

**Environmental Impact Assessment for the
proposed Banna Ba Pifhu Wind Energy Project
near Humansdorp, Eastern Cape:
Final Environmental Impact Assessment Report**

Chapter 11:

Impact on Archaeology



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CHAPTER 11. IMPACT ON ARCHAEOLOGY

This Chapter presents the Archaeological Impact Assessment conducted by Dr Johan Binneman of the Eastern Cape Heritage Consultants for the Banna Ba Pifhu wind energy EIA.

Note: This report follows the minimum standard guidelines required by the South African Heritage Resources Agency for compiling Archaeological Heritage Phase 1 Impact Assessment (AHIA) reports.

11.1 INTRODUCTION

11.1.1 Approach to the study

Note: This report is a phase 1 archaeological heritage impact assessment/investigation only and does not include or exempt other required heritage impact assessments (see below).

11.1.2 Terms of Reference

Terms of Reference for the archaeological assessment were to conduct a survey of possible archaeological heritage sites for the proposed Banna Ba Pifhu Wind Energy Facility to be constructed near Humansdorp Kouga Local Municipality, Humansdorp District, Eastern Cape Province. The survey was conducted to establish the possible range and importance of exposed and *in situ* archaeological heritage features, the potential impact of the development and, to make recommendations to minimize possible damage to these sites.

11.1.3 Method of survey

The proposed Banna Ba Pifhu Wind Energy site has been investigated by two people both by vehicle and on foot. It was not feasible to do a complete survey due to the very large size of the property and the dense grass cover. A layout map for the proposed locations was available at the start of the survey. This enabled us to follow the well-developed network of farm tracks throughout the area in a vehicle and to survey transects on foot from the tracks. In this way most of the area and proposed locations were investigated. GPS readings were taken with a Garmin and all important features were recorded digitally. Consultation was conducted with the local Gamtkwa KhoiSan community regarding the archaeological heritage of the area.

11.1.4 Assumptions, constraints and limitations

The archaeological study is based on background information supplied by the CSIR regarding the proposed development, and all that information is assumed to be correct.

There were no constraints or limitations associated with the field work.

11.1.5 Information sources

Museum/University databases and collections

The Albany Museum in Grahamstown houses collections and information from the wider region.

Community consultation

Consultation with the Gamtkwa KhoiSan First Nation was conducted as required by the National Heritage Resources Act No. 25 of 1999, Section 38(3e).

11.1.6 Declaration of Independence

BOX 11.1: DECLARATION OF INDEPENDENCE FOR ARCHAEOLOGY IMPACT ASSESSMENT

I **Johan Binneman** declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed Banna Ba Pifhu Wind Energy Project, application or appeal in respect of which I was appointed, other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.



Johan Binneman

11.2 DESCRIPTION OF AFFECTED ENVIRONMENT

A brief archaeological background to the project is provided in Appendix 11.1. The proposed area for the construction of the Banna Ba Pifhu Wind Energy Facility is further than five kilometres from the coast and falls outside the maximum distance from the beach at which coastal archaeological features such as shell middens are expected to be found. Apart from a few Early and Middle Stone Age stone tools observed in secondary context, no other archaeological sites/materials were observed and in general the area appears to be of low archaeological sensitivity (see Figures 11.1 and 11.2). Previous surveys in the wider area identified Early and Middle Stone Age stone tools in the exposed river gravels on the northern bank of the Seekoeirivier and surrounding hill tops throughout the region. These were also in secondary context and not associated with any other archaeological materials. It is unlikely that any archaeological heritage remains of any significance will be found in situ. The impact of the development on archaeological sites/materials will be limited. Due to the low significance of the pre-colonial archaeology no mitigation is suggested prior to the start of the project.

The Banna Ba Pifhu Wind Energy Facility is the seventh proposed project in the region close to the coast and will contribute directly to the 'cumulative visual impact' upon the region and also indirectly on the Cape St Francis/Thyspunt pre-colonial cultural landscape and the 'significance of place'.

11.3 PERMIT AND LEGISLATIVE REQUIREMENTS

The National Heritage Resources Act (Act No. 25 of 1999, section 35) (see Appendix 11.2) requires a full Heritage Impact Assessment (HIA) in order that all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual linguistic or technological value or significance are protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects.

11.4 RESULTS OF THE ARCHAEOLOGICAL STUDY

11.4.1 *Findings of the Archaeological study*

The proposed Banna Ba Pifhu Wind Energy site has been investigated by two people both by vehicle and on foot. It was not feasible to do a complete survey due to the very large size of the property and the dense grass cover. A layout map for the proposed turbine locations was available at the start of the survey. This enabled us to follow the well-developed network of farm tracks throughout the area in a vehicle and to survey transects on foot from the tracks. In this way most of the area and proposed locations were investigated. GPS readings were taken with a Garmin and all important features were recorded digitally. Consultation was conducted with the local Gamtkwa KhoiSan community regarding the archaeological heritage of the area.

The study area comprises a gently undulating plain covered by a relatively thin layer of grey soil and dense low grass (Figures 11.3 a-f). Virtually the entire area has been disturbed in the past by extensive ploughing and general farming activities. The dense grass cover made it difficult to find archaeological sites/materials, but a few weathered quartzite Early and Middle Stone Age stone tools were observed in roads where the pebble/cobble gravels were exposed (Figures 11.4 a-f). Stone tools were observed near turbine position 05 inside the study area (GPS reading: 34.03.966S; 24.47.306E) and another in the gravel road south of the study area (GPS reading: 34.05.037S; 24.45.863E) (Figures 11.4 b & c). The Early Stone Age stone tools date between 1.5 million and 250 000 years old and consisted of flaked cobbles and flakes. The Middle Stone Age stone tools consisted of mainly thick, small 'informal' flakes and chunks manufactured from quartzite and date between 250 000 and 30 000 years old. All stone tools were in secondary context, not associated with any other remains and of low cultural significance. Large numbers of hand axes, cleavers, flaked cobbles and flakes were also observed on the northern bank of the Seekoeirivier (see Binneman 2009) (Figures 11.1 and 11.2) (Figure 11.4 f).

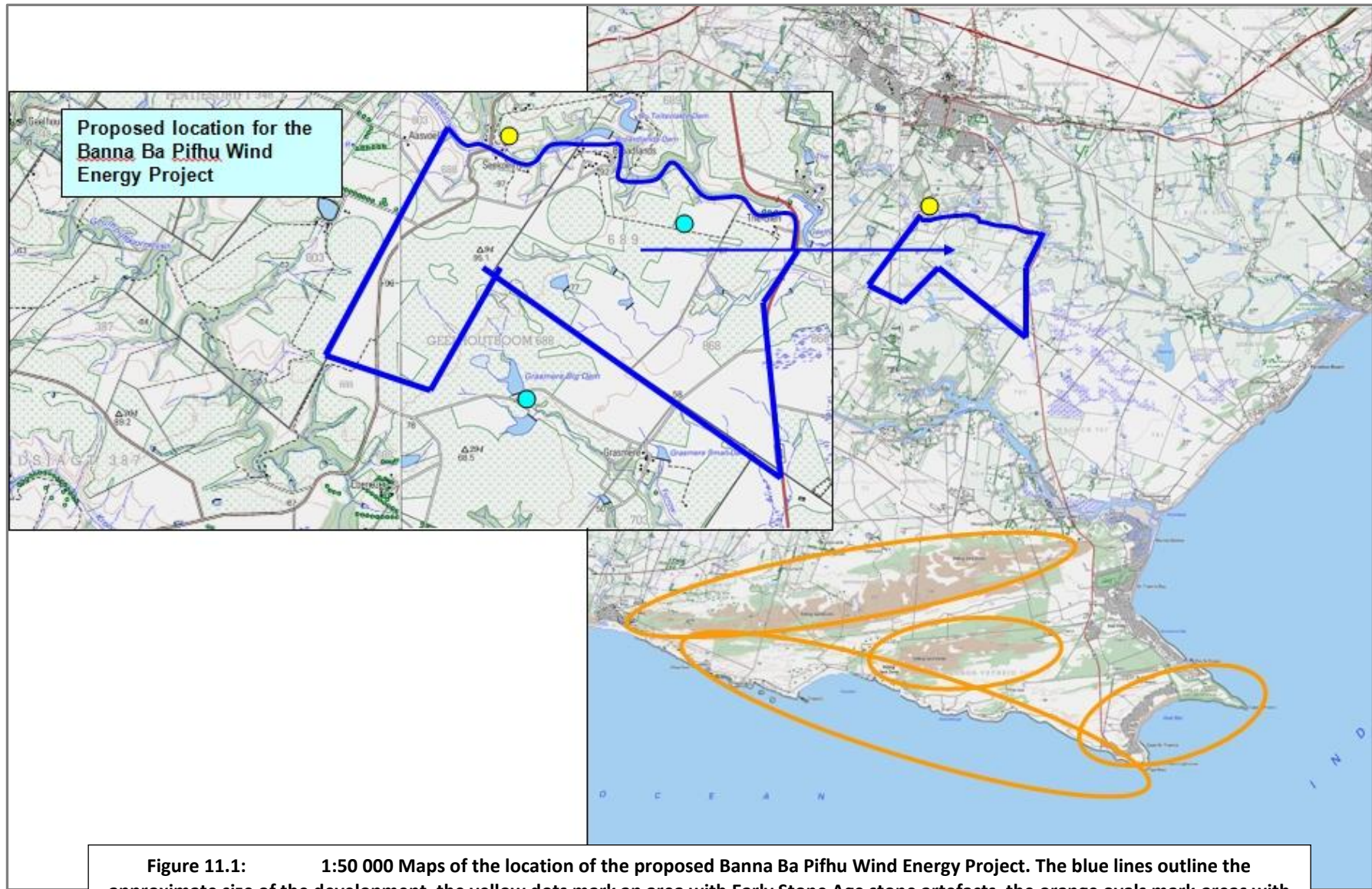


Figure 11.1: 1:50 000 Maps of the location of the proposed Banna Ba Pifhu Wind Energy Project. The blue lines outline the approximate size of the development, the yellow dots mark an area with Early Stone Age stone artefacts, the orange ovals mark areas with large concentrations of archaeological sites and the light blue dots stone tools observed during the survey.



Figure 11.2: Aerial images of the location of the development and the turbine positions marked by the small white circles (based on alternative 1 layout), the light blue dot marks an area with Earlier Stone Age stone tools and the pink dots stone tools observed during the survey (maps courtesy of the developer).



Figures 11.3a-f: Views of the proposed Banna Ba Pifhu Wind Energy site. Note the dense low grass cover throughout the entire site.



Figures 11.4a-f: Views of the thin grey topsoil and exposed underlying ferricretes (top left), exposed gravels in a road and adjacent field south of the study area associated with occasional Earlier and Middle Stone Age stone tools (top right and middle row left), cobble/pebble gravels exposed in a farm track near turbine position 05 and associated Earlier and Middle Stone Age stone tools observed in the track (middle row left and bottom left) and a sample of the hand axes and cleavers observed on the northern bank of the Seekoeirivier (Figures 11.1 and 11.2).

11.5 ASSESSMENT OF IMPACTS AND IDENTIFICATION OF MANAGEMENT ACTIONS

11.5.1 Pre-colonial archaeology

11.5.1.1 Nature of the impacts

From the investigation, it would appear that the proposed Banna Ba Pifhu Wind Energy Facility site is of low archaeological sensitivity (Table 11.1). Apart from a few exposed stone tools in a secondary context no sites/remains of significance were recorded, but material may be covered by soil and grass. The main impact to archaeological sites/remains (if any) will be the physical disturbance of the material and its context. The construction of the turbine foundations, substation, cabling between the turbines and access roads may expose, disturb and displace archaeological sites/material.

11.5.1.2 Extent of the impacts

Construction of the turbine foundations, substation, cabling between the turbines and access roads may impact on remains which are buried, but these impacts will be limited and restricted to the local area. The construction of the turbine bases may disturb small areas and the negative impact on possible archaeological sites/materials may be relatively small. Other projects such as the construction of roads, buildings and underground lines will disturb large areas and may expose sites/materials on a larger scale. In both cases further disturbances of sites/materials can be limited by mitigation.

Table 11.1. Impacts to the pre-colonial archaeology.

Nature: The potential impact of the construction of the turbines, substation, cabling between the turbines, access roads and workshop on above and below ground archaeology.		
	Without Mitigation	With Mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (4)	Minor (2)
Probability	Unlikely (3)	Unlikely (3)
Significance	Low < 30	Low < 24
Status (positive or negative)	Negative	Neutral
Reversibility	No	No
Irreplaceable loss of resources?	No, but in some cases, yes	No
Can impacts be mitigated?	Yes	

Mitigation: No mitigation is proposed before construction starts because the archaeological remains (if any) are of low significance (excluding human remains). However, if concentrations of archaeological materials are exposed then all work must stop for an archaeologist to investigate (see below).

If any human remains (or any other concentrations of archaeological heritage material) are exposed

during construction, all work must cease and it must be reported immediately to the nearest museum/archaeologist or to the South African Heritage Resources Agency, so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to investigate and to remove/collect such material. Recommendations will follow from the investigation.

Cumulative impacts: The cumulative impacts on the pre-colonial cultural landscape will increase because there are already six other wind energy facilities proposed for the wider region.

Residual impacts: Long term. Take a long time for construction disturbances to be restored.

11.5.2 Pre-colonial archaeological cultural landscape

Cultural landscapes, ... are cultural properties and represent the "combined works of nature and of man". They are illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal (UNESCO, Operational Guidelines for the Implementation of the World Heritage Convention, 2008).

The Banna Ba Pifhu Wind Energy Facility site has been transformed on a large scale by farming activities in the past. Although these gently undulating plains may have been home to groups of hunter-gatherers for the past 1,5 million years and pastoralists the past 2 000 years, little evidence is visible or has survived the clearing and ploughing of the landscape. Early and Middle Stone Age stone tools observed in the exposed river gravels, which are in a secondary context (as will all other material be if present), are the only evidence observed of pre-colonial occupation of the area. Furthermore, the site is further than five kilometres from the coast and the nearest large, significant accumulations of archaeological sites and materials in the coastal shifting dunes (Figures 11.1, 11.2, 11.5 and 11.6). In general the site appears to be of **low archaeological sensitivity** (Table 11.2).

11.5.2.1 Nature of the impacts

The construction of a large number of wind turbines will no doubt contribute to significant changes to the general cultural landscape and 'sense of place'. In general the development will also directly add to the accumulative visual effect with the other six proposed wind energy facilities for the wider region and the nearby Cape St Francis/Thyspunt cultural landscape (Figures 11.5 and 11.6).

11.5.2.2 Extent of the impacts

Due to the distance from the nearby Cape St Francis/Thyspunt cultural landscape (more than 5 km), the visual effect and intrusion on the significance of place and the pre-colonial archaeological cultural landscape will be more indirect and less than those close to the coast. However, as an addition to the other six proposed wind facilities which are closer to the Cape St Francis/Thyspunt cultural landscape, the Banna Ba Pifhu Wind Energy Facility will contribute to the 'cumulative visual impact' on the pre-colonial cultural landscape and the 'significance of place'.

Table 11.2. Impacts to the pre-colonial cultural landscape.

Nature: The potential effect of the construction of a large number of turbines and infrastructure on the pre-colonial cultural landscape in terms of visual impacts and changes to 'sense of place'.		
	Without Mitigation	With Mitigation
Extent	Local with regional effects (3)	Local with regional effects (3)
Duration	Long term/permanent (5)	Long term/permanent (5)
Magnitude	Moderate (5)	Low (5)
Probability	Probable (4)	Probable (4)
Significance	Medium 52	Medium 52
Status (positive or negative)	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	No
Mitigation: Locally the impact will stay negative regardless of mitigation.		
Cumulative impacts: The cumulative impacts on the pre-colonial cultural landscape will increase because there are already six other wind energy facilities proposed for the wider region.		
Residual impacts: Long term. Take a long time for construction disturbances to be restored.		

Reversibility of archaeological impacts and irreplaceability of resource loss

As far as the archaeological heritage resources within the Banna Ba Pifhu wind energy facility study area are concerned, any negative impacts due to damage or disturbance of sites/materials are **non-reversible**. Sites/materials are on the surface and/or buried a few centimetres deep and any construction activities will destroy and/or disturb the context of the sites/materials, especially in the case of human remains (burials).

The irreplaceability of the archaeological heritage lost as a result of the construction phase of the Ubuntu development is assessed as **low**. The reason is that the study area appears to be of low archaeological sensitivity (excluding human burials) and the majority of the sites/materials are in secondary context due to intensive ploughing in the past. Possible material found on the Banna Ba Pifhu site also occurs in adjacent areas.

Assessment of impacts of the preferred alternative of 30.6 MW

Note: The impacts assessed above are based on the alternative 1 layout of 50 MW. The specialist, Dr Johan Binneman, has reviewed the alternative preferred layout of 30.6 MW and has confirmed in an email dated 6 September 2012 that it will be highly unlikely that the reduced layout will impact on any important archaeological sites. He noted that they have done a comprehensive walk-through of the areas and if any disturbances to archaeological material occur it will be of **low significance**.

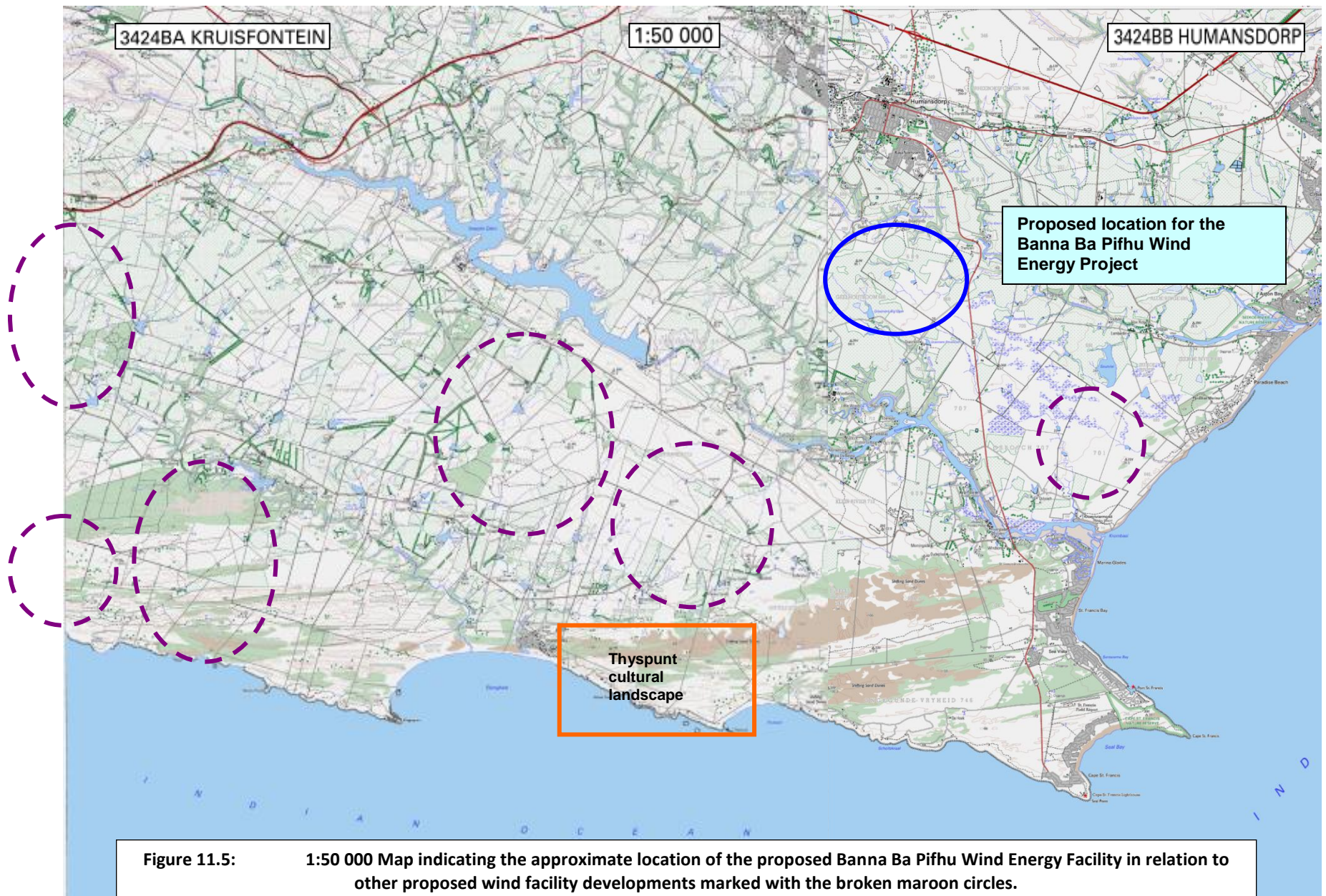


Figure 11.5: 1:50 000 Map indicating the approximate location of the proposed Banna Ba Pifhu Wind Energy Facility in relation to other proposed wind facility developments marked with the broken maroon circles.



Figure 11.6: Aerial image indicating the approximate location of the proposed Banna Ba Pifhu Wind Energy Facility in relation to other proposed wind facility developments marked with the broken pink circles.

11.6 RECOMMENDATIONS

- If any concentrations of archaeological material or human remains are uncovered during further development of the site, all work must immediately cease and should be reported to the Albany Museum and/or the South African Heritage Resources Agency so that systematic and professional investigation/excavations can be undertaken. Sufficient time should be allowed to remove/collect such material (See Appendix 11.3 for a list of possible archaeological sites that maybe found in the area).
- Construction managers/foremen should be informed before the start of construction on the possible types of heritage sites and cultural material they may encounter and the correct procedures to follow when they encounter sites

11.7 CONCLUSIONS

The proposed Banna Ba Pifhu Wind Energy Facility site is more than 5 kilometres from the coast and falls outside the coastal sensitive zone. The proposed wind energy site has been ploughed in the past and is now covered by dense short grass which made it difficult to find archaeological materials. Apart from a few Early and Middle Stone Age stone tools exposed in a track, no significant sites/materials were found and it is highly unlikely that *in situ* archaeological material/sites will be exposed during development.

Visually, the area investigated appears to be of **low archaeological sensitivity** and the impact of construction will be **low**. Together with the other six proposed wind energy facilities proposed for the coastal foreland, this development will add to the general accumulative visual impact on the area, but will have little visual effect on the nearby coastal pre-colonial archaeological landscape.

11.7.1 General remarks and conditions

It must be emphasised that the conclusions and recommendations expressed in this archaeological heritage sensitivity investigation are based on the visibility of archaeological sites/features and may not therefore, reflect the true state of affairs. Many sites/features may be covered by soil and vegetation and will only be located once this has been removed. In the event of such finds being uncovered, (such as during any phase of construction work), archaeologists must be informed immediately so that they can investigate the importance of the sites and excavate or collect material before it is destroyed. The onus is on the developer to ensure that this agreement is honoured in accordance with the National Heritage Act No. 25 of 1999.

It must also be clear that Archaeological Specialist Reports (AIAs) will be assessed by the relevant heritage resources authority. The final decision rests with the heritage resources authority, which should grant a permit or a formal letter of permission for the destruction of any cultural sites.

11.8 REFERENCES

- Binneman, J.N.F. 2001. An introduction to a Later Stone Age coastal research project along the south-eastern Cape coast. *Southern African Field Archaeology* 10:75-87.
- Binneman, J.N.F. 2005. Archaeological research along the south-eastern Cape coast part1: open-air shell middens *Southern African Field Archaeology* 13 & 14:49-77. 2004/2005.
- Deacon, H.J. 1992. Southern Africa and modern human origins. *Philosophical Transactions of the Royal Society*, London 337: 177–83.
- Deacon, H.J. 1993. Southern Africa and modern human origins. In: Aitken, M. J., Stringer, C. B. & Mellars, P. A., eds, *The origin of modern humans and impact of chronometric dating*. Princeton: Princeton University Press, pp. 104–17.
- Deacon, H.J. 2001. Modern human emergence: an African archaeological perspective. In: Tobias, P. V., Raath, M. A., Moggi-Cecchi, J. & Doyle, G. A., eds, *Humanity from African Renaissance to coming Millennia*. Johannesburg: University of the Witwatersrand Press, pp. 213–22.
- Deacon, H.J. & Geleijnse, V. 1988. The stratigraphy and sedimentology of the Main Site sequence at Klasies River, South Africa. *South African Archaeological Bulletin* 43:5-14.
- Deacon, H. J & Shuurman, R. 1992. The origins of modern people: the evidence from Klasies River. In: Bräuer, G. & Smith, F. H., eds, *Continuity or replacement: controversies in Homo sapiens evolution*. Rotterdam: Balkema, pp. 121–9.
- Deacon, H. J. & Wurz, S. 1996. Klasies River Main Site, Cave 2: a Howiesons Poort occurrence. In: Pwiti, G. & Soper, R., eds, *Aspects of African Archaeology*. Harare: University of Zimbabwe Publications, pp. 213–8.
- Deacon, H.J. & Deacon, J. 1999. *Human beginnings in South Africa: uncovering the secrets of the Stone Age*. Cape Town: David Phillips Publishers.
- Laidler, P.W. 1947. The evolution of Middle Palaeolithic technique at Geelhoutboom, near Kareedouw, in the southern Cape. *Transactions of the Royal Society of South Africa* 31:283-313.
- Rightmire, G.P. & Deacon, H.J. 1991. Comparative studies of Late Pleistocene human remains from Klasies River Mouth, *South Africa. Journal of Human Evolution* 20:131-156.
- Singer, R. & Wymer, J. 1982. *The Middle Stone Age at Klasies River Mouth in South Africa*. Chicago: University of Chicago Press.
- Wurz, S. 1999. The Howiesons Poort backed artefacts from Klasies River: an argument for symbolic behaviour. *South African Archaeological Bulletin* 54: 38–50.

Appendix 11.1: Brief Archaeological background

Brief literature review (a comprehensive desktop study was compiled for the proposed Broadlands photovoltaic power project on the same property)

The oldest evidence of the early inhabitants in the region are large stone tools, hand axes and cleavers, which can be found in the river gravels which capped the hill slopes in the region, and on the calcrete floors exposed in the dune systems along the coast towards Cape St Francis (Laidler 1947; Deacon & Geleijnse 1988; Binneman 2001, 2005). The time period is known as the Early Stone Age and the stone tools belong to the Acheulian Industry, dating between approximately 1,5 million and 250 000 years old.

After this period, the Acheulian hand axes and cleavers were replaced by a totally different looking stone tool industry, the so-called flake and blade industries of the Middle Stone Age (MSA). The period, between 120 000 - 30 000 years ago, also witnessed the emergence of the first modern humans (*Homo sapiens sapiens*). The oldest remains of anatomically modern humans in the world (some 110 000 years old) come from the Klasies River complex of caves some 15 kilometres east of the proposed development (Singer & Wymer 1982; Rightmire & Deacon 1991; Deacon 1992, 1993, 2001; Deacon, H. J & Shuurman, R. 1992). The archaeological deposits at the Klasies River Caves (1-5) date to 120 000 years old.

Although humans were already anatomically modern by 110 000 years ago, they were not yet exhibiting 'modern behaviour' and only developed into culturally modern humans between 80 000 and 70 000 years ago. This occurred during cultural phases known as the Still Bay and Howieson's Poort time periods/stone tool traditions. The Howison's Poort is well represented at Klasies River Cave 2 (Deacon & Wurz 1996; Wurz 1999).

Unfortunately, no caves and shelters in the region with deposits dating between 25 000 and 5 000 years ago have been excavated yet. Nevertheless, from sites farther along the coast and adjacent Cape Mountains, we know that the past 20 000 years, called the Late Stone Age (LSA), introduced several 'new' technological innovations. Others became more common, such as rock art, burials associated with grave goods, painted stones, new microlithic stone tool types, some fixed to handles with mastic, bow and arrow, containers, such as tortoise shell bowls and ostrich eggshell flasks (sometimes decorated), decorative items, bone tools and many more (Deacon & Deacon 1999).

The climate period between 20 000 and 14 000 years ago was extremely cold and had a great influence on the environment, the people and animals. During the Last Glacial Maximum (the last ice age) vast areas were exposed along the coast which created favourable conditions for grassland and grazing animals (also inland). The remains from archaeological sites indicate that there were several large grazing animal species which are now extinct, for example the giant buffalo, the giant hartebeest and the Cape horse. After 14 000 years ago the climate started to warm up again and the sea level rose rapidly. By 12 000 years ago the sea was close to modern conditions and the previously exposed grassland also disappeared due to the rising sea level, causing the extinction of many grassland species including the giant buffalo, hartebeest and the Cape horse (Deacon & Deacon 1999).

Between 10 000 and 8 000 years ago the environment became bushier and gave rise to smaller territorial browsing animals that lived in small groups or pairs. Most of the large Last Glacial grazing animals disappeared from the archaeological deposits in the region during this time. A characteristic of the past 8 000 years, also known as the Wilton time period, is the large number of small (microlithic) stone tools in the shelters and open-air middens of the region. However, by 4 500 years ago these stone tools were replaced at the the Klasies River Caves by large quartzite stone tools, labelled the Kabeljous Industry (Binneman 2001, 2005). The first real change in the socio-economic landscape came some 2 000 years ago when Khoi pastoralists settled in the region. They were the first food producers and introduced domesticated animals (sheep, goats and cattle) and ceramic vessels to the region (Binneman, 2001, 2005).

Appendix 11.2: Brief legal requirements

Parts of sections 35(4), 36(3) and 38(1) (8) of the National Heritage Resources Act 25 of 1999 apply:

Archaeology, palaeontology and meteorites

35 (4) *No person may, without a permit issued by the responsible heritage resources authority—*

- (a) *destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;*
- (b) *destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;*
- (d) *bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.*

Burial grounds and graves

36. (3) (a) *No person may, without a permit issued by SAHRA or a provincial heritage resources authority—*

- (a) *destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;*
- (b) *destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or*
- (c) *bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.*

Heritage resources management

38. (1) *Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as –*

- (a) *the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) *the construction of a bridge or similar structure exceeding 50m in length;*
- (c) *any development or other activity which will change the character of the site –*

- (i) exceeding 5000m² in extent, or*
- (ii) involving three or more erven or subdivisions thereof; or*
- (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
- (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA, or a provincial resources authority;*
- (d) the re-zoning of a site exceeding 10 000m² in extent; or*
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must as the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*

Appendix 11.3: Disclaimer Identification of Archaeological Features and Material from Inland Areas: Guidelines and Procedures for Developers

Human Skeletal material

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general the remains are buried in a flexed position on their sides, but are also found buried in a sitting position with a flat stone capping and developers are requested to be on the alert for this.

Stone artefacts

These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified

Fossil bone

Fossil bones may be found embedded in geological deposits. Any concentrations of bones, whether fossilized or not, should be reported.

Large stone features

Large stone features may be present in various forms and sizes, but are easy to identify. The most common are roughly circular stone walls (mostly collapsed) and may represent stock enclosures, remains of wind breaks or cooking shelters. Others consist of large piles of stones of different sizes and heights and are known as *isisivane*. They are usually near river and mountain crossings. Their purpose and meaning is not fully understood, however, some are thought to represent burial cairns while others may have symbolic value.

Historical artefacts or features

These are easy to identified and include foundations of buildings or other construction features and items from domestic and military activities.