
PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT

**THE SOUTH HYDROELECTRIC POWER SITE,
ORANGE RIVER, THEMBILIHLE LOCAL MUNICIPALITY,
NORTHERN CAPE, SOUTH AFRICA**

DATE: 2013-09-30



REPORT TO:

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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 –

DATE – 2013-09-30

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**THE SOUTH HYDROELECTRIC POWER SITE, ORANGE RIVER,
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 EXECUTIVE SUMMARY

TERMS OF REFERENCE –

Enviroworks has been appointed by the project proponent, Sidala, to prepare and submit the EIA and EMPr for the proposed construction of the *South Hydroelectric Power Site*, Orange River, Thembelihle Local Municipality, Northern Cape. The approximate 18MW facility will comprise of a weir and associated infrastructure, including a 132kV power line. The *South Hydroelectric Power Site* will be constructed on a portion of the Orange River which falls between the properties Portion 1 of Deelfontein No. 237 and Portion 3 of Eskdale No. 204, between Douglas and Hopetown at general development co-ordinate S29°26'28.9"; E23°54'59.7". ArchaeoMaps was appointed by Enviroworks to prepare the Phase 1 AIA for the project.

THE PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT –

PROJECT AREA: Portion 1 of Deelfontein No. 237 and Portion 3 of Eskdale No. 204, near Hopetown, Thembelihle Local Municipality, Northern Cape [1:50,000 map ref – 2923BD].

COVERAGE & GAP ANALYSIS: Pre-feasibility and field assessment, including the *South Hydroelectric Power Site* (approximately 50ha) and power line route Options A (3.6km) and B (2.9km). The field assessment excluded the access road and the extent of inundation levels upstream on the Orange River as a result of the development.

FIELD METHODOLOGY: Three day field assessment; GPS co-ordinates – Garmin Oregon 550; Photographic documentation – Pentax K20D. Site significance assessment – SAHRA 2007 system.

SUMMARY:

Map Code	Site	Co-ordinates	Recommendations
South Hydroelectric Power Site			
Site SH-S1	Tourist Accommodation, Cont. Period	S29°26'17.4"; E23°55'00.2"	N/A
Site SH-S2	Farmstead, Colonial Period	S29°26'47.6"; E23°54'30.6"	Option B power line: Temporary conservation & Permanent sign-posting
Site SH-S3	Livestock Enclosure, Colonial Period	S29°27'29.3"; E23°54'45.8"	N/A
Site SH-S4	Livestock Enclosure, Colonial Period	S29°28'08.9"; E23°54'24.2"	Option A power line: Temporary conservation
Type SH-A1	MSA & LSA Stone Age occurrence	-	Option A power line:
SH-A1.1	-	S29°28'16.3"; E23°54'24.1"	Phase 2 systematic surface collection & test pit(s) at 1 occurrence to precede development, done under SAHRA permit
SH-A1.2	-	S29°27'42.7"; E23°54'31.1"	
Type SH-A2	MSA & LSA Stone Age occurrence	-	Option A or Option B power line:
SH-A2.1	-	S29°28'04.4"; E23°54'25.1"	Phase 2 systematic surface collection & test pit(s) at 1 occurrence to precede development, done under SAHRA permit
SH-A2.2	-	S29°27'27.0"; E23°54'00.7"	
SH-A2.3	-	S29°26'52.0"; E23°54'32.1"	
Type SH-A3	MSA & LSA Stone Age occurrence	-	South Hydroelectric Power Site and Option A or Option B power line:
SH-A3.1	-	S29°26'44.5"; E23°55'07.0"	Phase 2 systematic surface collection & test pit(s) at 1 occurrence to precede development, done under SAHRA permit
SH-A3.2	-	S29°26'48.4"; E23°54'50.8"	
SH-A3.3	-	S29°27'33.7"; E23°54'34.8"	
SH-A3.4	-	S29°27'54.7"; E23°54'29.4"	
SH-A3.5	-	S29°27'12.1"; E23°54'11.8"	
A Phase 1 AIA to be done along the identified access road / A Rock Art survey to be conducted across affected farms / A Phase 1 AIA to be done across the extent of the expected inundation levels			

RECOMMENDATIONS –

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *South Hydroelectric Power Site*, Orange River, Thembelihle Local Municipality, Northern Cape, proceed as applied for provided the developer comply with the abovementioned summarized recommendations.

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1) TERMS OF REFERENCE

Enviroworks has been appointed by the project proponent, Sidala Energy Solutions (Pty) Ltd (Sidala), to prepare and submit the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMPr) for the proposed construction of the *South Hydroelectric Power Site*, Orange River, Thembelihle Local Municipality, Northern Cape. The approximate 18MW facility will comprise of a weir and associated infrastructure, including a 132kV power line. The *South Hydroelectric Power Site* will be constructed on a portion of the Orange River which falls between the properties Portion 1 of Deelfontein No. 237 and Portion 3 of Eskdale No. 204, between Douglas and Hopetown at general development co-ordinate S29°26'28.9"; E23°54'59.7".

ArchaeoMaps was appointed by Enviroworks to prepare the Phase 1 Archaeological Impact Assessment (AIA) for the project.

❖ Development Location, Details and Impact

Sidala is a South African based development company operating in the emergent renewable energy industry. Sidala has identified 2 sites, namely the *North* and *South Hydroelectric Power Sites* and intends to develop these facilities along the Orange River. The proposed developments will form part of the Department of Energy's *Renewable Energy Independent Power Producer Procurement Program* (Enviroworks 2013b).

The proposed *South Hydroelectric Power Site* will be situated at general development co-ordinate S29°26'28.9"; E23°54'59.7", on a portion of the Orange River which falls between the properties Portion 1 of Deelfontein No. 237 and Portion 3 of Eskdale No. 204, roughly 26km north-east of Hopetown, in the Thembelihle Local Municipal area of the Northern Cape [1:50,000 map ref – 2923BD] (Enviroworks 2013a).

The *South Hydroelectric Power Site* will utilize the flows released from the Vanderkloof Dam on the Orange River (the longest river in South Africa) to move through the hydroelectric facility and mechanize the turbine for generation of electricity. The *South Hydroelectric Power Site*, the preferred site alternative for the proposed development, was chosen based on topographical features, physical appropriateness and hydrological flow data. The approximate 18MW facility will comprise of a weir with powerhouse, switchyard, head and tailrace, a small dam, an access road and a 132kV power line (Enviroworks 2013a, 2013b).

High flood peaks of the structure necessitate the need for the spillway to be as lengthy as possible resulting in a concrete gravity structure for the entire weir. The layout shall comprise (Enviroworks 2013b):

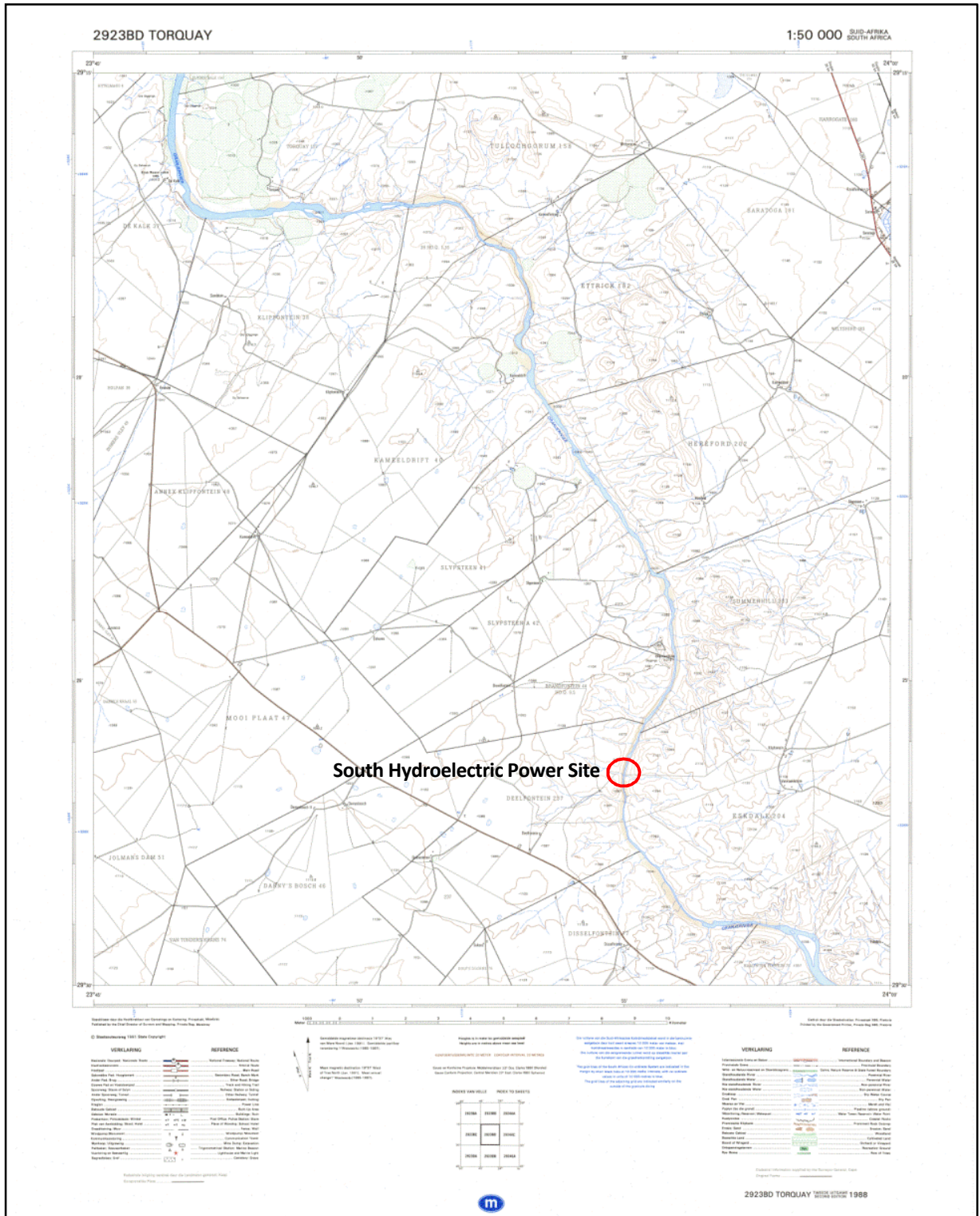
1. An ogee-type spillway with a stilling basin;
2. A river outlet system constructed near the riverbed to minimize the excavation and if required a bridge structure will be constructed to provide access thereto;
3. The system will include an intake structure, dam wall and outlet component; and
4. A powerhouse with intake area, powerhouse facility and outlet.

An overhead transmission line of 132kV will be necessary (Enviroworks 2013b): At present 2 power line options are being further investigated, namely an Option A or southern line route and an Option B or northern line route. Option A runs from the *South Hydroelectric Power Site* in a southwesterly direction for approximately 3.6km to the existing sub-station on Disselfontein No. 77 at S29°28'22.3"; E23°54'20.0". The Option B power line runs just north

of the Option A line route for 2.9km to where a new sub-station will be constructed at S29°27'42.2"; E23°53'48.0" on Deelfontein No. 237.

Two access road options are available, one from the east (R357) and the other from the west (R385), with the latter identified as the preferable access road option. The access road connecting the *South Hydroelectric Power Site* to one of these regional roads will be built, where possible, over the applicable existing access road, minimizing impact on the surrounding environment (Enviroworks 2013b).

Increased inundation levels as a result of the development is expected to have a maximum effect up to approximately 20km upstream (south-east) along the Orange River.



Map 1: 1:50,000 2923BD indicating the locality of the South Hydroelectric Power Site



Map 2: General locality of the proposed *South Hydroelectric Power Site* in relation to the *North Hydroelectric Power Site*, Douglas and Hopetown



Map 3: The *South Hydroelectric Power Site* and expected maximum inundation levels (blue)



Map 4: Locality of the *South Hydroelectric Power Site* on the properties Portion 1 of Deelfontein No. 237 and Portion 3 of Eskdale No. 204



Map 5: Close-up of the *South Hydroelectric Power Site*

2) THE PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT

❖ Archaeological Legislative Compliance

The Phase 1 Archaeological Impact Assessment (AIA) for the *South Hydroelectric Power Site, Orange River, Thembelihle Local Municipality, Northern Cape*, was done for purposes of compliance to the South African Heritage Resources Agency's (SAHRA) requirements in terms of the National Heritage Resources Act, No 25 of 1999 (NHRA 1999), with specific reference to Sections 34-38.

The Phase 1 AIA was requested as specialist sub-section with findings and recommendations thereof to be included in the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMPr) of the development, in compliance with requirements of the National Environmental Management Act, No 107 of 1998 (NEMA 1998) and associated Regulations (2010) and the NHRA 1999.

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 views as defined and protected by the NHRA 1999, that may be affected by the proposed development.

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

❖ Methodology and 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, SAHRIS, the SAHRA Built Environment Database on Declared Provincial Heritage Sites of the Northern Cape and the archaeological database of the McGregor Museum, Kimberley, were consulted.
- The field assessment was done on 2013-09-23 to 09-25 and assisted by Thabisa Fikizolo. The assessment was done by foot and off-road vehicle and limited to a Phase 1 surface survey. GPS co-ordinates were taken with a Garmin Oregon 550 (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. Scale bar: 10cm intervals.

The field assessment focused on the study site, the footprint of the *South Hydroelectric Power Site* and the 2 power line options. Treacherous terrain, vegetation, limited access tracks and farm camp fences did affect the field assessment, specifically with reference to the power line routes, resulting in only portions of the line routes having been physically assessed with interpretation based on extrapolation from assessed areas.

Field assessment did not include assessment of the access roads or the inundation areas.

Archaeological and cultural heritage site significance assessment and associated mitigation recommendations were done according to the system prescribed by SAHRA (2007).

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

❖ Assessor Accreditation

The assessment was done by Karen van Ryneveld (ArchaeoMaps):

- Qualification: MSc Archaeology (2003) WITS University.
- Accreditation:
 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 listed CRM archaeologist.

2.1) PRE-FEASIBILITY ASSESSMENT

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 *South Hydroelectric Power Site* study site can briefly be described as:

1. Early Hominin : Probability – *None*

2. Stone Age
 - a. ESA : Probability – *Medium-High*
 - b. MSA : Probability – *High*
 - c. LSA : Probability – *Medium-High* (Human remains may be expected; if identified of both scientific and social significance)
 - i. Rock Art : Probability – *Medium-High*
 - 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 – *Low*

4. Colonial Period
 - a. Colonial Period : Probability – *Medium* (Human remains expected to be primarily associated with formal cemeteries)
 - b. Iron Age / Colonial Period Contact : Probability – *Low*
 - c. Industrial Revolution : Probability – *Low-Medium*

❖ The SAHRA 2009 Database

A number of archaeological Cultural Resources Management (CRM) projects are recorded in the SAHRA 2009 Mapping Project Database situated within an approximate 60km radius from the *South Hydroelectric Power Site*, Orange River, Thembelihle Local Municipality, Northern Cape. CRM studies recorded in the SAHRA 2009 Mapping Project Database are listed as:

- Beaumont, P.B. (McGregor Museum). 2005. *Heritage Study for an EMP Covering a Portion of the Remainder of Kransfontein 19, Northern Cape Province.*
- Beaumont, P.B. (McGregor Museum). 2007. *Phase 1 Heritage Impact Assessment Report on the Farm Riets Drift 18, on the South Bank of the Orange River Between Douglas and Prieska, Karoo District Municipality, Northern Cape Province.*
- Dreyer, C. (Private). 2007. *First Phase Archaeological and Cultural Heritage Assessment of the Proposed Borrow Pit Sites and R385 Road Upgrading Between Douglas and Campbell, Northern Cape.*
- Dreyer, C. (Private). 2008. *Archaeological and Cultural Heritage Assessment of the Proposed MTN Mast at the Farm Elandsdraai 88, near Orange River Station, Hopetown District, Northern Cape.*

- Dreyer, C. (Private). 2008. *First Phase Archaeological and Cultural Heritage Assessment of the Proposed Diamond Prospecting Developments at the Farm Kameeldrift 40, Douglas, Northern Cape.*
- Morris, D. (McGregor Museum). 1997. *Archaeological Impact Assessment for Gypsum Industries in Respect of Proposed Mining at Kraankuil on the Farms Zeerust and Springbokspoor.*
- Morris, D. (McGregor Museum). 2003. *Archaeological Survey of the Farm Koodoosberg No.141, Northern Cape.*
- Morris, D. (McGregor Museum). 2005a. *Archaeological Impact Assessment at Abrahamoos Fontein near Plooyburg, Northern Cape.*
- Morris, D. (McGregor Museum). 2005b. *Archaeological Impact Assessment at Taaibosch Fontein near Plooyburg, Northern Cape.*
- Morris, D. (McGregor Museum). 2008. *Report on a Phase 1 Archaeological Impact Assessment of the Proposed Prospecting on Uityk 106, Locks Verdiet 105 and Brakpan 107, West of Kimberley, Northern Cape.*
- Van Schalkwyk, J.A. (National Cultural History Museum). 2008. *Heritage Impact Survey Report for the Development of Visitor Facilities in the Mokala National Park, Northern Cape Province.*
- Van Ryneveld, K. (McGregor Museum). 2004. *Cultural Resources Management Impact Assessment: (Portions of) Ettrick 182, Hopetown District, Northern Cape, South Africa.*
- Van Ryneveld, K. (McGregor Museum). 2005a. *Cultural Resources Management Impact Assessment: (Portions of) Leewpoort 161, Kimberley District, Northern Cape, South Africa.*
- Van Ryneveld, K. (McGregor Museum). 2005b. *Cultural Heritage Impact Assessment: Erf 1, Douglas, Herbert.*
- Van Ryneveld, K. (McGregor Museum). 2005c. *Cultural Heritage Site Inspection Report for the Purpose of a Prospecting Right EMP- (Portion of) De Kalk 37, Herbert District, Northern Cape, South Africa.*
- Van Ryneveld, K. (McGregor Museum). 2005d. *Cultural Resources Management Impact Assessment Portions of Paardeberg 154, Kimberley.*
- Van Ryneveld, K. (McGregor Museum). 2005e. *Cultural Resources Management Impact Assessment: Portion 1 of Roodepan 146, Kimberley District, Northern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2007a. *Phase 1 Archaeological Impact Assessment Portions of Erf 1, Douglas, Herbert District, Northern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2007b. *Phase 1 Archaeological Impact Assessment: A 1.1ha Mining Development, Portion of Erf 1, Douglas, Northern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2007c. *Portion of Erf 314, Douglas, Herbert District, Northern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2008. *Phase 1 Archaeological Impact Assessment: Diamond Mining, Portions of Erven 1 & 341, Douglas, Northern Cape, South Africa.*

A notable number of archaeological CRM studies have been done post compilation of the SAHRA 2009 Mapping Project Database and available on SAHRIS including, but not limited to:

- Becker, E. (Hatch). 2013. *Transnet Capital Projects Ngqura 16 MTPA Manganese Rail. Phase 1 Heritage Impact Assessment Rail Kimberley to De Aar.*
- Dreyer, C. (Private). 2006. *First Phase Archaeological and Cultural Heritage Assessment of the Proposed New Oxidation Ponds at Prieska, Northern Cape.*
- Dreyer, C. (Private). 2012. *Letter of Recommendation for the Exemption from a First Phase Archaeological and Heritage Investigation of the Proposed Establishment of a Photovoltaic (Solar Power) Installation on the Farm Wicklow 218, near Hopetown, Northern Cape.*

- Kaplan; J. (Agency for Cultural Resource Management). 2012. *Archaeological Impact Assessment. The Proposed Disselfontein Keren Energy Solar Plant near Hopetown, Northern Cape Province.*
- Morris, D. (McGregor Museum). 2011a. *Screening Phase Heritage Assessment of the Proposed PV Solar Park near Douglas, Northern Cape.*
- Morris, D. (McGregor Museum). 2011b. *Archaeological Impact Assessment Phase 1: Gannahoek N12 Quarry near Hopetown, Northern Cape.*
- Morris, D. (McGregor Museum). Undated. *Heritage Impact of the Proposed Douglas Solar Energy Project. Northern Cape.* (Not an Original Report Name).
- Opperman, H. (Epog Navorsings Maatskappy). 2012. *First Phase Archaeological and Cultural Heritage Assessment of the Proposed Residential Development of Portions 14 and 3 of the Farm Vluytjeskraal 149, District: Hopetown, Province: Northern Cape.*
- Pelser, A. J. (Archaetnos). 2011. *A Report on a Phase 1 Heritage Impact Assessment for Proposed Mining on the Farm Koedoeskloof in the Hay District, Northern Cape.*
- Pelser, A. J. (Archaetnos). 2012. *A Report on a Heritage Impact Assessment (HIA) For a Proposed Photovoltaic Solar Power Generation Plant on Klein Zwartz Bast 188, Kenhardt District, Northern Cape.*
- Pelser, A. J. and Van Vollenhoven, A. C. (Archaetnos). 2011. *A Report on a Heritage Impact Assessment for the Upgrade of Transnets Glosam Siding for PMG'S Bishop Mine (Loading Bay) on Portion 2 and the Remainder of Gloucester 674 near Postmasburg, Tsantsabane Local Municipality, Northern Cape.*
- Webley, L. & Orton, J. (ACO – UCT). 2012. *Heritage Impact Assessment Proposed Construction of the Graspan Photovoltaic Power Facility, Pixley Ka Seme District Municipality, Northern Cape Province.*

❖ SAHRA Built Environment Database – Northern Cape

Declared Provincial Heritage Sites (buildings older than 60 years) situated in the vicinity of the *South Hydroelectric Power Site* area recorded in the SAHRA Built Environment – Northern Cape database can be listed as:

SAHRA BUILT ENVIRONMENT – NORTHERN CAPE				
SAHRA Identifier	Site name	Place	NHRA Status	Co-ordinates
9/2/043/0004	Ruins of Jacobs house (pre-1880), De Kalk, Hopetown District	Hopetown	Provincial Heritage Site	S29°16'50"; E23°46'20"
9/2/043/0006	Old wagon bridge, Orange River (built during Anglo Boer war), Hopetown District	Hopetown	Provincial Heritage Site	S29°34'10"; E24°04'20"

Table 2: SAHRA Built Environment, Northern Cape

❖ The McGregor Museum Archaeological Database

The McGregor Museum archaeological database lists a number of specifically Rock Art engraving records but also small surface Stone Age collections in the 2923BD 1:50,000 map database. Consultation with David Morris, HoD Archaeology, McGregor Museum, indicated great concern regarding the record. Morris (Pers. Comm.: 2012) commented on the fact that very few of these records are geo-referenced, resulting in a biased spatial display of the archaeological sensitivity of the area. In addition the methodology and aim of early, specifically Rock Art research, at the McGregor Museum dating from the times of Directorship under Maria Wilman (from 1908) and

more specifically Dr. Gerard Fock, the 1st appointed museum archaeologist (from 1958), needs to be considered against standards and practice of today. Many of the McGregor Museum's early Rock Art records are photographed, some traced / rubbed, but as a rule referenced only with farm name. Second thereto logistics have not allowed follow-up visits to monitor preservation and update the heritage record. In accordance with the academic debate regarding the relationship between CRM and research archaeology, Morris is of the opinion that in many cases CRM archaeology for purposes of development will be the last opportunity to update old research records to current standards, an absolutely essential step if we are to consider the very principle of responsible development and our commitment to further knowledge and understanding of our past.

In addition to the McGregor Museum database records, Sidala reported to Enviroworks on more than 270 LSA engraving sites reported on by landowners during project consultation (Pers. Comm.: Anri Meintjies, Enviroworks, 2013).

McGregor Museum – Archaeology Database – 2923BD	
National Site Number	Site Description
2923BD001	Torquay [unknown co-ords] Rock engravings
2923BD002	De Kalk [unknown co-ords] Rock engravings
2923BD003	De Kalk [unknown co-ords] Rock engravings
2923BD004	De Kalk [unknown co-ords] Rock engravings
2923BD005	Slypsteen [unknown co-ords] Rock engravings
2923BD006	Slypsteen [unknown co-ords] Rock engravings
2923BD007	Slypsteen [unknown co-ords] Rock engravings
2923BD008	Slypsteen [unknown co-ords] Rock engravings
2923BD009	Slypsteen [unknown co-ords] Rock engravings
2923BD010	Slypsteen [unknown co-ords] Rock engravings
2923BD011	Darnysbosch [unknown co-ords] Rock engravings
2923BD012	Deelfontein [unknown co-ords] Rock engravings
2923BD013	Disselfontein 29.4787S 23.9280E (deci degs) Rock engravings
2923BD014	Disselfontein [unknown co-ords] Rock engravings
2923BD015	Disselfontein [unknown co-ords] Rock engravings
2923BD016	Disselfontein [unknown co-ords] Rock engravings
2923BD017	Disselfontein [unknown co-ords] Rock engravings
2923BD018	Ettrick [unknown co-ords] MMK 6405 Grooved stone brought in by farmer
2923BD019	Slypsteen [unknown co-ords] MMK 6418, 2 flakes poss ESA
2923BD020	Slypsteen [unknown co-ords] MMK 6019 Mixed LSA & ESA amongst engravings
2923BD021	Torquay [unknown co-ords] MMK 6601 LSA surface colln
2923BD022	Saratoga [unknown co-ords] MMK 6638, 4 MSA flakes
2923BD023	Disselfontein 29.4787S 23.9280E (deci degs) MMK 6988 Excavated MSA assemblage from hill top amongst engravings
2923BD024	Disselfontein 29.4789S 23.9299E (approx deci degs) MMK 6987 Ceramic LSA on river silt terrace
2923BD025	Disselfontein 29.4793S 23.9202E (approx deci degs) MMK 6989 LSA on river silt terrace
2923BD026	Disselfontein 29.4749S 23.9278E (approx deci degs) MMK 6990 Pottery on river silt terrace

Table 3: The McGregor Museum, Archaeology database – 2923BD



Map 6: Spatial display of the 2923BD McGregor Museum archaeological database, indicating the localities of only 4 geo-referenced heritage records

❖ General Discussion

From the CRM reports consulted the Stone Age record seems by far the most dominant in the region. On the farm Disselfontein Kaplan (2012) recorded a number of ESA bifaces and 2 handaxes and Pelser (2012) reported on additional ESA evidence from Klein Swartz Bast. The MSA record seems to dominate, often in association with LSA assemblages. MSA deposits were reported on by Kaplan (2012), Pelser (2011), Pelser & Van Vollenhoven (2011), Opperman (2012), Van Ryneveld (2005) and Webley & Orton (2012), while MSA and LSA mixed assemblages were reported on by Morris (2011), Pelser (2011, 2012) and Webley & Orton (2012). Despite the rich local and research record on LSA Rock Art engravings this site type seems to largely elude the CRM record, but reports on Rock Art engravings have been made by Morris (2011) at the Gannahoek quarry near Hopetown.

Colonial Period records reflect both the farming and the mining history of the area: Opperman (2012) recorded a historical farmhouse (2012). Pelser & Van Vollenhoven (2011) reported on additional Colonial Period structures, while Webley & Orton (2012) reported on a number of features and historical dump material that may well reflect, at least in part, early Colonial mining activities and associated development in the region. Colonial Period graves were reported on by Pelser (2011), Opperman (2012) and Becker (2013).

The history of Hopetown is intrinsically tied with the 1865 discovery of the 1st diamond in South Africa, the 23.25 carat 'Eureka' on the farm De Kalk. There is little doubt that diamonds literally created Hopetown, and when the boom ended the town declined into insignificance and almost weathered to oblivion. The town lies on the edge of the Great Karoo on an arid slope leading town to the Orange River and it is believed to have been named by the great explorer Colonel Robert Gordon, in honor of William Prince of Orange. Hopetown came into being in 1850

when Sir Harry Smith extended the northern frontier of the Cape to the mighty Orange and settlers started claiming land by 1854. Hopetown saw some action during the Anglo Boer War, at the skirmish at Houtkraal and a concentration camp is situated on the farm Doornbult. The Old Wagon route and the 1st bridge across the Orange, dating to 1871, carried traffic to the diamond fields and a blockhouse can still be seen standing on the banks of the river (www.heritage.org.za/karoo/hope/htm).

2.2) FIELD ASSESSMENT

Archaeological and cultural heritage resources identified during the field assessment are classified according to:

- **Contemporary cultural resources (Site SH-S1):**

Contemporary cultural resources, including structures younger than 60 years, are not formally protected by the NHRA 1999. These resources may however be of contemporary cultural significance and consultation with, and agreement by landowners should precede any impact on, or destruction thereof.

- **Colonial Period archaeological resources (Sites SH-S2 to SH-S4):**

The number of Colonial Period heritage resources identified is testimony to the long Colonial Period farming tradition of the greater Hopetown area. The NHRA 1999 protects all structures older than 60 years and all archaeological sites older than 100 years. Three Colonial Period heritage resources were identified during the field assessment. It needs to be stated that structure types described as Sites SH-S3 and SH-S4 may also be associated with specifically the Later Iron Age (post-contact period) and were also built by later LSA pastoralist groups: These sites are here classified as Colonial Period sites based on cultural association. None of the identified Colonial Period resources will be impacted on by the proposed development, but caution should be taken to ensure the conservation thereof through securing temporary conservation measures at the time of construction.

- **Stone Age archaeological resources (Area Type SH-A1 to SH-A3):**

Varying densities of Stone Age artefacts were found scattered across virtually the total of the study site. The immediate river bed, characterized by its stone-rich banks and steep landscape gradient yielded the lowest presence of lithic artefacts. Here only the infrequent tool was discovered, but in all cases associated with an extremely poor context, with all identified artefacts inferred to be the result mainly of water deposition from further upstream; albeit cautioning against the possibility that more significant Stone Age sites or occurrences may have been present in the past. If so, these would have been destroyed by successive episodes of flooding over the past few millennia.

Primarily Middle Stone Age (MSA) and Later Stone Age (LSA) occurrences characterized the higher lying areas of the *South Hydroelectric Power Site* study site and the power line study sites. Though no Earlier Stone Age (ESA) artefacts were identified, it would be premature to exclude the possibility of an ESA in totality, considering the notably extensive Stone Age distribution and the lack of sub-surface stratigraphic evidence for the general terrain. Surface identified Stone Age occurrences change in composition, but as a norm typified by a mixture of MSA and LSA lithics and notably with an emphasis on a microlithic LSA, rather than expected macrolithic assemblage types.

The variety of raw material sources from the immediate environment was typically exploited and raw material usage forms a distinguishing variable between occurrences. No attempt was made to record occurrence size: Stone Age occurrences continue across vast areas, with notable variation observed within an occurrence type. Based on the field assessment 3 basic types of Stone Age occurrences were identified.

Stone Age archaeological resources are formally protected by the NHRA 1999. Recommendations for Phase 2 mitigation of representative samples of the 3 basic identified types of occurrences (SH-A1 to SH-A3) are made to ensure that development proceeds responsibly.



Map 7: Results of the field assessment

2.2.1) THE SOUTH HYDROELECTRIC POWER SITE

The *South Hydroelectric Power Site* field assessment included brief assessment on both the eastern and western banks of the river from the general area where the weir will be constructed (S29°26'28.9"; E23°54'59.7") to approximately 1km upstream. The immediate river bed is characterized by stone-rich banks and steep landscape gradient. A very low density of Stone Age lithics were identified within the riverbed. However, these infrequent occurrences are ascribed largely to water disturbance and of necessity therewith associated with a very low archaeological significance. Ex-situ artefacts are so widely distributed that no attempt was made to record an artefact ratio (artefacts: m²). Two large cores, which may be ascribed to the ESA, but which may also be of MSA assignation were identified. The remainder of the lithics included flakes and waste flakes of MSA and LSA assignation, some of which with a recognizable rolled appearance.

Plateau's of the higher lying hills displayed varying incidents of lithic deposits, described under the relevant sections, and including MSA and primarily microlithic LSA mixed assemblages. At present it is inferred that Stone Age occupation was largely restricted to higher lying areas, with the Orange River having been a major draw card to the terrain, but with tangible traces of use thereof limited to higher lying areas. This may be a very local interpretation, applicable to the immediately assessed area and primarily the result of steep landscape gradient. More direct use of the Orange River and its tributaries is expected to become evident only upon further survey where variation in landscape gradient and other natural resources associated with differing archaeological deposits may be identified.

The rich LSA cultural landscape, evidenced also by the numerous accounts of Rock Art images recorded in the McGregor Museum database and reported on by landowners still eludes assessment results, despite the stone-rich riverbed being an ideal canvas for LSA artists. This may be argued in terms of the brief assessment for purposes of this study, the notably small area assessed, specifically with reference to the total of the inundation area expected to be impacted on by the development and large farm sizes on which Rock Art were recorded.



Plate 1: General view of the assessed South Hydroelectricity Power Site



Plate 3: Stone rich banks of the Orange River [1]



Plate 2: View over the area where the weir will be constructed



Plate 4: View from the river bank to the hills



Plate 5: Stone Rich banks of the Orange River [2]



Plate 7: View of a steep stream tributary



Plate 6: A large ESA / MSA artefact from the Orange riverbed



Plate 8: Steep Orange riverbed sections within the assessed area

2.2.2) THE POWER LINES – OPTION A (SOUTH) AND OPTION B (NORTH)

The general terrain through which both the Option A and Option B power lines run proved to be literally cluttered with Stone Age deposits. However, over large areas assemblages seem to be continuing extensions of the same type of occurrence and an attempt was made to classify these into 3 basic types of Stone Age deposits, labeled for purposes of this study Areas SH-A1, SH-A2 and SH-A3. The Option A power line traverses all 3 identified types and the Option B power line alignment crosses through Type SH-A2 and SH-A3. Basic Phase 2 mitigation would be necessary for either of the lines to be developed, however large occurrence sizes coined with limited impact thereon by the development identifies both power line option as feasible development proposals.



Plate 9: View of the Option A power line from the *South Hydroelectric Power Site*



Plate 11: General view of the Option A power line study site [2]



Plate 10: General view of the Option A power line study site [1]



Plate 12: View of the Option A power line from the existing substation



Plate 13: General view of the Option B line route from the *South Hydroelectric Power Site*



Plate 15: General view of the Option B power line [2]



Plate 14: General view of the Option B power line [1]



Plate 16: The Option B power line in the vicinity of the new substation

2.2.3) SITE DESCRIPTIONS

- ❖ Site SH-S1 – Tourist Accommodation, Contemporary Period – S29°26'17.4; E23°55'00.2"

The Site SH-S1 contemporary tourist accommodation and associated infrastructure is situated on the on the property Deelfontein No. 237, along the proposed western access road to the *South Hydroelectricity Power Site*. The site may well be impacted on by inundation levels. Site SH-S1 is younger than 60 years and not formally protected by the NHRA 1999. The site may however be of contemporary cultural significance and the developer should ensure that any impact thereon be done only in consultation with the landowner.

- *RECOMMENDATIONS*: Site SH-S1 post-dates 60 years of age and is not formally protected by the NHRA 1999. Impact on or destruction of the site is not subject to SAHRA / NC PHRA application or approval. The site may be of contemporary cultural significance and any impact on the site should only be done in consultation with the landowner.



Plate 17: View of Site SH-S1

❖ Site SH-S2 – Farmstead, Colonial Period – S29°26'47.6; E23°54'30.6"

Site SH-S2, inferred to be the original Deelfontein No. 237 farmstead may well date to the mid 1800's: The site is thus formally protected by the NHRA 1999. The site, with site features scattered across an approximate 230x350m area is located within approximately 70m from the Option B power line – But no identified site features will directly be impacted on by the current proposed alignment.

Site SH-S2 is typified by the stone built 2 roomed residential remains of the inferred original farmhouse. The larger of the 2 rooms measures approximately 8x10m in size while the smaller averages roughly 4x4m. Ruined wall remains are in places still standing to roof height. Associated with the residential remains are a number of livestock enclosures, all rectangular in shape and stone built with conservation of the wall remains varying quite radically. Close to the farmhouse ruins are 2 livestock enclosures or 'kraals' of roughly 8x8m and 10x12m in size respectively, with adjoining calf camps, with walls still standing in places to approximately 70cm in height but elsewhere weathered down to foundation level. Just west of the access track is another livestock enclosure ruin (roughly 8x8m in size with walls standing to approximately 40-50cm high), situated in quite close proximity to the homestead remains. These may well have been the early 'kraals' associated with the origin of the settlement. Across the stream to the south of the homestead is a notably large double-lobed rectangular stone built kraal with camps in excess of 20m in length and walls standing to 1+m in height. Walls seem to have been maintained for a significant time. Just east of the large 'kraal' is the remains of a weathered small enclosure, approximately 6x6m in size with walls standing to an average of 70cm high in places. A number of related smaller features can reasonably be expected on site upon more detailed assessment.

The total of Site SH-S2 overlies Stone Age deposits, of the type described as Type SH-A3, with its associated significance relating to cultural overlay.

- *RECOMMENDATIONS:* Site SH-S2 pre-dates 60/100 years of age and is formally protected by the NHRA 1999. The site is ascribed a SAHRA *Medium Significance* and a *Generally Protected B Field Rating*. The site will not be impacted on by development. However, proximity to the Option B power line alignment does call for caution. Should Option B be developed the developer should ensure that temporary conservation measures, implying a temporary fence of construction netting be placed around the site features and that the site be permanently sign-posted indicating that Site SH-S2 is formally protected by the NHRA 1999.



Plate 18: A stone built 'kraal' with residential remains in the background



Plate 20: Large livestock enclosure remains across the stream from the homestead



Plate 19: Residential remains at Site SH-S2



Plate 21: Livestock enclosure remains at Site SH-S2

❖ Site SH-S3 – Livestock Enclosure, Colonial Period – $S29^{\circ}27'29.3''$; $E23^{\circ}54'45.8''$

The Site SH-S3 livestock enclosure comprises of a small, rectangular shaped, stone built livestock enclosure, measuring roughly 4x4m in size with walls still standing to more or less 70cm in height. The structure can reasonably be inferred to pre-date 60 years of age. Site SH-S3 is situated approximately 200 east of the Option A power line and will not be impacted on by development. No additional conservation measures are required prior to development impact.

The significance of Site SH-S3, considering the terrain and limitations imposed thereby on the field assessment, lies in the possibility that similar small 'kraals' may well be situated along the non-assessed portions of the power lines. Where features of sort are encountered the developer should ensure that temporary conservation measures are put in place to avoid accidental impact on heritage resources.

- **RECOMMENDATIONS:** Site SH-S3 is inferred to pre-date 60 years of age and is formally protected by the NHRA 1999. The site is ascribed a SAHRA *Low Significance* and a *Generally Protected C Field Rating*. Being situated more than 200m east of the Option A power line the site will not be impacted on by development. (Similar type structures may be encountered along the final power line alignment. In which case the developer should ensure that temporary conservation measures be put in place for the tenure of the construction period to avoid accidental impact on heritage resources.)



Plate 22: View of Site SH-S3

❖ Site SH-S4 – Livestock Enclosure, Colonial Period – S29°28′08.9; E23°54′24.2”

Site SH-S4 comprises of a large, rough rectangular shaped livestock enclosure, with the main camp measuring approximately 15x15m in size and the adjoining calf camp more or less 4x4m. Stone walls are still standing in places in excess of 1+m while elsewhere they are weathered down to an average of 40cm in height. The site is inferred to pre-date 60 years of age.

The site is situated approximately 20m west of the proposed Option A power line alignment and temporary conservation measures should be in place prior to construction impact should Option A be developed.

- **RECOMMENDATIONS:** Site SH-S4 is inferred to pre-date 60 years of age and is formally protected by the NHRA 1999. The site is ascribed a SAHRA *Low Significance* and a *Generally Protected C Field Rating*. The site is situated approximately 20m west of the Option A power line and temporary conservation measures should be in place in the event of development of the Option A line route.



Plate 23: View of a portion of the Site SH-S4 main 'kraal'

- ❖ Stone Age Area Type SH-A1 – MSA & LSA – [SH-A1.1: S29°28'16.3"; E23°54'24.1" & SH-A1.2: S29°27'42.7"; E23°54'31.1"]

Two Stone Age Area Type SH-A1 assemblages were identified along the Option A power line route, including SH-A1.1 situated towards the southern extremity of the alignment on the property Disselfontein No. 77 and SH-A1.2 about 1km north of SH-A1.1 on the property Deelfontein No. 237. Both areas are characterized by red Hutton sand scattered with surface raw material nodules amongst which the artefacts are found. Artefacts are produced from the variety of raw material present, including quartzitic material and dolorite but with a notable preference of siliceous material specifically for the production of LSA microlithic samples. The assemblages comprises of mixed MSA and LSA tools, with the MSA preliminary ascribed to a Volman (1984) MSA3 and with the LSA, as mentioned, with an unexpected emphasis on microlithic samples. Microlithic samples are estimated to easily comprise 70% of the collections' artefacts. Artefact ratios (artefacts: m²) vary quite radically, and also within the recorded occurrence extends, but with a rough average of 10-15:1 recorded. No attempt was made to record actual occurrence sizes; occurrence boundaries are minimum boundaries recorded during survey.

Development of the Option A power line will cross over both recorded Stone Age Area Type SH-A1 occurrences and Phase 2 systematic surface collection associated with test pits to test sub-surface deposits should suffice as mitigation prior to development.

- *RECOMMENDATIONS:* Stone Age Area Type SH-A1 assemblages are ascribed a preliminary SAHRA *Medium Significance* and a *Generally Protected B Field Rating*. Considering fairly large occurrence sizes and the minimal impact that the Option A power line development will have on the deposits it is recommended that systematic surface collection and test pitting at one of the occurrences precede development to provide for a representative sample record of the deposits prior to development impact.



Plate 24: Selected Type SH-A1 artefacts

- ❖ Stone Age Area Type SH-A2 – MSA & LSA – [SH-A2.1: S29°28'04.4"; E23°54'25.1", SH-A2.2: S29°27'27.0"; E23°54'00.7" & SH-A2.3: S29°26'52.0"; E23°54'32.1"]

Three Stone Age Area Type SH-A2 occurrences were identified, with occurrence SH-A2.1 situated along the Option A power line alignment and occurrences SH-A2.2 and SH-A2.3 located along the Option B line route, all situated on the farm Deelfontein No. 237. Again the Stone Age artefact types are inferred to be a direct result of the immediate geology: Quartz rich deposits resulted in collections dominated by quartz artefacts, including white and to a much lesser extent poor rose quartz lithics. In addition to quartz siliceous material and other local raw materials were used. Artefact types include primarily flake forms of both the MSA and LSA, again with an emphasis on a Volman (1984) MSA 3 and microlithic LSA samples. Rough artefact ratios (artefacts: m²) of approximately 8:1 were recorded, but ratios vary across indicated occurrence areas. Occurrence areas indicated do not reflect actual occurrence extends; merely occurrence continuation across assessed areas and areas do have a tendency to occur in lenses often flowing into neighboring geological and archaeological areas. With reference thereto the SH-A2.2 area proved to be the best sample of Type SH-A2 and SH-A2.3 the poorest. Here the occurrence type tends to be quite mixed with Type SH-A3.

Development of either proposed power line option would necessitate systematic collection and test pitting of the Type SH-A2 Stone Age assemblage to collect a representative sample thereof and test possible stratigraphic components thereof.

- **RECOMMENDATIONS:** Stone Age Area Type SH-A2 assemblages are ascribed a preliminary SAHRA *Medium Significance* and a *Generally Protected B Field Rating*. Considering fairly large occurrence sizes and the minimal impact that either of the proposed power line options will have on the deposits it is recommended that systematic surface collection and test pitting at one of the occurrences prior to development impact.



Plate 25: Selected Type SH-A2 artefacts

- ❖ Stone Age Area Type SH-A3 – MSA & LSA – [SH-A3.1: S29°26'44.5"; E23°55'07.0", SH-A3.2: S29°26'48.8"; E23°54'50.8", SH-A3.3: S29°27'33.7"; E23°54'34.8", SH-A3.4: S29°27'54.7"; E23°54'29.4" & SH-A3.5: S29°27'12.1"; E23°54'11.8"]

Type SH-A3 deposits by far dominate the general study site, with identified occurrences SH-A3.1 and SH-A3.2 present on the higher lying areas of the *South Hydroelectric Power Site* study site itself. The Option A power line traverses identified occurrences SH-A3.2, SH-A3.3 and SH-A3.4, while the Option B alignment cross cuts through identified area SH-A3.2 and the notably large SH-H3.5 area. Deposits are found in varying contexts, mainly in a basic red Hutton sand context, often atop and along the foothills of dolorite outcrops, but also along stream beds and then frequently in a decomposed dolorite nodule context. Along the Option A power line the area between SH-A3.2 and SH-A3.3 may well constitute continuing deposits of the SH-A3 type. In general collections are typified by a dominance on MSA types, including a Volman (1984) MSA 2b and MSA 3 and to a lesser extent a microlithic LSA. MSA artefacts seem to be routinely produced from the more basic raw material sources, including quartzite and dolorite, but with a notable component produced from baked shale. Microlithic production seems to have harnessed the numerous siliceous resources from the geological surrounds. MSA typology however dominates the assemblages, representing an estimated 80% thereof. Maximum artefact ratios (artefacts: m²) of approximately 15:1 were recorded, but these do decrease at intervals to ≤1:1. Indicated occurrence extends represent only identified parameters recorded during survey and not actual occurrence boundaries, but in general indicating notably large site sizes extending for 100's of ha at end.

- **RECOMMENDATIONS:** Stone Age Area Type SH-A3 assemblages are ascribed a preliminary SAHRA *Medium Significance* and a *Generally Protected B Field Rating*. Considering notably excessive occurrence sizes these type of deposits are most characteristic of the general landscape. Occurrence size and the minimal impact thereon by development of the *South Hydroelectric Power Site* (SH-A3.1 and SH-A3.2) and either the Option A (SH-A3.2, SH-A3.3 and SH-A3.4) or Option B (SH-A3.2 and SH-H3.5) power line should be preceded by a systematic surface collection of at least 1 of the occurrences associated with basic test pitting to collect a representative sample of the Type SH-A3 deposits that will be impacted on.



Plate 26: Selected Type SH-A3 artefacts

2.3) CULTURAL LANDSCAPES AND VIEWSCAPES

A ‘cultural landscape’ refers to a particular geographic area that represents the unique combined work of man and nature (James & Martin 1981). The term has its origins in 16th Century Germany where ‘cultural landscape’ (*kultur landschaft*) implies ‘shaped lands’ to differentiate it from the ‘original landscape’ (*urlandschaft*), or the ‘unaltered’ landscape, prior to human impact (Sauer 1925). Sauer (1925) stresses the agency of culture as a force in shaping the visible features of the earth’s surface in delimited areas where the physical environment retains a central significance, as the medium with and through which human cultures act. According to Sauer (1925) *‘The cultural landscape is fashioned from a natural landscape by a cultural group. Culture is the agent, the natural the medium, the cultural landscape is the result.’*

In order to better understand the concept of ‘cultural landscape’ it is necessary to separate the term ‘culture’ to further our understanding of its many definitions. Within the anthropological arena culture is generally understood as a *‘complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society’*. Culture is ‘human culture’ and is acquired through a learning process. Through culture people can adapt to their environment in non-genetic ways, so people living in different environments will often have different cultures, or will develop different cultures (Van Willigen 1986). An integral part of culture is change; be it the result of a changing natural environment to which the culture have to adapt or contact with another culture, the primary force of cultural change, and often the result of socio-political pressure. Els (1992) explain that cultural contact change usually occurs according to either the process of acculturation (dominating ‘donor’ culture) or the process of enculturation (dominating ‘receiver’ culture). Both cultural processes can be spontaneous, forced or guided; but cultural process is never a one-way street – any given cultural system is at once a ‘donor’ and a ‘receiver’. The essence of cultural change lies in the restructuring of the parts so that a new cultural pattern results. Bourguignon (1979) highlights the fact that this ‘restructuring’ should center on the question of *‘What changes are (were) necessary to make culture, as we know it, possible?’* Culture is thus a process of constant change and adaptation; psychologically, behaviorally, technologically, politically, economically and spiritually (religiously), collectively referred to as ‘cultural evolution’. [Certain forms of society and culture could simply not have arisen before others; for example, industrial farming could not have been invented before simple farming, and metallurgy could not have developed without previous non-smelting processes involving metals (van Willigen 1986)].

When considering the concept of ‘cultural landscape’, taking cognizance of the vital force of change as an agent of culture, it is only logical that cultural change will be reflected in a changing cultural landscape.

The concept of ‘cultural landscape’ has also been adapted and developed within international heritage arenas (UNESCO 2005) as part of an international effort to reconcile one of the most encompassing dualisms in Western thought; those of ‘nature’; and ‘culture’. In so doing the World Heritage Committee has adopted 3 categories of ‘cultural landscape’, ranging from (a) those landscapes most deliberately ‘shaped’ by people, through (b) the full range of ‘combined’ works, to (c) those least evidently ‘shaped’ by people (yet highly valued). The 3 categories extracted from the UNESCO Committee’s Operational Guidelines are as follows (Punnell 2006):

1. A landscape designed and created intentionally by man;
2. An ‘organically evolved landscape’ which may be a ‘relict (or fossil) landscape’ or a ‘continuing landscape’; and
3. An ‘associative cultural landscape’ which may be valued because of the religious, artistic or cultural associations of the natural environment.

❖ The MSA and LSA Stone Age Cultural Landscape

The MSA and LSA Stone Age cultural landscape can be described as an organically evolved fossil landscape least evidently shaped by humans. It is evident that natural resources across the landscape were exploited and utilized, with material remains of former use scattered literally across the surface of the study site and complimented by the numerous accounts of Rock Art engravings from landowners, supplemented by more limited recordings in the McGregor Museum collection, but with little to no visual or physical impact altering the landscape itself.

❖ The Colonial Period Cultural Landscape

The Colonial Period cultural landscape of the *South Hydroelectric Power Site* can be described as an organically evolved continuing landscape least evidently shaped by humans. Sparsely scattered Colonial Period farming remains forms a continuum with contemporary remains and this landscape will continue to evolve alongside philosophical concepts and technological developments and innovations from within the farming industry

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The proposed *South Hydroelectric Power Site* development will permanently alter the cultural landscape, both visually and physically, specifically in the region of the weir and associated infrastructure and across the extent of the inundation area. Perpetual transformation of the landscape is thus inevitable. However, in itself probably one of the most tangible and visual manifestations of contemporary culture and giving expression to the current 'green' environment consciousness through 'green' energy developments. In that large scale transformation of the landscape is in itself cultural in nature, directly answering Bourguignon's (1979) question of '*What changes are necessary to make culture, as we know it, possible?*' Transformation of the cultural landscape can be viewed as a facet of 'cultural evolution', the result of psychological, behavioral, technological and economic change characterizing contemporary South African culture. The future transformed 'green' industrial landscape of the *South Hydroelectric Power Site* will be a deliberately 'shaped' landscape – designed and created intentionally by man.

3) RECOMMENDATIONS

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *South Hydroelectric Power Site*, Orange River, Thembelihle Local Municipality, Northern Cape, proceeds as applied for provided the developer comply with the below listed heritage compliance requirements:

SOUTH HYDROELECTRIC POWER SITE				
PORTION 1 OF DEELFONTEIN NO. 237 & PORTION 3 OF ESKDALE NO. 204, (NEAR HOPETOWN), THEMBILIHLE LOCAL MUNICIPALITY, NORTHERN CAPE				
Map Code	Type / Period	Description	Co-ordinates	Recommendations
South Hydroelectric Power Site – S29°26'28.9"; E23°54'59.7"				
Site SH-S1	Contemporary	Tourist accommodation	S29°26'17.4"; E23°55'00.2"	N/A
Site SH-S2	Colonial Period	Farmstead	S29°26'47.6"; E23°54'30.6"	Option B power line: Temporary conservation & Permanent sign-posting
Site SH-S3	Colonial Period	Livestock enclosure	S29°27'29.3"; E23°54'45.8"	N/A
Site SH-S4	Colonial Period	Livestock enclosure	S29°28'08.9"; E23°54'24.2"	Option A power line: Temporary conservation
Type SH-A1	MSA & LSA	Lithic occurrence	-	Option A power line:
SH-A1.1	-	-	S29°28'16.3"; E23°54'24.1"	Phase 2 systematic surface collection & test pit(s) at 1 occurrence to precede development, done under SAHRA permit
SH-A1.2	-	-	S29°27'42.7"; E23°54'31.1"	
Type SH-A2	MSA & LSA	Lithic occurrence	-	Option A or Option B power line:
SH-A2.1	-	-	S29°28'04.4"; E23°54'25.1"	Phase 2 systematic surface collection & test pit(s) at 1 occurrence to precede development, done under SAHRA permit
SH-A2.2	-	-	S29°27'27.0"; E23°54'00.7"	
SH-A2.3	-	-	S29°26'52.0"; E23°54'32.1"	
Type SH-A3	MSA & LSA	Lithic occurrence	-	South Hydroelectric Power Site and Option A or Option B power line:
SH-A3.1	-	-	S29°26'44.5"; E23°55'07.0"	Phase 2 systematic surface collection & test pit(s) at 1 occurrence to precede development, done under SAHRA permit
SH-A3.2	-	-	S29°26'48.4"; E23°54'50.8"	
SH-A3.3	-	-	S29°27'33.7"; E23°54'34.8"	
SH-A3.4	-	-	S29°27'54.7"; E23°54'29.4"	
SH-A3.5	-	-	S29°27'12.1"; E23°54'11.8"	
A Phase 1 AIA to be done along the identified access road				
A Rock Art survey be conducted across affected farms				
A Phase 1 AIA to be done across the extent of the expected inundation levels				

Table 4: Development and Phase 1 AIA findings – co-ordinate details

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 SAHRA / an ASAPA accredited CRM archaeologist. Human remains confirmed younger than 60 years are to be reported directly to the nearest police station.

- 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).

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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. Kingdoms 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 indicate 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 breadth 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 microlithic 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 to 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 (stretching 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 as 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 continent's 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 33°S (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 30,000km². By the 1st millennium ivory and skins were already exported overseas, with sites like Sofala and Chibueni, Mozambique, 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 Bambandanyalo 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 topography 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 dolomite 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 tones 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

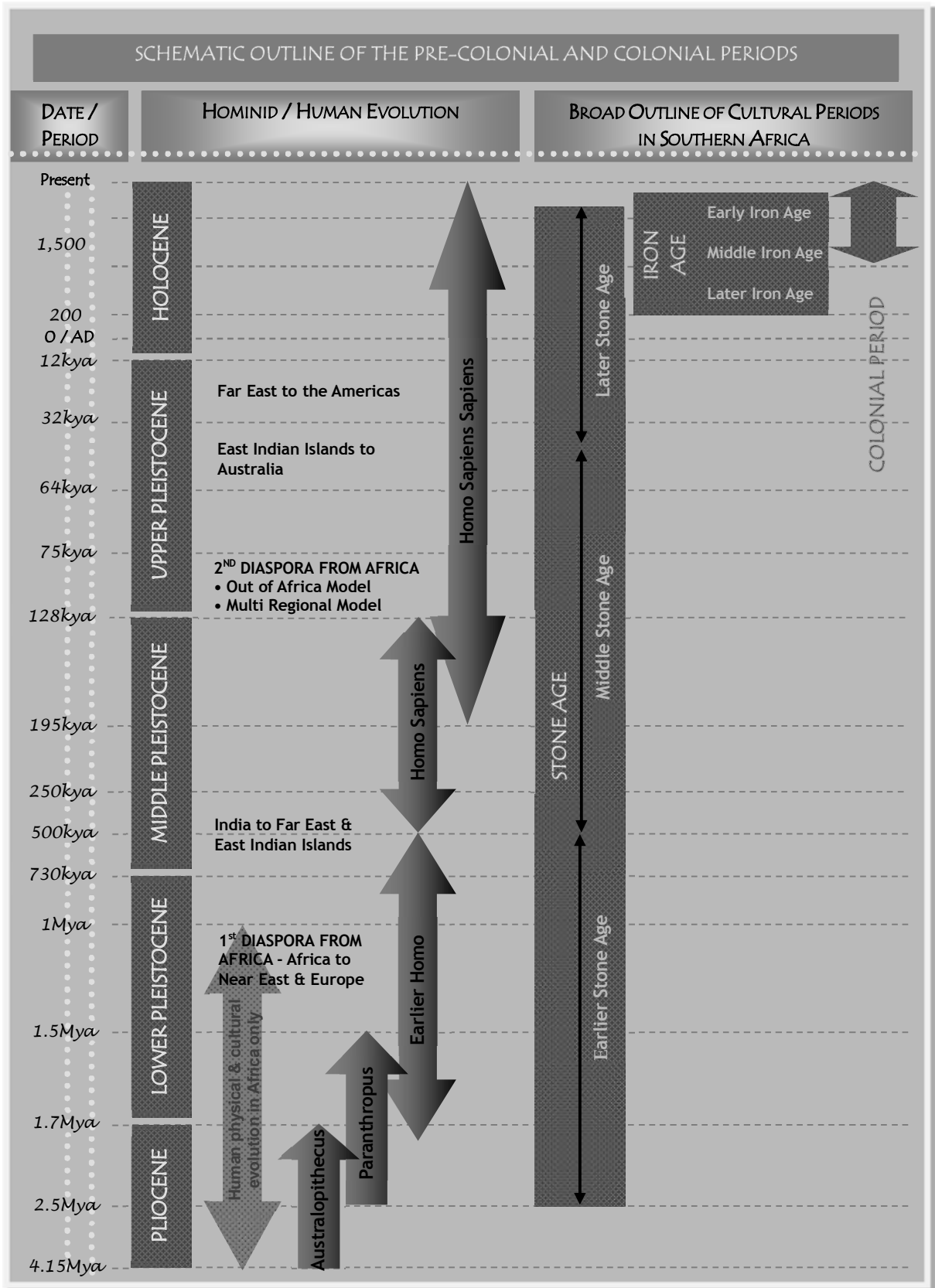
From the late 1600's conflict between migrants from the Cape (predominantly Boers) and Xhosa people in the region of the Fish River were strife, ultimately resulting in a series of 9 Frontier Wars (1702-1878) (Milton 1983). Both cultures were heavily based and reliant on agriculture and cattle farming. 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'.



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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 trace;
- 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, PALAEOLOGY 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 AND 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 –
- 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
 - 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

- Subject to the provisions of subsections 7), 8) and 9), any person who intends to undertake a development categorised as –
 - the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
 - the construction of a bridge or similar structure exceeding 50 m in length;
 - any development or other activity which will change the character of a site –
 - exceeding 5 000 m² in extent; or
 - involving three or more existing erven or subdivisions thereof; or
 - involving three or more erven or subdivisions thereof which have been consolidated within the past five years; or
 - the costs which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
 - the rezoning of a site exceeding 10 000 m² in extent; or
 - 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.
- The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection 1) –
 - 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
 - notify the person concerned that this section does not apply.
- The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection 2a) ...
- The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development decide –
 - whether or not the development may proceed;
 - any limitations or conditions to be applied to the development;
 - what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;
 - whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and
 - whether the appointment of specialists is required as a condition of approval of the proposal.

APPOINTMENT AND POWERS OF HERITAGE INSPECTORS

Section 50

- Subject to the provision of any other law, a heritage inspector or any other person authorised by a heritage resources authority in writing, may at all reasonable times enter upon any land or premises for the purpose of inspecting any heritage resource protected in terms of the provisions of this Act, or any other property in respect of which the heritage resources authority is exercising its functions and powers in terms of this Act, and may take photographs, make measurements and sketches and use any other means of recording information necessary for the purposes of this Act.
- A heritage inspector may at any time inspect work being done under a permit issued in terms of this Act and may for that purpose at all reasonable times enter any place protected in terms of this Act.
- Where a heritage inspector has reasonable grounds to suspect that an offence in terms of this Act has been, is being, or is about to be committed, the heritage inspector may with such assistance as he or she thinks necessary –
 - enter and search any place, premises, vehicle, vessel or craft, and for that purpose stop and detain any vehicle, vessel or craft, in or on which the heritage inspector believes, on reasonable grounds, there is evidence related to that offence;
 - confiscate and detain any heritage resource or evidence concerned with the commission of the offence pending any further order from the responsible heritage resources authority; and
 - take such action as is reasonably necessary to prevent the commission of an offence in terms of this Act.
- A heritage inspector may, if there is reason to believe that any work is being done or any action is being taken in contravention of this Act or the conditions of a permit issued in terms of this Act, order the immediate cessation of such work or action pending any further order from the responsible heritage resources authority.