

Phase 1 Archaeological Impact Assessment –

**Proposed Mixed Use Development (Jupiter Extension 8),
on Portion 2 of Farm Elandsfontein 90-IR, Germiston,
Ekurhuleni Metropolitan Municipality, Gauteng, South Africa**

- 5 January 2015 -

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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 –

- 5 January 2015 -

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**Proposed Mixed Use Development (Jupiter Extension 8),
 on Portion 2 of Farm Elandsfontein 90-IR, Germiston,
 Ekurhuleni Metropolitan Municipality, Gauteng, South Africa**

Executive Summary

Terms of Reference -

SEF have been appointed as independent EAP by the project proponent, Abland, to apply for EA, including an EIA and EMPr report, to the GDARD for the proposed mixed use / Industrial Zone 1 development, to be known as *Jupiter Extension 8*, Portion 2 of the Farm Elandsfontein 90-IR, Germiston, EMM, Gauteng. The *Jupiter Extension 8* development is situated at general development co-ordinate S26°12'44.1"; E28°08'25.0", with the study site comprising an approximate 20ha area. The proposed project entails the construction of various mixed used structural developments and associated rezoning applications as well as internal roads and necessary infrastructure to service the development.

ArchaeoMaps was appointed by SEF to coordinate the basic HIA for the development. The basic HIA comprises a Phase 1 AIA and in accordance with the SAHRIS palaeontological sensitivity map a '*palaeontological protocol for finds*' study. This report represents the Phase 1 AIA only, with findings and recommendations thereof to be included in the EIA and EMPr.

The Phase 1 Archaeological Impact Assessment -

Project Area: *Jupiter Extension 8*, Portion 2 of the Farm Elandsfontein 90-IR, Germiston, EMM, Gauteng [1:50,000 Map Ref – 2628AA].

Coverage & Gap Analysis: Pre-feasibility and field assessment.

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

Summary:

- o No archaeological or cultural heritage developmental 'fatal flaws' identified;
- o No archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, identified: Archaeological and cultural heritage concerns need not be taken into account in planning, final design or construction stages of development;
- o [Should any incidental archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, be encountered during the course of development the process described in the 'Protocol for Incidental Archaeological Finds' should be followed.]

Map Code	Site	Co-ordinates	Recommendations
Jupiter Extension 8, Gauteng			
-	Jupiter Extension 8	S26°12'44.1"; E28°08'25.0"	N/A

Recommendations –

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed mixed use / Industrial Zone 1 development, to be known as *Jupiter Extension 8*, Portion 2 of the Farm Elandsfontein 90-IR, Germiston, Ekurhuleni Metropolitan Municipality (EMM), Gauteng, proceeds as applied for without the developer having to comply with additional archaeological and cultural heritage compliance requirements.

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

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1 - Terms of Reference

Strategic Environmental Focus (Pty) Ltd (SEF) have been appointed as independent Environmental Assessment Practitioner (EAP) by the project proponent, Abland (Pty) Ltd (Abland) to apply for Environmental Authorization (EA), including an Environmental Impact Assessment (EIA) and Environmental Management Plan (EMPr) report, to the Gauteng Department of Agriculture and Rural Development (GDARD) for the proposed mixed use / Industrial Zone 1 development, to be known as *Jupiter Extension 8*, Portion 2 of the Farm Elandsfontein 90-IR, Germiston, Ekurhuleni Metropolitan Municipality (EMM), Gauteng. The *Jupiter Extension 8* development is situated at general development co-ordinate S26°12'44.1"; E28°08'25.0", with the study site comprising an approximate 20ha area. The proposed project entails the construction of various mixed used structural developments and associated rezoning applications as well as internal roads and necessary infrastructure to service the development.

ArchaeoMaps cc (ArchaeoMaps) was appointed by SEF to coordinate the basic Heritage Impact Assessment (HIA) for the development. The basic HIA comprises a Phase 1 Archaeological Impact Assessment (AIA) and in accordance with the SAHRIS palaeontological sensitivity map a '*palaeontological protocol for finds*' study.

This report represents the Phase 1 AIA only, with findings and recommendations thereof to be included in the EIA and EMPr. Terms of Reference (ToR) for the Phase 1 AIA, with specific reference to archaeological and basic cultural heritage compliance requirements are summarized as:

- Undertake a desktop study and field assessment to identify important archaeological and cultural heritage resources in the area. In particular identify:
 - Potential sites of archaeological and cultural heritage significance (GPS co-ordinates to be provided for planning purposes);
- Identify any potential 'fatal flaws' linked to the proposed development;
- Describe the findings of the study and their potential implications for the proposed project. This should include a description and assessment of the significance of the impacts of the proposed activities on the heritage resources; and
- Provide detailed guideline measures to manage any impacts, particularly during the construction phase but including the implementation phase, and an assessment of their likely effectiveness.

1.1.1) Development Location, Details and Impact

The proposed *Jupiter Extension 8* development, a mixed use / Industrial Zone 1 development, is situated on Portion 2 of the Farm Elandsfontein 90-IR, in Germiston, within the Ekurhuleni Metropolitan Municipal (EMM) area, Gauteng province [1:50,000 Map Ref – 2628AA]. The proposed development is to be situated at general development co-ordinate S26°12'44.1"; E28°08'25.0", with the study site comprising an approximate 20ha area (SEF 2014).

The proposed *Jupiter Extension 8* study site is undermined and has been used by Ergo Gold Mining (Pty) Ltd (Ergo Gold) for reprocessing of surface gold tailing retreatment by means of new technological processes. Mining operations are towards the final stages and upon completion Ergo Gold will initiate the application process for the Mining Closure Certificate to the Department of Mineral Resources (DMR). In the interim DMR has agreed, in accordance with the Germiston Town Planning Scheme and the Spatial Development Framework (SDF) that the end land use will be a mixed use / Industrial Zone 1 zoning; with the current zoning being listed as 'undetermined'. The proposed *Jupiter Extension 8* development is perceived to be a suitable and desirable alternative to mine rehabilitation for the following reasons (SEF 2014):

- Compatibility with surrounding land use and the SDF of the area;
- It will ensure long term and continuous environmental management.
- It will prevent possible illegal mining activities; and
- It will provide a positive contribution to the economy.

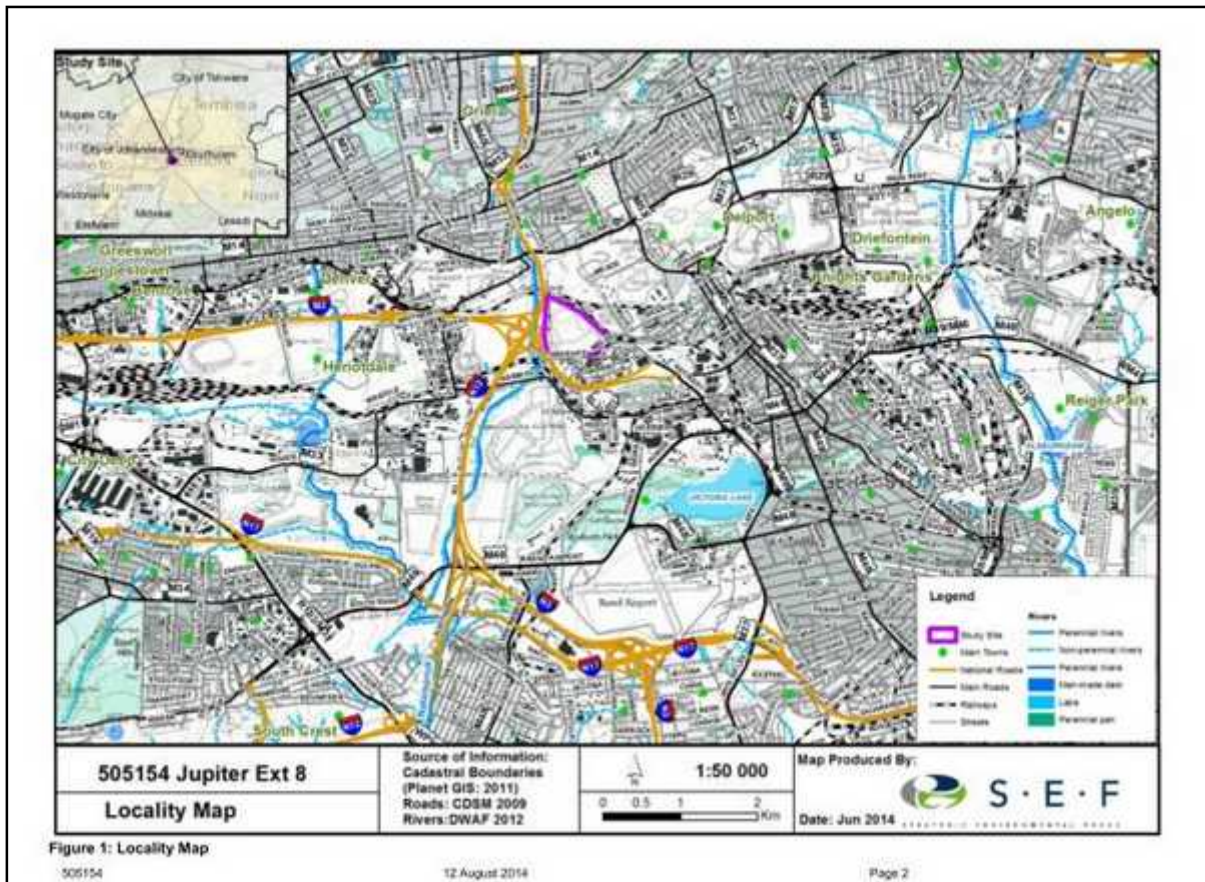
Surrounding land comprise primarily of built-up industrial areas and major roadways, including the N12 and M2. A railway line borders the northern, eastern and southern boundaries of the study site (SEF 2014).

The proposed *Jupiter Extension 8* development entails the construction of buildings, internal roads and necessary infrastructure to service the development. The proposal will comprise the following use zones (SEF 2014):

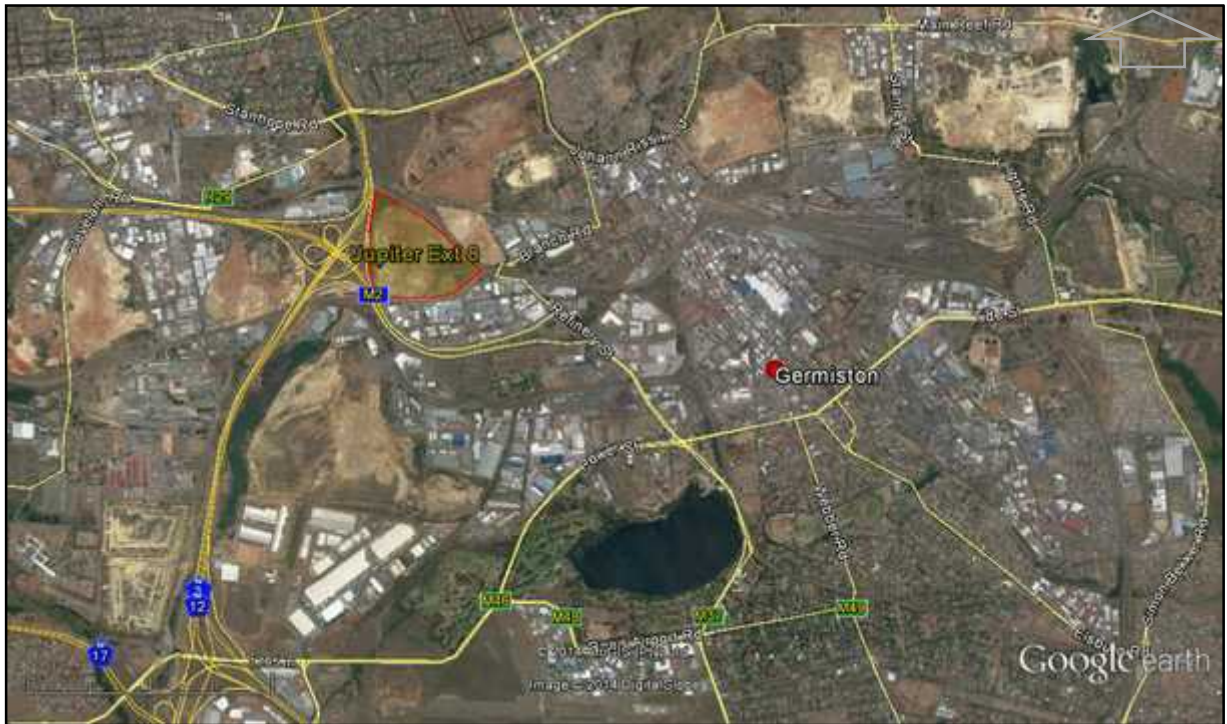
- Industrial Zone I; Commercial (including shops and offices); Conference facilities and restaurant; ‘Special’ for access; Public open space; and Roads.

Infrastructural and services specifics are defined as:

- Construction of internal roads; Construction and installation of stormwater infrastructure; and Upgrade of infrastructure for municipal water and sewerage services.



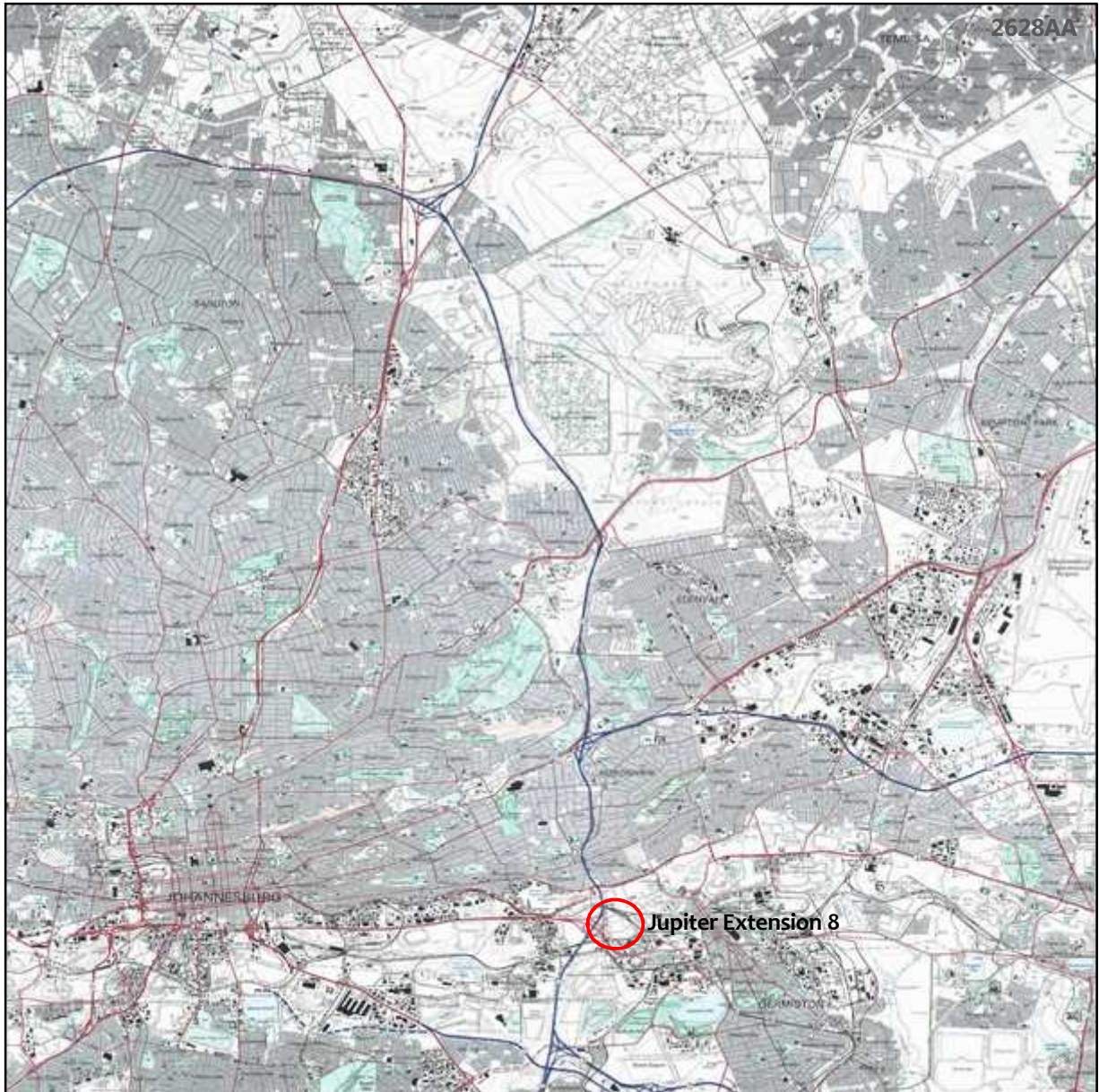
Map 1: Locality map – *Jupiter Extension 8*, Gauteng (courtesy SEF)



Map 2: General locality of the *Jupiter Extension 8* development, Ekurhuleni Metropolitan Municipality, Gauteng [1]



Map 3: General locality of the *Jupiter Extension 8* development, Ekurhuleni Metropolitan Municipality, Gauteng [2]



Map 4: Locality of the *Jupiter Extension 8* development, Ekurhuleni Metropolitan Municipality, Gauteng [1:50,000 Map Ref – 2628AA]

2 - The Phase 1 Archaeological Impact Assessment

2.1.1) Archaeological Legislative Compliance

The Phase 1 Archaeological Impact Assessment (AIA) for the proposed *Jupiter Extension 8*, Portion 2 of the Farm Elandsfontein 90-IR, Germiston, Ekurhuleni Metropolitan Municipality (EMM), Gauteng, was requested to meet the South African Heritage Resources Agency's (SAHRA) requirements with reference to archaeological and basic cultural heritage resources in terms of the National Heritage Resources Act, No 25 of 1999 (NHRA 1999), with specific reference to Section 38(1)(a), 38(1)(c)(i) and 38(1)(d).

NHRA 1999, Section 38	
1)	Subject to the provisions of subsections 7), 8) and 9), any person who intends to undertake a development categorized as –
a)	the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
b)	the construction of a bridge or similar structure exceeding 50 m in length;
c)	any development or other activity which will change the character of a site –
	i. exceeding 5 000 m² in extent; or
	ii. involving three or more existing erven or subdivisions thereof; or
	iii. involving three or more erven or subdivisions thereof which have been consolidated within the past five years; or
	iv. the costs which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
d)	the rezoning of a site exceeding 10 000 m² in extent; or
e)	any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,
	must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Table 1: Extracts from the NHRA 1999, Section 38

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

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

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

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

2.1.2) Methodology & Gap Analysis

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

- o The pre-feasibility assessment is based on the Appendix A introductory archaeological literature. In addition the SAHRA 2009 Mapping Project Database (MPD), SAHRIS and the SAHRA Database on declared Provincial Heritage Sites (PHS) – Gauteng, were consulted. The study excludes consultation of museum and university databases.
- o The field assessment was done over a 1 day period (2014-12-22) with fieldwork conducted by the author. 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 GPSmap 62s (Datum: WGS84). Photographic documentation was done with a Pentax K20D camera. A combination of Garmap and Google Earth software was used in the display of spatial information.

Archaeological and cultural heritage site 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 2: SAHRA archaeological and cultural heritage site significance assessment ratings and associated mitigation recommendations

2.1.3) Assessor Accreditation

Karen van Ryneveld (ArchaeoMaps):

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

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

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

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

2.2.1) Pre-feasibility Summary

Based on a basic introductory literature assessment of South African archaeology (See Appendices A and B) and background heritage database research, the probability of archaeological and cultural heritage sites situated within or in direct proximity to the *Jupiter Extension 8*, Germiston, study site can briefly be described as:

Archaeological and Basic Cultural Probability Assessment – <i>Jupiter Extension 8, Germiston, EMM, Gauteng</i>			
Primary Type / Period	Sub-Period	Sub-Period Type Site	Probability
EARLY HOMININ / HOMINID	-	-	Low
	Graves / Human remains: High scientific significance		
STONE AGE	Earlier Stone Age (ESA)		Low
	Middle Stone Age (MSA)		Low-Medium
	Later Stone Age (LSA)		Low
		Rock Art	None
		Shell Middens	None
	Graves / Human remains: ESA & MSA – High scientific significance; LSA – High scientific & social significance		
IRON AGE	Early Iron Age (EIA)		None
	Middle Iron Age (MIA)		None
	Later Iron Age (LIA)		Medium-High
	Graves & Human remains: EIA – High scientific & medium social significance; MIA & LIA: High scientific & social significance		
COLONIAL PERIOD	Colonial Period		High
		LSA – Colonial Period Contact	Low
		LIA – Colonial Period Contact	Medium
		Industrial Revolution	High
		Apartheid & Struggle	Medium-High
	Graves / Human Remains: Medium-high scientific & high social significance		

Table 3: Archaeological and basic cultural probability assessment

2.2.2) The SAHRA 2009 MPD & SAHRIS

A number of archaeological Cultural Resources Management (CRM) reports are recorded in the SAHRA 2009 Mapping Project Database (MPD), situated within an approximate 15km radius from the *Jupiter Extension 8* study site, listed as:

- Coetzee, F.P. (UNISA-ACO). 2006. *Assessment of Late Iron Age Settlements in the Rietvlei Nature Reserve, Rand Water Head Office, Klipriviersberg, Johannesburg.*
- Fourie, W. (Matakoma). 2006. *Heritage Impact Assessment: Albertsdal Extension 4 on Portions 35, 36 and 40 of the Farm Palmietfontein 141-IR, Gauteng Province.*
- Huffman, T.N. (WITS-ARM). 1999. *Archaeological Survey of Klipriviersberg Part One.*
- Huffman, T.N. (WITS-ARM). 2000. *Archaeological Survey of Roodekop Extension 6(1), Germiston.*
- Huffman, T.N. (WITS-ARM). 2002. *Archaeological Assessment of Stone-Walled Settlements on the Meyersdal Nature Estate, Klipriviersberg, Alberton.*
- Huffman, T.N. (WITS-ARM). 2005. *Archaeological Assessment of the Thubelisha Project, Boksburg.*
- Huffman, T.N. & Lathy, G. (WITS-ARM). 1998. *Archaeological Survey of the Kensington Golf Course, Johannesburg.*
- Kruger, N. & Schoeman, M.H. (Archaic Heritage). 2006. *Phase 1 Sub-surface Investigation – Archaeological Project Report – Old Johannesburg Fort.*
- Pistorius, J.C.C. (Private). 2003. *A Heritage Impact Assessment (HIA) Study for Cell 13 on Portion 66 of the Farm Modderfontein 35-IR in the Gauteng Province of South Africa.*
- Schoeman, M.H. & Van Doornum, B. (WITS-ARM). 2001. *Archaeological Assessment of the Abrahamson Cemetery, Boksburg.*

- Van der Walt, J. (WITS-HCU). 2008. *An Archaeological Impact Assessment for the Proposed Oosrand Secondary School, Reiger Park Extension, Gauteng Province.*
- Van Schalkwyk, J.A. (Natural Cultural History Museum). 2004. *Heritage Impact Assessment: Vosloorus Ext. 24.*
- Van Schalkwyk, J.A. (Natural Cultural History Museum). 2008. *Heritage Impact Survey Report for the Proposed Development on Portion 25 of the Farm Elandsfontein 107-IR, Johannesburg Magisterial District.*
- Van Schalkwyk, J.A. & Naude, M. (Natural Cultural History Museum). 1995. *A Survey of Cultural Resources along the Proposed PWV 16 Road Corridor, Brakpan District.*
- Van Schalkwyk, J.A. & Pelser, A.J. (Natural Cultural History Museum). 1999. *A Survey of Cultural Resources in the Kliprivierberg Nature Reserve, Johannesburg District.*

Nine cases are recorded on SAHRIS, situated within the 15km radius from the *Jupiter Extension 8* study site, with some of the development types exempted from heritage requirements, while others are recent Notifications of Intent to Develop (NID's), with related heritage assessment reports still pending submission on SAHRIS (including SAHRIS CaseID's 706, 954, 4221, 5094, 5955 and 6514). Four SAHRIS cases include archaeological CRM reports on the projects, being SAHRIS CaseID's 363, 1221, 5324 and 5748, with information contained therein serving to better describe the greater receiving archaeological environment of the *Jupiter Extension 8* study site. Reports are listed as:

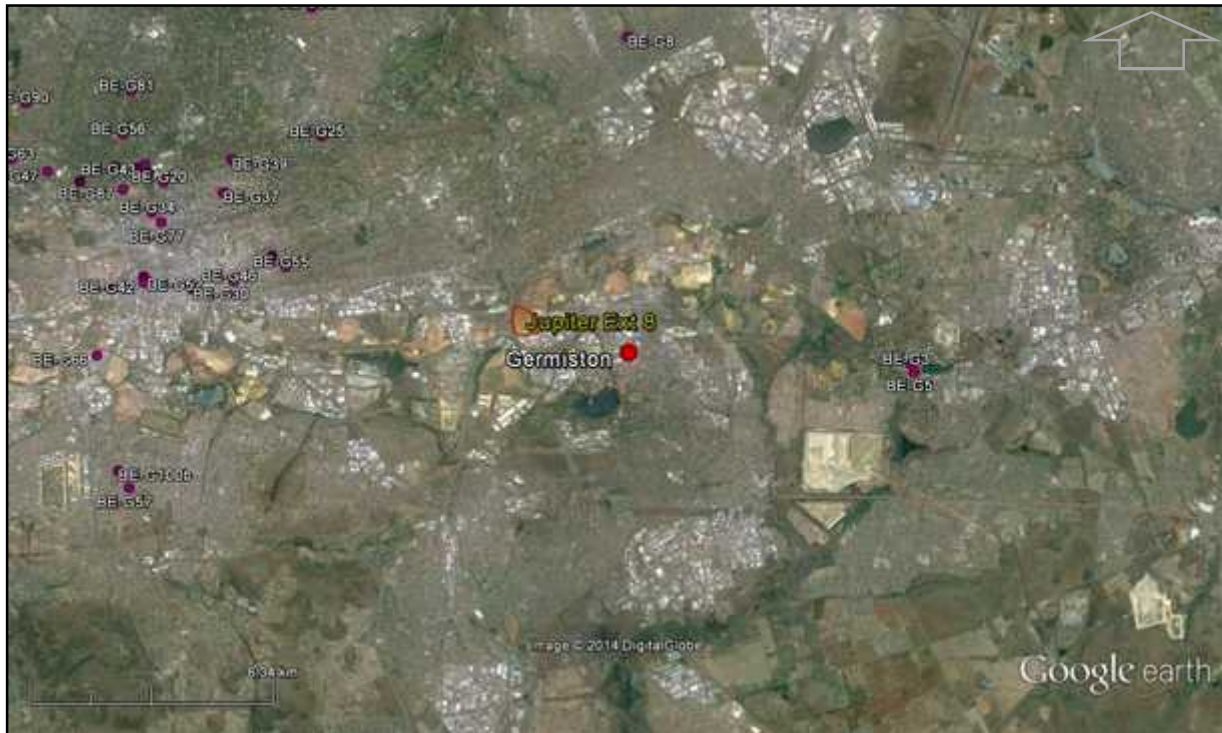
- Birkholtz, P.D. (PGS). 2011. *Phase 1 Heritage Impact Assessment – Proposed Development of Rieger Park Ext 16, Boksburg, Ekurhuleni Metropolitan Municipality, Gauteng Province.* [SAHRIS CaseID 363].
- Du Piesanie, J. & Nel, J. (Digby Wells). 2014. Notification of Intent to Develop. *Basic Assessment for the Construction of a Pipeline Associated with the Rondebult Wastewater Treatment Plant.* [SAHRIS CaseID 5748].
- Fourie, W. (PGS). 2014. *Request for Exemption from Archaeological Impact Study: Prevention of Water Ingress into Mined Out Areas of the Witwatersrand Mining Basin, Gauteng Province.* [SAHRIS caseID 5327].
- Karodia, S., Du Piesanie, J., Nel, J. & Beringer, G. (Digby Wells). 2012. *Heritage Statement for the Central Basin, Witwatersrand AMD Project.* [SAHRIS CaseID 1221].

2.2.3) SAHRA Provincial Heritage Site Database – Gauteng

Georeferenced declared Provincial Heritage Sites (PHS) recorded in the SAHRA – Gauteng database indicate a spatial display focusing on the majority of these sites situated towards the west north-west of Germiston. The database however list 2 non-georeferenced sites in Germiston (en.wikipedia.org/wiki/List_of_heritage_sites_in_Gauteng).

Declared Provincial Heritage Sites – Gauteng					
Map Ref	Identifier	Site Name	Town	NHRA status	Coordinates
BE-G9	9/2/223/0004	Simmer and Jack Mine Houses, Main Reef Road, Germiston	Germiston	Provisional Protection	-
BE-G10	9/2/223/0011	St Andrew's Presbyterian Church, F H Odendaal Street, Germiston [Established – 1890; Architectural style: Neo-Gothic]	Germiston	Provincial Heritage Site	-

Table 4: Declared Provincial Heritage Sites in relation to the study site



Map 5: Georeferenced Provincial Heritage Sites (PHS) situated within a rough 8-15km radius from the *Jupiter Extension 8* study site

2.2.4) General Discussion

Stone Age records seem to have a secondary presence in archaeological CRM reports despite the fact that the range of broad temporal Industries have been reported on. Fourie (2006) reported on a lag Earlier (ESA) and Middle Stone Age (MSA) deposit at Albertsdal, Palmietfontein, while Huffman (2000) commented on the widespread presence of surface MSA occurrences at Roodekop, Germiston, with at least 1 significant MSA site with fairly substantial stratigraphic depth recorded. In addition the Roodekop survey yielded 2 ESA sites as well as mixed MSA / Later Stone Age (LSA) occurrences. MSA and LSA lithic occurrences were also reported on from the Klipriviersberg Nature Reserve (Van Schalkwyk & Pelsler 1999).

Iron Age records are limited to the Later Iron Age (LIA), with the vast number of reported sites further defining LIA activity and specifically indigenous socio-political complexity of the greater terrain. Huffman (1999, 2002) identified 3 basic types of LIA sites, all being Stone Settlement type sites of the Central Cattle Pattern (CCP), namely:

1. Group I: Associated with the southern Sotho-Tswana (BaFokeng) and dating roughly to the period AD1500-1650 (Type N settlement; circular periphery stone walls);
2. Group II: Associated with the western Sotho-Tswana (BaKwena, variation by BaRolong) and dating roughly to the period AD1650-1820 (scalloped periphery stone walls); and
3. Group III: Associated with the southern Sotho-Tswana (BaFokeng) and dating roughly to the period AD1650-1820 (Type N settlement; circular periphery stone walls, but larger and more complex than Group I).

According to Huffman (1999, 2002) Type III sites dominate the Klipriviersberg Nature Reserve area, with a few Group II sites identified. Many a Group I site have been identified, but largely impacted on by later LIA cultural overlay, mainly by Group III sites. Both Group II and Group III sites are inferred to have been abandoned in the 1820's when Mzilikazi conquered the area. Records of Group II and Group III Stone Settlement sites are complemented by single homestead and cattle outpost sites. At least 3 additional cattle outpost sites, also situated in the Klipriviersberg Nature Reserve were reported on by Coetzee (2006).

The Colonial Period history of the greater area dominates the archaeological CRM record: European settlers first arrived on the Highveld during the 'Great Trek' of 1838, making for a sparsely scattered, farming population. This essential rural farming cultural landscape was to be forever transformed with the discovery of gold, by amongst others, George Harrison at Ferreira's Camp on the Farm Langlaagte, 1886 (Du Piesanie & Nel 2014).

1886 Also saw the discovery of gold by John Jack, originally from the Glasgow area, Scotland and August Simmer, from Vacha, Germany on the Farm Elandsfontein. In September 1886 they bought the property from then owner Sarel Meyer, established the company 'The Simmer & Jack Gold Mining Co. Ltd' and started mining in 1887. In 1889 Jack and the Scottish chemist John MacArthur developed the 'cyanide-process', a smelting process that transformed the gold mining industry (de.wikipedia.org/wiki/Simmer_and_Jack). In 1905 Germiston was established on Elandsfontein, named after the farm Germiston, Glasgow, where Jack had spent his childhood years. By 1921 the mine was the worlds' largest refinery (www.gautenghappenings.co.za/germiston_homepage.htm) and as early as 1924 Johannesburg Stock Exchange (JSE) listed (www.moneyweb.co.za/moneyweb-mining/grand-ladies-of-the-jse-delist), with the company name changed to 'Simmer & Jack Mines Ltd'. 'Simmer & Jack Mines Ltd' was officially closed in 1969 (de.wikipedia.org/wiki/Simmer_and_Jack).



Plate 1: August Simmer (left) and John Jack (right), 1889 (de.wikipedia.org/wiki/Simmer_and_Jack)



Plate 2: 'The Simmer & Jack Gold Mining Co. Ltd' plant, Elandsfontein, 1895 (de.wikipedia.org/wiki/Simmer_and_Jack)

Many a Colonial Period site or feature have been reported on in archaeological CRM reports, including rectangular stone walled structures and an old mining trench (Huffman 1999), Colonial Period middens (Huffman 2000, Huffman & Lathy 1998) and general farmstead remains (Fourie 2006, Van Schalkwyk & Pelsler 1999). Records often pertain to the mining history, including the old Vlaktefontein village and hostel with remains of the original mine still in-tact (Van Schalkwyk & Naude 1995), a fairly contemporary 1950's-1960's reduction facility (Birkholtz 2011) and a number of residential and industrial structures dating to the 1970's and thereafter (Karodia *et. al.* 2012).

The work by Kruger & Schoeman (2006) at the Old Johannesburg Fort, Hospital Hill, Braamfontein, allows a glimpse into the late 19th Century cultural environment. Following the discovery of gold and the resultant gold rush the population of the Witwatersrand exploded. In 1892 Paul Kruger, President of the then Zuid Afrikaanse Republiek (ZAR) sanctioned the construction of the 1st high security prison in Johannesburg. The prison was opened to white prisoners in 1893 and the year thereafter to Black prisoners. In 1896-1899 an old Fort was built around the prison. In 1910 a women's prison was added. The old prison and Fort was declared a National Monument in 1964, under the National Monuments Act, No 28 of 1969 (NMA 1969). 1983 saw all prisoners transferred to the Diepkloof prison while the heritage significance of the structure was hailed in 1996 when the complex became the temporary offices of the Interim Democratic Constitution.

The discovery of gold and the mineral wealth of the Witwatersrand had also been indirectly responsible for the Jameson Invasion (29 December 1895 – 2 January 1896) of the ZAR and the outbreak of 2nd Anglo-Boer War (1899-1902). Pistorius (2003) reported on 2 British shooting ranges situated on the Farm Modderfontein, the history and context of which is closely tied to the development of the explosive industry, an industrial development with its roots nestled in the gold mining industry. Modderfontein was the location of the 1st commercial explosive industry in South Africa. The factory, the '*De Zuid Afrikaanse Fabrieken voor Ontplofbare Stoffen Beperkt*', commonly known as the '*Dinamietmaatkappy*' was officially opened by President Paul Kruger in 1896, a company that became the biggest provider of commercial explosives in the world. After the Jameson Raid and the 2nd World War, the company, then in British hands (1902) was reestablished as the '*British-South African Explosives Company*', with the Baden-Powell Constabulary at the time also based on Modderfontein. In 1944 the company name was changed to '*African Explosives and Chemical Industries*' (AECI).

Coetzee (2006) reported on graves in direct association with a LIA site. Fourie (2014) and Karodia *et. al.* (2012) warns against the possibility of graves being encountered during the course of development and Du Piesanie & Nel (2014) commented on proximity of the South Park Cemetery to the Rondebult pipeline alignment.

Van Schalkwyk & Pelsler (1999) highlighted contemporary spiritual sites and continuing use thereof by indigenous groups in the Klipriviersberg Nature Reserve, while Huffman (2000) reported on similar spiritual living heritage sites from Roodekop, Germiston.

No archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, were identified during the archaeological field assessment of the *Jupiter Extension 8*, Germiston, study site. The site is characterized by silt tailings, mine dumps, scraped surfaces, artificial wetlands and low level infrastructural development including primarily gravel access roads. Three (3) contemporary structures or areas of informal, temporary, contemporary structural evidence are present on site. All of these identified areas post-date 60 years of age, implying that they are not formally protected by the NHRA 1999 – impact thereon or destruction thereof for purposes of the *Jupiter Extension 8* development is not subject to SAHRA / G-PHRA permit requirements. Brief description of these areas however serves to further describe the then contemporary receiving cultural landscape of the study site, including:

- C1 – (~S26°12'32.9"; E28°08'20.7"): C1 comprises a temporary demarcated area containing temporary offices and mining equipment.
- C2 – (~S26°12'51.3"; E28°08'17.6"): C2 constitutes a small zinc structure, inferred to be an on-site guard house.
- C3 – (~S26°12'51.5"; E28°08'36.8"): C3 comprises a brick and cement, approximate 1.5x1.5m rising to approximately 60cm high infrastructural structure, situated adjacent to the access road.

[Based on the findings of the surface assessment it can reasonably be inferred that it is highly unlikely that archaeological and cultural heritage resources, as defined and protected by the NHRA 1999, will be encountered during the course of construction. However, in the unlikely event of such resources being identified, sound protocol regarding their discovery would be imperative to ensure proper management, be it either the conservation or mitigation thereof.]



Map 6: Results of the Jupiter Extension 8, Germiston, archaeological field assessment (tracklog – white)



Plate 3: General view of the *Jupiter Extension 8* study site [1]



Plate 5: View of the *Jupiter Extension 8* study site, with the C1 temporary structures in the background



Plate 4: General view of the *Jupiter Extension 8* study site [2]



Plate 6: View of the *Jupiter Extension 8* study site in the vicinity of C2



Plate 7: General view of the *Jupiter Extension 8* study site [3]



Plate 9: General view of the *Jupiter Extension 8* study site [4]



Plate 8: View of the *Jupiter Extension 8* study site with neighboring development in the background



Plate 10: General view of the *Jupiter Extension 8* study site [5]

3 - Environmental Impact Assessment Rating

Identified archaeological and cultural heritage sites are ascribed an Environmental Impact Assessment (EIA) rating, based on the extent or spatial scale of the impact [E] (0 = None, 1 = Site specific, 2 = Local, 3 = Regional, 4 = National and 5 = International), the magnitude of the impact, positive or negative [M+ / M-] (0 = Zero, 2 = Very low, 4 = Low, 8 = High and 10 = Very high), the duration of the impact [D] (1 = Immediate, 2 = Short term, 3 = Medium term, 4 = Long term and 5 = Permanent), the probability of the occurrence [P] (1 = Improbable, 2 = Low probability, 3 = Medium probability, 4 = High probability and 5 = Definite), the irreplaceable loss of resources [I] (0 = None; 1 = Very low, 2 = Low, 3 = Moderate, 4 = High, 5 = Definite), the reversibility of potential impacts [R] (0 = No impact, 1 = Impact will be reversible; 2 = High potential for reversibility; 3 = Moderate potential for reversibility; 4 = Low potential for reversibility; 5 = Impact cannot be reversed) and cumulative impact (None, Low, Medium and High). A site significance point [SP] is assigned as follows:

- o $SP = (M + D + E + I + R) \times P.$

A maximum of 150 SP can be assigned to an impact. Environmental Significance [S] is assigned based on the SP as follows:

- o $<40 = \text{Low [L]}$;
- o $40-74 = \text{Medium [M]}$;
- o $75-99 = \text{Medium-High [MH]}$;
- o $100-124 = \text{High [H]}$; and
- o $125-150 = \text{Very High [H]}$.

The significance can be either positive [+] or negative [-]. An impact of low [L] is likely to contribute to either + or - decisions about whether or not to proceed with the development, with little real effect and is unlikely to have an influence on project design or alternative motivation. An impact of M implies that if unmanaged could influence a decision on whether or not to proceed with development. An impact of MH is similar to M, with caution to mitigation options and alternative mitigation options should be investigated where possible. An impact of H could influence a decision about whether or not to proceed with development, regardless of available mitigation options and an impact of VH implies that a project cannot proceed and that impacts are irreversible, regardless of available mitigation options.

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

Environmental Impact	Site Number	Environmental Significance																	
		Before Mitigation									After mitigation								
		M	D	E	I	R	P	SP	S	C	M	D	E	I	R	P	SP	S	C
N/A	Sites: N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Comment: N/A																			
Summary of mitigation points: N/A																			

Table 5: Environmental significance assessment of identified archaeological and cultural heritage sites at the *Jupiter Extension 8*, Germiston, study site – Not applicable

4 - Recommendations

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed mixed use / Industrial Zone 1 development, to be known as *Jupiter Extension 8*, Portion 2 of the Farm Elandsfontein 90-IR, Germiston, Ekurhuleni Metropolitan Municipality (EMM), Gauteng, proceeds as applied for without the developer having to comply with additional archaeological and cultural heritage compliance requirements.

- No archaeological or cultural heritage developmental 'fatal flaws' identified;
- No archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, identified: Archaeological and cultural heritage concerns need not be taken into account in planning, final design or construction stages of development;
- [Should any incidental archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, be encountered during the course of development the process described in the 'Protocol for Incidental Archaeological Finds' should be followed.]

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

<i>Jupiter Extension 8, Farm Elandsfontein 90-IR, Germiston, EMM, Gauteng</i>			
Map Code	Site	Co-ordinates	Recommendations
<i>Jupiter Extension 8, Gauteng</i>			
-	Jupiter Extension 8	S26°12'44.1"; E28°08'25.0"	N/A

Table 6: Archaeological and cultural heritage compliance summary for the proposed *Jupiter Extension 8* development, Gauteng

Notes:

- 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 assessment process.

5 - Protocol for Incidental Archaeological Finds

Should any archaeological or cultural heritage resources¹, including human remains / graves², as defined and protected by the NHRA 1999 and other relevant legislation, and not reported on in this report be identified during the course of development it is recommended that the process described below be followed.

Simplified guide to the identification of archaeological sites:

- ❖ **Stone Age** – Knapped stone display flakes that appear unnatural and may result in similar type ‘shaped’ stones often concentrated in clusters or forming a distinct layer in the geological stratigraphy. ESA shapes may represent ‘pear’ or oval shaped stones, often in the region of 10cm in length or larger. Typical MSA types include blade-like or triangular shaped stones often associated with randomly shaped stones that display use or edge-wear around the rim of the artefact. LSA types may well be small, informally shaped stones, often associated with bone, pieces of charcoal and in cases ceramic shards.
 - Rock Art** – Includes both painted and engraves images.
 - Shell Middens** – Include compact shell lenses that may be quite extensive in size or small ephemeral scatters of shell food remains, often associated with LSA artefact remains, but may also be of MSA and Iron Age cultural association.
- ❖ **Iron Age** – Iron Age sites are often characterized by stone features, i.e. the remains of former livestock enclosures or typical household remains, huts are often identified by either mound or depression hollows. Typical artefacts include ceramic remains, farming equipment, beads and trade goods, metal artefacts (including jewelry) etc. Remains of the ‘Struggle’ – events, histories and landmarks associated therewith are often, based on cultural association, classed as part of the Iron Age heritage of South Africa.
- ❖ **Colonial Period** – Built environment remains, either urban or rural, are of a western cultural affiliation with typical artefacts representing early western culture, including typical household remains, trade and manufactured goods, such as old bottles, porcelain and metal artefacts. War memorial remains including the vast array of associated graves and the history of the Industrial Revolution form important parts of South Africa’s Colonial Period heritage.

5.1.1) On-Site and Project Management Protocol for Incidental Archaeological Finds

On-site Reporting Process:

1. The identifier should immediately notify his / her supervisor of the find.
2. The identifier’s supervisor should immediately (and within 24 hours after reporting by the identifier) report the incident to the on-site SHE / SHEQ officer.
3. The on-site SHE / SHEQ officer should immediately (and within 24 hours after reporting by the relevant supervisor) report the incident to the appointed ECO officer. [Should the find relate to human remains the SHE / SHEQ officer should immediately notify the nearest SAPS station informing them of the find].
4. The ECO officer should ensure that the find is within 72 hours after the SHE / SHEQ officers report reported on SAHRIS and that an ASAPA accredited CRM archaeologist is contacted to make arrangements for an archaeological site inspection. [Should the find relate to human remains the ECO officer should ensure that the archaeological site inspection coincides with a SAPS site inspection, to verify if the find is of forensic, authentic (informal / older than 60 years), or archaeological (older than 100 years) origin].

¹ National Heritage Resources Act, Act No 25 of 1999 (NHRA 1999 and associated Regulations).

² Removal of Graves and Dead Bodies Ordinance, Ordinance No 7 of 1925 (RGDBO 1925);
Ordinance on Exhumations, Ordinance No 12 of 1980 (OE 1980);
Human Tissues Act, No 65 of 1983 (HTA 1983);
National Heritage Resources Act, No 25 of 1999 (NHRA 1999 and associated Regulations);
National Health Act, No 61 of 2003 (NHA 2003 and associated Regulations).

5. The appointed archaeologist should compile an 'archaeological site inspection' report based on the site specific findings. The site inspection report should make recommendations for the destruction, conservation or mitigation of the find and prescribe a recommended way forward for development. The 'archaeological site inspection' report should be submitted to the ECO, who should ensure submission thereof on SAHRIS.
6. SAHRA / the relevant PHRA will state legal requirements for development to proceed in the SAHRA / PHRA Comment on the 'archaeological site inspection' report.
7. The developer should proceed with implementation of the SAHRA / PHRA Comment requirements. SAHRA / PHRA Comment requirements may well stipulate permit specifications for development to proceed.
 - o Should permit specifications stipulate further Phase 2 archaeological investigation (including grave mitigation) a suitably ASAPA CRM accredited archaeologist should be appointed to conduct the work according to the applicable SAHRA / PHRA process. The archaeologist should apply for the permit. Upon issue of the SAHRA / PHRA permit the Phase 2 archaeological mitigation program may commence.
 - o Should permit specifications stipulate destruction of the find under a SAHRA / PHRA permit the developer should immediately proceed with the permit application. Upon the issue of the SAHRA / PHRA permit the developer may legally proceed with destruction of the archaeological or cultural heritage resource.
 - o Upon completion of the Phase 2 archaeological mitigation program the archaeologist will submit a Phase 2 report to the ECO, who should in turn ensure submission thereof on SAHRIS. Report recommendations may include that the remainder of an archaeological site be destroyed under a SAHRA / PHRA permit.
 - o Should the find relate to human remains of forensic origin the matter will be directly addressed by the SAPS: A SAHRA / PHRA permit will not be applicable.

NOTE: Note that SAHRA / PHRA permit and process requirements relating to the mitigation of human remains requires suitable advertising of the find, a consultation, mitigation and re-internment / deposition process.

Duties of the Supervisor:

1. The supervisor should immediately upon reporting by the identifier ensure that all work in the vicinity of the find is ceased.
2. The supervisor should ensure that the location of the find is immediately secured (and within 12 hours of reporting by the identifier), by means of a temporary conservation fence (construction netting) allowing for a 5-10m heritage conservation buffer zone around the find. The temporary conserved area should be sign-posted as a 'No Entry – Heritage Site' zone.
3. Where development has impacted on the resource, no attempt should be made to remove artefacts / objects / remains further from their context, and artefacts / objects / remains that have been removed should be collected and placed within the conservation area or kept for safekeeping with the SHE / SHEQ officer. It is imperative that where development has impacted on archaeological and cultural heritage resources the context of the find be preserved as good as possible for interpretive and sample testing purposes.
4. The supervisor should record the name, company and capacity of the identifier and compile a brief report describing the events surrounding the find. The report should be submitted to the SHE / SHEQ officer at the time of the incident report.

Duties of the SHE / SHEQ Officer:

1. The SHE / SHEQ officer should ensure that the location of the find is recorded with a GPS. A photographic record of the find (including implementation of temporary conservation measures) should be compiled. Where relevant a scale bar or object that can indicate scale should be inserted in photographs for interpretive purposes.
2. The SHE / SHEQ officer should ensure that the supervisors report, GPS co-ordinate and photographic record of the find be submitted to the ECO officer. [Should the find relate to human remains the SHE / SHEQ officer should ensure that the mentioned reporting be made available to the SAPS at the time of the incident report].
3. Any retrieved artefacts / objects / remains should, in consultation with the ECO officer, be deposited in a safe place (preferably on-site) for safekeeping.

Duties of the ECO officer:

1. The ECO officer should ensure that the incident is reported on SAHRIS. (The ECO officer should ensure that he / she is registered on the relevant SAHRIS case with SAHRIS authorship to the case at the time of appointment to enable heritage reporting].
2. The ECO officer should ensure that the incident report is forwarded to the archaeologist for interpretive purposes at his / her soonest opportunity and prior to the archaeological site inspection.
3. The ECO officer should facilitate appointment of the archaeologist by the developer / construction consultant for the archaeological site inspection.
4. The ECO officer should facilitate access by the archaeologist to any retrieved artefacts / objects / remains that have been kept in safekeeping.
5. The ECO officer should facilitate coordination of the archaeological site inspection and the SAPS site inspection in the event of a human remains incident report.
6. The ECO officer should facilitate archaeological reporting and heritage compliance requirements by SAHRA / the relevant PHRA, between the developer / construction consultant, the archaeologist, the SHE / SHEQ officer (where relevant) and the SAPS (where relevant).

Duties of the Developer / Construction Consultant:

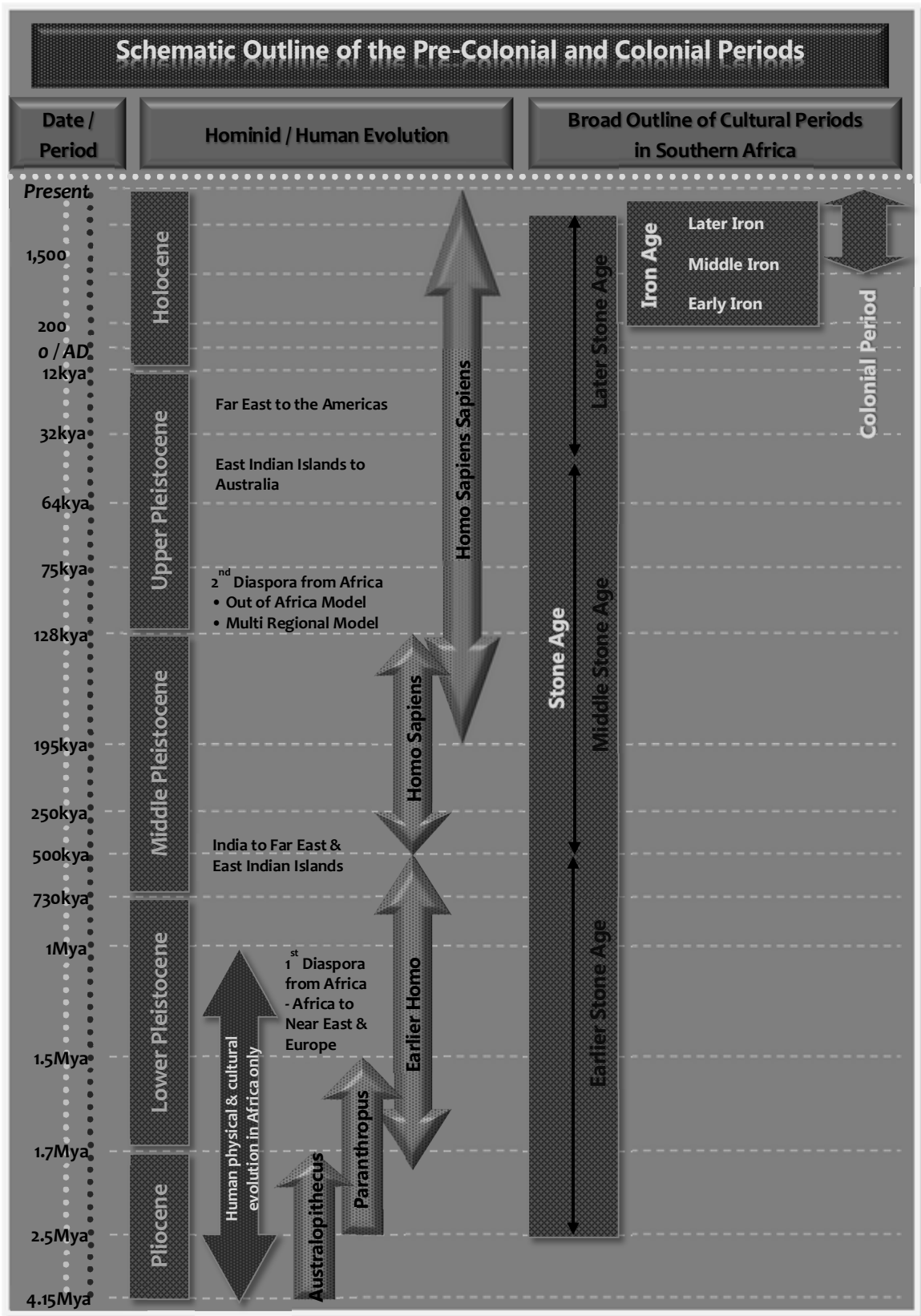
The developer / construction consultant should ensure that an adequate heritage contingency budget is accommodated within the project budget to facilitate and streamline the heritage compliance process in the event of identification of incidental archaeological and cultural heritage resources during the course of development, including as a norm during vegetation clearing, surface scraping, trenching and excavation phases, when resources not visible at the time of the surface assessment may well be exposed.

6 - Acronyms and Abbreviations

AD	: Anno Domini (the year 0.)
AIA	: Archaeological Impact Assessment
AMAFA	: Amafa aKwaZulu-Natali
ASAPA	: Association of Southern African Professional Archaeologists
BAR	: Basic Assessment Report
BC	: Before the Birth of Christ (the year 0.)
BCE	: Before the Common Era (the year 0.)
BIA	: Basic Impact Assessment
BID	: Background Information Document
BP	: Before the Present (the year 1950.)
cm	: Centimeter
CRM	: Cultural Resources Management
DAC	: Department of Arts and Culture
DEAT	: Department of Environmental Affairs and Tourism
DEDEAT	: Department of Economic Development, Environmental Affairs and Tourism
DME	: Department of Minerals and Energy
DSACR	: Department of Sport, Arts, Culture and Recreation
ECO	: Environmental Control Officer
EAP	: Environmental Assessment Practitioner
EC PHRA	: Eastern Cape Provincial Heritage Resources Authority
EIA	: Environmental Impact Assessment
EIA ₁	: Early Iron Age
EMPr	: Environmental Management Plan report
ESA	: Earlier Stone Age
ha	: Hectare
HIA	: Heritage Impact Assessment
HWC	: Heritage Western Cape
HCMP	: Heritage Conservation Management Plan
ICOMOS	: International Council on Monuments and Sites
IEM	: Integrated Environmental Management
km	: Kilometer
Kya	: Thousands of years ago
LIA	: Later Iron Age
LSA	: Later Stone Age
m	: Meter
m ²	: Square Meter
MIA	: Middle Iron Age
mm	: Millimeter
MPRDA (2002)	: Mineral and Petroleum Resources Development Act, No 28 of 2002
MSA	: Middle Stone Age
Mya	: Millions of years ago
NEMA (1998)	: National Environmental Management Act, No 107 of 1998
NHRA (1999)	: National Heritage Resources Act, No 25 of 1999
PIA	: Palaeontological Impact Assessment
PHRA	: Provincial Heritage Resources Authority
PSSA	: Palaeontological Society of South Africa
PPP	: Public Participation Process
SAHRA	: South African Heritage Resources Agency
SAHRIS	: South African Heritage Resources Information System
ScIA	: Socio-cultural Impact Assessment
SIA	: Social Impact Assessment

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Appendix B:

Introduction to the Archaeology of South Africa

Archaeologically the southern African cultural environment is roughly divided into the Stone Age, the Iron Age and the Colonial Period, including its subsequent Industrial component. This cultural division has a rough temporal association beginning with the Stone Age, followed by the Iron Age and the Colonial Period. The division is based on the identified primary technology used. The hunter-gatherer lifestyle of the Stone Age is identified in the archaeological record through stone being the primary raw material used to produce tools. Iron Age people, known for their skill to work iron and other metal, also practiced agriculture and animal husbandry. 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, Ndongonwane 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 Kgotpolwe 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 S33° (Maggs 1994); sites such as Canasta Place (800AD), Eastern Cape, mark the southern-most limit of Early Iron Age settlement (Nogwaza 1994).

➤ The Central Cattle Pattern

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

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

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

3.2) The Middle Iron Age

The hiatus of South African Middle Iron Age activity was centered in the Shashe-Limpopo Valley and characterized by the 5-tier hierarchical Mapungubwe State spanning some 30,000km². 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 typography remains unclear. The midden, the size of which may reflect the status of the settlement's ruler, engulfed the byre around 1060-1080AD, necessitating relocation of the cattle previously kept there. The re-organization of space and worldview implied suggests profound social changes even before the sites' abandonment in the early 13th century, when the focus of occupation moved to Mapungubwe Hill, 1 km away (Huffman 1998).

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

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

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

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

3.3) The Later Iron Age

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

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

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

From 1,300AD there is increasing evidence for the beginning of agro-pastoralist expansion considerably beyond the area of previous occupation. It is also to this time that the genealogies of several contemporary Bantu speaking groups can be traced (Wilson & Thompson 1969). Associated with this expansion was the regular employment of stone, rather than wood, as building material, an adaptation that has greatly facilitated the discovery and identification of settlements. Maggs (1976) describes 4 basic settlement types all characterized by the use of semi weathered 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 tons of ivory were exported annually from 1750-1790. As elephant populations declined, competition increased both for them and for the post 1790 supply of food to European and American whalers calling at Delagoa Bay (Smith 1970). Cattle raiding, conflict over land and changes in climatic and subsistence strategies characterized much of the cultural landscape of the time.

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

4) The Colonial Period

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

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

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

By the late 1500's Portuguese supremacy of the Indian Ocean was threatened. From 1591 numerous Dutch and English ships called at Table Bay and in 1652 the Dutch East India 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, Palaeontology and Meteorites

Section 35

- 3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.
- 4) No person may, without a permit issued by the responsible heritage resources authority –
 - a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
 - b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
 - c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
 - d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assists in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.
- 5) When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedure in terms of section 38 has been followed, it may –
 - a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;
 - b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;
 - c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph a) to apply for a permit as required in subsection 4); and
 - d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.
- 6) The responsible heritage resources authority may, after consultation with the owner of the land on which an archaeological or palaeontological site or meteorite is situated, serve a notice on the owner or any other controlling authority, to prevent activities within a specified distance from such site or meteorite.

Burial Grounds & Graves

Section 36

- 3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority –
 - a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
 - b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
 - c) bring onto or use at a burial ground or grave referred to in paragraph a) or b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.
- 4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction of any burial ground or grave referred to in subsection 3a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.
- 5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection 3b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority –
 - a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and
 - b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.
- 6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority –
 - a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and
 - b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

Heritage Resources Management

Section 38

- 1) Subject to the provisions of subsections 7), 8) and 9), any person who intends to undertake a development categorised as –
 - a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
 - b) the construction of a bridge or similar structure exceeding 50 m in length;
 - c) any development or other activity which will change the character of a site –
 - i. exceeding 5 000 m² in extent; or
 - ii. involving three or more existing erven or subdivisions thereof; or
 - iii. involving three or more erven or subdivisions thereof which have been consolidated within the past five years; or
 - iv. the costs which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

- d) the rezoning of a site exceeding 10 000 m² in extent; or
 - e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.
- 2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection 1) –
- a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or
 - b) notify the person concerned that this section does not apply.
- 3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection 2a) ...
- 4) The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development decide –
- a) whether or not the development may proceed;
 - b) any limitations or conditions to be applied to the development;
 - c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;
 - d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and
 - e) whether the appointment of specialists is required as a condition of approval of the proposal.