

Phase 1 Archaeological and Heritage Impact Assessment on Portion 1
of the farm Waterfall 461 JT in respect of the proposed construction of
an irrigation dam, Barberton, Mpumalanga Province.

Compiled for:



For **Eco 8 Environmental Planners**

Surveyor: Mr JP Celliers

7 April, 2022

I, Jean-Pierre Celliers as duly authorised representative of Kudzala Antiquity CC, hereby confirm my independence as a specialist and declare that neither I nor the Kudzala Antiquity CC have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which the client was appointed as Environmental Assessment practitioner, other than fair remuneration for work performed on this project.

SIGNATURE:

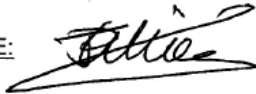
A handwritten signature in black ink, appearing to read 'J. Celliers', written over a horizontal line.

Table of Contents

Introduction	3
1.1. Terms of reference.....	3
1.1.1 Project overview	3
1.1.2. Constraints and limitations.....	3
1.2. Legislative Framework	3
1.3. Approach and statutory requirements	5
2. Description of surveyed area	6
3. Methodology.....	6
3.1. Archaeological and Archival background studies	7
3.1.1. Previous archaeological studies in the area.....	8
3.1.2. Historic maps.....	8
3.1.3. Physical survey	8
3.2. Social Consultation	9
3.3. Heritage site significance	9
4. History and Archaeology	11
4.1. Historic period.....	11
4.1.1. Early History	11
4.1.2. Colonial settlement period	12
4.1.3. History of the Anglo Boer War (1899-1902) in the area	14
4.1.4. Historic maps of the study area	15
4.1.5. Historical overview of the ownership and development of the farm Waterfall 461 JT.	23
4.2. Archaeology.....	29
4.2.1. Stone Age	29
4.2.2. Early Iron Age.....	32
4.2.3. Late Iron Age.....	34
5. Site descriptions, locations and impact significance assessment.....	35
5.1. Description of located sites	36
5.2. Cumulative impacts on the heritage landscape	43
6. Summary of findings and recommendations.....	44
6.1. Recommended management measures	44
7. Bibliography	46
Appendix A.....	50

Appendix B.....	54
Appendix C.....	56
Appendix D.....	60

Executive summary

Site name and location: An area of approximately 3,8 ha on Portion 1 of the farm Waterfall 461 JT where a proposed irrigation dam for agricultural purposes will be constructed.

Purpose of the study: An archaeological and heritage study in order to identify cultural heritage resources in respect of the proposed construction of an irrigation dam for agricultural purposes.

Topographical Maps: 1:50 000 2530 DB (1944, 1968, 1984, 2010).

EIA Consultant: Eco 8 Environmental Planners

Client: Greyvan Investments Pty (Ltd).

Heritage Consultant: Kudzala Antiquity CC.

Contact person: Jean-Pierre (JP) Celliers Tel: +27 82 779 3748

E-mail: kudzala@lantic.net

Report date: 7 April 2022

Description and findings:

An Archaeological and Heritage Impact Assessment was undertaken by Kudzala Antiquity CC in respect of the proposed construction of an irrigation dam on Portion 1 of the farm Waterfall 461 JT near Barberton in Mpumalanga Province. The study was done with the aim of identifying sites which are of heritage significance on the identified project areas and assess their current preservation condition, significance and possible impact of the proposed action. This forms part of legislative requirements as appears in section 38 of the National Heritage Resources Act (Act No. 25 of 1999). This report can be submitted in support of the National Environmental Management Act (Act 25 of 1998).

The survey was conducted on foot and with the aid of a motor vehicle in an effort to locate archaeological remains and historic sites, structures and features. Archival information including scrutiny of previous heritage surveys of the area formed the baseline information against which the survey was conducted. No sites of heritage significance was recorded during the physical survey.

In terms of section 34 of the National Heritage Resources Act (NHRA, 25 of 1999), no significant buildings or structures were located.

In terms of section 35 of the NHRA, no archaeological sites were located.

In terms of section 36 of the NHRA, no graves or gravesites and burial grounds were located.

A total of five survey orientation locations were documented (SO 1-5) which includes a GPS location and photographs of the landscape at that particular location.

It is not within the expertise of this report or the surveyor to comment on possible palaeontological remains which may be located in the study area.

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. Kudzala Antiquity CC will not be held liable for such oversights or for costs incurred as a result of such oversights.*

Copyright: Copyright in all documents, drawings and records whether manually or electronically produced, which form part of the submission and any subsequent report or project document shall vest in Kudzala Antiquity CC. None of the documents, drawings or records may be used or applied in any manner, nor may they be reproduced or transmitted in any form or by any means whatsoever for or to any other person, without the prior written consent of Kudzala Antiquity CC. The client, on acceptance of any submission by Kudzala Antiquity CC and on condition that the client pays to Kudzala Antiquity CC the full price for the work as agreed, shall be entitled to use for its own benefit and for the specified project only:

- The results of the project;
- The technology described in any report; and
- Recommendations delivered to the client.

Introduction

1.1. Terms of reference

Kudzala Antiquity CC was commissioned to conduct an archaeological and heritage resources survey in respect of the proposed construction of a dam for irrigation purposes on the farm Waterfall 461 JT near the town of Barberton in Mpumalanga Province. The survey was conducted in order to assess the potential impact that the proposed activity may have on archaeological and heritage resources. The survey was conducted for Eco 8 Environmental Planners.

1.1.1 Project overview

The client is in the process of obtaining environmental authorization to construct an irrigation dam in order to meet irrigation needs for existing and future orchards. The proposed dam is an earth-fill structure located on Portion 1 of the farm Waterfall 461 JT, situated a few kilometres north-west of Barberton, Mpumalanga.

1.1.2. Constraints and limitations

The study area consists of previously cultivated fields as evidenced by historical maps and aerial photographs (see section 3.1.2. and appendix C). Surface visibility and access was reduced in some portions of the study area due to very dense bush and undergrowth which included some Lantana, undergrowth and dense thick grass cover. This limited exploration of some portions of the study area.

1.2. Legislative Framework

The National Heritage Resources Act (NHRA) (Act No. 25, 1999) and the National Environmental Management Act (NEMA) (Act No. 107 of 1998) require that individuals or institutions have specialist heritage impact assessment studies undertaken whenever development activities are planned and such activities trigger activities listed in the legislation. This report is the result of an archaeological and heritage study in accordance with the requirements as set out in Section 38 (3) of the NHRA in an effort to ensure that heritage features or sites that qualify as part of the national estate are properly managed and not damaged or destroyed.

The study aims to address the following objectives:

- Analysis of heritage issues;

- Assess the cultural significance of identified places including archaeological sites and features, buildings and structures, graves and burial grounds within a specific historic context;
- Identifying the need for more research;
- Surveying and mapping of identified places including archaeological sites and features, buildings and structures, graves and burial grounds;
- A preliminary assessment of the feasibility of the proposed development or construction from a heritage perspective;
- Identifying the need for alternatives when necessary; and
- Recommending mitigation measures to address any negative impacts on archaeological and heritage resources.

Heritage resources considered to be part of the national estate include those that are of archaeological, cultural or historical significance or have other special value to the present community or future generations.

The national estate may include:

- places, buildings, structures and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and paleontological sites;
- graves and burial grounds including:
 - (i) ancestral graves;
 - (ii) royal graves and graves of traditional leaders;
 - (iii) graves of victims of conflict;
 - (iv) graves of individuals designated by the Minister by notice in the *Gazette*;
 - (v) historical graves and cemeteries; and other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- sites of significance relating to slavery in South Africa;
- movable objects including:
 - (i) objects recovered from the soil or waters of South Africa, including archaeological and paleontological objects and material, meteorites and rare geological specimens;
 - (ii) objects to which oral traditions are attached or which are associated with living heritage
 - (iii) ethnographic art and objects;
 - (iv) military objects
 - (v) objects of decorative or fine art;

- (vi) objects of scientific or technological interest; and
- (vii) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1 of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

Cultural resources are unique and non-renewable physical phenomena (of natural occurrence or made by humans) that can be associated with human (cultural) activities (Van Vollenhoven 1995:3). These would be any man-made structure, tool, object of art or waste that was left behind on or beneath the soil surface by historic or pre-historic communities. These remains, when studied in their original context by archaeologists, are interpreted in an attempt to understand, identify and reconstruct the activities and lifestyles of past communities. When these items are removed from their original context, any meaningful information they possess is lost, therefore it is important to locate and identify such remains before construction or development activities commence.

1.3. Approach and statutory requirements

The SAHRA Minimum standards of 2007 and 2016 guideline document, forms the background against which the survey was planned and the report compiled. An Archaeological Impact Assessment (AIA) consists of three phases. This document deals with the first phase. This (phase 1) investigation is aimed at getting an overview of cultural resources in the project area, assigning significance to these resources, assessing the possible impact that the proposed activity may have on these resources, making recommendations pertaining to the management of heritage resources and putting forward mitigation measures where applicable.

When the archaeologist or heritage specialist encounters a situation where the planned project will lead to the destruction or alteration of an archaeological/ heritage site or feature, a second phase investigation is normally recommended. During a phase two investigation mitigation measures are put in place and detailed investigation into the nature of the cultural material is undertaken. Often at this stage, archaeological excavation and detailed mapping of a site is carried out in order to document and preserve the cultural heritage.

Phase three consists of the compiling of a management plan for the safeguarding, conservation, interpretation and utilization of cultural resources (Van Vollenhoven, 2002).

Continuous communication between the developer and heritage specialist after the initial assessment has been carried out may result in the modification of a planned route or development to incorporate or protect existing archaeological and heritage sites.

2. Description of surveyed area

The study area falls within the Umjindi Local Municipality, near the town Barberton, Mpumalanga Province. The survey was carried out in an area where the Legogote Sour Bushveld veld type predominates. The survey was carried out on a project footprint consisting of approximately 3,8 hectares.

Veld type: The vegetation forms part of the Savanna Biome and classed as Legogote Sour Bushveld. This veld type occurs in Mpumalanga and Limpopo Provinces on the lower eastern slopes and hills or the northeastern escarpment from Mariepskop in the north through White River to the Nelspruit area and extending westwards up valleys of the Crocodile, Elands and Houtbosloop Rivers and terminating in the south in the Barberton area. Altitude is 600-1000 m and sometimes higher. The landscape is characterised by gently to moderately upper pediment slopes with dense woodland including many medium to large shrubs, short thicket occurs on less rocky sites (Mucina and Rutherford, 2009).

Geology and soils: The larger part of the area is underlain by gneiss and migmatite of the Nelspruit Suite but the southern part occurs on the potassium-poor rocks of the Kaap Valley Tonalite. Pretoria Group shale and quartzite occur in the westernmost areas. Archaean granite plains with granite inselbergs and large granite boulders also occur (Mucina and Rutherford, 2009).

Limiting factors: As mentioned under Constraints and Limitations above, in some parts of the project areas dense undergrowth and impenetrable thicket as well as inaccessible wetland, limited exploration of certain areas.

3. Methodology

This study consists of a detailed archival study in order to understand the study area in a historical timeframe, an archaeological background study which include scrutiny of previous archaeological reports of the area, obtained through the SAHRIS database, and published as well as unpublished written sources on the archaeology of the area, social consultation with people who live nearby and a lastly a physical survey of the affected and immediate area.

The South African Heritage Resources Agency (SAHRA) and the relevant legislation (NHRA) require that the following components be included in an archaeological impact assessment:

- Archaeology;
- Shipwrecks;
- Battlefields;
- Graves;

- Structures older than 60 years;
- Living heritage;
- Historical settlements;
- Landscapes;
- Geological sites; and
- Paleontological sites and objects.

All the above-mentioned heritage components are addressed in this report, except shipwrecks, geological sites and paleontological sites and objects.

The ***purpose*** of the archaeological, archival and heritage study is to establish the whereabouts and nature of cultural heritage sites should they occur on project area. This includes settlements, structures and artefacts which have value for an individual or group of people in terms of historical, archaeological, architectural and human (cultural) development.

The ***aim*** of this study is to locate and identify such objects or places in order to assess and rate their significance and establish if further investigation is needed. Mitigation measures can then be suggested and put in place when necessary.

3.1. Archaeological and Archival background studies

The purpose of the desktop study is to compile as much information as possible on the heritage resources of the area. This helps to provide an historical context for located sites. Sources used for this study include published and unpublished documents, archival material and maps. Information obtained from the following institutions or individuals were consulted:

- Published and unpublished archaeological reports and articles;
- Published and unpublished historical reports and articles;
- Archival documents from the National Archives in Pretoria;
- Historical maps; and
- South African Heritage Resource Information System (SAHRIS) database.

3.1.1. Previous archaeological studies in the area

Some archaeological impact assessments (AIA's) and heritage impact assessments have been done in the greater area of the proposed development area.

In 2008 Dr Julius Pistorius conducted a Phase One Heritage Impact Assessment for the upgrading of an Eskom Substation on the farm Hilltop 458 which is located a number of kilometres north-east of Waterfall 461 JT. The only significant feature he documented was the location of a single grave.

In 2018 Mr JP Celliers conducted a "Phase 1 Archaeological and Heritage Impact Assessment on the farm Waterfall 461 JT in respect of the proposed construction of an irrigation dam, Barberton, Mpumalanga Province". No sites of archaeological or heritage significance was documented.

3.1.2. Historic maps

Historical maps were scrutinized and features that were regarded as important in terms of heritage value were identified and if they were located within the boundaries of the project area they were physically visited in an effort to determine:

- (i) whether they still exist;
- (ii) their current condition; and
- (iii) significance.

3.1.3. Physical survey

- The survey of the proposed dam location was conducted on 11 March 2022
- The survey took one day to complete.
- The documented sites were numbered sequentially.
- Sites were recorded by using a handheld Garmin Oregon 450 GPS unit and the unit was given time to reach an accuracy of at least 5 metres.
- Sites were plotted on 1:50 000 topographical maps which are geo-referenced (WGS 84) and also on Google Earth.
- No sites of archaeological or heritage significance were located. A number of survey orientation sites were mapped for survey purposes.

3.2. Social Consultation

Social consultation forms an important part of identifying sites which may be of heritage significance.

Farm manager Mr Hannes Steyn, who has been working on the farm for a number of years, was consulted about the presence of heritage sites within the project area and he stated that to his knowledge there are no heritage sites or graves present within the proposed project area.

3.3. Heritage site significance

The South African Heritage Resources Agency (SAHRA) formulated guidelines for the conservation of all cultural resources (sections 6 and 7 of the NHRA, 1999) and therefore also divided such sites into three main categories. These categories might be seen as guidelines that suggest the extent of protection a given site might receive. They include sites or features of local (Grade 3) provincial (Grade 2) national (Grade 1) significance, grades of *local significance* and *generally protected* sites with a variety of degrees of significance.

For practical purposes the surveyor uses his own classification for sites or features and divides them into three groups, those of low or no significance, those of medium significance and those of high significance (***Also see table 5.2. Significance rating guidelines for sites***).

Values used to assign significance and impact characteristics to a site include:

- **Types of significance**

The site's scientific, aesthetic and historic significance or a combination of these is established.

- **Degrees of significance**

The archaeological or historic site's rarity and representative value is considered. The condition of the site is also an important consideration.

- **Spheres of significance**

Sites are categorized as being significant in the international, national, provincial, regional or local context. Significance of a site for a specific community is also taken into consideration.

To arrive at the specific allocation of significance of a site or feature, the specialist considers the following:

- Historic context;
- Archaeological context or scientific value;

- Social value;
- Aesthetic value; and
- Research value.

More specific criteria used by the specialist in order to allocate value or significance to a site include:

- The unique nature of a site;
- The integrity of the archaeological deposit;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined or is known);
- The preservation condition of the site;
- Quality of the archaeological or historic material of the site; and
- Quantity of sites and site features.

Archaeological and historic sites containing data, which may significantly enhance the knowledge that archaeologists currently have about our cultural heritage, should be considered highly valuable. In all instances these sites should be preserved and not damaged during construction activities. However, when development activities jeopardize the future of such a site, a second and third phase in the Cultural Resource Management (CRM) process is normally advised. This entails the excavation or rescue excavation of cultural material, along with a management plan to be drafted for the preservation of the site or sites.

Graves are considered very sensitive sites and should never under any circumstances be jeopardized by development activities. Graves and burial grounds are incorporated in the NHRA under section 36 and in all instances where graves are found by the surveyor, the recommendation would be to steer clear of these areas. If this is not possible or if construction activities have for some reason damaged graves, specialized consultants are normally contacted to aid in the process of exhumation and re-interment of the human remains.

4. History and Archaeology

4.1. Historic period

4.1.1. Early History

In Southern Africa the domestication of the environment began only a couple of thousands of years ago, when agriculture and herding were introduced. At some time during the last half of the first millennium BC, people living in the region where Botswana, Zambia and Angola are today, started moving southward, until they reached the Highveld and the Cape in the area of modern South Africa. As time passed and the sub-continent became fully settled, these agro-pastoralists, who spoke Bantu languages, started dominating all those areas which were ecologically suitable for their way of life. This included roughly the eastern half of modern South Africa, the eastern fringe of Botswana and the north of Namibia. Historians agree that the earliest Africans to inhabit in the Lowveld in Mpumalanga were of Sotho, or more particularly Koni-origin.

Up until the 1930s, malaria would have occurred sporadically in the study area during the rainy season. During the first half of the nineteenth century, Tsetse flies also thrived in this area. Pastoralists would have avoided the moist low-lying valleys and thickly wooded regions where these insects preferred to congregate. It is unlikely that populations would be dense in areas where malaria and the “sleeping sickness” transferred by Tsetse flies was a constant threat to humans and their stock (Bergh 1999: 3; Shillington 1995: 32).

In a few decades, the course of history in the old Transvaal province would change forever. The Difaqane (Sotho), or Mfekane (“the crushing” in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820s until the late 1830s. It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka’s Zulus to attack other tribes.

During the time of the Difaqane, a northwards migration of white settlers from the Cape was also taking place. Some travellers, missionaries and adventurers had gone on expeditions to the northern areas in South Africa – some as early as the 1720’s. One such an adventurer was Robert Schoon, who formed part of a group of Scottish travellers and traders who had travelled the northern provinces of South Africa in the late 1820s and early 1830s. Schoon had gone on two long expeditions in the late 1820’s and once again ventured eastward and northward of Pretoria in 1836 (Bergh, 1999: 13, 116-121).

By the late 1820s, a mass-movement of Dutch speaking people in the Cape Colony started advancing into the northern areas. This was due to feelings of mounting dissatisfaction caused by economical and other circumstances in the Cape. This movement later became known as the Great Trek. This migration resulted in a massive increase in the numbers of people of European descent. As can be expected, the

movement of whites into the Northern provinces would have a significant impact on the local farmer – herders who populated the land.

By 1860, the population of Europeans in the central Transvaal was already very dense and the administrative machinery of their leaders was firmly in place. Many of the policies that would later be entrenched as legislation during the period of apartheid had already been developed (Ross 2002: 39; Bergh, 1999: 170).

However, relations were at times also interdependent in nature. After the Great Trek, when European farmers had settled at various areas in the northern provinces, wealthier individuals were often willing to lodge needy white families on their property in exchange for odd jobs and commando service. These “bywoners” often arrived with a family and a few cows. He would till the soil and pay a minimal rent to the farmer from the crops he grew. The farmer did not consider him a labourer, but mostly kept workers for hard labour on the farm.

The discovery of gold in South Africa had a major impact in the region. In 1873 gold was discovered in Pilgrims Rest, 80 kilometres north of Nelspruit. This drew scores of prospectors into the region. The establishment of Barberton in 1884, after the discovery of the Sheba gold reef, also brought about greater activity in the area. The Nelspruit settlement first received official recognition in August 1884 (South African History Online 2013).

A large Homeland was located a small distance to the east of Nelspruit, and later became known as Kangwane. This area was proclaimed by the Land Act of 1936. In the Surplus People Project Report, the forced removal of people to the Kangwane area, or homeland, is discussed. According to this source the area could be regarded as a “dumping ground” allocated to South Africa’s Swazis, consisting of two blocks of land. The first of these, the Nsikazi reserve, was a finger of land stretching along the western boundary of the Kruger National Park, and had been under black occupation for over 50 years. The second block was adjacent to the western and northern boundaries of Swaziland, and consisted of the Nkomazi and Mswati/Mlondozi reserves released under the 1935 Land Act. (Bergh 1999: 42; Surplus people project 1983: 59)

4.1.2. Colonial settlement period

The Groot Trek of the Voortrekkers started with the Tregardt- van Rensburg trek in 1835. The two men met where Tregardt and his followers crossed the Orange River at Buffelsvlei (Aliwal North). Here van Rensburg joined the trek northwards. On August 23, 1837 the Tregardt trek left for Delagoabay from the Soutpansberg. They travelled eastwards alongside the Olifants River to the eastern foothills of the Drakensberg. From here they travelled through the Lowveld and the current Kruger National Park where they eventually crossed the Lebombo mountains in March 1838. They reached the Fortification at Lourenço Marques on 13 April 1838 (Bergh, 1998:124-125).

Permanent European (Voortrekker) settlement of the eastern areas of Mpumalanga can be traced back to a commission under the leadership of A.H. (Hendrik) Potgieter who negotiated with the Portuguese Governor at Delagoabaai in 1844 for land. It was agreed that these settlers could settle in an area that was four days journey from the east coast of Africa between the 10° and 26° south latitudes. Voortrekkers started migrating into the area in 1845. Andries-Ohrigstad was the first town established in this area in July 1845 after the Voortrekkers successfully negotiated for land with the Pedi Chief Sekwati. Farms were given out as far west as the Olifants River. The western boundary was not officially defined but at a Volksraad meeting in 1849 it was decided that the Elands River would be the boundary between the districts of Potchefstroom and Lydenburg as this eastern portion of the Transvaal was then known (Bergh, 1998).

Due to internal strife and differences between the various Voortrekker groups that settled in the broader Transvaal region, the settlers in the Ohrigstad area now governed from the town of Lydenburg decided to secede from the Transvaal Republic in 1856. The Republic of Lydenburg laid claim to a large area that included not only the land originally obtained from the Pedi Chief Sekwati in 1849 but also other areas of land negotiated for from the Swazis. The Republic of Lydenburg was a vast area and stretched from the northern Strydpoort mountains to Wakkerstroom in the south and Bronkhortsspruit in the west to the Swazi border and the Lebombo mountains east.

As can be expected, the migration of Europeans into the north would have a significant impact on the indigenous people who populated the land. This was also the case in Mpumalanga. In 1839 Mswati succeeded Sobhuza (also known as Somhlomo) as king of the Swazi. Threatened by the ambitions of his half brothers, including Malambule, who had support from the Zulu king Mpande, he turned to the Ohrigstad Boers for protection. He claimed that the land that the Boers had settled on was Swazi property. The Commandant General of the Ohrigstad settlement, Andries Hendrik Potgieter, responded that the land was ceded to him by the Pedi leader Sekwati, in return for protection of the Pedi from Swazi attacks (Giliomee, 2003).

However, in reaction to the increasingly authoritarian way in which Potgieter conducted affairs at Ohrigstad, the Volksraad of Ohrigstad saw Mswati's offer as a means to obtain more respectable title deeds for the property (Bonner, 1978). According to a sales contract set up between the Afrikaners and the Swazi people on 25 July 1846, the whites were the rightful owners of the land that had its southern border at the Crocodile River, which stretched out in a westerly direction up to Elandspruit; of which the eastern border was where the Crocodile and Komati rivers joined and then extended up to Delagoa bay in the north (Van Rooyen, 1951). The Europeans bought the land for a 100 heads of cattle (Huyser).

4.1.3. History of the Anglo Boer War (1899-1902) in the area

The discovery of diamonds and gold in the Northern provinces had very important consequences for South Africa. After the discovery of these resources, the British, who at the time had colonized the Cape and Natal, had intentions of expanding their territory into the northern Boer republics. This eventually led to the Anglo-Boer War, which took place between 1899 and 1902 in South Africa, and which was one of the most turbulent times in South Africa's history.

Even before the outbreak of war in October 1899 British politicians, including Sir Alfred Milner and Mr. Chamberlain, had declared that should Britain's differences with the Z.A.R. result in violence, it would mean the end of republican independence. This decision was not immediately publicised, and as a consequence republican leaders based their assessment of British intentions on the more moderate public utterances of British leaders. Consequently, in March 1900, they asked Lord Salisbury to agree to peace on the basis of the status quo ante bellum. Salisbury's reply was, however, a clear statement of British war aims (Du Preez, 1977).

During the British advance between February to September 1900, Lord Roberts replaced Genl. Buller as the supreme commander and applied a different tactic in confronting the Boer forces instead of a frontal attack approach he opted to encircle the enemy. This proved successful and resulted for instance in the surrender of Genl. Piet Cronje and 4000 burghers at Paardeberg on 27 February 1900.

This was the start of a number of victories for the British and shortly after they occupied Pretoria on 5 June 1900, a skirmish at Diamond Hill resulted in the Boer forces under command of Louis Botha, retreated alongside the Delagoa Bay railway to the east. Between the 21-27 August, Botha and 5000 burghers defended their line at Bergendal but were overwhelmed by superior numbers and artillery. This resulted in the Boer forces retreating even further east and three weeks later the British reached Komatipoort and thus the whole of the Eastern Transvaal south of the Delagoa Bay railway line was now occupied by British Forces.

General Louis Botha, with his Boer forces, marched through Nelspruit on 11 September 1900. A week later, on 18 September 1900, the British battalion of Lieutenant General F. Roberts arrived in Nelspruit. No major skirmishes in the war took place near Nelspruit, but a concentration camp for black people was established a small distance to the north of the town and a white concentration camp to the west of Barberton (Bergh, 1999: 54). Another event of import in the area was the arrival of the President of the Transvaal, Paul Kruger, in Nelspruit on 29 May 1900, where he received a message saying Lord Roberts had annexed the Transvaal. Kruger declared the annexation illegitimate on 3 September 1900, the same day that Nelspruit was proclaimed as the administrative capital of the Transvaal Republic. Kruger left Nelspruit in June of that year in order to board a ship to Swaziland (Bergh, 1999: 51; 54).

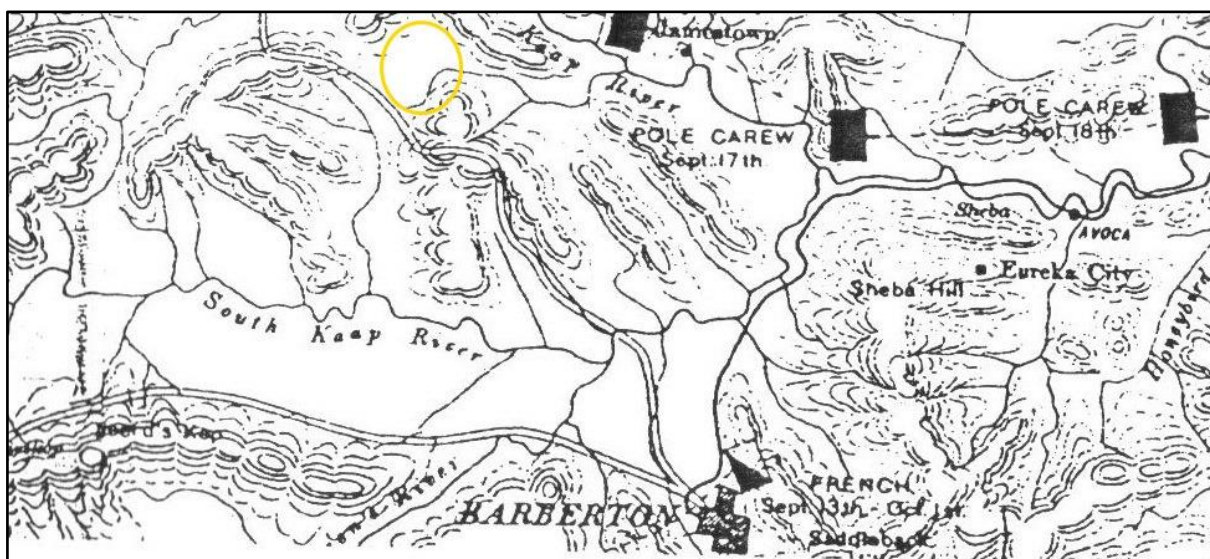


Fig. 4.1. Anglo Boer War map showing “The second stage of the combined advance on Komati Poort, Sept. 3rd -24th 1900. The approximate location of the study area is encircled in yellow (Major Jackson series, 1902).

During the Battle of Helvetia, ZAR forces succeeded in capturing “The Lady Roberts” British naval gun after an attack on enemy fortifications located at Helvetia between Lydenburg and Machadodorp on 28 December 1900. It was the only gun captured during the War and later destroyed by the ZAR forces to prevent the British claiming it back. The largest portions of the gun are at the National Museum in Pretoria but an inscribed piece which comes from the breech of the gun is part of the Lydenburg Museum collection.

4.1.4. Historic maps of the study area

Since the mid-1800s up until the present, South Africa has been divided and re-divided into various districts. Since 1845, the property under investigation would have formed part of the Lydenburg district. This remained the case up until 1902, when the property fell into Witrivier ward of the newly proclaimed Barberton district. In 1930 the Nelspruit district was proclaimed and the property fell under its jurisdiction. District boundaries were however shifted, to the effect that by 1977 the property formed part of the Barberton district again. By 1994 the farm area was still located within this district (Bergh, 1999: 17, 20-27).

The farm Waterfall 144 was proclaimed at some time in the early 1900s. This property was initially smaller than it is at present. By 1930 the farm was known as Waterfall 460, and had previously formed part of Section C of the Kaap Block, Barberton district. By 1931 a section of the property Maritzdrift had been incorporated into the property to form the southern part of what was then called Waterfall 4. By 1950

the property was known as Waterfall 125, but this changed again to Waterfall 461 JT at some time between 1950 and 1968.

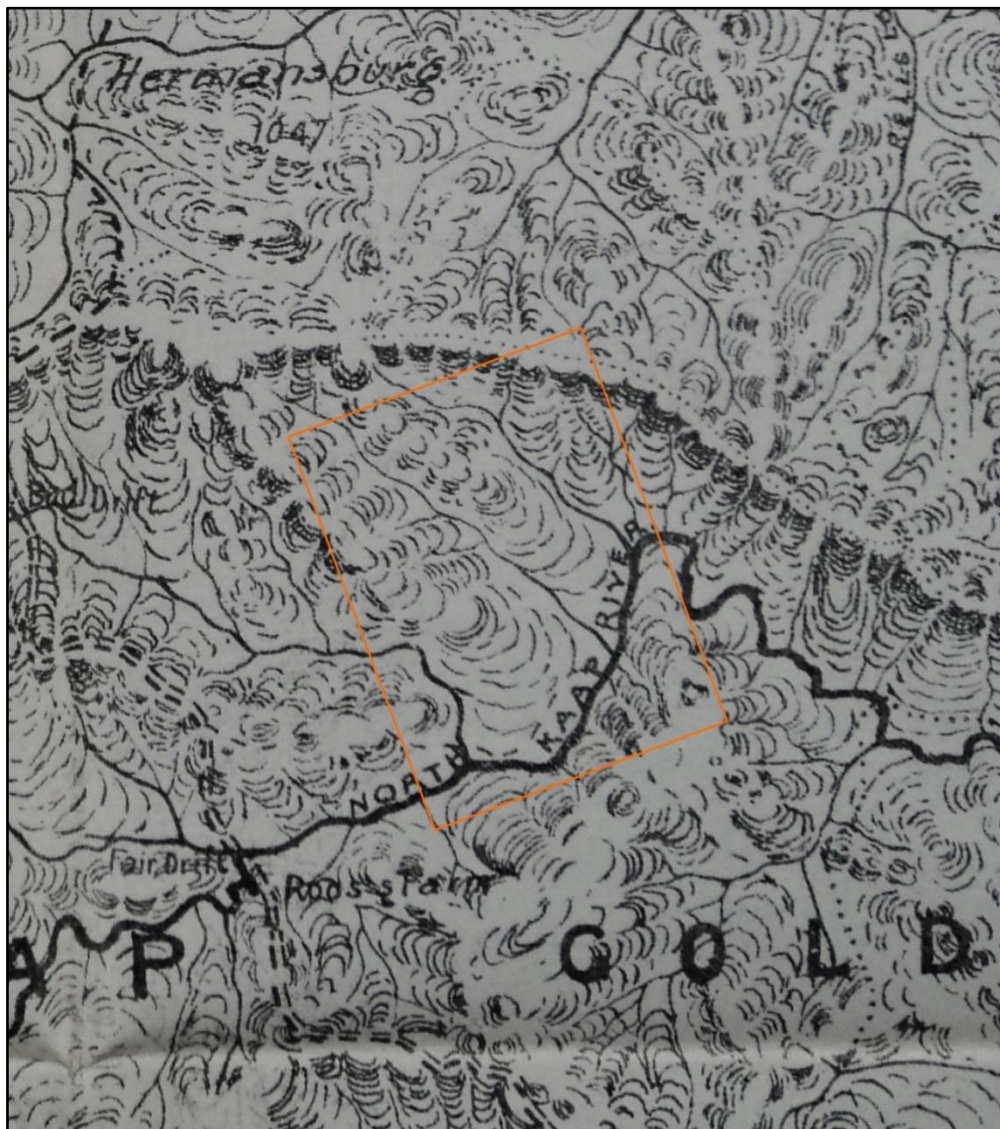


Fig. 4.2. Major Jackson Map of the Barberton district. The orange borders show the approximate location of the farm Waterfall. The North Kaap River and three of its tributaries went through the area. No homesteads or kraals are indicated in the farm area (Major Jackson 1902).

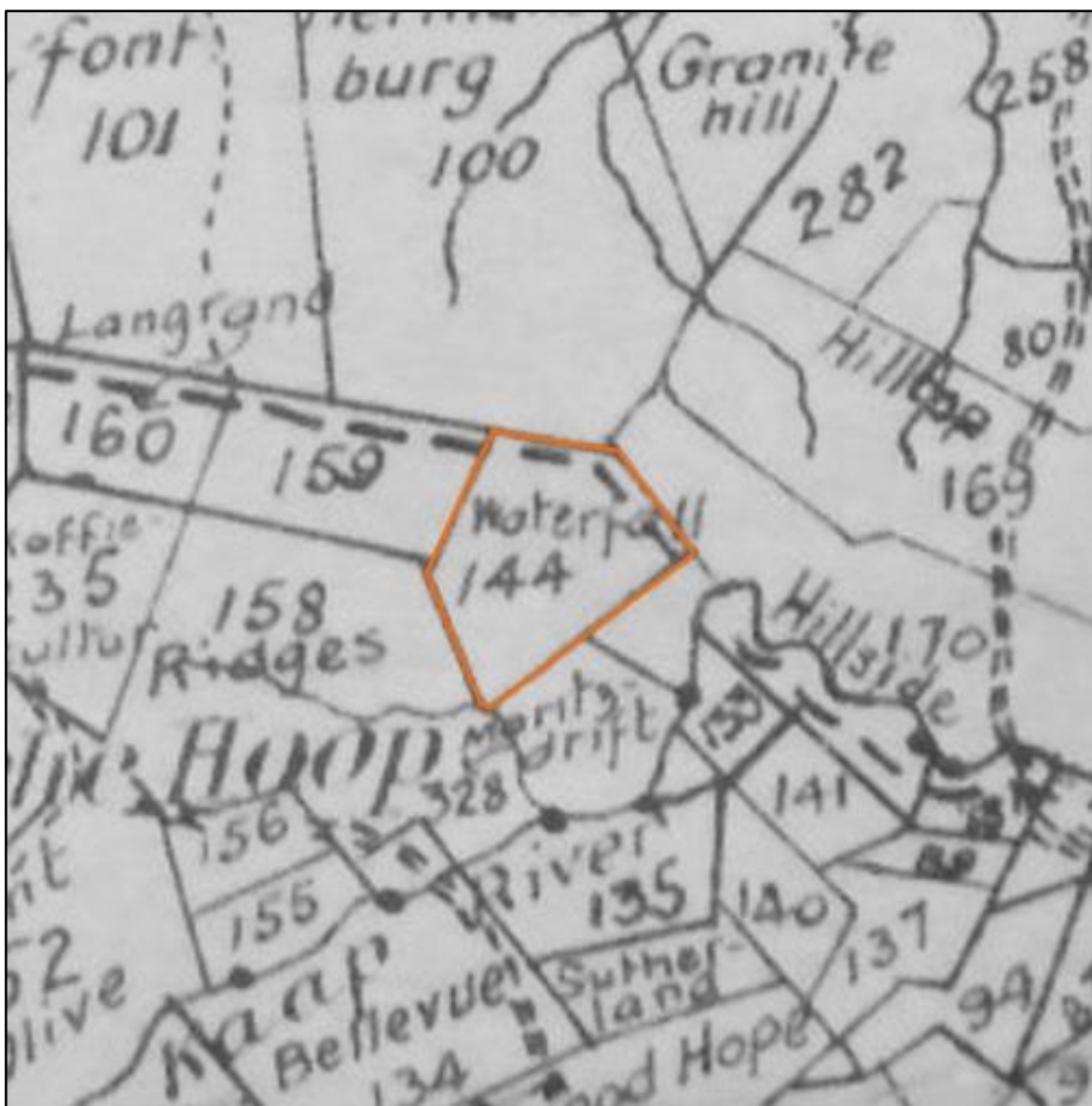


Fig. 4.3. Holmden's early 1900s map of the Transvaal. The location of Waterfall 144 is indicated with an orange border. A part of the property, Maritzdrift, would later be incorporated into the farm Waterfall. A proposed railway / railway under construction went through the northern part of Waterfall 144 (Holmden 190[?]).

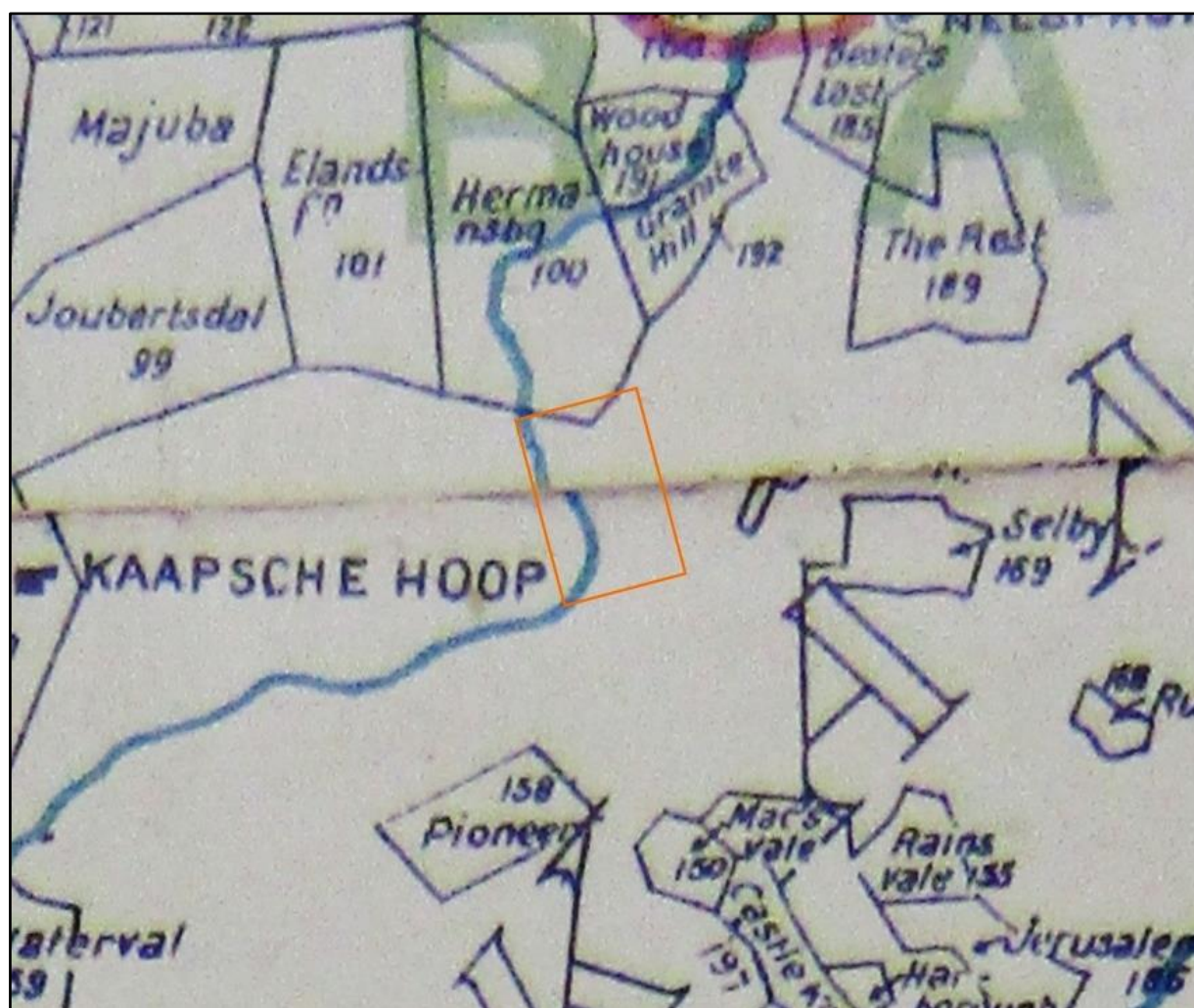


Fig. 4.4. A 1920's "Standard map of the Transvaal". The farm Waterfall is not indicated on this map. An orange border show the approximate location of the study area (Anon 1920s).

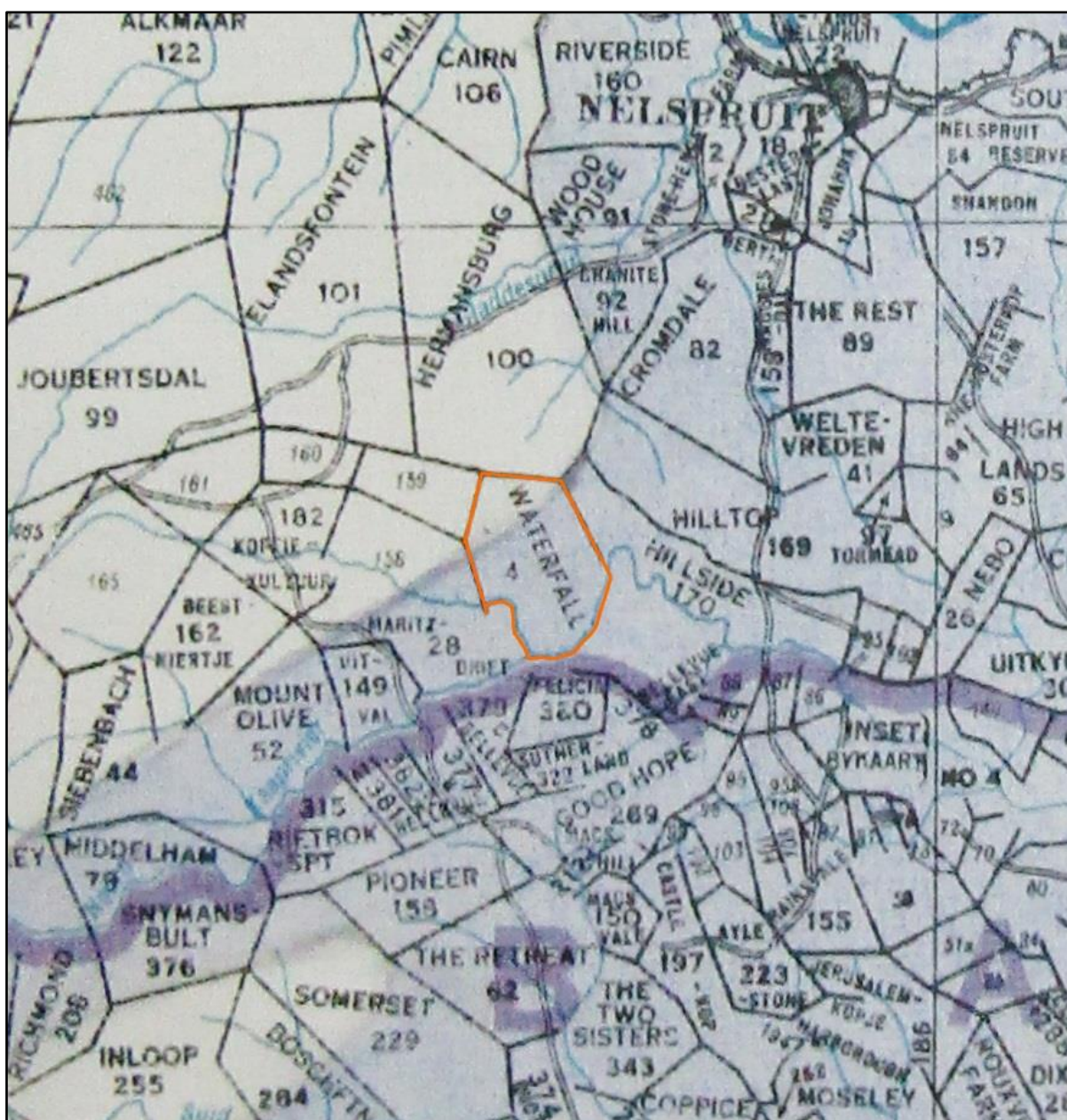


Fig. 4.5. Map of the Kruger National Park, dating approximately to the 1930s. One can see that a section of Maritzburg was incorporated as the southern part of the property which was known as Waterfall 4 by the 1930s (NARSSA Maps: 3/1254).

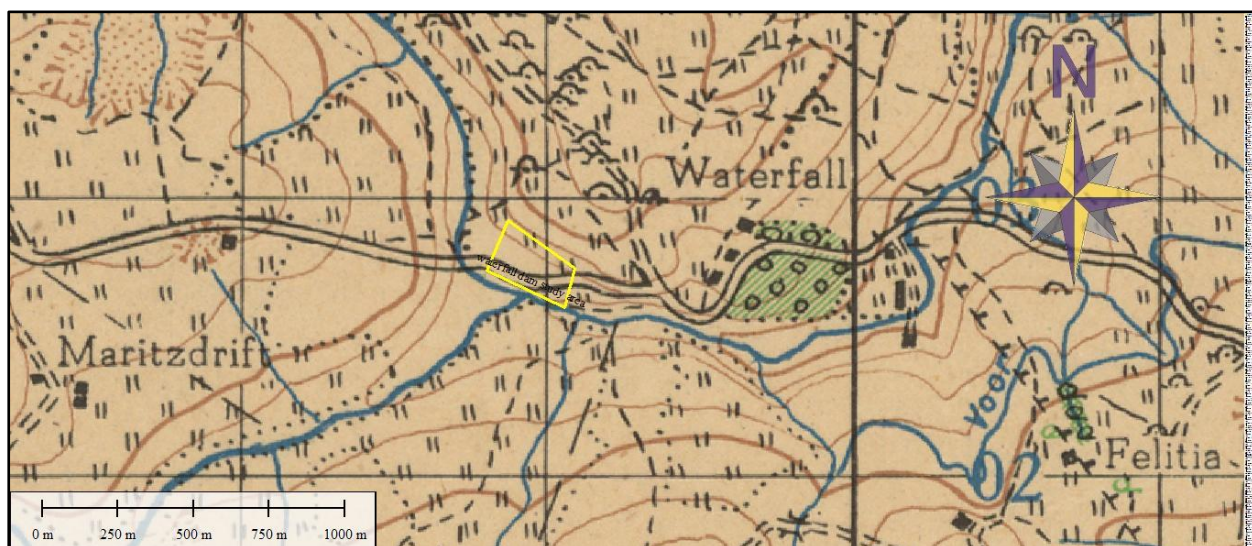


Fig. 4.6. Topographical map of the farm and study area dated 1944. The approximate location of the study area is indicated with a yellow border. The North Kaap River is visible along the southern border of the study area. A secondary road (double line), a minor road (double dotted line) and several footpaths (single dotted lines) is visible in the vicinity of the study area. The largest part of the farm was under cultivation, and orchards can be seen around the study area. A large number of traditional huts can be seen north of the study area (Topographical Map, 1944).

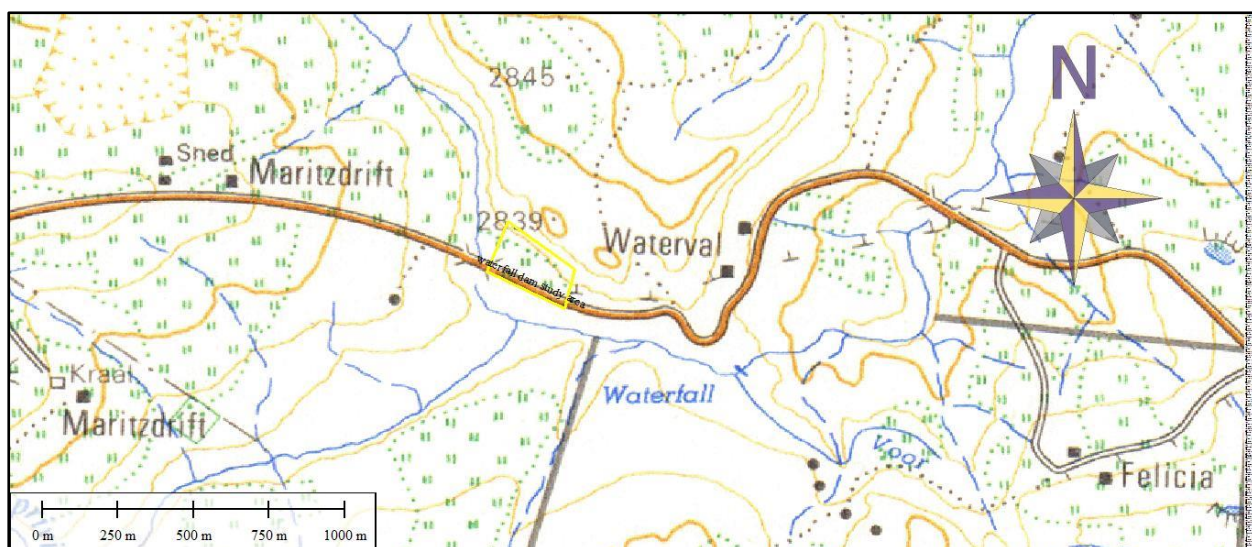


Fig. 4.7. Topographical map of the farm and study area dated 1968. The study area is outlined with a yellow border. The Noord Kaap River runs along the southern boundary of the study area. A secondary road passes by south of the study area and a number of tracks / footpaths are also visible. A telephone line passes south of the study area. A large portion of the study area was used as cultivated lands, and two buildings can be seen to the east (Topographical Map, 1968).

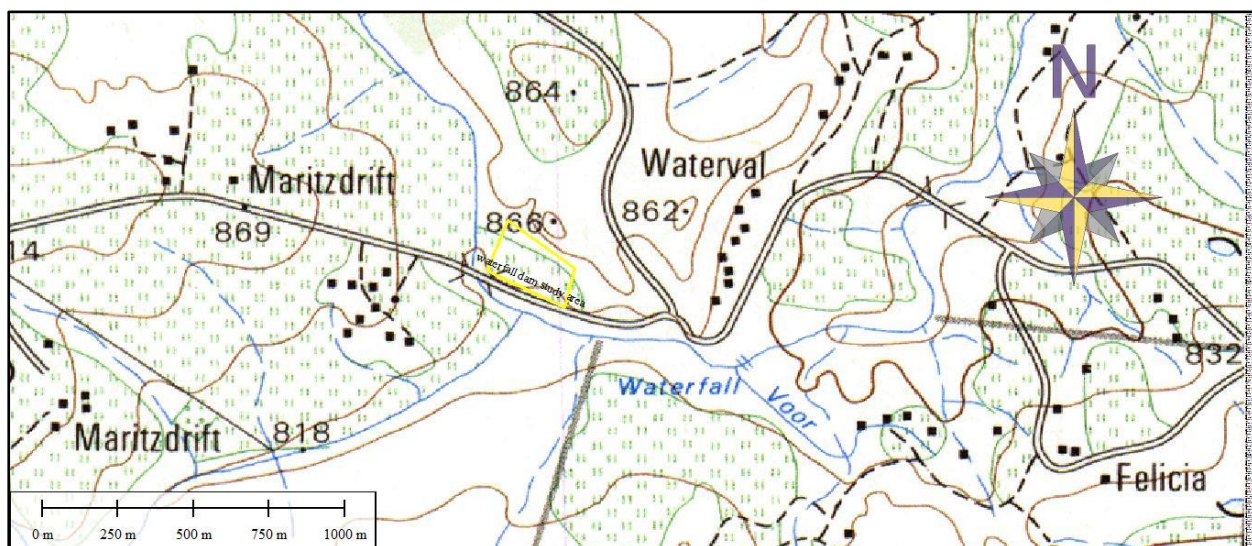


Fig. 4.8. Topographical map of the farm and study area in 1984. The study area is outlined with a yellow border. The Noord Kaap River runs along the southern boundary of the study area. A secondary road passes by south of the study area. A large portion of the study area was used as cultivated lands, and a number of buildings can be seen to the east and west (Topographical Map 1984).

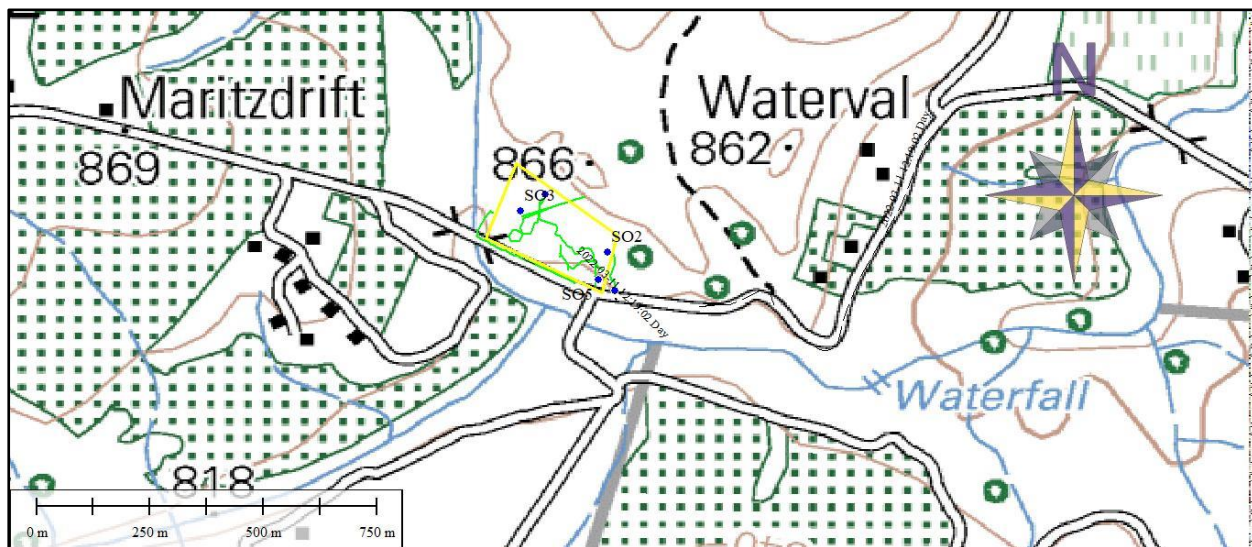


Fig. 4.9. Topographical map of the farm and study area in 2010. The farm study area is indicated with a yellow border. The Noord Kaap River runs along the southern boundary of the study area. A number of secondary roads are located south of the study area. Orchards are visible south, east and west of the study area. Eight buildings are visible west of the study area and another four to the east (Topographical Map 2010).



Fig. 4.10. An aerial photo of the property taken in 1936. The study area is bordered by a yellow line. It is clear that the area within the border of the study area as well as the surrounds were utilized as agricultural fields.



Fig. 4.11. An aerial photo of the property taken in 1979. The study area is bordered by a yellow line. At that time it seems the land within the study area was not cultivated and probably served as grazing.

4.1.5. Historical overview of the ownership and development of the farm Waterfall 461 JT.

Record of historical landowners

Unfortunately no records could be found regarding the earliest landowners of Waterfall. The following information could however be found in archival records:

- The Crown Grant for Portion A of Waterfall 4 was purchased by Gertrude Lilian Forward (previously Exall, born Guthrie) and Cleave Alfred Exall in June 1942 (NARSSA SAB, URU: 2034 2091).
- In December 1952, a Crown Grant for the farm Ridges, comprised of Lots Nos. 158 and 158, Section C, Kaap Block, as well as the Remaining Extent of Waterfall 4, was granted in favour of C. L. Exall and G. L. Forward (NARSSA SAB, URU: 3051 3090).

It seems that Portion A of Waterfall 4 probably forms part of what is presently known as Portion 1 of the property. The following information regarding Portion 1 of Waterfall 461 JT could be obtained by doing a search on the Windeed Search Engine:

Date	Transported from	Transported to	Sale Price
1970	-	Jacobs	Unknown
1983	Jacobs	John Dirk Grobler	Unknown
1987	John Dirk Grobler	Volkskas	Unknown
1987	Volkskas	G. J. J. Bruwer Beleggings Pty Ltd	
2003	G. J. J. Bruwer Beleggings Pty Ltd	Druiswater Boerdery Pty Ltd	

The property is currently in the ownership of the company Grey-Van Investments Pty Ltd, which purchased the land on 18 February 2015 (Windeed Search Engine 2018).

History of land use

On December 31, 1930, the cancellation of the lease for the farm Waterfall (then known as Waterfall 460), consisting of Lots 138 to 148, Section C, Cape Block, district Barberton, was awarded to William George Exall. Directly thereafter, a lease was awarded to William Harry Exall and Cleave Alfred Exall of the holding consisting of Portion A of the farm Waterfall 460, Barberton district, 775 morgen 61072 square feet in extent, for a period of five years from 1 January 1931, with the option of purchase at an appreciation of £732 (NARSSA SAB, URU: 1171 3559).

William Harry Exall and Cleave Alfred Exall were also granted a holding for lease, consisting of the Remaining Extent of the farm Waterfall 460, district Barberton and measuring 1443 morgen 31664 square feet, for a period of two and a half years as of 1 January 1931, without the option of purchase (NARSSA SAB, URU: 1171 3559).

On 31 May 1931, de-proclamation as a public digging of a part of the farm Waterfall 4 was approved. This included sections of the premises 139, 140 and 144/6 of Section C of the Kaap Block, collectively 631 morgen and 22104 square foot in extent (NARSSA SAB, URU: 1233 2879).

In 1933, it was approved that the lease contract held by William Harry Exall and Cleave Alfred Exall of the Remaining Extent of the farm Waterfall 4 would be extended for a period of 21 years, as of 1 July 1933 (NARSSA SAB, URU: 1406 179).

By 1938 William Harry Exall had passed away, leaving his wife Gertrude Lilian Exall (born Guthrie) as the Executrix Testamentary of his estate. W. H. Exall and C. A. Exall had exercised the option to purchase Portion A of Waterfall 4 on 1 January 1931. In 1938 Gertrude Lilian Hall and Cleave Alfred were involved in a water court case regarding the use of water from the North Kaap River on their property. A water furrow from the North Kaap River had been used by the owners of the farms Felicia and Waterfall for the past 30 years, and the owners of Waterfall wished to continue to do so. Since about 1918, the furrow was cleaned and at times repaired by the Exall brothers at their own cost (NARSSA TAB, WAT: 299/1938).

By July 1938 the liquidation of W. H. Exall's estate had been completed, and his interests had been ceded and transferred to his widow. The farm was used for the cultivation of vegetables and tobacco, which required irrigation. The furrow went over the property Felicia 380, owned by Jacob Hermanus Zeeman. Zeeman had insisted that the Exalls obtain the necessary servitudes in order to continue using the water furrow. An official application for servitudes of aqueduct and abutment in connection with the use of water from the North Kaap River by the Exalls was heard in the Magistrate's Court, Barberton on 14th July 1938. These rights were subsequently granted (NARSSA TAB, WAT: 299/1938).



Fig. 4.10. A sketch plan of the North Kaap River and water furrow that went from the farm Felicia 380 to Portion A of Waterfall 4 drawn in 1938. The area owned by the Exalls forms part of the present day Portion 1 of Waterfall (NARSSA TAB, WAT: 299/1938).

On 31 December 1938, the leases without the option of purchase in respect of the holdings comprising the Remaining Extent of Waterval 4 and Lots 158 and 158, Section C, Kaap Block, called "Ridged", held by C. A. Exall and G. L. Exall, were cancelled. A one year lease with the option of purchase for these same properties was then allotted to them. The lease period commenced on 1 January 1939, and the purchase price was set at £1,000.0.0 (NARSSA SAB, URU: 1743 2429).

In June 1942 the Crown Grant in respect of the holding comprising Portion A of Waterfall 4 was issued in favour of C. L. Exall and G. L. Forword (previously Exall) (NARSSA SAB, URU: 2034 2091).

In February 1950 it was approved that certain conditions contained in the Crown Grant in respect of Portion A of Waterfall 125 (formerly Waterfall 4), owned by C. A. Exall and G. L. Forword would be cancelled. These conditions were as follows:

- a) “the condition that the land hereby granted, or any portion thereof, shall not be alienated, hypothecated or in any way encumbered (other than by way of a servitude of usufructs, usus or habitation) by the grantees, except with the prior written consent of the Minister of Lands given on the recommendation of the (Central) Land Board, on such conditions as the Minister may think fit to impose”;
- b) “the condition that the land hereby granted, or any portion thereof, shall not be subdivided by the grantees or their successors in title, without the prior written consent of the Minister of Lands, given on the recommendation of the (Central) Land Board on such conditions as the Minister may think fit to impose” (NARSSA SAB, URU: 2721 512).

In December 1952, a Crown Grant for the farm Ridges, comprised of Lots Nos. 158 and 158, Section C, Kaap Block, as well as the Remaining Extent of Waterfall 4, was granted in favour of C. L. Exall and G. L. Forword (NARSSA SAB, URU: 3051 3090).

In April 1982 Portion 6 (Portion of Portion 2) of Waterfall 461 JT was transferred from Ian Gordon Miller to Vincent Hugh James. This property was located just to the east of the present day Portion 1 of the farm. In 1983, V. H. James applied to open a general dealer store on his small holding. The property was situated on the Waterfall Road, which was a byroad off the Barberton / Kaapsehoop Road, and served as an access to the farmers in the vicinity (NARSSA SAB, CDB: 14845 PB4/19/2/3/461/1).

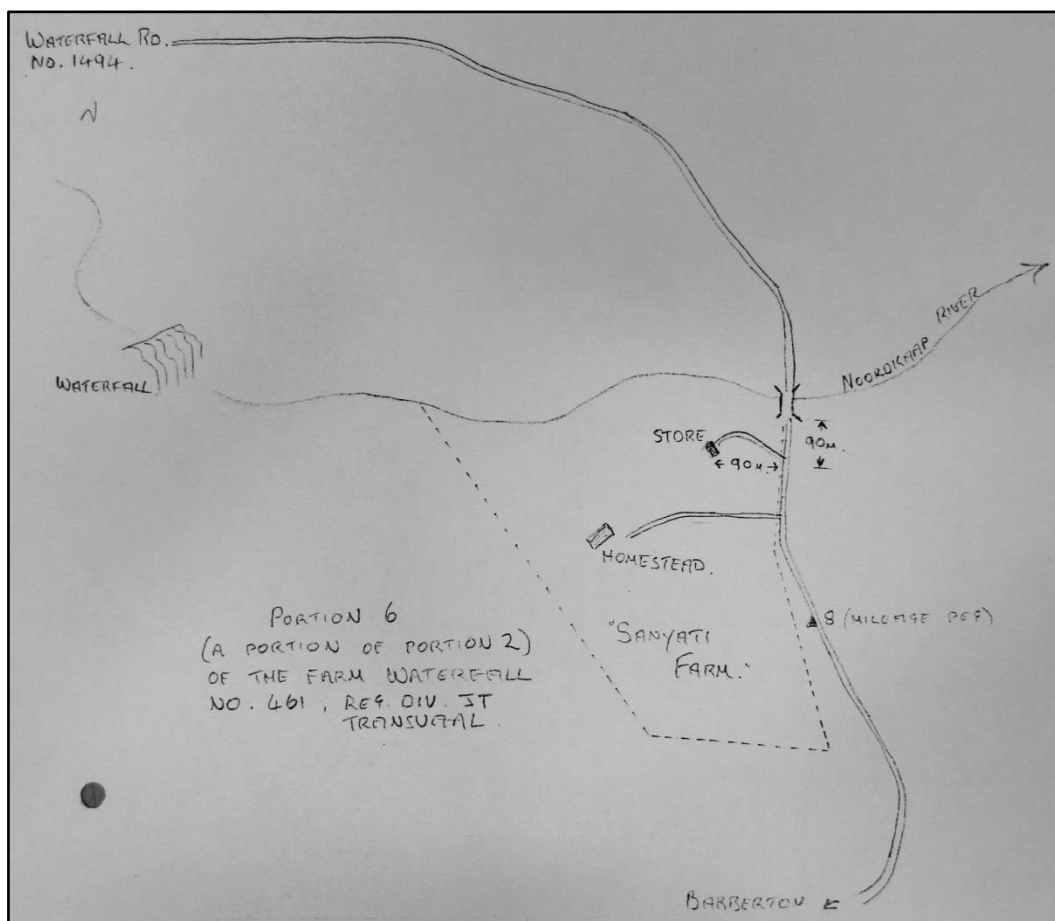


Fig. 4.12. Sketch map of Portion 6 (Portion of Portion 2) of Waterval 461 JT dated to 1930 (NARSSA SAB, CDB: 14845 PB4/19/2/3/461/1).

James therefore wished to supply the immediate surrounding labourers and farmers with their basic requirements, such as tinned foods, soaps, meal, matches, bread etc. The applicant also wished to market frozen fish after complying with the necessary regulations. James' application was approved by the Director of Local Government on 7 March 1984. The surface area of the business could not exceed 60 square metres (NARSSA SAB, CDB: 14845 PB4/19/2/3/461/1).

4.2. Archaeology

4.2.1. Stone Age

In Mpumalanga Province the Drakensberg separates the interior plateau also known as the Highveld from the low-lying subtropical Lowveld, which stretches to the Indian Ocean. A number of rivers amalgamate into two main river systems, the Olifants River and the Komati River. This fertile landscape has provided resources for humans and their predecessors for more than 1.7 million years (Esterhuizen & Smith in Delius, 2007).

The initial attraction of abundant foods in the form of animals and plants eventually also led to the discovery of and utilisation of various minerals including ochre, iron and copper. People also obtained foreign resources by means of trade from the coast. From 900 AD this included objects brought across the ocean from foreign shores.

The Early Stone Age (ESA)

In South Africa the ESA dates from about 2 million to 250 000 years ago, in other words from the early to middle Pleistocene. The archaeological record shows that as the early ancestors progressed physically, mentally and socially, bone and stone tools were developed. One of the most influential advances was their control of fire and diversifying their diet by exploitation of the natural environment (Esterhuizen & Smith in Delius, 2007).

The earliest stone tools date to around 2.5 million years ago from the site of Gona in Ethiopia. Stone tools from this site shows that early hominids had to cognitive ability to select raw material and shape it for a specific application. Many bones found in association with stone tools like these have cut marks which lead scientists to believe that early hominids purposefully chipped cobblestones to produce flakes with a sharp edge capable of cutting and butchering animal carcasses. This supplementary diet of higher protein quantities ensured that brain development of hominids took place more rapidly.

Mary Leaky discovered stone tools like these in the Olduvai Gorge in Tanzania during the 1960s. The stone tools are named after this gorge and are known as relics from the Oldowan industry. These tools, only found in Africa, are mainly simple flakes, which were struck from cobbles. This method of manufacture remained for about 1.5 million years. Although there is continuing debate about who made these tools, two hominids may have been responsible. The first of these was an early form of *Homo* and the second was *Paranthropus robustus*, which became extinct about 1 million years ago (Esterhuizen & Smith in Delius, 2007).

Some time later, around 1.7 million years ago, more specialised tools known as Acheulean tools, appeared. These are named after tools from a site in France by the name of Saint Acheul, where they

were first discovered in the 1800s. It is argued that these tools had their origin in Africa and then spread towards Europe and Asia with the movement of hominids out of Africa. These tools had longer and sharper edges and shapes, which suggest that they could be used for a larger range of activities, including the butchering of animals, chopping of wood, digging roots and cracking bone. *Homo ergaster* was probably responsible for the manufacture of Acheulean tools in South Africa. This physical type was arguably physically similar to modern humans, had a larger brain and modern face, body height and proportion very similar to modern humans. *Homo ergaster* was able to flourish in a variety of habitats in part because they were dependent on tools. They adapted to drier, more open grassland settings. Because these early people were often associated with water sources such as rivers and lakes, sites where they left evidence of their occupation are very rare. Most tools of these people have been washed into caves, eroded out of riverbanks and washed downriver. An example in Mpumalanga is Maleoskop on the farm Rietkloof where Early Stone Age (ESA) tools have been found. This is one of only a handful such sites in Mpumalanga.

Middle Stone Age (MSA)

A greater variety of tools with diverse sizes and shapes appeared by 250 000 before present (BP). These replaced the large hand axes and cleavers of the ESA. This technological advancement introduces the Middle Stone Age (MSA). This period is characterised by tools that are smaller in size but different in manufacturing technique (Esterhuizen & Smith in Delius, 2007).

In contrast to the ESA technology of removing flakes from a core, MSA tools were flakes to start with. They were of a predetermined size and shape and were made by preparing a core of suitable material and striking off the flake so that it was flaked according to a shape which the toolmaker desired. Elongated, parallel-sided blades, as well as triangular flakes are common finds in these assemblages. Mounting of stone tools onto wood or bone to produce spears, knives and axes became popular during the MSA. These early humans not only settled close to water sources but also occupied caves and shelters. The MSA represents the transition of more archaic physical type (*Homo*) to anatomically modern humans, *Homo sapiens*.

The MSA has not been extensively studied in Mpumalanga but evidence of this period has been excavated at Bushman Rock Shelter, a well-known site on the farm Klipfonteinhoek in the Ohrigstad district. This cave was excavated twice in the 1960s by Louw and later by Eloff. The MSA layers show that the cave was repeatedly visited over a long period. Lower layers have been dated to over 40 000 BP while the top layers date to approximately 27 000 BP (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

Later Stone Age (LSA)

Early hunter gatherer societies were responsible for a number of technological innovations and social transformations during this period starting at around 20 000 years BP. Hunting of animals proved more successful with the innovation of the bow and link-shaft arrow. These arrows were made up of a bone tip which was poisoned and loosely linked to the main shaft of the arrow. Upon impact, the tip and shaft separated leaving the poisoned arrow-tip imbedded in the prey animal. Additional innovations include bored stones used as digging stick weights to uproot tubers and roots; small stone tools, mostly less than 25mm long, used for cutting of meat and scraping of hides; polished bone tools such as needles; twine made from plant fibres and leather; tortoiseshell bowls; ostrich eggshell beads; as well as other ornaments and artwork (Esterhuizen & Smith in Delius, 2007).

At Bushman Rock Shelter the MSA is also represented and starts at around 12 000 BP but only lasted for some 3 000 years. The LSA is of importance in geological terms as it marks the transition from the Pleistocene to the Holocene, which was accompanied by a gradual shift from cooler to warmer temperatures. This change had its greatest influence on the higher-lying areas of South Africa. Both Bushman Rock Shelter and a nearby site, Heuningneskrans, have revealed a greater use in plant foods and fruit during this period (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

Faunal evidence suggests that LSA hunter-gatherers trapped and hunted zebra, warthog and bovinds of various sizes. They also diversified their protein diet by gathering tortoises and land snails (*Achatina*) in large quantities.

Ostrich eggshell beads were found in most of the levels at these two sites. It appears that there is a gap of approximately 4 000 years in the Mpumalanga LSA record between 9 000 BP and 5 000 BP. This may be a result of generally little Stone Age research being conducted in the province. It is, however, also a period known for rapid warming and major climate fluctuation, which may have led people to seek out protected environments in this area. The Mpumalanga Stone Age sequence is visible again during the mid-Holocene at the farm Honingklip near Badplaas in the Carolina district (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

At this location, two LSA sites were located on opposite sides of the Nhlazatshe River, about one kilometre west of its confluence with the Teespruit. These two sites are located on the foothills of the Drakensberg, where the climate is warmer than the Highveld but also cooler than the Lowveld (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

Nearby the sites, dated to between 4 870 BP and 200 BP are four panels, which contain rock art. Colouring material is present in all the excavated layers of the site, which makes it difficult to determine whether the rock art was painted during the mid- or later Holocene. Stone walls at both sites date from

the last 250 years of hunter gatherer occupation and they may have served as protection from predators and intruders (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

4.2.2. Early Iron Age

The period referred to as the Early Iron Age (AD 200-1500 approx.) started when presumably Karanga (north-east African) herder groups moved into the north eastern parts of South Africa. It is believed that these people may have been responsible for making of the famous Lydenburg Heads, ceramic masks dating to approximately 600AD.

Ludwig von Bezing was a boy of more or less 10 years of age when he first saw pieces of the now famous Lydenburg heads in 1957 while playing in the veld on his father's farm near Lydenburg. Five years later von Bezing developed an interest in archaeology and went back to where he first saw the shards. Between 1962 and 1966 he frequently visited the Sterkspruit valley to collect pieces of the seven clay heads. Von Bezing joined the archaeological club of the University of Cape Town when he studied medicine at this institution.

He took his finds to the university at the insistence of the club. He had not only found the heads, but potsherds, iron beads, copper beads, ostrich eggshell beads, pieces of bones and millstones. Archaeologists of the University of Cape Town and WITS Prof. Ray Innskeep and Dr Mike Evers excavated the site where von Bezing found the remains. This site and in particular its unique finds (heads, clay masks) instantly became internationally famous and was henceforth known as the Lydenburg Heads site.

Two of the clay masks are large enough to probably fit over the head of a child, the other five are approximately half that size. The masks have both human and animal features, a characteristic that may explain that they had symbolic use during initiation- and other religious ceremonies. Carbon dating proved that the heads date to approximately 600 AD and was made by Early Iron Age people. These people were Bantu herders and agriculturists and probably populated Southern Africa from areas north-east of the Limpopo river. Similar ceramics were later found in the Gustav Klingbiel Nature Reserve and researchers believe that they are related to the ceramic wares (pottery) of the Lydenburg Heads site in form, function and decorative motive. This sequence of pottery is formally known as the Klingbiel type pottery. No clay masks were found in a context similar to this pottery sequence.

Two larger heads and five smaller ones make up the Lydenburg find. The Lydenburg heads are made of the same clay used in making household pottery. It is also made with the same technique used in the manufacture of household pottery. The smaller heads display the modelling of a curved forehead and the back neck as it curves into the skull. Around the neck of each of the heads, two or three rings are engraved horizontally and are filled in with hatching marks to form a pattern. A ridge of clay over the forehead and above the ears indicates the hairline. On the two larger heads a few rows of small clay

balls indicate hair decorations. The mouth consists of lips – the smaller heads also have teeth. The seventh head has the snout of an animal and is the only head that represents an animal.

Some archaeological research was done during the 1970's at sites belonging to the Early Iron Age (EIA), location Plaston, a settlement close to White River (Evers, 1977). This site is located on a spur between the White River and a small tributary. It is situated on holding 119 at Plaston.

The site was discovered during house building operations when a collection of pottery sherds was excavated. The finds consisted of pottery shards both on the surface and excavated.

Some of the pottery vessels were decorated with a red ochre wash. Two major decoration motifs occurred on the pots:

- Punctuation, using a single stylus; and
- Broad line incision, the more common motif.

A number of EIA pottery collections from Mpumalanga and Limpopo may be compared to the Plaston sample. They include Silver Leaves, Eiland, Matola, Klingbiel and the Lydenburg Heads site. The Plaston sample is distinguished from samples of these sites in terms of rim morphology, the majority of rims from Plaston are rounded and very few bevelled. Rims from the other sites show more bevelled rims (Evers, 1977:176).

Early Iron Age pottery was also excavated by archaeologist, Prof. Tom Huffman during 1997 on location where the Riverside Government complex is currently situated (Huffman, 1998). This site is situated a few km north of Nelspruit next to the confluence of the Nelspruit and Crocodile River. It was discovered during the course of an environmental impact assessment for the new Mpumalanga Government complex offices. A bulldozer cutting exposed storage pits, cattle byres, a burial and midden on the crest of a gentle slope. Salvage excavations conducted during December 1997 and March 1998 recovered the burial and contents of several pits.

One of the pits contained, among other items, pottery dating to the eleventh century (AD 1070 ± 40 BP). This relates the pottery to the Mzonjani and Broederstroom phases. The early assemblage belongs to the Kwale branch of the Urewe tradition.

During the early 1970s Dr Mike Evers of the University of the Witwatersrand conducted fieldwork and excavations in the Eastern Transvaal. Two areas were studied: the first area was the Letaba area south of the Groot Letaba River, west of the Lebombo Mountains, east of the great escarpment and north of the Olifants River. The second area was the Eastern Transvaal escarpment area between Lydenburg and Machadodorp.

These two areas are referred to as the Lowveld and escarpment respectively. The earliest work on Iron Age archaeology was conducted by Trevor and Hall in 1912. This revealed prehistoric copper-, gold- and

iron mines. Schwelinus (1937) reported smelting furnaces, a salt factory and terraces near Phalaborwa. In the same year D.S. van der Merwe located ruins, graves, furnaces, terraces and soapstone objects in the Letaba area.

Mason (1964, 1965, 1967, 1968) started the first scientific excavation in the Lowveld, followed by N.J. van der Merwe and Scully. M. Klapwijk (1973, 1974) also excavated an EIA site at Silverleaves and Evers and van den Berg (1974) excavated at Harmony and Eiland, both EIA sites.

Research by the National Cultural History Museum resulted in the excavation of an EIA site in Sekhukuneland, known as Mototolong (Van Schalkwyk, 2007). The site is characterized by four large cattle kraals containing ceramics, which may be attributed to the Mzonjani and Doornkop occupational phases.

4.2.3. Late Iron Age

The later phases of the Iron Age (AD 1600-1800's) are represented by various tribes including Ndebele, Swazi, BaKoni, and Pedi, marked by extensive stonewalled settlements found throughout the escarpment and particularly around Machadodorp, Lydenburg, Badfontein, Sekhukuneland, Roossenekal and Steelpoort. The BaKoni were the architects of a unique archaeological stone building complex who by the 19th century spoke seKoni which was similar to Sepedi. The core elements of this tradition are stone-walled enclosures, roads and terraces. These settlement complexes may be divided into three basic features: homesteads, terraces and cattle tracks. Researchers such as Mike Evers (1975) and David Collett (1982) identified three basic settlement layouts in this area. Basically these sites can be divided into simple and complex ruins. Simple ruins are normally small in relation to more complex sites and have smaller central cattle byres and fewer huts. Complex ruins consist of a central cattle byre, which has two opposing entrances and a number of semi-circular enclosures surrounding it. The perimeter wall of these sites is sometimes poorly visible. Huts are built between the central enclosure and the perimeter wall. These are all connected by track-ways referred to as cattle tracks. These tracks are made by building stone walls, which forms a walkway for cattle to the centrally located cattle byres.

5. Site descriptions, locations and impact significance assessment

No sites of archaeological or heritage significance were documented.

A total of five survey orientation locations were documented (SO 1-5) which includes a GPS location and photographs of the landscape at that particular location. The survey orientation sites are tabled in Appendix B and their photos in Appendix D. A map of their location is also provided in Appendix C.

Tables indicate the **site significance rating scales and status** in terms of possible impacts of the proposed actions on any located or identified heritage sites (**Table 5.5 & 5.6**).

Table 5.1. Summary of located sites and their heritage significance

Type of site	Identified sites	Significance
Graves and graveyards	None	N/A
Late Iron Age	None	N/A
Early Iron Age	None	N/A
Historical buildings or structures	None	N/A
Historical features and ruins	None	N/A
Stone Age sites	None	N/A

Table 5.2. Significance rating guidelines for sites

Field Rating	Grade	Significance	Recommended Mitigation
National Significance (NS)	Grade 1	High Significance	Conservation, nomination as national site
Provincial Significance (PS)	Grade 2	High Significance	Conservation; Provincial site nomination
Local significance (LS 3A)	Grade 3A	High Significance	Conservation, No mitigation advised
Local Significance (LS 3B)	Grade 3B	High Significance	Mitigation but at least part of site should be retained
Generally Protected A (GPA)	GPA	High/ Medium Significance	Mitigation before destruction
Generally Protected B (GPB)	GPB	Medium Significance	Recording before destruction
Generally Protected C (GPC)	GPC	Low Significance	Destruction

5.1. Description of located sites

Survey orientations:

5.1.1. Site SO 1.

Location: See Appendix B and D (fig. 1)

Description: Survey orientation location.

Impact of the proposed development/ activity: N/A

Recommendation: N/A



Photo view north-east

5.1.2. Site SO 2.

Location: See Appendix B and D (fig. 2)

Description: Survey orientation location.

Impact of the proposed development/ activity: N/A

Recommendation: N/A



Photo view north

5.1.3. Site SO 3.

Location: See Appendix B and D (fig. 3).

Description: Survey orientation location.

Impact of the proposed development/ activity: N/A

Recommendation: N/A



Photo view north-east

5.1.4. Site SO 4.

Location: See Appendix B and D (fig. 4)

Description: Survey orientation location.

Impact of the proposed development/ activity: N/A

Recommendation: N/A



Photo view south

5.1.5. Site SO 5.

Location: See Appendix B and D (fig. 5)

Description: Survey orientation location.

Impact of the proposed development/ activity: N/A

Recommendation: N/A



Photo view north

TABLE 5.3. General description of located sites and field rating.

Site No.	Description	Type of significance	Degree of significance	NHRA heritage resource & rating
SO1	Survey orientation location	N/A	Archaeological: N/A Historic: N/A	None
SO2	Survey orientation location	N/A	Archaeological: N/A Historic: N/A	None
SO3	Survey orientation location	N/A	Archaeological: N/A Historic: N/A	None
SO4	Survey orientation location	N/A	Archaeological: N/A Historic: N/A	None
SO5	Survey orientation location	N/A	Archaeological: N/A Historic: N/A	None

TABLE 5.4. Site condition assessment and management recommendations.

Site no.	Type of Heritage resource	Integrity of cultural material	Preservation condition of site	Relative location	Quality of archaeological/historic material	Quantity of site features	Recommended conservation management
SO 1	N/A	N/A	N/A	Portion 1 Waterfall 461 JT	Archaeology: N/A Historically: N/A	-	N/A
SO 2	N/A	N/A	N/A	Portion 1 Waterfall 461 JT	Archaeology: N/A Historically: N/A	-	N/A
SO 3	N/A	N/A	N/A	Portion 1 Waterfall 461 JT	Archaeology: N/A Historically: N/A	-	N/A
SO 4	N/A	N/A	N/A	Portion 1 Waterfall 461 JT	Archaeology: N/A Historically: N/A	-	N/A
SO 5	N/A	N/A	N/A	Portion 1 Waterfall 461 JT	Archaeology: N/A Historically: N/A	-	N/A

TABLE 5.5. Significance Rating Scales of Impact

Site No.	Nature of impact	Type of site	Extent	Duration	Intensity	Probability	Score total
SO 1	Construction of a dam	N/A	N/A	Short term	Low	Improbable	2
SO 2	Construction of a dam	N/A	N/A	Short term	Low	Improbable	2
SO 3	Construction of a dam	N/A	N/A	Short term	Low	Improbable	2
SO 4	Construction of a dam	N/A	N/A	Short term	Low	Improbable	2
SO 5	Construction of a dam	N/A	N/A	Short term	Low	Improbable	2

***Notes:** Short term ≥ 5 years, Medium term 5-15 years, Long term 15-30 years, Permanent 30+ years

Intensity: Very High (4), High (3), Moderate (2), Low (1)

Probability: Improbable (1), Possible (2), Highly probable (3), Definite (4)

TABLE 5.6. Site current status and future impact scores

Site No.	Current Status	Low impact (4-6 points)	Medium impact (7-9 points)	High impact (10-12 points)	Very high impact (13-16 points)	Score Total
SO 1	Neutral	-	-	-	-	-
SO 2	Neutral	-	-	-	-	-
SO 3	Neutral	-	-	-	-	-
SO 4	Neutral	-	-	-	-	-
SO 5	Neutral	-	-	-	-	-

5.2. Cumulative impacts on the heritage landscape

Cumulative impacts can occur when a range of impacts which result from several concurrent processes have impact on heritage resources. The importance of addressing cumulative impacts is that the total impact of several factors together is often greater than one single process or activity that may impact on heritage resources. No heritage resources were identified and therefore no cumulative impacts are expected. Also see section 6.1. Recommended management measures.

6. Summary of findings and recommendations

No sites of heritage or archaeological significance were identified in the proposed project areas.

A total of five survey orientation locations were documented (SO 1-5) which includes a GPS location and photographs of the landscape at that particular location. Surface visibility and access in certain areas was reduced due to very dense vegetation and dense thick grass cover.

In terms of the archaeological component of the Act (25 of 1999, section 35) no sites were located or recorded in the study area.

In terms of the built environment in the project area (section 34 of the Act) no sites were identified in the study area.

In terms of burial grounds and graves (section 36 of the Act) no graves or gravesites were identified in the study area.

It is not within the expertise of this report or the surveyor to comment on possible paleontological remains which may be located in the study area.

The bulk of archaeological remains are normally located beneath the soil surface. It is therefore possible that some significant cultural material or remains were not located during this survey and will only be revealed when the soil is disturbed. Should excavation or large scale earth moving activities reveal any human skeletal remains, broken pieces of ceramic pottery, large quantities of sub-surface charcoal or any material that can be associated with previous occupation, a qualified archaeologist should be notified immediately. This will also temporarily halt such activities until an archaeologist has assessed the situation. It should be noted that if such a situation occurs it may have further financial implications.

6.1. Recommended management measures

Management objectives include not to impact on sites of heritage significance. Monitoring programmes which should be followed when a “chance find” of a heritage object or human remains occur, include the following:

- The contractors and workers should be notified that archaeological sites might be exposed during the construction work.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be

made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;

- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999).

7. Bibliography

- Amery, L.S. (ed), 1909. *The times history of the war in South Africa 1899-1902*, Vol VI. London,
- Barnard, C. 1975. *Die Transvaalse Laeveld. Komee van 'n Kontrei*.
- Bergh, J.S. (ed.) 1998. *Geskiedenisatlas van Suid-Afrika. Die vier noordelike provinsies*. (J.L. van Schaik, Pretoria).
- Bornman, H. 1995. *Pioneers of the Lowveld*.
- Breutz, P.L. 1985. *Pre-Colonial Africa: The South-Eastern Bantu Cultural Province*.
- Celliers, JP. 2018. Phase 1 Archaeological and Heritage Impact Assessment on the farm Waterfall 461 JT in respect of the proposed construction of an irrigation dam, Barberton, Mpumalanga Province.
- Delius, P. 2007. *Mpumalanga History and Heritage*. University of KwaZulu-Natal Press.
- Du Preez, S. J. *Peace attempts during the Anglo Boer War until March 1901*. Magister Artium thesis in History. Pretoria: University of Pretoria.
- Evers, T.M. in Voight, E.A. 1981. *Guide to Archaeological Sites in the Northern and Eastern Transvaal*. Transvaal Museum, Pretoria.
- Hall, H.L. 1938 (1990). *I Have Reaped my Mealies. An Autobiography*. Whitnall Simonsen.
- Huffman, T. N. 2007. *Handbook to the Iron Age: The Archaeology of Pre-Colonial Farming Societies in Southern Africa*. Kwa-Zulu Natal Press.
- Huyser, J. D. *Die Naturelle-Politiek van die Suid-Afrikaanse Republiek*. D. LITT. Verhandeling, Universiteit van Pretoria.
- Jones, H. M. & Jones G. M. 1999. *A Gazetteer of the Second Anglo-Boer War. 1899-1902*. Buckinghamshire: The Military Press.
- Mason, R. 1962. *Prehistory of the Transvaal: a record of human activity*. Witwatersrand University Press, Johannesburg.
- Massie, R.H. 1905. *The Native tribes of Transvaal*. Prepared for the general staff war office. Harrison and Sons, London.
- Myburgh, A.C. 1956. *Die Stamme van die Distrik Carolina*. Staatsdrukker. Pretoria.
- Packard, P. 2001. *"Malaria blocks development" revisited: the role of disease in the history of agricultural development in the Eastern and Northern Transvaal Lowveld. 1890-1960*. *Journal of Southern African Studies* 27 (3), September 2001.

Pistorius, J.C.C. 2008. *A Phase 1 Heritage Impact Assessment Study for the Upgrading of Eskom's Hilltop Substation on the Farm Hilltop 458 near Nelspruit in the Mpumalanga Province*. An unpublished report on file at SAHRA as: 2008-SAHRA-0151.

Ross, R. 1999. ***A concise history of South Africa***. Cambridge University Press. Cambridge.

Raper, P. E. 2014. *A dictionary of Southern African place names*. Johannesburg: Jonathan Ball Publishers.

Surplus people project: forced removal in South Africa. Volume 5: *Transvaal*. Cape Town. 1983.

Union of South Africa. 1918. *Majority Report of the Eastern Transvaal Natives Land Committee*. Cape Town.

Van Rooyen, T. S. 1951. ***Die verhouding tussen die Boere, Engelse, en naturelle in die Geskiedenis van die Oos-Transvaal tot 1882*** in Archives Yearbook for South African History, 14(1).

Van Schalkwyk, J.A., Naude, M., Steyn, A., & Smith, S. 1996. *Investigation of Two Rock Art Sites near Nelspruit, Mpumalanga Province*. An unpublished report by the National Cultural History Museum on file at SAHRA as: 1996-SAHRA-0015.

Van Schalkwyk, J.A. 2008. *Heritage Survey Report for the Marathon-Delta 132 kV Powerline, Mpumalanga*. An unpublished report on file at SAHRA as: 2008-SAHRA-0009.

Van Vollenhoven, A.C. 2002. ***Die Metodiek van Kultuurhulpbronbestuur (KHB)***. S.A. Tydskrif vir Kultuurgeskiedenis 16(2).

Van Vollenhoven, A.C. 1995. ***Die bydrae van Argeologie tot Kultuurhulpbronbestuur***. Referaat gelewer voor die Suid-Afrikaanse Vereniging vir Kultuurgeskiedenis, Transvaal Streektak, Sunnyside.

Van Vollenhoven, A. C. & Pelser, A. J. 2004. Steinaecker's Horse: Its role during the Anglo Boer War and in the establishment of the Kruger National Park. *SA Journal of Cultural History*, Vol. 18(2), Nov. 2004, pp. 1-30.

ELECTRONIC SOURCES:

1. Google Earth. 2018. 25°35'41.06" S 30°54'20.22" E elev 841 m. [Online]. [Cited 15 July 2018].
2. Google Earth. 2018. 25°35'26.33" S 30°54'21.82" E elev 823 m. [Online]. [Cited 15 July 2018].

3. South African History Online. 2013. 1999. *Nelspruit Timeline 1815-1996*. [Online]. Available: <http://www.sahistory.org.za/topic/nelspruit-timeline-1815-1996?page=2>. [Cited 14 July 2018]
4. Windeed Search Engine. 2018. *Deeds Office Property. Waterfall, 461, 1 (Remaining Extent) (Mpumalanga)*. [Accessed: 15 July 2018]

ARCHIVAL SOURCES(National Archive Pretoria)

National Archives and Records Service of South Africa. 1930. SAB, URU: 1171 3559. (1) *Cancellation of lease in respect of farm "Waterfall" No. 460 Kaap Block, Barberton granted to WG Exall in terms of Executive Council Minutes No. 2196 of 1911 and subsequently ceded to WH Exall and CA Exall* (2) *Allotment to WH Exall and CA Exall of holding comprising Portion "A" of above farm on lease for 5 years with option of purchase and* (3) *Allotment to WH Exall and CA Exall of holding comprising Remaining Extend Of Above Farm On Lease For 2 1/2 years without option of purchase.*

National Archives and Records Service of South Africa. 1931. SAB, URU: 1233 2879. *Deproclamation as a public digging of portion of farm Waterfall No 4, Mining District Barberton.*

National Archives and Records Service of South Africa. 1934. SAB, URU: 1406 179. *Extension for period of 21 years of lease in respect of Remaining Extent of farm "Waterfall" No 4 Nelspruit held by WH Exall and CA Exall jointly.*

National Archives and Records Service of South Africa. 1938. SAB, URU: 1743 2429. *Cancellations of leases in respect of holdings comprising A) Portion of farm Waterfall No 4 and B) Lots 158 and 159 Section C Kaap Block Nelspruit held by CA Exall and Mrs GL Exall, etc.*

National Archives and Records Service of South Africa. 1938. TAB, WAT: 299/1938. *Water Court Case. Gertrude Lillian Exall and estate of William Harry Exall. Waterfall, North Kaap River, Nelspruit.*

National Archives and Records Service of South Africa. 1942. SAB, URU: 2034 2091. *Issue of Crown Grant to CA Exall and another, in respect of Portion A of farm "Waterfall", No 4, Nelspruit.*

National Archives and Records Service of South Africa. 1950. SAB, URU: 2721 512. *Cancellation of certain conditions contained in Crown Grant No 209/1943, in respect of Portion A of Waterfall No 125, District Barberton (formerly No 4, Dist Nelspruit) Tvl.*

National Archives and Records Service of South Africa. 1952. SAB, URU: 3051 3090. *Uitreiking van Kroongrondbrief ten aansien van Ridges en Rest van Waterfall Nr 4 Nelspruit Transvaal.*

National Archives and Records Service of South Africa. 1982-1984. SAB, CDB: 14845 PB4/19/2/3/461/1. Departement Plaaslike Bestuur. Gemeenskapsvorming. Besigheidsregte. Barberton. Gedeelte 5 van Gedeelte van Gedeelte 2 van Waterfall 461JT.

National Archives and Records Service of South Africa. N/d. Maps: 3/1254. Kruger National Park.

MAPS

1. Anon. 1920s. *The standard map of the Transvaal. Compiled from registered diagrams and information supplied by the various land owner and from other authentic sources.* Johannesburg: The Map Office.
2. Holmden. 190(?). *Holmden's Map of the Transvaal and Swaziland. Compiled from registered diagrams and information supplied by the various land owners and from other authentic sources.* Johannesburg: the Map Office.
3. Major Jackson, H. M. 1902. *Transvaal Major Jackson Series Map. Sheet No. 8. Barberton.* Pretoria: Field Intelligence Department.
4. Surveyor-General. 1917. *Union of South Africa. Province of Transvaal. Magisterial District of Barberton.* Pretoria: Surveyor-General's Office.
5. Topographical Map. 1944. *South Africa. 1:50 000 Sheet. 2530DB Kaapsche Hoop 2530DB. First Edition.* Union of South Africa: G. P. W. and Mobile Map Printing Company.
6. Topographical Map. 1968. *South Africa. 1:50 000 Sheet. 2530DB Kaapsehoop 2530DB. Second Edition.* Pretoria: Government Printer.
7. Topographical Map. 1984. *South Africa. 1:50 000 Sheet. 2530DB Kaapsehoop 2530DB. Third Edition.* Pretoria: Government Printer.
8. Topographical Map. 2010. *South Africa. 1:50 000 Sheet. 2530DB Kaapsehoop 2530DB. Fourth Edition.* Pretoria: Government Printer.

Appendix A

Terminology

“Alter” means any action affecting the structure, appearance or physical properties of a place or object, whether by way of structural or other works, by painting, plastering or other decoration or any other means.

“Archaeological” means –

- Material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artifacts, human and hominid remains and artificial features or structures;
- Rock Art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;
- Wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artifacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation; and
- Features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found;

“Conservation”, in relation to heritage resources, includes protection, maintenance, preservation and sustainable use of places or objects so as to safeguard their cultural significance;

“Cultural significance” means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance;

“Development” means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including –

- construction, alteration, demolition, removal or change of use of a place or a structure at a place;
- carrying out any works on or over or under a place;

- subdivision or consolidation of land comprising, a place, including the structures or airspace of a place;
- constructing or putting up for display signs or hoardings;
- any change to the natural or existing condition or topography of land; and
- any removal or destruction of trees, or removal of vegetation or topsoil;

“Expropriate” means the process as determined by the terms of and according to procedures described in the Expropriation Act, 1975 (Act No. 63 of 1975);

“Foreign cultural property”, in relation to a reciprocating state, means any object that is specifically designated by that state as being of importance for archaeology, history, literature, art or science;

“Grave” means a place of internment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place;

“Heritage resource” means any place or object of cultural significance;

“Heritage register” means a list of heritage resources in a province;

“Heritage resources authority” means the South African Heritage Resources Agency, established in terms of section 11, or, insofar as this Act (25 of 1999) is applicable in or in respect of a province, a provincial heritage resources authority (PHRA);

“Heritage site” means a place declared to be a national heritage site by SAHRA or a place declared to be a provincial heritage site by a provincial heritage resources authority;

“Improvement” in relation to heritage resources, includes the repair, restoration and rehabilitation of a place protected in terms of this Act (25 of 1999);

“Land” includes land covered by water and the air space above the land;

“Living heritage” means the intangible aspects of inherited culture, and may include –

- cultural tradition;
- oral history;
- performance;
- ritual;
- popular memory;
- skills and techniques;
- indigenous knowledge systems; and
- the holistic approach to nature, society and social relationships;

“Management” in relation to heritage resources, includes the conservation, presentation and improvement of a place protected in terms of the Act;

“Object” means any moveable property of cultural significance which may be protected in terms of any provisions of the Act, including –

- any archaeological artifact;
- palaeontological and rare geological specimens;
- meteorites;
- other objects referred to in section 3 of the Act;

“Owner” includes the owner’s authorized agent and any person with a real interest in the property and –

- in the case of a place owned by the State or State-aided institutions, the Minister or any other person or body of persons responsible for the care, management or control of that place;
- in the case of tribal trust land, the recognized traditional authority;

“Place” includes –

- a site, area or region;
- a building or other structure which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure;
- 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;
- 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;

“Site” means any area of land, including land covered by water, and including any structures or objects thereon;

“Structure” means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.

Appendix B

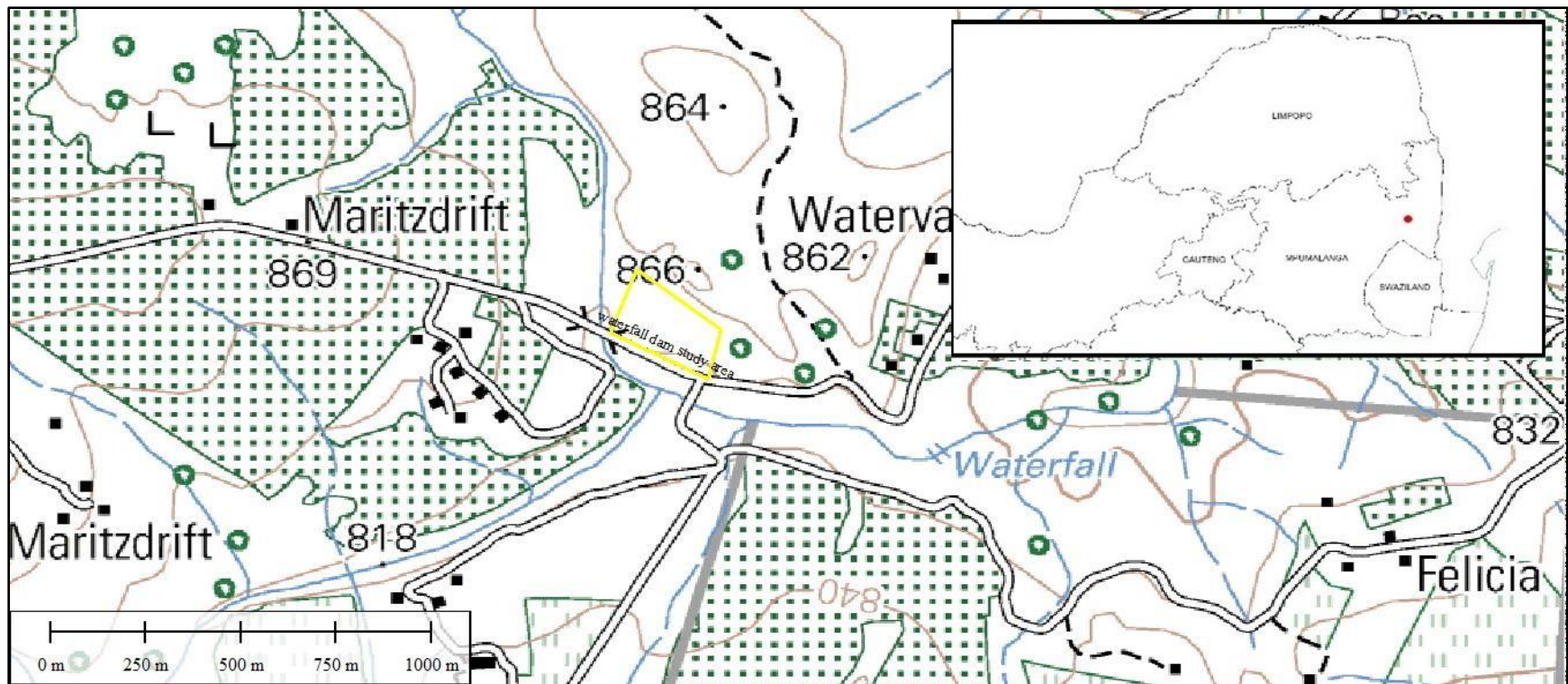
List of sites

A total of five survey orientation sites were recorded. The sites were named SO 1-5.

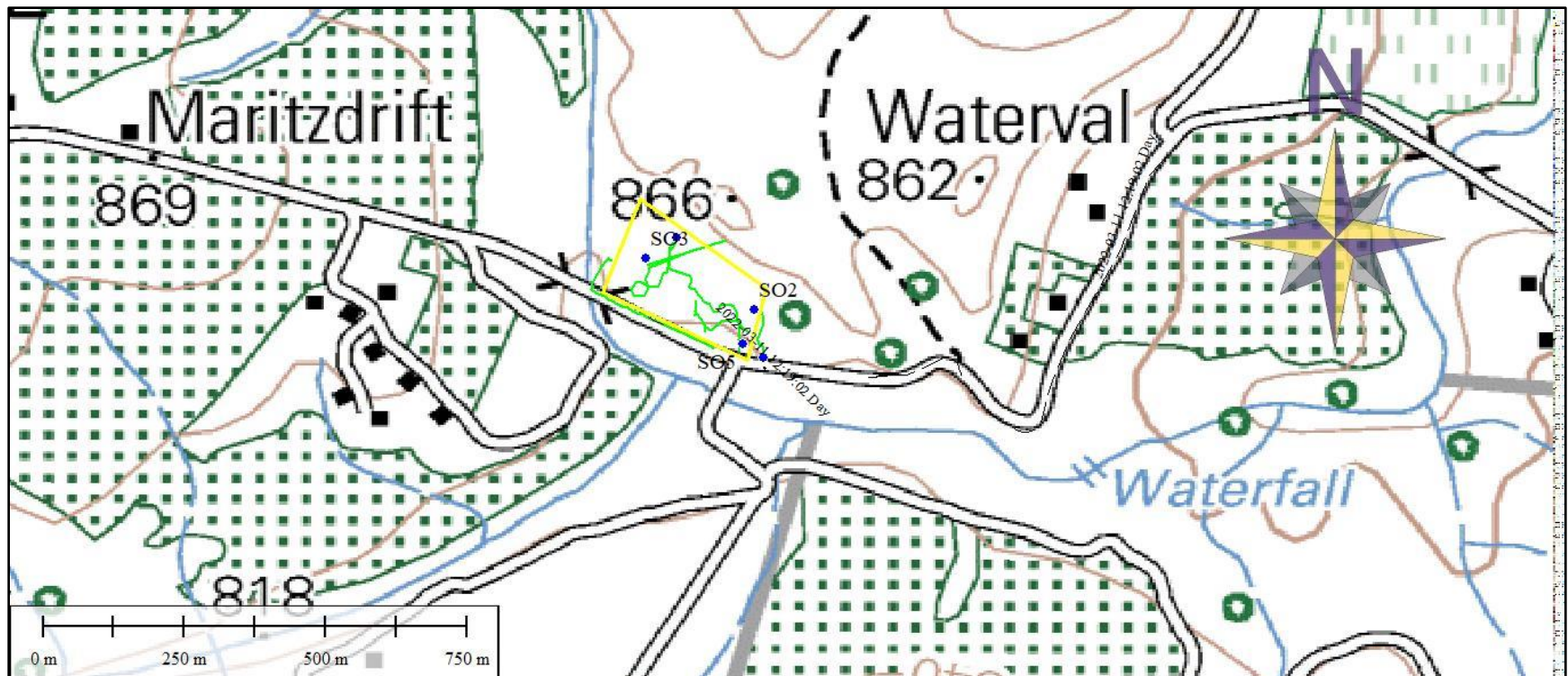
Table A. Survey Orientation Locations.

Site Name	Date of compilation	GPS Coordinates		Photo figure No.
SO 1	11/03/2022	S25°36,0007'	E030°54,0308'	1
SO 2	11/03/2022	S25°35,9551'	E030°54,0217'	2
SO 3	11/03/2022	S25°35,9063'	E030°53,9183'	3
SO 4	11/03/2022	S25°35,8859'	E030°53,9473'	4
SO 5	11/03/2022	S25°35,9875'	E030°54,0104'	5

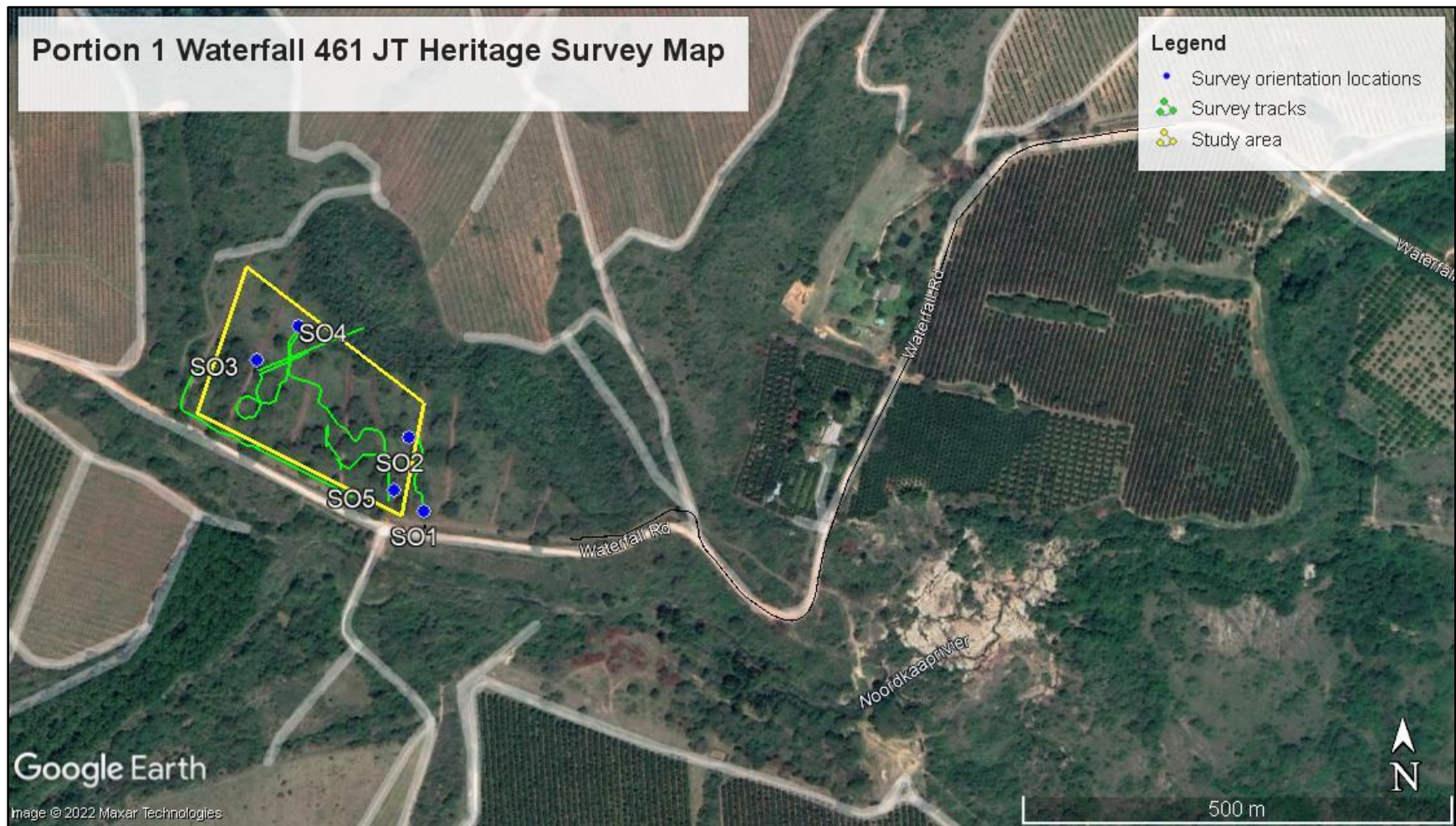
Appendix C



REGIONAL MAP. Topographical Map 2530 DB (2010) Scale 1:50 000



Topographical Map 2530 DB (2010) Scale 1:50 000



Aerial view. Google Earth 2022.

Appendix D

Survey Orientation Photos



Fig. 1. Site SO1. Photos taken in a north-western and western direction.



Fig. 2. Site SO2. Photos taken in a western and south-western direction.



Fig. 3. Site SO3. Photos taken in a south-eastern and western northern direction.



Fig. 4. Site SO 4. Photo taken in a south-eastern and western direction.



Fig. 5. Site SO 5. Photos taken in a south-western and western direction.