

# DESKTOP HERITAGE IMPACT ASSESSMENT: PROPOSED MINING OF TWO BORROW PITS ON THE REMAINDER OF FARM ENKELDEBULT 150, SOUTH OF PHILLIPSTOWN, NORTHERN CAPE

(Assessment conducted under Section 38 (8) of the  
National Heritage Resources Act No 25 of 1999)

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## EXECUTIVE SUMMARY

ACO Associates cc was appointed by TBL Consulting to undertake a Desktop Heritage Impact Assessment for the mining of two borrow pits located to the south of Phillipstown, off the R389 to Hanover.

The client has applied for a mining permit to excavate aggregate from existing borrow pits (Quarry 1 and Quarry 2) within a 3km kilometre radius of the site camp authorised for the construction of the Longyuan Mulilo De Aar 2 North windfarm on Enkeldebult Farm, Remainder of 150.

A field assessment of the area immediately adjacent the borrow pits was undertaken by Halkett & Webley in 2014, during the walkdown for the new access road and construction yard for the De Aar 2 North Wind Energy Facility.

During that survey, we identified:

- A stone-walled kraal on a little rocky ridge immediately south of the Enkeldebult farmhouse and gravel road, over-printing a scatter of MSA and LSA archaeological remains;
- The red brick ruins and associated rubbish dump of the original 19<sup>th</sup> century farmhouse and buildings of Enkeldebult;
- No graves were identified although there is a possibility that graves may have been situated near the farmhouse ruins.

An assessment of aerial photographs (Google Earth) of the locations for Quarry 1 and Quarry 2 do not suggest any historical remains (such as stone kraals) which might be impacted.

No impacts are expected to the Built Environment or Cultural Landscape.

It is recommended that mining of the borrow pits may proceed but the following recommendations should be enforced:

It is possible that fossil material or human remains may be uncovered during excavations for the borrow pits.

- If any fossil material is uncovered, the ECO should notify the South African Heritage Resources Association (SAHRA) immediately (Tel: 021 462 4502);
- If any human remains are uncovered anywhere on the site, work in that area should stop immediately and SAHRA must be notified.

## ***Declaration of Consultants Independence***

I Lita Ethel Webley, as the appointed independent specialist hereby declare that I:

- act/ed 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: 12 February 2016

Lita Webley (PhD) is an archaeologist with 12 years of working experience in heritage throughout southern Africa and joined the Archaeology Contracts Office in 2008. She is accredited with Principal Investigator status with the Association of Professional Archaeologists of Southern Africa.

## 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 2500 000 years ago.

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

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

**Holocene:** The most recent geological time period which commenced 10 000 years ago.

**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 20-300 000 years ago associated with early modern humans.

**National Estate:** The collective heritage assets of the Nation

**Palaeontology:** Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

**Pleistocene:** A geological time period (of 3 million – 20 000 years ago).

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

**Structure (historic:)** Any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith. Protected structures are those which are over 60 years old.

## Acronyms

|       |   |
|-------|---|
| DEA   | Department of Environmental Affairs     |
| ESA   | Early Stone Age                         |
| GPS   | Global Positioning System               |
| HIA   | Heritage Impact Assessment              |
| LSA   | Late Stone Age                          |
| MSA   | Middle Stone Age                        |
| NHRA  | National Heritage Resources Act         |
| SAHRA | South African Heritage Resources Agency |

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## 1. INTRODUCTION

ACO Associates cc was appointed by TBL Consulting to undertake a desktop HIA for the mining of two quarries/borrow pits to the south of Phillipstown in the Northern Cape Province (Figure 1).



Figure 1: The quarries are located to the east of De Aar and south of Phillipstown, off the R389 to Hanover.

## 2. DEVELOPMENT PROPOSALS

The client has applied for a mining permit to excavate aggregate from two existing borrow pits within a 3 kilometre radius of the camp site authorised for the construction of a windfarm on the remainder of the farm Enkeldebult 150. The borrow pits are referred to as Quarry 1 and Quarry 2. The project forms part of a Basic Assessment to be undertaken in terms of the EIA Regulations of 2014 in order to obtain an Environmental Authorisation and a Mining Permit.

- No land outside of the demarcated borrow pits will be utilised for mining rock aggregate;
- Heavy machinery will stay within existing access roads and demarcated borrow pits;
- Any spillages of rock aggregate mined from the borrow pits will be cleaned up immediately.



Figure 2: The two borrow pits are located to the south of the Enkeldebut farmhouse and the gravel access road to the De Aar 2 North Wind Energy Facility.

### 3. HERITAGE LEGISLATION

This report is conducted in terms of Section 38 (8) of the National Heritage Resources Act, No 25 of 1999.

The NHRA provides protection for the following categories of heritage resources:

- Landscapes, cultural or natural (Section 3 (3))
- Buildings or structures older than 60 years (Section 34);
- Archaeological Sites, palaeontological material and meteorites (Section 35);
- Burial grounds and graves (Section 36);
- Public monuments and memorials (Section 37);
- Living heritage (defined in the Act as including cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships) (Section 2 (d) (xxi)).

#### 3.1 Grading

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

**Table 1: Grading of Heritage Resources**

| Grade | Level of significance | Description   |
|-------|-----------------------|---|
| I     | National              | Of high intrinsic, associational and contextual heritage value within a national context, i.e. formally declared or potential Grade 1 heritage resources. |

|      |            |   |
|------|------------|---|
| II   | Provincial | Of high intrinsic, associational and contextual heritage value within a provincial context, i.e. formally declared or potential Grade 2 heritage resources.         |
| IIIA | Local      | Of high intrinsic, associational and contextual heritage value within a local context, i.e. formally declared or potential Grade 3a heritage resources.             |
| IIIB | Local      | Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3b heritage resources.                               |
| IIIB | Local      | Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3c heritage resources. |

The grading of heritage sites, as prescribed in the NHRA, is only concerned with categories I, II and III. The subdivision of Grade III sites was introduced in the Western Cape.

## 4. METHODOLOGY

### 4.1 Background Literature study

Background research included a review of the published material as well as unpublished reports on the SAHRIS database. The 1:50 000 maps of the area as well as Google Earth aerial images were consulted. Numerous impact assessments have been conducted in the immediate vicinity of the quarries as the escarpment outside of De Aar is considered favourable for the generation of wind energy. ACO Associates have been involved in conducting heritage impact assessments on the plateau since 2010.

Numerous heritage reports have been completed on proposed wind and solar facilities in the immediate surrounds of De Aar and are listed in the references.

Specifically, during the assessment for the Longyuan Mulilo De Aar 2 North Wind Energy Facility, Webley & Halkett (2014) assessed the access road and proposed location for a construction yard on the farm Enkeldebult. This area is immediately adjacent the two quarries which are assessed in this report.

### 4.2 Assumptions and Limitations

This desktop assessment assumes that the archaeological survey conducted in 2010 (Webley & Orton) and 2014 (Webley & Halkett) has adequately identified the heritage resources in proximity to the proposed quarry mining and that no further field assessment is required.

A separate Palaeontological study has not been undertaken for the purposes of this study. The palaeontological results of surveys undertaken in this area for various wind energy facilities (Almond 2010; 2012; 2012b; 2013; Millsted 2014) have been summarized and included.

## 5. RECEIVING ENVIRONMENT

The study area is situated on a plateau to the east of De Aar and south of the town of Phillipstown. This part of the Northern Cape is characterised by wide open plains interspersed with koppies. The wind farms are proposed for a large flat plateau to the east of De Aar. The plateau rises at least 100 m above the surrounding plains. The plateau is typically flat and covered in typical Karoo scrub and grasses, but there are more dense clusters of trees in some of the deeply incised valleys. There are a number of dry stream beds which may flow periodically after summer rains.

## 5.1 Palaeontological Background

Numerous palaeontological impact assessments have been conducted of the De Aar area by Almond (2010, 2012a, 2012b & 2013) and Millstead (2014). Almond describes the area as being underlain by Middle Permian fluvial sediments of the Lower Beaufort Group (Karoo Supergroup) as well as Early Jurassic igneous intrusions of the Karoo Dolerite Suite. The Lower Beaufort rocks in this area contain a sparse fossil biota of mammal-like reptiles, true reptiles, vertebrate and invertebrate trace fossils, petrified wood and other plant fossils. Further Palaeozoic fossils remains are unlikely to be encountered in the western portions of the site, on Vendussie Kuil 165 and the western half of Knapdaar 8 since the bedrocks here are largely unfossiliferous dolerite and the Beaufort Group rocks have been intensely baked. In the central and especially the eastern parts of Knapdaar 8, however, valuable vertebrate and other fossil heritage may be present.

## 5.2 Archaeological Background

### *Early and Middle Stone Age*

The Karoo has a long pre-colonial history as testified by the many thousands of stone artefacts that can be found among surface gravels in many areas. The vast majority of these artefacts are heavily weathered indicating great antiquity and relate to the Early (ESA) and Middle Stone Ages (MSA). During their survey Webley & Orton (2010) reported on a widespread distribution of Middle Stone Age hornfels artefacts across the top of the plateau. No artefacts typical of the Howieson's Poort industry or bifacially worked points (Stillbay) were recognised. Archaeological sites with clearly defined margins could generally not be easily identified due to the universal spread (so-called "ancient litter") of the material. They were given a low significance grading.

### *Late Stone Age*

The LSA stone artefacts found in the Karoo are not very well understood, perhaps largely as a result of the general lack of datable occurrences. Very few rock shelters have been found and excavated (e.g. Hart 1989) and the vast majority of occurrences are open scatters of artefacts with no associated organic materials. It appears that the earlier periods of the LSA are poorly represented in the Karoo, if at all, while sites dating to the last few thousand years are routinely located. Most LSA artefacts in the central Karoo region are made from hornfels or indurated shales. Small thumbnail and end scrapers are frequently encountered and adzes and spokeshaves also form an important part of the retouched component. Webley & Orton (2010) noted a few discrete Later Stone Age sites of medium to high significance as they represent a pre-ceramic variant on the Wilton and/or "Smithfield" about which very little is known.

Webley & Orton (2010) reported on a number of stone kraal complexes that may represent seasonal utilisation by early farming communities of the "Winterveld" on the top of the plateau during the 19<sup>th</sup> and early 20<sup>th</sup> century.

Rock engraving/s on dolerite boulders have been recorded on farms beneath the plateau, but none were identified on the top (Webley & Orton 2010; Webley & Halkett 2015).

## 5.3 Historical Background

The first Trekboers settled in the area around the 1770s but were driven out by attacks from Bushmen. It is only from the beginning of the 19<sup>th</sup> century that stock farmers started moving in the direction of the De Aar area in search of better winter grazing, hence the name "Winterveld" which was given to this district. The early loan farms were not mapped and no diagrams of the farms were lodged. However, the farms on the top of the plateau were surveyed from around 1824.

The town of De Aar dates back to 1904, just after the cessation of the 1899-1902 Anglo-Boer War. The railway junction dates to 1881 when Cape Town and Kimberley were linked by rail after diamonds were discovered at the latter town. It was very important to the British during the Anglo-Boer War since railway lines from Cape Town and Port Elizabeth joined here and extended on through Kimberly to Mafikeng (AngloBoerWar.com 2011). The town was laid out around the railway junction on the farm De Aar which was purchased in 1889 by Isaac and Wolf Friedlander, who ran a trading store and hotel at the railway junction. After the war, the brothers established the town.

Webley & Orton (2010) noted that the majority of the permanent farmsteads are located below the plateau.

#### **5.4 Cemeteries, graves and stone cairns**

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 farm workers. It is assumed that such graveyards will be located close to old farm houses. However, there are only a few permanent dwellings on the plateau. During our surveys, we questioned all landowners about possible graves in the study area, none were reported to us. It is possible that there will be unmarked graves on the plateau which will be disturbed during the development.

### **6. FINDINGS DURING THE 2014 FIELD SURVEY**

In our 2014 field survey (Webley & Halkett's 2015) for the De Aar 2 North WEF, the laydown area, as well as the position of the site offices and stores were assessed on the farm Enkeldebult, located immediately north of the proposed borrow pits (Figure 3). It was determined that the existing farm buildings would be used for site offices and stores.

The construction yard was initially going to be built on the little ridge opposite the farmhouse (south of the farmhouse and the gravel access road). This ridge is midway between Quarries 1 and 2.

The stone kraal on the rocky ridge to the south of the gravel road appears to be related to the ruined farmhouse. The thin spread of archaeological remains on the koppie may pre-date the kraal and its presence may indicate that the ridge formed an important focus in the past.

The little ridge immediately south of the road (Figure 3) contains a scatter of sites, including:

- A stone kraal with mixture of MSA, LSA (flakes, hornfels cores, 2 flakes of white opaline and ½ bored stone) and historical material, including 19<sup>th</sup> century ceramics (British refined earthenware);

North of the road, at the intersection of the gravel access road and the track down to Quarry 1, is the ruins of a 19<sup>th</sup> century farmhouse. According to the landowner, this is the site of the original farm house on Enkeldebult. It comprises a red brick building, completely demolished, as well as a number of outbuildings. It is associated with a large rubbish dump (midden) with 19<sup>th</sup> century ceramics and a small stone kraal containing a thick white deposit (calcined dung).

It seems likely that the stone kraal on the rocky ridge to the south of the road is associated with the ruined farm buildings.

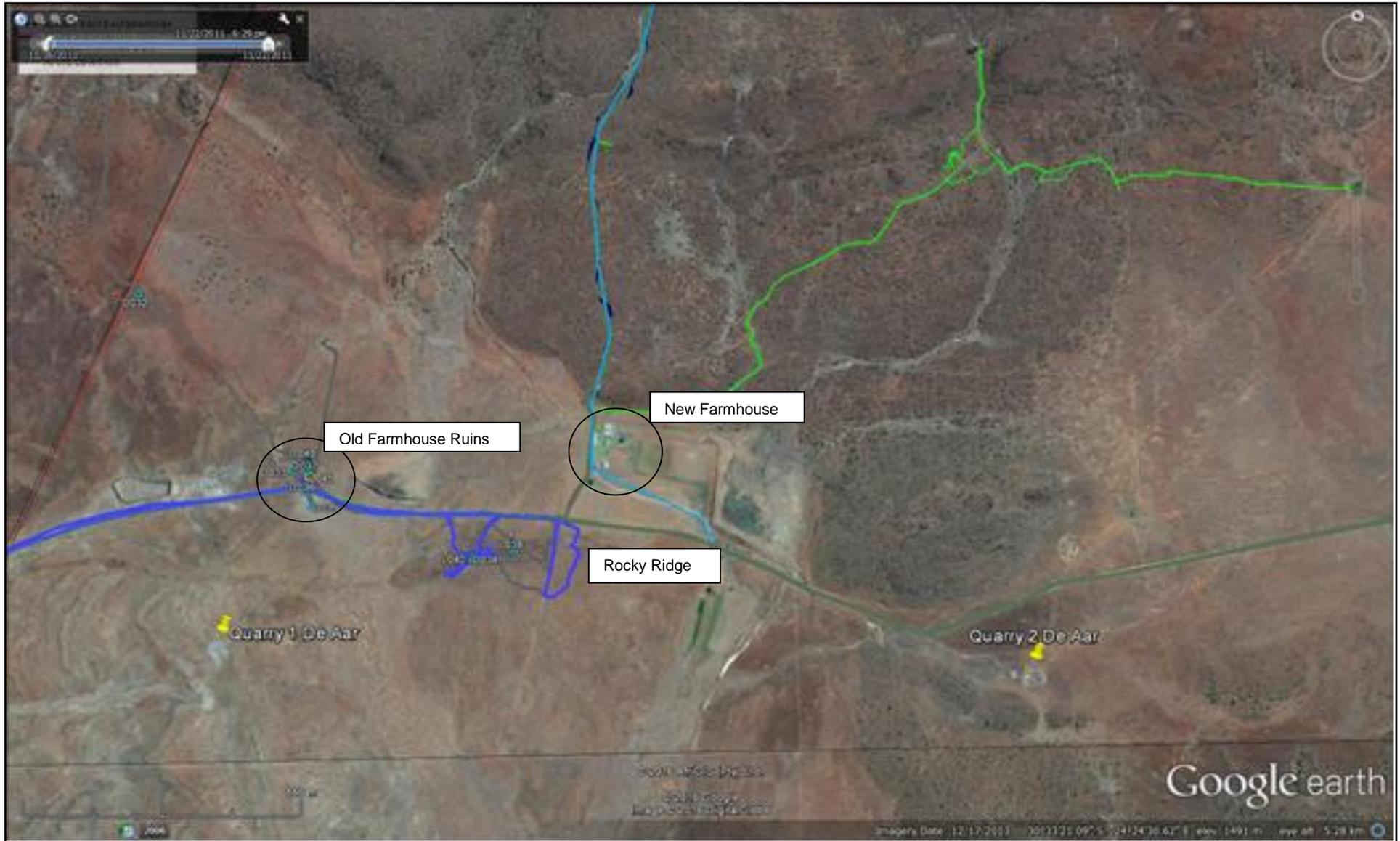


Figure 3: The quarries are situated to the south of the access gravel road to the De Aar 2 North Wind Farm. The little rocky ridge lies immediately south of the road, while the new Enkeldebult farmhouse and the ruins of the old house are north of the road. The blue tracks are from the 2014 survey, while the green and turquoise tracks are from the 2010 survey.



Figure 4: Quarry 1 is located some 500m to the south of the ruined farmhouse and 700m to the south-west of the stone kraal.

## 7. IMPACT ASSESSMENT

### 7.1 Impacts to Palaeontology

The mining of the borrow pits will entail excavations through the superficial sediments unto the underlying bedrock. These impacts may adversely affect palaeontological heritage by destroying, disturbing or permanently sealing-in fossil remains. The potential impacts of the borrow pits, compared with those of the wind farms which have been approved for the De Aar plateau, are fairly minor however.

A significant benefit for palaeontologists, is that the excavation of the borrow pits may uncover fossils which are not identifiable on the surface. Potentially significant fossil material may be made available for scientific study, if the appropriate mitigation measures are put in place.

**Table 2:** Potential impact to Palaeontology

|  | Extent     | Intensity  | Duration          | Consequence | Probability | Significance | Status   | Confidence |
|--|------------|------------|-------------------|-------------|-------------|--------------|----------|------------|
| Without Mitigation   | 1<br>Local | 1<br>Local | 3<br>Irreversible | 5<br>Low    | Improbable  | Very Low     | Negative | High       |
| Essential Mitigation Measures:   |            |            |                   |             |             |              |          |            |
| <ul style="list-style-type: none"> <li>If any fossil material area uncovered, then work in that area should stop, and SAHRA (Telephone: 021 462 4502) should be contacted.</li> </ul>  |            |            |                   |             |             |              |          |            |
| Best Practice Mitigation Measures:   |            |            |                   |             |             |              |          |            |
| <ul style="list-style-type: none"> <li>Palaeontological remains are best left <i>in situ</i>, and conserved for the future. If this is not possible then mitigation in the form of excavation with a permit will be required.</li> </ul> |            |            |                   |             |             |              |          |            |
| With mitigation  | 1<br>Low   | 1<br>Low   | 3<br>Irreversible | 5<br>Low    | Improbable  | Very Low     | Neutral  | High       |

The potential impacts to Palaeontology are expected to be low, if the following measures are followed:

- The ECO should be trained to identify the types of fossils that may be encountered within the geological units present in the reporting area;
- Should scientifically important fossil material be encountered during mining operations, they may need to be mitigated with a permit from SAHRA and the resultant material being lodged with an accredited institution.

## 7.2 Impact on Pre-Colonial Archaeology

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. Since heritage sites, including archaeological sites, are non-renewable, it is important that they are identified and their significance assessed prior to development.

The main cause of impacts to archaeological sites is direct, physical disturbance of the material itself and its context. The significance of an archaeological site is highly dependent on its geological and spatial context. The impacts are likely to be most severe during the construction period.

**Table 3:** Potential impact to pre-colonial Archaeology

|  | Extent     | Intensity  | Duration          | Consequence | Probability | Significance | Status   | Confidence |
|--|------------|------------|-------------------|-------------|-------------|--------------|----------|------------|
| Without Mitigation   | 1<br>Local | 1<br>Local | 3<br>Irreversible | 5<br>Low    | Improbable  | Very Low     | Negative | High       |
| Essential Mitigation Measures:   |            |            |                   |             |             |              |          |            |
| <ul style="list-style-type: none"> <li>• If any significant concentrations of archaeological material area uncovered, then work in that area should stop, and SAHRA (Telephone: 021 462 4502) should be contacted.</li> </ul>            |            |            |                   |             |             |              |          |            |
| Best Practice Mitigation Measures:   |            |            |                   |             |             |              |          |            |
| <ul style="list-style-type: none"> <li>• Archaeological remains are best left <i>in situ</i>, and conserved for the future. If this is not possible then mitigation in the form of excavation with a permit will be required.</li> </ul> |            |            |                   |             |             |              |          |            |
| With mitigation  | 1<br>Low   | 1<br>Low   | 3<br>Irreversible | 5<br>Low    | Improbable  | Very Low     | Neutral  | High       |

There is always a chance that below-ground archaeological material may be exposed during the mining of the existing borrow pits. In the event of anything unusual being encountered, SAHRA must be consulted immediately so that mitigation 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.

## 7.3 Impact on Built Environment

The 2014 survey identified the new Enkeldebult farmhouse and the ruins of the original Enkeldebult farmhouse (Figure 2) immediately to the north of the gravel access road. An examination of the aerial photographs for this area confirms that there are no buildings or structures (apart from the stone kraal on the rocky ridge) immediately south of the gravel road. No impacts are therefore expected to the built environment.

## 7.4 Impacts to Graves

There are no visible farm cemeteries which are directly threatened by the borrow pits. The Webley & Halkett (2015) report indicated that there might be graveyards belonging to farm workers on Enkeldebult which may be difficult to identify as they may lack headstones and fences. Exhumation

of graves is generally not recommended due to the legal processes which are required and it is preferable that they are avoided.

**Table 4:** Potential Impacts to Graves

|   | Extent     | Intensity | Duration          | Consequence | Probability | Significance | Status   | Confidence |
|---|------------|-----------|-------------------|-------------|-------------|--------------|----------|------------|
| Without Mitigation  | 1<br>Local | 1<br>High | 3<br>Irreversible | 5<br>Low    | Probable    | High         | Negative | High       |
| Essential Mitigation Measures: <ul style="list-style-type: none"> <li>If any human remains are uncovered during construction, then work in that area should stop immediately, and SAHRA (Telephone: 021 462 4502) should be contacted.</li> </ul> Best Practice Mitigation Measures: <ul style="list-style-type: none"> <li>Human remains are best left <i>in situ</i>. If it becomes necessary to exhume human remains, then application must be made to SAHRA.</li> </ul> |            |           |                   |             |             |              |          |            |
| With mitigation   | 1<br>Low   | 1<br>Low  | 3<br>Irreversible | 5<br>Low    | Improbable  | High         | Neutral  | High       |

In the event of human bones being found on site, SAHRA must be informed immediately and the remains removed by an archaeologist under an emergency permit. This process will incur some expense as removal of human remains is at the cost of the developer. Time delays may result while application is made to the authorities and an archaeologist is appointed to do the work.

## 7.5 Impacts to the 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. There are vast tracts of Karoo landscape and the mining of two existing borrow pits, off a gravel road, will not result in the loss of any aspects of the Karoo Cultural Landscape.

## 8. CONCLUSION

It is concluded that the mining of the borrow pits will result in a relatively small impact to the sub-surface, relative to the impacts resulting from the wind farms which have been authorized for the De Aar plateau.

A potentially positive outcome of the borrow pits may be that fossils become available for scientific study that would otherwise remain hidden. It is important that the ECO is alerted to the possibility of uncovering fossil material and that he immediately notify SAHRA should this happen.

Based on the archaeology of the adjoining areas, it seems highly unlikely that any significant archaeological material will be uncovered. The field surveys conducted in 2010 and 2014 confirm a widespread scatter of MSA material of low significance.

It is not anticipated that any aspects of the built environment will be impacted by the borrow pits. Both the contemporary and ruined Enkeldebult farm buildings are located to the north of the gravel access road. The stone kraal on the rocky ridge to the south of the gravel road appears to be related to the ruined farmhouse. The thin spread of archaeological remains on the koppie may pre-date the kraal and its presence may indicate that the ridge formed an important foci in the past.

It is possible that unmarked graves and/or human remains may be uncovered during deep excavations.

No impacts are expected to the Cultural Landscape.

The following recommendations should be enforced:

- If any fossil material or human remains are uncovered during construction, the ECO should have the area fenced off and contact SAHRA (Tel: 021 462 4502) immediately.

## 9. REFERENCES

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