

Plastic and Coal Gasification Plant in Waltloo, Pretoria

Phase 1 Archaeological Impact Assessment

Prepared by:

Drs Matt Lotter¹ and Tim Forssman²

¹Association of Southern African Professional Archaeologists, Professional Member 339 with
CRM accreditation

²Association of Southern African Professional Archaeologists, Professional Member 307 with
CRM accreditation

Prepared for:

EScience Associates (Pty) Ltd
PO Box 2950, Saxonwold, 2132
9 Victoria Street, Oaklands, Johannesburg, 2192
VAT No: 473 025 4416
Reg No: 2009/014407/07

First draft: 02 December 2019

Second draft: 03 December 2019

Final draft:

Declaration of Independence

The report has been compiled by Drs Matt Lotter and Tim Forssman acting as heritage specialists. The results expressed in this report have been collected using standard archaeological procedures and are objective. The authors declare no other conflicting interests in this report.

Signed:

A handwritten signature in black ink, appearing to be 'M Lotter', with a large, sweeping flourish at the end.

Dr Matt Lotter

A handwritten signature in black ink, appearing to be 'Tim Forssman', with a long, horizontal flourish extending to the right.

Dr Tim Forssman

This document has been prepared by:

Dr Matt Lotter

Association of Southern African Professional Archaeologists, Professional Member 339 with
CRM accreditation
+27732119832 (cell); mattlotter@gmail.com (email)

and

Dr Tim Forssman

Association of Southern African Professional Archaeologists, Professional Member 307 with
CRM accreditation
+27784224828 (cell); tim.forssman@gmail.com (email)

Both authors were responsible for draft report compilation, archaeological fieldwork and report compilation.

Signed:

A highly stylized, cursive handwritten signature in black ink, consisting of several overlapping loops and flourishes.

Dr Matt Lotter

A handwritten signature in black ink that reads "Tim Forss" in a cursive style, with a long horizontal line extending from the end of the signature.

Dr Tim Forssman

List of acronyms

AIA	Archaeological Impact Assessment
EIA	Environmental Impact Assessment
ESA	Earlier Stone Age
MSA	Middle Stone Age
POI	Point of Interest
LSA	Later Stone Age

Glossary of terms

Find / Find spot	Either term is used to refer to an isolated find, a single artefact or item of cultural heritage. These may be significant but are not considered sites.
Site	An accumulation of cultural heritage, domestic remains or other human traces of human activity. It is a term used to refer to any area of this nature from very small (a few finds spatially associated with one another) to large and obvious residential or activity areas.

Executive Summary

Introduction

EScience Associates contracted Drs Matt Lotter and Tim Forssman to perform an Archaeological Impact Assessment of a 3ha plot of land to be developed into a coal and plastic gasification plant in Waltloo, Pretoria.

Methods

The entire portion of land was investigated on foot for any surface traces of cultural heritage. Where excavations had taken place on the property, these and their spoil heaps were also examined for any heritage traces. All finds or sites were recorded following standard archaeological procedures. A specially designed site recording form was used to notate any observable traits, including cultural heritage types, deposit information and assemblage or site context, and this was graded following a set rating criteria. All survey routes were GPS recorded and every find was photographed along with the landscape.

Results

No cultural heritage items were found in the development area. A possible stromatolite was located but its provenience is unknown. Limiting the outcome of this investigation is the discriminant dumping that has occurred on the site covering many parts of the surface. This potentially is obscuring cultural heritage. However, a lack of remains anywhere else, including in the excavated areas, probably makes this possibility unlikely.

Conclusions

It is anticipated that development will have no impact on cultural heritage in the proposed development area and no recommendations are put forward. Nonetheless, there may still be cultural heritage subsurface that was not observable or inferrable from surface finds, as is always the case. Should any cultural heritage be observed once development commences, a specialist must be consulted to perform an examination of the finds.

Table of Contents

1. Introduction

- a. Scope of the study*
- b. Project description*
- c. Specialist expertise*
- d. South African legislation*

2. Archaeological and historical background: desktop study

- a. Overview of the local archaeological sequence*
 - i. Stone Age
 - ii. Iron Age
 - iii. Colonial period
- b. Archaeology and history of the study area and surrounds*
- c. Database consultation*

3. Materials and methods

- a. Site location and description*
- b. Study methods*
 - i. Archival study: background literature review
 - ii. Site visit and survey
 - iii. Reporting
- c. Constraints and limitations*

4. Results and discussion

5. Development impact and proposed mitigation

- a. Development impact*
- b. Recommendations*

6. Conclusions

7. References

List of Figures

Figure 1: The distribution of Acheulean sites in South Africa (from Lotter & Kuman 2018: 44).

Figure 2: The appearance of farmer communities (Bantu-language speaking groups) in southern Africa (from Huffman 2007: 336).

Figure 3: A depiction of Simon van der Stel's Vergelegen compound with the surrounding lodges (from Markell et al. 1995: 14).

Figure 4: Principle mines in the Gauteng region (from Reeks 2012: xvi).

Figure 5: Google Earth map showing the study area: The study area's context within Gauteng (A), Pretoria (B) and Waltloo (C) and a bird's eye view of the study area itself (D).

Figure 6: Survey tracklog indicated in green. Red line demarcates property boundary.

Figure 7: Single point of interest (white and black square). Blue polygon shows large developed platform (tar and concrete; see following figure). Red line demarcates property boundary.

Figure 8: Different locations within the surveyed area. A: central SW boundary looking north, showing the least disturbed area of the property; B: NW corner of the property looking north, showing significant landscape modification; C: SE portion of the property looking north (within the blue polygon, scale is 30cm), showing a large concrete platform; D: disturbed landscape in the central part of the property, looking west.

Figure 9: Possible stromatolite located at the single POI. Note the abundance of dumped material nearby. Scale is 30cm.

List of Tables

Table 1: The Stone Age in southern Africa (from Lombard et al. 2012: 125).

1. Introduction

a. Scope of the study

EScience Associates (Pty) Ltd was appointed to conduct an Environmental Impact Assessment (EIA) of a proposed plastic and coal gasification plant in Waltloo, Pretoria, on a parcel of land measuring approximately three hectares. Drs Matt Lotter and Tim Forssman were subsequently appointed by EScience Associates to perform an Archaeological Impact Assessment (AIA) of the proposed area. As the proposed development plan is not known, the entire parcel of land was examined.

b. Project description

The AIA covers all portions of the proposed development. The aim of the study was to identify any tangible cultural heritage present on the land and assess its importance, and establish mitigation factors should the site be designated for destruction. To do so, a survey over the land was performed recording and grading all surface remains. Recording was performed following a standard record form. From these data, finds and sites were graded based on the rating criteria, which includes various conditions (**see Section 3, ii**). This follows standard archaeological procedures.

c. Specialist expertise

Dr Matt Lotter has undertaken extensive and in-depth research at several Stone Age, Iron Age and rock art localities around southern Africa, as well as internationally in China, Lesotho and Botswana. He has been involved in a number of Phase 1 Heritage and Archaeological Impact Assessments as well as Phase 2 mitigations. He has also published several scientific articles with a focus on Earlier Stone Age technologies and geoarchaeological landscape evolution. He is registered with the Association of Southern African Professional Archaeologists (ASAPA, ID 339).

Dr. Tim Forssman has undertaken extensive and in-depth research at several Stone Age, Iron Age and rock art localities around southern Africa. He has been involved in a number of Phase 1 Heritage and Archaeological Impact Assessments as well as Phase 2 mitigations. He was the Project Leader on the Polihali Project for a year, overseeing the mitigation of 12 Stone Age sites and coordinating several specialists in the Stone Age, rock art, Iron Age and Intangible Cultural Heritage fields. He has also published several scientific articles with a focus on the Later Stone Age, Iron Age, rock art and archaeological methods. He is registered with the Association of Southern African Professional Archaeologists (ASAPA, ID 307).

d. South African legislation

South African legislation (NHRA) dictates that any item of cultural heritage may not be disturbed, interfered with, or destroyed without authorisation from a heritage authority. Following Nema (No 107 of 1998; 23: 2(b)), one should "...identify, predict and evaluate the actual potential impact on the environment, socio-economic conditions and cultural heritage". A specialist is required to perform the correct and appropriate identification, evaluating and assessing of cultural heritage significance following a rating criteria (**see Section 3, ii**). Requiring and governing this assessment is the following South African legislation:

- i. National Environmental Management Act (NEMA) Act 107 of 1998
- ii. National Heritage Resources Act (NHRA) Act 25 of 1999
- iii. Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
- iv. Development Facilitation Act (DFA) Act 67 of 1995

In each Act, the following sections are applicable in terms of the identification, evaluation and assessment of cultural heritage resources:

- i. National Environmental Management Act (NEMA) Act 107 of 1998:
 - a. Basic Environmental Assessment (BEA) – Section (23)(2)(d);
 - b. Environmental Scoping Report (ESR) – Section (29)(1)(d);
 - c. Environmental Impacts Assessment (EIA) – Section (32)(2)(d); and,
 - d. EMP (EMP) – Section (34)(b).
- ii. National Heritage Resources Act (NHRA) Act 25 of 1999:
 - a. Protected Areas – Section 28;
 - b. Protection of Heritage Resources – Sections 34 to 36; and,
 - c. Heritage Resources Management – Section 38.
- iii. Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002:
 - a. Section 39(3).

2. Archaeological and historical background: desktop study

a. *Overview of the local archaeological sequence*

Southern Africa has a lengthy archaeological sequence spanning approximately the last two million years. This has been conveniently separated into 'Ages', which themselves are further divided. While there are many issues with doing so, it provides a useful gauge for understanding different techno-complexes, periods, and cultural sequences. We follow this same categorisation here.

i. Stone Age

The Stone Age is composed of three divisions, which are further subdivided (Table 1). These primary divisions are the Earlier, Middle and Later Stone Ages. In southern Africa, the Earlier Stone Age (ESA) begins at approximately 2.1 million years ago. Early tools, which are ascribed to the Oldowan Industry, are large tools most often made from locally available raw materials. Tool form is not yet standardised and artefacts generally retain a limited number of flake removals, which are struck off using a hammerstone (Kuman 2014). The Oldowan is followed by the Acheulean Industry, from c. 1.75 to 0.3 million years ago, which is characterised by the occurrences of handaxes and cleavers, although this is probably over-emphasised since some Acheulean assemblages lack these. While a number of sites are known in southern Africa, they are fairly scarce (Figure 1) (Lotter & Kuman 2018).

The Middle Stone Age (MSA) follows and begins between 300 and 250 thousand years ago and gradually disappears between 40 and 20 thousand years ago. Assemblages older than 130 thousand years are rare, and from this time onwards more MSA sites are known. Assemblages from these sites are generally thought to be characterised by blade technology, prepared cores, formal tools exhibiting secondary retouch and a range of ornaments, jewellery and symbolic devices, such as engraved ochre slabs. It must be noted that there is variability between regions and time periods from 130 thousand years ago and the period has been divided into several phases. Notably, the Howieson's Poort Industry is one that is marked by smaller formal tools and segmented artefacts; it is a unique development and an early example of what came to characterise the following Later Stone Age (LSA). Assemblages dating between c. 100 and 50 thousand years ago are generally thought to possess cultural traits that indicate the appearance of modern thought or cognition, sometimes called complexity (Wadley 2015).

Table 1: The Stone Age in southern Africa (from Lombard et al. 2012: 125).

Period	SAL technocomplex	Also known as (including regional variants)
Later Stone Age <40 ka	<i>ceramic final Later Stone Age</i> <2 ka	ceramic post-classic Wilton, Late Holocene with pottery (Doornfontein, Swartkop)
	<i>final Later Stone Age</i> 0.1–4 ka	post-classic Wilton, Holocene microlithic (Smithfield, Kabeljous, Wilton)
	Wilton 4–8 ka	Holocene microlithic (Springbokooog)
	<i>Oakhurst</i> 7–12 ka	Terminal Pleistocene/early Holocene non-microlithic (Albany, Lockshoek, Kuruman)
	<i>Robberg</i> 12–18 ka	Late Pleistocene microlithic
	<i>early Later Stone Age</i> 18–40 ka	(informal designation); Late Pleistocene microlithic
Middle Stone Age >20 to <300 ka	<i>final Middle Stone Age</i> 20–40 ka	(informal designation) MSA IV at Klasies River, MSA 4 generally
	<i>Sibudu</i> 45–58 ka	late MSA/post-Howieson's Poort or MSA III at Klasies and MSA 3 generally (all informal designations)
	<i>Howieson's Poort</i> 58–66 ka	
	<i>Still Bay</i> 70–77 ka	
	<i>pre-Still Bay</i> 72–96 ka	(informal designation)
	<i>Mossel Bay</i> 77–105 ka	MSA II at Klasies River, MSA 2b generally (Pietersburg, Orangian)
	<i>Klasies River</i> 105–130 ka	MSA I at Klasies River, MSA 2a generally (Pietersburg)
	<i>early Middle Stone Age</i> 130–300 ka	(informal designation)
Earlier Stone Age >200 ka	<i>ESA-MSA transition</i> >200–600 ka	(informal designation) (Fauresmith, Sangoan)
	<i>Acheulean</i> 300 ka–1.5 Ma	
	<i>Oldowan</i> 1.5–2 Ma	

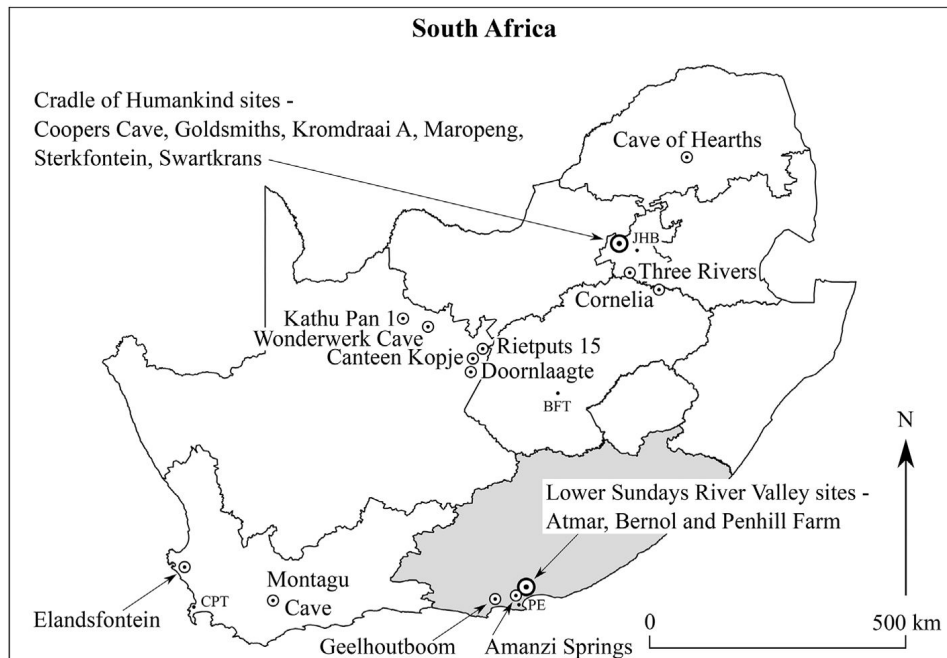


Figure 1: The distribution of Acheulean sites >0.5 million years in South Africa (from Lotter & Kuman 2018: 44).

The LSA is the final Age and begins during the transition from the MSA between 40 and 20 thousand years ago. This early period, though, is characterised by considerable variability that only gives way to a regionally standardised toolkit from after 20 thousand years ago. Small bladelets characterised this initial phase, which, around 12 thousand years ago, was replaced by a larger tool industry characterised by scrapers and adzes. Following this, the Wilton arose around eight thousand years ago and represents a highly standardised period of scraper, backed tool and adze production, although several phases are known, and includes a wide range of ornaments, jewellery, bone tools and rock art (Lombard et al. 2012). LSA-producing foragers, or hunter-gatherers, lived in almost every landscape in southern Africa and are represented today by Bushman or San¹ communities (Mitchell 2002).

Rock art was produced by many communities, but the best known is the rock art of hunter-gatherers who were also the producers of the LSA. The art typically captures trance experiences, which is when a shaman enters the spirit world through a trance dance. While in it, he or she will heal the sick, control game, ward off evil spirits and travel to neighbours or to God's village, as well as perform other tasks. Rock art generally depicts these scenes as well as folklore and mythology (Forssman & Gutteridge 2012). Khoekhoe herders had their own painting tradition, which is less well-understood, although at least some of it relates to girls' initiation. Bantu-language speaking groups also painted and generally their depictions are to do with initiation and conflict during the colonial era (Mitchell 2002). While their art is fairly well-studied, it is their occupation sequence of southern Africa that has dominated Iron Age research.

ii. Iron Age

Iron Age farmers began arriving in southern Africa little more than two thousand years ago. This was initially from Angola, through southern Zambia, the Caprivi Strip in Namibia, northern Zimbabwe and Botswana to settle in the central southern African region (Figure 2). Early settlements just north of the Limpopo River date to around AD 200. Soon afterwards, they entered what is now South Africa (Mitchell & Whitelaw 2005).

The most significant developments that occurred in the southern African region, at least at first, were those that began around AD 900 in northern South Africa. Here, farmers began exchanging local trade wealth for exotic items like glass beads from the Mozambique coastline where travelling merchants from the north based themselves. These items supported the local

¹ The terms Bushman and San have been used derogatorily in the past. Modern communities who draw their identity from present and past hunter-gatherers have requested that these terms be used to identify them when not referring to language groups. We do so here with the utmost respect and do not invoke any pejorative connotations.

growth of wealth, which was initially based on cattle and on locally sourced value items. This growth led to the beginning of elite communities based at what came to be prominent settlements. These then developed into political centres where social stratification appeared. Around AD 1220, these developments, along with several others, resulted in the establishment of Mapungubwe, southern Africa's first state-level society. When it declined, around AD 1300, Great Zimbabwe rose to prominence, which was succeeded by Khami and Thulamela (Huffman 2009). Although this gives the impression of a fairly straight-forward developmental process, it was in fact fairly heterogeneous.

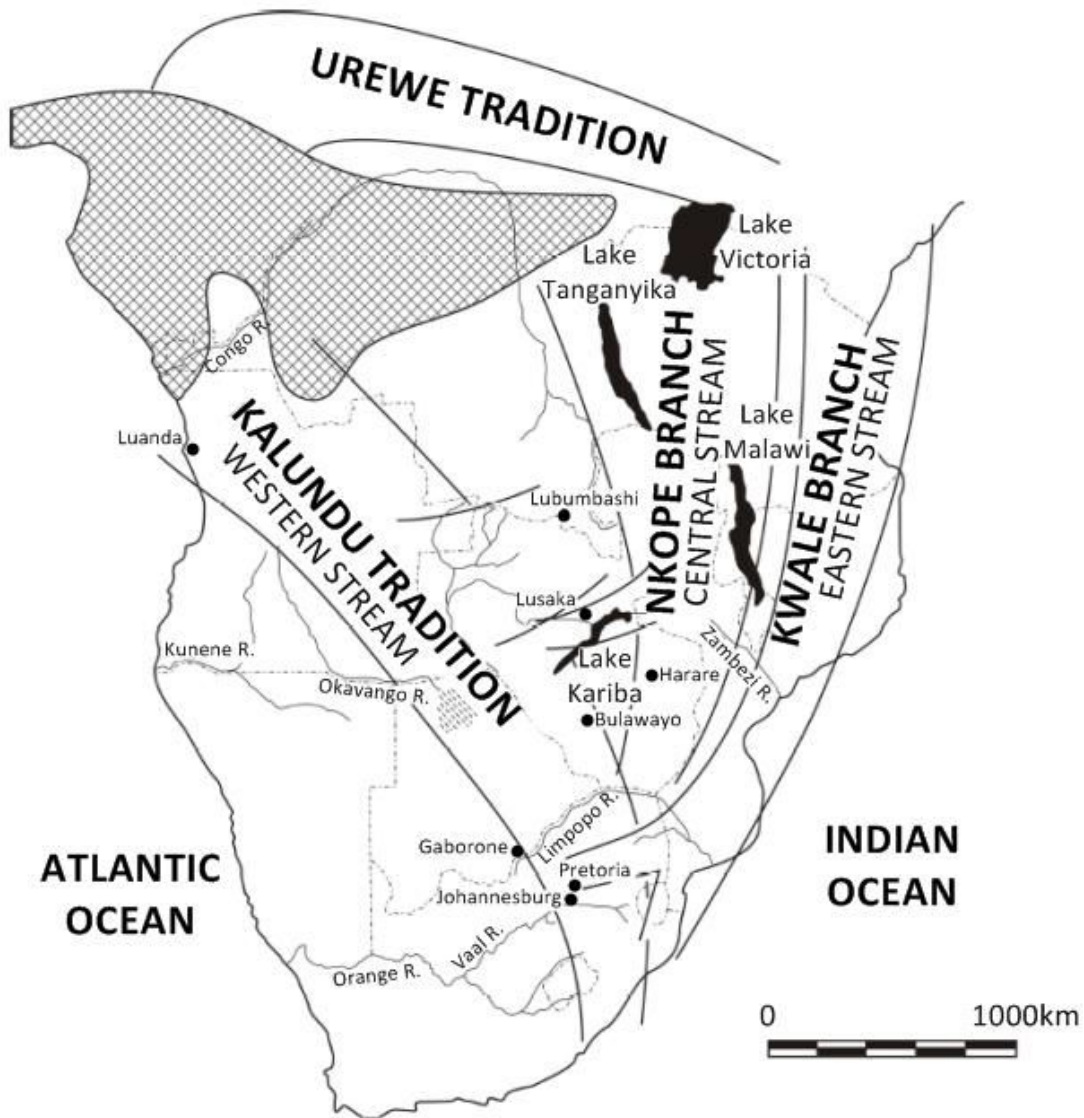


Figure 2: The appearance of farmer communities (Bantu-language speaking groups) in southern Africa (from Huffman 2007: 336).

Around the mid-second millennium AD, groups from the north, known by their ceramics called Ntsuanatsatsi, moved south into the North-West Province region. Here they established political control, around AD 1450 to 1500, and became the Tswana empire. These communities established massive urban centres, some over 3km in length, with complex political authorities (Pistorius 1994). Many are known through missionary and traveller accounts, such as those from William Burchell or Robert Moffatt in the 1800s, who encountered these capitals. The Tswana polity, which was made up of several totems, spread as far as modern-day Gauteng where they encountered Pedi, eSwati and Zulu communities (Sadr 2019).

Sometime between the 1810s and 1830s, the Difaqane (Sotho) or Mfecane (Zulu/Xhosa) took place. This was a period marked by conflict, raiding, food insecurity, and warfare. Although having its origins largely in KwaZulu-Natal, its impact was felt through-out much of eastern southern Africa and further north. At this time, different Zulu groups were covering vast regions and attacking settlements and villages taking resources, food, slaves and livestock. Some were driven as far north as Uganda. The impact of the conflict resulted in new settlement patterns, large-scale movements of people, and critical shortages of subsistence resources. It marked a tumultuous period in southern Africa's prehistory with the likely death of many thousands of people (Wright 1989).

The Iron Age is a notably diverse and complex period. Many different identities interacted, traded, fought, created alliances, and intermixed during this period. Thorough reviews exist but are not necessary in the context of this report; only some key events or histories have been discussed above (e.g. Huffman 2007). During this period, not only were farmer communities living in the region and meeting one another, but foragers and herders were also present. These three different communities had regular encounters that caused significant changes in one another's lifeways. The Iron Age also overlaps with the entire colonial period; even today many people practice a subsistence-based farming much as they did in the past. In the extended region, Iron Age settlements are located in the Magaliesburg and Rustenburg areas (Huffman 2002) and further west in the Cradle of Humankind.

iii. Colonial period

Prior to the Dutch establishing a refreshment station in what is now the Western Cape in 1652, Portuguese traders and travellers had made contact with local communities. Trading along almost the entirety of southern Africa's coastline for supplies and what to them was exotica, they encountered many of the communities mentioned in the text here. Their interactions included often detailed note taking and mapping of certain regions, which are hugely valuable to this day in terms of understanding the local social landscape. For example, their accounts of Sofala are highly valuable since this immensely influential trading post on the Mozambique

coastline has not been re-discovered. The Portuguese and also Arabic records are all we have of its existence and role in local economies (Wood 2000). From the settlement of the Western Cape, though, the influence of European colonisation was increasingly felt.

Settlement progressed slowly through southern Africa. At first, it was restricted to the fairly amicable Cape region with missionaries, travellers, biologists and explorers travelling inland. Contact with local herders and foragers was regular and there is evidence of some living or trading regularly with forts and outposts (Schrire 2014). Slaves were also taken and at some of the more prominent farms, such as Simon van der Stel's Vergelegen, a slave lodge was uncovered (Figure 3) (Markell et al. 1996). Interactions with local communities were highly nuanced and variable.

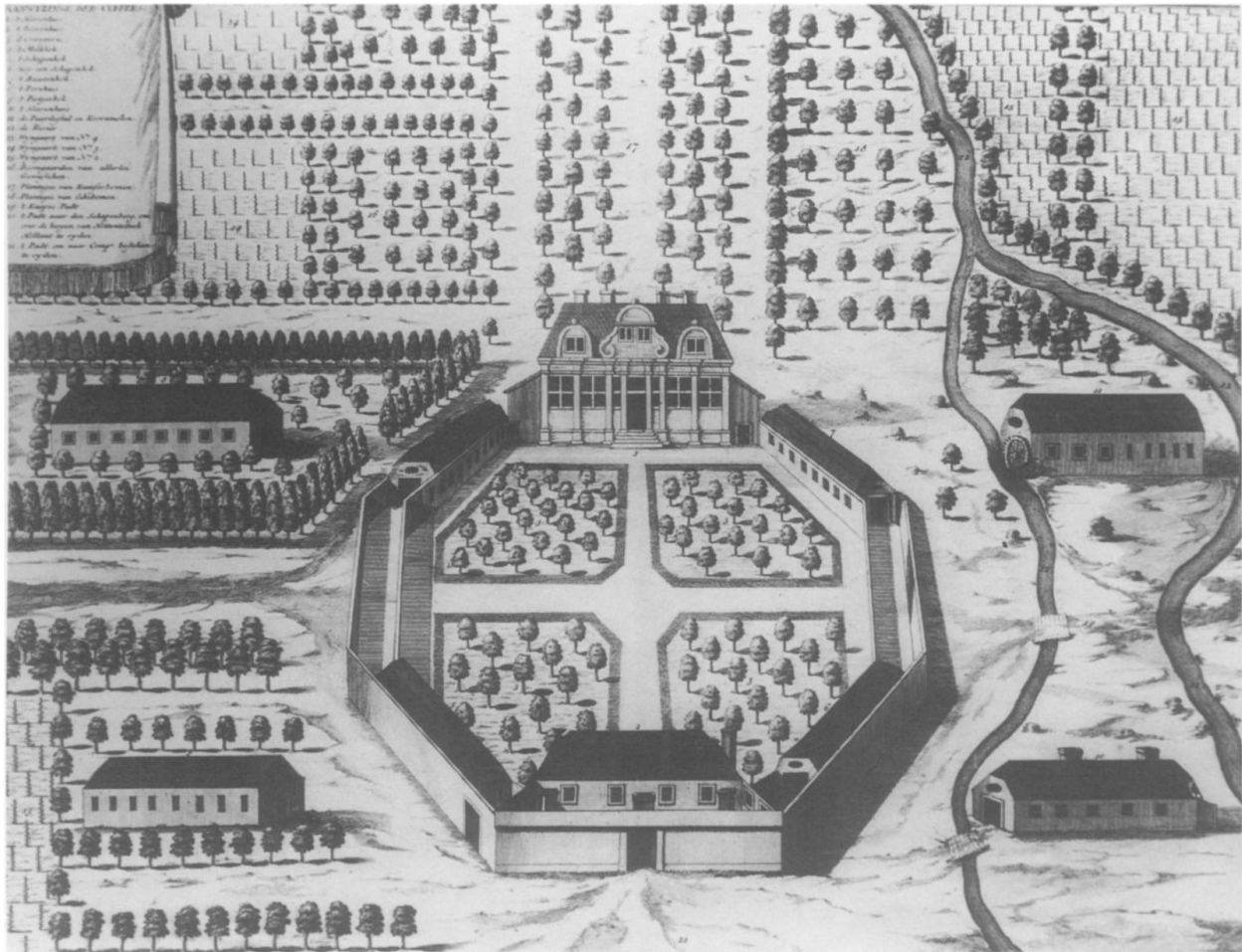


Figure 3: A depiction of Simon van der Stel's Vergelegen compound with the surrounding lodges (from Markell et al. 1995: 14).

The British took control of the Cape Colony in 1795 after the Battle of Muizenberg. This began a process of social disintegration with many European locals unwilling to contribute to the British

government and crown (although from 1803 to 1806 the Dutch regained authority temporarily). The end result was the Great Trek. In 1832, Dr Andrew Smith and William Berg, an Englishman and a Boer, set-off on an early exploratory trek along the coast towards what is now KwaZulu-Natal. On returning, they convinced Boer leaders of the potential the land held for farming, livestock and settlement. After a larger exploratory trek in 1834, the first wave of trekkers left in 1835 followed in 1836 by more. About 6000 people in total left on the trek led by now historically recognised figures such as Louis Tregerdt, Hans van Renburg and Hendrik Potgieter, among others. This led to the widespread settlement of Boers and others in the eastern and northern territories of South Africa, as well as conflicts with the Matabele and Zulu; a notable battle was held at the contested Ncome/Blood River site (Ngobese & Mukhuba 2018).

In the late 1800s, when the Zuid Afrika Republic and Oranje Vrijstaat (Orange Free State) states had been established, gold was discovered in the Transvaal (d. 1886). By this time, *uitlanders* (European foreigners) were living among the local Boer community and working in Johannesburg and Pretoria as well as paying taxes, for which they received less than the local Boers. Tension between the British and Boer states arose. With the discovery of gold the British saw it fit to attempt to take over the two states in order to protect their people living under Boer rule and also to thwart a German attempt at taking control of large parts of Africa. While this is hotly contested, and an over-simplification, it contributed to the South African War (formerly Boer War) from 1899 to 1902. The war ultimately claimed the lives of probably over 50,000 Boer and black (from several communities) people as well as many British soldiers and those from the colonies. The Boer's ceded in May 1902 and the British formed the South African Republic. Boers continued living in the new republic although many resisted and wished to continue fighting. If it were not for the work of Jan Smuts and others, persistent warfare and angst may have continued (Judd & Surridge 2013).

While southern African archaeology and history is a complex matter, what is presented here is an overview and somewhat narrow summary of certain key events in the region's prehistory before about 1900. For a thorough review, see Mitchell (2002).

b. Archaeology and history of the study area and surrounds

ESA and MSA assemblages are known of in Pretoria and its extended region but few LSA sites have been investigated. The former two Stone Ages have been identified at several locations in the Cradle of Humankind (Lombard et al. 2012), which is also where the nearest LSA sites have been studied (Wadley 1989). However, with regard to ESA traces, Mason (1962) investigated a number of nearby sites including in Wonderboom, east of Waltloo. Some of the sites he investigated have yielded large and impressive assemblages that may provide significant insights into the local Stone Age sequence. It is conceivable that other areas in Pretoria also

contain impressive Stone Age assemblages. No rock art is known of in the vicinity around Pretoria and the nearest site that has received research attention is near Bronkhorstspuit (Forssman & Louw 2018).

The history of the Gauteng region is dominated by a single event; the discovery of gold in 1886. The succeeding South African War was very much linked to the industry that developed after the initial identification of gold reserves. Soon after its discovery, many individuals and enterprises sought to gain their riches through gold mining activities. This is often termed 'The Gold Rush'. It led to a great influx of people into the Zuid Afrika Republic including many European foreigners, and eventually led to British interference (Judd & Surridge 2013). However, it was later realised that not only was gold available, but also many other minerals and resources. Mining developed into a massive industry in the early 1900s and still is to this day.

In the vicinity of Pretoria, silver was mined. Soon after 'The Gold Rush', silver mining began in various areas. However, the market for silver varied from that of gold, which was far more valuable and stable. Silver mining, for this reason, fluctuated between 1885 and the mid-twentieth century. Reserves were found in many areas of eastern Pretoria and silver veins extended throughout the region allowing mines to be setup in a number of locations (Figure 4). Silverton, for example, Waltloo's western neighbour, was named as such because of the cluster of mines known in the area. These mines largely belonged to prominent Randlords and businessmen and some became their residential areas, such as at The Willows (Reeks 2012).

The potential for their being evidence of mining activities in the Waltloo area and surrounds is notably high, given the localised activities in these areas. Furthermore, the presence of Iron Age people in the extended region and the Stone Age traces found in Pretoria, at sites such as Wonderboom, make the possibility of finding these traces also high. However, based on reports from the immediate area, the local preservation of these traces is unlikely.

c. Database consulted

The South African Heritage and Resources Agency's (SAHRA) online database, SAHRIS, was consulted. Several studies, forming part of impact assessments, have been conducted in the area. Van Schalkwyk and de Jong (1998) conducted a survey east of the gasification development area, during which they did not locate any significant cultural heritage. Van Shalkwyk (2011) performed another assessment for a road development and was also unable to identify any significant cultural heritage; although, he did locate buildings older than 60 years. Van der Walt (2015) also examined an old warehouse area in Waltloo, in the industrial zone north of the study area. He, too, found nothing of any cultural heritage significance. Following

these accounts, the area appears to be devoid of preserved cultural heritage, linked possibly to the more recent local developments. This differs from east of Mamelodi (van der Walt 2008; van Schalkwyk 2011) and north-west of Derdepoort (Nienaber et al. 1997; van der Walt 2007), where Late Iron Age (Southern Ndebele) and Early Iron Age (AD 350 to 900) sites have been identified, respectively. The possibility of people inhabiting the Waltloo area is very high, but the likelihood of their occupation and activity traces being preserved in the area is very low.

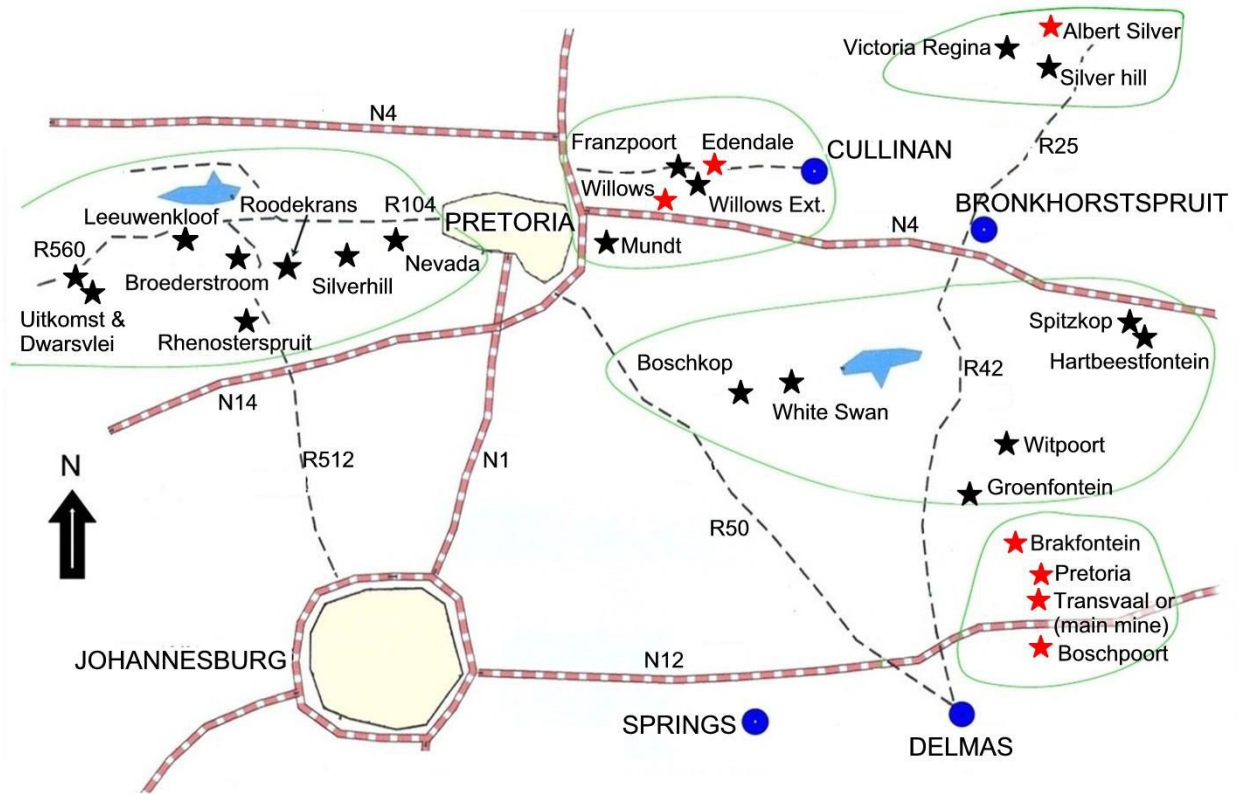


Figure 4: Principle gold and silver mines in the Gauteng region (from Reeks 2012: xvi).

3. Materials and methods

a. Site location and description

The proposed plastic and coal gasification plant is located in Waltloo within the Tshwane Municipality (Figure 5). Waltloo is situated east of Silverton in eastern Pretoria and north of the N4 highway. The 3ha of land parcel upon which the development will take place is bounded by Waltloo Road to the south-east and Petroleum Street to the south-west ($25^{\circ} 43' 46.54''$ S, $28^{\circ} 19' 01.26''$ E). North, but separated by a small corridor of land is Alwyn Street, and an undeveloped parcel of land is to the north-east.

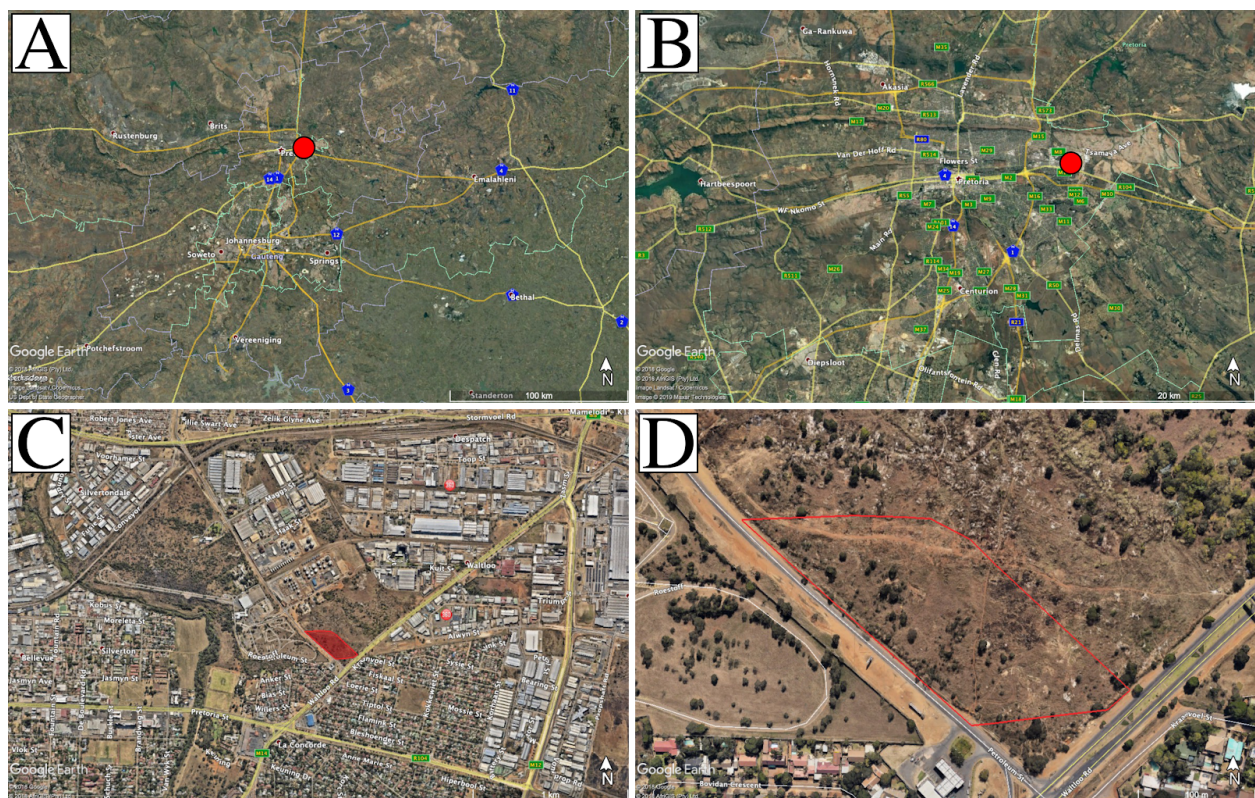


Figure 5: Google Earth map showing the study area: The study area's context within Gauteng (A), Pretoria (B) and Waltloo (C) and a bird's eye view of the study area itself (D).

The land is currently vacant, although several temporary/informal housing structures have been erected. Dumping is prolific and appears to occur haphazardly across the portion of land. Shallow surface excavations have also taken place in several areas. Collectively, these activities have significantly disturbed the local landscape. Movement of people across the parcel of land is common.

b. Study methods

i. Archival study: background literature review

An archival and heritage desktop study was performed. Literary sources from previous archaeological, anthropological and historical studies from the region were consulted, as well as previous impact assessment from the area. The results from this study are presented in **Section 2: Archaeological and Historical Background: desktop study.**

ii. Site visit and survey

The site visit was conducted by Dr Matt Lotter on Monday, November 25th, 2019. This involved a foot survey across the property as indicated by supplied location information (property delineation). A systematic sampling method was employed during the survey, in which high profile areas and areas most likely to contain preserved archaeology were visited. All archaeological occurrences were sufficiently recorded, photographed and described and a GPS (Garmin 64s) was used to record the surveyed tracks.

The following equipment was utilised during the field assessment:

- Garmin GPS 64s
- Canon D70 DSLR camera
- Samsung Note tablet
- Field journal and stationery
- Photographic scales
- Compass
- Cellular telephones
- Tape measures

To record heritage remains, a standard site recording form designed by the consultants was relied on in order to ensure consistency. This form records: location, site and deposit context, human and animal interference, cultural material, chronological markers, deposit depth and cultural material diversity. From this, each recording is provided a grading which is then combined to generate an overall site rating out of 10. Sites above six are considered important and assessed further in order to determine what mitigation, if any, is required.

Points of interest (POI) were also recorded. These are locations that have some item of interest, although in the case of this report, these did not have any cultural heritage significance.

iii. Reporting

All finds are reported herein. Every detail recorded in the site recording form is presented along with the location of the find or site and photographs, where applicable. The results from the grading assessment, with their justification, are also presented alongside the find or site data. In cases where no finds or sites are made, such an assessment is not provided.

c. Constraints and limitations

Ground surface visibility was extremely limited due to the sheer abundance of dumped material, making the identification of surface archaeology very difficult. It is possible that archaeological find spots or sites were missed as a result; however, in many areas of the property, digging at the surface has exposed the underlying sediments, which illustrate a complete lack of archaeology subsurface.

As with all archaeological surveys, the primary goal is to identify cultural material exposed on the surface. From this, one is able to make inferences about what may also lie below the surface. However, without actual test trenches or geotrenches, it is not possible to be certain what is represented underground. Furthermore, underground heritage remains may not be represented on the surface making their identification impossible. This serves as a considerable limitation. Should any cultural heritage be identified when the development begins, a specialist must be consulted to examine the finds.

4. Results and discussion

Figures 6 and 7 below provide an indication of the survey tracklog and the points of interest located during the assessment. The survey tracklog shows that ample coverage of the 3ha property was attained. Only a single, non-archaeological POI was located during the survey (discussed below).

Overall, the property is heavily disturbed by modern activity (surface dumping, digging and temporary/informal housing structures; Figure 8), and no cultural heritage was located within the demarcated survey area. The total area covered by this dumping and digging has increased considerably since the satellite images were captured (Figures 6 & 7), and only small areas of unmodified land now occur (Figure 6A). Figures 7 and 8C also demonstrate that the southeast portion of the property has already been developed, given the presence of a large concrete platform and an adjacent tar road. Collectively, these cover an area approximately 60x60m (3600m²). The abundance of surface digging throughout the property also suggests that the preservation of archaeological material, at depth, is unlikely. Furthermore, that this has occurred provided some sense of what may lie below the surface. Based on investigations at these excavations and in their spoil heaps, no archaeological traces were noted; although this does not exclude the possibility that they may still exist in other areas of the development zone.



Figure 6: Survey tracklog indicated in green. Red line demarcates property boundary.



Figure 7: Single point of interest (white and black square). Blue polygon shows large developed platform (tar and concrete; see following figure). Red line demarcates property boundary.

No areas with any cultural heritage were identified. However, Figure 9 illustrates the single POI located within the NW portion of the property. This large boulder appears to be a stromatolite, yet this would require confirmation from a qualified geologist. It is worth noting though that this boulder differs in composition from the local exposed bedrock (igneous rock, possibly andesite), and it also occurs in an area where there is an abundance of dumped material (boulders, cobbles, gravel and concrete). As such it may have been introduced to this area, which would mean its overall significance is low.



Figure 8: Different locations within the surveyed area. A: central SW boundary looking north, showing the least disturbed area of the property; B: NW corner of the property looking north, showing significant landscape modification; C: SE portion of the property looking north (within the blue polygon, scale is 30cm), showing a large concrete platform; D: disturbed landscape in the central part of the property, looking west.



Figure 9: Possible stromatolite located at the single POI (non-archaeological). Note the abundance of dumped material nearby. Scale is 30cm.

5. Development impact and proposed mitigation

a. Development impact

The development within the limits of the proposed coal and plastic gasification impact area are not anticipated to have any impact on cultural heritage, based on the absence of heritage finds on the surface or in the excavated areas.

b. Recommendations

No heritage finds of any significance were identified in the impact footprint of the gasification plant. Therefore, regarding the visible cultural heritage, there are no recommendations.

However, developers should be cognisant of the possibility that once development commences, cultural heritage buried underground may be exposed. Should this occur, the development in the vicinity of the find should be halted and a specialist must be consulted to examine the finds.

6. Conclusions

EScience Associates contracted Drs Matt Lotter and Tim Forssman to perform an Archaeological Impact Assessment of a 3ha plot of land to be developed into a coal and plastic gasification plant in Waltloo, Pretoria. The entire portion of land was investigated for surface traces of cultural heritage. Where excavations had taken place on the property, these and their spoil heaps were also examined for any heritage traces. None were found. A possible stromatolite was located but its provenience is unknown. Limiting the outcome of this investigation is the discriminant dumping that has occurred on the site covering many parts of the surface. This is potentially obscuring cultural heritage; however, the sheer lack of remains anywhere else, including in the surrounding area (previous reported surveys) and in the excavated areas on the property, makes the possibility of this unlikely. Nonetheless, there may still be cultural heritage subsurface that was not observable or inferrable from surface finds, as is always the case. Should any cultural heritage be observed once development commences, a specialist must be consulted to perform an examination of the finds. Despite this, it is anticipated that development will have no impact on cultural heritage in the proposed development area and no recommendations are put forward.

7. References

- Forssman, T. and Gutteridge, L., 2012. *Bushman Rock Art: an interpretive guide*. Barberton: 30 Degrees South.
- Forssman, T. and Louw, C., 2018. The space of flow at Telperion Shelter: the rock art of a recycled, reused and reimagined place. *Time and Mind*, 11(2), pp.185-208.
- Huffman, T.N. 2002. Regionality in the Iron Age: the case of the Sotho Tswana. *Southern African Humanities*, 14, pp. 1-22.
- Huffman, T.N., 2007. *Handbook to the Iron Age*. Pietermaritzburg: University of KwaZulu-Natal Press.
- Huffman, T.N., 2009. Mapungubwe and Great Zimbabwe: the origin and spread of social complexity in southern Africa. *Journal of Anthropological Archaeology*, 28(1), pp.37-54.
- Judd, D. and Surridge, K., 2013. *The Boer War: A History*. Oxford: Bloomsbury Academic.
- Kuman, K., 2014. Oldowan industrial complex. *Encyclopedia of Global Archaeology*, pp.5560-5570.
- Lombard, M., Wadley, L., Deacon, J., Wurz, S., Parsons, I., Mohapi, M., Swart, J. and Mitchell, P., 2012. South African and Lesotho Stone Age sequence updated. *South African Archaeological Bulletin*, 67(195), pp.123-144.
- Lotter, M.G. and Kuman, K., 2018. The Acheulean in South Africa, with announcement of a new site (Penhill Farm) in the lower Sundays River Valley, Eastern Cape Province, South Africa. *Quaternary International*, 480, pp.43-65.
- Markell, A., Hall, M. and Schrire, C., 1995. The historical archaeology of Vergelegen, an early farmstead at the Cape of Good Hope. *Historical Archaeology*, 29(1), pp.10-34.
- Mason, R.J., 1962. *Prehistory of the Transvaal: a record of human activity*. Johannesburg: Witwatersrand University Press.
- Mitchell, P., 2002. *The Archaeology of Southern Africa*. Cambridge: Cambridge University Press.

Mitchell, P. and Whitelaw, G., 2005. The archaeology of southernmost Africa from c. 2000 BP to the early 1800s: a review of recent research. *The Journal of African History*, 46(2), pp.209-241.

Ngobese, D. and Mukhuba, T., 2018. Re-inventing the battle of Ncome/Blood River: reflection on its contested historical consciousness and commemorative events. *Gender and Behaviour*, 16(2), pp.11751-11761.

Nienaber, W.C., Prinsloo, H.P. and Pistorius, J.C.C., 1997. Derdepoort: 'n vroeë Ystertydperkterrein noord van die Magaliesberg. *South African Journal of Ethnology*, 20(1), pp.15-22.

Pistorius, J.C., 1994. Molokwane, a seventeenth century Tswana village. *South African Journal of Ethnology*, 17(2), pp.38-53.

Reeks, G.W., 2012. *The History of Silver Mining in the Greater Pretoria Region, 1885 - 1999*. Unpublished MA thesis. Pretoria: University of South Africa.

Sadr, K., 2019. Kweneng: a newly discovered pre-colonial capital near Johannesburg. *Journal of African Archaeology*, 1(aop), pp.1-22.

Schrire, C., 2014. *Historical archaeology in South Africa: material culture of the Dutch East India Company at the Cape*. Left Coast Press.

Van der Walt, J. 2007. *AIA for Residential Development on Portions of the Farm Derdepoort*. Unpublished report submitted to SAHRA.

Van der Walt, J. 2008. *Mamelodi Hatherley Power Line on the Farm Hatherley 311 Jr, Mamelodi, Gauteng Province*. Unpublished report submitted to SAHRA.

Van der Walt, J. 2015. *AIA for the proposed development of ERF 78 in Waltloo*. Unpublished report submitted to SAHRA.

Van Schalkwyk, J. 2011. *Heritage Impact Assessment for the Proposed Upgrade of Road R104, Silverton to Bronkhorstspuit, Gauteng Province*. Unpublished report submitted to SAHRA.

Van Schalkwyk, J. and De Jong, R., 1998. *A Survey of Cultural Resources in the Nelmapius Extension 4 Urban Development, East of Pretoria, Gauteng Province*. Unpublished report submitted to SAHRA.

Wadley, L., 1989. Legacies from the Later Stone Age. *South African Archaeological Society Goodwin Series*, 6, pp.42-53.

Wadley, L., 2015. Those marvellous millennia: the Middle Stone Age of southern Africa. *Azania: Archaeological Research in Africa*, 50(2), pp.155-226.

Wood, M., 2000. Making connections: relationships between international trade and glass beads from the Shashe-Limpopo area. *South African Archaeological Society Goodwin Series*, 8, pp.78-90.

Wright, J., 1989. Political Mythology and the Making of Natal's mfecane. *Canadian Journal of African Studies/La Revue canadienne des études africaines*, 23(2), pp.272-291.