

**AN ARCHAEOLOGICAL WALK THROUGH SURVEY OF THE FINAL TURBINE  
FOOTPRINT FOR THE PROPOSED TSITSIKAMMA COMMUNITY WIND ENERGY  
FACILITY, KOUGA LOCAL MUNICIPALITY, HUMANSDORP DISTRICT, EASTERN  
CAPE PROVINCE: AN AMENDMENT TO THE PHASE 1 ARCHAEOLOGICAL IMPACT  
ASSESSMENT CONDUCTED DURING August 2011**

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## CONTENTS

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## **BRIEF BACKGROUND SUMMERY**

A comprehensive desktop study and a phase 1 archaeological impact assessment (AIA) for the preliminary layout of the proposed Tsitsikamma Community Wind Energy Facility and associated infrastructure at Wittekleibosch near Humansdorp, Kouga Local Municipality, Cacadu District Municipality, Eastern Cape Province, have been compiled during August 2011. This report has been reviewed, accepted and regarded as sufficient by the South African Heritage Resources Agency for the right to develop. No other heritage impact assessments were required. The recommendations and consultation with the Gamtkwa KhoiSan Council have been covered by the previous report.

## **Terms of reference**

The footprint of the final layout is totally different from the previous one. Thus, the proposal was to conduct a walk through of the final layout of all turbines and related infrastructures, including access roads for the proposed Tsitsikamma Community Wind Energy Facility and associated infrastructure at Wittekleibosch near Humansdorp, Kouga Local Municipality, Cacadu District Municipality, Eastern Cape Province, to describe and to evaluate;

- the importance of possible archaeological sites, features and materials,
- the potential impact of the development on these resources and,
- to propose recommendations to minimize possible damage to these resources.

## **Site and location**

The proposed Tsitsikamma Community Wind Energy Facility site is situated approximately 30 km west of Humansdorp, south of the N2 National Road in the Wittekleibosch area, in the Kouga Local Municipality, Humansdorp District, Cacadu District Municipality, Eastern Cape Province. The development is located between the N2 National Road (south) and the coast (a distance of between 5 and 12 kilometres) and east, north-east of the Tsitsikamma River. The site comprises of relatively flat, high lying agricultural land and currently being used mainly for grazing. The development will take place on Portions 4 - 6 of Wittekleibosch 787 (Maps 1-4).

## **Type of development**

The proposed development entails the construction and operation of a wind energy facility and associated infrastructure. The wind energy facility will comprise of 31 wind turbines with a proposed total generating capacity of up to 100 MW. The associated infrastructure required for the facility will include concrete foundations to support the turbines. Cabling between the turbines will be laid underground where practical. An on-site substation to facilitate the connection between the wind energy facility and the grid will be constructed. New overhead power lines (132kV distribution line) will be constructed to connect to Eskom's existing Melkhout substation near Humansdorp (approximately 25 kilometres northeast of the study site). Other developments will include internal access roads to each turbine and a workshop/administrative area for maintenance and storage of equipment.

## **Investigation**

The final footprint of the proposed Tsitsikamma Community Wind Energy Facility site is situated further than 5 kilometres from the coast and falls outside the coastal sensitive zone. A large part of the study site has been ploughed extensively in the past and is covered by dense grass for grazing and large patches of mainly alien vegetation. These circumstances made archaeological visibility virtually impossible. Only a few Earlier Stone Age stone tools were observed exposed on a ferricrete sub-surface palaeosol. It is unlikely that any significant archaeological material will be exposed during the development.

## **Cultural sensitivity**

The study area investigated appears to be of low archaeological (sites/materials) sensitivity and the impact of construction will be of low negativity. However, although the visual impact of the turbines will have a negative effect on the pre-colonial archaeological landscape, the effect will be slightly less dominant with the final layout than before.

## **Recommendations**

The graves near turbine position No. 15 must be fenced-off and care should be taken that they are not disturbed or damaged during the construction phase.

If any concentrations of archaeological material are uncovered during development, work must immediately cease and be reported to the nearest archaeologist and/or the South African Heritage Resources Agency.

## **The Developer**

Exxaro Resources and Watt Energy (Pty) Ltd.

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## **Brief archaeological background**

The oldest evidence of the early inhabitants in the region are large stone tools, called hand axes and cleavers which can be found in the gravels which cap 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 Earlier Stone Age (ESA) and the stone tools belong to the Acheulian Industry, dating between approximately 1,5 million and 250 000 years old.

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 time period, between 120 000 - 30 000 years ago, also witness 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) comes from the Klasies River complex of caves some seven kilometres west 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 fully exhibiting 'modern behaviour' and only developed into culturally modern behaving 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).

From about 30 000 years ago, several 'new' technological innovations were introduced to the region. During this period, known as the Later Stone Age (LSA), rock art, burials associated with grave goods, painted stones, new microlithic stone tool types, bows and arrows, decorative items and many more became common (Deacon & Deacon 1999).

The period between 20 000 and 14 000 years ago experienced extremely cold climatic conditions which influenced the environment, people and animals. During the Last Glacial Maximum vast areas were exposed along the coast which created favourable conditions for grassland and grazing animals (also inland). The remains from archaeological sites indicated 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 territorial smaller type browsing animals that lived in small groups or pairs. Most of the large Last Glacial grazing animals disappeared from the archaeological deposits during this time period from sites in the region. A characteristic of the past 8 000 years, also known as the Wilton time period, was the large number of small (microlithic) stone tools in the shelters and open-air middens of the region. 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).

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## **Relevant impact assessments close to the study area**

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## **Summary of the previous archaeological investigation**

The dense vegetation cover and waterlogged fields made it difficult to observe archaeological sites/materials during the August 2011 survey, but a few Earlier and Middle Stone Age quartzite stone tools (1,5 million – 30 000 years old) were observed at an old sand mine and vehicle track where the sub-surface ferricretes were exposed. The stone tools were in secondary context and of low cultural significance. The Earlier Stone Age stone tools included hand axes, cores, flaked cobbles and flakes (date between 1.5 and 250 000 years old). The Middle Stone Age stone tools (date between 250 000 and 30 000 years old) included broken blades and flakes which displayed typical faceted striking platforms. Some flakes displayed utilization damage but no 'formally' retouched flakes were observed. The conclusions were that the site appeared to be of low archaeological sensitivity, that it is unlikely that any archaeological remains of any significance will be found *in situ* or of any contextual value and that the impact of the development on archaeological sites/materials will be limited.

## **THE WALKTHROUGH INVESTIGATION**

### **Methodology and results**

The final layout of the turbine locations is completely different from the one investigated during August 2011 (Maps 1-5). Nevertheless, due to a comprehensive investigation by two people of the previous footprint whereby almost all turbine locations were visited on foot, the final walkthrough only had to concentrate on the spaces between the two different footprints. All the turbines (12) from the southern part of the preliminary footprint were also placed further north which also facilitated the final walkthrough.

The final walkthrough was conducted on foot and from a vehicle. GPS readings were taken with a Garmin and all important features were digitally recorded. The Tsitsikamma

Community Wind Energy Facility site comprises a relatively flat plain and used mainly for agricultural activities. Virtually the entire study area has been transformed in the past by bush clearing, ploughing and planting of grass for grazing, construction of dams, general farming activities and more recently by the establishment of small informal settlements. Large areas are also covered by dense alien vegetation (Figs 1-23). As was the case with the previous survey, the dense vegetation made it difficult to find archaeological sites/materials. The turbine positions are located either on disturbed areas covered by short, dense grass or among dense patches of mainly alien vegetation. Early Stone Age stone tools were found where the pebble/cobble gravels were exposed (1,5 million – 250 000 years old) were observed on a vehicle track which exposed sub-surface ferricretes (GPS reading: 34.03.34,44S; 24.29.29,94E) (Map 5a) (Figs. 8-9). The stone tools were in secondary context and of low cultural significance. A few neglected graves (date as recent as 2010) were also observed approximately 200 metres south of turbine location No. 15 (GPS reading: 34.04.47,46S; 24.29.36,24E) (Map 5b) (Fig. 14-15)

## DISCUSSION AND MITIGATION

The Tsitsikamma Community Wind Energy Facility site was covered in the past by dense coastal dune thicket, low forest and fynbos vegetation. These have been cleared to provide grazing for cattle and other farming activities. In the process any archaeological sites/materials were disturbed/destroyed by these activities. The area is covered by a thin layer of grey sandy soil overlying an old land surface of ferricrete on which concentrations of Earlier and Middle Age stone tools occur. Bush clearing and ploughing have disturbed these stone tools which were in secondary context already and not associated with any other archaeological materials. No further action is required regarding the few Earlier Stone Age stone tools.

In general, apart from a few Earlier Stone Age stone tools, the Tsitsikamma Community Wind Energy Facility site appears to be of low archaeological sensitivity and that it is unlikely that any archaeological remains of any significance will be found *in situ* or of any contextual value during the development. The impact of the development on archaeological sites/materials will also be limited. Furthermore, all the turbines in the final layout are situated more than five kilometres from the coast (the maximum distance shell middens are expected to be found inland) and therefore falls outside the coastal archaeological sensitive zone.

Although it is unlikely that any sensitive archaeological remains will be exposed during the development, there is always a possibility that human remains and/or other archaeological and historical material may be uncovered during the development. Should such material be exposed then it must be reported to the nearest museum, archaeologist or to the South African Heritage Resources Agency (see general remarks and conditions below). The development may proceed, but it is recommended that;

1. The graves near turbine position No. 15 must be fenced-off and care should be taken that they are not disturbed or damaged during the construction phase.



- Graves and graveyards older than 60 years are protected by the National Heritage Resources Act (Act No. 25 Of 1999) (Section 36). Those younger than 60 years are not protected by the National Heritage Resources Act, but protected by the Human Tissue Act and by regional and municipal regulations and may not be disturbed or destroyed without the necessary permits and proceedings.
  - If relocation of the graves is considered, then all the correct procedures, especially the public participation process must be followed. Permits must be obtained from SAHRA for any work on graves and graveyards. It is recommended that a specialist be consulted should any further work be required on the graveyard.
2. If any concentrations of material are uncovered during development, it should be reported to the Albany Museum and/or the South African Heritage Resources Agency immediately so that systematic and professional investigation/excavations can be undertaken. Sufficient time should be allowed to remove/collect such material (See appendix B for a list of possible archaeological sites that maybe found in the area).
  3. Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites. It is suggested that a person be trained to be on site to report to the site manager if sites are found.



**Figs 1. General views of the Tsitsikamma Community Wind Energy site.**



**Figs 2-9. General views towards turbine position 1 (top row left), towards 16, 31, 12 and 2 (top row right and bottom row), towards 27, 10, 3, 5 and 8 (second row right and third row) and the exposed the Early Stone Age Stone tools (bottom row, see map 5a).**





Figs 10-17. General views towards turbine positions 13-14 (top row), towards 17 (second row), the graves (the left image was taken during 2012 and the right during 2011) and a view towards 5 (third row, see map 5b), and towards 8, 6 and 7 (bottom row).





**Figs 18-23. General views towards turbine positions 11, 25, 26 and 28 (top row), cable route towards turbine 28 past the settlement (second row), and towards turbine positions 4, 21, 24, 29 and 30 (third row).**

## **ASSESSMENT OF THE IMPACTS**

### **Pre-colonial archaeology**

#### *Nature of the impacts*

From the investigation, it would appear that the proposed Tsitsikamma Community Wind Energy Facility site is of low archaeological sensitivity. Apart from a few exposed stone tools no sites/remains of significance were observed, but material may be covered by soil

and vegetation. 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.

#### *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 1. Impacts to the pre-colonial archaeology.**

<b>Nature:</b> The potential impact of the construction of the turbines, substation, cabling between the turbines, access roads and workshop on above and below ground archaeology.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (1)	Local (1)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	Minor (2)	Minor (2)
<b>Probability</b>	Unlikely (2)	Unlikely (2)
<b>Significance</b>	Low < 30	Low < 30
<b>Status (positive or negative)</b>	Negative	Neutral
<b>Reversibility</b>	No	No
<b>Irreplaceable loss of resources?</b>	No, but in some cases, yes	No
<b>Can impacts be mitigated?</b>	Yes	
<b>Mitigation</b> 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.		
<b>Cumulative impacts:</b> The number of concrete bases will determine the impact on the buried materials (if any) and if these increase so will the impact.		
<b>Residual impacts:</b> Permanent		

### **Pre-colonial archaeological cultural landscape**

#### *Nature of the impact*

The Tsitsikamma Community Wind Energy Facility site is situated adjacent to one of the world's most important pre-colonial cultural landscapes, the Klasies River/Klippepunt area. Within this unique pre-colonial cultural landscape, anatomically modern human

populations originated and spread to Europe and other parts of the globe. In the August 2011 report it was suggested that the nearest turbines from the Klasies River Caves and Geelhoutboom dunes be moved 2 kilometres further back towards the N2 national road, or the number of the turbines be reduced to lessen the visual impact on the cultural landscape. Although these suggestions were rejected by SAHRA, the developer in the final outlay of the turbine positions took cognisance of the recommendations and moved 12 turbines well beyond the proposed five kilometre boundary for the archaeological cultural landscape from the coast. This consideration by the developer must be applauded because it will contribute to 'ease' the visual and cumulative impacts on the Klasies River/Klippepunt cultural landscape and the overall 'significance of place', in a small way.

### *Extent of impact*

Although the visual impact has been 'eased', the visibility of the turbines will still be the single largest change to the Klasies River/Klippepunt pre-colonial cultural landscape. Due to the size of the turbines the visual impact will be negative and change the 'significance of place'. This will be long term to permanent and cannot be mitigated to decrease the impact.

**Table 1. Impacts to the pre-colonial cultural landscape.**

<b>Nature:</b> The large number of turbines will impact on one of the most unique pre-colonial cultural landscape in the world in terms of visual impacts and changes to 'sense of place'.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (4)	Local (3)
<b>Duration</b>	Long term/permanent (5)	Long term/permanent (5)
<b>Magnitude</b>	High (8)	Low (4)
<b>Probability</b>	Highly probable (4)	Highly probable (3)
<b>Significance</b>	Medium 68	Low 48
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Reversible	Reversible
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	no	no
<b>Mitigation</b> The developer has followed the recommendations expressed in the previous report and moved 12 turbines further back from the pre-colonial cultural landscape. Given the size of the turbines and the right of development, further mitigation cannot reduce the negative visual effect on 'significance of place'.		
<b>Cumulative impacts:</b> The cumulative impacts may be increasing as further wind farms are planned for adjoining areas. The large number of turbines will bring permanent changes to the pre-colonial cultural landscape in terms of visual impacts and changes to 'sense of place'.		
<b>Residual impacts:</b> Disturbances to the landscape by the construction of roads and trenches for the cables will be long term to permanent.		

## GENERAL REMARKS AND CONDITIONS

Note: This report is for a Phase 1 archaeological heritage impact assessment only and do not include or exempt other required heritage impact assessments (see below).

The National Heritage Resources Act (Act No. 25 of 1999, section 35)(see Appendix A) 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

It must be emphasised that the conclusions and recommendations expressed in this archaeological heritage sensitivity investigation are based on the visibility of archaeological sites/material and may not therefore, reflect the true state of affairs. Many sites 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, (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 Resources Act No. 25 of 1999 (NHRA).

It must also be clear that Phase1 Specialist Reports (AIAs) will be assessed by the relevant heritage resources authority. The final decision rests with the heritage resources authority, which should give a permit or a formal letter of permission for the destruction of any cultural sites.

## APPENDIX A: brief legislative 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 5000m<sup>2</sup> 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 000m<sup>2</sup> 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 B: IDENTIFICATION OF ARCHAEOLOGICAL FEATURES AND MATERIAL FROM INLAND AND ADJACENT COASTAL AREAS: guidelines and procedures for developers**

### **Shell middens**

Shell middens can be defined as an accumulation of marine shell deposited by human agents rather than the result of marine activity. The shells are concentrated in a specific locality above the high-water mark and frequently contain stone tools, pottery, bone and occasionally also human remains. Shell middens may be of various sizes and depths, but an accumulation which exceeds 1 m<sup>2</sup> in extent, should be reported to an archaeologist.

### **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**

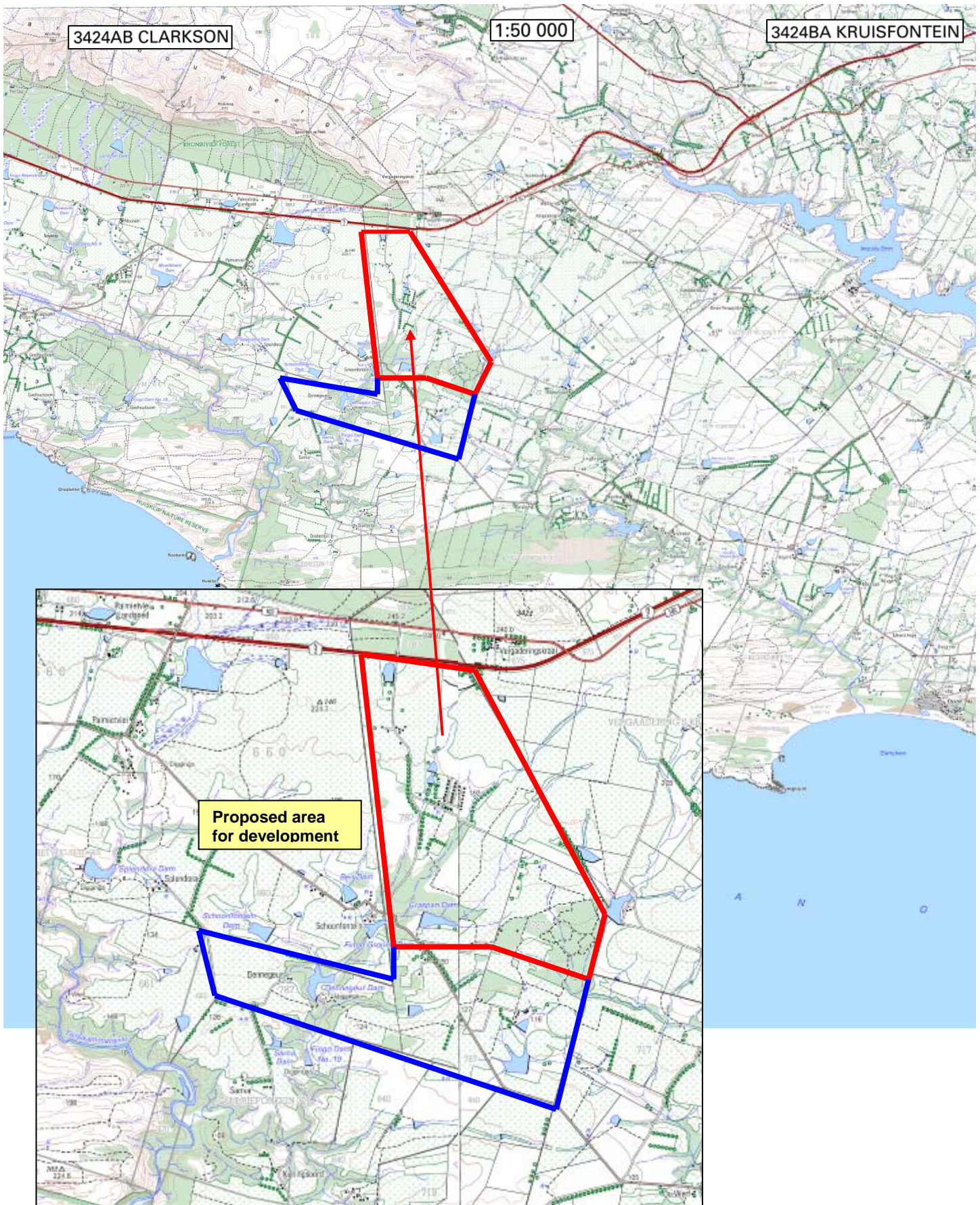
Fossil bones may be found embedded in geological deposits. Any concentrations of bones, whether fossilized or not, should be reported.

### **Large stone features**

They come in different 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.



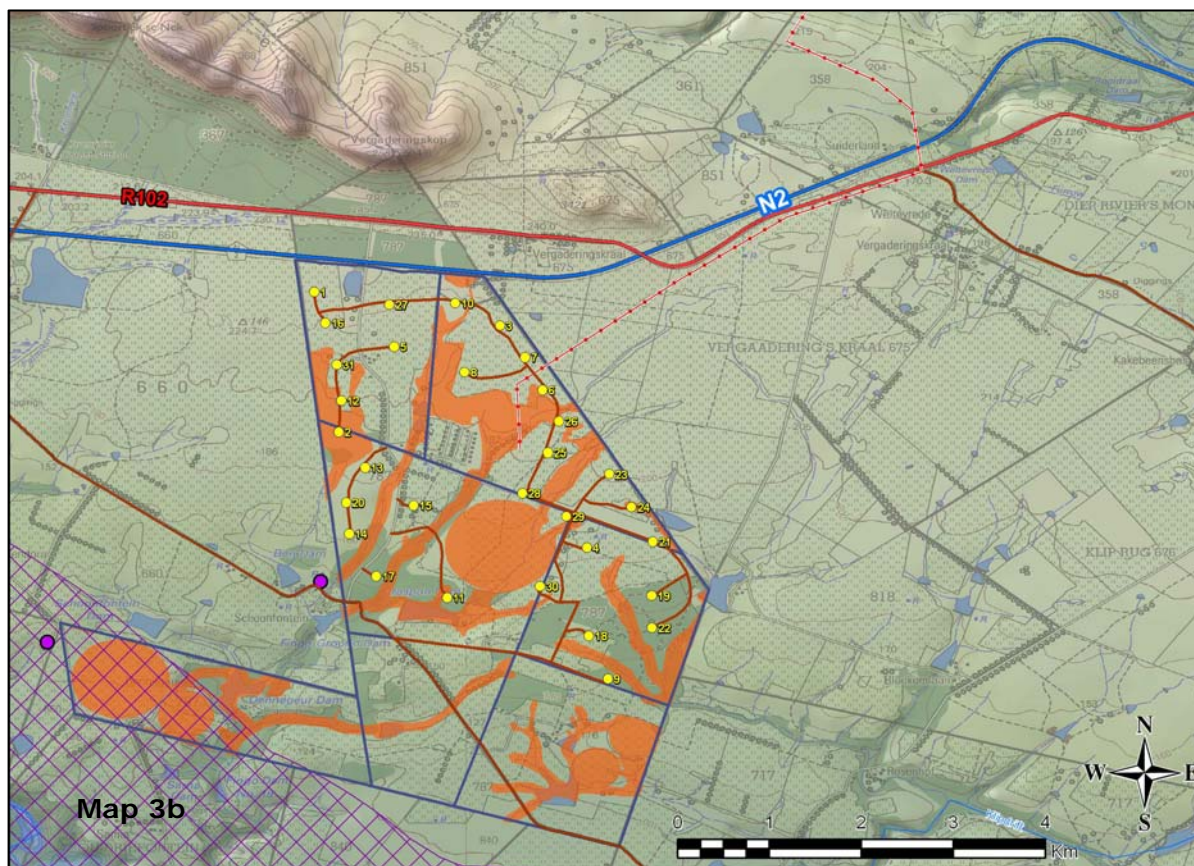
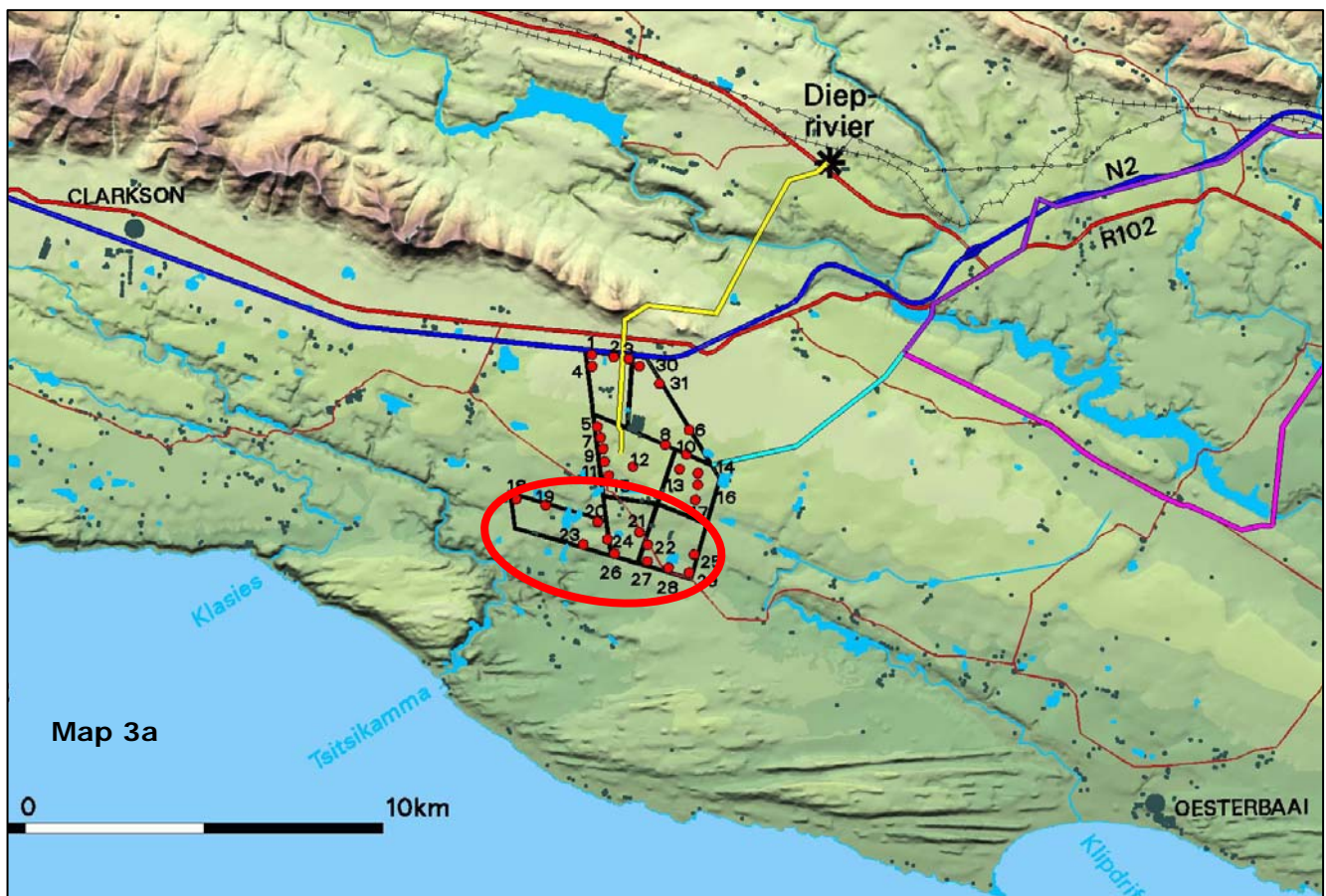
**Map 1. 1:50 000 Map indicating the location of the proposed Tsitsikamma Community Wind Energy Facility. The red lines outline the approximate size of footprint and the blue the size of the total property.**





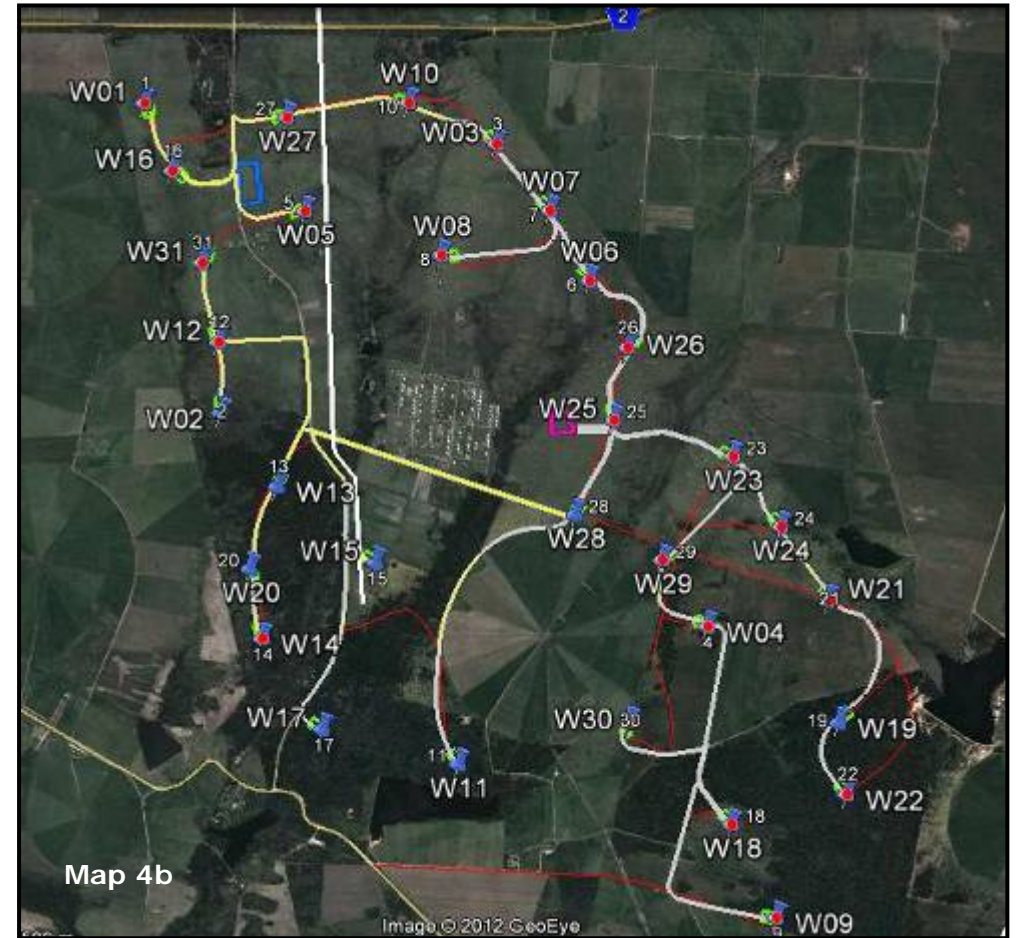
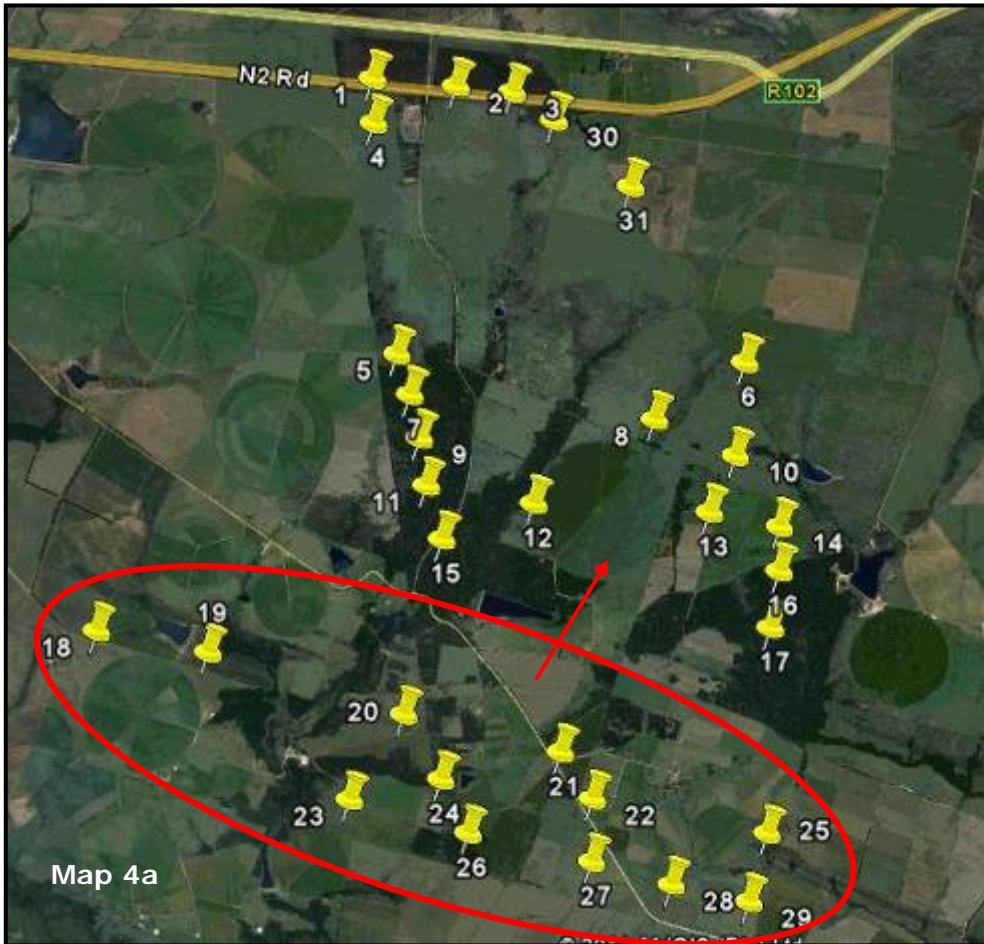
Map 2. Aerial images of the location of the proposed Tsitsikamma Community Wind Energy Facility (maps courtesy of Savannah (Pty) Ltd).



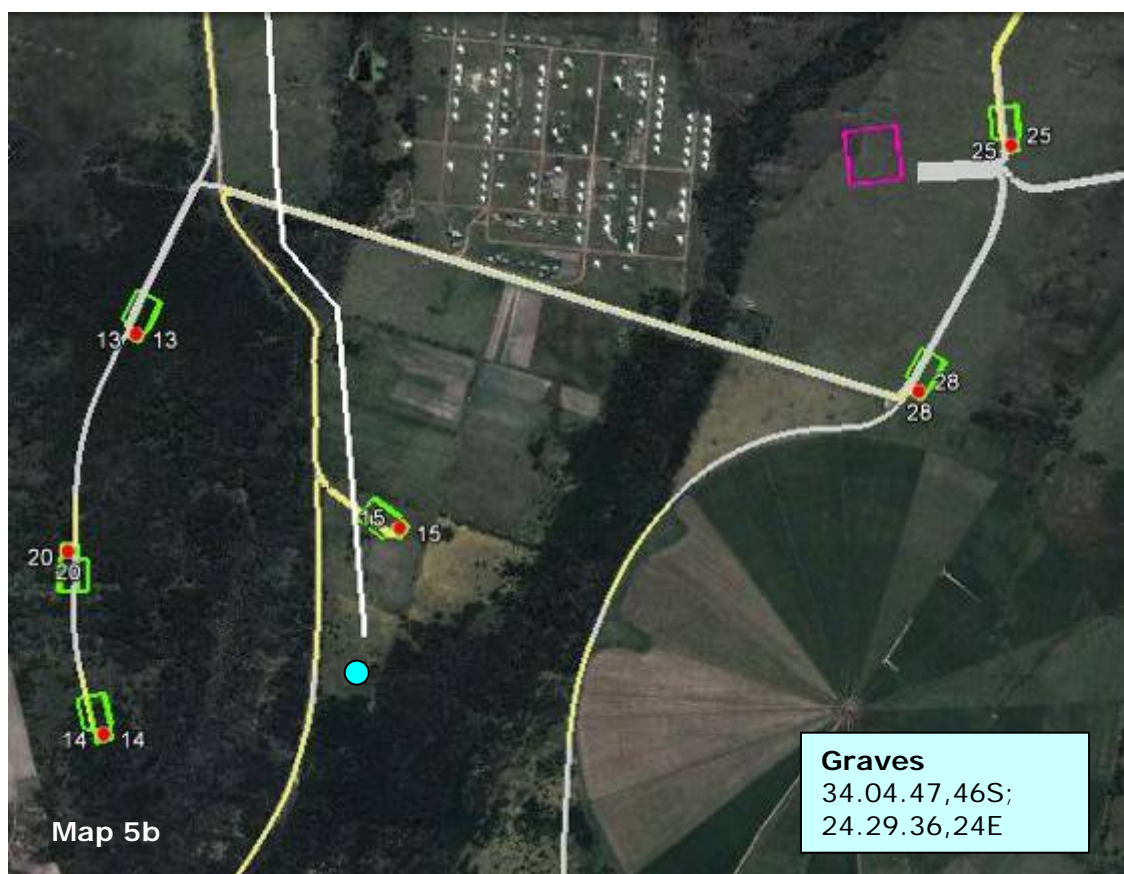
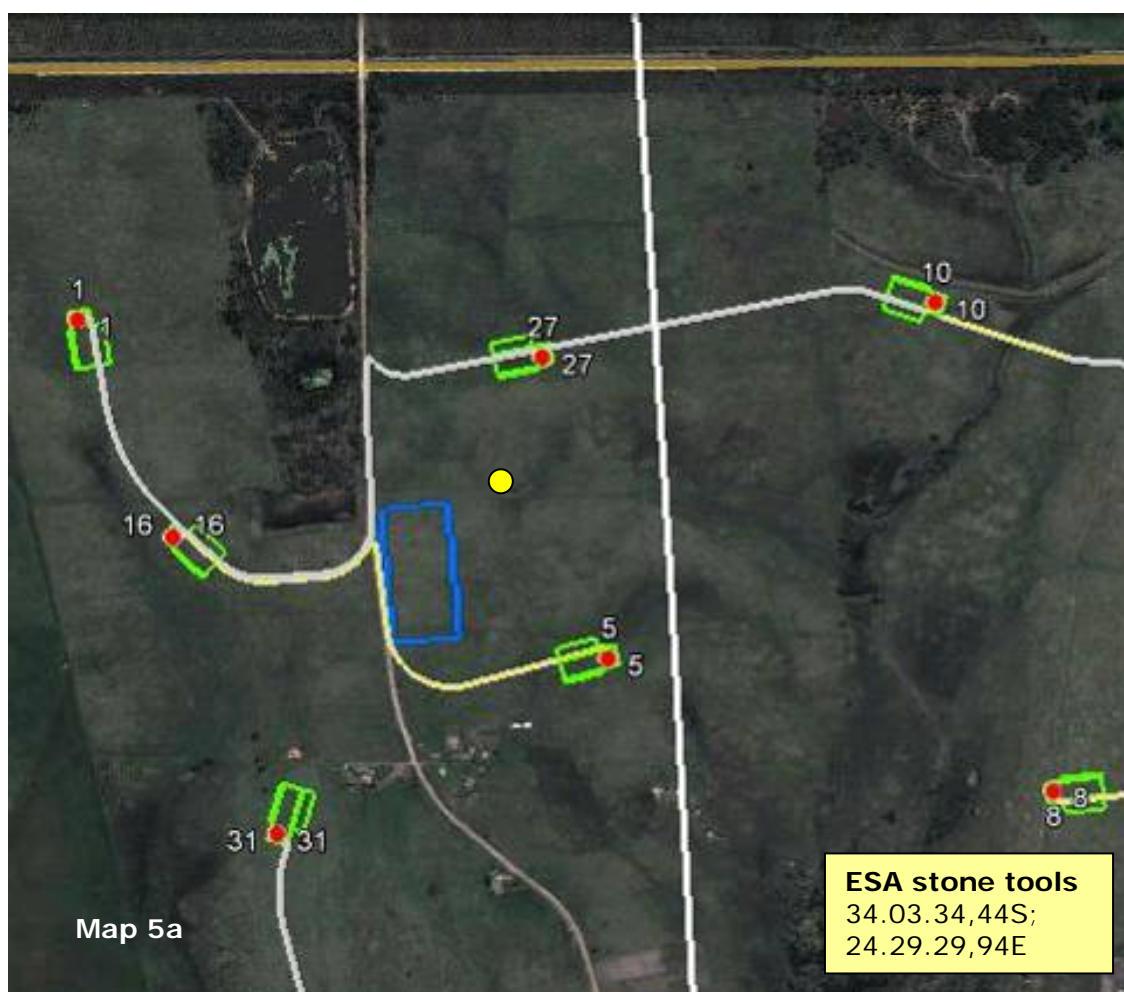


Maps 3a & b. The top map (3a) displays the original layout of the turbine positions and the bottom map (3b) the final layout. Note that all the turbines in the southern part of the property (red oval, 3a) have been moved further north (3b) (maps courtesy of Savannah (Pty) Ltd).





Maps 4a & b. The left map (4a) displays the original layout of the turbine positions (yellow pegs) and the right map (4b) the final layout and infrastructure. Note that all the turbines in the southern part of the property (red oval, 4a) have been moved further north (4b) (maps courtesy of Savannah (Pty) Ltd).



Map 5a & b. The location of the Early Stone Age stone tools is indicated by the yellow dot (5a) and the graves by the light blue dot (5b).