africa (Pty) Ltd. ACO Associates. Cape Town.
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## 11 APPENDIX 1: LIST OF HERITAGE SITES RECORDED IN 2022 WALKDOWN SURVEY

DA2S WEF – 2022 Walkdown Survey				
Waypoint	Latitude	Longitude	Description	Grade
JG101	-30.641875°	24.332748°	Dense cluster of hornfels lithics eroding out of the red coversands in a donga system. Some heavily patinated MSA pieces but mostly appears to be LSA (Smithfield?). Blade dominated with a few retouched pieces. 2 x endscrapers. Number of bladelet cores. Visible eroding out over ±50 m <sup>2</sup> but lithic number are lower.	3C
JG102	-30.644576°	24.326108°	Ephemeral scatter of heavily patinated and worn MSA lithics in red sand lying on dolerite outcropping. ±1 piece / m <sup>2</sup> .	NCW
JG103	-30.643049°	24.320822°	Lithic scatter on outcropping dolerite. Mostly heavily patinated and slightly worn MSA on hornfels. Triangular flakes and core. Some LSA lithics present in a small area (±2 m <sup>2</sup> ). Lithics visible in area of ±20 x 5 m.	3C
JG104	-30.643048°	24.320256°	Dense LSA scatter on hornfels. ±20 pieces / m <sup>2</sup> . Mostly fresh but some with light grey patination. Bladelets, one with retouched end and an endscraper noted. Smithfield? More lithics noted in surrounding unvegetated areas. <b>Avoid (20 m buffer) or Mitigate</b>	3C
JG105	-30.642532°	24.315251°	Ephemeral scatter of red patinated and worn MSA lithics made on hornfels. Visible in ±4 m <sup>2</sup> . Maximum of 5 pieces / m <sup>2</sup> .	NCW
JG106	-30.642578°	24.315167°	Dense scatter of patinated MSA lithics. Hornfels. On dolerite substrate in red coversand. Exposed by erosion in an area ±1.5 m wide x 3 m long. 20-30 pieces / m <sup>2</sup> .	3C
JG107	-30.642416°	24.315013°	Mixed MSA and LSA (Lockhoek?) scatter. Same context and density as JG1067 but with LSA in the majority.	3C
JG108	-30.627496°	24.286731°	Ephemeral scatter of red patinated MSA on hornfels. Covers area of approximately 20 m <sup>2</sup> .	NCW
JG109	-30.622084°	24.294946°	Extensive and dense (in patches) MSA lithic scatter. Heavily rolled and patinated hornfels. Eroding out of a thin coversand on a wider dolerite plaat on the edge of a stream. Occasional piece of LSA reuse.	3C
JG110	-30.622435°	24.295375°	On opposite side of stream from JG109. LSA in profusion with some patinated MSA. Eroding out of banks of red sand. No retouched pieces noted, however.	3C
JG111	-30.622286°	24.295744°		3C
JG112	-30.623695°	24.297081°	MSA and LSA lithics in shallow erosion gully. Includes a large Lockshoek sidescraper. In area of ±2 x 15 m.	3C
JG113	-30.624503°	24.296758°	Dense but very worn "scree" of MSA hornfels lithics. Lage flakes. Some could be ESA	3C
JG114	-30.625666°	24.297928°	Mixed assemblage of LSA and MSA lithics on hornfels "scree". The hornfels cobbles and pebbles are the source of the raw material for the artefacts. At least 60 m <sup>2</sup> in extent.	3C
JG115	-30.630393°	24.305521°	LSA stone scatter. Smithfield artefacts on hornfels. 2 x quartz crystal. Rough extent = 50 x 50 m.	3C
JG116	-30.638698°	24.316766°	Fresh hornfels lithics in road cutting. With OES and bone fragments including tortoise. Visible in small area of ±4 m <sup>2</sup> . Possibly sealed context site. Both Smithfield and Lockshoek material present.	3B
JG117	-30.651064°	24.318968°	Heavily patinated and worn MSA scatter on level, open nek between two koppies. Hornfels. Large	3C

			blades, cores and chunks. Most dense in area of $\pm 15$ m <sup>2</sup> but more lithics likely in surrounding area.	
JG118	-30.653848°	24.316049°	Hornfels outcropping and scree on nek between koppies. Some possible MSA lithics although much of the breakage is probably natural. Possible raw material source.	NCW
JG119	-30.653510°	24.314419°	Ephemeral MSA scatter on dolerite boulder slope just below summit of a high koppie. Hornfels and patinated light red. 1 x Levallois flake noted, otherwise flakes, some blades and chunks. $\pm 10$ m <sup>2</sup> area.	NCW
JG120	-30.653391°	24.313339°	Band of hornfels and lightly baked grey shale. Lots of natural breakage but some MSA flakes seen including some very large flakes (bigger than a hand) which may be ESA. The lithics extend to roughly the position of JG121 down the slope. Looks like linked to exposure in the flanks of a dolerite outcrop of good hornfels.	NCW
JG121	-30.652999°	24.312500°		
JG126	-30.569132°	24.313862°	Kraal and hut complex within dolerite heuweltjies. 2 x packed dolerite boulder kraals. Wall height up to 75 cm. Rectangular. $\pm 5$ x 9 m (JG124) and 14 x 11 m (JG125). 2 x circular huts (G106 and G107) approximately 2 m across. Small collection of ceramics – at least 2 x dishes and 1 x cup. Fragments of clear glass bottle and some tins. Avoid	3C
JG127	-30.569229°	24.313845°		
G106	-30.569347°	24.313751°		
G107	-30.569481°	24.314021°		
JG128	-30.569205°	24.314513°	Packed stone circular hut approximately 50 m east of the rest of the complex. Roughly same dimensions as other huts. Avoid	3C
JG130	-30.578140°	24.320469°	Kranskop farm complex – house, barn, kraal and more modern workers' cottages. Complex is well maintained but appears not be currently be in use. G108 is a small family graveyard on the eastern edge of the complex. Names on the graves are Venter.	3C
G108	-30.579597°	24.321990°		
JG131	-30.581717°	24.317755°	Scatter of worn and patinated MSA lithics (hornfels) on flat dolerite plaat between hills. Wet with seasonal seep crossing the plaat. Approximately 5 m <sup>2</sup> . 5-10 pieces of stone / m.	NCW
JG132	-30.583990°	24.326553°	Ephemeral litter (5-6 pieces) of worn and patinated hornfels. MSA	NCW
JG133	-30.587128°	24.341673°	Vendusie Kuil farm complex. Old barn / store with more modern (1970s?) flat roofed farmhouse. Older building behind house housing electrical generator. 3 x labourer's cottages on hill behind house.	3C
JG134	-30.588031°	24.341977°	Historical ashheap adjacent to the Vendusie Kuil farm complex. <b>Avoid (20 m buffer) or Mitigate</b>	3C
G101	-30.623441°	24.298500°	Ephemeral scatter of worn and patinated MSA hornfels lithics along a small stream. Lithics extend about 30 m along the stream. Some fresh flakes noted. No formal tools seen	NCW
G102	-30.623936°	24.297779°	Dense lithic scatter on low rocky outcrop SW of G101. Well patinated MSA flakes but also fresh LSA(?) lithics. Three cross-mending pieces of pottery noted. Lithics recorded in an approximately 40 m radius of the outcrop.	3C
G109	-30.585153°	24.335351°	Worn and patinated MSA flakes and cores in an area of roughly 25 m <sup>2</sup> . Ephemeral	NCW
G110	-30.595656°	24.330355°	LSA site on top of a koppie in open area approximately 50 x 60 m. Hornfels. Cores, flakes and chips/chunks predominate. About 40-50 pieces / m in the densest areas. <b>Avoid (60 m buffer) or Mitigate</b>	3C
G111	-30.597811°	24.335694°	Scatter of hornfels lithics between dolerite outcrops. Not dense. But covering and area of 50 x 40m. Mix of MSA and LSA.	3C
G112	-30.597615°	24.333814°	Small scatter of patinated and worn MSA lithics on flat rocky waterway. Retouch (old) still visible	NCW

			on some. Area of approximately 30 x 20 m, but lithics noted more widely across whole hillside.	
G113	-30.601482°	24.334688°	Area of hornfels cobbles many of which seem to have been flaked. Big flakes also present. MSA quarry site? <b>Avoid – 30 m buffer</b>	3C
G114	-30.598322°	24.338857°	Packed rock cairn. Possible boundary marker?	3C



**Appendix B: Turbine Blade Painting as Avifaunal Specialist Mitigation Measure - Heritage Specialist Comment**

(See separate pdf file)



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Date: 16 September 2022

Nicole Holland  
Holland and Associates Environmental Consultants  
PO Box 31108  
Tokai  
7966  
e-mail: nicole@hollandandassociates.net

Dear Nicole,

**DE AAR 2 SOUTH WIND ENERGY FACILITY: ADOPTION OF AVIFAUNAL SPECIALIST MITIGATION MEASURE - HERITAGE SPECIALIST COMMENT.**

The developer for the De Aar 2 South Wind Energy Facility (WEF) in responding to the avifaunal specialist, Chris van Rooyen's recommendation that one of the blades of each turbine be painted, as an avifaunal mitigation measure (Figure 1), has requested comment in terms of the impacts on heritage as a result of implementing this recommendation. As this change is only likely to result in a visual change and not result in any change to physical heritage objects and sites, the comments of the visual impact specialist in this regard is noted since visual heritage is part of the overall heritage considerations of the project.

The Visual Specialists have been requested to compile a short separate specialist comment to address the acceptability of the proposed blade painting for the Mulilo De Aar 2 South WEF, including whether or not it will result in an increased level or change in the nature of visual impacts.

The original Visual Impact Assessment (VIA) was prepared by Karen Hansen in 2011 but she has subsequently retired and the services of Mr Lawson and Mr Oberholzer have been retained in her stead. Her original Visual Impact Assessment (VIA) included mitigation measures which indicated that blades must be white (with no stripes, decals or logos). However, before Ms Hansen retired, she provided a specialist comment relating to the same type of blade painting for the existing De Aar 2 North WEF project, confirming that it would be acceptable.

Given that the proposed mitigation measure relating to the colour of the turbine blades on the De Aar 2 South WEF is a change to the mitigations contained in the original VIA of 2011, this current statement addresses changes that may result from the proposed blade painting which will be addressed in the Environmental Management Programme (EMPr) update process.

**Comments of the Visual specialist**

**Methodology**

The Authors were not involved in the original VIA and therefore do not have any photomontages to compare the visual effect of the painted blades painting with the original unpainted blades. They have instead prepared a series of images depicting the proposed turbines at a range of distances with an unpainted turbine blade, as well as black and red-painted blades, (see Figures 2 and 3). The images are theoretical, and provide an over-simplification, as in reality there would be topographic variation and other terrain.

**Findings and Conclusion**

Figures 2 and 3 indicate that the painted turbine blades would be clearly visible from 0 to 2km distance, and moderately to marginally visible from 2 to 5km distance. From 5km and beyond the

visibility of the painted blades would be negligible to not visible. The red-painted blade would be slightly more visible than the black-painted one.

Given that nearby receptors, such as farmsteads, are generally 2km and much further in distance from the proposed Mulilo De Aar 2 South WEF, the overall visual significance would range from moderate to mostly negligible and not visible.

The following mitigation measure was included in the original VIA: "The colour finish of the turbines: paint treatment: white, matte, no stripes, decals, logos" could be amended to "The colour finish of the turbines: Paint treatment: white, matte, no stripes, decals, logos preferable, however painting of one of the blades of each turbine (with red or black), as per avifaunal specialist recommendations, is acceptable".

The conclusion that can be drawn from this theoretical exercise is that the overall visual impact significance ratings for the proposed WEF would not change as a result of the painted turbine blades, and the proposed painting of the blades is considered acceptable from a visual impact perspective. The painting of turbine blades is likely to become more common as a bird mitigation measure for WEFs in the future, which needs to be taken into consideration.

### **ACO Associates comment on the proposal**

The proposed colour change can in no way impact any physical heritage built environment or archaeological resources as previously assessed in the project area (Webley and Orton 2011, Webley and Halkett 2015, Gribble 2022).

Since the overall visual impact significance ratings for the proposed WEF would not change as a result of the painted turbine blades it is our finding that:

- The proposed amendment (i.e. painting one of the blades of the turbines red as per Figure 1 option 4) would not result in an increased level or change in the nature of heritage impacts;
- The proposed amendment would not result in a change to the significance ratings in our previous heritage assessments for the projects;
- The proposed amendment would not require any changes or additions to the mitigation measures outlined in our previous heritage assessments for the projects.

### **Conclusion**

It is therefore our conclusion that: Painting of one of the blades of the turbines as described is acceptable from a heritage impact perspective.

### **References:**

Gribble, J. 2022. Heritage walkdown survey report for the final layout of the Mulilo De Aar 2 South Wind Energy Facility, Northern Cape Province. Unpublished report prepared for Holland and Associates Environmental Consultants on behalf of Mulilo De Aar 2 South (Pty) Ltd. ACO Associates cc.

Lawson, Q. and Oberholzer, B. 2022. Proposed Mulilo De Aar 2 South Wind Energy Facility near De Aar, Northern Cape Province: Visual Specialist Comment on proposed Turbine Blade Painting. Unpublished report prepared for Holland & Associates Environmental Consultants on behalf of Mulilo De Aar 2 South (Pty) Ltd. Quinton Lawson, Architect and Bernard Oberholzer, Landscape Architect.

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Webley, L & Halkett D. 2015. Addendum: Proposed wind energy facility situated on the eastern plateau (south) near De Aar, Northern Cape Province (De Aar 2 south). Unpublished report prepared for Holland & Associates Environmental Consultants on behalf of Longyuan Mulilo De Aar 2 South (Pty) Ltd. ACO Associates cc.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'D. Halkett', with a horizontal line underneath.

David Halkett: Director  
For ACO Associates cc

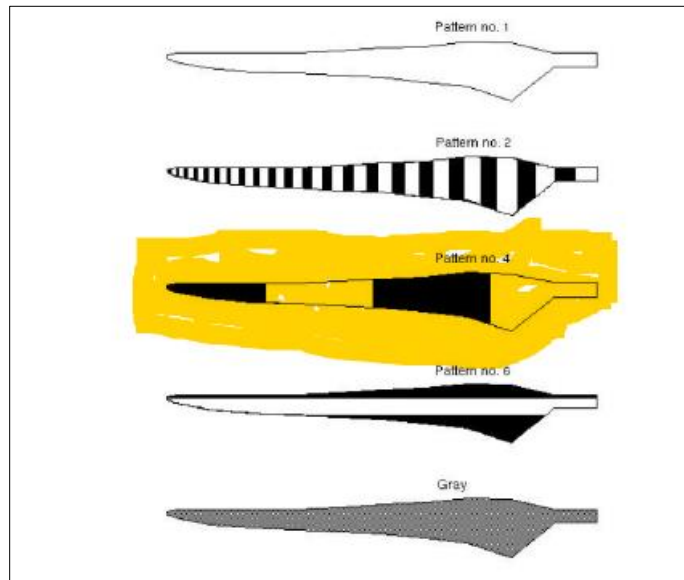


Figure 1: The Avifaunal specialist recommendation is that all turbines must have one blade painted in signal red according to pattern no.4

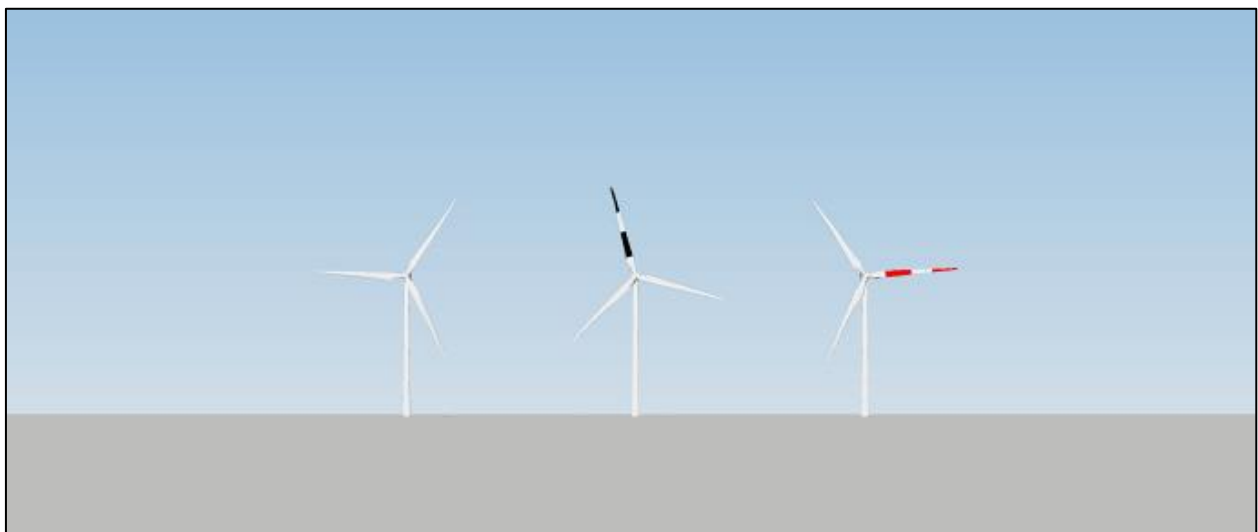


Figure 2: Scale of proposed turbines and painted blades at 2km

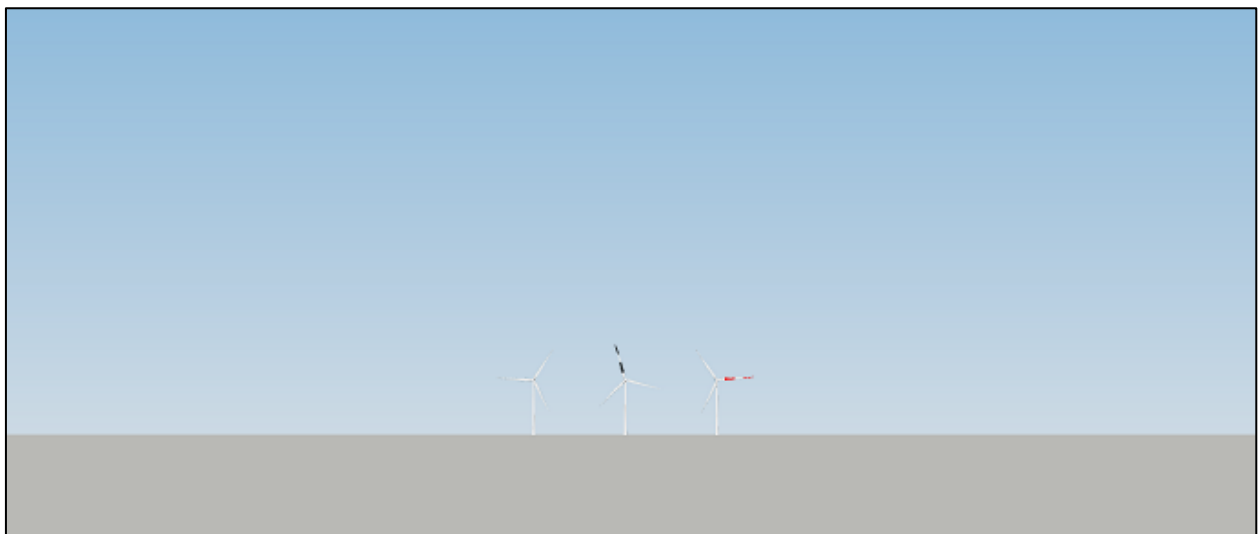


Figure 3: Scale of proposed turbines and painted blades at 5km



Figure 3: Example of existing De Aar 2 North turbines at about 3km (source : Google Earth - 'Earthview')