

**A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT FOR THE PROPOSED
CONSTRUCTION OF A PHOTO VOLTAIC CENTRE ON ERF 1275, KNOWN AS
GLEDE, ADELAIDE, NXUBA MUNICIPALITY, EASTERN CAPE PROVINCE**

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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.

EXECUTIVE SUMMARY

Purpose of the Study

The original proposal was to conduct a phase 1 archaeological impact assessment of the proposed construction site for a 14 megawatt photo voltaic solar centre on Erf 1275 known as Glede, Adelaide, Nxuba Municipality, Eastern Cape Province. The survey was conducted to establish the range and importance of possible exposed and *in situ* archaeological sites/materials, the potential impact of the development and, to make recommendations to minimize possible damage to these sites.

The location of the development

The proposed 14 megawatt photo voltaic solar centre is situated on Erf 1275 known as Glede, next to the R63 main road between Adelaide and Fort Beaufort approximately 2 kilometres east of Adelaide, Nxuba Municipality, Eastern Cape Province.

Type of development

The proposed development entails the establishment and operation of a solar facility on an area of 19 ha with a generating capacity of 14 MW.

The investigation

The proposed Adelaide photo voltaic solar centre site is covered with grey sandy soil, low grass, and patches of *Acacia karoo* trees and used for stock farming. No archaeological material was observed in the proposed area for development, but occasional weathered Middle Stone Age stone tools and two stone cairns were observed adjacent to the property. It is unlikely that any significant archeological material will be exposed during the development.

Cultural sensitivity

The study area investigated appears to be of low archaeological sensitivity and the impact of construction will be of low negativity. The visual impact of the development on the surrounding cultural landscape will be low. Development may proceed as planned.

Recommendations

1. If any concentrations of archaeological material are uncovered during development, it should be reported immediately to the Albany Museum and/or the South African Heritage Resources Agency.
2. Construction managers/foremen should be informed, before construction starts, on the possible types of heritage sites which may be encountered during construction.

PROJECT INFORMATION

Status

The proposed photo voltaic solar centre is to be developed by Scatec Solar (Pty) Ltd to introduce power to the national grid under the control of Eskom. This report is part of a Basic Assessment Process (BA).

The type of development

The proposed Adelaide photo voltaic solar centre and associated infrastructure will be developed on approximately 19 ha with a generating capacity of 14 MW. The panels of the solar cells are situated on raised aluminium, stainless steel or wooden frames. The frames are approximately 3.0 m in width, with a height of 2.2 m. The panels are established at an angle of approximately 25° from the horizontal. The frames are founded into the ground by means of small steel footings. Electrical wiring and power lines are positioned below ground with switch boxes established on the frames.

The Developer:

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Terms of reference

Conduct a phase 1 archaeological impact assessment of the proposed construction site for a 14 megawatt photo voltaic centre on Erf 1275 known as Glede, Adelaide, Nxuba Municipality, Eastern Cape Province. The survey was conducted 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.

BRIEF ARCHAEOLOGICAL BACKGROUND

Literature review

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 west 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 Middledrift 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 Middledrift (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 Middledrift and Ann Shaw where he found a stone tool tradition in the bottom layers which he called the Middledrift 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

None from the immediate vicinity

DESCRIPTION OF THE PROPERTY

Area Surveyed

Location data

The proposed area for the construction of a 14 megawatt photo voltaic centre is situated approximately 2 kilometres east of Adelaide on Erf 1275 known as Glede, Adelaide, Nxuba Municipality, Eastern Cape Province. It is located next to the R63 Main Road to Fort Beaufort (south) and the R344 gravel road to Grahamstown (west) (Maps 1-2).

Map

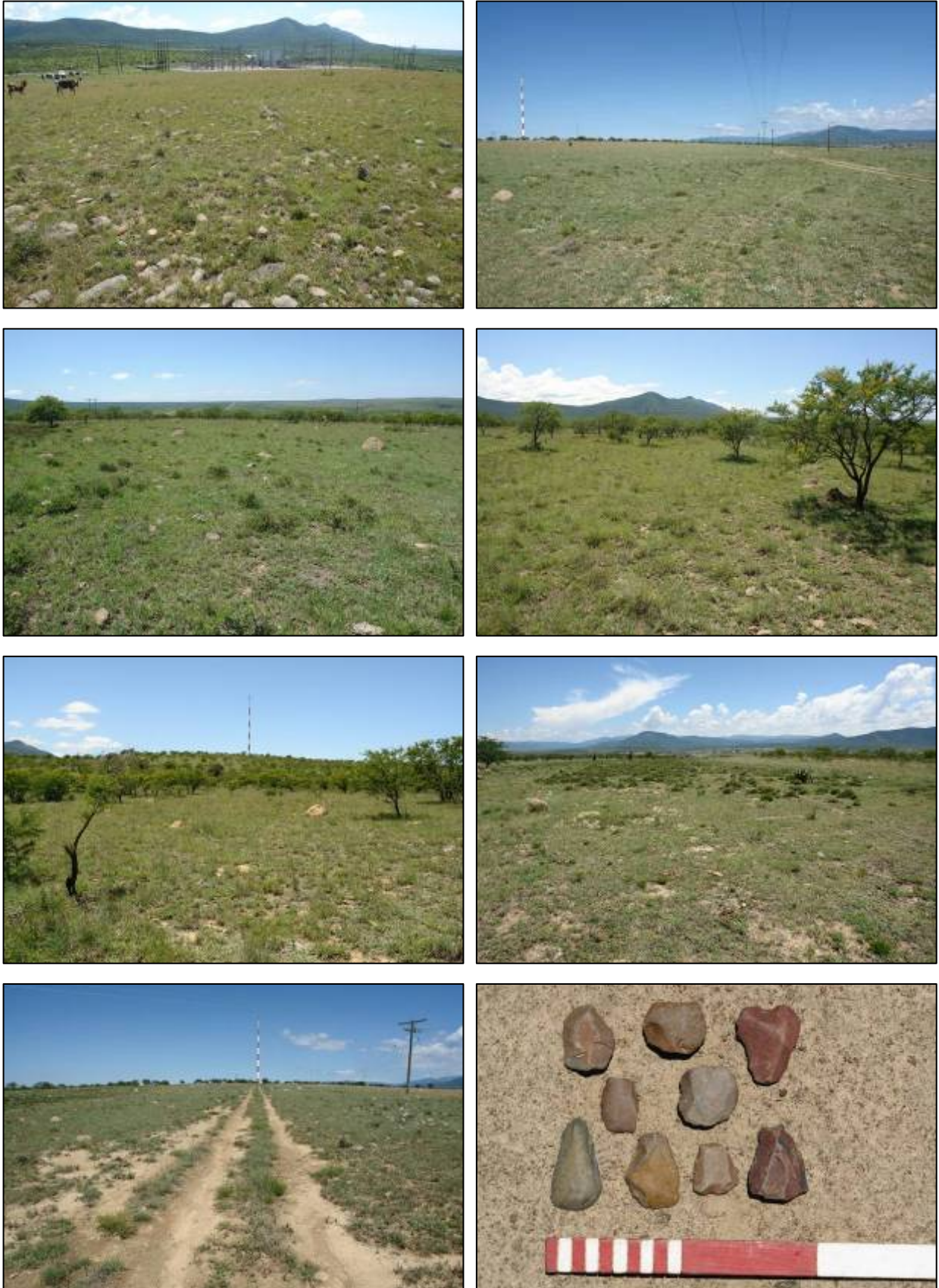
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ARCHAEOLOGICAL INVESTIGATION

Methodology and results

The survey was conducted on foot. GPS readings were taken with a Garmin and all important features were digitally recorded. The proposed area for development is situated adjacent to a sub-station on a gentle undulating plateau overlooking the Koonap River valley. The terrain comprised grey sandy soil covered by short, dense grass, shrubs and patches of *Acacia Karoo* trees and is used mainly for stock farming (Figs 1-6). General small scale farming activities have disturbed the property, but had no effect on any major archaeological sites/materials. The surface visibility was good, but surprisingly no significant archaeological sites/materials were observed. There are no graves or buildings older than 60 years. In general it would appear that it is unlikely that any sensitive archaeological remains will be exposed during the development. The area is of low cultural sensitivity and the proposed development may proceed.

A few weathered hornfels Middle Stone Age (older than 30 000 years) stone tools were observed in a track leading to the communication tower (Figs 7-8). The stone tools were in secondary context and of little archaeological significance. Two stone cairns were also observed near the tower, but it is unknown if they represent graves or originated due to farming activities or during the construction of the tower (Figs 9-12). However, these features and stone tools were located outside the proposed property for development and therefore no further action is required.



Figs 1-8. General views of the sub-station and the proposed site for the construction of a 14 megawatt photo voltaic centre (top three rows) and a few weathered Middle Stone Age observed in the track leading to the communication tower outside the study area (bottom row).



Figs 9-12. The two stone cairns observed near the communication tower outside the area earmarked for development.

ASSESSMENT OF THE IMPACTS

Pre-colonial archaeology

Nature of the impacts

From the investigation, it would appear that the proposed photo voltaic centre site is of low archaeological sensitivity. Apart from a few stone tools and two stone cairns outside the property, no other 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 their contexts. The construction of the solar panels, cabling between the panels and access roads may expose, disturb and displace archaeological material.

Extent of the impacts

Construction of the solar panels, cabling between the panels 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 solar panels may disturb small areas and the negative impact on possible archaeological sites/materials may be relatively small, but will be permanently. 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.

Nature: The potential impact of the construction of the solar panels, cabling between the panels, and access roads on above and below ground archaeology.		
	Without Mitigation	With Mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (4)	Permanent (4)
Magnitude	Minor (2)	Minor (2)
Probability	Unlikely (2)	Unlikely (2)
Significance	Low < 20	Low < 20
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: Sites/material will be disturbed permanently.		
Residual impacts: Damage/destruction of human remains/graves will be permanent.		

Pre-colonial archaeological cultural landscape

Nature of the impact

The archaeological significance of the area is low and therefore the visual impact of the solar facility on the cultural landscape will be low as well. There are no historical buildings, graves or other features of importance on or near the site. The development is situated next to a major highway and will be visible, but due to size of the development and the solar panels (2.2 m high and 3,05 wide) they will have limited visual impact on the landscape and 'sense of place'. However, the construction of roads and trenches for the cables will disturb and scar the landscape permanently.

Extent of impact

The visual impact of the solar panels will be restricted to the immediate area of the development and will have little negative effect on the cultural landscape and 'significance/sense of place'. However, more similar developments in the immediate area will have an accumulative impact. The 'presence' of the solar panels will be long term to permanent and disturbances to the landscape by the construction of roads and trenches for the cables will be long term to permanent, but negative impacts can be mitigated.

Table 2. Impacts to the pre-colonial cultural landscape.

Nature: The potential impact of the construction of the solar panels, cabling between the panels, and access roads on the cultural landscape and ‘sense of place’.		
	Without Mitigation	With Mitigation
Extent	Local (1)	Local (1)
Duration	Long term/permanent (4)	Long term/permanent(4)
Magnitude	Minor (2)	Minor (2)
Probability	Unlikely (2)	Unlikely (2)
Significance	Low < 20	Low < 20
Status (positive or negative)	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	yes
Mitigation No mitigation is proposed because the archaeological remains are of low significance.		
Cumulative impacts The cumulative impacts will only increase if further solar facilities are planned for adjoining areas, which may bring changes to the pre-colonial 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 proposed 14 megawatt photo voltaic centre site appears to be of low archaeological significance, but it is close/over looking the Koonap River valley and riverine archaeological material, such as freshwater middens may be covered by soil and vegetation. Apart from a few Middle and later Stone Age stone tools and two stone cairns observed outside the area earmarked for development, no other archaeological remains were observed. Due to the size of the solar panels the visual impact on the surrounding cultural landscape will be low. 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. It is recommended that;

1. 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).
2. Construction managers/foremen should be informed, before construction starts, on the possible types of heritage sites which may be encountered during construction.

GENERAL REMARKS AND CONDITIONS

Note: This report is a phase 1 archaeological impact assessment/investigation only and does 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/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 (AIA's) 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.

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 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 A: 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

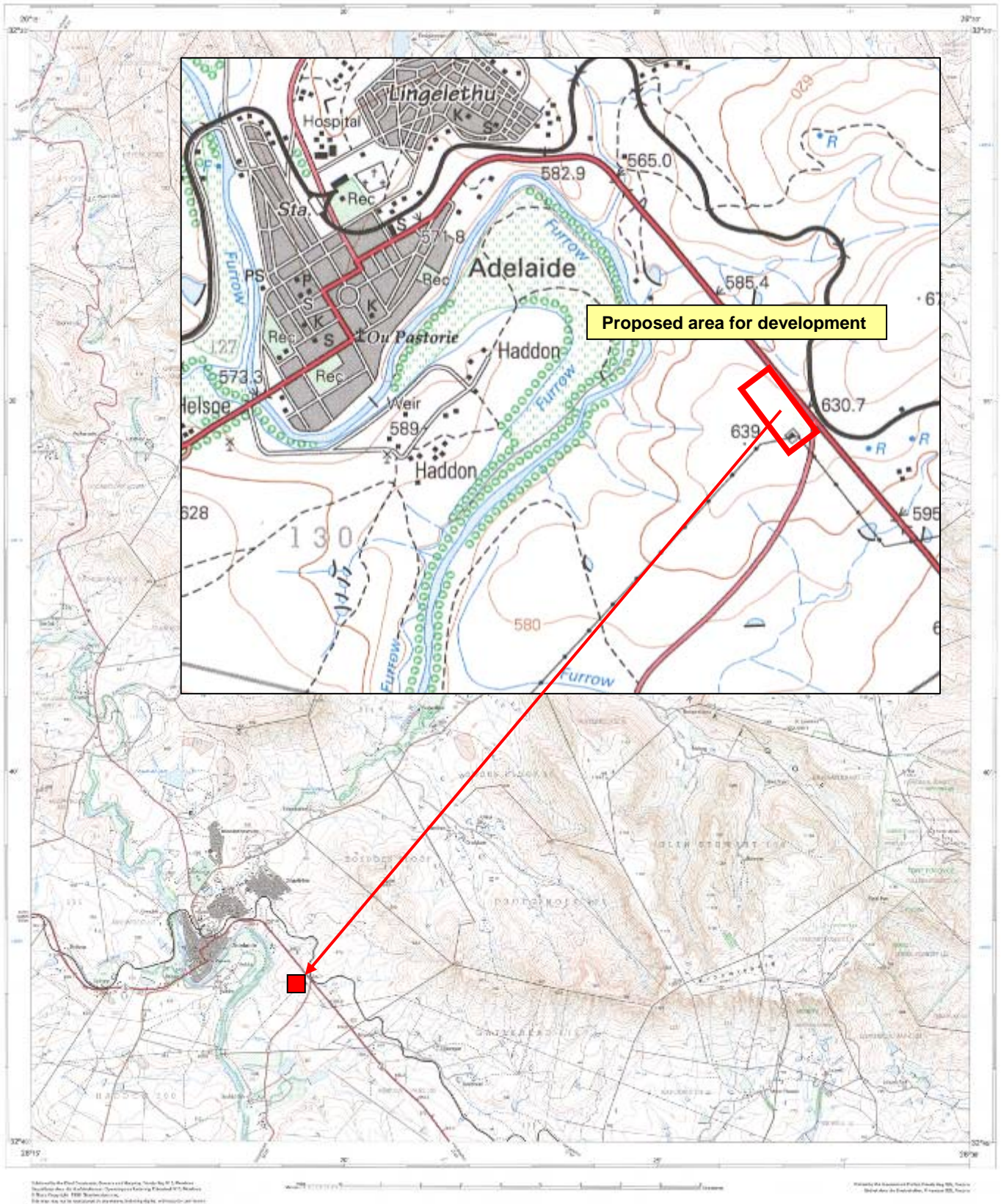
These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified.

Fossil bone

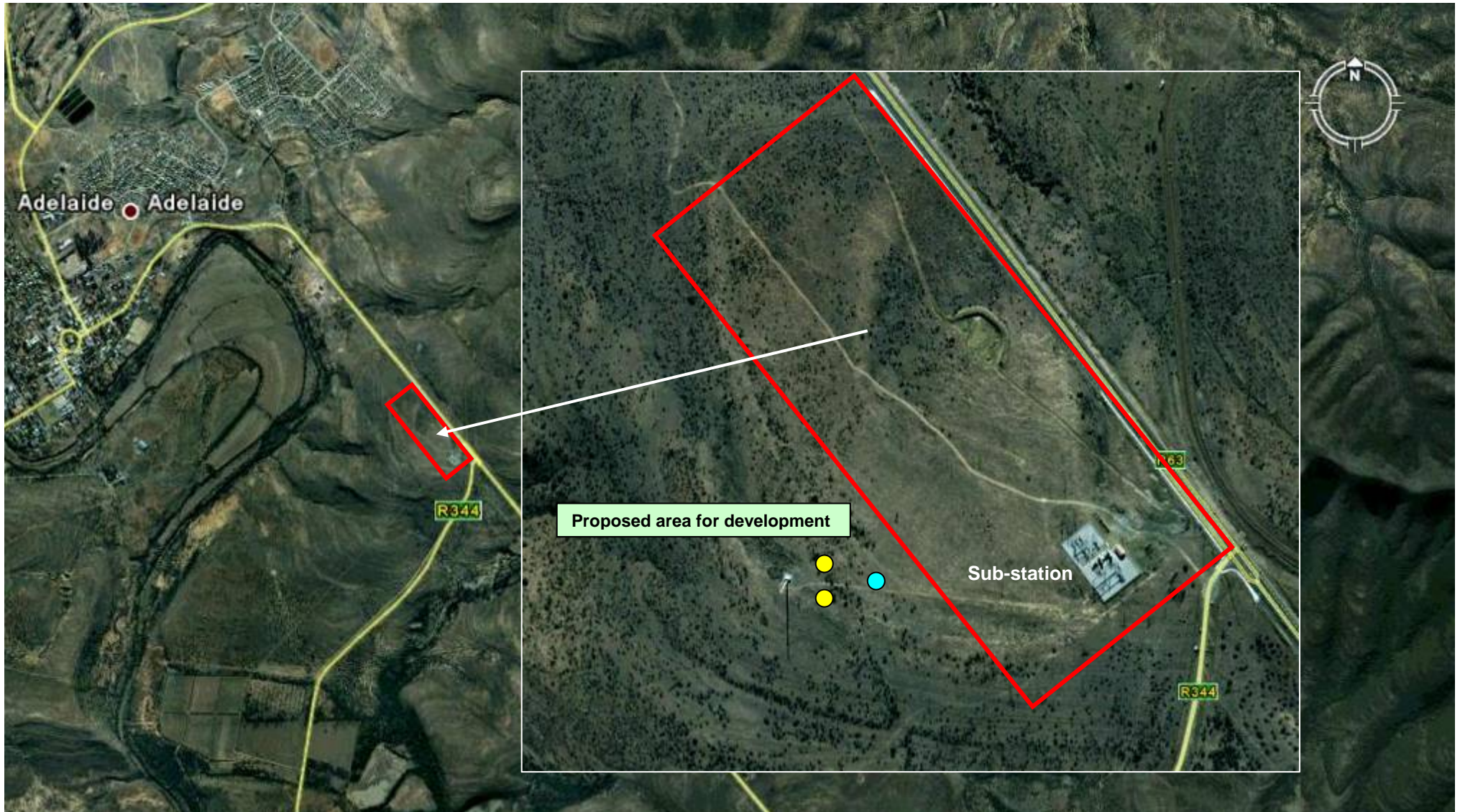
Fossil bones may be found embedded in geological deposits. Any concentrations of bones, whether fossilized or not, should be reported.

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.



Map 1. 1:50 000 maps indicating the location of the proposed development. The red rectangle marks the approximate size of the site.



Map 2. Aerial photographs indicating the location of the proposed development. The red rectangle marks the approximate size of the site, the yellow dots two stone cairns and the blue dot a few Middle Stone Age stone tools.