

AN ARCHAEOLOGICAL WALKTHROUGH SURVEY OF THE TURBINE FOOTPRINT FOR THE PROPOSED PHASE 1 AMAKHALA EMOYENI WIND ENERGY FACILITY, COOKEHOUSE DISTRICT, BLUE CRANE ROUTE MUNICIPALITY, EASTERN CAPE PROVINCE.



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BRIEF SUMMARY

Background

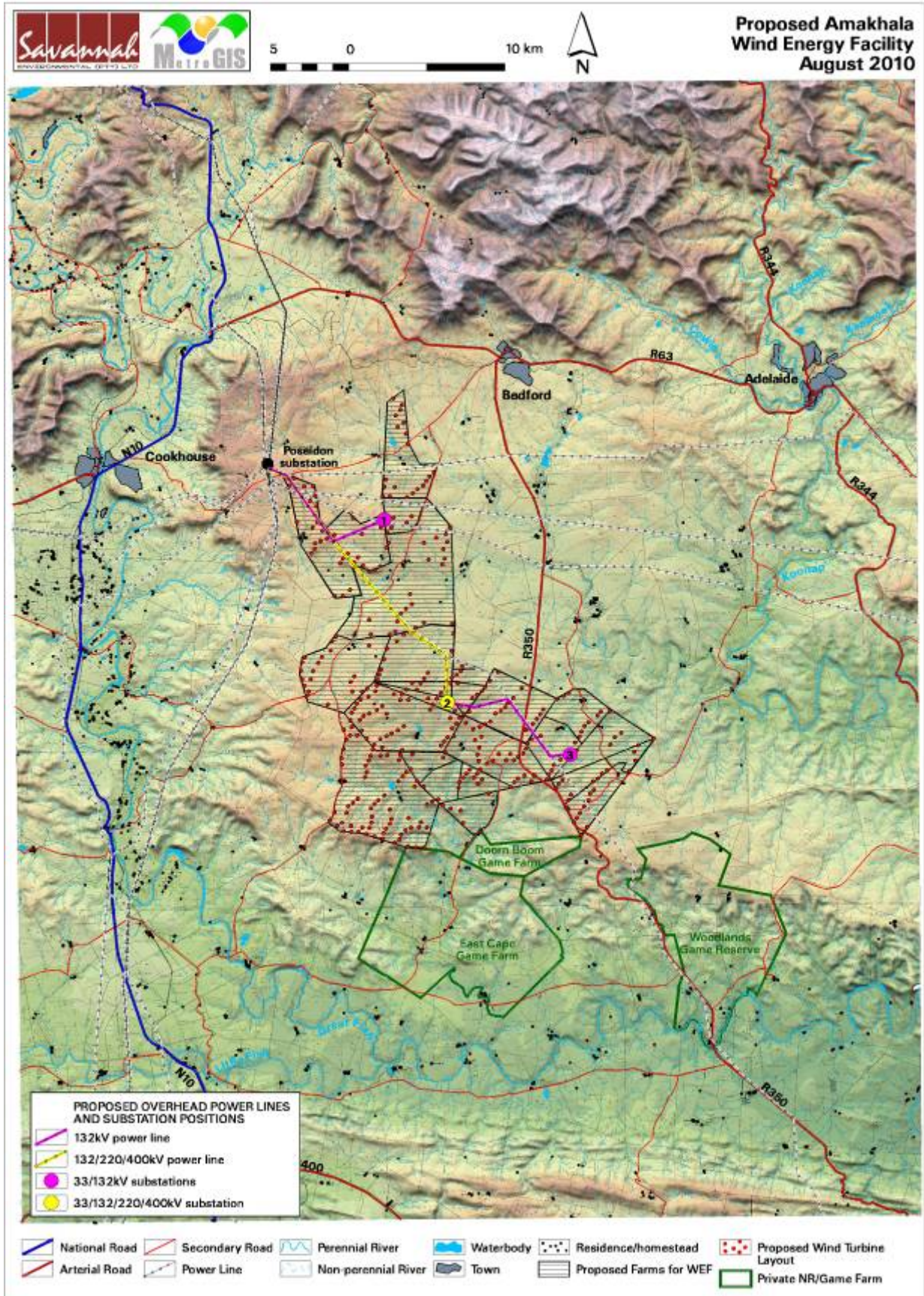
A comprehensive heritage impact assessment report has been compiled by ACO Associates cc during 2010 for Savannah Environmental (Pty) Ltd (independent environmental consultants) on behalf of Windlab Developments South Africa (Pty) Ltd (developer) after an extensive reconnaissance investigation of the Amakhala Emoyeni Wind Energy Facility site which is situated between the towns of Cookehouse and Bedford (see Halkett et al. 2010). The report also outlined, discussed and provided a detailed list of recommendations and mitigation measures to follow. Therefore the background information for the project and the study area will not be repeated here in any detail (also see Webley & Hart 2008; Webley et al. 2009; Hart & Webley 2010; Booth 2011).

Initially it was proposed to position 350 turbines and associated infrastructure (access roads, substations, power lines and underground cables etc.) with a capacity of generating between 500-750 Mw on a number of farms covering an area of approximately 273 square kilometres (Map 1). Recently it was decided that the project will be completed in two phases. Phase 1 will comprised of 66 turbines (this study) and will be developed on the northern part close to the Poseidon substation (Map 2).

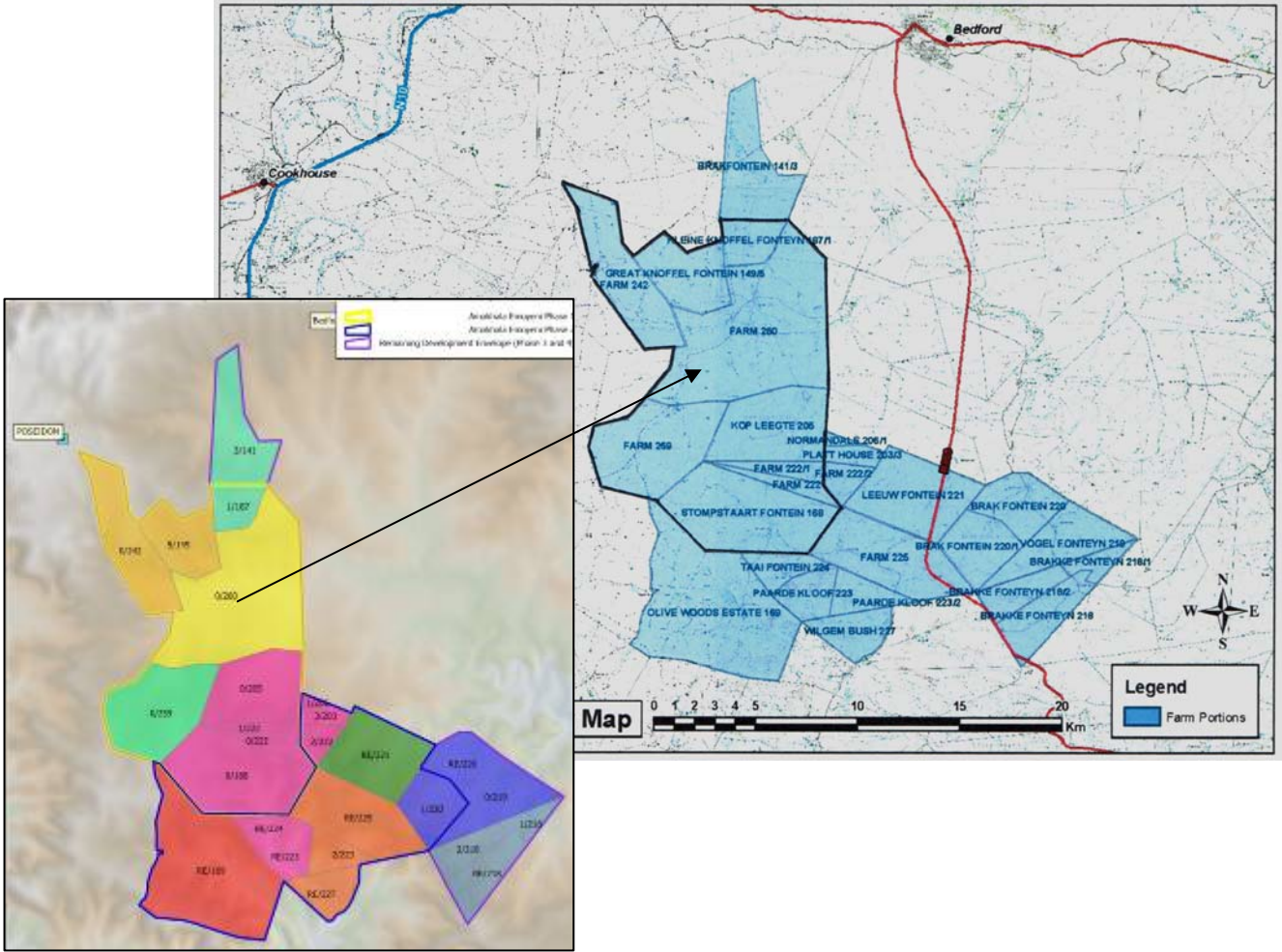
Purpose of the Study

The South African Heritage Resources Agency recommended that the footprint of all turbine locations and related infrastructures, including access roads must be surveyed by an archaeologist so that all heritage resources and their related significance can be identified (SAHRA Review Comments November 2010). The purpose of the study was to conduct a walkthrough survey of the turbine positions and access roads to establish;

- the range and importance of possible exposed and *in situ* archaeological sites, features and materials,
- the potential impact of the development on these resources and,
- to make recommendations to minimize possible damage to these resources.



Map 1. Locality map indicating the Amakhala Emoyeni Wind Energy Facility site and provisional layout of the proposed development in 2010 (map supplied by Savannah Environmental (Pty) Ltd).



Map 2. Maps of the Phase 1 development (maps supplied by Savannah Environmental (Pty) Ltd).

The site and location

The proposed Phase 1 development falls within the Blue Crane Route Local Municipality, Cacadu Distric Municipality, Eastern Cape and is situated between the towns of Cookehouse (approximately 14 kilometres south east) and Bedford (some 8 kilometres south west). It is located east of the N10 main road which links Paterson with Cookehouse and west of the R350 main road connecting Grahamstown with Bedford. Phase 1 comprises the northern half of the original proposed Amakhala Emoyeni Wind Energy Facility site (Map 2). The closest point from the Poseidon substation to the study area is roughly 700 metres and includes the properties;

Portion 1 of Farm Kleine Knoffel Fonteyn 187

Portion 5 of Farm Great Knoffelfontein 149

Portion 1 of Farm Normandale 206

Portion 3 of Farm Platt House 203

Remainder of Farm Stompstaart 168

Remainder of Farm kop Leegte 205

Remainder of Farm 260

Remainder of Farm 259

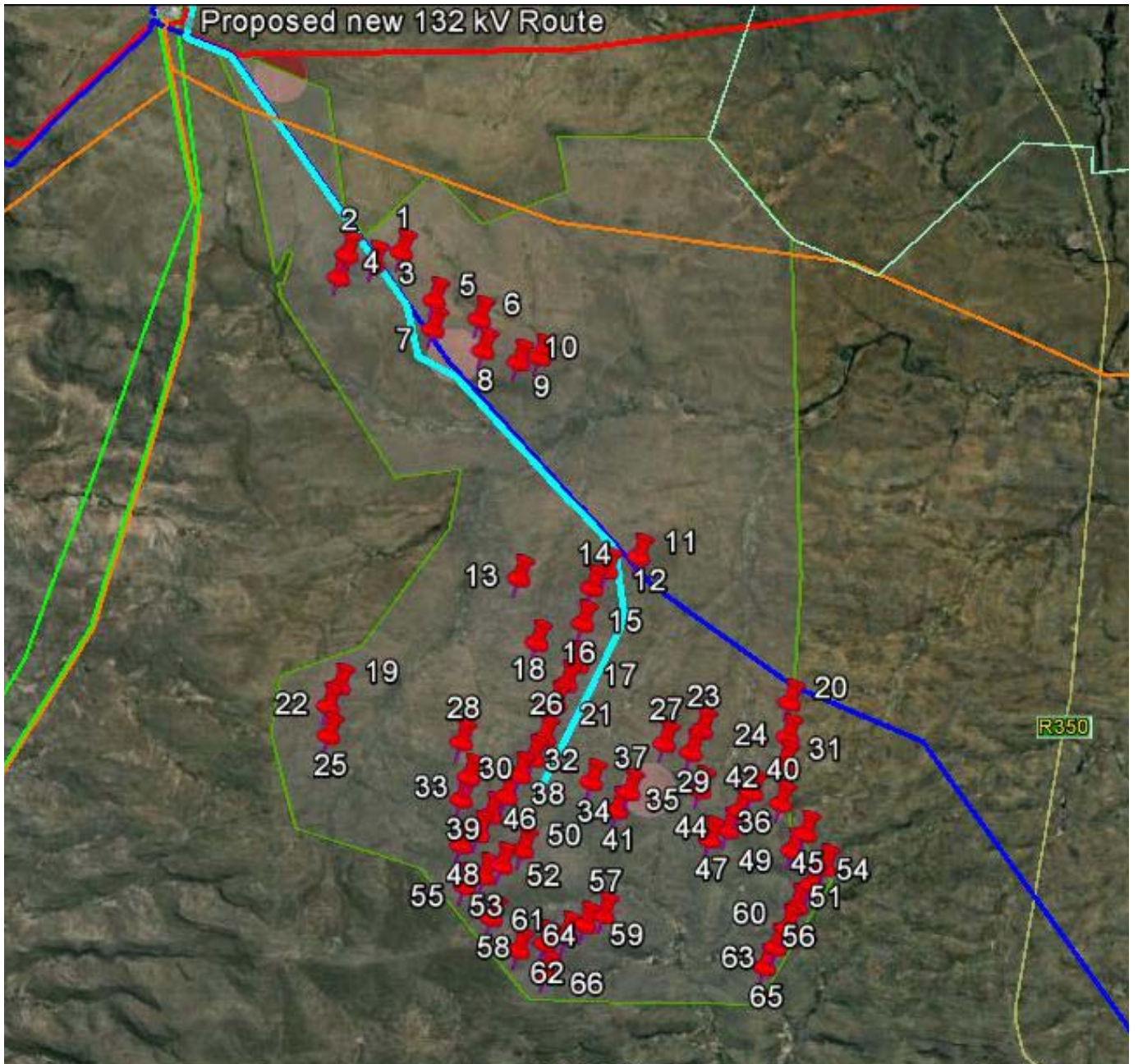
Remainder of Farm 222

Remainder of Farm 242

The general landscape comprises a gentle undulating hill landscape, lowlands and non-perennial open valley drainage systems/lines (Fig 1). No perennial rivers traverse the study area. The mayor rivers occurs many kilometres to the north, east (Great Fish River) and west (Sunday's River). The dominant natural vegetation is grassland, small, low shrubs in places and patches of *Acacia karroo* in the drainage valleys. The main activity in the study area is commercial stock farming and the land is used for grazing of livestock. Apart from the usual small scale disturbances due to farming activities such as fences, tracks, dams, soil erosion and power lines which crosses through the area, the hill tops shows little disturbances. Most development and disturbance, such as homesteads and associated infrastructure occur mainly along, and next to the gravel road between Bedford and Middleton (next to the N10) which traverse the study area, or in valleys areas close to drainage lines.

Type of development

The proposed development entails the construction and operation of a wind energy facility and associated infrastructure. The wind energy facility will comprises of 66 wind turbines with a proposed total generating capacity of up to 100 MW (Map 3). The associated infrastructure required for the facility will include concrete foundations to support the turbines. Cabling between the turbines will be lain 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 Poseidon substation north of the study area. Other developments will include internal access roads to each turbine and a workshop/administrative area for maintenance and storage of equipment.



Map 3. Final Layout of the turbine locations and powerline route (map supplied by Savannah Environmental (Pty) Ltd).

Investigation

The purpose of the study was to do a walkthrough of the turbine locations, underground cable routes and roads, which will be positioned in long lines following the crests of the hills, ridges and high ground. Although the terrain was relatively easy to access, the archaeological visibility in general was poor to moderate due to the dense surface cover of grass and shrubs in places. Apart from only two large Middle Stone Age stone tools concentrations in secondary contexts, a number of dry packed stone kraals and walls were also observed on the high ground. Numerous other stone features were also observed throughout the study area, such as stone fence posts, erosion prevention wall, furrows and low walls, but although these features have everyday functional value, they have little heritage significance.

Cultural sensitivity

In general the study area investigated appears to be of low archaeological and historical (sites/materials) sensitivity and the impact of construction will be of low negativity. However, construction activities and the visual impact of the turbines will have a negative effect on the cultural landscape.

Recommendations

1. To protect a large concentration of Middle Stone Age stone tools near turbine position No. 2, the construction of the underground cables and roads must be moved 100 metres west.
2. To protect a large concentration of Middle Stone Age stone tools between turbine locations No's 42 and 49, the construction of the underground cables and roads must be moved 50 metres northeast.
3. To protect a dry packed stone walled gate between turbine locations No's 30 and 40, the construction of the underground cables and roads must be moved 50 metres north.
4. Where upright stone fence posts may be removed where they are near the construction of underground cables and roads. However, those posts necessary for the specific activities may be removed and the remainder must be conserved.
5. 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.
6. Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter. It is suggested that a person be trained to be on site to report to the site manager if sites are found.
7. An archaeologist should regularly visit the construction site (for example, once a month) to inspect the construction routes and activities.

The developer

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Brief archaeological background

The area has a rich documented historical past of conflict, change, adaptation and interaction between different groups and individuals (Mostert 1992). The pre-colonial archaeological history of the area is less clear, mainly because little field research has been conducted here. Several Heritage Impact Assessments conducted in recent years of the study area provide information on the different stone tool industries found in the area from eroded open sites (Webley, *et al.* 2009; Halket, D. & Webley, L. 2010; Hart, T. & Webley, L. 2010; Booth 2011). Nevertheless, there are a large number of reports, references and accessioned material in museums of the region and nationally which provide us with a general background. This information was compiled by R.M. Derricourt during the early 1970s and published in his book, *Prehistoric man in the Ciskei and Transkei in 1977*. He also conducted fieldwork at Middeldrift and Ann Shaw close to the study area.

From the archival information and limited field work, it is evident that the area has an interesting and complex archaeological past. Earlier Stone Age (ESA) hand axes, cleavers and other stone tools, dating to approximately a million or more years old, were found on the slopes of the Thyume River around the University of Fort Hare in Alice. During a rescue excavation on the campus in 1974 thousands of ESA stone tools were recovered (Opperman 1979). The Albany Museum also houses a large collection of ESA material from the Grahamstown area. Large numbers of ESA stone tools were also found at Middeldrift (Hewitt 1925; Burkitt 1928). These sites were regarded important at the time and were visited by A.J.H. Goodwin (Goodwin & Lowe 1929).

Both locations also yielded Middle Stone Age (MSA) stone artefacts dating between 200 000 and 30 000 years old. MSA artefacts can be found throughout the region, but carry little information because they are not associated with any other archaeological material. Excavations at MSA sites adjacent to the study area include the well-known type site for the Howieson's Poort Industry (rock shelter with the same name) near Grahamstown (Stapleton & Hewitt 1927) and Oakleigh Farm Shelter near Queenstown (Derricourt 1977).

Later Stone Age open sites, dating to the past 20 000 years are also widely scattered throughout the area. The bulk of information for the wider region comes from the Cape Fold Mountains to the south of the study area where several sites were excavated. Among these are Wilton Large Rock Shelter (Deacon 1972), Melkhoutboom Cave (Deacon 1976) and Uniondale Rock Shelter (Leslie-Brooker 1987). Two rock shelters, Edgehill and Welgeluk excavated by Hall (1990) in the Koonap River Valley close to the study area, provide an excellent archaeological record of exclusive subsistence and cultural risk management strategies during the past 5 500 years for Eastern Cape Midlands. Another small shelter at Adam's Kranz in the Great Fish River valley has also been excavated. A hafted arrowhead was recovered from the site (Binneman 1994). Further north in the southern Winterberg

Mountains, research at Fairview Shelter (Robertshaw 1984) suggests mobile seasonal movements between the Winterberg and the Fish River regions during the Late Holocene. Derricourt (1977) excavated several mounds at Middeldrift and Ann Shaw where he found a stone tool tradition in the bottom layers which he called the Middeldrift Tradition, dating to some 5 000 years old. The origins of the upper deposits of these mounds are not clear, but it would appear that they were associated with pastoralist groups. Thin, fine, mainly undecorated pot shards, a KhoiSan burial and complete cow burials found in these mounds, would strongly suggest Khoi occupation. Early European travellers such as Beutler (Theal 1896) also found the Gonaqua Khoi in 1752 living here and along the Keiskamma River towards the nearby coast. The Eastern Cape Midland, Koonap River valley and the adjacent Winterberg Mountains to the north and Cape Fold Belt to the south are also rich in San and KhoiSan rock art.

Although there are no records of Early Iron Age (first farming communities) sites or material from this area, it is possible that such settlements may be present in the region (Maggs 1973). Evidence in the form of thick walled well-decorated pot shards is present along the coast (Rudner 1968) and the nearest settlement was excavated just west of East London (Nongwaza 1994). Research in the Great Kei River Valley indicates that the first mixed farmers were already settled in the Eastern Cape A.D. 600 - 700 (Binneman 1994).

In the same area at Ann Shaw, Derricourt also excavated a Late/Historical Iron Age settlement with grain pits and ash heaps. The grain pits were of typical Nguni type; jar-shaped with a small opening. The floor was lined with stones and sealed with a layer of clay.

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Relevant impact assessments

- Booth, C. 2011. A phase I archaeological impact assessment (AIA) for the proposed Cookhouse II wind energy facility, Blue Crane Route, Local Municipality, Eastern Cape. Prepared for Savannah Environmental Ltd. (Pty).
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THE WALKTHROUGH INVESTIGATION

Methodology and results

The purpose of the study was to do a walkthrough of the turbine locations, underground cable routes, roads and other infrastructures. The turbines will be positioned some distances apart in long lines following the crests of the hills, ridges and high ground. The investigation was conducted on foot and spots checks and surveys were conducted from a

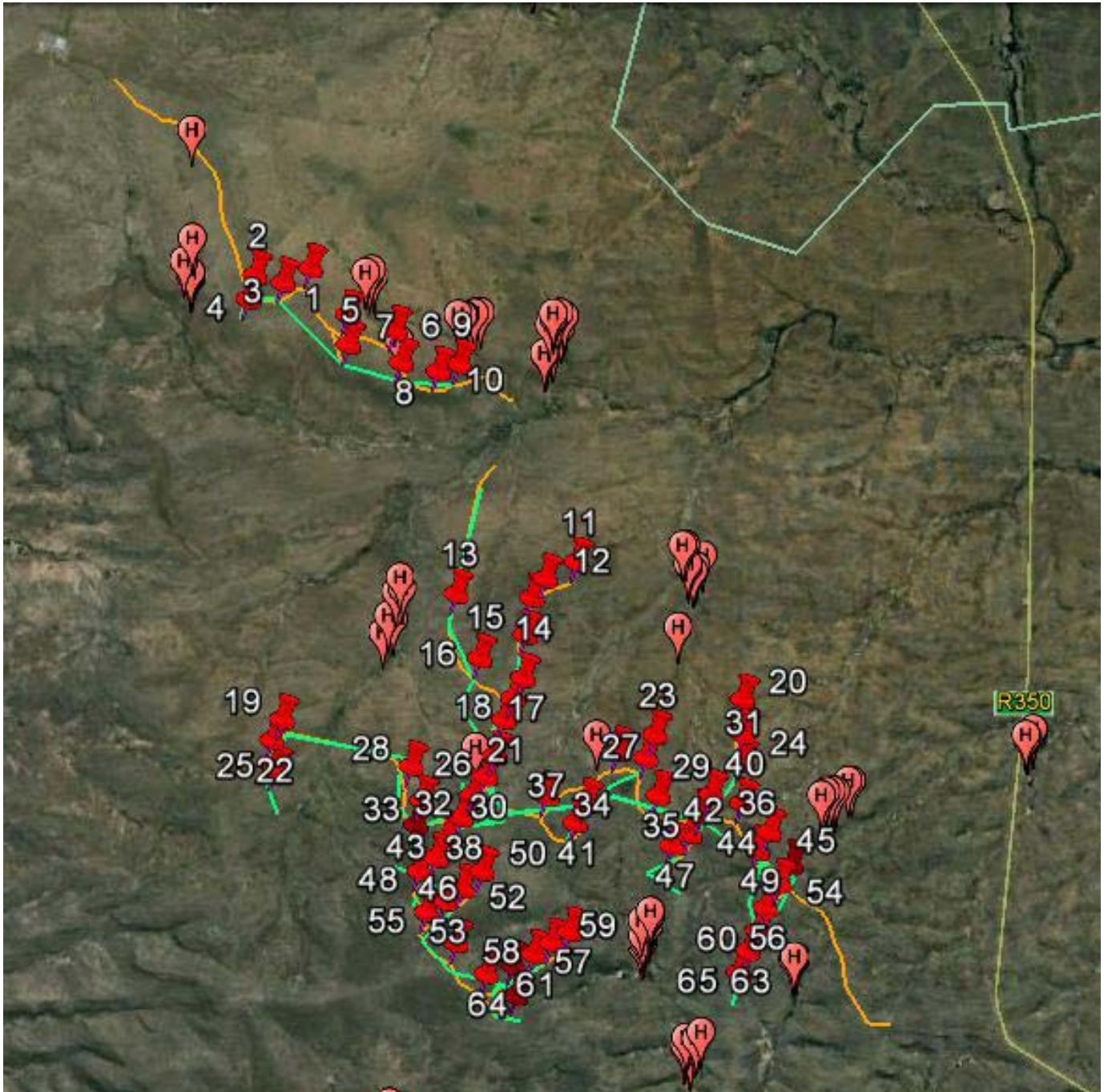
vehicle to investigate as much of the terrain as possible. Farm tracks to the turbine locations were followed by vehicle and investigated further on foot. Transects were conducted on foot to reach the turbine locations where no farm tracks existed. GPS readings were taken and all important features were digitally recorded (for views of the turbine routes and the surrounding landscape and vegetation see Appendix D, Figs 1-14).

A large number of pre-colonial and colonial heritage sites have been recorded during the previous reconnaissance survey of the entire Amakhala Emoyeni Wind Energy Facility site (see Halket et al. 2010) (Map 4). The bulk of the sites were historical heritage features of the European settlement in the region and included farm buildings, dry packed stone kraals, grave yards, graves and refuse dumps. These were mainly situated and concentrated close to, or near the main gravel roads and in valleys/drainage systems. A number of pre-colonial sites/materials were also observed during the reconnaissance survey with the older Earlier/Middle Stone Age material occurring along rocky ridges and the Later Stone Age in general concentrated close to drainage lines and in valleys (see Halket et al. 2010).

Due to the fact that the final layout of the turbine positions and cable routes follows the high ground, little attention was given to open valleys, steep slopes and farm yards. No turbines will be positioned in or near these areas and the colonial landscape has been recorded in detail during the reconnaissance survey (see Halket et al. 2010).

The walkthrough of the study site turned out to be an exhausting exercise with little results in terms of heritage sites/materials (Appendix A). Although the terrain was relatively easy to access, the archaeological visibility in general was poor to moderate due to the dense surface cover of grass and shrubs in places after good rains during the past two years (for a general views of the landscape and vegetation see Figs 1-14). Apart from only two large Middle Stone Age stone tools concentrations in secondary contexts (Maps 7 & 10), a number of dry packed stone kraals and walls were also observed on the high ground (Maps 12 & 11; figs 9, 12 & 13). Numerous other stone features were also observed throughout the study area, such as stone fence posts, erosion prevention wall, furrows and low walls (Fig 18). Although these features have everyday functional value, they have little heritage significance.

Roads and underground cables will cross valleys/drainage lines at only two locations (see Maps 5-6, figs 4 & 6). These areas were investigated, but no sites/materials were observed. However, where valleys/drainage lines were crossed by vehicle to reach turbine routes, spot checks were conducted where sheet erosion exposed the surface soil. Large concentrations of Middle, but mainly Later Stone Age stone tools and pottery were observed at three locations near valley/drainage systems (Figs 15, 16 & 17). The concentrations composed of a typical 'Eastern Cape Midlands Later Stone Age' assemblage of stone tools which included microlithic thumbnail scrapers and small end scraper-adzes manufactured on blackish/blue shale. Small fragments of pottery were also observed on the same exposed surfaces. However, these sites fall outside the proposed area for development, but added additional information to the general archaeological record of the region.



Map 4. Heritage sites recorded by ACO during a reconnaissance survey in 2010 (map supplied by Savannah Environmental (Pty) Ltd).

ASSESSMENT OF THE IMPACTS

Pre-colonial archaeology

Nature of the impacts

Apart from two exposed Middle Stone Age stone tool sites, no other sites/remains of significance were observed. However site/materials may be covered by soil and vegetation. The main impact to archaeological sites/remains (if any) will be the physical disturbance and/or destruction of the material and its context. The construction of the turbine foundations, substation, cabling between the turbines and access roads may expose, disturb, displace and destroy archaeological sites/material. It is assumed that the overhead transmission lines may have less impact on possible buried archaeological material due to their smaller foot print, but that depends on the construction activities.

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 on 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 (2)	Minor (2)
Probability	Unlikely (2)	Unlikely (2)
Significance	Low < 30	Low < 30
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	
<p>Mitigation</p> <p>It is recommended that the construction of the underground cables and roads be moved between 50-100 metres from two large concentrations of Middle Stone Age stone tools.</p> <p>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.</p>		
Cumulative impacts: The number of concrete bases will determine the impact on the buried materials (if any) and if these increase so will the impact.		
Residual impacts: Permanent		

Colonial period heritage

Nature of the impacts

The bulk of the historical features are concentrated along the main gravel road and in the valleys. No turbines will be placed near these concentrations of historical features. Only a few isolated dry packed stone features such as kraals and walls were observed on the high ground where the development will take place. These features are large and have great functional value, but are of low heritage significance. The increase of a large number of workers into the area may have an impact on the historical buildings due to possible vandalism.

Extent of the impacts

In general the turbine locations are fair distances from the stone features and the development will not directly impact on these features. No cemeteries or graves were observed on the high ground.

Table 2. Impacts on the colonial period heritage.

Nature: The potential impact of the construction of the turbines, substation, cabling between the turbines, access roads and workshop on historical features and material.		
	Without Mitigation	With Mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Minor (2)
Probability	Unlikely (2)	Unlikely (2)
Significance	Low < 30	Low < 30
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	
<p>Mitigation</p> <p>It is recommended that the construction of the underground cables and roads be moved 50 metres from a dry packed stone walled gate.</p> <p>If any graves, or any other concentrations of historical/colonial 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.</p>		
Cumulative impacts: Similar to above		
Residual impacts: Permanent in the case of graves		

Impact on the cultural landscape

Nature of the impacts

The construction of a large number of turbines will change and have a significant visual effect on the cultural landscape and overall sense of place. It will also introduce a 'industrial character' to a once rural agricultural environment. The negative visual impact

on the historical and natural landscape will be restricted mainly to the immediate region. Although the turbines are large structures they will not be so dominant from the major main roads and nearby towns. However, the main impact on the cultural landscape will be the extensive construction of roads and other activities which will leave permanent scars.

Extent of the impacts

The size and large number of turbines will definitely change the character and meaning of 'place'. The extensive construction of roads and other activities will transform the landscape and it will be difficult to fully rehabilitate this scarring of the landscape. It may even caused larger problems such as large scale soil erosion. However, it will also create new identities and activities in the immediate and wider surrounding areas. It is felt that these developments will generate opportunities for tourism in the future, which will create jobs and have positive economic expansion.

Table 3 . Impact on the cultural landscape.

Nature: The potential impact of the construction of the turbines, substation, cabling between the turbines, access roads and workshop on the cultural landscape.		
	Without Mitigation	With Mitigation
Extent	Local (4)	Local (4)
Duration	Long term/permanent (5)	Long term/permanent (5)
Magnitude	Moderate(6)	moderate (6)
Probability	Highly probable (4)	Highly probable (4)
Significance	High	High
Status (positive or negative)	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	no	no
Mitigation Given the size of the turbines, no mitigation can reduce the negative visual effect on 'significance of place'.		
Cumulative impacts: 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 cultural landscape in terms of visual impacts and changes to 'sense of place'.		
Residual impacts: Disturbances to the landscape by the construction of roads and trenches for the cables will be long term to permanent.		

DISCUSSION AND MITIGATION

The results of the reconnaissance survey, nature and extent of the impacts, mitigation and recommendations for the archaeological heritage, cemeteries and graves, built environment, cultural landscape and sense of place were comprehensively discussed in the report and will not be addressed again in any detail (see Halket et al. 2010).

Although the occasional weathered stone tools were observed along the turbine routes, it would appear unlikely that any significant *in situ* sites/material will be exposed during the development. A reason for the lack of sites/materials on the high ground may be that they are simply not there, because the open, windy environment was too unpleasant for human occupation. From a positive side one may argue that at least from the visual

observations it would appear that little heritage sites/materials may be disturbed and/or destroyed during the construction of the wind facility. However, on the other hand there may be sites/materials covered by soil and vegetation (for example the two Middle Stone Age sites which were exposed by erosion). Unlike the steeper valley slopes and bottoms where soil erosion exposed sub surface strata and also archaeological sites/materials, this was not the case along the hill tops and high ground. Due to the gentle undulating nature of the landscape little sheet soil erosion occurred on the high ground. Whatever the reason, the results from the walkthrough survey in general, confirmed the assumptions/predictions of the reconnaissance survey in that the more sensitive archaeological sites will be in the valley areas and the less sensitive on the high ground (see Halket et al. 2010).

Sensitive locations and features

1. A Middle Stone Age site near turbine location No. 2 (see Map 7).

A large concentration of Middle Stone Age stone tools (30 000 – 250 000 years old) has been exposed in a vehicle track over a distance of more than 100 metres near turbine location No. 2 on the high ridge in the northern part of the Amakhala Emoyeni Wind Energy Facility site (Map 7). The total extent of the concentration is not known because the area is covered by some 20-30 cm of top soil and dense low grass. The stone tools displayed typical faceted striking platforms and comprised weathered cores, chunks, flakes and triangular points, mainly manufactured of a fine grained greenish quartzite and blackish/blue shale. The majority of the points were retouched along one or both edges. The stone tools in the track were in secondary context and were not associated with any other archaeological material. However, although the occurrence appeared to be of low pre-colonial significance, stone tools may be in context and that recognisable distribution patterns such as manufacturing areas are covered by soil and grass adjacent to the vehicle track. The fact that it was only observed due to road erosion, may suggest that there may be many more similar sites covered by soil and vegetation.

Since it is only one of two Middle Stone Age sites observed on the high ground where the development will take place (it is unknown how many similar sites will be damaged and/or destroyed by the large scale development), it is **recommended** that,

- The site is protected as a Middle Stone Age ‘type’ site for the region.
- Furthermore, it is **recommended** that the underground cables and roads, which are running through the exposed Middle Stone Age stone tool scatter and turbine No. 2, are moved 100 metres west to avoid any further disturbance/damage (see Map 7).
- The site area must also be fenced-off during the construction activities in the immediate area to avoid damage to the site. An area of 100 metres along the vehicle track and 25 metres on both sides, parallel to the track must be fenced-off to protect the site.

2. A line of stone posts between turbine locations 6, 8 and 10 (see Map 8).

A line of stone fence posts running in a northeast direction were observed near turbine location 8 (Map 8). Although these features are part of the historical cultural landscape and examples of the practical use of stone in the region, they were functional and have use value, but in general have little heritage importance.

It is therefore **recommended** that where the construction of underground cables and roads will take place, only those posts necessary for the specific activities be removed and the remainder be conserved.

3. A line of stone posts between turbine locations 13 and 16 (see Map 9).

Follow same procedure as above.

4. A Middle Stone Age site between turbine locations 42 and 49 (see Map 10).

A large concentration of Middle Stone Age stone tools were also observed at an earth dam constructed in a small wetland (Map 10). The stone tools were similar to those found at Site 1 (above).

It is **recommended** that the construction of the underground cables be moved 50 metres away towards the northeast to protect the site and the wetland.

5. A dry packed stone walled gate between turbine locations 30 and 40 (see Map 11).

A distinctive architectural characteristic of the region is the numerous dry packed stone buildings and other features. Although these features have huge functional and use value, they also represent the shared and combined heritage skills of all the people of the region (European farmers, KhoiSan and Bantu speakers) in the past. A number of these features, mainly kraals with paved floors and boundary marker walls were observed on the high ground where the development will take place (see Maps 11 & 12; figs 9, 12, 13, 14).

Only one dry packed stone feature, a walled gate, is close to the proposed construction of underground cables (see Map 11). It is **recommended** that the construction of the cables be moved 50 metres away towards the north to prevent damage.

6. Other recommendations;

- 6.1. Although it would seem 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 during construction, all work must cease and it must be reported 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 (See appendix C for a list of possible archaeological sites that maybe found in the area).
- 6.2. 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.
- 6.3 If any sites/materials are found recommendation 6.1 above must be followed. An archaeologist should regularly visit the construction site (for example, once a month) to inspect the construction routes and activities.

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 B) 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: List of selected observations.

Map description	Map reference	GPS Location	Type	Location
C1-C2	Maps 5 and 7	32.47.13,38S 25.57.30,01E 32.47.14,53S 25.57.34,09E	Middle Stone Age Site	Near turbine 2
Stone posts	Maps 5 and 8	32.48.9,78S 25.59.7,08E	Row of stone fence posts – also recorded by ACO	Near turbine 8
Graves	Map 5	32.48.5,15S 26.00.21,39E	Number of graves	not threatened by development
D and e	Map 8	32.48.17,91S 26.00.22,53E 32.48.25,35S 26.00.26,44E	Earlier and Middle Stone Age stone tools	Low significance and not threatened by development
Red brick shed	Map 8	32.48.18,28S 26.00.16,24E	Almost 60 years old	not threatened by development
6 and 5	Map 9	32.50.34,21S 25.59.17,65E 32.50.34,78S 25.59.47,39E	Row of stone fence posts	Near turbine 13
xx	Map 10	32.53.00,02S 26.02.41,24E	Middle Stone Age Site	Underground cables runs close to the site
Gate	Map 11	32.52.33,03S 26.01.40,61E	Stone walled gate	Underground cables runs close to the site
Kraal	Map 12	32.52.08,80S 26.01.08,27E	Large stone walled kraal - also recorded by ACO	not threatened by development
Wall	Map 12	32.52.10,76S 25.59.42,36E	Large stone wall - also recorded by ACO	not threatened by development
Stone wall	Map 12	32.54.34,66S 25.59.45,37E	Large stone wall	not threatened by development

Entrance gate	Map 6	32.54.49,55S 26.04.22,00E	Large Stone walled gate	Eastern access road is close to this feature
i	Map 6	32.53.42,91S 26.01.23,01E	Later Stone Age site with pottery	not threatened by development
xiv	Map 6	32.51.28,22S 26.00.57,79E	Middle and Later Stone Age sites	not threatened by development
xiii	Map 6	32.51.04,45S 26.01.19,18E	Middle and Later Stone Age sites	not threatened by development
MSA	Map 6	32.50.23,51S 26.02.17,88E	Middle Stone Age stone tools	not threatened by development
57 miles	Map 6	32.50.15,14S 26.02.14,11E	Historical mile stone and road to Cookehouse	not threatened by development

APPENDIX B: 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 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 C: 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 human remains are buried in a flexed position on their side, but are also found buried in a sitting position with a flat stone capping. Developers are requested to be on alert for the possibility of uncovering such remains.

Freshwater mussel middens

Freshwater mussels are found in the muddy banks of rivers and streams and were collected by people in the past as a food resource. Freshwater mussel shell middens are accumulations of mussel shell and are usually found close to rivers and streams. These shell middens frequently contain stone tools, pottery, bone, and occasionally human remains. Shell middens may be of various sizes and depths, but an accumulation which exceeds 1 m² in extent, should be reported to an archaeologist.

Large stone cairns

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.

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.

Historical artefacts or features

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

APPENDIX D

DIGITAL IMAGES OF THE LANDSCAPE
AND
AERIAL VIEWS OF THE HERITAGE SITES AND TURBINE LOCATIONS

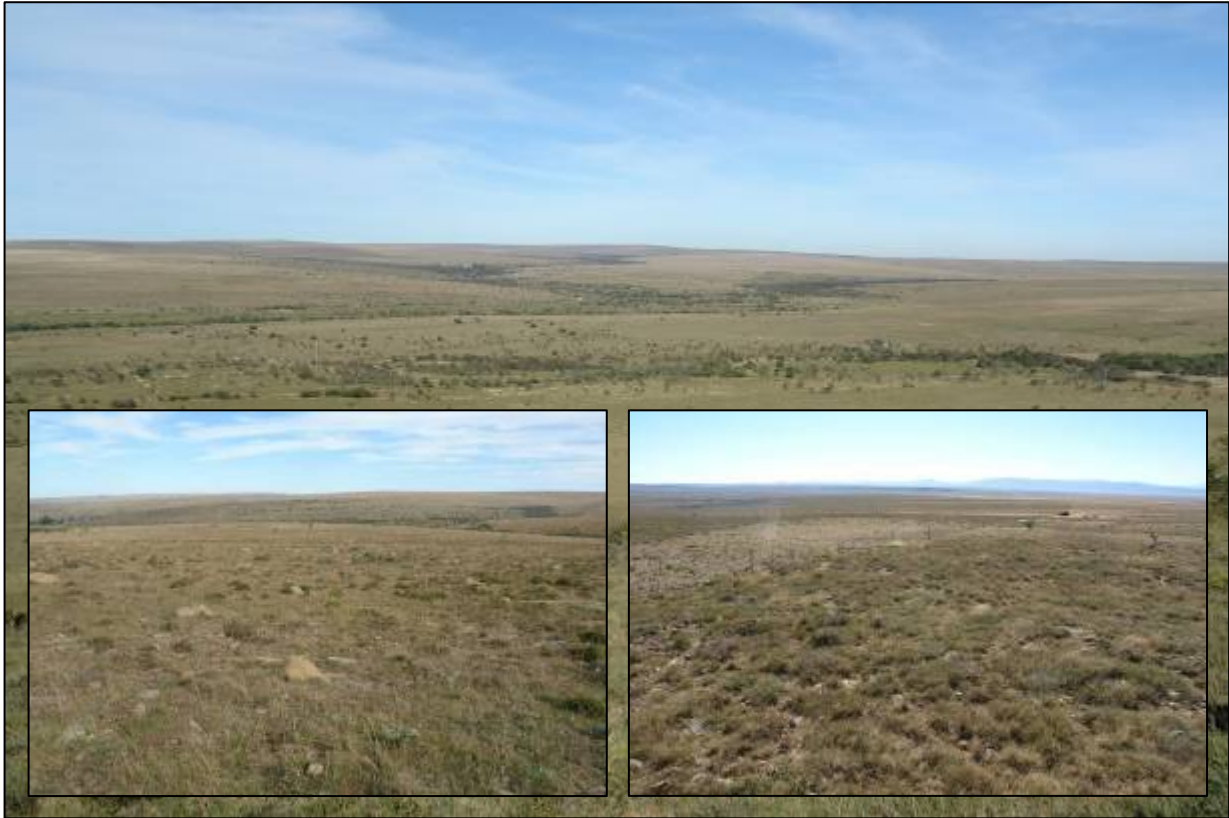


Fig 1. General views of the Amakhala Emoyeni Wind Energy Facility site.



Fig 2. General views of the route from the Poseidon Substation (main and left insert) towards the mast and turbine positions 1-4 (right insert).

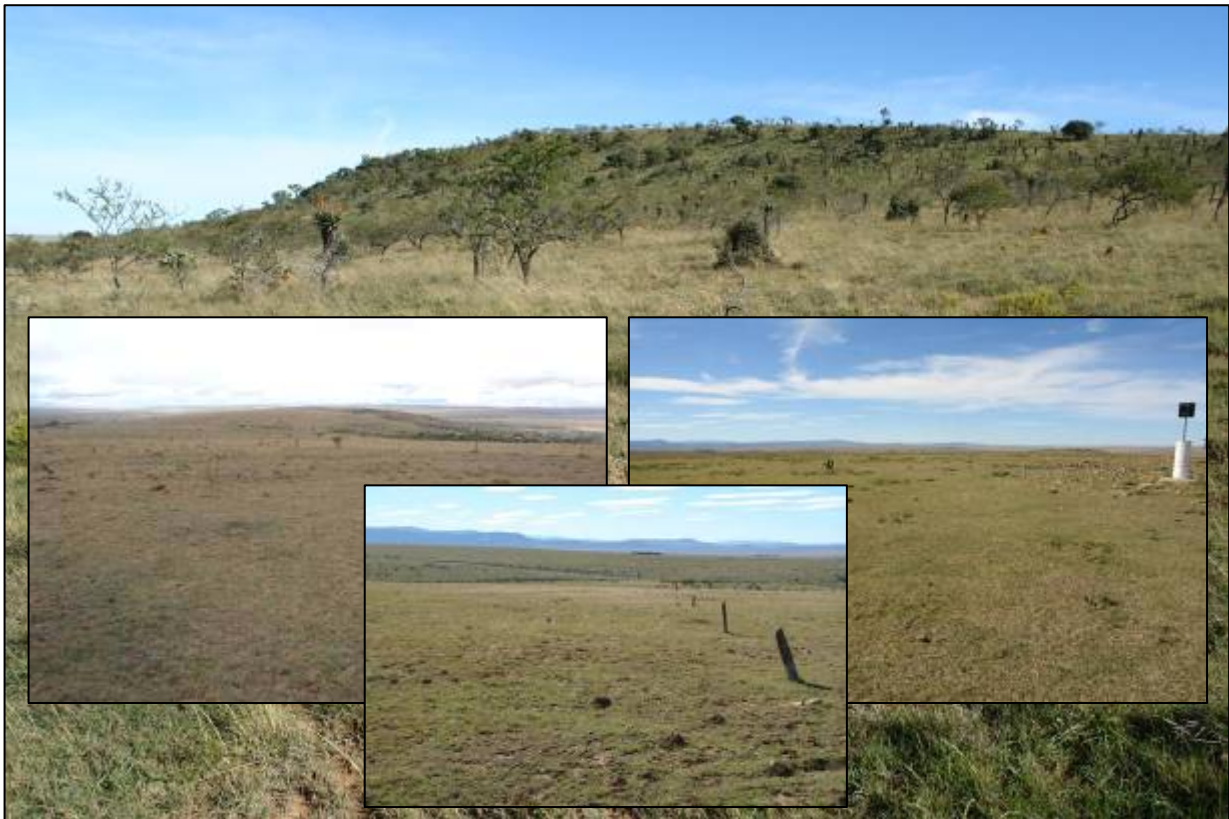


Fig 3. Different views of the route from the mast towards turbine positions 5-10 (right and left inserts) and the hill on which these will be constructed (main image). A line of stone fence posts is situated close to turbine position 8.



Fig 4. Different views of the route across the small drainage line towards turbine positions 11-14. In the background is the hill with turbine positions 5-10.



Fig 5. Different views towards turbine positions 19, 22 and 25.



Fig 6. Different views of the route across the water cause between turbine positions 19, 22, 25 and 28.



Fig 7. Different views towards turbine locations 11-16.



Fig 8. Different views towards turbine locations 28-39.



Fig 9. Different views towards turbine locations 17, 18 and 17 (main image), 30-48 (left insert) and a stone wall near 26.



Fig 10. Different views towards turbine locations 35-47.



Fig 11. Different views towards turbine locations 20, 24 and 31.



Fig 12. Different views towards turbine locations 23, 27 and 29 (main image), and a stone wall gate and large kraal near these turbines.



Fig 13. Different views towards turbine locations 57 -66 (main image), 50-55 (left insert) and a stone wall near 66.



Fig 14. Different views of the eastern access road to the Amakhala Emoyeni Wind Energy Facility site.

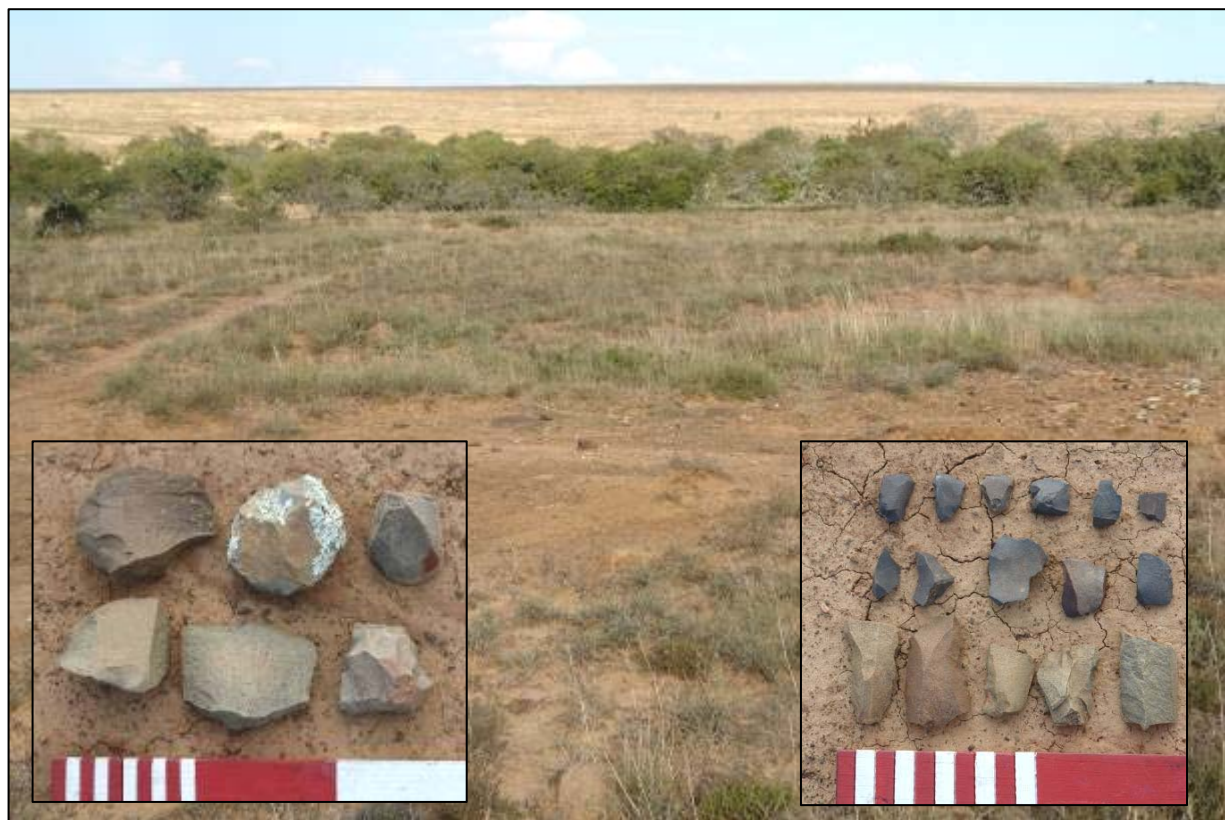


Fig 15. General view of Site 1, an eroded surface close to a drainage line with exposed stone tools, mainly Later Stone Age but also occasional Middle Stone Age tools.



Fig 16. General view of Site 2, an eroded surface close to a drainage line near Site 1 with exposed Middle and Later Stone Age stone tools.

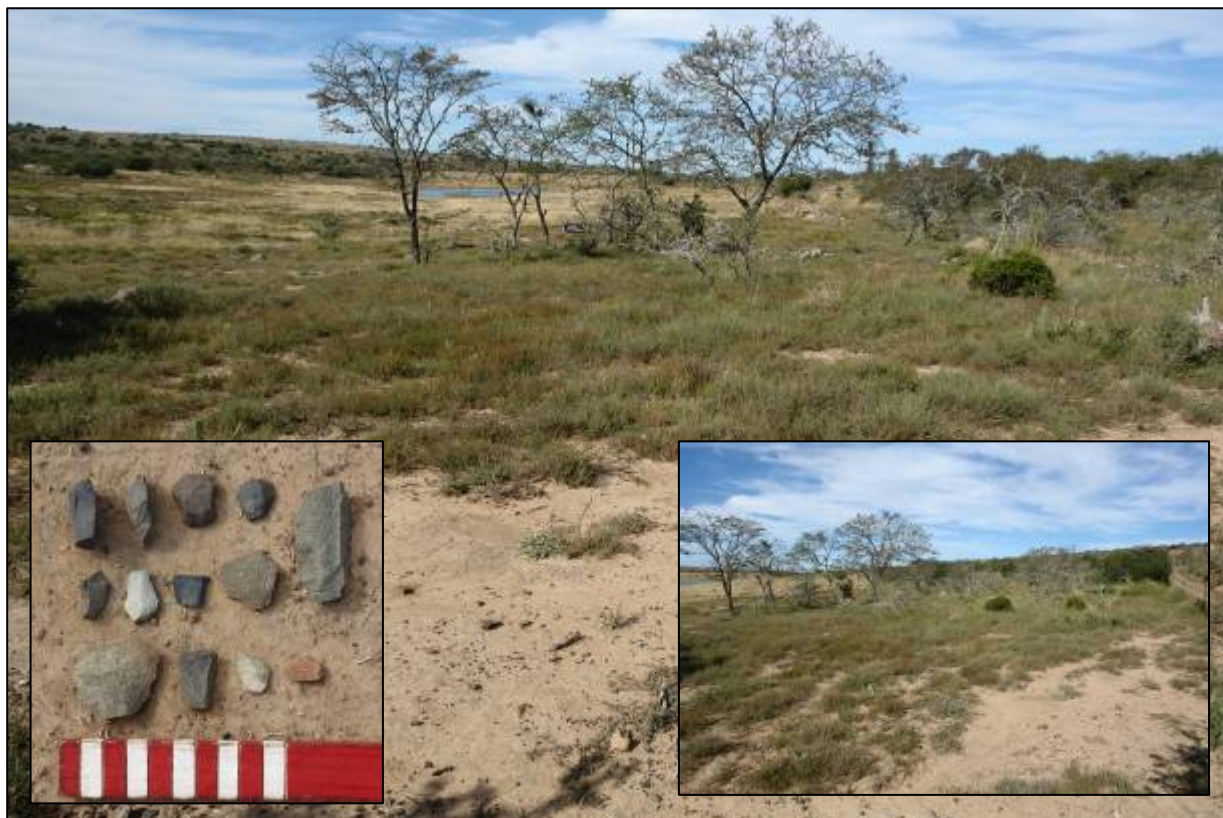
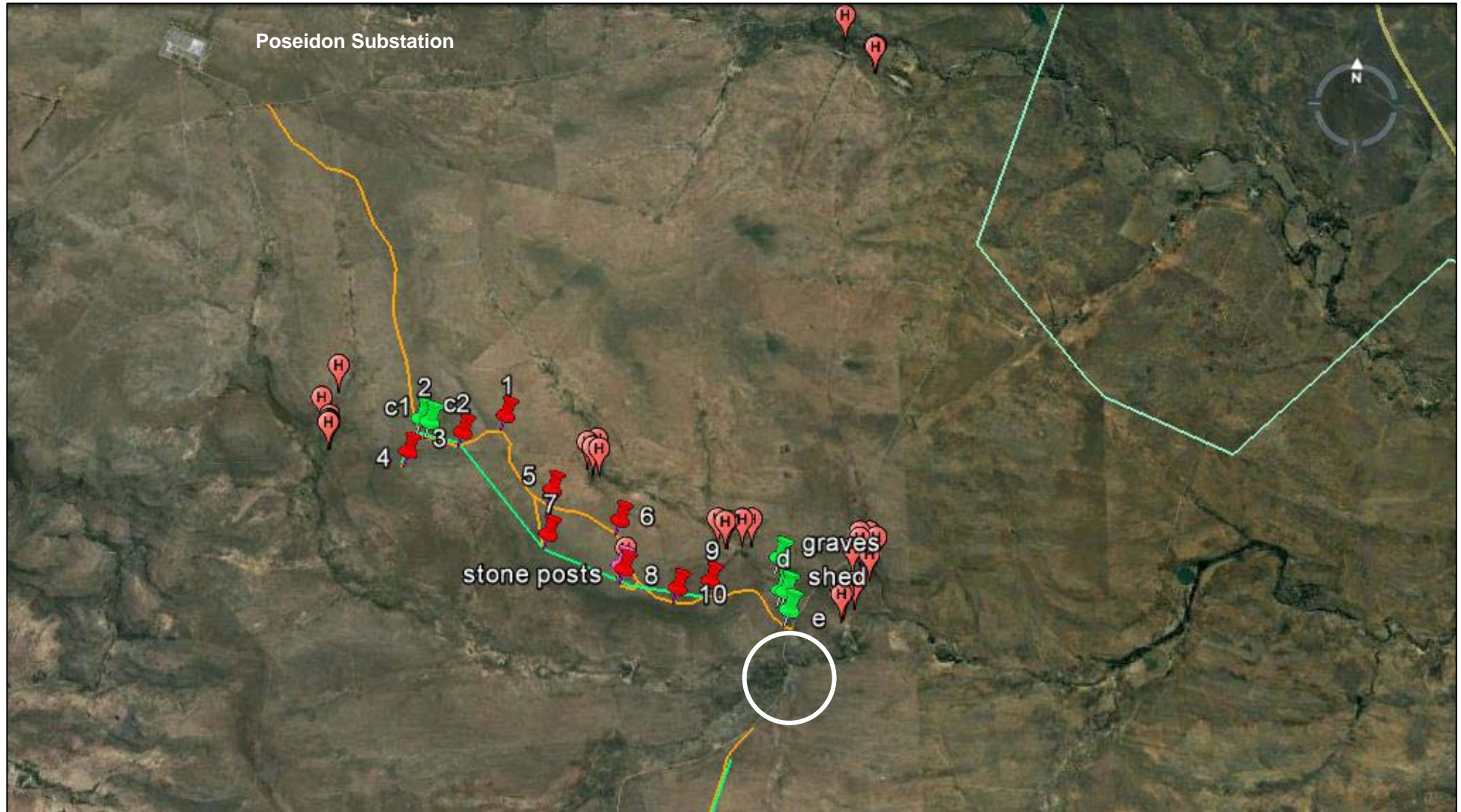


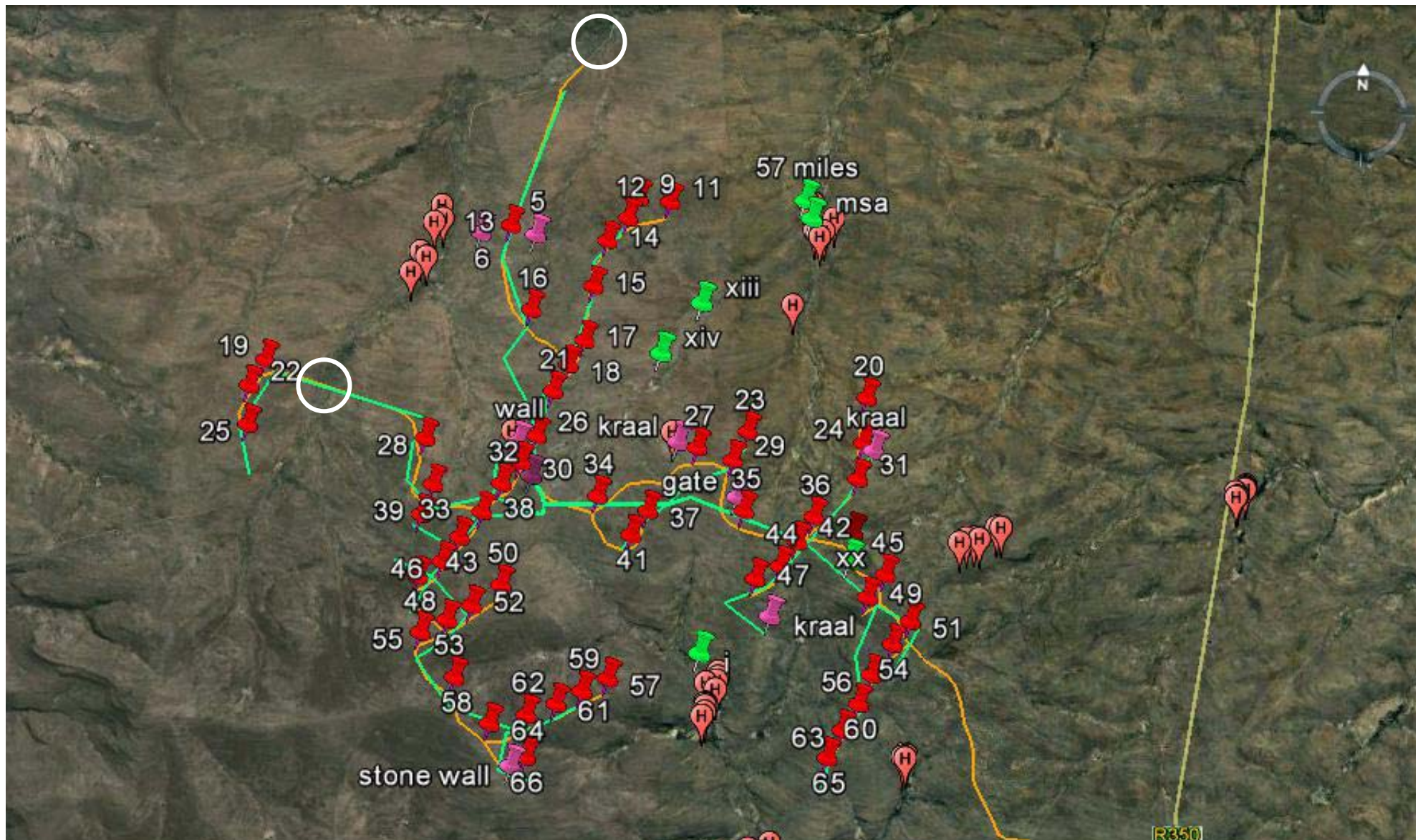
Fig 17. General view of Site 2, an eroded surface close to a drainage line with exposed Later Stone Age stone tools and pottery.



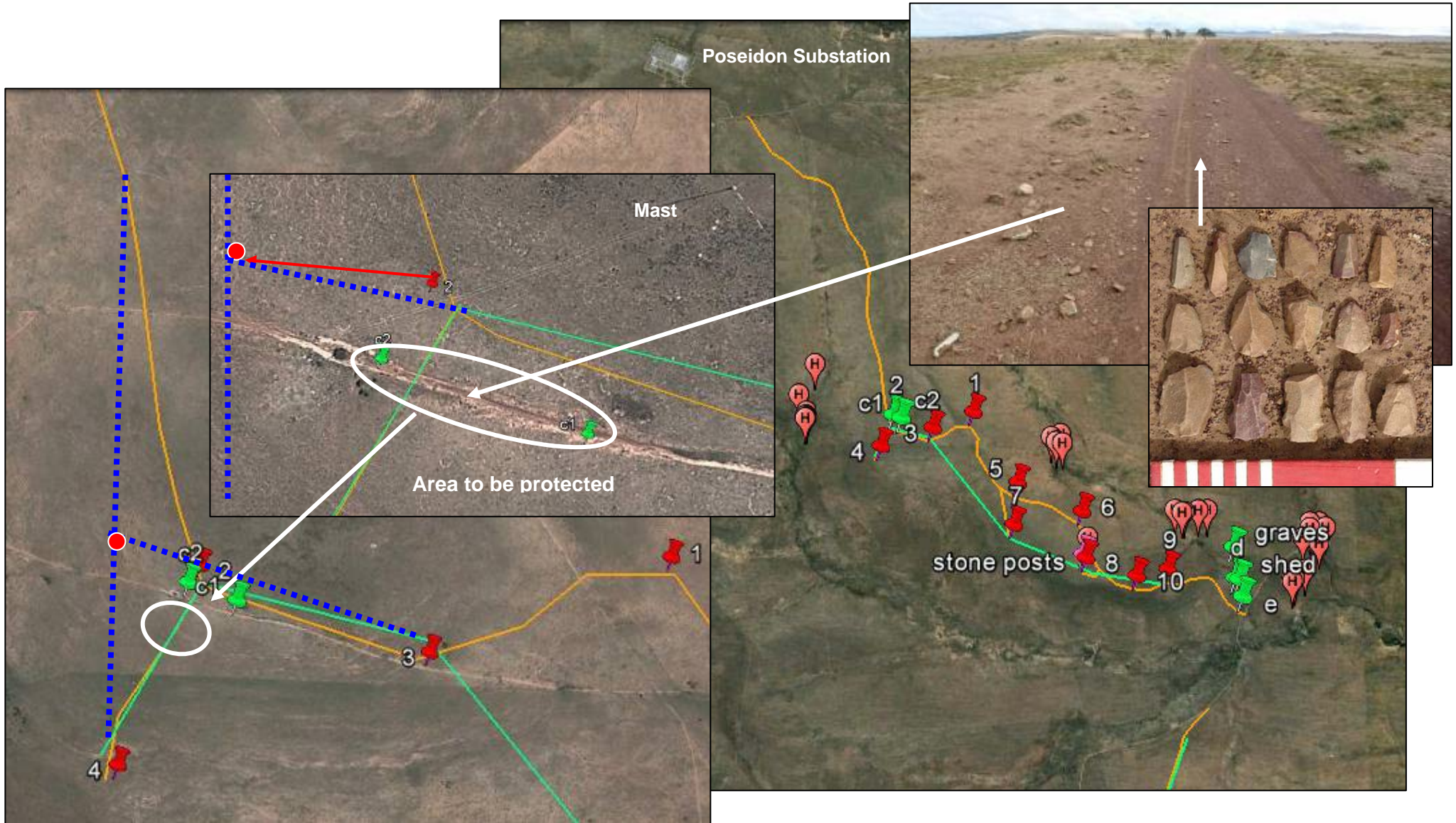
Fig 18. Examples of everyday functional use of stone, which include the construction of water furrows, dams and erosion prevention walls. These features are often changed/re-built and have little heritage value.



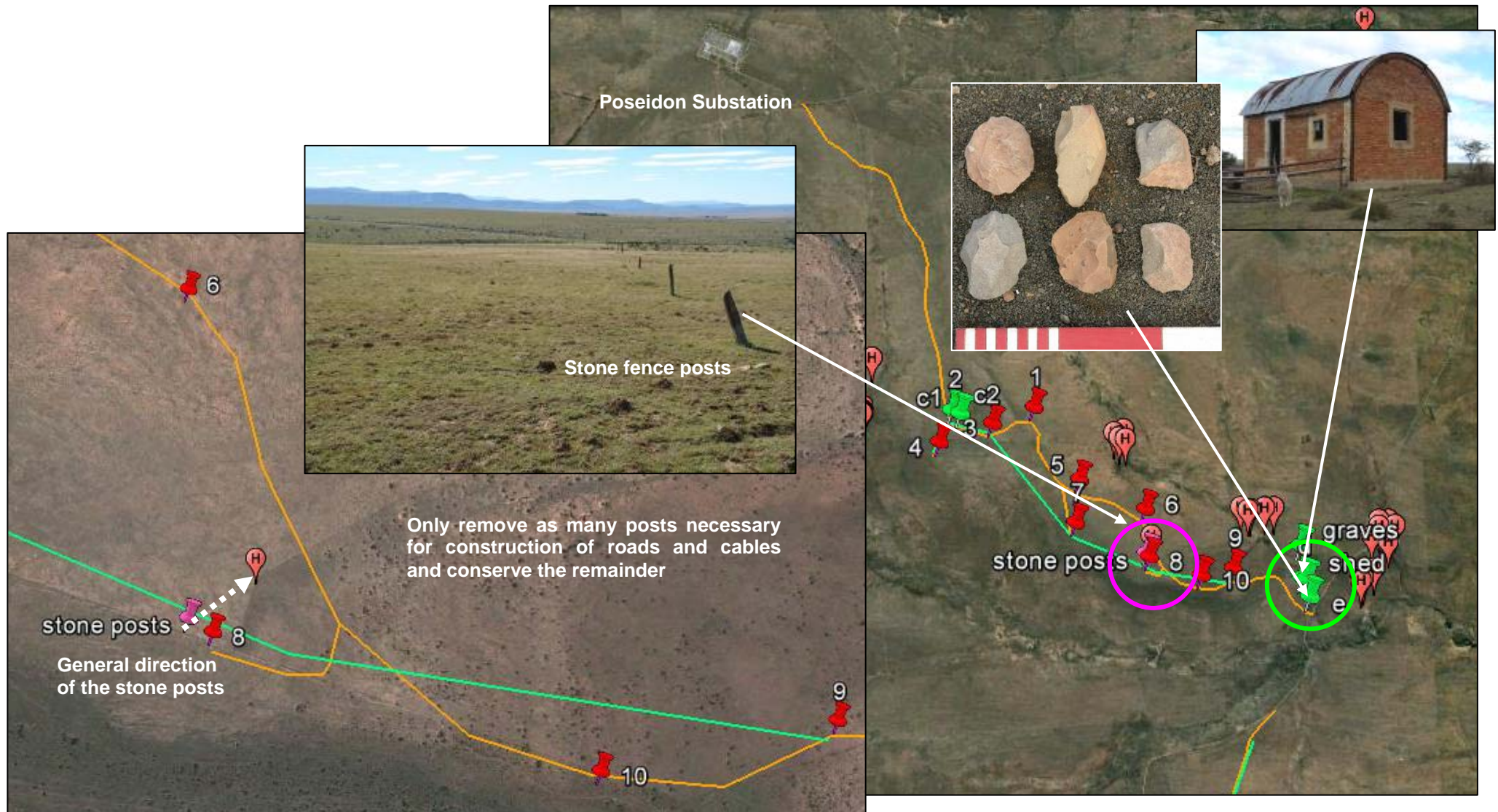
Map 5. Aerial view of the northern turbine locations, archaeological and historical heritage sites/materials. The drainage crossing marked by the white circle has been investigated, but no sites/materials were observed. The H-pegs represent heritage sites identified during the ACO survey and the green pegs sites observed during the walkthrough.



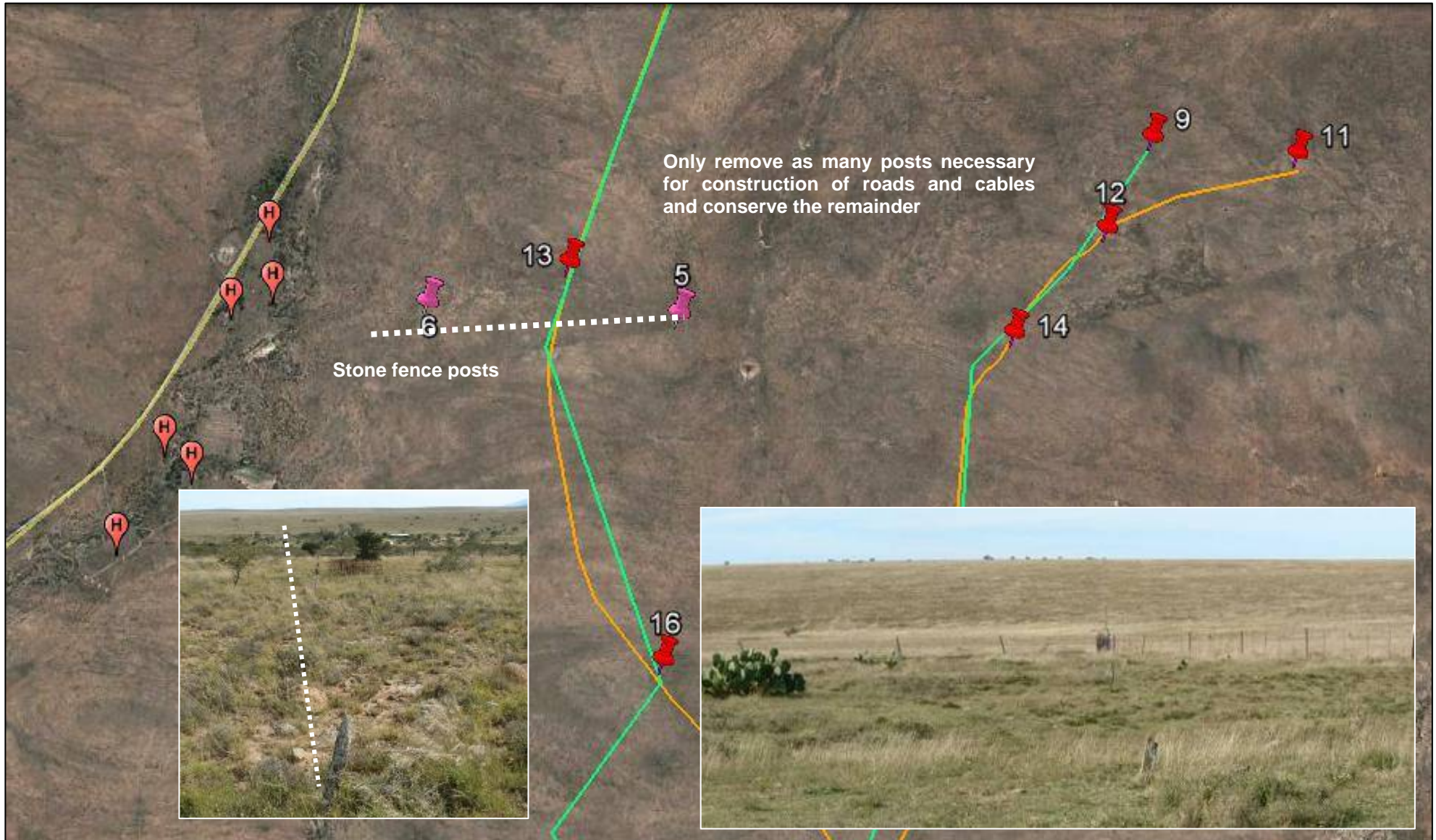
Map 6. Aerial view of the southern turbine locations, archaeological and historical heritage sites/materials. The drainage crossings marked by the white circle has been investigated, but no sites/materials were observed. The H-pegs represent heritage sites identified during the ACO survey and the green and pink pegs sites observed during the walkthrough.



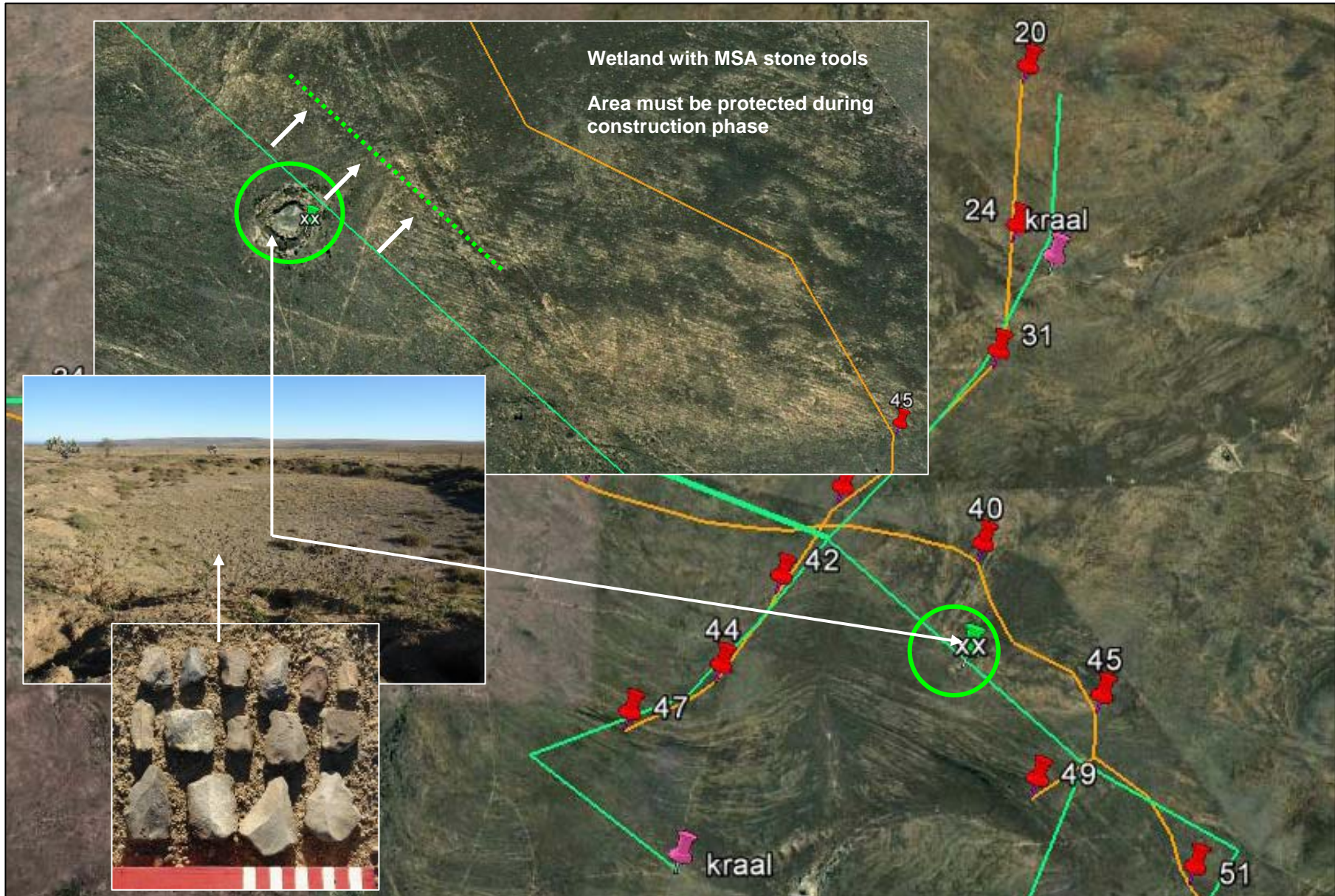
Map 7. Aerial views of the location of a Middle Stone Age site near turbine location 2. It is recommended that the underground cables be moved 100 metres west to protect the site (blue broken line).



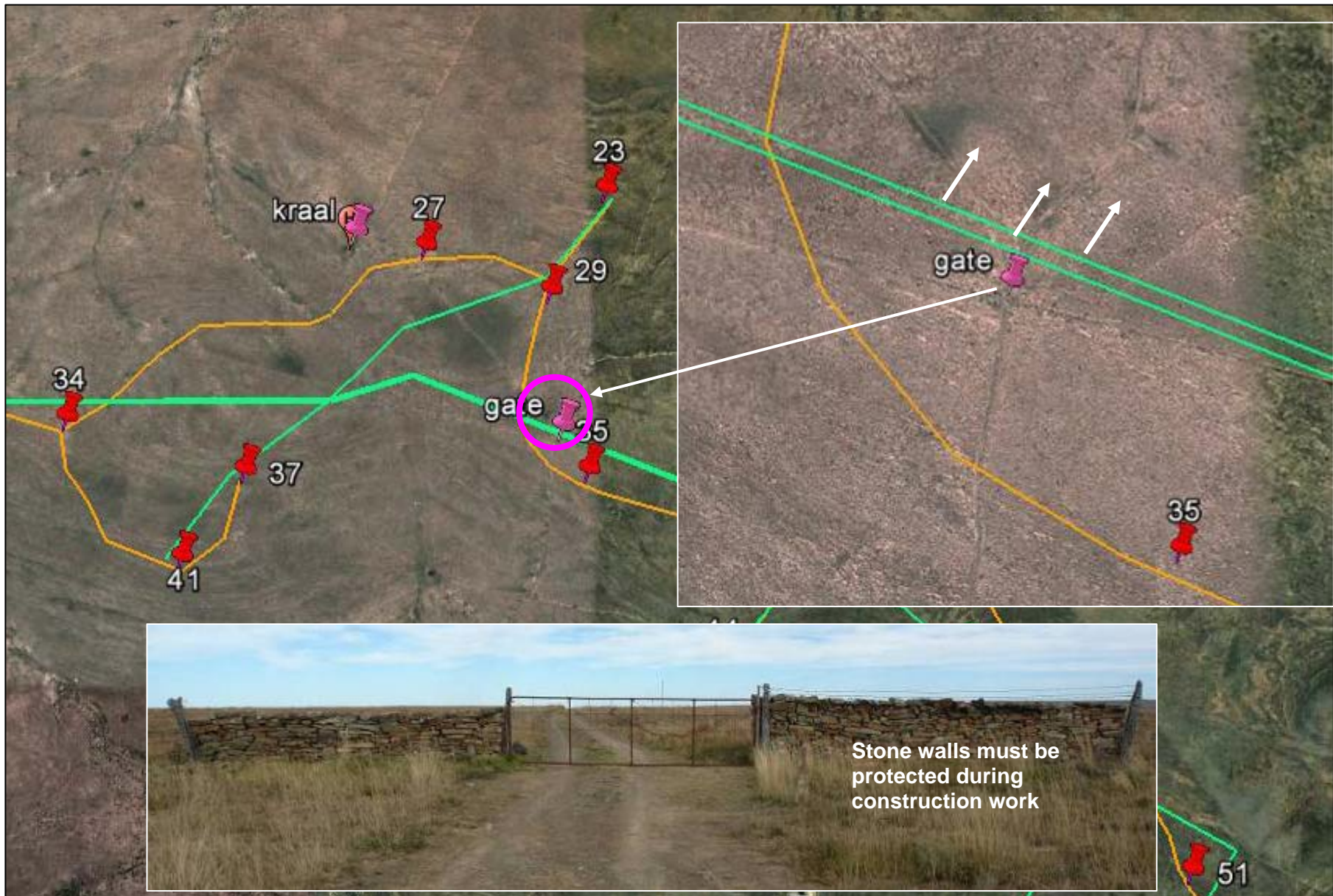
Map 8. Aerial views of the location of a line of stone posts between turbine locations 6, 8 and 10. It is recommended that only those posts necessary for the construction of cables and roads are removed and the remainder be conserved. The Earlier and Middle Stone Age stone tools were in secondary context and of low significance (green circle). The small red brick building is younger than 60 years (pers. comm. owner) and also of low historical significance.



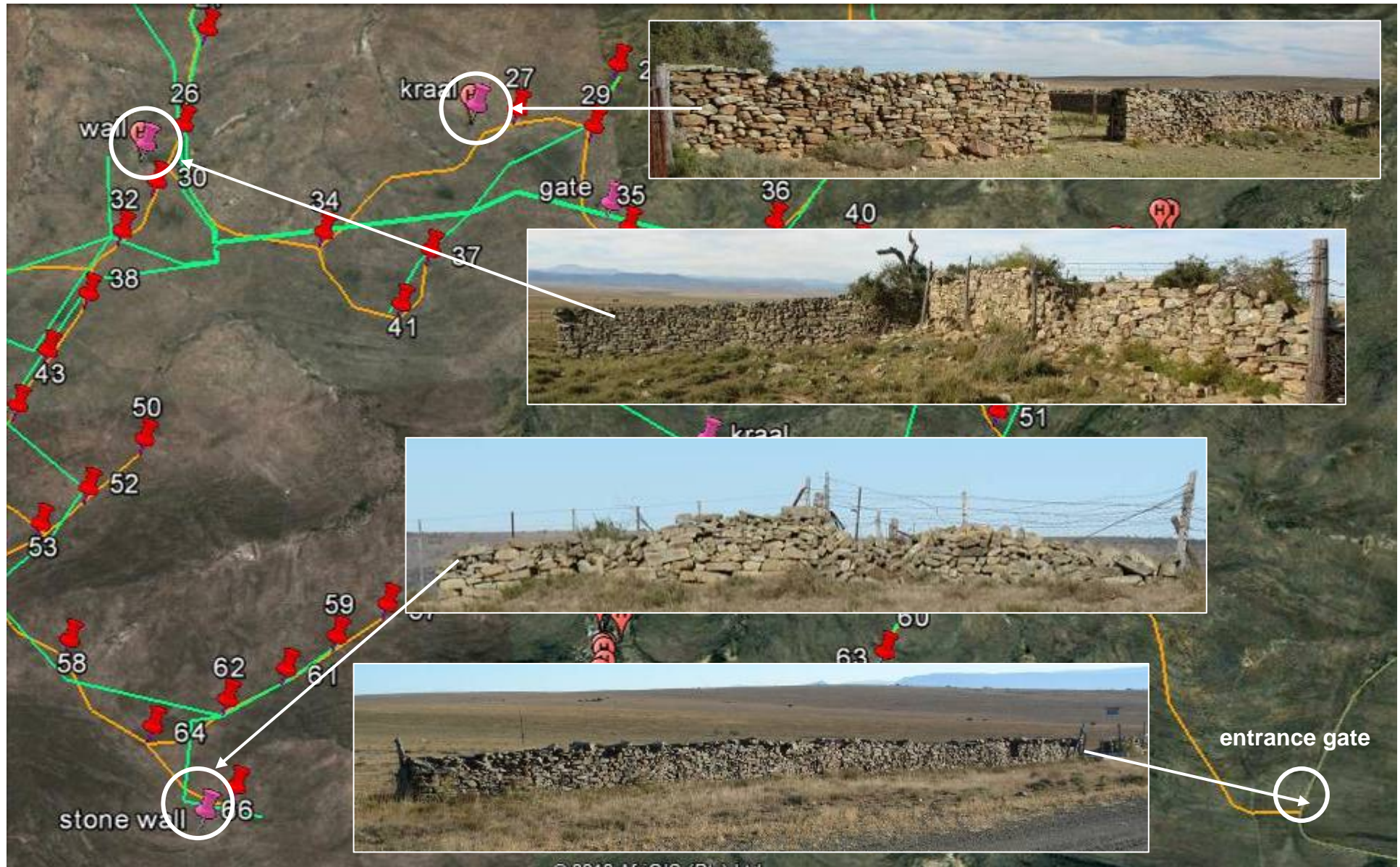
Map 9. Aerial view of the location of a line of stone posts between turbine locations 13 and 16. It is recommended that only those posts necessary for the construction of cables and roads are removed and the remainder be conserved.



Map 10. Aerial views of the location of a Middle Stone Age site between turbine locations 42 and 49. It is recommended that the cables are moved 50 metres away from the Middle Stone Age site and wetland to protect these sites.



Map 11. Aerial views of the location of a dry packed stone walled gate between turbine locations 30 and 40. It is recommended that the cables are moved 50 metres away from the gate to protect of the feature.



Map 12. Aerial view of the locations of dry packed stone walls. Although these features are not directly threatened by the development, care must be taken that they are protected from possible damage.