

APPENDIX 2: ENVIRONMENTAL IMPACT ASSESSMENT FOR THE ESTABLISHMENT OF THE LANGHOOGTE WIND FARM, WESTERN CAPE: ARCHAEOLOGICAL IMPACT ASSESSMENT. By Lita Webley & David Halkett

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EXECUTIVE SUMMARY

ACO Associates cc was appointed by Arcus Gibb (Pty) Ltd, on behalf of the client SAGIT, to undertake an Archaeological Impact Assessment of the proposed Langhoogte Wind Energy facility. The proposed facility comprising 45 wind turbines and associated infrastructure will be located along the N2 and R43 to the east of Botrivier, in the Western Cape Province.

Notice of Intent to Develop (NID) was submitted to Heritage Western Cape and the following Interim Comment was received (14 July 2011): "An HIA is required consisting of an Archaeological Study, a Palaeontological Study, a Visual Study with an Integrated set of Recommendations".

This Archaeological Impact Assessment considers the Pre-Colonial and Historical Archaeology of the study area.

Findings

- It was anticipated that diffuse scatters of Early Stone Age material would be found in the ploughed lands, as was recorded on the adjoining Caledon Wind Farm, but no ESA artefacts were identified because of the dense stands of agricultural crops;
- The presence of Middle Stone Age and Later Stone Age sites on a little rocky hill behind De Vlei farmstead is indicative of their widespread distribution across the landscape in the prehistoric past but their archaeological signature has been almost erased by two hundred years of agriculture. *In situ* archaeological sites may be found in patches of unploughed lands on koppies or along river banks;
- A single lower grindstone from a ploughed field supports historic accounts that Later Stone Age groups once moved across this landscape;
- The historic archaeological signature is limited to farmsteads and their immediate environs;
- There are farm cemeteries on Langhoogte and Klipheuwel, near the farm buildings. These are discussed in the Heritage Impact Assessment.

Mitigation

- No mitigation is required with respect to the ESA material which is likely to be uncovered during construction;
- Care should be taken when constructing the roads and underground cabling for Turbine 10, to the west of the hill behind the farmstead of De Vlei, that archaeological sites 003-005 are not damaged or destroyed;
- A buffer of 400m should be maintained around farmsteads to ensure that no buried historic material is destroyed. If any historical material is uncovered during the construction phase of

the development then the environmental officer responsible for monitoring the work should inform Heritage Western Cape;

- No cemeteries are threatened by the development. However, should human remains be uncovered during the construction of the wind farm, then work should stop and Heritage Western Cape should be notified;

132kV Powerline

No preference is expressed, in terms of archaeology, for any of the three alternative southern routes.

The impact of a 132kV power line on archaeological remains is likely to be minimal unless the pylon is planted directly on top of a site, thereby resulting in its total destruction. It is recommended that spot checks are done of proposed pylon locations, once the final power line route has been determined, to ensure that no significant archaeological/heritage remains are destroyed.

Summary

The Archaeological survey supported the proposed facility. If there are any changes to the layout of the facility after submission of the EIA report, then further survey work may be required, particularly if turbines are placed in areas which have not been ploughed previously.

TABLES

Table 1: List of archaeological findings recorded during the surveys.

FIGURES

Figure 1: The location of the proposed wind farm to the east of Botrivier on the N2 and R43.

Figure 2: The proposed location of the wind energy facility, showing the location of the turbines and associated infrastructure.

Figure 3: The four 132 kV overhead power line alternatives which will connect to the Houhoek substation.

Figure 4: The tracks and sites recorded during the surveys on the proposed facility.

Figure 5: The three southern powerline alternatives (Options 1-3) are shown as yellow lines. The blue lines indicate the tracks recorded during the survey.

Figure 6: Map of the four wind energy facilities proposed for the area between Botrivier and Caledon.

ABBREVIATIONS

DEA&DP	Department of Environmental Affairs and Development Planning
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
HWC	Heritage Western Cape
LSA	Late Stone Age
MSA	Middle Stone Age
NHRA	National Heritage Resources Act
SAHRA	South African Heritage Resources Agency

GLOSSARY

Archaeology: Remains resulting from human activities which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures.

Early Stone Age: The archaeology of the Stone Age between 700 000 and 2500 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).

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.

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.

1. INTRODUCTION

ACO Associates cc was requested by Arcus Gibb (Pty) Ltd, on behalf of the client, South African General Investment and Trust (SAGIT), to undertake an Archaeological Impact Assessment to assess the impacts to archaeology of a proposed wind farm consisting of approximately 45 wind turbines located along the N2 and R43, to the east of Botrivier, Overberg, Western Cape Province (Figure 1). The layout of the proposed wind energy facility is provided in the Heritage component of the EIA.

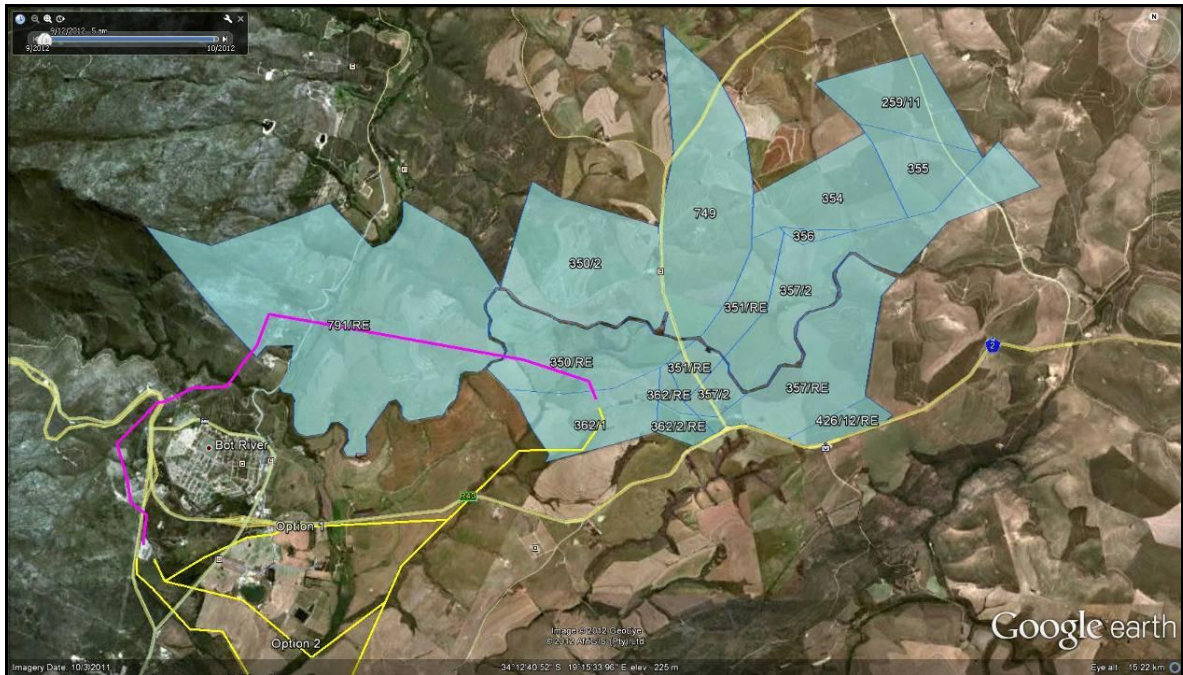


Figure 1: The location of the proposed wind farm to the east of Botrivier on the N2 and R43.

1.1 The Proposal

The proposal is to construct a wind farm comprising 45 wind turbines, a control room, access roads from the N2 and R43 and underground cabling.

The wind energy facility will be connected to the sub-station at Houhoek (south of Botrivier) via a 132kV overhead power line. Four alternative routes have been proposed: one route northward through Farm 791 and over the Botrivier Valley and across the N2; and three southern routes which cross the N2 and link with the substation (Figure 3).



Figure 2: The proposed location of the wind energy facility, showing the location of the turbines and associated infrastructure.

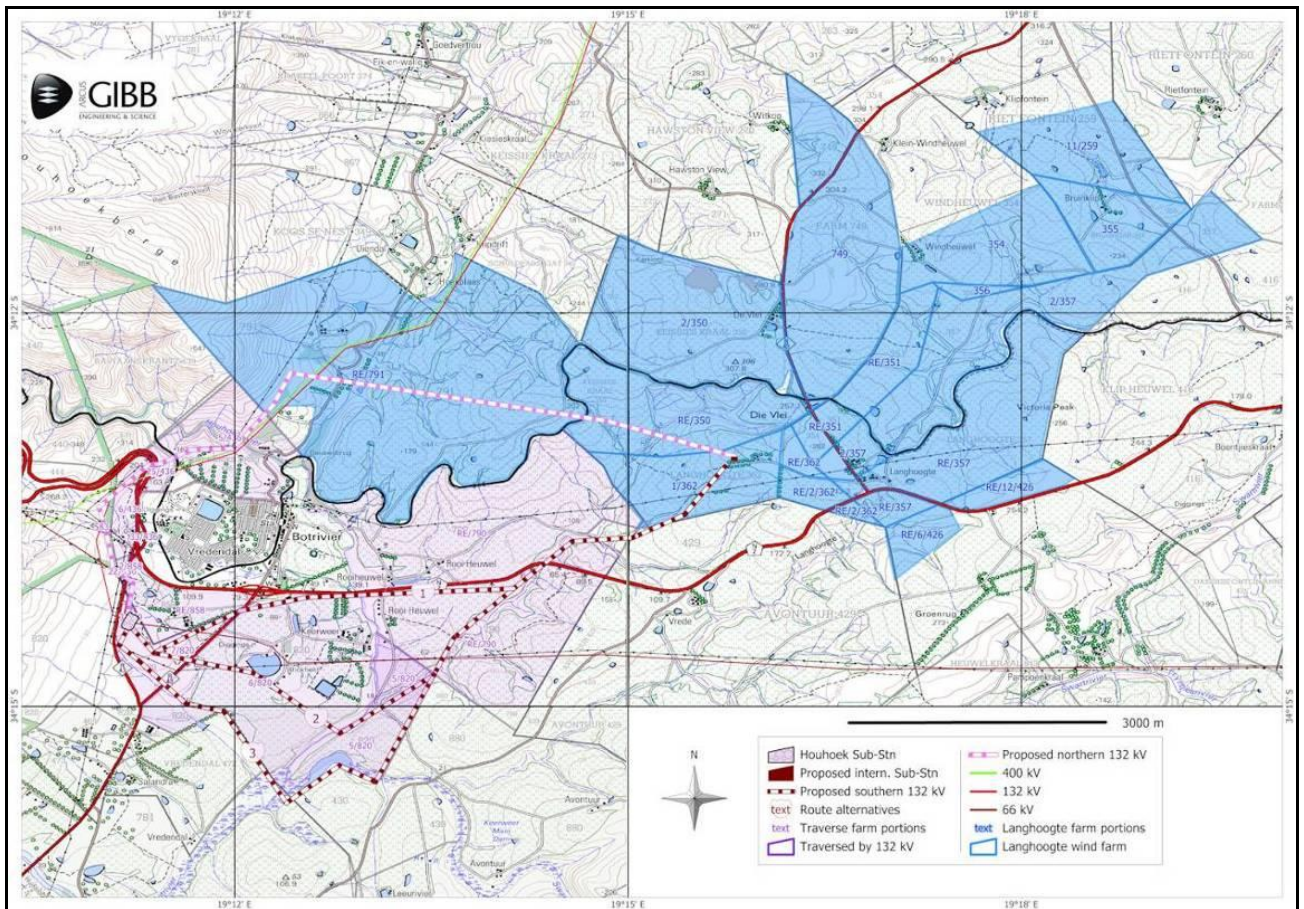


Figure 3: The four 132 kV overhead power line alternatives which will connect to the Houhoek substation.

2. LEGISLATION

The National Heritage Resources Act (NHRA) No. 25 of 1999 protects a variety of heritage resources including palaeontological, prehistoric and historical material (including ruins) more than 100 years old (Section 35), human remains (Section 36) and non-ruined structures older than 60 years (Section 34). Landscapes with cultural significance are also protected under the definition of the National Estate (Section 3 (3.2d)).

Since the project is subject to an Environmental Impact Assessment, Heritage Western Cape (HWC) is required to provide comment on the proposed project in order to facilitate final decision making by the Department of Environmental Affairs (DEA).

Notice of Intent to Develop (NID) was submitted to Heritage Western Cape and the following Interim Comment was received (14 July 2011): "An HIA is required consisting of an Archaeological Study, a Palaeontological Study, a Visual Study with an Integrated set of Recommendations".

3. TERMS OF REFERENCE

This archaeological assessment considers the impacts to pre-colonial and historical period archaeology as per the requirements of Interim Comment of Heritage Western Cape.

The assessment includes:

- A Site visit and desk top study to determine the archaeological resources on the property and its immediate environs;
- An assessment of the possible impact of the proposed development on the archaeology;
- The rating of significance of the archaeological resources;
- An assessment of whether the proposed development will result in a negative impact on the archaeological resources;
- Recommendations for mitigation if necessary;
- An archaeological monitoring programme during construction of the facility.

4. ARCHAEOLOGICAL BACKGROUND

4.1 Pre-Colonial Archaeology

Very little archaeological research has been conducted inland of the coastal belt of the Overberg. Macfarlane made the following observation as early as 1949: "*I have examined the high-level gravels at Napier, Swellendam and Riversdale and every deposit examined by me contains stone implements of a well-developed Pre-Stellenbosch culture of principally a Cromerian facies*". He noted "*Handaxes are not common; they are usually flaked on one surface, the dorsal plane being left intact*". There is some disagreement as to whether this industry pre-dates the Acheulian or is contemporary with it.

Very little is known about the distribution of the Later Stone Age peoples (San and Khoekhoen) although it is known that Khoekhoen groups such as the Hessequa and Chainoqua frequented the Overberg before the advent of the colonial farming period (Nienaber 1989). As the free burgers moved into the Overberg in the early 18th century, the Khoekhoen were disposed of their land. They were presented with the option of entering into the service of the colonists or settling at mission stations such as Genadendal. The name of "*Keissies Kraal*" may be a reference to a Khoekhoen "kaptein" who lived in the area and according to du Toit (2004) the name Boontjieskraal is a reference to a Khoekhoen called "Jan Buntjie".

Archaeological consultancy reports for the area suggest that scattered Stone Age archaeological material dating from the Early, Middle and Late Stone Age periods will occur. The survey by Webley & Halkett (2011) of the Caledon WEF, which adjoins the proposed Langhoogte WEF, identified at least nine scatters of Early Stone Age (ESA) material on ploughed lands. The stone tools included quartzite flakes, flaked cobbles, cores including discoid cores and some crude bifaces (handaxes). In his survey on the farms Klipheuwel and Dassiesfontein to the south of the N2, Hart (2010) also identified some scatters of ESA material. Kaplan (2006) has also undertaken surveys around the Botrivier area and found some ESA artefacts.

4.2 Historical Archaeology

The general historical context of the study area is significant. There are historic structures on adjoining properties, such as Boontjieskraal to the east, and Compagnies Drift (now Beaumont Wine Estate) to the west, next to the village of Botrivier. Neither is declared heritage sites but both have the potential to be graded as Grade 2 or Grade 3a sites. It is known that this area has been subject to European settlement since the late 17th century and a Dutch East India Company outpost was established on Compagnies Drift from at least 1731 (Fransen 2004). Most of the farms in this general area were established before the mid-18th century and retain remnants of historic settlement such as farm buildings and farm cemeteries.

The town of Botrivier is situated at the base of the Houwhoek Pass, at the entrance to the Overberg and has its origins on the historic farm of Compagnies Drift. The farm was situated on the drift across the Botrivier used by all the early travellers and was an important stop.

Historical archaeological research has been conducted at Genadendal by Clift (2001) and at the Caledon Hot Springs by Halkett (2000).

5. METHODOLOGY

The pre-feasibility study in January 2011 comprised a brief desktop assessment. The desktop review summarised the background historical information on the study area as well as the archaeology of the area. A further short site visit was undertaken by Jayson Orton of ACO Associates cc in August 2011 to determine if there were any fatal flaws which might impede the development of the wind facility.

This was followed by two site visits in September 2012. The first to assess the impact of the proposed turbines, laydown areas, access roads and underground cabling on the archaeology of the area. The second visit to assess the impact of the proposed 132kV powerline.

The positions of the turbines, laydown areas, access roads and underground cabling were loaded onto hand-held GPS receivers (on the WGS84 datum) which enabled us to target the relevant areas. All heritage sites were recorded with the GPS, photographed and their significance rated (Table 1). No archaeological material was removed from the project area, but recorded and photographed *in situ*.

5.1 Assumptions and Limitations

While no ESA artefacts were found during the survey of the Langhoogte Wind Farm, it is assumed that they occur in the ploughed fields since they were recorded on the adjoining Caledon Wind Farm (Webley & Halkett 2011).

The most significant limitation to assessing the impact of the proposed facility on the archaeology of the area was the fact that most of the fields were under standing crops such as wheat, canola and lucerne. These crops were at least 50cm in height, restricting visibility. Turbines placed in agricultural lands could not be assessed.

Assessments were conducted in fallow fields and in areas which had never been ploughed, such as rocky koppies or stream banks, as these provided the best opportunity for identifying archaeological sites.

No foot surveys were undertaken of the powerline alternatives because of the length of the lines and the time this would take. Access to properties, which had been identified for the powerline alternatives, was restricted as some owners/managers were not in favour of the development. However, this is not a serious limitation, as the alternative lines were assessed using a combination of aerial photography and oral information (discussion with land owners).

6. ARCHAEOLOGICAL FINDINGS

The tracks of the survey undertaken in 2012 are presented in Figure 4.

The most significant scatter of stone artefacts in the study area occurs on the little rocky hill behind De Vlei farmstead. Turbine 10 is located to the west of the hill but there are no archaeological remains on this particular area. It is at least 300m from sites 003, 004 and 005 which are situated on the northern flank of the hill in proximity to a large rock. The rock has a small overhang on one side and this has been partially filled with some rough stone walling. Site 003 is located to the south of the rock while Site 004 is located to the east. Site 005 is spread over a large talus area to the north of the rock. The source of the silcrete is a large outcrop of silcrete on the top of the hill. There is some evidence of utilisation of this silcrete outcrop.



Plate 1: Rocky hill behind De Vlei farmstead;



Plate 2: Site 003 lies in the open area in the foreground with some rough stone walling filling the gap in the rock.



Plate 3: Silcrete artefacts from Site 003;



Plate 4: Silcrete and quartz artefacts from Site 004 as well as a single piece of refined earthenware.



Figure 4: The tracks (pale blue) and sites recorded during the surveys on the proposed facility.

Site 003 comprises a scatter of MSA silcrete artefacts (Plate 3) in a localised open area near a large rock. There may be some Later Stone Age re-use of some of the silcrete flakes.

Site 004 comprises a Later Stone Age distribution near the same large rock (Plate 4). Artefacts are made on silcrete as well as quartz. There is a single LSA segment, a bladelet, flakes, cores, chips, etc. There is also a single piece of refined earthenware with spongeware decoration. The European ceramic may not be contemporary with the archaeological remains but is historic.

Site 005 consists of a widespread distribution of MSA artefacts spread down a gravel talus slope to the north of the large boulder (Plate 2). It comprises cores and flakes. It is likely that these artefacts were made from the silcrete found in an outcrop on top of the hill (Plate 6).



Plate 5: MSA artefacts found at Site 005;



Plate 6: Silcrete outcrop on the top of the hill (Site 006)



Plate 7: A lower grindstone recovered from a pile of rocks at the edge of a field (Site 002).



Plate 8: Site 001 is a stone marker

The lower grindstone (Plate 7) found in a pile of rocks at the edge of a ploughed field (Site 002) is confirmation that Later Stone Age groups were moving across the undulating landscape of the Overberg. Very few LSA sites have been recorded because of the disruptions which have resulted from two hundred years of agriculture in this area.

Table 1: List of archaeological findings recorded during the surveys.

Site Name	GPS co-ordinates	Description of site	Significance
001	S34 11 47.8 E19 17 44.2	Boundary stone	Low
002	S34 12 33.8 E19 15 00.0	Double lower grindstone on quartzite found in a pile of rocks on the edge of a field. Close to turbine 31.	Low

003	S34 11 50.2 E19 15 58.9	Scatter of silcrete artefacts on a small hill behind De Vlei farmhouse. Possibly MSA with some Later Stone Age re-use.	Low
004	S34 11 49.0 E19 15 58.7	A Later Stone Age distribution next to a large rock on a small hill behind De Vlei farmhouse. 1 segment, flakes, cores, chips. Flaked quartz. 1 piece of refined earthenware – spongeware.	Low to Medium
005	S34 11 47.8 E19 15 58.8	Spread of silcrete artefacts over a large talus on the lower slopes of the hill behind De Vlei farmhouse. Possibly also MSA.	Low
006	S34 11 50.8 E19 16 00.9	A large boulder of coarse silcrete with some evidence of knapping nearby.	Low

The only historical archaeological signature which was recorded during the survey was the boundary marker stone (Site 001). Many of the old Surveyor General maps describe the boundary markers consisting of cairns or upright rocks (Plate 8).

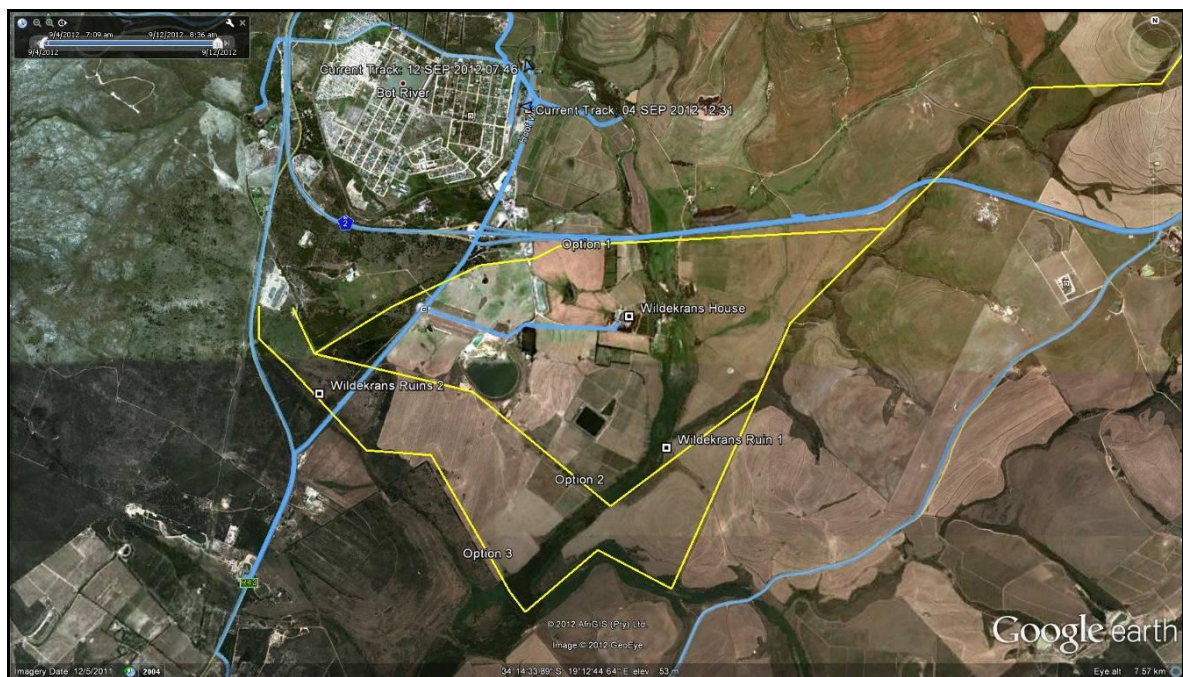


Figure 5: The three southern powerline alternatives (Options 1-3) are shown as yellow lines. The blue lines indicate the tracks recorded during the survey.

There are ruined structures such as Wildekrans Ruins 1 and 2 on the farm Wildekrans (Farm 820/6 and Farm 820/7) which may be impacted by the proposed construction of the 132kV line (Figure 5). These ruins were not visited and their archaeological/historical significance was not assessed because access to the site was not granted.

7. IMPACTS IDENTIFICATION AND ASSESSMENT

It is not anticipated that the impacts of the proposed development on the archaeology of the area will be significant.

The construction of turbines, underground cabling and access roads in these fields will not result in the destruction of stone artefacts. The main cause of impacts to archaeological sites is physical disturbance of the material and its context. The heritage and scientific potential of an archaeological

site is highly dependent on its geological and spatial context. This means that even though, for example, a deep excavation may expose archaeological artefacts, the artefacts are relatively meaningless once removed from the area in which they are found. Large scale excavations may damage archaeological sites, and construction of roads and laydown areas can also contribute to high levels of impact. Specific impacts to Stone Age sites are considered below.

No historical archaeological material, apart from the stone marker, was recorded during our survey. Clearly historical archaeological material will be present in the vicinity of buildings and structures which are over 100 years old. However, the material is not likely to be threatened during the construction of the wind farm as a buffer of four hundred (400) metres has been implemented around each farmstead.

The impact of the construction of a 132kV power line on the archaeological remains of the area is likely to be minimal unless the pylon is planted directly on top of a site, thereby resulting in its destruction. It seems unlikely that the pylon will be placed directly on top of ruined buildings (Figure 5), such as those identified on Portions 6 and 7 of Farm 820 (Wildeckrans), but these potential impacts can be mitigated through spot checks during construction.

7.1 Construction Phase

There is a chance that the excavations for the tower bases could potentially impact buried archaeological material, similarly excavations of cable trenches and clearing of access roads could impact on material that lies buried in the surface soils.

However, the ESA artefacts which have been recorded on the adjoining Caledon Wind Farm and which almost certainly occur in the Langhoogte Wind Farm are not considered to be in primary context due to the fact that agricultural activities have taken place in this area over many hundreds of years. The impact of the construction of the wind energy facility on the ESA stone scatters is not considered significant.

The construction of wind turbine 10, located on the western side of the hill behind De Vlei farmstead, and at least 300m from Sites 003, 004 & 005 recorded to the north of the hill, is not expected to have an impact on archaeology. They are some distance apart. However, impacts may result from the construction of the road and underground cabling. Spot checks will be necessary during the construction phase to ensure that no archaeological sites are damaged.

It is anticipated that more Later Stone Age archaeological material, such as the grindstone recorded during this survey, may be uncovered during construction. However, impacts to these types of occurrences are not expected to be significant.

Impacts on the pre-colonial archaeology of the study area will therefore be quite limited (local).

With regard historical archaeology, the only site identified was a marker stone. It may be uprooted if the road is widened to accommodate large trucks. However, this is not considered a significant impact.

With regard the construction of a 132kV powerline from the Langhoogte Wind Energy Facility to the Houhoek substation, there is a potential impact on ruined structures on the farm Wildeckrans (Portions 6 and 7 of Farm 820) which may need mitigation.

7.2 Operational Phase

There are no anticipated impacts to archaeology during the operational phase of the facility.

7.3 Decommissioning Phase

There are no anticipated impacts to archaeology during the decommissioning phase of the facility.

7.4 Cumulative Impacts

There are currently three other wind energy facilities proposed in the immediate area:

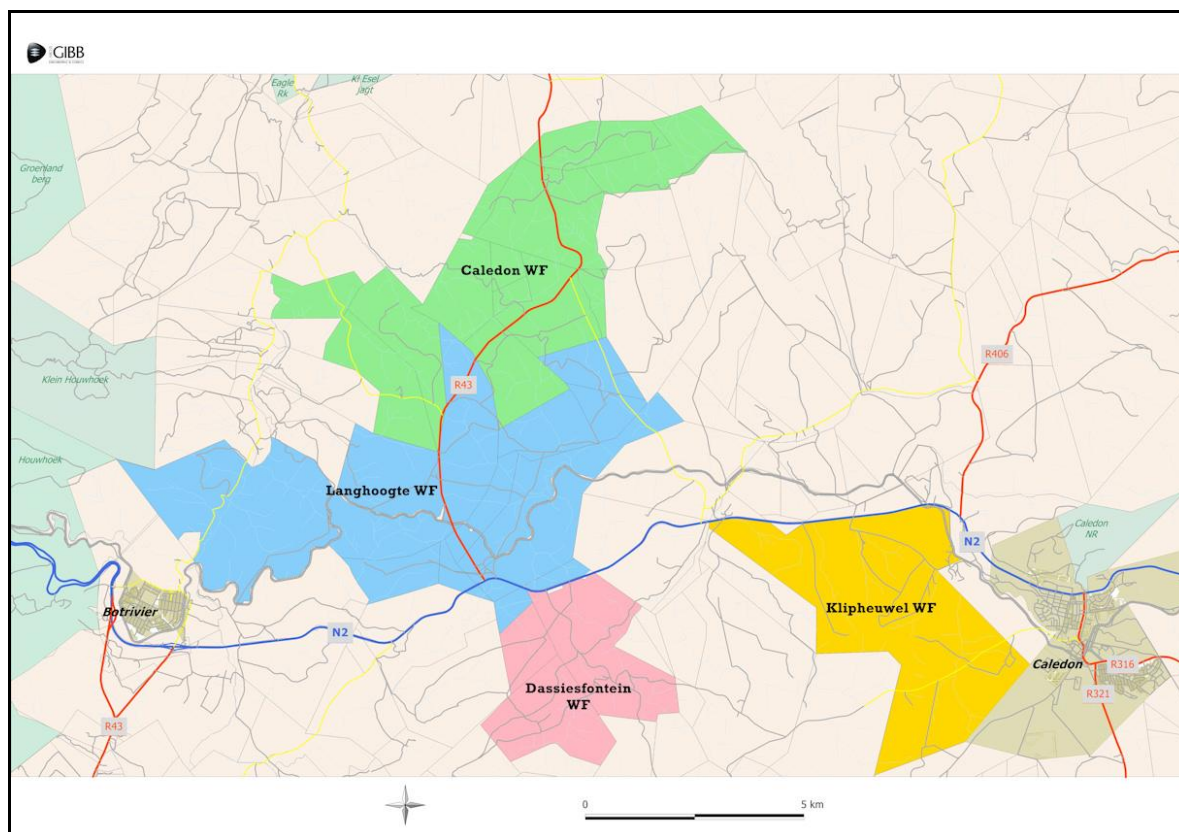


Figure 6: Map of the four wind energy facilities proposed for the area between Botrivier and Caledon.

The Caledon Wind Farm to the north of Langhoogte consists of 37 turbines. The EIA application has been submitted to DEA but authorisation has not yet been issued. The Dassiesfontein Wind Farm (6 turbines) and the Klipheuwel Wind Farm (10 turbines) have obtained DEA authorisation in June 2011.

There is however uncertainty as to whether these neighbouring WEFs will be built.

The impacts of the proposed development to archaeology on each of these wind farms have been assessed as being of minor significance (Hart 2010; Webley & Halkett 2011). It is therefore not anticipated that the cumulative impact of constructing the Langhoogte Wind Farm will have a significant impact on the archaeology of this area.

8. POTENTIAL MITIGATION MEASURES

It is important to observe that the destruction of archaeological sites is irreversible and permanent. Once an archaeological site is destroyed, it cannot be re-created or restored to its original state.

With regard potential impacts on pre-colonial archaeological sites in the study area, no mitigation is proposed. Early Stone Age artefacts scatters have been reported from the Overberg. The ESA stone implements consist of ephemeral scatters in old ploughed fields. They do not appear to be in context after 200 years of agriculture and it is unlikely that the collection of the stone tools for statistical measurement and analysis will contribute materially to our understanding of the ESA in this area. No mitigation is proposed.

The potential negative impact of Turbine 10 on archaeological Sites 003, 004 and 005 is considered to be low since they are at least 300m metres apart. However, the road and underground cabling for the turbine passes in close proximity to the koppie and sites. Spot checks will be necessary during construction to ensure that no archaeology is damaged.

The discussion on the two historical graveyards, recorded during the survey, is included in the Heritage Impact Assessment. However, should human remains (either archaeological or pre-colonial) be uncovered during the construction of the wind farm, then work should stop and Heritage Western Cape should be notified.

With regard the potential impacts on historical archaeology, no mitigation is proposed. No historical material was identified during the survey with the exception of one marker beacon. Historical material is generally located in close proximity to old habitations. While a number of farmsteads occur in the study area, the majority are younger than 60 years and none area threatened by the proposed development. A buffer is being implemented around the homesteads and this should also protect any below-ground historical archaeological material. If any historical material is uncovered during the construction phase of the development then the environmental officer responsible for monitoring the work should inform Heritage Western Cape.

With respect the construction of the 132kV powerline, it is recommended that spot checks are done of proposed pylon locations, once the final power line route has been determined, to ensure that no archaeological and/or heritage sites are destroyed.

9. IMPACT ASSESSMENT

The impact of particularly the construction of the wind energy facility may result in the physical destruction of archaeological resources or in the displacement of archaeological resources so that they loose their context, and thereby their value.

9.1 Construction Phase

<i>Impact</i>	<i>Nature</i>	<i>Extent</i>	<i>Duration</i>	<i>Intensity</i>	<i>Reversibility</i>	<i>Impact on Irreplaceable Resources</i>	<i>Consequence</i>	<i>Probability</i>	<i>Significance</i>	<i>Confidence</i>
Impact 1: Pre-Colonial Archaeology										
Impact Description: The construction of turbines, underground cabling and access roads will result in scatters of ESA stone implements being moved from their position. This may potentially result in loss of information. While Turbine 10 is located about 300m from Sites 003, 004 & 005, the underground cabling and access roads pass closer.										
Without Mitigation	-	Low	Permanent	Low	High	Low	Low	Medium	Low	High
Mitigation Description: No mitigation is required as there is no evidence that ESA stone artefacts are in their original context and that collections would result in the generation of new information. With regard Sites 003, 004 & 005 – it is recommended that spot checks are undertaken by an archaeologist during construction of the access road and underground cabling to Turbine 10 to ensure that no archaeology is damaged. Indicate if mitigation is possible: Mitigation would include the collection of stone tools for statistical analysis or the excavations of archaeological stone tool scatters. However, there is no reason to support this. Mitigation with regards Sites 003, 004 & 005 would involve fencing off the hillside during construction but this is not considered a reasonable alternative.										
With Mitigation	-	Local	Permanent	Negligible	High	Low	Low	Improbable	Low	High
Cumulative Impact: There is an abundance of ESA artefact scatters in the Botrivier - Caledon and the destruction of a few scatters in a field would not materially impact on our knowledge of the archaeology of the area. Description of impact and significance: Potential loss of information. However, the significance of the stone tool scatters is low.										
Impact 2: Historical Archaeology										
Impact Description: The construction of turbines, underground cabling and access roads may potentially result in the destruction of below ground historical archaeological material. This may potentially result in loss of information										
Without Mitigation	-	Local	Permanent	Low	High	Low	Low	Medium	Low	High
Mitigation Description: No mitigation is proposed as no historical archaeological material was recorded during the field surveys with the exception of a marker stone. Ruined structures may potentially be destroyed during the construction of the 132kV overhead powerline, but no mitigation is necessary until the final route has been determined. It may be necessary to do spot checks of proposed pylon locations.										

With Mitigation	-	Local	Permanent	Negligible	High	Low	Low	Improbable	Low	High
Cumulative Impact: The destruction of a number of historical archaeological sites in this area could result in significant loss of information.										
Description of impact and significance: Since no historical sites have been identified, the impacts are considered low.										

The impacts will not change for the Operational or Decommissioning Phase of the wind farm. Once the infrastructure related to the wind farm has been removed, the *status quo* will return.

9.2 Impact Assessment – Alternatives

No alternative proposals have been made with regard the construction of the Langhoogte Wind Farm.

9.3 No Go Option

If the wind energy facility is not constructed, the status quo will remain. The stone artefacts in agricultural fields which are currently disturbed by ploughing, will continue to be disturbed. Archaeological sites which are “protected”, as they are located on rocky koppies and along streams, will continue to be conserved.

There will be no potential disturbance of historical archaeological material near old farm buildings.

9.4 Alternative Powerline Option

From an archaeological perspective, the construction of a 132kV powerline will have little negative impact on pre-colonial archaeological material. This is because the footprint of the pylon (pole) used for such a line is very small. Unless a pylon is placed directly on top of an *in situ* archaeological site, the impacts will be minimal.

In the case of both the single northern option and the three southern options, the line will be predominantly constructed through agricultural lands which have already been disturbed. However, Southern Option 2 and Southern Option 3 will pass in proximity to ruined buildings on the farm Wildekrans (Portions 6 & 7 on Farm 820). No direct impact is expected, and mitigation will be possible with micro-siting of the pylons.

10. PROPOSE AN APPROPRIATE MONITORING PROGRAMME

In view of the low significance rating ascribed to the pre-colonial archaeological material identified in the study area, no monitoring by an archaeologist is required.

With respect the construction of the 132kV powerline, it is recommended that spot checks are done of pylon locations in sensitive areas, such as unploughed lands, once the final power line route has been determined. This will ensure that the ruined buildings on Wildekrans are not impacted.

During the construction phase of the development, significant pre-colonial and historical archaeological material buried below the soil surface, may be uncovered. If they are not adequately dealt with, they may be destroyed. If finds are accidentally uncovered, they must be reported to Heritage Western Cape by the environmental officer or senior person on site.

During the construction phase of the project, buried human remains may be uncovered. If they are not adequately dealt with, they may be accidentally destroyed. Human remains are protected by several sets of legislation which means that certain protocols must be followed in the event of a find.

If human remains are accidentally uncovered:

- Leave remains in place, do not remove anything;

- Cordon off the area;
- Notify the archaeologist at Heritage Western Cape;
- Contact an archaeologist who will indicate whether to inform the SA Police Services;
- If exhumation is required, a permit will have to be obtained from the SAHRA Burials Unit.

11. CONCLUSION

This Archaeological Impact Assessment considers the Pre-Colonial and Historical Archaeology of the study area.

- It was anticipated that diffuse scatters of Early Stone Age material would be found in the ploughed lands, as was recorded on the adjoining Caledon Wind Farm, but no ESA artefacts were recorded because of the dense stands of agricultural crops;
- The presence of Middle Stone Age and Later Stone Age sites on a little rocky hill behind De Vlei farmstead is indicative of their widespread distribution across the landscape in the prehistoric past but their archaeological signature has been almost erased by two hundred years of agriculture. *In situ* archaeological sites may be found in patches of unploughed lands on koppies or along river banks;
- A single lower grindstone from a ploughed field supports historic accounts that Later Stone Age groups once moved across this landscape;
- The historic archaeological signature is limited to farmsteads and their immediate environs;
- There are farm cemeteries on Langhoogte and Klipheuwel, near the farm buildings. These are assessed in the Heritage Impact Assessment.

Mitigation

- No mitigation is required with respect to the ESA material which is likely to be uncovered during construction;
- Care should be taken when constructing the access roads and underground cabling to Turbine 10 behind the farmstead of De Vlei that archaeological sites 003-005 are not damaged or destroyed. Spot checks by an archaeologist are recommended;
- A buffer of 400m should be maintained around farmsteads to ensure that no buried historic material is destroyed. If any historical material is uncovered during the construction phase of the development then the environmental officer responsible for monitoring the work should inform Heritage Western Cape;
- No cemeteries are threatened by the development. However, should human remains be uncovered during the construction of the wind farm, then work should stop and Heritage Western Cape should be notified;

132kV Powerline

No preference is expressed, in terms of archaeology, for any of the three alternative southern routes.

The impact of a 132kV power line on archaeological remains is likely to be minimal unless the pylon is planted directly on top of a site, thereby resulting in its total destruction. It is recommended that spot checks are done of proposed pylon locations, once the final power line route has been determined, to ensure that no significant archaeological sites or heritage remains (such as the ruins on Wildekrans) are destroyed.

Summary

The Archaeological survey supported the proposed facility. If there are any changes to the layout of the facility after submission of the EIA report, then further survey work may be required, particularly if turbines are placed in areas which have not been ploughed previously.

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