

Heritage Impact Assessment Report

HERITAGE IMPACT ASSESSMENT FOR THE MINING
RIGHTS APPLICATION FOR THE FARM DE PONT 228

PREPARED BY:
G&A HERITAGE



PREPARED FOR:

DOREAN ENVIRONMENTAL
SERVICES CC

CREDIT SHEET

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***Disclaimer;** Although all possible care is taken to identify all sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. G&A Heritage and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

SIGNED OFF BY: STEPHAN GAIGHER



MANAGEMENT SUMMARY

Site name and location: De Pont 228 near Parys in the Free State Province.

Municipal Area: Ngwathe Local Municipality.

Developer: Sweet Sensation 168 (Pty) Ltd.

Consultant: G&A Heritage, PO Box 522, Louis Trichardt, 0920, South Africa. 38A Vorster Street, Louis Trichardt, 0920

Date of Report: 27 May 2015

Sweet Sensations 168 (Pty) Ltd is proposing the development of a new sand mining operation on the Farm De Pont 228 near Parys in the Free State Province. As part of the mining rights application being submitted for the mining permit, this reports looks at the heritage component of the environmental impact assessment.

Findings;

The area investigated lies on a developed farm. Most of the land has been utilized for crop farming in the recent past resulting in extensive alternation to the topography of the study area. A small, dilapidated mud-brick building was identified however it was of no historic value.

Recommendations;

There is a possibility of unmarked graves being uncovered during development and the relevant steps for the mitigation of such a situation is given in the report. Due to the fragmented nature of the sand deposits on this property it is not anticipated that this specific area will be mined.

Fatal Flaws;

No fatal flaws were identified.

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PROJECT RESOURCES

HERITAGE IMPACT REPORT

FIRST PHASE HERITAGE IMPACT ASSESSMENT REPORT FOR THE MINING RIGHTS APPLICATION FOR DE PONT 228, NEAR PARYS IN THE FREE STATE PROVINCE.

INTRODUCTION

Legislation and methodology

G&A Heritage was appointed by *Dorean Environmental Services CC* and *Sweet Sensations 168 (Pty) Ltd* to undertake a first phase heritage impact assessment for the mining rights application for De Pont 228 near Parys in the Free State Province. Section 38(1) of the South African Heritage Resources Act (25 of 1999) requires that a heritage study be undertaken for:

- (a) Construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- (b) Construction of a bridge or similar structure exceeding 50 m in length; and
- (c) Any development, or other activity which will change the character of an area of land, or water –
 - (1) Exceeding 10 000 m² in extent;
 - (2) Involving three or more existing erven or subdivisions thereof; or
 - (3) Involving three or more erven, or subdivisions thereof, which have been consolidated within the past five years; or
- (d) The costs of which will exceed a sum set in terms of regulations; or
- (e) Any other category of development provided for in regulations.

While the above describes the parameters of developments that fall under this Act, Section 38 (8) of the NHRA is applicable to this development. This section states that;

(8) The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

In regards to a development such as this that falls under Section 38 (8) of the NHRA, the requirements of Section 38 (3) applies to the subsequent reporting, stating that;

- (3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2) (a): Provided that the following must be included:
 - (a) The identification and mapping of all heritage resources in the area affected;
 - (b) An assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6 (2) or prescribed under section 7;
 - (c) An assessment of the impact of the development on such heritage resources;

- (d) An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- (e) The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- (f) If heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- (g) Plans for mitigation of any adverse effects during and after the completion of the proposed development.

A heritage impact assessment is not limited to archaeological artefacts, historical buildings and graves. It is far more encompassing and includes intangible and invisible resources such as places, oral traditions and rituals. A heritage resource is defined as any place or object of cultural significance i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This includes the following:

- (a) Places, buildings, structures and equipment;
- (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;
- (e) Geological sites of scientific or cultural importance;
- (f) Archaeological and paleontological sites;
- (g) Graves and burial grounds, including –
 - (1) Ancestral graves,
 - (2) Royal graves and graves of traditional leaders,
 - (3) Graves of victims of conflict (iv) graves of important individuals,
 - (4) Historical graves and cemeteries older than 60 years, and
 - (5) Other human remains which are not covered under the Human Tissues Act, 1983 (Act No.65 of 1983 as amended);
- (h) Movable objects, including ;
 - (1) Objects recovered from the soil or waters of South Africa including archaeological and paleontological objects and material, meteorites and rare geological specimens;
 - (2) Ethnographic art and objects;
 - (3) Military objects;
 - (4) Objects of decorative art;
 - (5) Objects of fine art;
 - (6) Objects of scientific or technological interest;
 - (7) Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings; and
 - (8) Any other prescribed categories, but excluding any object made by a living person;
- (i) Battlefields;
- (j) Traditional building techniques.

A 'place' is defined as:

- (a) A site, area or region;
- (b) A building or other structure (which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure);
- (c) A group of buildings or other structures (which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures); and
- (d) An open space, including a public square, street or park; and in relation to the management of a place, includes the immediate surroundings of a place.

'Structures' means any building, works, device, or other facility made by people and which is fixed to land and any fixtures, fittings and equipment associated therewith older than 60 years.

'Archaeological' means:

- (a) Material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- (b) Rock art, being a 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 is older than 100 years including any area within 10 m of such representation; and
- (c) Wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land or in the maritime cultural zone referred to in section 5 of the Maritime Zones Act 1994 (Act 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which are older than 60 years or which in terms of national legislation are considered to be worthy of conservation;
- (d) Features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

'Paleontological' 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.

'Grave' means a place of interment and includes the contents, headstone or other marker of and any other structures on or associated with such place. The South African Heritage Resources Agency (SAHRA) will only issue a permit for the alteration of a grave if it is satisfied that every reasonable effort has been made to contact and obtain permission from the families concerned.

The removal of graves is subject to the following procedures as outlined by the SAHRA:

- Notification of the impending removals (using English, Afrikaans and local language media and notices at the grave site);
- Consultation with individuals or communities related or known to the deceased;
- Satisfactory arrangements for the curation of human remains and / or headstones in a museum, where applicable;
- Procurement of a permit from the SAHRA;
- Appropriate arrangements for the exhumation (preferably by a suitably trained archaeologist) and re-interment (sometimes by a registered undertaker, in a formally proclaimed cemetery);
- Observation of rituals or ceremonies required by the families.

The limitations and assumptions associated with this study are as follows;

- Sites were evaluated by means of description of the cultural landscape and analysis of written sources and available databases.
- It was assumed that layout as provided by Dorean Environmental Services CC was correct.
- We assumed that the public participation process performed as part of the Environmental Impact Assessment process would be sufficiently encompassing not to be repeated in the Heritage Impact Assessment.

Table 1. Impacts on the NHRA Sections

Act	Section	Description	Possible Impact	Action
National Heritage Resources Act (NHRA)	34	Preservation of buildings older than 60 years	No impact	None
	35	Archaeological, paleontological and meteor sites	No impact	None
	36	Graves and burial sites	Possible Impact	Management plan
	37	Protection of public monuments	No impact	None
	38	Does activity trigger a HIA?	Yes	HIA

Table 2. NHRA Triggers

Action Trigger	Yes/No	Description
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length.	No	N/A
Construction of a bridge or similar structure exceeding 50m in length.	No	N/A
Development exceeding 5000 m ²	Yes	Proposed De Pont Sand Mine
Development involving more than 3 erven or sub divisions	No	N/A
Development involving more than 3 erven or sub divisions that have been consolidated in the past 5 years	No	N/A
Re-zoning of site exceeding 10 000 m ²	Yes	Possible rezoning
Any other development category, public open space, squares, parks or recreational grounds	No	N/A

PROJECT LOCATION

The proposed De Pont sand mining operation is located close to Parys in the Free State Province.

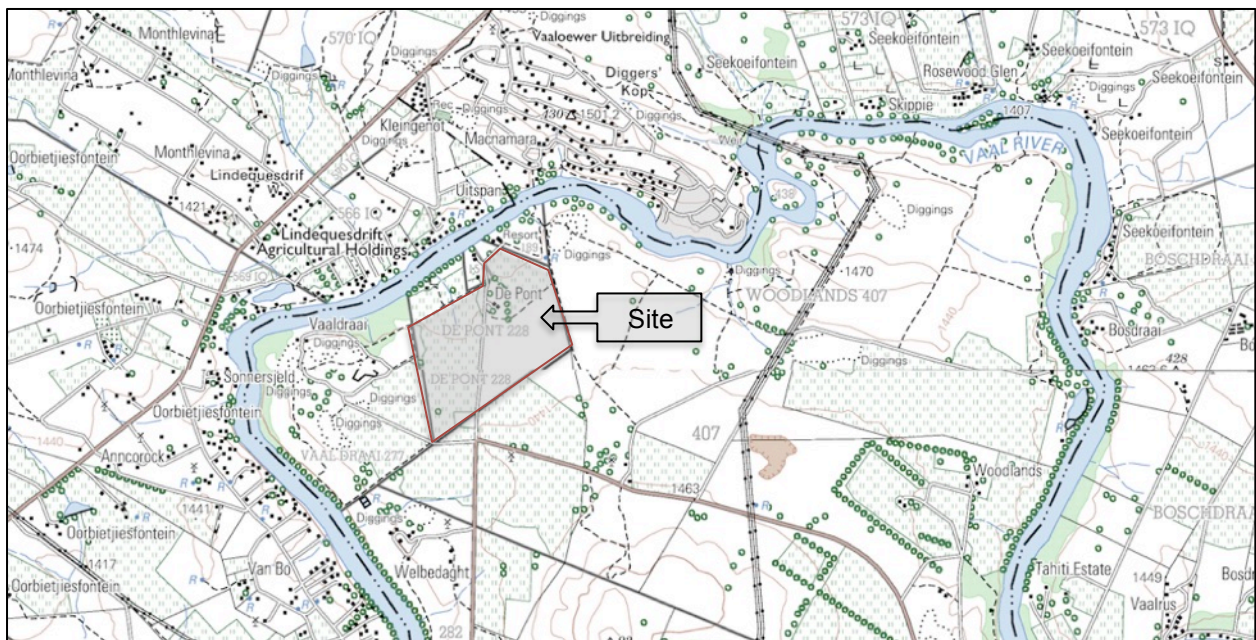


Figure 1: Location Map (2627 DA 2006 & 2627DC 2006)



Figure 2. Aerial view of the study area

METHODOLOGY

This study defines the heritage component of the Environmental Impact Assessment process. It is described as a first phase Heritage Impact Assessment (HIA). This report attempts to evaluate both the accumulated heritage knowledge of the area as well as information derived from direct physical observations.

EVALUATING HERITAGE IMPACTS

A combination of document research as well as the determination of the geographic suitability of areas and the evaluation of aerial photographs determined which areas could and should be accessed.

After plotting of the site on GPS the areas were accessed using suitable combinations of vehicle access and access by foot.

Sites were documented by digital photography and geo-located with GPS readings using the WGS 84 datum.

Further techniques included interviews with local inhabitants, visiting local museums and information centres and discussions with local experts. All this information was combined with information from an extensive literature study as well as the result of archival studies based on SAHRA provincial databases.

ASSESSING VISUAL IMPACT

Visual impacts of developments result when sites that are culturally celebrated are visually affected by a development. The exact parameters for the determination of visual impacts have not yet been rigidly defined and are still mostly open to interpretation. CNdV and DEAP (2006) have developed some guidelines for the management of the visual impacts of wind turbines in the Western Cape, although these have not yet been formalized. In these guidelines they recommend a buffer zone of 1km around significant heritage sites to minimize the visual impact.

PREVIOUS STUDIES IN THE AREA

Parys Area:

- Dreyer, C. 2007. First Phase Archaeologist and Cultural Heritage of the Proposed New Prison at Parys, Free State.
- Huffman, T. 2005. Archaeological Assessment of the Parys Golf Island and Feesgronde, FS Province.
- Van Der Walt, J. 2012. Archaeological Impact Assessment for the Proposed Jumanji Estate Development, Parys, Free State Province.
- Van Ryneveld, K. 2007. Archaeological Impact Assessment: Tumahole Ext 7 Residential Development, Parys, Free State, South Africa.
- Van Schalkwyk, J. 2006. Heritage Impact Assessment for the Proposed Waterford Golf and River Estate, Parys Are, Free State.
- Dreyer, C. 2005. Archaeological and Cultural Assessment of the Proposed Upgrading of the Road (R59) Between Parys & N1, Free State.
- Dreyer, C. 2005. First Phase Archaeological and Historical Investigation of the Proposed Developments on the Farm Geluk 196 & Ladiesfontein 255 – Parys, Free State.
- Kusel, U. 2009. Cultural Heritage Resources Assessment of Portion 6 of the Farm Daskop 1103 Parys, Free State Province.
- Van Der Walt, J. 2010. Archaeological Impact Assessment for a residential development on a portion of the Farm Doornhoek 1000, District Parys, Free State Province.
- Van Der Walt, J. 2008. Archaeological Impact Assessment: Subdivision 2 of the Farm Palmietfontein 99, Parys, Free State Province.

Vredefort Dome Area:

- Du Pisani, J. 2008. Vredefort Dome World Heritage Site (VDWHS) Integrated Management (IMP) Cultural Heritage Plan (CHP).
- Dreyer, C. 2010. First Phase Archaeological and Heritage Assessment of the site proposed for the Vodacom mast at the farm Buffelskloof 511 IQ, Vredefort Dome, North West Province.
- Dreyer, C. 2008. First Phase Archaeological and Cultural Heritage Assessment of the proposed residential developments at the farm Buffelskloof 511 IQ, Vredefort Dome, Potchefstroom, North West Province.

- Henderson, Z. Koortzen, C. 2007. Assessment of the Proposed Eskom Line Alternatives within the Zeus-Mercury-Vredefort Dome Extended Study Area, in terms of Archeological and other Heritage Sites.
- Pelsler, A. 2003. Askoppies: Late Iron Age Sotho-Tswana Settlement on the Vredefort Dome.
- Pelsler, A. 2004. Human Skeletal Remains from Askoppies, a Late Iron Age Tswana Settlement on the Vredefort Dome.
- Pelsler, A. 2005. The Archaeological Investigation of a Possible Copper Smythy on Askoppies, a Late Iron Age Tswana Site on the Vredefort Dome, North West Province.
- Dreyer, C. 2004. Archaeological and Historical Assessment of the Proposed Tourist Accommodation Facilities on the Farm Buffelskloof 511 IQ in the Vredefort Dome Conservancy.

HERITAGE INDICATORS WITHIN THE RECEIVING ENVIRONMENTS

REGIONAL CULTURAL CONTEXT

PALAEONTOLOGY

The proposed mining activities will be limited to the extraction of alluvial surface sand and as a result there will be no intrusion into the underlying bedrock. For this reasons no specific paleontological study was undertaken.

STONE AGE

During the Middle Stone Age, 200 000 years ago, modern man or Homo sapiens emerged, manufacturing a wider range of tools, with technologies more advanced than those from earlier periods. This enabled skilled hunter-gatherer bands to adapt to different environments. From this time onwards, rock shelters and caves were used for occupation and reoccupation over very long periods of time (Mitchell 2002).

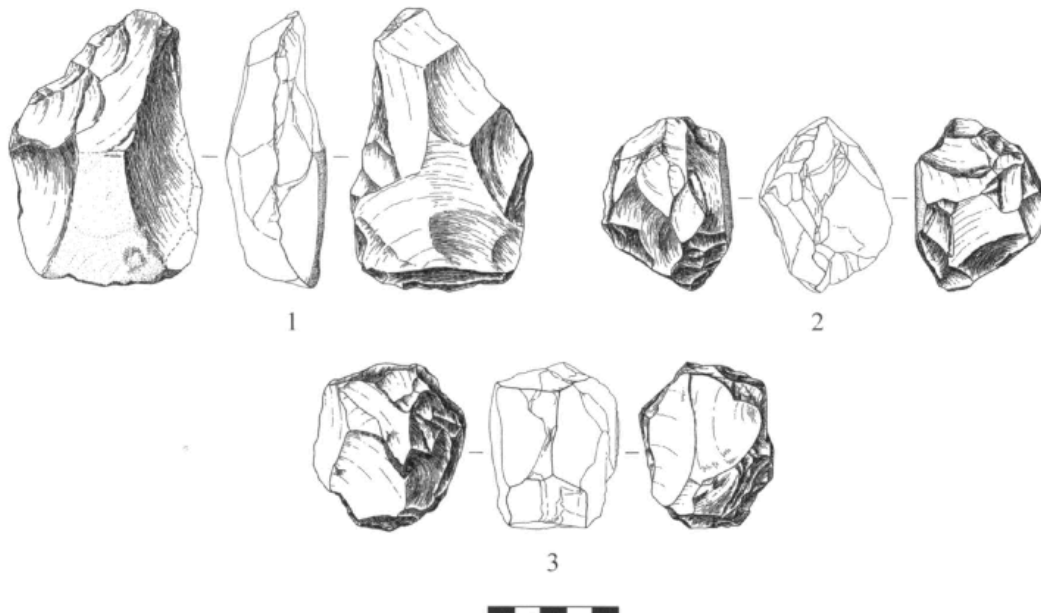


Figure 3. (1) handaxe on flake; (2) thick discoidal core; (3) polyhedral core (Pollarolo, Kuman, Bruxelles, 2010)

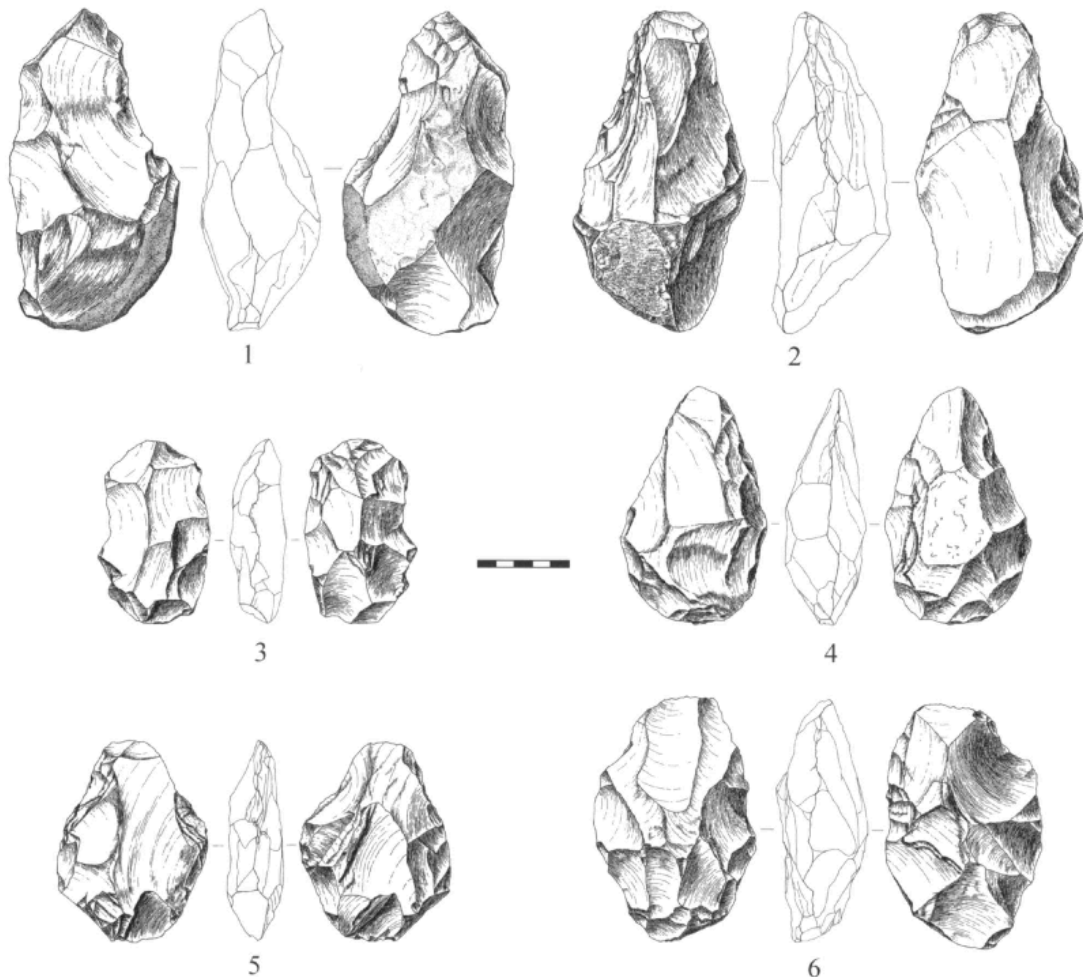


Figure 4. (1,2) Handaxes with large side removal; (3-6) handaxes (Pollarolo, Susino, Kuman, Bruxelles, 2010)

The Late Stone Age, considered to have started some 20 000 years ago, is associated with the predecessors of the San and Khoi Khoi. San hunter-gatherer bands with their small (microlithic) stone tools may have lived the Parys area. Stone Age hunter-gatherers lived well into the 19th century (Morris 2004).

A REVIEW OF THE SOUTH AFRICAN STONE AGE

The above description of the Stone Age sequences of southern Africa has been predominant for most of the last 80 years. In 2011 the first extensive review of this theory was performed by a group of leading Stone Age experts at a workshop in Gauteng. As a result many of the more accepted ideas around the Stone Age sequence has been revised and a possible new sequence or industry complex has been added (Lombard, Wadley, Deacon, Wurz, Parsons, Mohapi, Swart & Michell, 2012).

The resultant overview of the South African / Lesotho Stone Age now look as follows;

Later Stone Age

- **Age Range:** recent to 20-40 thousand years ago
- **General characteristics:** expect variability between assemblages, a wide range of formal tools, particularly scrapers (microlithic and macrolithic), backed artefacts, evidence of hafted stone and bone tools, borers, bored stones, upper and lower grindstones, grooved stones, ostrich eggshell (OES) beads and other ornaments, undecorated/decorated OES fragments, flasks/flask fragments, bone tools (sometimes with decoration), fishing equipment, rock art, and ceramics in the final phase.

Ceramic or Final Later Stone Age

- Generally < 2 thousand years ago

- MIS 1
- Contemporaneous with, and broadly similar to, final Later Stone Age, but includes ceramics
- Economy may be associated with hunter-gatherers or herders

Typo/technological characteristics

- *Stone tool assemblages are often microlithic (for definition of 'microlithic' see Elston & Kuhn 2002)*
- *In some areas they are dominated by long end scrapers and few backed microliths; in others formal tools are absent or rare*
- *Grindstones are common, ground stone artefacts, stone bowls and boat-shaped grinding grooves may occur*
- *Includes grit- or grass-tempered pottery*
- *Ceramics can be coarse, or well-fired and thin-walled; some times with lugs, spouts and conical bases; sometimes with decoration; sometimes shaped as bowls*
- *Ochre is common*
- *OES is common*
- *Metal objects, glass beads and glass artefacts also occur*

Final Later Stone Age

- 100 – 4000 years ago
- MIS 1
- Hunter-gatherer economy

Typo/technological characteristics

- *Much variability can be expected*
- *Variants include macrolithic (similar to Smithfield [Sampson 1974]) and/or microlithic (similar to Wilton) assemblages*
- *Assemblages are mostly informal (Smithfield)*
- *Often characterised by large untrimmed flakes (Smithfield)*
- *Sometimes microlithic with scrapers, blades and bladelets, backed tools and adzes (Wilton-like)*
- *Worked bone is common*
- *OES is common*
- *Ochre is common*
- *Iron objects are rare*
- *Ceramics are absent*

Wilton

- 4000 – 8000 years ago
- MIS 1
- At some sites continues into the final Later Stone Age as regional variants (e.g. Wilton Large Rock Shelter and Cave James)

Typo/technological characteristics

- *Fully developed microlithic tradition with numerous formal tools*
- *Highly standardised backed microliths and small convex scrapers (for definition of standardisation see Eerkens & Bettinger 2001)*
- *OES is common*
- *Ochre is common*
- *Bone, shell and wooden artefacts occur*

Oakhurst

- 7000 – 12 000 years ago
- MIS 1
- Includes Albany, Lockshoek and Kuruman as regional variants

Typo/technological characteristics

- *Flake based industry*

- *Characterised by round, end, and D-shaped scrapers and adzes*
- *Wide range of polished bone tools*
- *Few or no microliths*

Robberg

- 12 000 to 18 000 years ago
- MIS 2

Typo/technological characteristics

- *Characterised by systematic bladelet (<26mm) production and the occurrence of outils ecaillés or scaled pieces*
- *Significant numbers of unretouched bladelets and bladelet cores*
- *Few formal tools*
- *Some sites have significant macrolithic elements*

Early Late Stone Age

- 18 000 – 40 000 years ago
- MIS 2-3
- Informal designation
- Also known as transitional MSA-LSA
- Overlapping in time with final Middle Stone Age

○ *Typo/technological Characteristics*

- *Characterised by unstandardised, often microlithic, pieces and includes the bipolar technique*
- *Described at some sites, but not always clear whether assemblages represent a real archaeological phase or a mixture of LSA/MSA artefacts*

Middle Stone Age

- Age Range: 20 000 – 30 000 years ago
- General characteristics: Levallois or prepared core techniques (for definitions see Van Peer 1992; Boeda 1995; Pleurdeau 2005) occur in which triangular flakes with convergent dorsal scars, often with faceted striking platforms, are produced. Discoidal systems (for definition see Inizan et al. 1999) and intentional blade production from volumetric cores (for definition see Pleurdeau 2005) also occur; formal tools may include unifacially and bifacially retouched points, backed artefacts, scrapers, and denticulates (for definition see Bisson 2000); evidence of hafted tools; occasionally includes marine shell beads, bone points, engraved ochre nodules, engraved OES fragments, engraved bone fragments, and grindstones.
- In the sequence below we highlight differences or characteristics that may be used to refine interpretations depending on context.

Final Middle Stone Age

- 20 000 – 40 000 years ago
- MIS 3
- Informal designation partly based on the Sibudu sequence
- *Typo/technological characteristics*
 - *Characterised by high regional variability that may include, e.g. bifacial tools, bifacially retouched points, hollow-based points*
 - *Triangular flake and blade industries (similar to Strathalan and Melikane)*
 - *Small bifacial and unifacial points (similar to Sibudu and Rose Cottage Cave)*
 - *Sibudu point characteristics: short, stout, lighter in mass compared to points from the Sibudu technocomplex, but heavier than those from the Still Bay*
 - *Can be microlithic*
 - *Can include bipolar technology*
 - *Could include backed geometric shapes such as segments, as well as side scrapers*

Sibudu

- 45 000 – 58 000 years ago

- MIS 3
- Previously published as informal late Middle Stone Age and post-Howieson's Poort at Sibudu
- Formerly known post-Howieson's Poort, MSA 3 generally, and MSA III at Klasies River
- *Typo/technological characteristics*
 - *Most points are produced using Levallois technique*
 - *Most formal retouch aimed at producing unifacial points*
 - *Sibudu unifacial point (type fossil) characteristics: faceted platform; shape is somewhat elongated with a mean length of 43.9 mm), a mean breadth of 26.8 mm and mean thickness of 8.8 mm (L/B ratio 1.7); their mean mass is 11.8 g (Mohapi, 2012)*
 - *Some plain butts*
 - *Rare bifacially retouched points*
 - *Some side scrapers are present*
 - *Backed pieces are rare*

Howieson's Poort

- 58 000 – 66 000 years ago
- MIS 3-4
- *Typo/technological characteristics*
 - *Characterised by blade technology*
 - *Includes small (<4 cm) backed tools, e.g. segments, scrapers, trapezes and backed blades*
 - *Some denticulate blades*
 - *Pointed forms are rare or absent*

Still Bay

- 70 000 – 77 000 years ago
- MIS 4-5a
- *Typo/technological characteristics*
 - *Characterised by thin (<10 mm), bifacially worked foliate or lanceolate points*
 - *Semi-circular or wide-angled pointed butts*
 - *Could include blades and finely serrated points (Lombard et al. 2010)*

Pre-Still Bay

- 72 000 – 96 000 years ago
- MIS 4-5
- *Typo/technological characteristics*
 - *Characteristics currently being determined / studied*

Mossel Bay

- 77 000 to —105 000 years ago
- MIS 5a-4
- Also known as MSA II at Klasies River or MSA 2b generally
- *Typo/technological characteristics :*
 - *Characterised by recurrent unipolar Levallois point and blade reduction*
 - *Products have straight profiles; percussion bulbs are prominent and often splintered or ring-cracked*
 - *Formal retouch is infrequent and restricted to sharpening the tip or shaping the butt*

Klasies River

- 105 000 to —130 000 years ago
- MIS 5d-5e
- Also referred to as MSA I at Klasies River or MSA 2a generally

- *Typo/technological characteristics:*
 - *Recurrent blade and convergent flake production*
 - *End products are elongated and relatively thin, often with curved profiles*
 - *Platforms are often small with diffused bulbs*
 - *Low frequencies of retouch*
 - *Denticulate pieces*

Early Middle Stone Age

- *Suggested age MIS 6 to MIS 8 (130 000 to —300 000 years ago)*
- *Informal designation*
-
- *Typo/technological characteristics:*
 - *This phase needs future clarification regarding the designation of cultural material and sequencing*
 - *Includes discoidal and Levallois flake technologies, blades from volumetric cores and a generalised toolkit*

Earlier Stone Age

- *Age range: >200 000 to 2 000 000 years ago*
- *General characteristics: early stages include simple flakes struck from cobbles, core and pebble tools; later stages include intentionally shaped handaxes, cleavers and picks; final or transitional stages have tools that are smaller than the preceding stages and include large blades.*
- *In the sequence below we highlight differences or characteristics that may be used to refine interpretations depending on context.*

ESA-MSA transition

- *200 to —600 thousand years ago*
- *MIS 7-15*
- *Typo/technological characteristics:*
 - *Described at some sites as Fauresmith or Sangoan*
 - *Relationships, descriptions, issues of mixing and ages yet to be clarified*
 - *Fauresmith assemblages have large blades, points, Levallois technology, and the remaining ESA components have small bifaces*
 - *The Sangoan contains small bifaces (<100 mm), picks, heavy and light-duty denticulated and notched scrapers*
 - *The Sangoan is less well de scribed than the Fauresmith*

Acheulean

- *300 thousand to —1.5 million years ago*
- *MIS 8-50*
- *Typo/technological characteristics:*
 - *Bifacially worked handaxes and cleavers, large flakes > 10 cm*
 - *Some flakes with deliberate retouch, sometimes classified as scrapers*
 - *Gives impression of being deliberately shaped, but could indicate result of knapping strategy*
 - *Sometimes shows core preparation*
 - *Generally found in disturbed open-air locations*

Oldowan

- *1.5 to >2 million years ago*
- *MIS 50-75*
- *Typo/technological characteristics*
 - *Cobble, core or flake tools with little retouch and no flaking to predetermined patterns*
 - *Hammerstones, manuports, cores*
 - *Polished bone fragments/tools*

Although the above classification clarifies the last eighty years of Stone Age research it is clear that much work is still to be done before a definitive classification scale can be produced.

IRON AGE

Not much is known regarding the Iron Age ethno-history of the Parys area before the Ndebele under Mzilikasi invaded the area during the time referred to as the Difaqane in and around 1823 (Rasmussen, 1975). Most of the relevant work before this time was performed by Legassick (1969), who was able to reconstruct much of the pre-Difaqane Iron Age sequence. As a result we know that Tswana-speaking Rolong and Khudu from Parys had to flee westwards during the Ndebele raids. Maggs (1976) argues that Fokeng and Kwena communities most probably inhabited Type N settlements which are related to Taylor's Group I (Taylor 1979). According to Legassick (1969), these Type N inhabitants would most probably have been Kwena or Fokeng who have inhabited this area since the 16th century. Maggs (1976) also argues that groups related to the Rolong lived in his Type Z settlements and Taylor equates this type with his Group II settlements Taylor concludes that the material cultural expression of Group I is a result of Group I people being influenced by Group II Rolong. This is a plausible interpretation considering the fluid ward system of the Tswana whereby foreigners are incorporated into patrilineal decision-making groups (Schapera 1935). We know, for example, that in 1823 foreign client families occupied a series of settlement under the chieftainship of the Rolong paramount Sehundelo (Cope 1977). (Loubser, 1985).

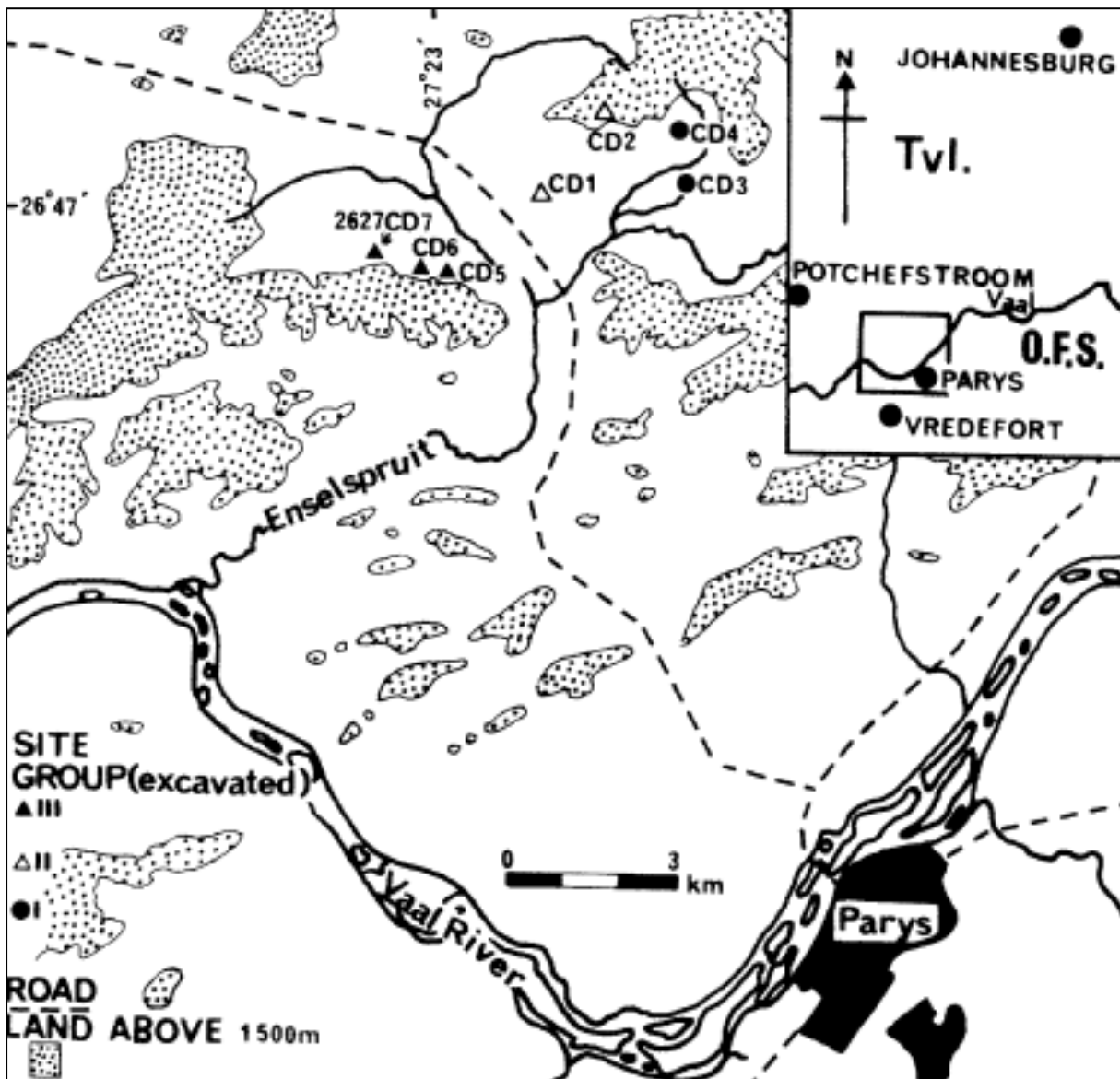


Figure 5. Location of excavated Iron Age Site in the Parys area (Loubser, 1985)

THE HISTORIC ERA

Historic Study of the Parys Area:

DATE	DESCRIPTION
2000 Million Years Ago	The unique surrounding in which the town of Parys is situated, had its origin roughly around 2000 million years ago when a giant meteorite struck the earth just south east of Vredefort in the Free State Province. The impact structure that was subsequently formed has come to be known as the Vredefort Dome, the oldest and largest meteorite impact site on earth, measuring about 200km in diameter.
1870's	In the early 1870's, towns in the northern Free State were set very far apart, and members of the different churches had far to travel to participate in their religious services. It was then decided by the Ring of the Dutch Reformed Church to implant the idea of a congregation north of the Rhenoster River into the minds of residents of the farm Klipspruit, on the Vaal River, which was owned by three Van Coller brothers (Hans, Dolf and Philip) as well as their brother-in-law, William Davel. Mr. Wouter De Villiers (father of G.F. De Villiers, who later became the Mayor of Parys), Mr. J.G. Luyt (an attorney of Heilbron and afterwards a member of O.V.S. Parliament) and Mr. Fleck (a land surveyor) were sent to owners of Klipspruit to propose they lay out the farm as a township. They found the Van Collers and Davel disinclined to listen to any arguments put forward. The three men then went to the adjoining farm, Vischgat (present day Vredefort) that lay some ten miles South-East of Klipspruit. The owner of Vischgat (a Mr. Geere) was cooperative and the township of Vredefort was established. Thereafter the Van Coller brothers and William Davel realized that an opportunity was missed and in 1876 the township was laid out. On the 14th of June 1876 a Mr. Wouter de Villiers held the first sale of seven erven at £25 each.
1870's	Mr. Schillbach who had served on the Franco-Prussian War and had taken part of the siege of Paris named the town "Parys" because he compared the Vaal River to the Seine. The town adjoining farms were named Issy and Versailles, after the two forts that were outside the French Capital.
1882	Sir John Brand acceded to request for a nearer fountain of Justice than the town of Heilbron, forty-four miles away, and appointed a special Justice of the Peace to reside in Parys. The first, and only holder of the office, was J. P. Steyler, who held it until 1897, when a Resident-Landdros was appointed.
1883	A Village Management Board was appointed in 1883.
1886	Gold was discovered in the Witwatersrand which caused major developments to the town of Parys, being a on the route between Bloemfontein and the goldfields.
1887	In 1887 the Village Management Board was elevated to Municipal status.
1889 to 1902	The outbreak of the Anglo-Boer war caused a standstill to the development of the town and caused much destruction. All able bodied males over the age of twelve enrolled in the Heilbron Commando. The first incident in the Parys area occurred during the retreat from Kroonstad to Pretoria. A section with several wagons had stopped for the night on a farm between Vredefort and Parys. One of the wagons was loaded with ammunition and was driven by two brothers, Hans and Franz Jooste. The British started shelling and a lucky shot hit the wagon. Franz was killed in the explosion. Hans was captured tow months later and banned to St Helena as

	<p>a prisoner of war.</p> <p>On the 20th of April 1900 Driscoll's Scouts passed through Parys. They must have been reconnoitering the area in preparation for the British advance. General French's cavalry crossed over the Drift onto Golf Island sometime in May 1900.</p> <p>During most of this period the British had a large camp down at what is now the Koppieskraal road but also maintained a small H. Q. in the Parys Hotel.</p> <p>Due to the town's surroundings it became an ideal place for guerilla warfare and snipers made good use of the natural advantages of the hills and the river around the town. Most of the buildings were destroyed and by 1902 when the war was over, the inhabitants had to make a fresh start.</p>
1902 to 1912	<p>At the time there were many men who had been ruined because of the war, and had no means of existence. In order to provide work for these men, a railway line was started as a relief work. A large camp of engineers and workers was established near the town and the work of building the line, and that of surveying the dam site and the country to be irrigated, was carried on from the camp. The engineer in charge of everything was Mr. J. E. Adamson.</p> <p>At the end of 1905, when the line was declared open, the Lieut. Governor Sir Hamilton Gould Adams officiated.</p>
Early 1900's to 1912	<p>Because of the abundance of water, many irrigation canals were built. The town council (with Mr. J. L. Moll as the Mayor at that time) implemented an electric lights scheme, using the water of the irrigation scheme to generate electricity. Mr. Ferdinand Saunders was the consulting engineer to the electricity scheme. By Christmas in 1912, the first electric lights glowed in Parys.</p>
1913 - 1915	<p>Residents of the town had felt for quite some time that a bridge across the Vaal River was no more than its just due. A ferry service crossed on to an island, and from there another ferry completed the crossing. Farmers on the Transvaal side preferred to go to Potchefstroom, thirty miles away, rather than face the trouble and expenses of a ferry crossing. Towards the end of 1913, tenders were asked for a reinforced concrete bridge over the Vaal, the length of the whole plan being 1600 feet, in 40 sections of 40 feet each. The contract was finally awarded to a Mr. Warren of Potchefstroom and the contract price was about 16 000 pounds.</p> <p>The work was started in May 1914, but the outbreak of the First World War three months later, caused long delays and the bridge was only finished and opened for traffic around Christmas 1915.</p> <p>With the completion of the bridge, came an increase of trade from the Transvaal side of the river. The farmers from Lindequesdrift to Venterskroon and as far afield as Buffelshoek now found Parys easy access, and considerably nearer than Potchefstroom. With the increase trade, the town began to grow and many new buildings went up. At the Rooibult (Pomona) portion of the town, the greater number of sold Morgen lots had not immediately been brought under cultivation, but gradually, one by one, they were cultivated, with the result that the water was insufficient for all the new ground under cultivation.</p>
1915 - 1930	<p>The council meetings at that time were largely taken up in hearing complaints about the shortage of water from Property owners and the position became quite acute. After much deliberation the council agreed to raise the level of the weir by four feet and install another turbine and pump. Mr. Hancock, of Potchefstroom, drew up the plans for the weir, and tenders were requested from qualified persons. Mr. Reed was accepted, and he set to work.</p> <p>A flood breached the wall and new plans were drawn up and a much stronger structure was devised and built departmentally. Mr. Gibbons was the engineer in charge and Mr. McKenzie, who was</p>

	then chief of the Water and Electrical departments, did the work.
1974	In 1974 an officer of the Parys Voortrekker Commando, Ben Nel and other members of the Commando decided to build a monument in the crater in honour of Franz Jooste. The monument was unveiled on 26 October 1974 by the Commandant of the Voortrekker Commando, Rev. Andries Myburg. The story of the Jooste Incident was documented and placed inside the monument to ensure that Franz Jooste will be remembered.
1986	The Town Hall (built in 1904) was proclaimed a provincial heritage site in 1986.
1999	Staycold (manufacturer of commercial refrigeration), one of the main industries in Parys, is a world-class facility. Staycold manufactures for both the local and international markets. It is currently exporting to countries such as the United Kingdom, France, Spain, Ireland, Singapore, Hong Kong, New Zealand, Australia and almost the whole of the African continent. In October 1999 Staycold received the Premiers Award For Export Excellence by Mr. Alec Erwin (Minister of trade and industry) and was allocated the Standard Bank Trophy as overall Exporter of the Year.
2005	The Vredefort Dome is currently described as the World's oldest and largest impact structure declared South Africa's seventh World Heritage site in July 2005.

Sources:

- “Chronological order of town establishment in South Africa based on Floyd (1960:20-26)”
- <http://www.parys.co.za/parys/history-about-parys.html>
- <http://www.parys.info/index.php/about/history-of-parys>
- <http://www.parys.co.za/parys/about-parys.html>
- Harry Hunt. “A Stoep Story”

THE CULTURAL LANDSCAPE

The main cultural landscape is associated with farming activities. This cultural identity has grown to such an extent that it overshadows any previous cultural identity that the area might have had in the past.



Figure 6: Cultural Landscape



Figure 7: Cultural Landscape

MUD-BRICK STRUCTURE

A small, dilapidated mud-brick building was identified and it could be of historic value. It is important that the developer be made aware of its location.

GPS Coordinates:

S 26° 44' 42"

E 27° 35' 20"

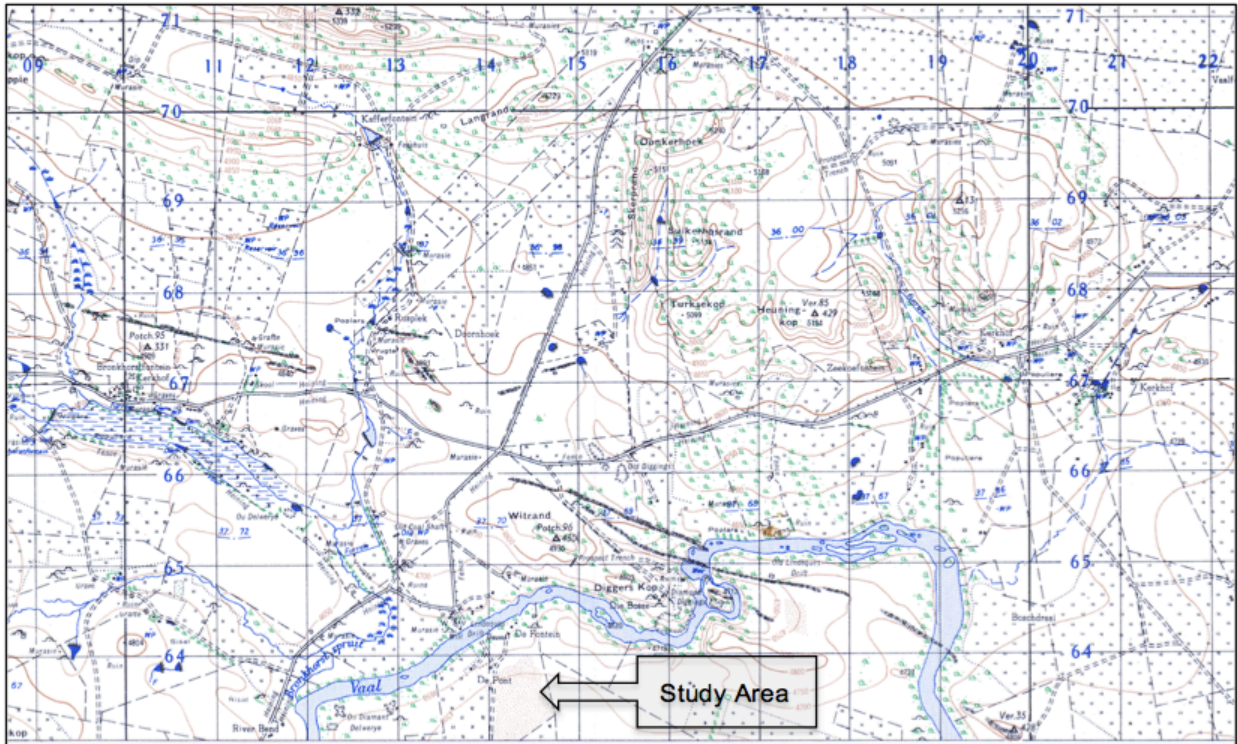


Figure 8: Mud-brick Structure on site

Cultural Significance: None

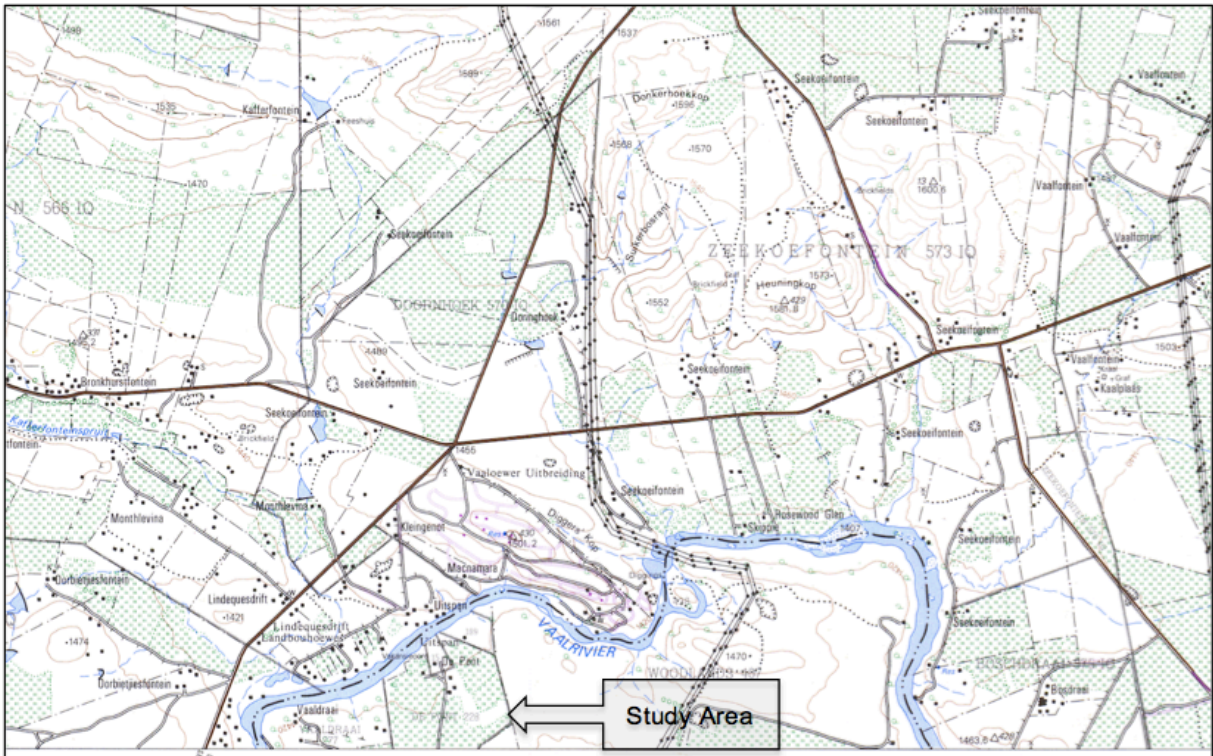
Recommendation: The possibility of unmarked graves close to this structure should be taken into account and monitored during any mining activities.

HISTORIC MAPS AND BUILT ENVIRONMENT



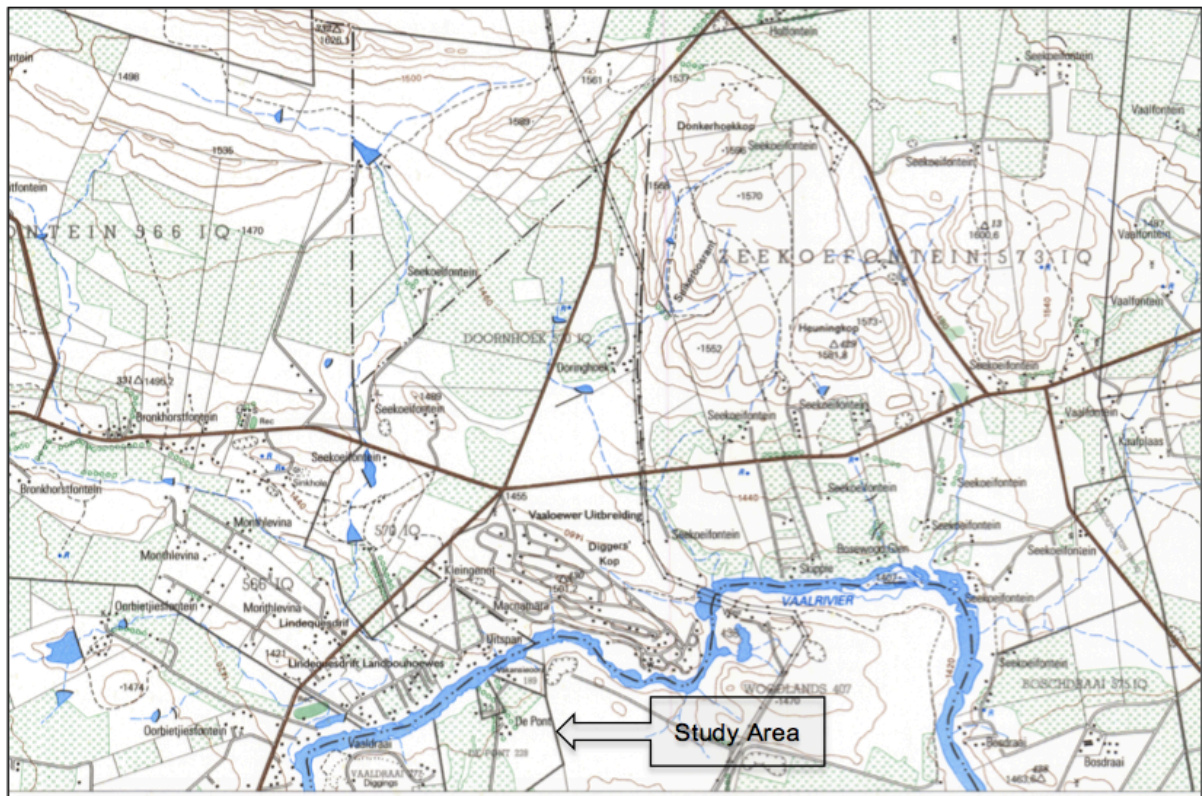
2627 DA 1945

Figure 9. 1945 Topographic map



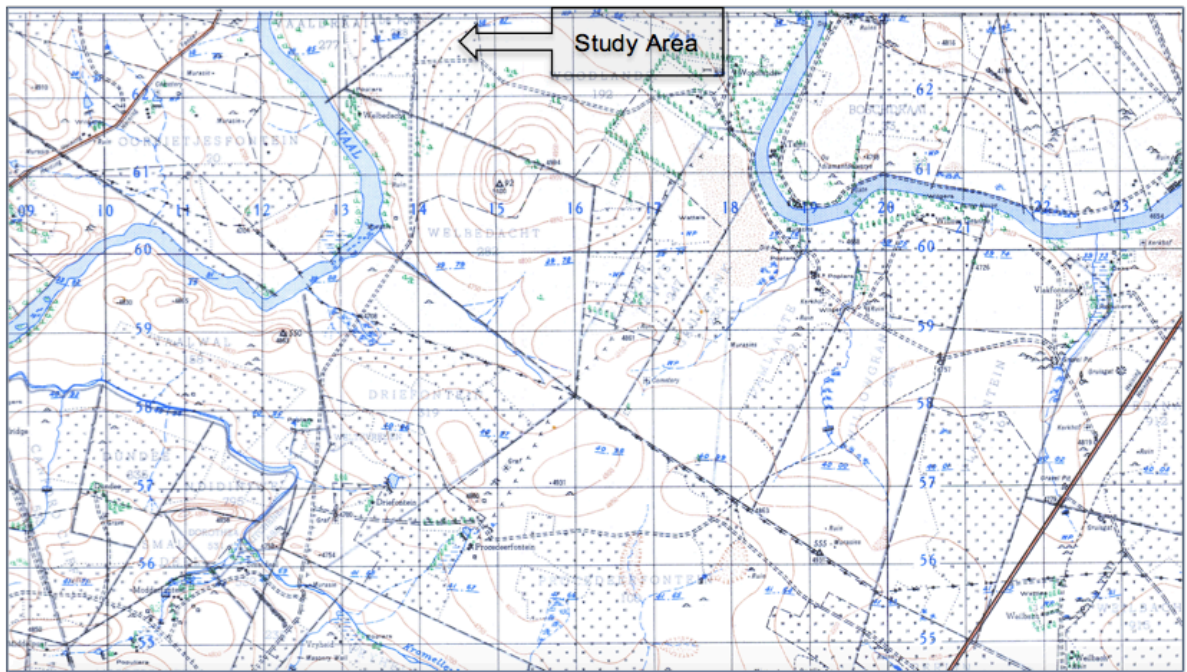
2627 DA 1984

Figure 10. 1984 Topographic map



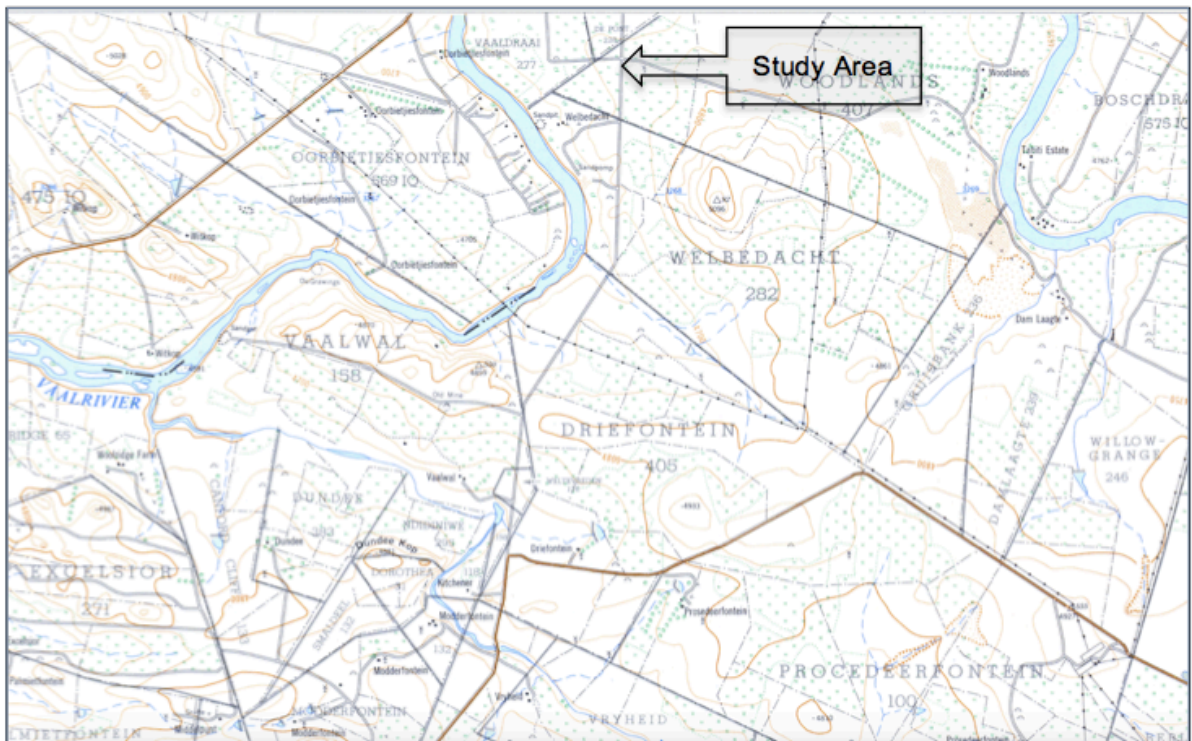
2627 DA 1995

Figure 11. 1995 Topographic map



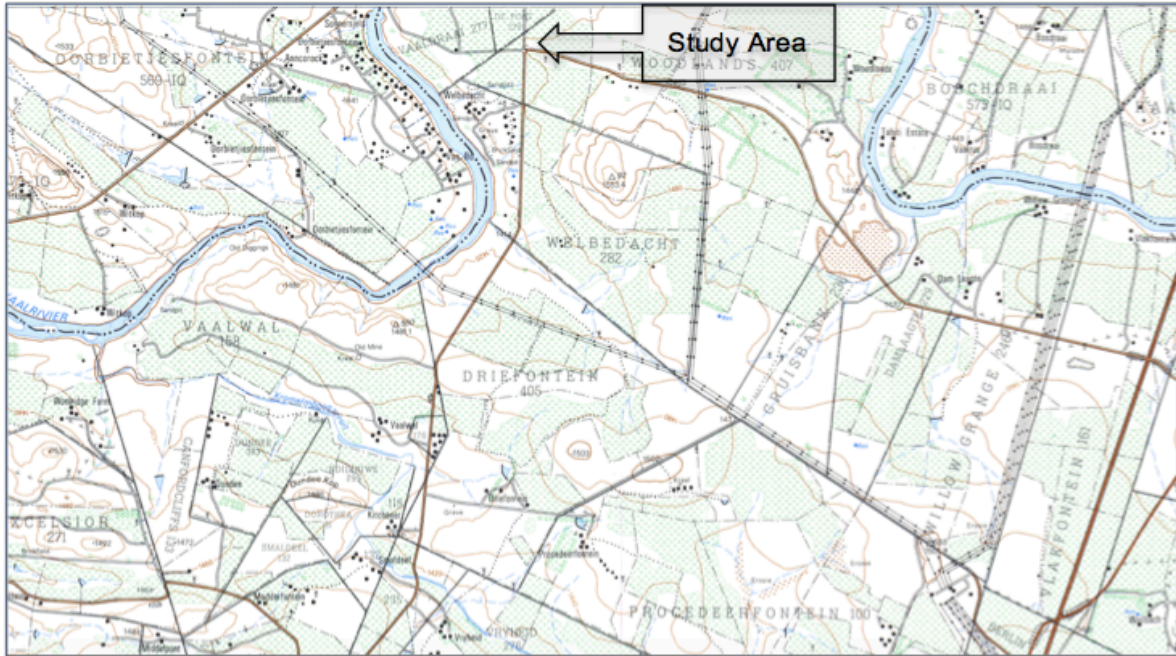
2627 DC 1945

Figure 12. 1945 Topographic Map



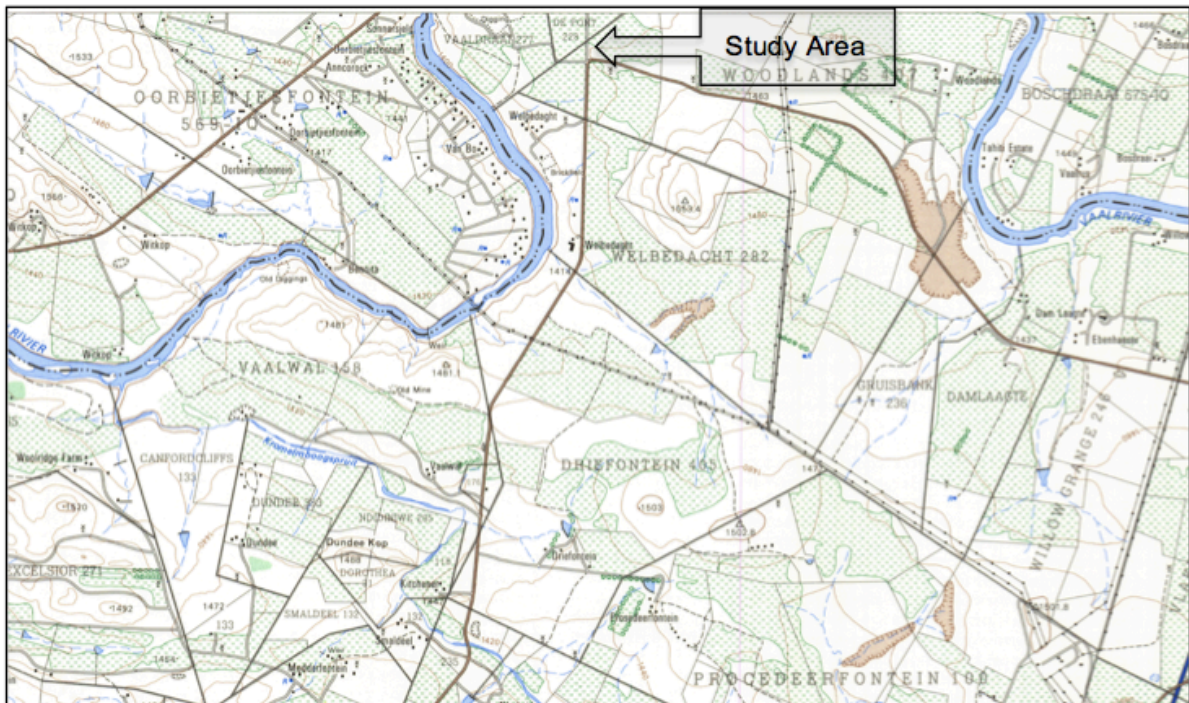
2627 DC 1966

Figure 13. 1966 Topographic map



2627 DC 1977

Figure 14. 1977 Topographic map



2627 DC 1991

Figure 15. 1991 Topographic map

The above historic maps show that no development was documented on the study area from 1945 and anything before that would have been present in 1945 before the advent of extensive agricultural landscaping.

THE VREDEFORT DOME WORLD HERITAGE SITE (VDWHS) – DISCUSSION

The proposed development area does not fall within the buffer zone of the Vredefort Dome World Heritage site, however it is close enough to this (approximately 30km) to warrant the mentioning of the management parameters for developments that might affect the WHS.

Description

“Vredefort Dome, approximately 120 km south-west of Johannesburg, is a representative part of a larger meteorite impact structure (astrobleme). Dating back 2,023 million years, it is the oldest astrobleme found on Earth so far. With a radius of 190 km, it is also the largest and the most deeply eroded. Vredefort Dome bears witness to the world's greatest known single energy-release event, which caused devastating global change, including, according to some scientists, major evolutionary changes. It provides critical evidence of the Earth's geological history and is crucial to our understanding of the evolution of the planet. Despite this, geological activity on the Earth's surface has led to the disappearance of evidence from most impact sites and Vredefort is the only example to provide a full geological profile of an astrobleme below the crater floor, allowing research into the genesis and development of an astrobleme immediately post-impact.

The site contains high quality and accessible geological (outcrop) sites that demonstrate a range of geological evidences of a complex meteorite impact structure. The rural and natural landscapes of the serial property help to portray the magnitude of the ring structures resulting from the impact.” (<http://whc.unesco.org/en/list/1162>, http://whc.unesco.org/en/list/1162/multiple=1&unique_number=1342)

Protection and management requirements

“Provision of legal protection and the establishment and maintenance of an effective management system involving all relevant stakeholders are essential requirements for this property.

The national World Heritage Convention Act of 1999 is to be applied to the World Heritage property following the completion of the national designation process. Various legal instruments are also applicable to ensure the protection of the property: These pieces of legislation include the Environmental Conservation Act (Act No. 73 of 1989), the National Environmental Management Act(Act No. 107 of 1998), the Physical Planning Act(Act No. 88 of 1967), the Subdivision of Agricultural Land Act(Act No 70 of 1970), the Free State Township Ordinance(Ord. No. 9 of 1969), National Environmental Management Biodiversity Act(Act No 10 of 2004) and the Free State Nature Conservation Ordinance(Ord. No. 8 of 1969). In terms of these laws, all development within or outside the property is subjected to an environmental impact assessment. Once the World Heritage Convention Act also applies to this property, it will automatically be recognized as a protected area in terms of the National Environmental Management: Protected Areas (Act 57 of 2003). Protection in terms of the latter legislation also implies that mining or prospecting will be completely prohibited within the property or its buffer zone. The management of the property is to be guided by a multi-stakeholder Vredefort Dome Steering Committee and carried out on an interim basis by the Vredefort Dome Inter-Provincial Task Team. A framework defining roles and responsibilities is required. The future Management Authority is to oversee the implementation of the integrated management plan, taking into account the existing State Party's action plan and draft management guidelines regarding the coordination of land-uses, development pressures, visual integrity, presentation and visitation of this World Heritage property.

An integrated management plan is required for the serial property so as to address the critical issues of the enforcement of the special land use planning requirements for the private property farmlands within the serial property, the preservation of the aesthetic rural/natural landscape and the protection, presentation of and public access to the clearly defined key satellite components. These conditions are essential to ensure that active conservation management is possible.” (<http://whc.unesco.org/en/list/1162>, http://whc.unesco.org/en/list/1162/multiple=1&unique_number=1342)

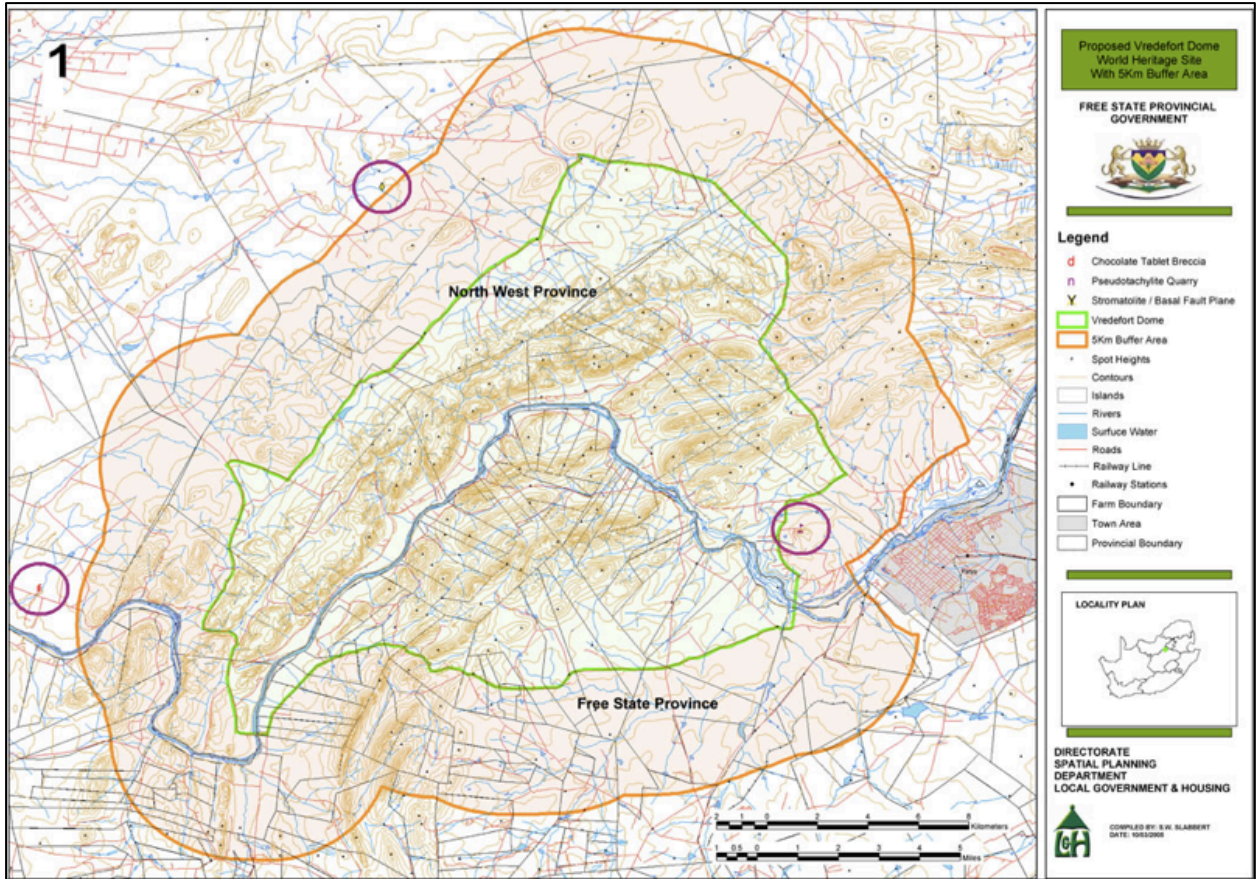


Figure 16. Buffer zone around the VDWHS

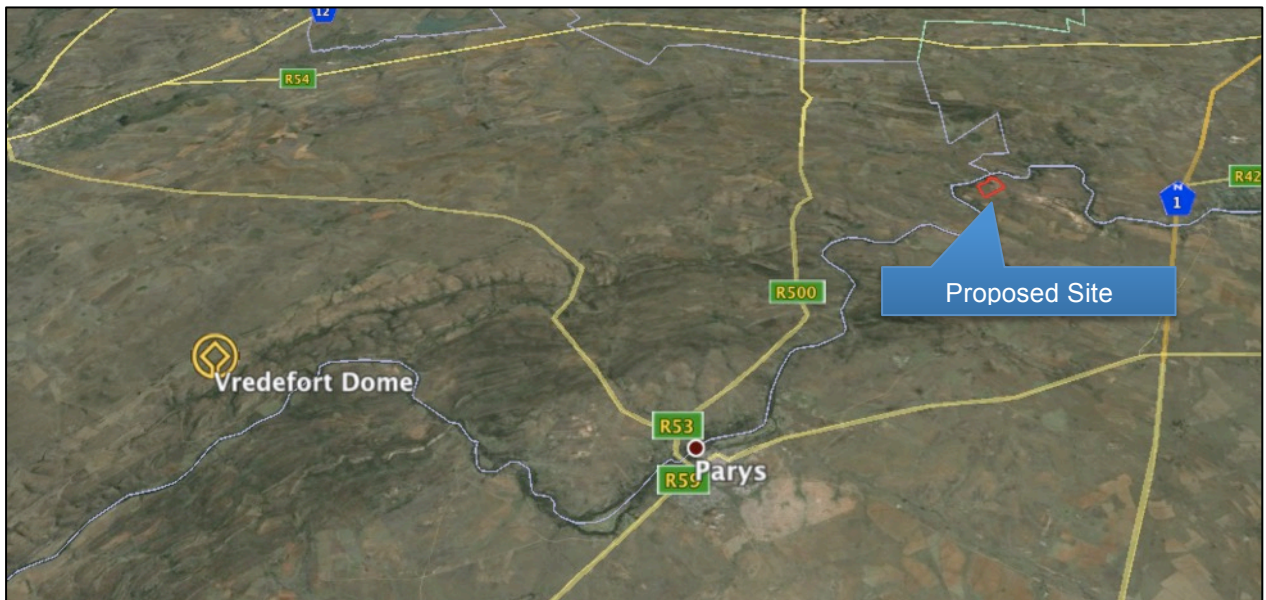


Figure 17. Proposed Development in relation to the VDWHS

MEASURING AND EVALUATING THE CULTURAL SENSITIVITY OF THE STUDY AREA

In 2003 the South African Heritage Resource Agency (SAHRA) compiled the following guidelines to evaluate the cultural significance of individual heritage resources;

TYPE OF RESOURCE;

- Place
- Archaeological Site
- Structure
- Grave
- Paleontological Feature
- Geological Feature

TYPE OF SIGNIFICANCE

1. HISTORIC VALUE

It is important in the community, or pattern of history

- Important in the evolution of cultural landscapes and settlement patterns
- Important in exhibiting density, richness or diversity of cultural features illustrating the human occupation and evolution of the nation, province, region or locality.
- Important for association with events, developments or cultural phases that have had a significant role in the human occupation and evolution of the nation, province, region or community.
- Important as an example for technical, creative, design or artistic excellence, innovation or achievement in a particular period.

It has strong or special association with the life or work of a person, group or organisation of importance in history;

- Importance for close associations with individuals, groups or organisations whose life, works or activities have been significant within the history of the nation, province, region or community.

It has significance relating to the history of slavery

- Importance for a direct link to the history of slavery in South Africa.

2. AESTHETIC VALUE

It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group.

- Important to a community for aesthetic characteristics held in high esteem or otherwise valued by the community.
- Importance for its creative, design or artistic excellence, innovation or achievement.
- Importance for its contribution to the aesthetic values of the setting demonstrated by a landmark quality or having impact on important vistas or otherwise contributing to the identified aesthetic qualities of the cultural environs or the natural landscape within which it is located.
- In the case of an historic precinct, importance for the aesthetic character created by the individual components which collectively form a significant streetscape, townscape or cultural environment.

3. SCIENTIFIC VALUE

It has potential to yield information that will contribute to an understanding of natural or cultural

heritage

- Importance for information contributing to a wider understanding of natural or cultural history by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.
- Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.
- Importance for information contributing to a wider understanding of the origin of life; the development of plant or animal species, or the biological or cultural development of hominid or human species.
- Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the nation, Province, region or locality.
- It is important in demonstrating a high degree of creative or technical achievement at a particular period
- Importance for its technical innovation or achievement.

4. SOCIAL VALUE

- It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
- Importance as a place highly valued by a community or cultural group for reasons of social, cultural, religious, spiritual, symbolic, aesthetic or educational associations.
- Importance in contributing to a community's sense of place.

DEGREES OF SIGNIFICANCE

In 2006 SAHRA prescribed classification standards for determining the heritage significance of sites within the SADC region. These recommendations were subsequently approved by ASAPA and are reproduced here to indicate the measuring standards for heritage sensitivity used in this report;

Field Rating	Grade	Significance	Mitigation
National Significance (NS)	Grade 1	-	Conservation; National Heritage Site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Heritage Sites nomination
Local Significance (LS)	Grade 3A	High	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High	Mitigation with part of site retained in original
Generally Protected A (GP.A)	-	High/Medium	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium	Recording before destruction
Generally Protected C (GP.C)	-	Low	Destruction

Table 3. SAHRA Assigned Heritage Site Significance Grading

Assessment of Heritage Potential

Assessment Matrix

Determining Heritage Sensitivity

In addition to guidelines provided by the National Heritage Resources Act (Act No. 25 of 1999), a set of criteria based on Deacon (J) and Whitelaw (1997) for assessing archaeological significance has been developed for Northern Cape settings (Morris 2007a). These criteria include estimation of landform potential (in terms of its capacity to contain archaeological traces) and assessing the value to any archaeological traces (in terms of their attributes or their capacity to be construed as evidence, given that evidence is not given but constructed by the investigator).

Estimating site potential

Table 4 (below) is a classification of landforms and visible archaeological traces used for estimating the potential of archaeological sites (after J. Deacon and, National Monuments Council). Type 3 sites tend to be those with higher archaeological potential, but there are notable exceptions to this rule, for example the renowned rock engravings site Driekopseiland near Kimberley which is on landform L1 Type 1 – normally a setting of lowest expected potential. It should also be noted that, generally, the older a site the poorer the preservation, so that sometimes any trace, even of only Type 1 quality, could be of exceptional

significance. In light of this, estimation of potential will always be a matter for archaeological observation and interpretation.

Table 4. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, NMC as used in Morris)

Class	Landform	Type 1	Type 2	Type 3
L1	Rocky Surface	Bedrock exposed	Some soil patches	Sandy/grassy patches
L2	Ploughed land	Far from water	In floodplain	On old river terrace
L3	Sandy ground, inland	Far from water	In floodplain or near features such as hill/dune	On old river terrace
L4	Sandy ground, coastal	>1 km from sea	Inland of dune cordon	Near rocky shore
L5	Water-logged deposit	Heavily vegetated	Running water	Sedimentary basin
L6	Developed urban	Heavily built-up with no known record of early settlement	Known early settlement, but buildings have basements	Buildings without extensive basements over known historical sites
L7	Lime/dolomite	>5 myrs	<5000 yrs	Between 5000 yrs and 5 myrs
L8	Rock shelter	Rocky floor	Loping floor or small area	Flat floor, high ceiling
Class	Archaeological traces	Type 1	Type 2	Type 3
A1	Area previously excavated	Little deposit remaining	More than half deposit remaining	High profile site
A2	Shell of bones visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick; shell and bone dense
A3	Stone artefacts or stone walling or other feature visible	Dispersed scatter	Deposit <0.5m thick	Deposit >0.5 m thick

Table 5. Site attributes and value assessment (adapted from Whitelaw 1997 as used in Morris)

Class	Landforms	Type 1	Type 2	Type 3
1	Length of sequence /context	No sequence Poor context Dispersed distribution	Limited sequence	Long sequence Favourable context High density of arte / ecofacts
2	Presence of exceptional items (incl. regional rarity)	Absent	Present	Major element
3	Organic preservation	Absent	Present	Major element
4	Potential for future archaeological investigation	Low	Medium	High
5	Potential for public display	Low	Medium	High
6	Aesthetic appeal	Low	Medium	High
7	Potential for implementation of a long-term management plan	Low	Medium	High

Assessing site value by attribute

Table 5 is adapted from Whitelaw (1997), who developed an approach for selecting sites meriting heritage recognition status in KwaZulu-Natal. It is a means of judging a site's archaeological value by ranking the relative strengths of a range of attributes (given in the second column of the table). While aspects of this matrix remain qualitative, attribute assessment is a good indicator of the general archaeological significance of a site, with Type 3 attributes being those of highest significance.

SIGNIFICANCE EVALUATION

As the criteria set out in the National Heritage Resources Act tend to approach heritage from the level of 'national' significance and few heritage sites and features fall within this category, a second set of criteria are used to determine the regional and local significance of heritage sites. Three sub-categories are used to determine this significance:

- (a) Historical significance – this category determines the social context in which a heritage site and resource need to be assessed. These criteria focus on the history of the 'place' in terms of its significance in time and the role they played in a particular community (human context).
- (b) Architectural significance – The objective of this set of criteria is to assess the artefactual significance of the heritage resource, its physical condition and meaning as an 'object'.
- (c) Spatial significance – focuses on the physical context in which the object and place exists and how it contributed to the landscape, the region, the precinct and neighbourhood.

HISTORIC SIGNIFICANCE

No	Criteria	Significance Rating
1	Are any of the identified sites or buildings associated with a historical person or group? No	-
2	Are any of the buildings or identified sites associated with a historical event? No	-
3	Are any of the identified sites or buildings associated with a religious, economic social or political or educational activity? No	-
4	Are any of the identified sites or buildings of archaeological significance? No	-
5	Are any of the identified buildings or structures older than 60 years? No	-

ARCHITECTURAL SIGNIFICANCE

No	Criteria	Rating
1	Are any of the buildings or structures an important example of a building type? No	-
2	Are any of the buildings outstanding examples of a particular style or period? No	-
3	Do any of the buildings contain fine architectural details and reflect exceptional craftsmanship? No	-
4	Are any of the buildings an example of an industrial, engineering or technological development? No	-
5	What is the state of the architectural and structural integrity of the building? N/A	-
6	Is the building's current and future use in sympathy with its original use (for which the building was designed)? N/A	-
7	Were the alterations done in sympathy with the original design? N/A	-
8	Were the additions and extensions done in sympathy with the original design?	

	N/A	-
9	Are any of the buildings or structures the work of a major architect, engineer or builder? No	-

SPATIAL SIGNIFICANCE

Even though each building needs to be evaluated as single artefact the site still needs to be evaluated in terms of its significance in its geographic area, city, town, village, neighbourhood or precinct. This set of criteria determines the spatial significance.

No	Criteria	Rating
1	Can any of the identified buildings or structures be considered a landmark in the town or city? No	-
2	Do any of the buildings contribute to the character of the neighborhood? No	-
3	Do any of the buildings contribute to the character of the square or streetscape? No	-
4	Do any of the buildings form part of an important group of buildings? No	-

IMPACT EVALUATION

This HIA Methodology assists in evaluating the overall effect of a proposed activity on the heritage environment. The determination of the effect of a heritage impact on a heritage parameter is determined through a systematic analysis of the various components of the impact. This is undertaken using information that is available to the heritage practitioner through the process of the heritage impact assessment. The impact evaluation of predicted impacts was undertaken through an assessment of the significance of the impacts.

DETERMINATION OF SIGNIFICANCE OF IMPACTS

Significance is determined through a synthesis of impact characteristics, which include context, and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas Intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

IMPACT RATING SYSTEM

Impact assessment must take account of the nature, scale and duration of effects on the heritage environment whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the project stages:

- planning
- construction
- operation
- decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact will be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance has also been included.

RATING SYSTEM USED TO CLASSIFY IMPACTS

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the mitigation of the impact. Impacts have been consolidated into one rating. In assessing the significance of each issue the following criteria (including an allocated point system) is used:

NATURE		
Include a brief description of the impact of the heritage parameter being assessed in the context of the project. This criterion includes a brief written statement of the heritage aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY		
This describes the degree to which an impact on a heritage parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which heritage resources will be irreplaceably lost as a result of a		

proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION		
This describes the duration of the impacts on the heritage parameter. Duration indicates the lifetime of the impact as a result of the proposed activity		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts on the heritage parameter. A cumulative effect/impact is an effect, which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible Cumulative Impact	The impact would result in negligible to no cumulative effects
2	Low Cumulative Impact	The impact would result in insignificant cumulative effects
3	Medium Cumulative impact	The impact would result in minor cumulative effects
4	High Cumulative Impact	The impact would result in significant cumulative effects
INTENSITY / MAGNITUDE		
Describes the severity of an impact		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).

3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE		
<p>Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the heritage parameter. The calculation of the significance of an impact uses the following formula:</p> <p>(Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.</p> <p>The summation of the different criteria will produce a non weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.</p>		
Points	Impact Significance Rating	Description
6 to 28	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive Low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive Medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive High impact	The anticipated impact will have significant positive effects.
74 to 96	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive Very high impact	The anticipated impact will have highly significant positive effects.

ANTICIPATED IMPACT OF THE DEVELOPMENT

No heritage sites were documented within the boundaries of the study area, therefore the primary impacts of the development will be null.

RESOURCE MANAGEMENT RECOMMENDATIONS

Although unlikely, sub-surface remains of heritage sites could still be encountered during the construction and mining activities associated with the project. Such sites would offer no surface indication of their presence due to the high state of alterations in some areas as well as heavy plant cover in other areas. The following indicators of unmarked sub-surface sites could be encountered;

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate)
- Bone concentrations, either animal or human
- Ceramic fragments such as pottery shards either historic or pre-contact
- Stone concentrations of any formal nature

Although no sites of heritage significance were identified within the proposed study area, the following recommendations are given should any sub-surface remains of heritage sites be identified as indicated above;

- All operators of excavation equipment should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered.
- All construction in the immediate vicinity (50m radius of the site should cease).
- The heritage practitioner should be informed as soon as possible.
- In the event of obvious human remains the SAPS should be notified.
- Mitigative measures (such as refilling etc.) should not be attempted.
- The area in a 50m radius of the find should be cordoned off with hazard tape.
- Public access should be limited.
- The area should be placed under guard.
- No media statements should be released until such time as the heritage practitioner has had sufficient time to analyse the finds.

REFERENCES CITED & RESEARCHED

- Arts and Culture in the Ekurhuleni Metro Area, n.d. Published by the Ekurhuleni Metropolitan Municipality.
- Arts and Culture Task Group, (1995), Draft report for the Ministry of Arts, Culture, Science and Technology. Pretoria: ACTAG.
- Bewsher, P K, & De Jong, R C, (1997), Ecotourism and cultural resource management. Document prepared for the SA Wildlife College. Pretoria: Centre for Ecotourism.
- Canadian Parks Service, (1989). Proposed policy.
- Cultural Institutions Act, No 119 of 1998.
- De Jong, R.C., (1992). Draft policy guidelines for cultural resource management in nature conservation and forestry areas in South Africa. Pretoria: National Cultural History Museum (unpublished)
- Department of Arts, Culture, Science and Technology, (1996). White Paper on Arts, Culture and Heritage. Pretoria: SA Communication Service.
- DEAT, (1996). White Paper on the Development and Promotion of Tourism in South Africa. Pretoria: The Department.
- DEAT, (1998). A national strategy for Integrated Environmental Management in South Africa. Discussion document. Pretoria: The Department.
- DEAT, (1998). White Paper on environmental management policy for South Africa. Government Gazette, Vol 395, No 18894, 15 May 1998.
- Department of Public Works, (1998), White Paper 1997. Public Works towards the 21st century. Government Gazette, Vol 391, No 18616, 14 January 1998.
- *Cultural Heritage 146 Ekurhuleni SoER 2003*
- Entries on towns in the *Standard Encyclopedia of Southern Africa*, published by Nasou, 1970-1976 (11 volumes).
- Eskom Heritage website
- Files in Gauteng Office of SAHRA, Northwards, Parktown, Johannesburg
- Galla, A, (1996), Shifting the paradigm. A plan to diversify heritage practice in South Africa. Cape Town: South African Museums Association.
- Gauteng Department of Economic Affairs and Finance, (1997). Gauteng Tourism White Paper. Johannesburg: The Department.
- Hall, C.M, & McArthur, S. (eds), (1996). Heritage management in Australia and New Zealand. Draft publication.
- Harrison, R, (1994). Manual of heritage management. Oxford: Butterworth Heinemann.
- Jote, K, (1994). International legal protection of cultural heritage. Stockholm: Juristförlaget.
- Killick, D. 2004. Review Essay: "What Do We Know About African Iron Working?" *Journal of African Archaeology*. Vol 2 (1) pp. 135–152.
- LEGASSICK, M. 1969. The Sotho-Tswana peoples before 1800. In Thompson, L. ed. African societies in southern Africa: London: Heinemann.
- LOUBSER, J. H. N. 1981. Ndebele archaeology of the Pietersburg area. Unpublished M. A. thesis: University of the Witwatersrand

- MAGGS, T. M. O'C. 1972. Bilobial dwellings: a persistent feature of southern Tswana settlements. S. Afr. archaeol. Soc. Goodwin Ser. 1:54-64.
- MAGGS, T. M. O'C. 1982. Mgoduyanuka: terminal Iron Age settlement in the Natal grasslands. Ann. Natal Mus. 25:123-141.
- MASON, R. J. 1962. The prehistory of the Transvaal. Johannesburg: Witwatersrand University Press.
- MONNIG, H. O. 1967. The Pedi. Pretoria: Van Schaik.
- McCarthy, T.S. 2006. The Witwatersrand Supergroup. In: Johnson MR, Anhaeusser and Thomas RJ (Eds). The Geology of South Africa. Geological Society of South Africa, Johannesburg/Council for Geoscience, Pretoria. pp 155-186.
- McCarthy, T.S. and Rubidge, B.S. 2005. The story of Earth and Life – a southern African perspective on the 4.6 billion year journey. Struik Publishers, Cape Town. pp 333.
- Mason, R. (1986). Origins of Black People of Johannesburg and the Southern Western Central Transvaal AD350-1880. Occasional Paper No. 16 of the Archaeological Research Unit.
- Musa, (1994). Museums for South Africa: Intersectoral investigation for national policy. Pretoria: MUSA Secretariat.
- National Heritage Council Act, No 11 of 1999.
- National Heritage Resources Act, No 25 of 1999.
- National Research Foundation, Nexus database of current and completed research projects
- RASMUSSEN, R. K. 1975. Ndebele wars and migrations. Unpublished Ph.D. thesis: University of California.
- Republic of South Africa, (1996). Constitution of the Republic of South Africa, Act 108 of 1996. Government Gazette, Vol 378, No 17678, 18 December 1996.
- Ross, M. (1996). Planning and the heritage. Policy and procedures. Second edition. London: E & FN Spon.
- SAHRA website <http://www.sahra.org.za>
- SCHAPER, I. 1930. Some ethnological texts in Sekgatla. Bantu Stud. 4:73-93.
- SCHAPER, I. 1953. The Tswana. London: International African Institute.
- Stark, F, (1986). Germiston: The heart of South Africa. Germiston: Felstar Publishing.
- TAYLOR, M. O. V. 1979a. Wildebeestfontein: a Late Iron Age site in the south-east Transvaal. S. Afr. archaeol. Soc. Goodwin Ser. 3:120-129.
- TAYLOR, M. O. V. 1979b. Late Iron Age settlements on the northern edge of the Vredefort Dome. Unpublished M.A. thesis: University of the Witwatersrand.
- TAYLOR, M. O. V. 1984. Southern Transvaal stone-walled sites a spatial consideration. In Hall, M. J., Avery, G., Avery, D. M., Wilson, M. L. & Humphreys, A. J. B. eds Frontiers: southern African archaeology today: 248-251. Oxford: British Archaeological Reports International Series
- UNESCO, (1983). Conventions and recommendations concerning the protection of the cultural heritage. Paris: UNESCO.
- US National Parks Service, (1988). Management Policies.