










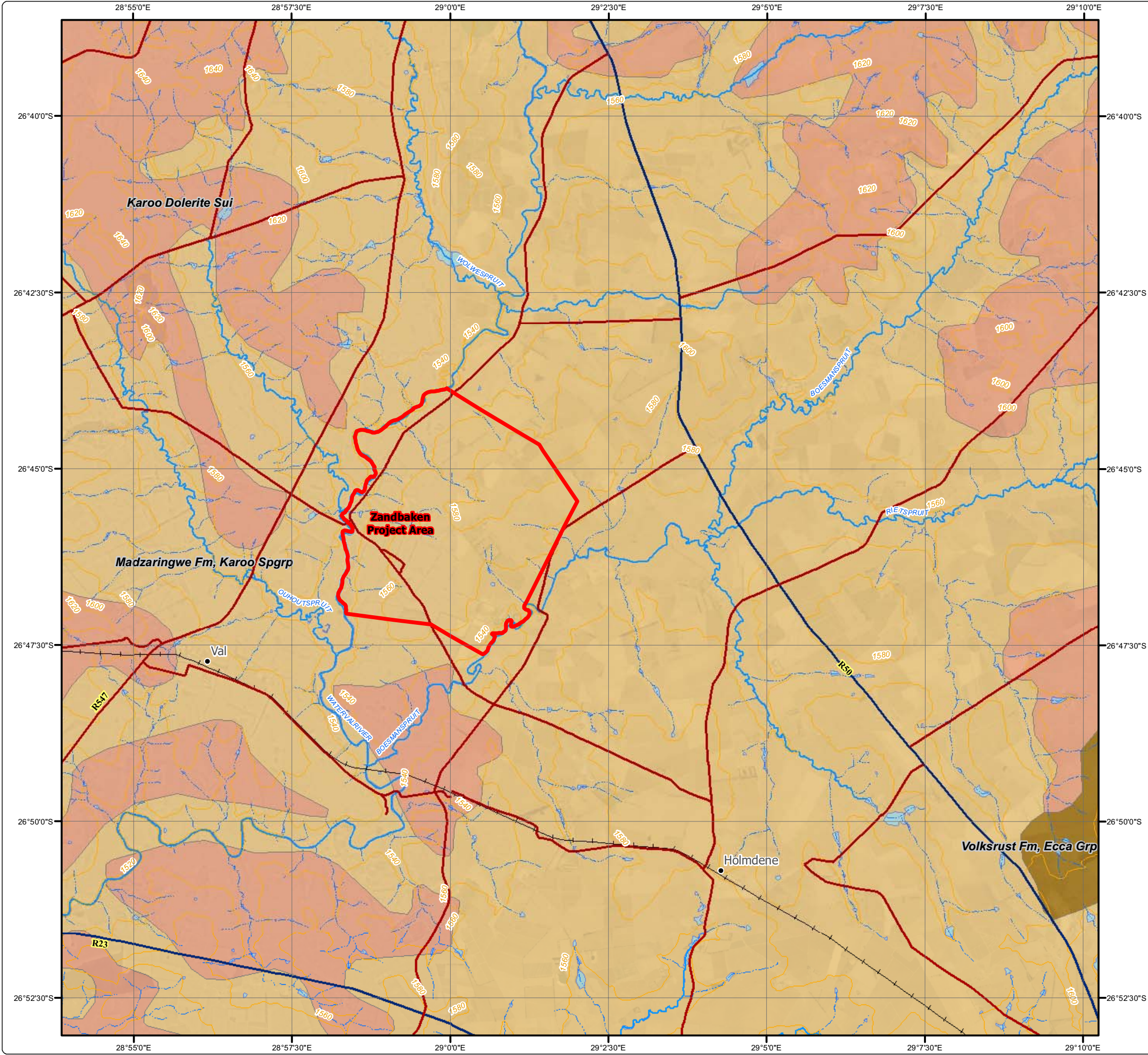


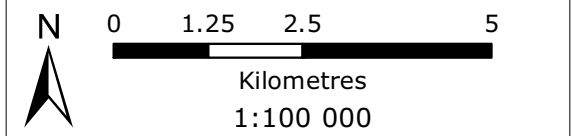
# EIA/EMPR for Zandbaken Project Regional Geology

## Legend

-  Project Area
  -  Arterial / National Route
  -  Main Road
  -  Railway Line
  -  Contours (20 m)
  -  Perennial Stream
  -  Non-Perennial Stream
  -  Dam / Lake
- ### Regional Geology
-  Karoo Dolerite Sui
  -  Madzaringwe Fm, Karoo Spgrp
  -  Volksrust Fm, Eccca Grp



Projection: Transverse Mercator Ref #: tdm.XST1716.201209.139  
 Datum: Cape Revision Number: 1  
 Central Meridian: 29°E Date: 13/09/2012





---

### 4.1.3 Stone Age

South Africa has been inhabited by tool producing hominins for at least two million years. Much of the evidence for the presence of hominin activity is derived from stone tools. These tools are not only indicative of their presence in the landscape, but also attest to the technological developments of our genus. Varying factors, including geology, geomorphology, climate, fauna and flora have resulted in a complex record of social and technological changes through time.

Classification of these tools is done on three levels, namely:

- Form;
- Function; and
- Technique.

Based on the criteria for classification, it is evident that the initial model<sup>1</sup> of Early Stone Age (ESA), Middle Stone Age (MSA) and Later Stone Age (LSA) (*with variants*) developed by Goodwin and Van Riet Lowe (1929) is appropriate. Having stated this, the last formal summary of the southern African Stone Age Sequence prior to Lombard et al. (2012) was conducted in 1984.

The approach adopted by Lombard et al. (2012) is to acknowledge that archaeological assemblages are not exact replicas of one another even though they may overlap economically, chronologically and/or regionally. The classification is based on *technocomplexes*, also known as industrial complexes, defined as assemblages that share a polythetic range (a context or a class of things having many but not all properties in common). Through time, changes in an industry may be expressed as phases, whereas regional variations (spread less widely than a technocomplex but found at several sites) may be expressed as distinct industries in a technocomplex where there is a high level of similarity in design, but not necessarily frequency, of artefact types (Lombard, et al., 2012).

---

<sup>1</sup> This model has been reassessed and modified through time **Invalid source specified..**

**Table 4-2: The South African and Lesotho Stone Age Sequence (after Lombard et al., 2012)**

Period	Technocomplex	Also known as (including regional variants)
Later Stone Age <40 ka	ceramic final LSA <2 ka	Ceramic post-classic Wilton, Late Holocene with pottery (Doornfontein, Swartkop)
	final LSA 0.1-4 ka	Post-classic Wilton, Holocene microlithic (Smithfield, Kabeljous, Wilton)
	Wilton 4-8 ka	Holocene microlithic
	Oakhurst 7-1 ka	Terminal Pleistocene / early Holocene non-microlithic (Albany, Lockshoek, Kuruman)
	Robberg 12-18 ka	Late Pleistocene microlithic
	early LSA 18-40 ka	(informal designation) Late Pleistocene microlithic
Middle Stone Age >20 ka - <300 ka	final MSA 20-40 ka	(informal designation) MSA IV at Klasies River, MSA 4 generally
	Sibudu 45-58 ka	late MSA / post-Howieson's Poort or MSA III at Klasies and MSA 3 generally (all informal designations)
	Howieson's Poort 58-66 ka	
	Still Bay 70-77 ka	
	pre-Still Bay 72-96 ka	(informal designation)
	Mossel Bay 77-105 ka	MSA II at Klasies River, MSA 2b generally (Pietersburg, Orangian)
Klasies River 105-130 ka	MSA I at Klasies River, MSA 2a generally (Pietersburg)	

Period	Technocomplex	Also known as (including regional variants)
	early MSA 130-300 ka	(informal designation)
Early Stone Age >200 ka	ESA-MSA transition >200-600 ka	(informal designation) (Fauresmith, Sangoan)
	Acheulean 300-1.5 Ma	
	Oldowan 1.5-2 Ma	

---

The LSA dates between 20 000 and 40 000 years ago (ka). The economy of the LSA may be associated with hunter-gatherer or herder societies. Within the LSA, stone tool assemblages are often microlithic but in some areas they are dominated by long scrapers and few backed microliths. General characteristics of the LSA include:

- Variability between assemblages;
- A wide range of formal tools such as:
  - scrapers;
  - backed artefacts;
  - hafted stone and bone tools;
  - borers;
  - bored stones;
  - upper and lower grindstones;
  - grooved stones;
  - ostrich eggshell (OES) beads;
  - undecorated and decorated OES fragments;
  - flask and/or flask fragments;
  - bone tools;
  - fishing equipment;
  - rock art; and
  - ceramics.

The MSA dates between 20 ka and 300 ka. A key technique characteristic of the MSA is the Levallois or prepared core technique in which triangular flakes with convergent dorsal scars, often with faceted striking platforms, are produced. Discoidal systems and intentional blade production from volumetric cores also occur within the MSA. The general characteristics of the MSA include:

- Formal tools such as:
  - unifacially and bifacially retouched points;
  - backed artefacts;
  - scrapers and denticulates,
- Evidence of hafted tools;
- Occasionally marine shell beads;
- Bone points;
- Engraved ochre nodules;

XST1716

- 
- Engraved OES fragments;
  - Engraved bone fragments; and
  - Grindstones.

The ESA dates between 200 ka and 2 million years ago (mya). General characteristics of the ESA include:

- Simple flakes struck from cobbles, cores and pebble tools;
- Intentionally shaped handaxes, cleavers and picks during the later stages;
- Large blades in the final or transitional stages.

ESA assemblages have been investigated from the Maleoskop Site near Groblersdal, approximately 100 km south of the project area (Esterhuysen & Smith, 2007). Other prolific Stone Age sites in Mpumalanga include Bushman Rock Shelter and Heuningneskrans Shelter, located approximately 70 km southeast of the project area (Louw, 1969; Plug, 1982; Klein, 1984).

Within the project area, previous impact assessment surveys have shown that MSA and LSA stone tools are widely distributed as scatters across the landscape. The results of previous impact assessment reports are discussed in Section 4.4.

#### **4.1.4 Iron Age**

The Iron Age in South Africa is divided into three periods:

- Early Iron Age;
- Middle Iron Age; and
- Late Iron Age.

According to Maggs (1976), Type V and Type N walling are present within Mpumalanga and may be found on the slopes of hills (Figure 4-1). Type V consists of the standard core of cattle enclosures surrounding beehive houses and grain bins. Corbelled huts may be present with this type of walling (Figure 4-2). Type N walling consists of a few cattle kraals in the centre of the settlement, linked by other stone walling and a perimeter wall that encloses the entire settlement (Huffman, 2007).

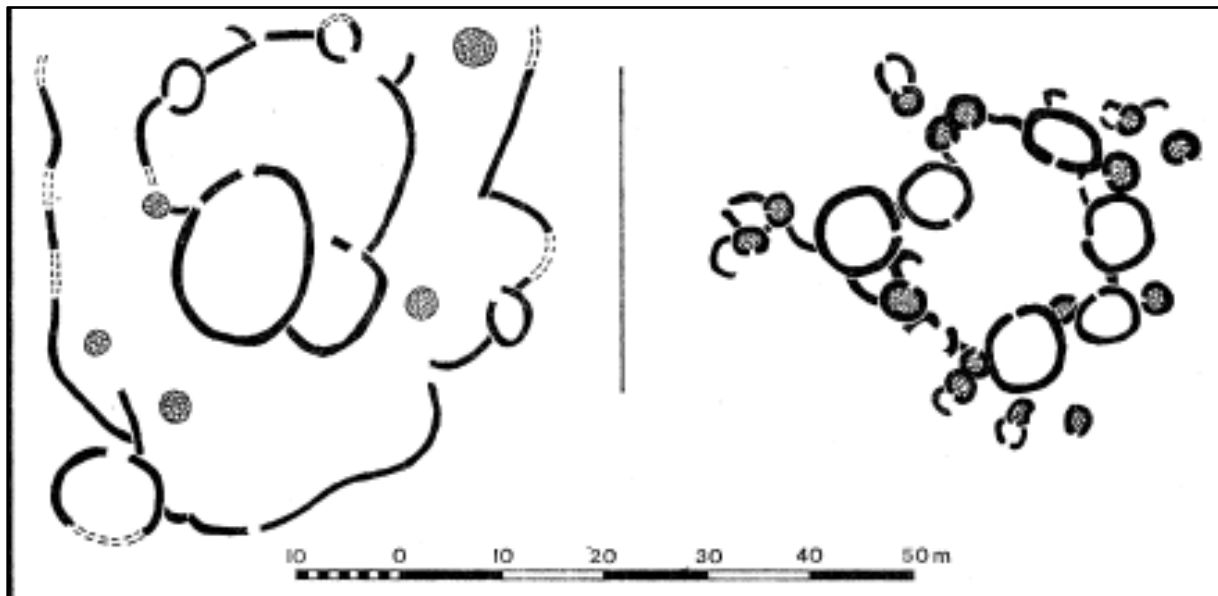


Figure 4-1: Type N and Type V settlement layouts (Maggs, 1976)

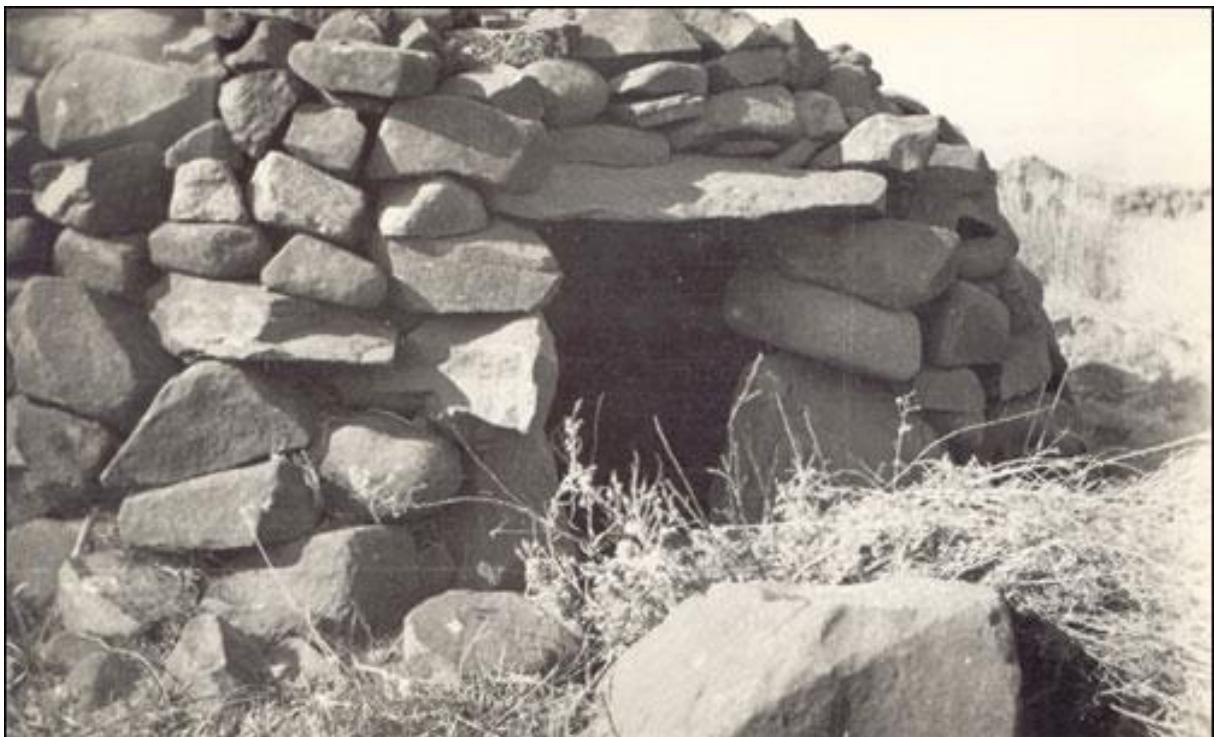


Figure 4-2: Example of a corbelled hut (courtesy of <http://www.sahistory.org.za/bloemfontein/prehistory-bloemfontein-area>)

Iron Age settlements within the surrounding areas include that of Wildebeestfontein near Kinross in the Bethal District. This site consisted of nine middens and several depressions indicating dwellings, with a layout pattern similar to Type V settlements with some possible alteration due to the *Difeqane*.

XST1716

---

The site (Wildebeestfontein) was disturbed due to the construction of a water reservoir when human skeletal remains were uncovered (Taylor, 1979). The site was excavated and uncovered artefacts from the 1899 - 1901 Boer War on the surface and Stone Age lithics in the lower levels of the excavations. Iron Age artefacts that were excavated include ceramics with comb-stamping and red ochre burnish, as well as raised bands of finger-nail impressions on the rims. The shape of the ceramics included restricted jars with very short recurved necks or without a point of inflection. Other artefacts found included a bone awl, bone tools, a clay bead, ostrich eggshell bead, a cowrie shell and freshwater mussel. The ostrich eggshell bead and cowrie shell were associated with the human burial. The date given to the site is approximately mid-19<sup>th</sup> century or early 20<sup>th</sup> century (Taylor, 1979).

Another site is that of Robertsdrift, a Type V settlement at the confluence of the Vaal and Klip rivers outside Standerton. It was discovered after aerial photographs were taken of the area. Ceramics with comb stamping motifs were identified during excavations (Derricourt & Evers, 1973).

#### **4.1.5 Historical Period**

During the First Boer War of 1880-1881, a British garrison was located at Standerton. The British built forts on surrounding koppies south of the town. The British attempted to overthrow the Boers on Stander's Kop. During the skirmish, five British soldiers died in battle (Duxbury, 1980).

A concentration camp was located on the banks of the Vaal River, south of Standerton, and the river was heavily polluted by disease. The concentration camp at Standerton experienced such high mortality rates that wood intended to make school furniture was used for coffins instead. An elaborate system of pipes was built by the Transvaal camp water engineer to ensure clean, safe water could be used from the river. A monument was built in Standerton to commemorate those who died in the concentration camps (Riedi, 2005; Grobler, 2006; Van Heyningen, 2010). Gerard Moerdijk, who designed the Voortrekker Monument and many other Afrikaner monuments in the Transvaal, was an occupant in the Standerton concentration camp for almost a year as a young boy (Fischer & Clarke, 2005).

The town of Val, formerly known as Waterval, is located on the farm Oudehoutspruit 586 IR approximately 10 km south-west of the proposed underground mine footprint. Val is situated along the railway line from Standerton to Johannesburg. This small hamlet is indicated on the June 1902 Major Jackson – Standerton map. According to the Val Hotel history website page (Britz & Britz, 2012), the original farm, Oudehoutspruit 117, was bought by Joseph Smith. He established an inn that would serve the stagecoach route that ran from the Lowveld to Johannesburg. The Waterval Post Office operated from 1888, but closed for the duration of the Second Anglo-Boer War. It was reopened on 1 January 1901 for military purposes and in October 1901 for civil post. Both the Val Post Office and the Waterval Post Office operated at the same time, causing some confusion. The Waterval Post Office was closed in 1902. The *Nederlandsche Zuid-Afrikaansche Spoorweg Maatskappij* (N.Z.A.S.M) established in 1884 under President Paul Kruger, created a railway network to link the ZAR with the port of Lourenço Marques (Maputo) (Van-Helten, 1978). In 1896, the route to



Durban was opened and a time capsule was buried under the railway bridge. With the arrival of the train station, a typical Highveld town was born. A general dealer, hotel (The Val Hotel), blacksmith and a mill was built.

When the First Anglo-Boer War was declared, Joseph Smith refused to choose sides. He was deported during the war, and his wife, Elizabeth managed the farm and business. In his diary, Private Tucker, described the “Waterval Camp” as one of the nicest camps. A few minor skirmishes occurred within the vicinity. An incident, known as the “Whiskey Train” occurred on the section of railway near Val on 29 December 1900. According to Private Tucker, Boers held up the train and stole all the beer, spirits and champagne that were in the cargo hold, packing it into five ox-wagons (Todd, 1980). It was about this time that the town’s name was changed from ‘Waterval’ to ‘Val’.

Influential individuals that passed through the hamlet included General Smuts, General Louis Botha and Koen Brits who met at the Val Hotel to discuss the Treaty of Vereeniging (that ended the First Anglo-Boer War). A picture of this meeting is present in the lounge of the hotel (Webster, 2012).

The railway station was closed in the 1970’s, and the town along with the hotel fell into disrepair. In 1994, the hotel was auctioned and bought by André and Rita Britz who restored the hotel. Rita Britz is a descendant of the original occupants (Van den Berg, Steyn and Engelbrecht families) of the town since 1886 (Britz & Britz, 2012).

#### **4.1.6 Social History**

The 1913 Land Act was based on the principles of segregation and an immediate result of this was economic suppression of black farmers in the Transvaal. In the 19<sup>th</sup> century, most of the land in Mpumalanga (previously known as Eastern Transvaal) was owned by whites and the primary economic activity was farming (Schirmer, 2007).

In the southern region of Mpumalanga and around the project area, the district of Standerton and Bethal was one of five major farming districts (Schirmer, 2007). The remaining four were Piet Retief; Barberton, Nelspruit, and White River; Lydenburg; and Ermelo, Carolina and Wakkerstroom.

In 1918, the first agricultural census showed that the district of Standerton and Bethal produced the highest percentage of maize in the region (Schirmer, 2007). Agriculture continued to expand. The 1993 agricultural census showed that Middelburg produced the highest percentage maize followed by Standerton (Schirmer, 2007). The general 20<sup>th</sup> landscape may therefore be characterised as a large-scale agricultural landscape.

Black farmers in the region were forced into at least five categories of livelihood patterns:

- 1. Labour trade in exchange for permission to plough on white-owned land;
- 2. Black farmers would rent land from companies who owned large tracts of land;
- 3. Some black farmers were able to farm on white-owned land and on their own sections of the property;

- 4. Some black farmers could farm on mission-owned land; and
- 5. Few black farmers legally owned their land.

In many districts, the struggle for land and the poor working conditions under which black farmers were expected to operate led to numerous political struggles in the region during the 1940s to 1990s. Farm worker's associations were formed and in numerous towns, even the youth gathered to discuss political issues (Holden & Mathabatha, 2007).

After 1948, the African National Congress (ANC) began a militant campaign which involved mass action, boycotts, and strikes. This culminated in the Defiance Campaign which was the largest non-violent resistance that was joined by all racial groups in South Africa. In 1950, Robert Mangaliso Sobukwe was appointed as secretary of the ANC branch in Standerton from 1950 to 1954 (Anonymous, 2000). He was also a teacher at Jandrell Secondary School but in 1952 he lost his teaching position after speaking out in favour of the Defiance Campaign but was soon reinstated (Anonymous, 2000).

Sakhile, on the outskirts of Standerton approximately 30 km south-east of the Zandbaken Project area, was a multicultural township with a population of coloureds, blacks and Indians. Sakhile could be considered a local District Six or Sophia Town, with a similar history. In the 1960s, as part of the Apartheid era Group Areas Act, townships were created in Mpumalanga for each 'ethnic' group. The oral historical record indicated that in 1961 and 1962, Indians and coloureds were moved as part of the forced removals from Sakhile to a 'Coolie Camp' (Legal Resources Centre Trust, 2008). In 1971 and 1972, a second forced removal took place and coloured people were moved to Azalea and the Indian people to Stanwest on the outskirts of Standerton (Legal Resources Centre Trust, 2008).

The town of Val's location next to the Standerton-Johannesburg railway line allowed for a rich history including Anglo-Boer episodes and Afrikaner nationalism. In 1913, Mahatma Gandhi led between 4000 and 5000 miners along the Durban-Johannesburg railway as part of the rail workers and miners' strike. Gandhi was arrested and imprisoned in Val (Britz & Britz, 2012). Heritage resources in the town may include historical buildings such as the Church of St. Francis of Assisi which was rebuilt in 1971 after being burnt down, remnants of the old railway station that closed down in the 1970s, and the Val Hotel that was first established as an inn in the 19<sup>th</sup> century.

## **4.2 Relevant Databases and Collections**

The archival and database survey was conducted by consulting the following resources:

- Chief Surveyor General;
- National Automated Archival Information Retrieval System (NAARIS);
- University of the Witwatersrand (WITS) Archaeology Site Database;
- Genealogical Society of South Africa database;
- Council for Geosciences database;

XST1716

- Geological Society of South Africa database; and
- South African Heritage Resources Information Systems (SAHRIS).

The Chief Surveyor General database was surveyed and no additional information was found.

The NAARS database was consulted. The following documents were found:

- A document dating to 1989 referred to a school bus route that passed the farm Zandbaken in the Standerton District (TAB-0-OR2920/98). Currently, there is one school located in the area namely the Bonganiven Primary School. There were two schools in the area, at Val and on the farm Hartebeeskuil. A change to the bus route was proposed, so that the route would bypass more farms in the area, so as to pick up more children. This could be an indication that the area was experiencing a population increase.
- A document dating to 1905 referred to a police station in the town of Val, (TAB-615-AG710/04). Currently, there is no police station in Val but the historical aerial photographs and an aerial satellite survey shows that there are a number of buildings in the town, one of which may be the old police station. References to a jail are made when Ghandi was arrested, so there may have been one present within the town.
- A document dating to 1910 referred to the acquisition of 'Native' farm labourers for the farms around Val (TAB-460-NA728/10). This document further shows that black labourers were often used to work on the white farms, often as indentured labourers. These black labourers possibly lived in compounds or in servant quarters on the white-owned farms on which they worked. Heritage resources may therefore include the houses in which the black labourers lived as well as any graves that may exist near these houses.
- Documents dating to 1911 (TAB-381-D684) referred to correspondence to a dairy farm in Val.
- The town of Val was a commercial hub in an area surrounded by agriculture and related commerce. This is further substantiated by the number of farmers in the area that sold their produce (maize) to the Val Roller Mill. No clear indication when the mill was built was found, but it may have been as early as the late 1890's (Val Hotel-History). Maize was transported from the Val Roller Mill to Johannesburg, Durban and Cape Town for export (Figure 4-3).
- Documents supporting statements made in Section 4.1.6 regarding black land owning farmers who sold their produce were found. Muslim merchants by the names of Shariff Noor and Lahib Janoo sold maize to the Val Roller Mill in 1937 and 1938 (Figure 4-4 and Figure 4-5).



MEALIE CONTROL ACT 1931 AS AMENDED. Form F1. 5818 o 58

Certificate of Proof of Export.

(NOT TRANSFERABLE)

Issued by the Mealie Industry Control Board in terms of Section five of the Mealie Control Act 1931 as amended. N<sup>o</sup> 5278

REF. 51/169 (Spec No 4283) Date 14-11-1937

Name Val Roller Mills,

Address Val.

Mealie Trader's No. 11446

This is to certify that by arrangement with the Mealie Industry Control Board

Messrs. S. Shapiro & Co.

of Newtown.

have during Oct. 1937 exported on your behalf

290 (Two hundred + ninety) bags

of mealies or the equivalent in mealie products which you, as mealie trader, are liable to export in terms of Section five of the Mealie Control Act 1931, as amended.

In order to comply with Regulation No 6 of Government Notice 896 dated the 11th June, 1937, you are required to submit this certificate to the Minister, through the Secretary for Agriculture and Forestry, Union Buildings, Pretoria, to enable him to register, in your favour, the export of the number of bags mentioned above.

14 NOV 1937  
PRETORIA

J. Swanson  
Secretary.

Figure 4-3: Val Roller Mills produce exported from Johannesburg

MEALIE CONTROL ACT 1931 AS AMENDED.

Form F1

**Certificate of Proof of Export.**

(NOT TRANSFERABLE)

Issued by the Mealie Industry Control Board in terms of Section five of the Mealie Control Act 1931 as amended.

REF: 1659/121 No. 2695 Date: 11-10-1937


Name: L. Janoo & Son

Address: Val

Mealie Trader's No. 4003

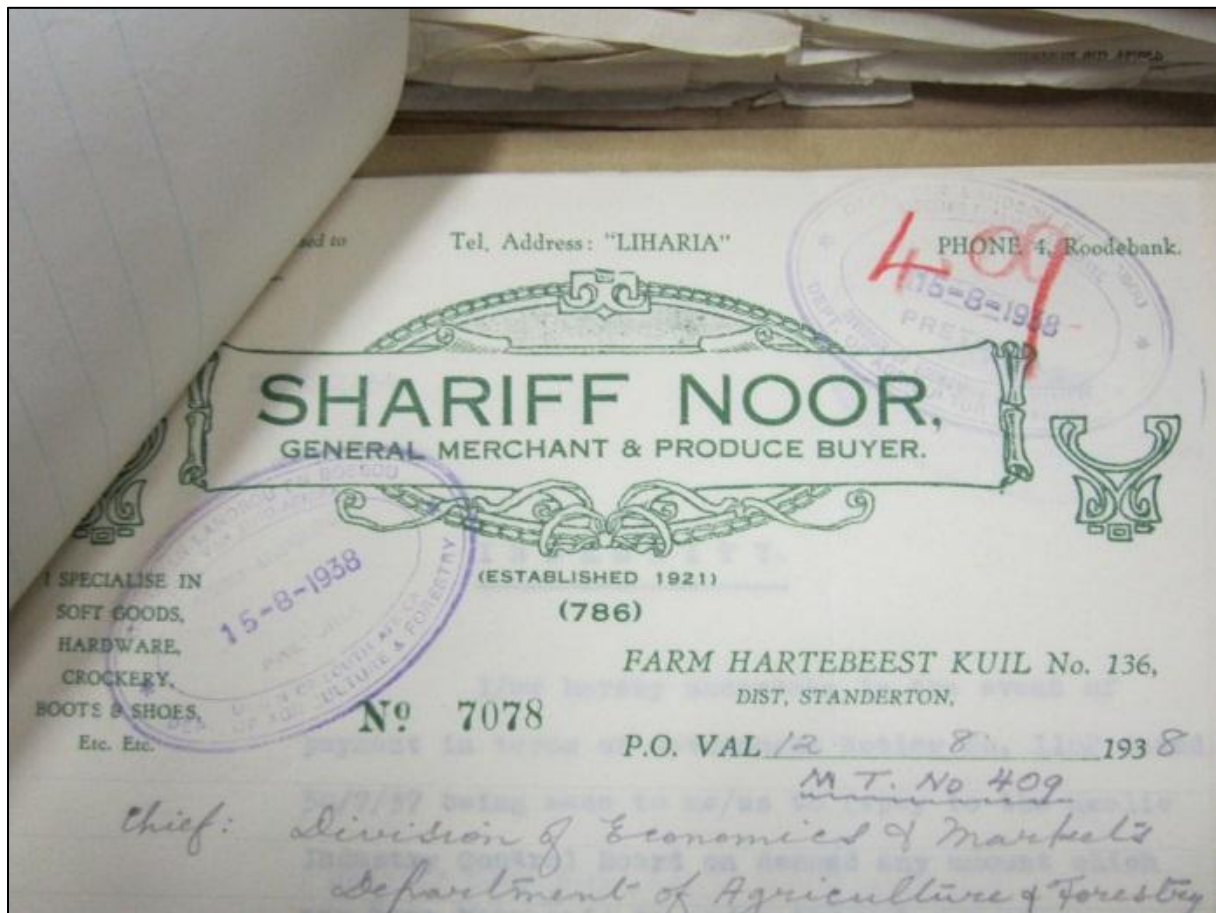
This is to certify that by arrangement with the Mealie Industry Control Board Messrs. Val. Roller Mills (Pty) Ltd. of Johannesburg have during September 1937 exported on your behalf 287 (two hundred & eighty seven) bags of mealies or the equivalent in mealie products which you, as mealie trader, are liable to export in terms of Section five of the Mealie Control Act 1931, as amended.

In order to comply with Regulation No 6 of Government Notice 896 dated the 11th June, 1937, you are required to submit this certificate to the Minister, through the Secretary for Agriculture and Forestry, Union Buildings, Pretoria, to enable him to register, in your favour, the export of the number of bags mentioned above.



O. Walker  
p.p. Secretary,  
Mealie Industry Control Board

Figure 4-4: L. Janoo & Sons produce exported by Val Roller Mills from Johannesburg



**Figure 4-5: Letterhead of Shariff Noor General Merchant and Produce buyer**

The WITS database revealed a total of two sites around the project area. These sites include that of a Type V stone-walled settlement (Tegwan's Nest) with ceramics from the Moloko branch and an unknown site. The stone-walled site is approximately 17 km west of the project area.

A total of seven registered cemeteries were identified from the Genealogical Society of South Africa database within 5 km from the project area. These include family burial grounds, as well as a burial ground for the hamlet of Val.

The Council for Geoscience and the Geological Society of South Africa databases were surveyed for all available publications and geological maps on the regional geology. The results are discussed in the Literature Review in Section 4.1.1.

The SAHRIS database was consulted for all available and relevant previous impact assessment reports. The results are discussed in Section 4.4.

### 4.3 Historical Layering

A desktop cartographic survey was conducted in order to determine the potential of sites to exist within the project area and the surrounding region, as well as relative age based on the



XST1716

---

dates of the maps. Historical aerial photographs, historical maps, current topographic maps and satellite imagery were used to this end.

The 1902 Major Jackson map of Standerton (June, 1902) was surveyed for potential heritage resources (Plan 5).

The farm Sandbaken 166 (now Zandbaken 585 IR and Sandbaken 363 IS) was indicated on the map. Adjacent to Sandbaken 166 on the farm Oudehoutspruit 117 (now Oudehoutspruit 586 IR), a commercial structure labelled as *Smith's Store* is indicated on the map. Two bridges, referred to as *Drift (air)* were identified. The first is located near the road and between Sandbaken 166 and Oudehoutspruit 117. The second bridge is located towards the northern section of Sandbaken 166 between the farm and Oudehoutspruit 117. Two koppies are also indicated on Sandbaken 166. The railway line is indicated on the map and is directed through the town of Val to the Waterval Border Post and the Vlaklaagte Station and then on onto the town of Standerton.

### **Historical aerial photographs**

Historical aerial photographs from 1953 to 1975 were surveyed for potential historical structures. Any structures such as a house or homestead, a residential complex, or industrial and mining buildings that were identified in these photographs would be older than 60 years and therefore protected in terms of Section 34 of the NHRA.

The following historical aerial photographs were surveyed:

- 1953
  - 326-007-03552
  - 326-007-03553
  - 326-008-03741
- 1955
  - 201-010-04348
  - 201-010-04347
- 1969
  - 653-027-00445
  - 653-027-08666
- 1975
  - 750-011-00156
  - 750-011-00157
  - 750-011-00158
  - 750-011-00159
  - 750-011-00160

XST1716

---

- 750-011-00161
- 750-011-00162
- 750-011-00163

In the historical aerial photographs from 1953 (Plan 6), a total of ten built structures were observed within the Zandbaken Project area. These structures may possibly be houses and homesteads associated with the fields. It is also highly likely that graves exist near these houses and homesteads and in the fields. In addition, a possible kraal was identified in close proximity to a field (XST1716/HS003-kraal). Although these structures lie within the Zandbaken Project area, they are not located on the affected farm Sandbaken 363 IS Portion 3 on which the proposed underground mine footprint is situated.

In the historical aerial photograph from 1969, not much development had taken place and the land was identified as primarily agricultural land as fields were clearly demarcated (Plan 7). New development, in the form of residential settlements and homesteads, was observed outside the project area.

Overall, the historical aerial photographs from 1953 to 1981 showed that the land was primarily used for agricultural purposes with homesteads expanding to include extensions and additional infrastructure.

The 1996 topographical map of 2628 DD Val was surveyed for potential heritage resources. The map showed that the project area is still a greenfields area with a number of buildings on the properties. The Val railway station is indicated on the map. No additional heritage resources were identified.

An aerial satellite survey was conducted over the Zandbaken Project area. No heritage resources could be identified from the aerial satellite survey.