Phase 1 Archaeological Impact Assessment –

The Becclesfarm Bridge (Roodewal 146 & Beccles 335), near Tarkastad, Tsolwana Local Municipality, Eastern Cape, South Africa

- 16 October 2014 -

Report to:

Sello Mokhanya (Eastern Cape Provincial Heritage Resources Authority – EC PHRA)
E-mail: smokhanya@ecphra.org.za; Tel: 043 745 0888; Postal Address: N/A

Nande Suka (Coastal & Environmental Services - CES)
E-mail: n.suka@cesnet.co.za; Tel: 043 726 7809; Postal Address: P.O. Box 8145, Nahoon, 5201

Prepared by:

Karen van Ryneveld (ArchaeoMaps)
E-mail: kvanryneveld@gmail.com; Tel: 084 871 1064; Postal Address: Postnet Suite 239, Private Bag X3, Beacon Bay, 5205

Specialist Declaration of Interest

I, Karen van Ryneveld (Company – ArchaeoMaps; Qualification – MSc Archaeology), declare that:

- I am suitably qualified and accredited to act as independent specialist in this application;
- I do not have any financial or personal interest in the application, its' proponent or any subsidiaries, aside from fair remuneration for specialist services rendered; and
- That work conducted has been done in an objective manner – and that any circumstances that may have compromised objectivity have been reported on transparently.

Signature – - 16 October 2014 -

Phase 1 Archaeological Impact Assessment –

The Becclesfarm Bridge (Roodewal 146 & Beccles 335), near Tarkastad, Tsolwana Local Municipality, Eastern Cape, South Africa

Executive Summary

Terms of Reference -

CES have been appointed as independent EAP by Element Consulting Engineers on behalf of the project proponent, the Tsolwana Local Municipality, to manage the application for EA to the Eastern Cape Provincial DEDEAT, including a BAR, for the construction of the *Becclesfarm Bridge* development. The proposed development is to be situated on the properties Roodewal 146 and Beccles 335, near Tarkastad, within the Tsolwana Local Municipal area of the CHDM, Eastern Cape. Two bridge localities are considered for the application, namely Site 1 – S32°02'34.9"; E26°27'06.2" and Site 2 – S32°02'56.4"; E26°27'07.7".

ArchaeoMaps was appointed by CES to conduct the Phase 1 AIA as specialist component to the development's HIA, with findings and recommendations thereof to be included in the BAR.

The Phase 1 Archaeological Impact Assessment -

Project Area: *Becclesfarm Bridge,* near Tarkastad, Tsolwana Local Municipality, EC [1:50,000 Map Ref – 3226AB].

Coverage & Gap Analysis: *Becclesfarm Bridge* – Site 1 and *Becclesfarm Bridge* – Site 2.

Field Methodology: One day field assessment; GPS co-ordinates – Garmin GPSmap 62s; Photographic documentation – Pentax K20D. Site significance assessment – SAHRA 2007 system.

Summary:

Map Code	Site	Co-ordinates	Recommendations
***Becclesfarm Bridge* development**			
Site 1	*Becclesfarm Bridge* – Site 1	S32°02'34.9"; E26°27'06.2"	**Development to proceed as applied for** (No archaeological or cultural heritage concerns)
Site 2	*Becclesfarm Bridge* – Site 2	S32°02'56.4"; E26°27'07.7"	**Development to proceed as applied for** (No archaeological or cultural heritage concerns)
BFB-S1	Colonial Period – Farmstead Remains	S32°02'14.1"; E26°27'11.8"	**Permanent conservation** (Conservation measures already in place) AND (Temporary sign posting)

Recommendations –

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *Becclesfarm Bridge* development, at proposed Site 1, or Site 2, to be situated on the properties Roodewal 146 and Beccles 335, near Tarkastad, Tsolwana Local Municipality, Eastern Cape, proceeds as applied for without the developer having to comply with additional archaeological or cultural heritage compliance requirements.

The EC PHRA HIA Comment will state legal requirements for development to proceed, or reasons why, from a heritage perspective, development may not be further considered.

Contents

List of Tables:

List of Figures:

List of Maps:

List of Plates:

1 - Terms of Reference

Coastal & Environmental Services (CES) have been appointed as independent Environmental Assessment Practitioner (EAP) by Element Consulting Engineers on behalf of the project proponent, the Tsolwana Local Municipality, to manage the application for Environmental Authorization (EA) to the Eastern Cape Provincial Department of Economic Development, Environmental Affairs & Tourism (DEDEAT), including a Basic Assessment Report (BAR), for the construction of the *Becclesfarm Bridge* development. The proposed development is to be situated on the properties Roodewal 146 and Beccles 335, near Tarkastad, within the Tsolwana Local Municipal area of the Chris Hani District Municipality (CHDM), Eastern Cape. Two bridge localities are considered for the application, namely Site 1 – S32°02'34.9"; E26°27'06.2" and Site 2 – S32°02'56.4"; E26°27'07.7".

ArchaeoMaps was appointed by CES to conduct the Phase 1 Archaeological Impact Assessment (AIA) as specialist component to the development's Heritage Impact Assessment (HIA), with findings and recommendations thereof to be included in the BAR. Terms of Reference (ToR) for the Phase 1 AIA are stipulated as (CES 2014a):

- To determine the likelihood of significant archaeological and cultural heritage remains at the proposed *Becclesfarm Bridge* development study site;
- To identify, map and describe any significant finds;
- To assess the sensitivity and significance of identified remains; and
- To identify mitigatory measures to protect and maintain any valuable archaeological and cultural heritage remains that may be impacted on by development.

1.1.1) Development Location, Details and Impact

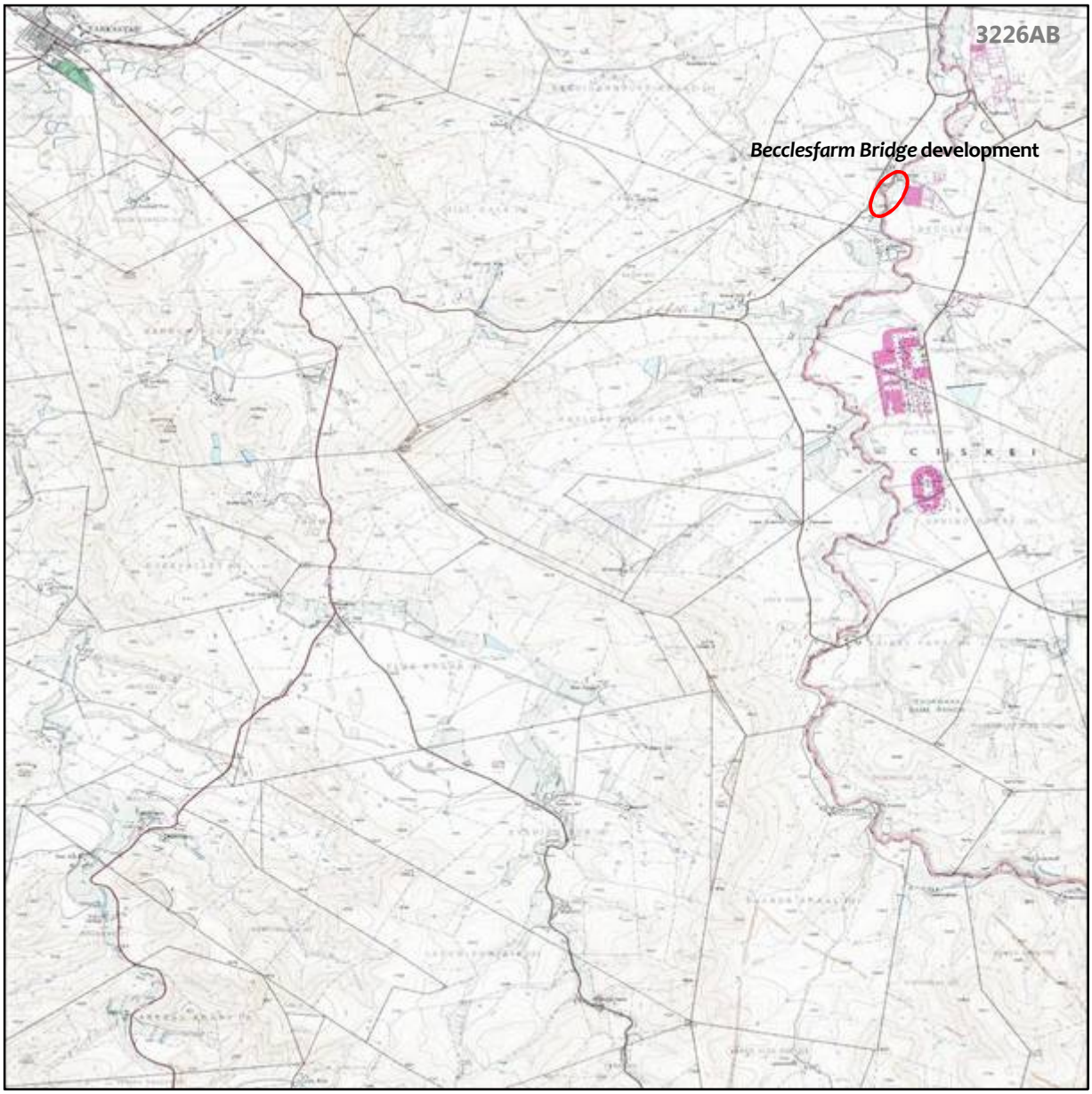
The *Becclesfarm Bridge* development will be situated near Beccle's Farm Village on the properties Roodewal 146 and Beccles 335, approximately 18km east of Tarkastad and 40km south-west of Queenstown in the Tsolwana Local Municipal area of the CHDM, Eastern Cape, South Africa [1:50,000 Map Ref – 3226AB].

The Tsolwana Local Municipality is proposing to construct a bridge across the Black Kei River at Beccle's Farm Village. The bridge crossing providing access from Tarkastad to Becclesfarm has suffered significant flood damage in the past. In the interim a temporary replacement structure was undertaken, but never completed. This structure comprises precast culvert units forming a low level structure on a curved section in the river. However, it appears that the river has shifted its course during recent floods, making the current crossing inadequate and posing a serious safety concern to the community. The damaged culvert crossing forces the community to make use of a gravel road that descends directly onto the river bed level: Vehicles drive onto, and pedestrians physically cross the river bed. During times of heavy rain and floods the crossing is inaccessible and the community cut off from Tarkastad and basic facilities to the west of the Black Kei. The closest alternative river crossings are situated between 6-10km away; a considerable distance considering limited vehicular use among the economically marginalized Becclesfarm community (CES 2014b).

At present 2 bridge localities are considered, namely Site 1, situated at general co-ordinate S32°02'34.9"; E26°27'06.2" and approximately 650m south thereof Site 2, at general co-ordinate S32°02'56.4"; E26°27'07.7".

Map 1: General locality of the proposed *Becclesfarm Bridge* development, between Tarkastad and Queenstown, Eastern Cape

Map 2: Close-up of the locality of the *Becclesfarm Bridge* development



Map 3: General locality of the *Becclesfarm Bridge* development – 1:50,000 Map Ref – 3226AB

2 - The Phase 1 Archaeological Impact Assessment

2.1.1) Archaeological & Cultural Heritage Legislative Compliance

The Phase 1 Archaeological Impact Assessment (AIA) for the proposed *Becclesfarm Bridge* development near Tarkastad, Tsolwana Local Municipality, Eastern Cape, was requested by the Eastern Cape Provincial Heritage Resources Authority (EC PHRA) as specialist component to the development's Heritage Impact Assessment (HIA), in terms of the National Heritage Resources Act, No 25 of 1999 (NHRA 1999), with specific reference to Section 38.

The Phase 1 AIA aimed to locate, identify and assess the significance of cultural heritage resources, inclusive of archaeological deposits / sites, built structures older than 60 years, burial grounds and graves, graves of victims of conflict and basic cultural landscapes or viewscapes as defined and protected by the NHRA 1999, that may be affected by the development.

This report comprises a basic Phase 1 AIA, including a basic pre-feasibility study and field assessment only.

Additional relevant legislation pertaining to the Phase 1 AIA is listed as:

- National Environmental Management Act, No 107 of 1998 (NEMA 1998) and associated Regulations (2010);

2.1.2) Methodology & Gap Analysis

The Phase 1 AIA includes a basic pre-feasibility study and field assessment:

- The pre-feasibility assessment is based on the Appendix 1 introductory archaeological literature. In addition the SAHRA 2009 Mapping Project Database (MPD), SAHRIS and the SAHRA Database on Declared Provincial Heritage Sites – Eastern Cape, were consulted. The study excludes consultation of the Albany Museum, the SAHRA accredited Data Recording Centre (DRC) for the Eastern Cape region's database.

- The field assessment was done over a 1 day period (2014-10-06). The assessment was done by foot and limited to a Phase 1 surface survey. GPS co-ordinates were taken with a Garmin GPSmap 62s (Datum: WGS84). Photographic documentation was done with a Pentax K20D camera. A combination of Garmap and Google Earth software was used in the display of spatial information.

- Archaeological and cultural heritage site recording, significance assignation and associated mitigation recommendations were done according to the system prescribed by SAHRA (2007, 2013).

SAHRA Archaeological and Cultural Heritage Site Significance Assessment			
Site Significance	**Field Rating**	**Grade**	**Recommended Mitigation**
High Significance	National Significance	Grade I	Site conservation / Site development
High Significance	Provincial Significance	Grade II	Site conservation / Site development
High Significance	Local Significance	Grade III-A	Site conservation or extensive mitigation prior to development / destruction
High Significance	Local Significance	Grade III-B	Site conservation or extensive mitigation prior to development / destruction
High / Medium Significance	Generally Protected A	Grade IV-A	Site conservation or mitigation prior to development / destruction
Medium Significance	Generally Protected B	Grade IV-B	Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
Low Significance	Generally Protected C	Grade IV-C	On-site sampling, monitoring or no archaeological mitigation required prior to or during development / destruction

Table 1: SAHRA archaeological and cultural heritage site significance assessment ratings and associated mitigation recommendations

2.1.3) Assessor Accreditation

The Phase 1 AIA was conducted by Karen van Ryneveld (ArchaeoMaps):

- Qualification: MSc Archaeology (2003) WITS University.
- Accreditation: Association of Southern African Professional Archaeologists (ASAPA) accredited Cultural Resources Management (CRM) practitioner [member nr – 163]
    1. 2004 – Association of Southern African Professional Archaeologists (ASAPA) – Professional Member.
    2. 2005 – ASAPA CRM Section: Accreditation – Field Director (Stone Age, Iron Age, Colonial Period).
    3. 2010 – ASAPA CRM Section: Accreditation – Principle Investigator (Stone Age).

Karen van Ryneveld is a SAHRA / AMAFA / EC PHRA / HWC listed CRM archaeologist.

Karen has been involved in CRM archaeology since 2003 and has been the author (including selected co-authored reports) of more than 300 Phase 1 AIA studies. Phase 1 AIA work is centered in South Africa, focusing on the Northern and Eastern Cape provinces and the Free State. She has also conducted Phase 1 work in Botswana (2006/2007). In 2007 she started ArchaeoMaps, an independent archaeological consultancy. In 2010 she was awarded ASAPA CRM Principle Investigator (PI) status based on large scale Phase 2 Stone Age mitigation work (De Beers Consolidated Mines – Rooipoort, Northern Cape – 2008/2009) and has also been involved in a number of other Phase 2 projects including Stone Age, Shell Middens, Grave / Cemetery projects and Iron Age sites.

In addition to CRM archaeology she has been involved in research, including the international collaborations at Maloney's Kloof and Grootkloof, Ghaap plateau, Northern Cape (2005/2006). Archaeological compliance experience includes her position as Head of the Archaeology, Palaeontology and Meteorites (APM) Unit at AMAFA aKwa-Zulu Natali (2004).

Based on the basic introductory literature assessment of South African archaeology (see Appendix – A) the probability of archaeological and cultural heritage sites within the proposed *Becclesfarm Bridge* study site, near Tarkastad, Tsolwana Local Municipality, Eastern Cape, can briefly be described as:

1. **Early Hominin** : Probability – *None*

2. **Stone Age**
   a. ESA : Probability – *Low*
   b. MSA : Probability – *Medium-High*
   c. LSA : Probability – *Medium* (Human remains may be expected; if identified of both scientific and social significance)
      i. Rock Art : Probability – *None-Low*
      ii. Shell Middens : Probability – *None*

3. **Iron Age**
   a. Early Iron Age : Probability – *None*
   b. Middle Iron Age : Probability – *None*
   c. Later Iron Age : Probability – *Medium*

4. **Colonial Period**
   a. Colonial Period : Probability – *Low-Medium* (Human remains expected to be primarily associated with formal cemeteries)
   b. Iron Age / Colonial Period Contact : Probability – *Low*
   c. Industrial Revolution : Probability – *None-Low*

2.2.1) The SAHRA 2009 MPD & SAHRIS

A single heritage Cultural Resources Management (CRM) project, being a palaeontological Letter of Recommendation (LoR), is recorded in the SAHRA 2009 Mapping Project Database (MPD) and situated within an approximate 40km radius from the *Becclesfarm Bridge* development, listed as:

- De Klerk, B. (Albany Museum). 2008. *Letter of recommendation for the Exemption of a Full Phase 1 Palaeontological Impact Assessment: Borrow Pit, Thornhill, Tsolwana Municipality, Eastern Cape*.

More archaeological CRM reports are available on SAHRIS, including the abovementioned corresponding archaeological report. The limited number of archaeological CRM reports compiled for developments in the *Becclesfarm Bridge* / Tarkastad area resulted in a fairly wide background study, towards Molteno in the north, Queenstown and Cathcart towards the east and south-east and Cradock in the west, pointing directly towards limited available archaeological information for the more immediate *Becclesfarm Bridge* study site. Archaeological CRM reports available on SAHRIS and consulted for the purpose of this study can be listed as:

- Anderson, G. (Umlando). 2010. *Heritage Survey of the Proposed Thomas River Wind Energy Project, Cathcart*.
- Anderson, G. (Umlando). 2012. *Heritage Survey of the Proposed Tsolwana Road Upgrade, Eastern Cape*.
- Binneman, J., Booth, C. & Higgit, N. (Albany Museum). 2010. *A Phase 1 Archaeological Impact Assessment (AIA) for the Proposed Dorper Wind Energy Facility on a Site near Molteno, Chris Hani District Municipality, Eastern Cape Province*.

- Booth, C. (Albany Museum). 2012a. *A Phase 1 Archaeological Impact Assessment for the Proposed 75MW Dobbin Photovoltaic Solar Farm on the Farm Het Fontein 1/66, near Cradock, Inxuba Yethemba District Municipality, Eastern Cape Province.*
- Booth, C. (Albany Museum). 2012b. *A Phase 1 Archaeological Impact Assessment for 5 Proposed Borrow Pits, Whittlesea Area near Queenstown, Lukhanji Local Municipality, Eastern Cape Province.*
- Van Ryneveld, K. (ArchaeoMaps). 2011a. *Phase 1 Archaeological Impact Assessment – Bulk Services for the Proposed Rathwick Development, Queenstown, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2011b. *Phase 1 Archaeological Impact Assessment – Utilization of Borrow Pits – Chris Hani District Municipality, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2011c. *Phase 1 Archaeological Impact Assessment – The Xashimba Abattoir, near Queenstown, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2012. *Phase 1 Archaeological Impact Assessment – Penhoek Pass – Upgrade of the N6-4 [km52-km66.2], between Queenstown and Jamestown, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2014. *Phase 1 Archaeological Impact Assessment – Kati-Kati Housing Project, (Portion of) Erf 633, Kati-Kati, (near Cathcart), Eastern Cape, South Africa.*
- Van Ryneveld, K. & Koortzen, C. (National Museum Bloemfontein). 2006. *Archaeological Site Inspection – Borrow Pit 76.0 Quarry Impact on Archaeological 'Michausdal' Deposits, Cradock District, Eastern Cape, South Africa.*
- Webley, L. (Albany Museum). 2008. *Letter of Recommendation for the Exemption of a Full Phase 1 Archaeological Impact Assessment: Borrow Pit, Thornhill, Tsolwana Municipality, Eastern Cape.*

2.2.2) SAHRA Provincial Heritage Site Database – Eastern Cape

Map 4: Spatial distribution of declared Provincial Heritage Sites in relation to the *Becclesfarm Bridge* study site

Geo-referenced declared Provincial Heritage Sites, recorded in the SAHRA – Eastern Cape database, situated within an approximate 40km radius from the proposed *Becclesfarm Bridge* study site are clustered in the urban areas of Tarkastad and Queenstown, and can be listed as:

Declared Provincial Heritage Sites – Eastern Cape					
Map Ref	**Identifier**	**Site Name**	**Town**	**NHRA status**	**Coordinates**
BE-EC95	9/2/028/0013	St John's Church, Post Retief, Fort Beaufort District	Fort Beaufort	Provincial Heritage Site	S32°18'19"; E26°18'59"
BE-EC159	9/2/077/0003	Hexagon, Queenstown [Originally laid out in the centre of Queenstown for defence purposes - has remained the focal point of the town plan. Concept of hexagon shape originated with Commander T. H. Bowker,]	Queenstown	Provincial Heritage Site	S31°53'46"; E26°52'16"
BE-EC160	9/2/077/0004	Old Municipal Market, 5 Hexagon, Queenstown	Queenstown	Provincial Heritage Site	S31°53'46"; E26°52'14"
BE-EC161	9/2/077/0005	Town Hall, Cathcart Road, Queenstown [Sandstone building designed by architect Sidney Stent and erected by the builders Male & Kirton. Cornerstone laid on 24 May 1882 by the wife of Mayor D. S. Barrable.]	Queenstown	Provincial Heritage Site	S31°53'52"; E26°52'26"
BE-EC162	9/2/077/0008	Museum, Naude Street, Queenstown [Architectural style: Victorian. Erected in 1868 as a primary school.]	Queenstown	Provincial Heritage Site	S31°53'42"; E26°52'20"
BE-EC163	9/2/077/0009	Queens College, Berry Street, Queenstown [Original portion of building complex designed in 1897 and cornerstone of the main entrance laid on 15 September1897. School was extended in 1914 and again in 1919 and 1920.]	Queenstown	Provincial Heritage Site	S31°53'25"; E26°52'35"
BE-EC189	9/2/093/0003	Old Dutch Reformed Church Parsonage, 17 Grey Street, Tarkastad [Built soon after the arrival of the Reverend J. G. S. de Villiers as the first Minister of Tarkastad, 1864.]	Tarkastad	Provincial Heritage Site	S32°00'30"; E26°15'59"

Table 2: Declared Provincial Heritage Sites in relation to the *Becclesfarm Bridge* study site

2.2.3) General Discussion

Despite the limited number of archaeological CRM studies done in the vicinity of the *Becclesfarm Bridge* study site these point towards a notably rich archaeological and cultural heritage record, with sites reported on in virtually every report. To date the only Earlier Stone Age (ESA) was recorded by Anderson (2010), who identified low densities of ESA lithic artefacts in an ex-situ context mixed with Later Stone Age (LSA) material. Middle Stone Age (MSA) reports seem more ample: Scattered low density MSA occurrences were reported on by Booth (2012a) and Van Ryneveld (2012), while fairly significant MSA assemblages were found at borrow pits along the Queenstown to Tarkastad road, in cases associated with an LSA admixture (Van Ryneveld 2011b). At the Xashimba Abattoir, closer to Queenstown, layered MSA deposits were identified in a natural open pit, with associated lithic surface occurrences and geological layering painting a complex picture of the immediate paleo-environment and associated paleo environmental use (Van Ryneveld 2011c). MSA 'Michausdal' deposits, near Cradock, showed clear variation interpreted as 2 distinct phases, either indicative of successive temporal usage or intercultural MSA utilization of the same site (Van Ryneveld & Koortzen 2006). Mixed MSA and LSA occurrences were identified at the Rathwick study site, Queenstown (van Rynveld 2011a), near Cathcart (Anderson 2010), at the Molteno WEF study site (Binneman *et. al.* 2010) and more importantly so during Anderson's (2012) assessment of the Tsolwana Road, just south, south-west of the *Becclesfarm Bridge* study site. To date distinctive, exclusive LSA deposits were only reported on from the Cradock WEF area, and suitably so with a number of rock engravings recorded during the same survey, adding significantly to the range of known LSA tangible heritage resources (Booth 2012a). In addition to the rock engravings from the Cradock area, a myriad of inferred rock engravings are also reported on informally, situated in the mountainous areas towards the north of Tarkastad (showme.co.za/south-africa/eastern-cape/karoo-heartland/tarkastad/#introanchor).

The general Tarkastad area lies outside the known Early (EIA) and Middle Iron Age (MIA) distribution ranges. Identified laborer settlements and associated grave and cemetery sites, identified along the Tsolwana Road (Anderson 2012), are thus ascribed a Later Iron Age cultural affiliation, most probably dating to Colonial Period times.

The archaeological CRM Colonial Period record is fairly substantial. Colonial Period structures, mainly abandoned historical

farmsteads, associated cemeteries and graves and dry stone walling (livestock enclosures) were identified at the Molteno WEF study site, with stoneware, porcelain, glass, iron and copper surface artefacts (Binneman *et.al.* 2010) and along the Tsolwana Road, where Colonial Period resources also include the '*Tentergate*' church and cemetery (Anderson 2012). Resources at the Cradock WEF study site is limited to dry stone walling and associated Colonial Period surface artefacts; ceramics, metal, tin and glass (Booth 2012a). Along the N6 still in use Colonial Period farmsteads and a Colonial Period shelter, directly relating to the early construction of the Penhoek Pass, under the policy of convict labor of John Montagu (1797-1853) provides for an interesting economic and technological layer to the essential farming related Colonial Period record (van Ryneveld 2012).

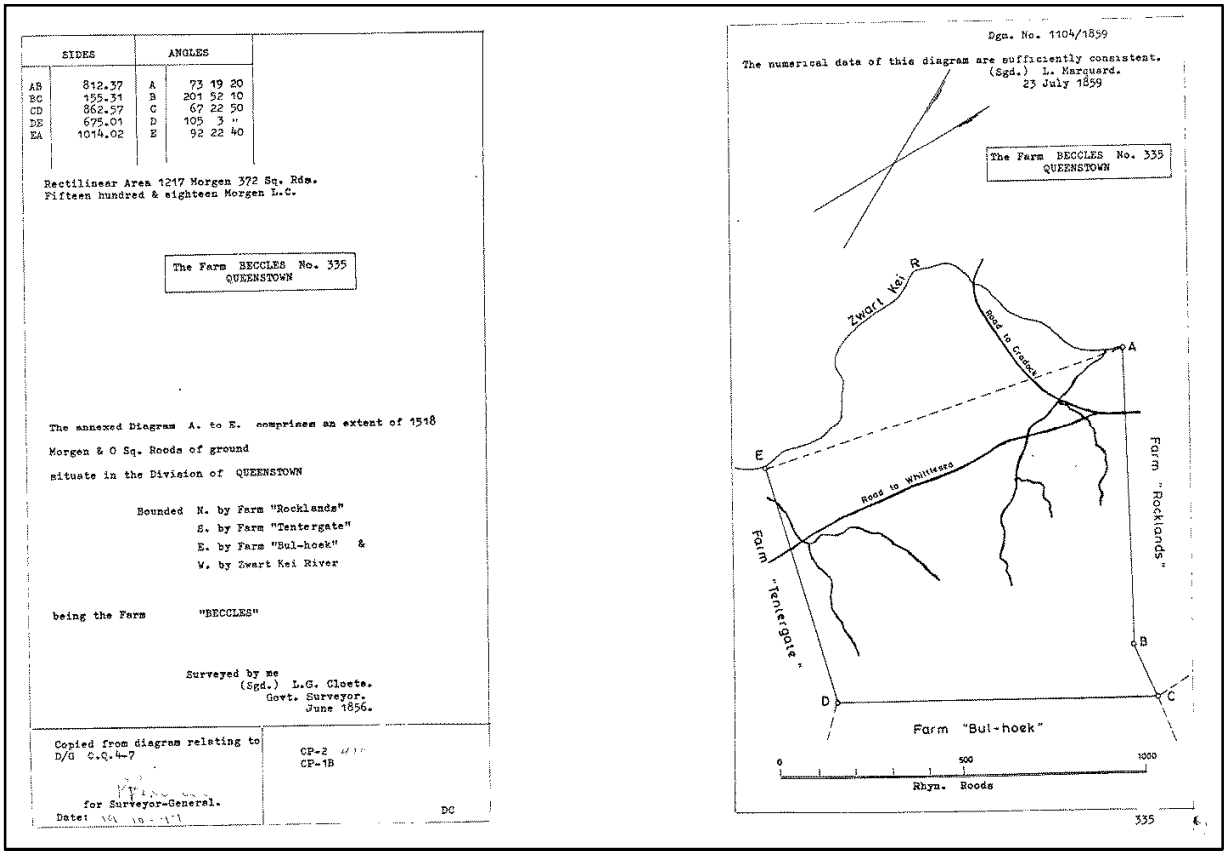


Figure 1: CSG Record Nr 1104/1859 – Beccles 335, 1859

With little historical information available on the farm Beccles, aside from an early survey record, dating to 1856 and its registration, dating to 1859, a brief history of Tarkastad itself is of relevance. Records indicate that Dutch farmers settled in the general Tarkastad region from the early 1800's and that for a while 2 '*Great Trek*' leaders, Andries Potgieter and Piet Retief, both farmed in the region. After the Dutch farmers decided to accompany their leaders on the '*Great Trek*', English 1820 settlers moved in. The town is steeped in historical charm; historical architecture, old watermills and paraphernalia including iron water hydrants, lamp stands etc. The town was officially established in 1862, as a church centre, with the Old Dutch Reformed Church Parsonage (built in 1864) being a declared Provincial Heritage Site. Tarkastad became a municipality in 1864. The '*Battle of Elands River*' (1901) was fought on the Elands River Poort Mountain Pass, roughly 25km north north-west of Tarkastad, during the Anglo Boer War and the grave of Lt. Sheridan, cousin of Winston Churchill, who was killed in the battle can be found on the Modderfontein farm just outside the town (showme.co.za/south-africa/eastern-cape/karoo-heartland/tarkastad/#introanchor; en.wikipedia.org/wiki/Tarkastad).

No archaeological or cultural heritage resources, as described and protected by the NHRA 1999, were identified during the field assessment of the *Becclesfarm Bridge* – Site 1 or *Becclesfarm Bridge* – Site 2 study sites. One archaeological and cultural heritage site, Site BFB-S1, a Colonial Period site, is situated along the access road, approximately 650m north of the *Becclesfarm Bridge* – Site 1 study site. The site is at present still in use, with a permanent fence around the private property: Existing fencing comply with SAHRA / EC PHRA minimum site conservation standards for the inferred vernacular structures comprising the site. It is recommended that additional temporary conservation measures (temporary signage) be attached to the existing fence at the site to ensure no accidental impact during the course of construction.

From an archaeological and cultural heritage perspective the proposed development poses no threat to identified protected heritage resources and development at either Site 1 or Site 2 is feasible.

Map 5: Results of the field assessment (tracklog – white)

2.3.1) Becclesfarm Bridge – Site 1: S32°02′34.9″; E26°27′06.2″

No archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, were identified along the access road or at the general *Becclesfarm Bridge* – Site 1 study site. Exposed sections of the Black Kei River, in excess of 1+m, as well as shallow surface disturbance at the study site yielded no archaeological material, implying that surface anthropogenic sterility is echoed in sub-surface levels.

- **RECOMMENDATIONS:** Should Site 1 be selected for development it is recommended that development proceed without the developer having to comply with additional archaeological or cultural heritage compliance requirements.

Plate 1: General view of the *Becclesfarm Bridge* – Site 1 study site [1]

Plate 2: General view of the *Becclesfarm Bridge* – Site 1 study site [2]

2.3.2) Becclesfarm Bridge – Site 2: S32°02′56.4″; E26°27′07.7″

No archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, were identified along the access track or in the vicinity of the proposed *Becclesfarm Bridge* – Site 2 study site. Again riverbed sections, at Site 2 in excess of 2m proved to be anthropogenically sterile; implying an extremely limited likelihood of sub-surface resources being encountered during the course of development.

- **RECOMMENDATIONS:** Should Site 2 be selected for development it is recommended that development proceed without the developer having to comply with additional archaeological or cultural heritage compliance requirements.

Plate 3: General view of the *Becclesfarm Bridge* – Site 2 study site [1]

Plate 4: General view of the *Becclesfarm Bridge* – Site 2 study site [2]

2.3.3) Recorded Archaeological and Cultural Heritage Resources

2.3.3.1) Site BFB-S1 – Colonial Period – Farmstead Remains: S32°02'14.1"; E26°27'11.8"

Site BFB-S1 is situated along the access road leading to the *Becclesfarm Bridge* – Site 1 and *Becclesfarm Bridge* – Site 2 study sites, on route to Beccles Farm Village. The site, situated on Portion 2 of Farm 146, is inferred to represent the original Colonial Period farmstead of Farm 146. The farmstead is characterized by a number of buildings, including dry-stacked stone buildings, comprising primarily outbuildings and livestock enclosures as well as the original residence and main outbuildings. Dry-stacked stone structures vary greatly in conservation standards – some of which are conserved in full (with inferred later reparations) and still in use, while others are characterized by portions of wall remains only. The residence and main outbuildings are in a typical gabled Karoo style, brick and plastered, and at present painted green. The site, visible from the access road was not directly inspected: Situated on private property the site is permanently fenced with an access gate, complying with SAHRA / EC PHRA minimum site conservation standards. Structures are inferred to be vernacular. Based on association structures may reasonably be inferred to date sequentially roughly to the 1860's and thereafter when farms in the general area were being registered.

Site BFB-S1 is situated approximately 650m north of the *Becclesfarm Bridge* – Site 1 study site. The site will not be impacted by development.

- **RECOMMENDATIONS:** The Site BFB-S1 Colonial Period farmstead remains predate 60 years of age. The site is thus formally protected by the NHRA 1999: The site receives automatic SAHRA / EC PHRA protection as a site of *High Significance* with a *Provincial Grade II Field Rating*. The site will not be impacted on by development. The site is at present permanently fenced with an access gate, complying with SAHRA / EC PHRA minimum site conservation standards. It is recommended that the developer ensures that temporary signage, indicating the area as a '*No Entry Zone*' during the course of construction be affixed to the existing fence to ensure no accidental impact on site features.

Plate 5: Selected Colonial Period structures comprising part of the Colonial Period Site BFB-S1

3 - Environmental Impact Assessment Rating

Identified archaeological and cultural heritage sites are ascribed an Environmental Impact Assessment (EIA) rating according to the CES – 2008 system (CES 2014b), based on the *Temporal Scale* (Short term [<5 years] = 1; Medium term [5-20 years] = 2; Long term [20-40 years] = 3 and Permanent [40+ years] = 4), *Spatial Scale* (Localized [≤ a few ha] = 1; Study area [proposed site & immediate environs] = 2, Regional [District & Provincial level] = 3, National [Country level] = 3 and International [International level] = 4), *Severity*, which can be either positive [+] or negative [-] (Slight = 1, Moderate = 2, Severe = 3, Very severe = 4) and *Likelihood* (Unlikely = 1, May occur = 2, Probable = 4 and Definite = 8). Based on the above EIA significance criteria a significance point [SP] is assigned as follows:

- SP = (*Temporal scale* + *Spatial scale* + *Severity* + *Likelihood*).

A maximum of 20 SP can be assigned to an impact. Environmental Significance [S] is assigned based on the SP as follows (CES 2014b):

- 4-8 = *Low* [An acceptable impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in either positive or negative medium to short term effects on the social / natural environment];
- 9-12 = *Moderate* [An important impact which requires mitigation. The impact is insufficient in itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in either a positive or negative medium to long-term effect on the social / natural environment];
- 13-16 = *High* [A serious impact, if not mitigated, may prevent the implementation of the project if it is a negative impact. These impacts would be considered by society as constituting a major and usually long-term change to the social / natural environment and result in severe or beneficial effects];
- 17-20 = *Very High* [A very serious impact which, if negative, may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are unmitigable and usually result in very severe or very beneficial effects].

➢ The significance of an identified impact can be either positive [+] or negative [-].

Environmental impact assessment ratings are grouped per sites with the same basic recommendation per site type or type of impact, with cognizance to the fact that impacts on heritage sites are as a norm irreversible (heritage sites are non-renewable resources) and with reference to the SAHRA (2007, 2013) prescribed mitigation options per site significance rating, weighed against development / possible natural impact.

Environmental Impact	Site Number	Environmental Significance									
Conservation (Permanent conservation measures already in place)	Colonial Period Farmstead Remains	**Impact: Without Mitigation**									
		Effect						**Likelihood**		**Overall score [SP]**	**Significance [S]**
		Temporal scale		**Spatial scale**		**Severity**					
		Short term	1	Localized	1	Slight	[-] 1	Unlikely	1	[-] 4	[-] Low
		Impact: With Mitigation									
		Effect						**Likelihood**		**Overall score [SP]**	**Significance [S]**
		Temporal scale		**Spatial scale**		**Severity**					
		N/A	-	N/A	-	N/A	-	N/A	-	N/A	N/A
	Comment: Colonial Period farmstead remains										
	Summary of mitigation points: 1. **Site BFB-S1:** Permanent conservation measures already in place. Temporary signage during the course of construction to ensure no accidental impact on the site.										

Table 3: Environmental significance assessment of identified Colonial Period farmstead remains

4 - Recommendations

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *Becclesfarm Bridge* development, at proposed Site 1, or Site 2, to be situated on the properties Roodewal 146 and Beccles 335, near Tarkastad, Tsolwana Local Municipality, Eastern Cape, proceeds as applied for without the developer having to comply with additional archaeological or cultural heritage compliance requirements.

The EC PHRA HIA Comment will state legal requirements for development to proceed, or reasons why, from a heritage perspective, development may not be further considered.

***Becclesfarm Bridge* development, near Tarkastad, Tsolwana Local Municipality, Eastern Cape**			
Map Code	**Site**	**Co-ordinates**	**Recommendations**
***Becclesfarm Bridge* development**			
Site 1	*Becclesfarm Bridge* – Site 1	S32°02'34.9"; E26°27'06.2"	**Development to proceed as applied for** (No archaeological or cultural heritage concerns)
Site 2	*Becclesfarm Bridge* – Site 2	S32°02'56.4"; E26°27'07.7"	**Development to proceed as applied for** (No archaeological or cultural heritage concerns)
BFB-S1	Colonial Period – Farmstead Remains	S32°02'14.1"; E26°27'11.8"	**Permanent conservation** (Conservation measures already in place) AND (Temporary sign posting)

Table 4: Archaeological and cultural heritage compliance summary for the proposed *Becclesfarm Bridge* development

Notes:

- Should any archaeological or cultural heritage resources, including human remains / graves, as defined and protected by the NHRA 1999, and not reported on in this report be identified during the course of development the developer should immediately cease operation in the vicinity of the find and report the site to the EC PHRA / an ASAPA accredited CRM archaeologist and arrange for an archaeological site inspection. Human remains confirmed younger than 60 years are to be reported directly to the nearest police station.
  - Quick guide to the identification of archaeological sites and resources:

    Stone Age - Accumulations of knapped or unnaturally flaked stone of varying sizes and shapes, often found in notable clusters which may correspond to surface and sub-surface stratigraphic members. Stone accumulations may be associated with bone, charcoal and even ceramic sherds. Along the coastline artefacts are often found associated with shellfish remains generally referred to as shell middens, in cases characterized by extremely ephemeral scatters only. Graves (LSA) are typically not surface demarcated and only exposed during the course of construction.

    Iron Age - Sites are often identified by surface structure remains such as stone stacked wall remnants, earth mounds and linear alignments and clusters of vegetation representing disintegrated or covered features. Circular mounds or depressions may be indicative of former hut localities. Typical artefacts comprise of ceramic sherds as well as metal, earthenware, porcelain and glass pieces. Graves and informal cemeteries are routinely associated with Iron Age sites; typical grave markers include earth mounds, stone cairns, oval shaped stone outlines and inscribed or non-inscribed headstones.

    Colonial Period - Sites are most characteristically identified by structures or structure remains, including residential, military, farming, industrial production and infrastructure related which may be directly or indirectly related to artefactual remains, including earthenware, glass, metal etc. Graves or cemetery sites are often associated with Colonial Period structure or site remains. Grave markers more than often comprise of inscribed headstones, but may include simple stone cairn, single stone or mound remains.
- Should any registered Interested & Affected Party (I&AP) wish to be consulted in terms of Section 38(3)(e) of the NHRA 1999 (Socio-cultural consultation / SAHRA SIA) it is recommended that the developer / EAP ensures that the consultation be prioritized within the timeframe of the Environmental Impact Assessment (EIA).

5 - Acronyms and Abbreviations

AD	: Anno Domini (the year 0.)
AIA	: Archaeological (and Cultural Heritage) Impact Assessment
AMAFA	: Amafa aKwaZulu-Natali
ASAPA	: Association of Southern African Professional Archaeologists
BAR	: Basic Assessment Report
BC	: Before the Birth of Christ (the year 0.)
BCE	: Before the Common Era (the year 0.)
BIA	: Basic Impact Assessment
BID	: Background Information Document
BP	: Before the Present (the year 1950.)
cm	: Centimeter
CRM	: Cultural Resources Management
DAC	: Department of Arts and Culture
DEAT	: Department of Environmental Affairs and Tourism
DEDEAT	: Department of Economic Development, Environmental Affairs and Tourism
DME	: Department of Minerals and Energy
DSACR	: Department of Sport, Arts, Culture and Recreation
ECO	: Environmental Control Officer
EAP	: Environmental Assessment Practitioner
EC PHRA	: Eastern Cape Provincial Heritage Resources Authority
EIA	: Environmental Impact Assessment
EIA_1	: Early Iron Age
EMPr	: Environmental Management Plan report
ESA	: Earlier Stone Age
ha	: Hectare
HIA	: Heritage Impact Assessment
HWC	: Heritage Western Cape
HCMP	: Heritage Conservation Management Plan
ICOMOS	: International Council on Monuments and Sites
IEM	: Integrated Environmental Management
km	: Kilometer
Kya	: Thousands of years ago
LIA	: Later Iron Age
LSA	: Later Stone Age
m	: Meter
m^2	: Square Meter
MIA	: Middle Iron Age
mm	: Millimeter
MPRDA (2002)	: Mineral and Petroleum Resources Development Act, No 28 of 2002
MSA	: Middle Stone Age
Mya	: Millions of years ago
NEMA (1998)	: National Environmental Management Act, No 107 of 1998
NHRA (1999)	: National Heritage Resources Act, No 25 of 1999
PIA	: Palaeontological Impact Assessment
PHRA	: Provincial Heritage Resources Authority
PSSA	: Palaeontological Society of South Africa
PPP	: Public Participation Process
SAHRA	: South African Heritage Resources Agency
SAHRIS	: South African Heritage Resources Information System
ScIA	: Socio-cultural Impact Assessment
SIA	: Social Impact Assessment

6 - References

1. Anderson, G. (Umlando). 2010. *Heritage Survey of the Proposed Thomas River Wind Energy Project, Cathcart*.

2. Anderson, G. (Umlando). 2012. *Heritage Survey of the Proposed Tsolwana Road Upgrade, Eastern Cape*.

3. Binneman, J., Booth, C. & Higgit, N. (Albany Museum). 2010. *A Phase 1 Archaeological Impact Assessment (AIA) for the Proposed Dorper Wind Energy Facility on a Site near Molteno, Chris Hani District Municipality, Eastern Cape Province.*

4. Booth, C. (Albany Museum). 2012a. *A Phase 1 Archaeological Impact Assessment for the Proposed 75MW Dobbin Photovoltaic Solar Farm on the Farm Het Fontein 1/66, near Cradock, Inxuba Yethemba District Municipality, Eastern Cape Province.*

5. CES. 2014a. *Letter of Appointment as Sub Consultant: ArchaeoMaps – Archaeological and Heritage Consultancy*.

6. CES. 2014b. *Environmental Impact Assessment. Becclesfarm Bridge, Tsolwana Local Municipality. Background Information Document and Invitation to Comment.*

7. CES. 2014c. *CES – Sept 2008. Methodology for Assessing the Significance of Impacts*.

8. en.wikipedia.org/wiki/Tarkastad.

9. South African Government. (No. 107 of) 1998. *National Environmental Management Act*.

10. South African Government. (No. 25 of) 1999. *National Heritage Resources Act*.

11. South African Heritage Resources Agency. 2007. *Minimum Standards for the Archaeological and Heritage Components of Impact Assessments.* (Unpublished guidelines.)

12. South African Heritage Resources Agency. 2013. SAHRA APM Guidelines: Minimum Standards for the Archaeological Components of heritage Impact Assessments. (Unpublished draft guidelines.)

13. Van Ryneveld, K. (ArchaeoMaps). 2011a. *Phase 1 Archaeological Impact Assessment – Bulk Services for the Proposed Rathwick Development, Queenstown, Eastern Cape, South Africa.*

14. Van Ryneveld, K. (ArchaeoMaps). 2011b. *Phase 1 Archaeological Impact Assessment – Utilization of Borrow Pits – Chris Hani District Municipality, Eastern Cape, South Africa.*

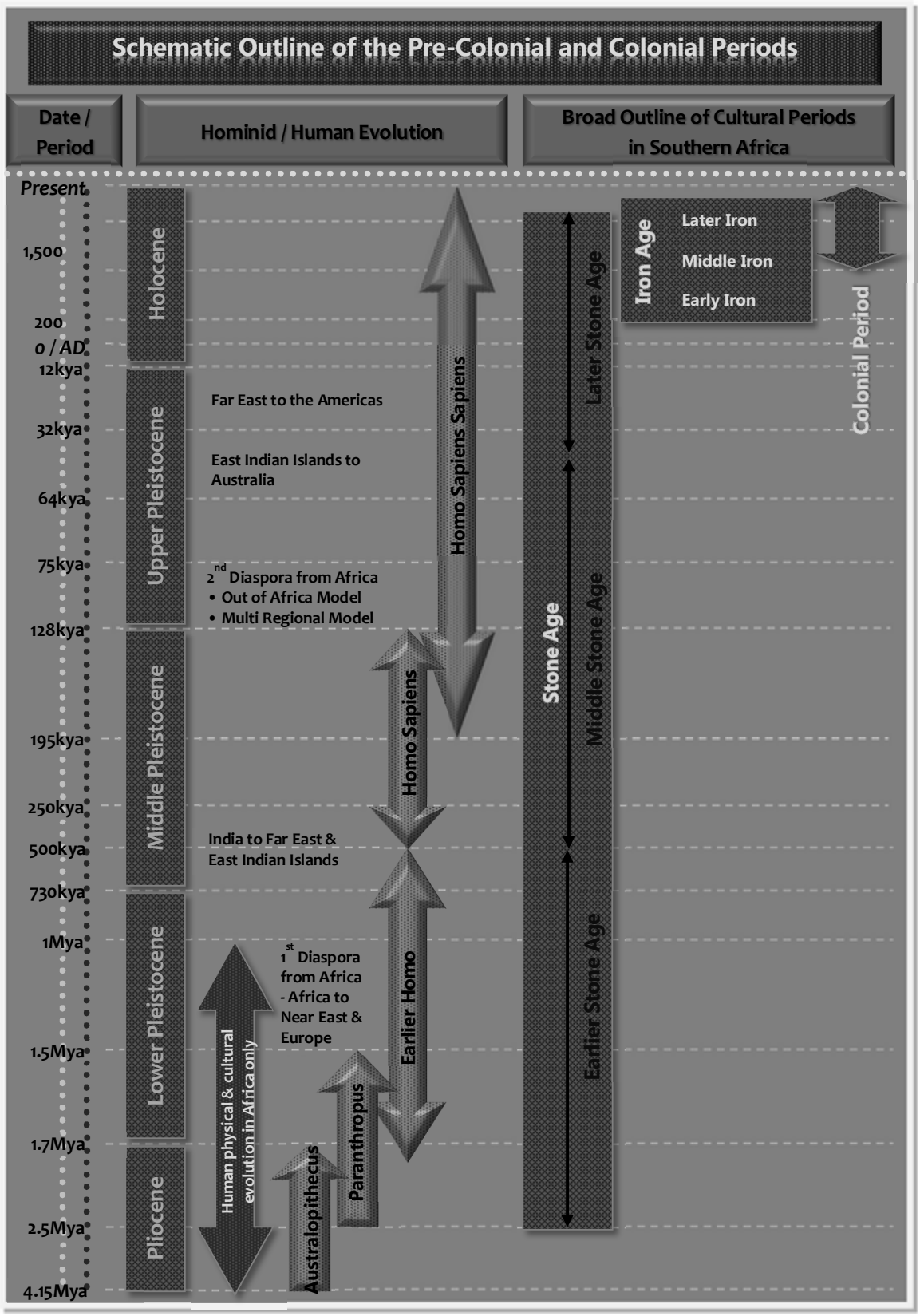
15. Van Ryneveld, K. (ArchaeoMaps). 2011c. *Phase 1 Archaeological Impact Assessment – The Xashimba Abattoir, near Queenstown, Eastern Cape, South Africa.*

16. Van Ryneveld, K. (ArchaeoMaps). 2012. *Phase 1 Archaeological Impact Assessment – Penhoek Pass – Upgrade of the N6-4 [km52-km66.2], between Queenstown and Jamestown, Eastern Cape, South Africa.*

17. Van Ryneveld, K. & Koortzen, C. (National Museum Bloemfontein). 2006. *Archaeological Site Inspection – Borrow Pit 76.0 Quarry Impact on Archaeological 'Michausdal' Deposits, Cradock District, Eastern Cape, South Africa.*

18. showme.co.za/south-africa/eastern-cape/karoo-heartland/tarkastad/#introanchor.

Appendix A:


Schematic Outline of the Pre-Colonial and Colonial Periods
Date / Period
Hominid / Human Evolution
Broad Outline of Cultural Periods in Southern Africa
Present
1,500
200
0 / AD
12kya
32kya
64kya
75kya
128kya
195kya
250kya
500kya
730kya
1Mya
1.5Mya
1.7Mya
2.5Mya
4.15Mya
Holocene
Upper Pleistocene
Middle Pleistocene
Lower Pleistocene
Pliocene
Far East to the Americas
East Indian Islands to Australia
2nd Diaspora from Africa
• Out of Africa Model
• Multi Regional Model
India to Far East & East Indian Islands
1st Diaspora from Africa - Africa to Near East & Europe
Human physical & cultural evolution in Africa only
Homo Sapiens Sapiens
Homo Sapiens
Earlier Homo
Paranthropus
Australopithecus
Stone Age
Later Stone Age
Middle Stone Age
Earlier Stone Age
Iron Age
Later Iron
Middle Iron
Early Iron
Colonial Period

Appendix B:

Introduction to the Archaeology of South Africa

Archaeologically the southern African cultural environment is roughly divided into the Stone Age, the Iron Age and the Colonial Period, including its subsequent Industrial component. This cultural division has a rough temporal association beginning with the Stone Age, followed by the Iron Age and the Colonial Period. The division is based on the identified primary technology used. The hunter-gatherer lifestyle of the Stone Age is identified in the archaeological record through stone being the primary raw material used to produce tools. Iron Age people, known for their skill to work iron and other metal, also practiced agriculture and animal husbandry. Kingships and civilizations associated with the Iron Age are indicative of a complex social hierarchy. The Colonial Period is marked by the advent of writing, in southern Africa primarily associated with the first European travelers (Mitchell 2002).

During the latter part of the Later Stone Age (LSA) hunter-gatherers shared their cultural landscape with both pastoralists and Iron Age people, while the advent of the Colonial Period in South Africa is marked by a complex cultural mosaic of people; including LSA hunter-gatherers, pastoralists, Later Iron Age farming communities and Colonial occupation.

1) Early Hominin Evolution

DNA studies indicates that humans and chimpanzees shared a common ancestor between 6-8Mya (Sibley & Ahlquist 1984). By 4Mya, based on fossil evidence from Ethiopia and Kenya, hominins (humans and their immediate fossil ancestors and relatives) had already evolved. The earliest fossils are ascribed to *Ardipithecus ramidus* (4.4Mya), succeeded by *Australopithecus anamensis* (4.2-3.9Mya). These fossils are inferred to lie at the base from which all other hominins evolved (Leakey *et al.* 1995; White *et al.* 1994).

In South Africa the later hominins are classed into 3 groups or distinct genera; *Australopithecus* (gracile australopithecines), *Paranthropus* (robust australopithecines) and *Homo.* South Africa has 3 major hominin sites: Taung in the North-West Province, where Raymond Dart identified the first *Australopithecus* fossil in 1924 (Dart 1925); The Cradle of Humankind (Sterkfontein Valley) sites in Gauteng, the most prolific hominin locality in the world for the period dating 3.5-1.5Mya which have yielded numerous *Australopithecus, Paranthropus* and limited *Homo* fossils (Keyser *et al.* 2000; Tobias 2000); and Makapansgat in the Limpopo Province, where several more specimens believed to be older than most of the Cradle specimens were discovered (Klein 1999).

A. africanus, represented at all 3 sites are believed to have been present on the South African landscape from about 3Mya. From approximately 2.8Mya they shared, at least in the Cradle area, the landscape with *P. robustus* and from roughly 2.3Mya with early forms of *Homo* (Clarke 1999). Global climatic cooling around 2.5Mya may have stimulated a burst of species turnover amongst hominins (Vrba 1992); the approximate contemporary appearance of the first stone tools suggests that this was a critical stage in human evolution. But exactly which early hominin population is to be accredited as the ancestor of *Homo* remains elusive.

H. ergaster is present in the African palaeo-anthropological record from around 1.8Mya and shortly thereafter the first exodus from Africa is evidenced by *H. erectus* specimens from China, Indonesia and even Europe (Klein 1999).

2) The Stone Age

2.1) The Earlier Stone Age

In South Africa the only Earlier Stone Age (ESA) Oldowan lithic assemblage comes from Sterkfontein Cave. The predominant quartz assemblage is technologically very simple, highly informal and inferred to comprise exclusively of multi-purpose tools (Kuman *et al.* 1997). The latter part of the ESA is characterized by the Acheulean Industrial Complex, present in the archaeological record from at least 1.5Mya. Both *H. ergaster* and *P. robustus* may be accredited with the production of these tools. The association between stone tools and increased access to meat and marrow supporting the greater dietary breath of *Homo* may have been vital to *Homo's* evolutionary success; and the eventual extinction of the robust australopithecines (Klein 1999).

Probably the longest lasting artefact tradition ever created by hominins, the Acheulean is found from Cape Town to north-western Europe and India, occurring widely in South Africa. Despite the many sites it is still considered a '*prehistoric dark age*' by many archaeologists, encompassing one of the most critical periods in human evolution; the transition from *H. ergaster* to archaic forms of *H. Sapiens* (Klein 1999).

The Acheulean industry is characterized by handaxes and cleavers as *fosilles directeurs* (signatory artefact types), in association with cores and flakes. Handaxes and cleavers were multi-purpose tools used to work both meat and plant matter (Binneman & Beaumont 1992). Later Acheulean flaking techniques involved a degree of core preparation that allowed a single large flake of predetermined shape and size to be produced. This *Victoria West technique* indicates an origin within the Acheulean for the *Levallois technique* of the Middle Stone Age (Noble & Davidson 1966). The lithic artefact component was supplemented by wood and other organic material (Deacon 1970).

2.2) The Middle Stone Age

The Middle Stone Age (MSA), dating from approximately 500kya to 40-27/23kya is interpreted as an intermediate technology between the Acheulean and the Later Stone Age (LSA) (Goodwin & van Riet Lowe 1929). The MSA is typologically characterized by the absence of handaxes and cleavers, the use of prepared core techniques and the production of blades, triangular and convergent flakes, with convergent dorsal scars and faceted striking platforms, often produced by means of the *Levallois technique* (Volman 1984). The widespread occurrence of MSA technology across Africa and its spread into much of Eurasia in Oxygen Isotope Stage (OIS) 7 is viewed as part of a process of population dispersal associated with both the ancestors of the later Neanderthals in Europe and anatomically modern humans in Africa (Foley & Lahr 1997).

After the riches offered by the Cradle sites and Makapansgat, southern Africa's Middle Pleistocene fossil record is comparatively poor. Early Middle Pleistocene fossil evidence suggests an archaic appearance and fossils are often assigned to *H. heidelbergensis* and *H. sapiens rhodesiensis* (Rightmire 1976). Modern looking remains, primarily from Border Cave (KwaZulu-Natal) and Klasies River Mouth (Eastern Cape) raised the possibility that anatomically modern humans had, by 120kya, originated south of the Sahara before spreading to other parts of the world (Brauer 1982; Stringer 1985). Subsequent studies of modern DNA indicated that African populations are genetically more diverse and probably older than those elsewhere (Cann *et al.* 1994). Combined, the fossil and genetic evidence underpins the so-called *Out of Africa 2* model (arguing that gene flow and natural selection led regional hominin populations along distinct evolutionary trajectories after *Homo's* expansion from Africa in the Lower Pleistocene *Out of Africa 1* model) of modern human origins and the continuing debate as to whether it should be preferred to its *Multiregional* alternative (arguing that modern humans evolved more or less simultaneously right across the Old World) (Mellars & Stringer 1989; Aitken *et al.* 1993; Nitecki & Nitecki 1994).

Persuasive evidence of ritual activity or bodily decoration is evidenced by the widespread presence of red ochre at particularly MSA 2 sites (after Volman's 1984 MSA 1-4 model; Hensilwood & Sealy 1997), while evidence from Lion Cave, Swaziland, indicates that specularite may have been mined as early as 100kya (Beaumont 1973). Evidence for symbolic behavioral activity is largely absent; no evidence for rock art or formal burial practices exists.

2.3) The Later Stone Age

Artefacts characteristic of the Later Stone Age (LSA) appear in the archaeological record from 40/27-23kya and incorporates micolithic as well as macrolithic assemblages. Artefacts were produced by modern *H. sapien* or *H. sapien sapien*, who subsisted on a hunter-gatherer way of life (Deacon 1984; Mitchell 2002).

According to Deacon (1984) the LSA can temporally be divided into 4 broad units directly associated with climatic, technological and subsistence changes:

1. Late Pleistocene microlithic assemblages (40-12kya);
2. Terminal Pleistocene / early Holocene non-microlithic assemblages (12-8kya);
3. Holocene microlithic assemblages (8kya to the Historic Period); and
4. Holocene assemblages with pottery (2kya to the Historic Period) closely associated with the influx of pastoralist communities into South Africa (Mitchell 2002).

Elements of material culture characteristic of the LSA reflect modern behavior. Deacon (1984) summarizes these as:

1. Symbolic and representational art (paintings and engravings);
2. Items of personal adornment such as decorated ostrich eggshell, decorated bone tools and beads, pendants and amulets of ostrich eggshell, marine and freshwater shells;
3. Specialized hunting and fishing equipment in the form of bows and arrows, fish hooks and sinkers;
4. A greater variety of specialized tools including bone needles and awls and bone skin-working tools;
5. Specialized food gathering tools and containers such as bored stone digging stick weights, carrying bags of leather and netting, ostrich eggshell water containers, tortoiseshell bowls and scoops and later pottery and stone bowls;
6. Formal burial of the dead in graves (sometimes covered with painted stones or grindstones and accompanied by grave goods);
7. The miniaturization of selected stone tools linked to the practice of hafting for composite tools production; and
8. A characteristic range of specialized tools designed for making some of the items listed above.

➢ Rock Art

Rock Art is one of the most visible and informative components of South Africa's archaeological record. Research into LSA ethnography (as KhoiSan history) has revolutionized our understanding of both painted and engraved (petroglyph) images, resulting in a paradigm shift in Stone Age archaeology (Deacon & Dowson 2001). Paintings are concentrated in the Drakensberg / Maluti mountains, the eastern Free State, the Cape Fold Mountains, the Waterberg Plateau and the Soutpansberg mountains. Engravings on the other hand are found throughout the Karoo, the western Free State and North-West Province (Mitchell 2002). Both forms of LSA art drew upon a common stock of motifs, derived from widely shared beliefs and include a restricted range of naturalistically depicted animals, geometric imagery, human body postures and non-realistic combinations of human and animal figures (anthropomorphic figurines). LSA Rock Art is closely associated with spiritual or magical significance (Lewis-Williams & Dowson 1999).

Aside from LSA or KhoiSan Rock Art, thus art produced by both hunter-gatherer and pastoralist and agro-pastoralist groups, Rock Art produced by Iron Age populations are known the be present towards the north of the country.

➢ Shell Middens ('Strandloper' Cultures)

South Africa's nearly 3,000km coastline is dotted by thousands of shell middens, situated between the high water mark and approximately 5km inland, bearing witness to long-term exploitation of shellfish mainly over the past 12,000 years. These LSA shell middens are easily distinguishable from natural accumulations of shells and deposits can include bones of animals eaten such as shellfish, turtles and seabirds, crustaceans like crabs and crayfish and marine mammal remains of seals, dolphins and occasionally whales. Artefacts and hearth and cooking remains are often found in shell midden deposits. Evidence exist that fish were speared, collected by hand, reed baskets and by means of stone fish traps in tidal pools (Mitchell 2002).

Shell midden remains were in the past erroneously assigned to 'Strandloper cultures'. Deacon & Deacon (1999) explain that '*no biological or cultural group had exclusive rights to coastal resources.*' Some LSA groups visited the coast periodically while others stayed year round and it is misleading to call them all by the same name. Two primary sources of archaeological enquiry serves to shed more light on the lifestyles of people who accumulated shell middens, one being the analysis of food remains in the middens itself and the other being the analysis of LSA human skeletal remains of people buried either in shell middens or within reasonable proximity to the coast.

Shell middens vary in character ranging from large sites tens of meters in extent and with considerable depositional depth to fairly small ephemeral collections, easily exposed and destroyed by shifting dune action. Shell middens are also found inland, along rivers where fresh water mussels occur. These middens are often fairly small and less common; in the Eastern Cape often dated to within the past 3,000 years (Deacon & Deacon 1999).

In addition shell middens are not exclusively assigned to LSA cultures; shellfish were exploited during the Last Interglacial, indicating that the practice was most probably continuous for the past 120,000 years (MSA shell middens). Along the coast of KwaZulu-Natal evidence exist for the exploitation of marine food resources by Iron Age communities. These shell middens are easily distinguished from Stone Age middens by particularly rich, often decorated ceramic artefact content. Colonial Period shell middens are quite rare and extremely ephemeral in character; primarily the result of European shipwreck survivors and reported on along the coast of KwaZulu-Natal and the Transkei, Eastern Cape.

3) The Iron Age

For close to 2 millennia people combining cereal agriculture with stock keeping have occupied most of southern Africa's summer rainfall zone. The rapid spread of farming, distinctive ceramics and metallurgy is understood as the expansion of a Bantu-speaking population, in archaeological terms referred to as the Iron Age.

3.1) The Early Iron Age

Ceramic typology is central to current discussions of the expansion of iron using farming communities. The most widely used approach is that of Huffman (1980), who employs a multidimensional analysis (vessel profile, decoration layout and motif) to reconstruct different ceramic types. Huffman (1998) argues that ceramics can be used to trace the movements of people, though not necessarily of specific social or political groupings. Huffman's Urewe Tradition coincides largely with Phillipson's (1977) Eastern Stream. A combined Urewe Tradition / Eastern Stream model for the Early Iron Age can be summarized as:

1. The Kwale branch (extending along the coast from Kenya to KwaZulu-Natal);
2. The Nkope branch (located inland and reaching from southern Tanzania through Malawi and eastern Zambia into Zimbabwe); and
3. The Kalundu branch (strething from Angola through western Zambia, Botswana and Zimbabwe into South Africa).

In southern Africa, recent work distinguishes two phases of the Kwale branch: The earlier Silver Leaves facies (250-430AD) occurring as far south as the Northern Province. The later expression or Mzonjani facies (420-580AD) occurs in the Northern Province a well as along the KwaZulu-Natal coastal belt (Huffman 1998). Since the Silver Leaves facies is only slightly younger than the Kwale type site in Kenya, very rapid movement along the coast, perhaps partly by boat, is inferred (Klapwijk 1974). Subsequently (550-650AD) people making Mzonjani derived ceramics settled more widely in the interior of South Africa.

Assemblages attributable to the Nkope branch appear south of the Zambezi but north of South Africa from the 5th Century. Ziwa represents an early facies, with Gokomere deriving jointly from Ziwa and Bambata. A subsequent phase is represented by the Zhizo facies of the Shashe-Limpopo basin, and by Taukome (Huffman 1994). Related sites occur in the Kruger National Park (Meyer 1988). Zhizo (7th – 10th Century) is ancestral to the Toutswe tradition which persisted in eastern Botswana into the 13th Century.

Kalundu origins need further investigation; its subsequent development is however better understood. A post Bambata phase is represented by the 5th – 7th Century sites of Happy Rest, Klein Africa and Maunatlana in the Northern Province and Mpumalanga (Prinsloo 1974, 1989). Later phases are present at the Lydenburg Heads site (Whitelaw & Moon 1996) and by the succession of Mzuluzi, Ndondonwane and Ntshekane in KwaZulu-Natal (7th – 10th Centuries) (Prins & Grainger 1993). Later Kalundu facies include Klingbeil and Eiland in the northern part of the country (Evers 1980) with Kgopolwe being a lowveld variant in Mpumalanga (10th – 12th Century). Broadhurst and other sites indicate a still later survival in Botswana (Campbell 1991).

Despite the importance accorded to iron agricultural implements in expanding the spread of farming and frequent finds of production debris, metal objects are rare. Metal techniques were simple, with no particular sign of casting, wire drawing or hot working. Jewelry (bangles, beads, pendants etc.) constitute by far the largest number of finds but arrows, adzes, chisels, points and spatulae are known (Miller 1996).

Early Iron Age people were limited to the Miombo and Savannah biomes; excluded from much of the continents western half by aridity and confined in the south during the 1st millennium to bushveld areas of the old Transvaal. Declining summer rainfall restricted occupation to a diminishing belt close to the East Coast and north of S33° (Maggs 1994); sites such as Canasta Place (800AD), Eastern Cape, mark the southern-most limit of Early Iron Age settlement (Nogwaza 1994).

➢ The Central Cattle Pattern

The Central Cattle Pattern (CCP) was the main cognitive pattern since the Early Iron Age (Huffman 1986). The system can be summarized as opposition between male pastoralism and female agriculture; ancestors and descendants; rulers and subjects; and men and women. Cattle served as the primary means of transaction; they represented symbols exchanged for the fertility of wives, legitimacy of children and appeasement of ancestors. Cattle were also used as tribute to rulers confirming sub-ordination and redistribution as loan cattle by the ruler to gain political support. Cattle represented healing and fertilizing qualities (Huffman 1998; Kuper 1980).

This cognitive and conceptual structure underlies all cultural behavior, including the placement of features in a settlement. The oppositions of male and female, pastoralism and agriculture, ancestors and descendants, rulers and subjects, cool and hot are represented in spatial oppositions, either concentric or diametric (Huffman 1986).

A typical CCP village comprise of a central cattle enclosure (byre) where men are buried. The *Kgotla* (men's meeting place / court) is situated adjacent to the cattle enclosure. Surrounding the enclosure is an arc of houses, occupied according to seniority. Around the outer perimeter of the houses is an arc of granaries where women keep their pots and grinding stones (Huffman 1986). The model varies per ethnic group which helps to distinguish ethnicity throughout the Iron Age, but more studies are required to recognize the patterns.

3.2) The Middle Iron Age

The hiatus of South African Middle Iron Age activity was centered in the Shashe-Limpopo Valley and characterized by the 5-tier hierarchical Mapungubwe State spanning some 30,000km^2. By the 1st millennium ivory and skins were already exported overseas, with sites like Sofala and Chibuene, Mosambique, interfacing between interior and transoceanic traders. Exotic glass beads, cloth and Middle Eastern ceramics present at southern African sites mark the beginning of the regions incorporation into the expanding economic system that, partly tied together with maritime trading links across the Indian Ocean, increasingly united Africa, Asia and Europe long before Da Gama or Columbus (Eloff & Meyer 1981; Meyer 1998).

Occupation was initially focused at Bambandanyalo and K2. The Bambananyalo main midden (1030-1220AD) stands out above the surrounding area, reaching more than 6m in places and covering more than 8ha the site may have housed as many as 2,000 people (Meyer 1998). The CCP was not strictly followed; whether this is ideologically significant or merely a reflection of local typography remains unclear. The midden, the size of which may reflect the status of the settlement's ruler, engulfed the byre around 1060-1080AD, necessitating relocation of the cattle previously kept there. The re-organization of space and worldview implied suggests profound social changes even before the sites' abandonment in the early 13th century, when the focus of occupation moved to Mapungubwe Hill, 1 km away (Huffman 1998).

Excavations at Mapungubwe Hill, though only occupied for a few decades (1220-1290AD), yielded a deep succession of gravel floors and house debris (Eloff & Meyer 1981). Huffman (1998) suggests that the suddenness with which Mapungubwe was occupied may imply a deliberate decision to give spatial expression to a new social order in which leaders physically removed themselves from ordinary people by moving onto more inaccessible, higher elevations behind the stone walls demarcating elite residential areas. Social and settlement changes speak of considerable centralization of power and perhaps the elaboration of new ways of linking leaders and subjects.

At Bambandanyalo and Mapungubwe elite burial grave goods include copper, bone, ivory and golden ornaments and beads. Social significance of cattle is reinforced by their importance among the many human and animal ceramic figurines and at least 6 'beast burials' (Meyer 1998).

Today the drought prone Shashe-Limpopo Valley receives less than 350mm of rainfall per annum, making cereal cultivation virtually impossible. The shift to drier conditions in the late 1200's across the Shashe-Limpopo basin and the eastern Kalahari may have been pivotal in the break-up of the Mapungubwe polity, the collapse of Botswana's Toutswe tradition and the emergence of Great Zimbabwe (1220-1550AD), southern Africa's best known and largest (720ha) archaeological site (Meyer 1998).

South of the Limpopo and north of the Soutpansberg, Mapungubwe derived communities survived into the 14th Century, contemporary with the establishment of Sotho-speaking makers of Maloko pottery.

3.3) The Later Iron Age

South African farming communities of the 2nd millennium experienced increased specialization of production and exchange, the development of more nucleated settlement patterns and growing political centralization, albeit not to the same extent as those participating in the Zimbabwe tradition. However, together they form the background to the cataclysmic events of the late 18th / early 19th Century *Mfecane* (Mitchell 2002).

Archaeological evidence of settlement pattern, social organization and ritual practice often differ from those recorded ethnographically. The Moloko ceramic tradition seems to be ancestral to modern Sotho-Tswana speakers (Evers 1980) and from about 1,100AD a second tradition, the Blackburn tradition, appears along South Africa's eastern coastline. Blackburn produced mostly undecorated pottery (Davies 1971), while Mpambanyoni assemblages, reaching as far south as Transkei, includes examples of rim notching, incised lines and burnished ochre slip (Robey 1980). At present, no contemporary farming sites are known further inland in KwaZulu-Natal or the Eastern Cape.

Huffman (1989) argues that similarities between Blackburn and early Maloko wares imply a related origin, presumably in the Chifumbaze of Zambia or the Ivuna of Tanzania, which contains a range of ceramic attributes important in the Blackburn as well as beehive grass huts similar to those made by the Nguni. This is one of the few suggestions of contact between Sotho-Tswana and Nguni speakers on the one hand and farming communities who, if Huffman is correct, were already long established south of the Limpopo. Both ethnographic and archaeological data demonstrate that Sotho-Tswana and Nguni are patrilineal and organize their settlements according to the CCP (Kuper 1980).

From 1,300AD there is increasing evidence for the beginning of agro-pastoralist expansion considerably beyond the area of previous occupation. It is also to this time that the genealogies of several contemporary Bantu speaking groups can be traced (Wilson & Thompson 1969). Associated with this expansion was the regular employment of stone, rather than wood, as building material, an adaptation that has greatly facilitated the discovery and identification of settlements. Maggs (1976) describes 4 basic settlement types all characterized by the use of semi weathered dolorite to produce hard binding *daga* for house floors and a wall building tradition employing larger more regular stones for the inner and outer faces and smaller rubble for the infill. As with the more dispersed homesteads of KwaZulu-Natal and the Eastern Cape, sites tend to be in locally elevated situations, reflecting a deep seated Sotho and Nguni preference for benign higher places rather than supernaturally dangerous riverside localities; another important contrast to both 1st millennium (Maggs 1976) and later Zulu Kingdom settlement patterns (Hall & Maggs 1979).

The lack of evidence for iron production in the interior and eastern part of South Africa emphasize exchange relationships between various groups and associated more centralized polities. By the 19th Century iron production in KwaZulu-Natal was concentrated in particular clans and lineages and associated with a range of social and religious taboos (Maggs 1992). South of Durban comparatively few smelting sites are known (Whitelaw 1991), a trend even more apparent in Transkei (Feely 1987). However, metal remained the most important and archaeologically evident item traded between later farming communities. (Other recorded trade items include glass and ostrich eggshell beads; Indian Ocean seashells; siltstone pipes; *dagga,* and later on tobacco; pigments including ochre, graphite and specularite; hides and salt.)

Rising polity settlements are particularly evident in the north of the country and dated to the 17th Century, including Molokwane, capital of the Bakwena chiefdom (Pistorius 1994) and Kaditshwene, capital of a major section of the Hurutshe, whose population of 20,000 in 1820 almost equals contemporary Cape Town in size (Boeyens 2000). The agglomeration of Tswana settlements in the north of the country was fuelled by both population growth and conflict over access to elephant herds for ivory and long distance trade with the East Coast. During this period ceramic decoration became blander and more standardized than the earlier elaborate decoration that included red ochre and graphite coloring.

The *Mfecane* refers to the wars and population movements of the early 19th Century which culminated in the establishment of the Zulu Kingdom and came to affect much of the interior, even beyond the Zambezi: The late 18th Century was marked by increasing demands for ivory (and slaves) on the part of European traders at Delagoa Bay; as many as 50 tons of ivory were exported annually from 1750-1790. As elephant populations declined, competition increased both for them and for the post 1790 supply of food to European and American whalers calling at Delagoa Bay (Smith 1970). Cattle raiding, conflict over land and changes in climatic and subsistence strategies characterized much of the cultural landscape of the time.

Competition for access to overseas trade encouraged some leaders to replace locally organized circumcision schools and age-sets with more permanently maintained military regiments. These were now used to gain access through warfare to land, cattle and stored food. By 1810 three groups, the Mthethwa, Ndwandwe and Ngwane dominated northern KwaZulu-Natal (Wright 1995). The Mthethwa paramountcy was undermined by the killing of its leader Dingiswayo in *circa* 1818, which led to a brief period of Ndwandwe dominance. In consequence one of Dingiswayo's former tributaries, Shaka, established often forceful alliances with chiefdoms further south. Shaka's Zulu dominated coalition resisted the Ndwandwe who in return fled to Mozambique. As the Zulu polity expanded it consolidated its control over large areas, incorporating many communities into it. Others sought refuge from political instability by moving south of the Thukela River, precipitating a further *domino effect* as far as the Cape Colony's eastern border (Wright 1995).

4) The Colonial Period

In the 15th Century Admiral Zheng He and his subordinates impressed the power of the Ming Dynasty rulers in a series of voyages as far afield as Java, Sri Lanka, southern Arabia and along the East African coast, collecting exotic animals *en route*. But nothing more came of his expeditions and China never pursued opportunities for trade or colonization (Mote 1991).

Portuguese maritime expansion began around the time of Zheng He's voyages; motivated by a desire to establish a sea route to the riches of the Far East. By 1485 Diogo Cao had reached Cape Cross, 3 years later Bartolomeu Dias rounded the Cape of Good Hope and less than a decade later Vasco da Gama called at several places along South Africa's coast, trading with Khoekhoen (Khoi) at Mossel Bay before reaching Mozambique and crossing the ocean to India. His voyage initiated subsequent Portuguese bases from China to Iraq. In Africa interest was focused on seizing important coastal trading towns such as Sofala and gaining access to the gold of Zimbabwe. Following the 1510 Portuguese-Khoekhoen battle at Table Bay, in which the viceroy of India was killed, Portuguese ships ceased to call along the South African coast (Elphick 1985).

A number of shipwrecks, primarily along the eastern coast attest to Portuguese activity including the Sao Joao, wrecked in 1552 near Port Edward and the Sao Bento, destroyed in 1554 off the Transkei coast. Survivors' accounts provided the 1st detailed information on Africa's inhabitants (Auret & Maggs 1982).

By the late 1500's Portuguese supremacy of the Indian Ocean was threatened. From 1591 numerous Dutch and English ships called at Table Bay and in 1652 the Dutch East Indian Company (VOC) established a permanent base, with the intent to provide fresh food and water to VOC ships. In an attempt to improve the food supply a few settlers (free burghers) were allowed to establish farms. The establishment of an intensive mixed farming economy failed due to shortages of capital and labor, and free burghers turned to wheat cultivation and livestock farming. While the population grew slowly the area of settlement expanded rapidly with new administrative centers established at Stellenbosch (1676), Swellendam (1743) and Graaf-Reinet (1785). By the 1960's the Colony's frontier was too long to be effectively policed by VOC officials (Elphick 1985).

From the 1700's many settlers expanded inland over the Cape Fold Mountain Belt. The high cost of overland transport constrained the ability to sell their produce while settlement of the interior was increasingly made difficult by resident KhoiSan groups, contributing due to a lack of VOC military support to growing Company opposition in the years before British control of the Cape (1795 / 1806) (Davenport & Saunders 2000).

In 1820 a major British settlement was implanted on the eastern frontier of the Cape Colony, resulting in large numbers of the community moving into the interior, initially to KwaZulu-Natal, and then after Britain annexed Natal (1843), further into the interior to beyond the Vaal River. Disruptions of the *Mfecane* eased their takeover of African lands and the *Boers* (farmers) established several Republics. A few years later the 2nd South African War saw both the South African and Orange Free State Republics annexed by Britain, a move largely motivated by British desire to control the goldfields of the Witwatersrand. With adjacent regions of the sub-continent also falling, directly or indirectly, under British rule and German colonization of Namibia, European control of the whole of southern Africa was firmly established before the 1st World War (Davenport & Saunders 2000).

➢ Xhosa Iron Age Cultures meets Colonists in the Eastern Cape

From the late 1600's conflict between migrants from the Cape (predominantly Boers) and Xhosa people in the region of the Fish River were strife, ultimately resulting in a series of 9 Frontier Wars (1702-1878) (Milton 1983). Both cultures were heavily based and reliant on agriculture and cattle farming. As more Cape migrants, and later settlers from Britain (1820) and elsewhere arrived, population pressures and competition over land, cattle and good grazing became intense. Cattle raiding became endemic on all sides, with retaliatory raids launched in response. As missionaries arrived with evangelical messages, confrontations with hostile chiefs who saw them as undermining traditional Xhosa ways of life resulted in conflicts which flared into wars.

As pressures between the European settlers and the Xhosa grew, settlers organized themselves into local militia, counteracted by Xhosa warring skills: But both sides were limited by the demands of seasonal farming and the need for labor during harvest. Wars between the Boers and the Xhosa resulted in shifting borders, from the Fish to the Sundays River, but it was only after the British annexed the Cape in 1806 that authorities turned their attention to the Eastern

regions and petitions by the settlers about Xhosa raids. British expeditions, in particular under Colonel John Graham in 1811 and later Harry Smith in 1834, were sent not only to secure the frontier against the Xhosa, but also to impose British authority on the settlers, with the aim to establish a permanent British presence. Military forts were built and permanently manned. Over time the British came to dominate the area both militarily and through occupation with the introduction of British settlers. The imposition of British authority led to confrontations not only with the Xhosa but also with disaffected Boers and other settlers, and other native groups such as the Khoikhoi, the Griqua and the Mpondo. The frontier wars continued over a period of about 150 years; from the 1st arrival of the Cape settlers, and with the intervention of the British military ultimately ending in the subjugation of the Xhosa people. Fighting ended on the Eastern Cape frontier in June 1878 with the annexation of the western areas of the Transkei and administration under the authority of the Cape Colony (Milton 1983).

➢ The Industrial Revolution

The Industrial Revolution refers roughly to the period between the 18th - 19th Centuries, typified by major changes in agriculture, manufacturing, mining, transport, and technology. Changing industry had a profound effect on socio-economic and socio-cultural conditions across the world: The Industrial Revolution marks a major turning point in human history; almost every aspect of daily life was eventually influenced in some way. Average income and population size began to exhibit unprecedented growth; in the two centuries following 1800 the world's population increased over 6-fold, associated with increasing urbanization and demand of resources. Starting in the latter part of the 18th century, the transition from manual labor towards machine-based manufacturing changed the face of economic activity; including the mechanization of the textile industries, the development of iron-making techniques and the increased use of refined coal. Trade expansion was enabled by the introduction of canals, improved roads and railways. The introduction of steam power fuelled primarily by coal and powered machinery was underpinned by dramatic increases in production capacity. The development of all-metal machine tools in the first two decades of the 19th century facilitated the manufacture of more production machines in other industries (More 2000).

Effects of the Industrial Revolution were widespread across the world, with its enormous impact of change on society, a process that continues today as 'industrialization'.

5) References Cited

1. Aitken, M.J., Stringer, C.B. & Mellars, P.A. (eds). 1993. *The origin of modern humans and the impact of chronometric dating*. Princeton: Princeton University Press
2. Auret, C. & Maggs, T.M.O'C 1982. *The great ship São Bento: remains from a mid-sixteenth century Portuguese wreck on the Pondoland coast*. Annals of the Natal Museum 25:1-39
3. Beaumont, P.B. 1973. *The ancient pigment mines of South Africa.* South African Journal of Science 69: 41-46
4. Binneman, J.N.F. & Beaumont, P.B. 1992. *Use-wear analysis of two Acheulean handaxes from Wonderwerk Cave, Northern Cape.* South African Field Archaeology 1:92-97
5. Boeyens, J.C.A. 2000. *In search of Kadishwene.* South African Archaeological Bulletin 55:3-17
6. Brauer, G. 1982. *Early anatomically modern man in Africa and the replacement of the Mediterranean and European Neanderthals*. In De Lumley, H. (ed) L'Home erectus et la place de l'homme de tautavel parmi les hominids fossils. Nice: Centre National de la Recherche Scientifique
7. Cann, R.L., Rickards, O. & Lum, J.K. 1994. *Mitochondrial DNA and human evolution: our one lucky mother*. Nature 325: 31-36
8. Campbell, A.C. 1991. *The riddle of the stone walls.* Botswana Notes and Records 23:243-249
9. Clarke, R.J. 1999. *A discovery of complete arm and hand of the 3.3 million year old Australopithecus skeleton from Sterkfontein.* South African Journal of Science 95:447-480
10. Dart, R.A. 1925. *Australopithecus africanus: the man-ape of South Africa.* Nature 115:195-199
11. Davenport, T.R.H. & Saunders, C. 2000. *South Africa: A modern history*. London: Macmillan
12. Davies, O. 1971. *Excavations at Blackburn.* South African Archaeological Bulletin 26: 165-178
13. Deacon, H.J. 1970. *The Acheulian occupation at Amanzi Springs, Uitenhage District, Cape Province.* Annals of the Cape Provincial Museums 8:89-189
14. Deacon, J. 1984. *Later Stone Age people and their descendants in southern Africa*. In Klein, R.G. (ed). Southern Africa prehistory and paleoenvironments. Rotterdam: A.A. Balkema
15. Deacon, H.J. & Deacon., J. 1999. *Human Beginnings in South Africa. Uncovering the Secrets of the Stone Age.* Cape Town: David Phillip Publlishers
16. Deacon, J. & Dowson, A.D. (eds.) 2001. *Voices from the past. /Xam Bushmen and the Bleek and Lloyd Collection.* Johannesburg: Witwatersrand University Press
17. Eloff, J.F. & Meyer, A. 1981. *The Greefswald sites.* In Voigt, E.A. (ed) Guide to archaeological sites in the northern and eastern Transvaal. Pretoria: South African Association of Archaeologists
18. Elphick, R. 1985. *Khoikhoi and the founding of white South Africa.* Johannesburg: Ravan Press
19. Evers, T.M. 1980. *Klingbeil Early Iron Age sites, Lydenburg, Eastern Transvaal, South Africa.* South African Archaeological Bulletin 35:46-57
20. Feeley, .M. 1987. *The early farmers of Transkei, southern Africa, before AD 1870.* Oxford: British Archaeology Reports
21. Foley, R.A & Lahr, M.M. 1997. *Mode 3 technologies and the evolution of modern humans.* Cambridge Archaeological Journal 7:3-36
22. Goodwin A.J.H. & van Riet Lowe, C. 1929. *The Stone Age cultures of South Africa*. Annals of the South African Museum 27:1-289
23. Hall, M. & Maggs, T.M.O'C. 1979. *Nqabeni: a later Iron Age site in Zululand*. South African Archaeological Society Goodwin Series 3:159-176
24. Hensilwood, C. & Sealy, J.C. 1997. *Bone artefacts from the Middle Stone Age at Blombos Cave, southern Cape, South Africa.* Current Anthropology 38:390-395
25. Huffman, T.N. 1980. *Ceramics, Classification and Iron Age Entities.* African Studies 39:123-174
26. Huffman, T.N. 1989. *Ceramics, Settlements and Late Iron Age Migrations*. African Archaeological Review 7: 155-182
27. Huffman, T.N. 1986. *Iron Age Settlement Patterns and the Origin of Class Distinction in Southern Africa.* Advances in World Archaeology 5:291-338
28. Huffman, T.N. 1994. Toteng Pottery and the Origins of Bambata. Southern African Field Archaeology 3:3-9
29. Huffman, T.N. 1998. *The Antiquity of Lobola.* South African Archaeological Bulletin 53:57-62
30. Keyser, A., Menter, C.G., Moggi-Cheggi, J., Pickering T.R, & Berger, L.R. 2000. *Drimolen: A New Hominid Bearing Site in Gauteng, South Africa.* South African Journal of Science 96:193-197
31. Klapwijk, M. 1974. *A Preliminary Report on Pottery from the North-Eastern Transvaal, South Africa.* South African Archaeological Bulletin 29:19-23
32. Klein, R.G. 1999. *The Human Career: Human Biological and Cultural Origins.* Chicago: University of Chicago Press
33. Kuman, K, Field, A.S. & Thackeray, J.F. 1997. *Discovery of New Artefacts at Kromdraai.* South African Journal of Science 93: 187-193
34. Kuper, A. 1980. *Symbolic Dimensions of the Southern Bantu Homestead.* Africa 1:8-23
35. Leakey, M.G., Feibel, C.S., McDougall, I & Walker, A.C. 1995. *New Four-Million-Year-Old Hominid Species from Kanopi and Allia Bay, Kenya*. Nature 376:565-57

36. Lewis-Williams, D. & Dowson, T. 1999. *Images of Power. Understanding San Rock Art*. Halfway House: Southern Book Publishers
37. Maggs, T.M.O'C. 1976. *Iron Age communities of the Southern Highveld.* Pietermaritzburg: Natal Museum
38. Maggs, T.M.O'C. 1992. *'My Father's Hammer Never Ceased its' Song Day and Night': The Zulu Ferrous Metalworking Industry*. Natal Museum Journal of Humanities 4:65-87
39. Maggs, T.M.O'C. 1994. *The Early Iron Age in the Extreme South: Some Patterns and Problems*. Azania 29/30:171-178
40. Mellars, P.A. & Stringer, C.B. (eds). 1989. *The Human Revolution: Behavioural and Biological Perspectives on the Origins of Modern Humans.* Edinburgh: Edinburgh University Press
41. Miller, D.E. 1996. *The Tsodilo Jewellery: Metal Work from Northern Botswana*. Cape Town: University of Cape Town Press
42. Milton, J. 1983. *The Edges of War. A History of Frontier Wars (1702-1878)*. Kenwyn: Juta & Co.
43. Mitchell, P. 2002. *The Archaeology of Southern Africa*. Cambridge: Cambridge University Press
44. Meyer, A. 1988. *N Kultuurhistories Interpretasie van die Ystertydperk in die Nasionale Krugerwildtuin*. Phd thesis, University of Pretoria
45. Meyer, A. 1998. *The Archaeological Sites of Greefswald.* Pretoria: University of Pretoria Press
46. More, C. 2000. *Understanding the Industrial Revolution.* London: Routledge
47. Mote, F.W. 1991. *China in the Age of Columbus.* In Levenson, J.A. (ed) Circa 1492: Art in the Age of Exploration. New Haven: Yale University Press
48. Nitecki, M.H. & Nitecki, D.V. (eds). 1994. *Origins of Anatomically Modern Humans.* New York: Plenum
49. Noble, W & Davidson, I. 1996. *Human Evolution, Language and Mind: A Psychological and Archaeological Enquiry*. Cambridge: Cambridge University Press
50. Nogwaza, T. 1994. *Early Iron Age Pottery from Canasta Place, East London District.* South African Field Archaeology 3:103-106
51. Pakenham, T. 1993. *The Illustrated Boer War*. Parklands: Jonathan Ball Publishers.
52. Pistorius, J.C.C. 1992. *Molokwane an Iron Age Bakwena Village. Early Tswana Settlement in the Western Transvaal*. Johannesburg: Perskor Press.
53. Prins, F.E. & Graigner, J.E. 1993. *Early Farming Communities in Northern Transkei: The Evidence from Ntsitsana and Adjacent Areas*. Natal Museum Journal of Humanities 5:153-174
54. Phillipson, D.W. 1977. *The Later Prehistory of Eastern and Southern Africa.* London: Heineman
55. Prinsloo, H. P. 1974. *Early Iron Age Site at Klein Afrika near Wyliespoort, Soutpansberg Mountains, South Africa.* South African Journal of Science 70:27 1-273
56. Prinsloo, H.P. 1989. *Vroe Ystertydperk Terreine in die Soutpansberg.* M.A. Thesis, Universiy of Pretoria
57. Rightmire, G.P. 1976. *Relationships of Middle and Upper Pleistocene Hominids from Sub-Saharan Africa.* Nature 260:238-240
58. Robey, T.S. 1980. *Mpanbanyoni, A Late Iron Age Site on the Natal South Coast.* Annals of the Natal Museum 24:147-164
59. Sibley, C.G. & Ahlquist, J.E. 1884. *The Phylogeny of the Hominid Primates as Indicated by DNA-DNA Hybridization.* Journal of Molecular Evolution 20:2-15
60. Smith, A.K. 1970. *The struggle for the Control of Southern Mozambique* 1720-1835. Ossa 63-96
61. Stringer, C.B. 1985. *Middle Pleistocene Hominid Variability and the Origin of Late Pleistocene Humans.* In Delson, E. (ed) Ancestors: The Hard Evidence. New York: Alan Liss
62. Tobias, P.V. 2000. *The Fossil Hominids.* In Partridge, T.C. & Maud, R,R. The Cenozoic of Southern Africa. Oxford: Oxford University Press
63. Volman T.P. 1984. *Early Prehistory of Southern Africa.* In Klein, R.G. Southern Africa Prehistory and Palaeoenvironments. Rotterdam: A.A. Balkema
64. Vrba, E.S. 1992. *Mammals as a Key to Evolutionary Theory*. Journal of Mammology 73:1-28
65. White, T.D., Suwa, G. & Asfaw, B. 1994. *Australopithecus Ramidus: A New Species of Early Hominid from Aramis, Ethiopia.* Nature 371:306-312
66. Whitelaw, G. 1991. *Precolonial Iron Production around Durban and in Southern KwaZulu-Natal.* Natal Museum Journal of Humanities 3:29-39
67. Whitelaw, G. & Moon, M. 1996. *The Distribution and Ceramics of Pioneer Agriculturists in KwaZulu-Natal.* Natal Museum Journal of Humanities 8:53-79
68. Wilson, M. & Thompson, L. (eds). 1969. *Oxford History of South Africa.* Oxford: Oxford University Press
69. Wright, J.B. 1995. *Political Transformations in the Thukela-Mzimkhulu Region in the Late Eighteenth and Early Nineteenth Centuries.* In Hamilton, C. The *Mfecane* Aftermath: Reconstructive Debates in Southern African History. Johannesburg: Witwatersrand University Press

Appendix C:

Extracts from the National Heritage Resources Act, No 25 of 1999

Definitions
Section 2

In this Act, unless the context requires otherwise:

ii. "*Archaeological*" means –
- a) material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- b) rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10 m of such representation;
- c) wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic,… and any cargo, debris, or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation.

viii. "*Development*" means any physical intervention, excavation or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including –
- a) construction, alteration, demolition, removal or change of use of a place or structure at a place;
- b) carrying out any works on or over or under a place;
- c) subdivision or consolidation of land comprising, a place, including the structures or airspace of a place;
- d) constructing or putting up for display signs or hoardings;
- e) any change to the natural or existing condition or topography of land; and
- f) any removal or destruction of trees, or removal of vegetation or topsoil;

xiii. "*Grave*" means a place of interment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place;

xxi. "*Living heritage*" means the intangible aspects of inherited culture, and may include –
- a) cultural tradition;
- b) oral history;
- c) performance;
- d) ritual;
- e) popular memory;
- f) skills and techniques;
- g) indigenous knowledge systems; and
- h) the holistic approach to nature, society and social relationships.

xxxi. "*Palaeontological*" means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trance;

xli. "*Site*" means any area of land, including land covered by water, and including any structures or objects thereon;

xliv. "*Structure*" means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith;

National Estate
Section 3

1) For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.

2) Without limiting the generality of subsection 1), the national estate may include –
- a) places, buildings, structures and equipment of cultural significance;
- b) places to which oral traditions are attached or which are associated with living heritage;
- c) historical settlements and townscapes;
- d) landscapes and natural features of cultural significance;
- e) geological sites of scientific or cultural importance
- f) archaeological and palaeontological sites;
- g) graves and burial grounds, including –
  - i. ancestral graves;
  - ii. royal graves and graves of traditional leaders;
  - iii. graves of victims of conflict
  - iv. graves of individuals designated by the Minister by notice in the Gazette;
  - v. historical graves and cemeteries; and
  - vi. other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No 65 of 1983)
- h) sites of significance relating to the history of slavery in South Africa;
- i) movable objects, including –
  - i. objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
  - ii. objects to which oral traditions are attached or which are associated with living heritage;
  - iii. ethnographic art and objects;
  - iv. military objects;
  - v. objects of decorative or fine art;
  - vi. objects of scientific or technological interest; and
  - vii. books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1 xiv) of the National Archives of South Africa Act, 1996 (Act No 43 of 1996).

Structures
Section 34

1) No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

Archaeology, Palaeontology and Meteorites
Section 35

3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.
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;
    c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
    d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assists in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.
5) When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedure in terms of section 38 has been followed, it may –
    a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;
    b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;
    c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph a) to apply for a permit as required in subsection 4); and
    d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.
6) The responsible heritage resources authority may, after consultation with the owner of the land on which an archaeological or palaeontological site or meteorite is situated, serve a notice on the owner or any other controlling authority, to prevent activities within a specified distance from such site or meteorite.

Burial Grounds & Graves
Section 36

3) 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.
4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction of any burial ground or grave referred to in subsection 3a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.
5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection 3b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority –
    a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and
    b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.
6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority –
    a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and
    b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-internment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

Heritage Resources Management
Section 38

1) Subject to the provisions of subsections 7), 8) and 9), any person who intends to undertake a development categorised as –
    a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
    b) the construction of a bridge or similar structure exceeding 50 m in length;
    c) any development or other activity which will change the character of a site –
        i. exceeding 5 000 m^2 in extent; or
        ii. involving three or more existing erven or subdivisions thereof; or
        iii. involving three or more erven or subdivisions thereof which have been consolidated within the past five years; or

iv. the costs which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

d) the rezoning of a site exceeding 10 000 m² in extent; or

e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

must at 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.

2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection 1) –

a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or

b) notify the person concerned that this section does not apply.

3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection 2a) …

4) The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development decide –

a) whether or not the development may proceed;

b) any limitations or conditions to be applied to the development;

c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;

d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and

e) whether the appointment of specialists is required as a condition of approval of the proposal.