

**PHASE ONE HERITAGE IMPACT ASSESSMENT
OF THE PROPOSED MADLALA ROAD UPGRADE,
INKOSI LANGALIBALELE MUNICIPALITY, KZN.**



ACTIVE HERITAGE cc.

For: Hanslab (PTY) Ltd

**Frans Prins
MA (Archaeology)**

P.O. Box 947
Howick
3290

feprins@gmail.com

activeheritage@gmail.com

www.activeheritage.webs.com

Fax: 086 7636380

21 February 2018

Details and experience of independent Heritage Impact Assessment Consultant

Consultant: Frans Prins (Active Heritage cc)
Contact person: Frans Prins
Physical address: 33 Buchanan Street, Howick, 3290
Postal address: P O Box 947, Howick, 3290
Telephone: +27 033 3307729
Mobile: +27 0834739657
Fax: 0867636380
Email: Activeheritage@gmail.com

PhD candidate (Anthropology) University of KwaZulu-Natal
MA (Archaeology) University of Stellenbosch 1991
Hons (Archaeology) University of Stellenbosch 1989

University of KwaZulu-Natal, Honorary Lecturer (School of Anthropology, Gender and Historical Studies).

Association of Southern African Professional Archaeologists member

Frans received his MA (Archaeology) from the University of Stellenbosch and is presently a PhD candidate on social anthropology at Rhodes University. His PhD research topic deals with indigenous San perceptions and interactions with the rock art heritage of the Drakensberg.

Frans was employed as a junior research associate at the then University of Transkei, Botany Department in 1988-1990. Although attached to a Botany Department he conducted a palaeoecological study on the Iron Age of northern Transkei - this study formed the basis for his MA thesis in Archaeology. Frans left the University of Transkei to accept a junior lecturing position at the University of Stellenbosch in 1990. He taught mostly undergraduate courses on World Archaeology and research methodology during this period.

From 1991 – 2001 Frans was appointed as the head of the department of Historical Anthropology at the Natal Museum, Pietermaritzburg. His tasks included academic research and publication, display conceptualization, and curating the African ethnology collections of the Museum. He developed various displays at the Natal Museum on topics ranging from Zulu material culture, traditional healing, and indigenous classificatory systems. During this period Frans also developed a close association with the Departments of Fine Art, Psychology, and Cultural and Media Studies at the then University of Natal. He assisted many post-graduate students with projects relating to the cultural heritage of South Africa. He also taught post-graduate courses on qualitative research methodology to honours students at the Psychology Department,

University of Natal. During this period he served on the editorial boards of the *South African Journal of Field Archaeology* and *Natalia*.

Frans left the Natal Museum in 2001 when approached by a Swiss funding agency to assist an international NGO (Working Group for Indigenous Minorities) with the conceptualization of a San or Bushman museum near Cape Town. During this period he consulted extensively with various San groupings in South Africa, Namibia and Botswana. During this period he also made major research and conceptual contributions to the Kamberg and Didima Rock Art Centres in the Ukhahlamba Drakensberg World Heritage Site.

Between 2003 and 2007 Frans was employed as the Cultural Resource Specialist for the Maloti Drakensberg Transfrontier Project – a bilateral conservation project funded through the World Bank. This project involved the facilitation with various stakeholders in order to produce a cultural heritage conservation and development strategy for the adjacent parts of Lesotho and South Africa. Frans was the facilitator for numerous heritage surveys and assessments during this project. This vast area included more than 2000 heritage sites. Many of these sites had to be assessed and heritage management plans designed for them. He had a major input in the drafting of the new Cultural Resource Management Plan for the Ukhahlamba Drakensberg World Heritage site in 2007/2008. A highpoint of his career was the inclusion of Drakensberg San indigenous knowledge systems, with San collaboration, into the management plans of various rock art sites in this world heritage site. He also liaised with the tourism specialist with the drafting of a tourism business plan for the area.

During April 2008 Frans accepted employment at the environmental agency called Strategic Environmental Focus (SEF). His main task was to set-up and run the cultural heritage unit of this national company. During this period he also became an accredited heritage impact assessor and he is rated by both Amafa and the South African Heritage Resources Agency (SAHRA). He completed almost 50 heritage impact assessment reports nation-wide during an 18th month period.

Frans left SEF and started his own heritage consultancy called “Active Heritage cc” in July 2009. Although mostly active along the eastern seaboard his clients also include international companies such as Royal Dutch Shell through Golder Associates, and UNESCO. He has now completed almost 1000 heritage conservation and management reports for various clients since the inception of “Active Heritage cc”. Amongst these was a heritage study of the controversial fracking gas exploration of the Karoo Basin and various proposed mining developments in South Africa and proposed developments adjacent to various World Heritage sites. Apart from heritage impact assessments (HIA's) Frans also assist the National Heritage Council (NHC) through Haley Sharpe Southern Africa', with heritage site data capturing and analysis for the proposed National Liberation Route World Heritage Site and the national intangible heritage audit. In addition, he is has done background research and conceptualization of the proposed Dinosaur Interpretative Centre at Golden Gate National Park and the proposed Khoi and

San Interpretive Centre at Camdeboo, Eastern Cape Province. During 2009 he also produced the first draft dossier for the nomination of the Sehlabathebe National Park, Lesotho as a UNESCO inscribed World Heritage Site.

Frans was appointed as temporary lecturer in the department of Heritage and Tourism, UKZN in 2011. He is also a research affiliate at the School of Cultural and Media Studies in the same institution.

Frans's research interests include African Iron Age, paleoecology, rock art research, San ethnography, traditional healers in South Africa, and heritage conservation. Frans has produced more than forty publications on these topics in both popular and academic publications. He is frequently approached by local and international video and film productions in order to assist with research and conceptualization for programmes on African heritage and culture. He has also acted as presenter and specialist for local and international film productions on the rock art of southern Africa. Frans has a wide experience in the fields of museum and interpretive centre display and made a significant contribution to the conceptual planning of displays at the Natal Museum, Golden Horse Casino, Didima Rock Art Centre and !Khwa tu San Heritage Centre. Frans is also the co-founder and active member of "African Antiqua" a small tour company who conducts archaeological and cultural tours world-wide. He is a Theta accredited cultural tour guide and he has conducted more than 50 tours to heritage sites since 1992.

Declaration of Consultants independence

Frans Prins is an independent consultant to Hanslab (PTY) Ltd and has no business, financial, personal or other interest in the activity, application or appeal in respect of which he was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances whatsoever that compromise the objectivity of this specialist performing such work.



Frans Prins

TABLE OF CONTENTS

1	BACKGROUND INFORMATION ON THE PROJECT	2
2	BACKGROUND TO ARCHAEOLOGICAL HISTORY OF AREA	3
2.1	Archaeology.....	3
2.1.1	<i>The Early Stone Age</i>	4
2.1.2	<i>The Middle Stone Age</i>	4
2.1.3	<i>The Later Stone Age</i>	5
2.1.4	<i>Rock Paintings</i>	6
2.1.5	<i>Iron Age Sites</i>	7
2.1.6	<i>The Historical Period</i>	8
2.1.7	<i>Graves</i>	9
2.1.8	<i>The Living Landscape</i>	10
	Living Heritage – Wilderness	11
2.1.9	<i>Palaeontology</i>	12
3	BACKGROUND INFORMATION OF THE SURVEY	13
3.1	Methodology	13
3.1.1	<i>Guidance from Desktop Study</i>	13
3.2	Restrictions encountered during the survey	15
3.2.1	<i>Visibility</i>	15
3.2.2	<i>Disturbance</i>	15
3.3	Details of equipment used in the survey.....	15
4	DESCRIPTION OF SITES AND MATERIAL OBSERVED	15
4.1	Locational data	15
4.2	Description of the general area surveyed.....	15
4.2.1	<i>Background</i>	15
5	STATEMENT OF SIGNIFICANCE (HERITAGE VALUE)	17
5.1	Field Rating.....	17
6	RECOMMENDATIONS	19
7	MAPS AND FIGURES	20
8	REFERENCES	27

LIST OF TABLES

Table 1.	Background information.....	2
Table 2.	List of grave sites situated within 50m from the proposed road upgrade.....	9
Table 3.	Field rating and recommended grading of sites (SAHRA 2005)	10
Table 4.	Evaluation and statement of significance.....	11

LIST OF ABBREVIATIONS AND ACRONYMS

EIA	Early Iron Age
ESA	Early Stone Age
HISTORIC PERIOD	Since the arrival of the white settlers - c. AD 1820 in this part of the country
IRON AGE	Early Iron Age AD 200 - AD 1000 Late Iron Age AD 1000 - AD 1830
LIA	Late Iron Age
LSA	Late Stone Age
MSA	Middle Stone Age
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998 and associated regulations (2006)).
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999) and associated regulations (2000))
SAHRA	South African Heritage Resources Agency
STONE AGE	Early Stone Age 2 000 000 - 250 000 BP Middle Stone Age 250 000 - 25 000 BP Late Stone Age 30 000 - until c. AD 200

EXECUTIVE SUMMARY

A heritage survey of the proposed Madlala Road upgrade, Inkosi Langalibalele Municipality, identified two grave sites within 50m from the proposed road upgrade. No archaeological or historical sites occur on the footprint. The greater area is also not part of any known cultural landscape. A buffer zone of at least 10m must be maintained around both identified graveyards in terms of mitigation. The project area has a high rating for palaeo-sensitivity as outcrops of fossil bearing-mudstones and sandstones of the Tarkastad Subgroup make up the topography of the surrounding landscape. Therefore, before the proposed upgrade can go ahead there is a need for a Phase 2 PIA as it is possible that palaeontological material will be encountered within Drainage Line 1 and 2 where the project proposes to remove material from the watercourse to upgrade the existing water-flow structures beneath the road. Attention is drawn to the South African Heritage Resources Act, 1999 (Act No. 25 of 1999) and the KwaZulu-Natal Heritage Act (Act No. 4 of 2008), which requires that operations that expose archaeological or historical remains as well as graves and fossil material should cease immediately, pending evaluation by the provincial heritage agency

1 BACKGROUND INFORMATION ON THE PROJECT

Table 1. Background information

Consultant:	Frans Prins (Active Heritage cc) for Hanslab (PTY) Ltd
Type of development:	The Kwa-Zulu Natal Department of Transport, proposes to upgrade portions of the existing Local Road L2517 & District Road D2451 to create Madlala Road (Type 7A Gravel Road). The proposed road upgrade will be approximately 1.5km in length, 6m wide with a 20m road reserve as per the Department of Transport standard dimensions for a type 7A gravel road. Furthermore, the applicant proposes to upgrade any existing structures within the identified drainage lines. The Applicant proposes to install: a concrete slab structure and a 1 no. x 900mm pipe culvert structure respectively. The proposed route traverses 2 no. drainage lines, therefore, Listed Activities 12 & 19 of the EIA Regulations of 2014 are triggered and form the focus of this Application.
Rezoning or subdivision:	Rezoning
Terms of reference	To carry out a Phase One Heritage Impact Assessment
Legislative requirements:	The Heritage Impact Assessment was carried out in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and following the requirements of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and the KwaZulu-Natal Heritage Act, 1997 (Act No. 4 of 2008)

1.1. Details of the area surveyed:

The proposed road upgrade is situated approximately 20 km to the west of the N3 in the foothills of the central KwaZulu-Natal Drakensberg (Figs 1 & 2). The track transverses the rural villages of Kwa Bhekabezayo and Shaya Moya. It consists of an existing mud track. The proposed road upgrade will be approximately 1.5km in length, 6m wide with a 20m road reserve. Furthermore, the applicant proposes to upgrade any existing structures within the identified drainage lines. The Applicant proposes to install: a concrete slab structure and a 1 no. x 900mm pipe culvert structure respectively.

The GPS co-ordinates for the proposed road upgrade are:

Start point of the proposed road: S 29° 07'18.39" E 29° 41'01.91"

Middle point of the proposed road: S 29° 07' 11.59" E 29° 40' 42.77"

End point of the proposed road: S 29° 07' 31.85" E 29° 40' 25.02"

The GPS co-ordinates for the installation of proposed structures are as follows:

Slab structure: S 29° 07'17.03" E 29° 40'35.58"

1 no. x 900mm pipe culvert: S 29° 07' 22.41" E 29° 40' 31.71"

2 BACKGROUND TO ARCHAEOLOGICAL HISTORY OF AREA

2.1 Archaeology

The greater Drakensberg area is well endowed with cultural heritage, including various wilderness areas within and outside the formal protected area network (Fig 3). Although most literature refers to this heritage mainly in terms of San rock art, the region also contains other categories of cultural heritage features representative of various cultures and time-periods. The cultural heritage of the Drakensberg is diverse and highly fragile. Cultural heritage, unlike natural heritage, is non-renewable and irreplaceable. Once damaged, it is gone forever. San rock paintings and associated Later Stone Age sites, as well as the palaeontology of the area, are unique and have global significance. The remaining categories, however, certainly have national, provincial, and regional significance. The area has had several different cultural groups associated with it, from the San to the southern Sotho, the Zulu-speaking and Xhosa-speaking groups, and, more recently, the Griqua and Anglo-Boer descendants. Each of these groups has its own unique cultural expressions and has related in various ways to the others. These differences are found in the building styles of homes,

their way of life as they interact with their environment, traditional dress, and so on. In addition, there are a number of living heritage values associated with all of these groups, many of which are unknown or poorly recorded. The following section is a more detailed description of the various cultural heritage features.

2.1.1 The Early Stone Age

The occurrence of Early Stone Age tools such as hand axes in areas below the 1 800 m contour suggests that the first inhabitants of the area predated modern humans by at least 800 000 years. Sites belonging to this period in the Drakensberg are mostly characterised by a few surface scatters and individual stone tools – usually in the close vicinity of water. They were most probably manufactured by *Homo erectus*, a predecessor of modern humans.

2.1.2 The Middle Stone Age

Anatomically modern people (*Homo sapiens sapiens*) with a very different economic strategy and more sophisticated stone tool kits moved into the area about 200 000 years ago. Archaeological assemblages left behind by these people have been termed Middle Stone Age. Not only were these societies more effective hunters than their predecessors but Middle Stone Age sites elsewhere in southern Africa also provide convincing evidence for some of the earliest symbolic behaviour in the world. It was Middle Stone Age people from southern and eastern Africa who left the continent roughly between 80 000 – 60 000 years ago to populate the rest of the world. Middle Stone Age sites in the Drakensberg region occur in both Lesotho and South Africa. Sites occur as surface scatters as well as deep cave deposits. Prime archaeological deposits, however, occur in the Eastern Cape and Free State sections of the region. Archaeological excavations at Strathalan Cave in the Eastern Cape Province indicate that the Middle Stone Age persisted in the Eastern Cape Drakensberg until around 22 000 years ago (Mitchell 2002).

2.1.3 The Later Stone Age

The stone tool assemblages belonging to the immediate ancestors of the San or Bushmen have been termed Later Stone Age. Later Stone Age tools are generally much smaller but also more diversified than the earlier tool kits. It was during this period that the bow and arrow was used extensively, and societies exploited their environments distinctly more intensively and effectively.

Literally hundreds of Later Stone Age sites prevail in the Drakensberg region. In addition, most of the rock art in the region was created by the San. The earliest evidence for Later Stone Age occupation of the Maloti Drakensberg comes from Sehonghong Cave in south eastern Lesotho and from Strathalan Cave in the Eastern Cape section of the region. Here a specific Later Stone Age period called the Robberg Industry has been dated to approximately 20 000 years ago. In contrast, evidence from Good Hope shelter 1 near the bottom of Sani Pass suggests that the earliest archaeological evidence for San people in the KwaZulu-Natal portion of the Drakensberg dates back to approximately 8 000 years ago. Whereas most parts of the Maloti Drakensberg were only seasonally occupied by San hunter gatherers for the larger part of the last 20 000 years, the situation started to change during the later part of the Holocene around 5 000 years ago. This was compounded by the arrival of immigrant black farmers in the region soon after 1600 AD and European colonialism around 1834 AD (Wright & Mazel 2007). During the historical period, the Maloti Drakensberg and adjacent mountainous areas became the last stronghold for various southern San groups such as the Baroa, //Xegwi, !Ga!ne, //Kx'au, and //Ku//ke. Their Later Stone Age way of life finally came to an end during the late 19th century.

San descendants still live in the area but for all practical purposes have assimilated with their more powerful neighbours. Many place names within the region still retained their original San pronunciations such as the Inxu, Sehonghong, Qomoqomong and Qhoasing rivers, and the Qeme, Qhuqhu, Qhalasi, and Qholaqhoe mountains. Approximately 1 300 Later Stone Age sites are known within the South African side of the Drakensberg.

2.1.4 Rock Paintings

The Maloti Drakensberg region is particularly well known for the occurrence of some of the finest and most complex prehistoric rock paintings in the world. Depictions of humans dominate, although finely executed animals such as eland and rhebuck are common. Some of the art is executed in various colours and in detailed precision that almost renders it a three dimensional aspect. Most researchers support the theory developed by Professor David Lewis-Williams and his colleagues that the figures represent trance induced visions during San religious rites (Lewis-Williams 2003).

According to some researchers, the celebrated Rosetta Panel at Game Pass Shelter, situated approximately 10km from the study area, holds the key to our understanding of all San rock art in the sub-Saharan region of Africa. However, this interpretation is not supported by all rock art researchers. Notable deviations from this approach have been developed by Anne Solomon, and more recently by Thomas Dowson.

The Maloti Drakensberg is also one of the areas with the highest density of prehistoric rock art in the world and certainly contains the highest concentration of prehistoric art south of the Sahara in Africa. Although the scientific dating of these paintings is still under researched, recent research suggests that the oldest paintings may date to approximately 4000 years ago (Wright & Mazel 2007). This is much older than previously thought.

The chronological uniqueness of the art, however, is not so much in its antiquity as in the fact that the Maloti Drakensberg was the last area in Africa south of the Zambezi River where the San rock art tradition was still actively practised. Paintings at two sites in the southern portion of the region were created as recently as 1920 (Prins 2009).

The communal areas of amaNgwane and amaZizi (that is part of the greater Okhombe area) contains approximately 300 rock painting sites. These are similar in style and context to the better known art of the Ukhahlamba

Drakensberg World Heritage Site. The project area specifically is situated in the foothills of the Central Drakensberg. Perhaps the most celebrated and researched rock art site in this region is Main Caves that is situated approximately 6km to the west of the proposed road upgrade (Wright & Mazel 2007).

2.1.5 Iron Age Sites

Around 2 000 years ago the southern African demographic landscape was transformed with the arrival of the first Bantu-speaking agriculturists in the sub-region. These subsistence farmers lived for the most part in the lower altitude, wooded areas of the eastern seaboard. Around 1250 AD certain agriculturists started occupying the higher altitude, grassland areas. Sites belonging to this period in KwaZulu-Natal are referred to as Moor Park settlements and they typically occupy hill tops with a low stone walling effect. The original Moor Park type-site occurs approximately 7km to the east of the project area. Although none occur within the designated Maloti-Drakensberg project area, they can be found at the fringes, at an altitude of approximately 1 200-1 400 m. By 1600 AD, groups such as the amaZizi reached the foothills of the northern Drakensberg near Winterton (Wright and Mazel 2007).

Various splinter groups of the amaZizi left KwaZulu Natal and also settled in parts of Lesotho where, over time, they adopted a Sotho identity. The baPhuti of south eastern Lesotho are perhaps the best known of these early immigrants. By the early 1700s various other Sotho and Nguni-speaking groups moved into the area and established chieftaincies in those areas below the 1 800 m contour. Impressive Iron Age sites belonging to this period and built in typical Sotho-style occur near Harrismith and Phuthaditjhaba in the Eastern Free State. Nguni-style sites of this period have also been found in KwaZulu-Natal and the Eastern Cape parts of the Drakensberg.

The expansion of the Zulu kingdom around 1818 had a major impact on Iron Age settlement in the region. Various chieftaincies were attacked, and their routed remnants typically traversed the Maloti Drakensberg region in search of better settlement elsewhere. Bandits often hid out in the mountains, and a number

allegedly practised cannibalism. Perhaps the most significant development during this period was the founding of the Southern Sotho nation under King Moshoeshoe I.

Various sites in Lesotho belong to this period – some of them, like Thaba Bosiu, are typically mountain strongholds. Almost 2 000 Iron-Age sites have been identified in the Maloti Drakensberg region, and most occur in altitudes lower than 1 800 m contour. Some sites belonging to the ancestors of the amaZizi and amaNkwane, the present ethnic groups to live in the study area, have been recorded in the nearby Didima Nature Reserve in the south and near Bergville (Maggs 1987). In fact, there is evidence for Later Iron Age occupation in the foothills of the northern Drakensberg, in the near vicinity of the study area, from about 1400 AD (Huffman 2007).

2.1.6 The Historical Period

The historical period spans the era of colonialism that started around 1830 AD when the first missionaries and Dutch immigrants arrived from the Cape Colony in the Maloti Drakensberg region. Sites associated with Voortrekker settlement of the area occur in the eastern Free State and the northern portion of KwaZulu-Natal near Winterton and Bergville. For the most part, these were the places where laagers were formed (with very low archaeological visibility) and old farmsteads with associated grave yards.

A particular site worth mentioning is Kerkenberg near Oliviershoek Pass, where Debora Retief painted the initials of her father on a rock before the trekkers descended into KwaZulu Natal. In Lesotho, the rebellion by Chief Moorosi and the resultant action by the Cape Colony government at the southern tip of the country left footprints of forts and associated graves at Moyeni Camp, Fort Hartley, Cutting Camp, and Mount Moorosi.

The most important structure relating to the history of Bushman raids is most probably Forth Nottingham, in KwaZulu-Natal, which was built around 1852. Various historical mission stations founded in the mid to late 1800s such as those

at Morija and St James in Lesotho and Emmaus, Reichenau, and Mariazell in South Africa, are still in active use. The Ongeluksnek Pass in the Eastern Cape is intimately associated with the epic trek of the Griqua people in 1861, led by Adam Kok.

The area associated with the first native uprising against the British colonial government, by the celebrated Hlubi chief Langalibalele in 1873, is at Giants Castle Nature Reserve in the uKhahlamba Drakensberg Park World Heritage Site (Derwent 2002). This area is situated to the immediate north west of the project area. Various battle sites associated with the Basotho Wars between the Boer Republic of the Orange Free State and the Sotho Kingdom of Moshoeshoe I are to be found in the eastern Free State and adjacent parts of Lesotho.

Sites belonging to the period of the Anglo-Boer War (1898-1901) abound in the eastern Free State portion of the project area. These are typically areas where skirmishes took place or where ammunition was destroyed. A few rock engravings belonging to the Anglo-Boer War period have been documented from the Golden Gate Highland Park. However, thorough research is still required to ascertain the meaning and value of these engravings.

Many historical sites can be categorised as belonging to the “built environment” as defined in heritage legislation. These are the physical remnants and traces of historical settlements that underpin the cultural value and meaning of the surrounding communities.

2.1.7 Graves

There are various grave sites belonging to different periods and cultural associations in the Drakensberg region. Perhaps the most famous sites are those belonging to the southern Sotho royalty at Botha Bothe in Lesotho; the grave of Nkosi Langalibalele at Giants Castle - approximately 10km to the north west of the project area, KwaZulu Natal graves associated with the royalty of the amaZizi and amaNgwane near Bergville, KwaZulu-Natal; the grave of Adam Kok at Matatiele, Eastern Cape; and various graves in the Free State belonging to

the Voortrekker and Anglo-Boer War periods. Interestingly, graves belonging to the prehistoric San inhabitants of the area are markedly absent or, as yet, have not been identified by researchers.

2.1.8 The Living Landscape

The living heritage of the Drakensberg area is varied and as yet little understood. Yet preliminary investigations by the Maloti Drakensberg Project (Anderson 2007) indicate that certain areas, including sites in communal areas close to Underberg, are still frequented by local communities who afford them ritual or sacred significance. Such locales may include archaeological sites with a living heritage component or natural features such as mountains, forests, boulders, caves, pools, or waterfalls with cultural significance. Living heritage is not only site-specific but also relates to oral history, indigenous knowledge systems, and indigenous languages, practices, and beliefs.

Oral history specifically is a rich resource that has been passed down the generations and provides diverse narratives and interpretations concerning places of historical significance. It also provides a window on community perspectives regarding heritage resources, including indigenous names for sites and plant and animal species – all of which are imbued with cultural meaning.

Indigenous Knowledge Systems (IKS) constitute an integral component of local knowledge, at grass roots level, often associated with traditional methods of land management and use. In this regard, IKS can enhance conservation and sustainable management of cultural heritage to which communities may relate.

Conservation should provide an enabling environment for communities to continue with the tradition of transmitting knowledge and skills and of safeguarding their cultural heritage. Traditional ceremonies still performed in the larger Drakensberg region include the *Bale* initiation schools among certain southern Sotho groups, the *amemulo* (coming of age) ceremonies among the amaNgwane, in the near vicinity of the study area, the *Nkubelwana* (planting of

the first seed) among Zulu-speakers, rainmaking, and various ceremonies associated with the veneration of the ancestors. Six indigenous languages are still spoken in the area, including siBhaca, which was believed to be almost extinct.

Two broad categories of site-specific living heritage sites have been identified:

- Sites of national significance of which nine have been identified in the SA portion of the MDTFCA. These include rock art sites, sandstone shelters without any archaeological remains but used extensively as pilgrimage sites, two sacred forests, and three sacred mountains. All of these sites are frequented by indigenous groups as part of an annual pilgrimage.
- Sites of local significance include various pools, waterfalls, hot springs, kaolin and red ochre deposits, and boulders afforded special significance by traditional healers and sectarian Christian groupings. Seventeen such sites have been identified in the larger Drakensberg area.

Living Heritage – Wilderness

Areas least influenced by human activities are often said to be representative of a “pristine” landscape. Such areas are recognised by the IUCN. In the context of the Drakensberg, only the Ukhahlamba Drakensberg World Heritage Site has any proclaimed wilderness areas, making up about 48% of the Park. In this regard, a specific wilderness management plan has been produced for the World Heritage site, with the express aim of retaining the integrity of these wilderness areas. In terms of the South African National Environmental Management: Protected Areas Act (no 57 of 2003), a wilderness area is defined as *“an area designatedfor the purpose of retaining an intrinsically wild appearance and character, or capable of being restored to such and which is undeveloped and roadless, without permanent improvements or human habitation”*.

In addition, wilderness can be considered as a value of a given area and in this regard can be defined as a “...*largely undeveloped and intrinsically wild character of the area in vast wilderness areas that provide outstanding opportunities to experience solitude and for spiritual renewal*” (EKZNW 2006).

There are a number of stakeholders promoting the concept of wilderness, including the Wilderness Action Group and the Wilderness Foundation. From a cultural heritage perspective, the concept is more akin to a western inspired ideal than an academic reality. In this sense the concept of wilderness, as an area where visitors may experience and enjoy pristine nature removed from anthropogenic influence and pollution, is therefore a western expression of living heritage. The wilderness notion, however, finds expression also in the indigenous concepts of cultural landscapes which are usually natural areas with profound cultural significance.

2.1.9 Palaeontology

Given its nature, palaeontology should be a component of geology and biodiversity. Nevertheless, the present heritage legislation in South Africa also covers palaeontology. In fact, the heritage management procedures relating to palaeontology are almost identical to those of archaeology. The palaeontological history of the Maloti Drakensberg area is fascinating as it tells the story of the super southern continent called Gondwanaland and its associated fauna and flora preserved today as fossils (McCarthy & Rubidge 2005).

Fossils and footprints belonging to various periods from around 270 million years ago to around 180 million years ago have been recorded and collected in the geological layers beneath the basalts. These layers, amongst other interesting facts, provide evidence of the greatest mass extinction of species in the world around 251 million years ago towards the end of the Permian period. Some species survived this extinction as attested by abundant fossils of certain species such as *Lystrosaurus* found deep in the Triassic period layers. Many of these occurrences can be found within a 10km radius from the study area. Whereas the majority of fossilized remains in the area are *therapsids* (mammal-like

reptiles, ancestors of most mammal species today), the Maloti Drakensberg also harbours evidence of some of the earliest dinosaurs in the world. Footprints belonging to these early dinosaurs appear in various localities in the Molteno formations of both Lesotho and South Africa.

The most celebrated palaeontological site occurs in the Golden Gate Highlands National Park. Here the earliest known dinosaur eggs in the world and a near intact embryo of an average sized dinosaur, i.e. *Massospondylus*, were located by scientists some thirty years ago. These early eggs, dated to almost 200 million years ago, are almost 100 million years older than other known dinosaur nest egg sites in the world. In adjacent Lesotho the Qomoqomong Dinosaur footprint and museum site has been developed for tourism purposes. The endemic turkey size dinosaur *Lesothosaurus* is known from various localities within Lesotho.

3 BACKGROUND INFORMATION OF THE SURVEY

3.1 Methodology

A desktop study was conducted of the archaeological databases housed in the KwaZulu-Natal Museum. The SAHRIS website was consulted for previous heritage surveys and heritage site data covering the project area. In addition, the available archaeological and heritage literature covering the Estcourt areas was consulted. Aerial photographs covering the area were scrutinised for potential Iron Age and historical period structures and grave sites. A ground survey, following standard and accepted archaeological procedures, was conducted on the 25 January 2018. Particular attention was focused on the occurrence of potential grave sites and other heritage resources on the footprint.

3.1.1 Guidance from Desktop Study

- The desktop study indicates that Stone Age Sites of all periods and traditions may occur in the foothills of the central Drakensberg region. However, Early Stone Age sites typically occurs close to permanent and prominent sources of water, none of which occur in the immediate environs of the project area.

- Middle Stone Age tools have been found in dongas and erosion gullies at various locales in the KwaZulu-Natal Midlands including the foothills of the Drakensberg. These sites are usually out of context and of little research value. Middle Stone Age deposits often occur in deep cave deposits throughout KwaZulu-Natal (including the foothills of the central Drakensberg). Again no erosion gullies or suitable rocky outcrops that may harbour shelters with deep cave deposits occur in the project area.
- Later Stone Age sites, including rock painting sites, are prolific in the foothills of the Drakensberg to the immediate west of the project area. However, there are no suitable rocky outcrops in the project area that may harbour shelters with Later Stone Age deposits and/or rock paintings.
- Early Iron Age Sites typically occur along major river valleys below the 700 m contour in KwaZulu-Natal. It is very unusual to find sites above the 1000m contour. The project area is situated well above the 1000m contour far removed from a major river valley setting. It is therefore most unlikely to expect Early Iron Age sites at the project area.
- Later Iron Age sites may occur in the project area. These sites were occupied by the ancestors of the first Nguni-speaking agriculturists as well as their descendants who settled in KwaZulu-Natal. Sites in the environs of Estcourt, to the immediate east of the project area, are built with stone and as a result such sites have a high archaeological visibility. Various period Iron Age sites occur in this region including earlier Moor Park type settlements (dating to approximately 1400 AD) and Later period sites belonging to amaZizi and amaBhele chiefdoms who occupied the area during the late 1700's and early 1800's. It would be relatively easy to locate such sites by means of aerial photography surveys and such sites may occur at the project area.
- Historical buildings, structures and farmsteads do occur scattered throughout the foothills of the Drakensberg. In addition, the areas around Estourt, to the immediate east of the project area, was settled by early Voortrekker pioneers in the 1830's. Historical era buildings and structures could occur at or near the project area.

3.2 Restrictions encountered during the survey

3.2.1 Visibility

Visibility was good.

3.2.2 Disturbance

No disturbance of any potential heritage features was noted.

3.3 Details of equipment used in the survey

GPS: Garmin Etrek

Digital cameras: Canon Powershot A460

All readings were taken using the GPS. Accuracy was to a level of 5 m.

4 DESCRIPTION OF SITES AND MATERIAL OBSERVED

4.1 Locational data

Province: KwaZulu-Natal

Closest Towns: Escourt

Municipality: Inkosi Langalabilele Municipality

4.2 Description of the general area surveyed

4.2.1 Background

The project area is situated in a rural village in the foothills of the Central KwaZulu-Natal Drakensberg. The area also falls within the proposed buffer zone of the Maloti Drakensberg World Heritage Park (Fig 3). As such only limited and controlled development is allowed. Although existing data bases and previous CRM surveys in the area indicate numerous archaeological sites none of these are situated within 500m from the proposed road upgrade (Fig 4). The desktop survey is echoed by the ground survey which, did not locate any archaeological sites on the footprint. The area is also not part of any known cultural landscape. The Thaba Mhlope Mountain, which is visible in the distance (Figs 4 & 10) do have living heritage values, as the mountain is frequented by Hlubi and Zulu traditional healers during the training of neophytes.

However, Thaba Mhlope is situated more than 2km to the west of the footprint and will not be affected by the proposed road upgrade.

Local residents encountered on the side of the road were asked about the potential location of any heritage sites on the footprint. However, with the exception of graves, they were largely uninformed. Numerous graves do occur in the rural villages transected by the proposed road upgrade (Fig 5). However, only two of these grave sites occur closer than 50m to the proposed road upgrade (Figs 6, 7, 11 & 12). A description of these grave sites is provided in Table 2.

Table 2. Grave Sites situated within 50m from the proposed road upgrade.

	Heritage site category	Brief description	Rating	Mitigation	GPS Co-ordinates
1	Grave Site 1 (Figs 6 & 11).	Rural graveyard consisting of 7 informal graves. The graveyard covers an area of approximately 20m x 15m. The graveyard is situated approximately 23m to the north of the proposed road upgrade. The graves are difficult to date but appears to be younger than 60 years old.	High Significance Locally (Local Grade 111B) (Table 3)	Maintain a 10m buffer zone around the graveyard due to the proximity of the graveyard to the existing road. Alternatively motivate for a second phase heritage impact assessment, by a grave relocation expert. A comprehensive community consultation process will have to be initiated to arrange for potential grave exhumation and reburial (Appendix 1).	S 29° 7' 19.31" E 29° 40' 57.63"
2	Grave Site 2 (Figs 7 & 12).	An informal graveyard consisting of 8 graves. The graveyard is associated with an existing homestead. The graveyard covers an area of approximately 20m x 25m. It is situated approximately 35m from the edge of the proposed road upgrade. They appear	High Significance Locally (Local Grade 111B) (Table 3)	Maintain a 10m buffer zone around the graveyard due to the proximity of the graveyard to the road. Alternatively motivate for a second phase heritage impact assessment, by a grave relocation expert. A comprehensive community consultation process will have to be initiated to arrange for potential grave	S 29° 7' 11.70" E 29° 40' 44.04"

		to be younger than 60 years.		exhumation and reburial (Appendix 1).	
--	--	------------------------------	--	---------------------------------------	--

5 STATEMENT OF SIGNIFICANCE (HERITAGE VALUE)

5.1 Field Rating

Both graveyards are rated as locally significant (Table 3) as they are still being visited by relatives of the deceased.

Table 3. Field rating and recommended grading of sites (SAHRA 2005)

Level	Details	Action
National (Grade I)	The site is considered to be of National Significance	Nominated to be declared by SAHRA
Provincial (Grade II)	This site is considered to be of Provincial significance	Nominated to be declared by Provincial Heritage Authority
Local Grade IIIA	This site is considered to be of HIGH significance locally	The site should be retained as a heritage site
Local Grade IIIB	This site is considered to be of HIGH significance locally	The site should be mitigated, and part retained as a heritage site
Generally Protected A	High to medium significance	Mitigation necessary before destruction
Generally Protected B	Medium significance	The site needs to be recorded before destruction
Generally Protected C	Low significance	No further recording is required before destruction

Apart from the two identified graveyards there are no heritage sites situated within 50m from the proposed road upgrade. The area is also not part of any known cultural landscape (Table 4). The paleontological significance of the area is discussed in Appendix 2.

Table 4. Evaluation and statement of significance (excluding paleontology).

Significance criteria in terms of Section 3(3) of the NHRA		
	Significance	Rating
1.	Historic and political significance - The importance of the cultural heritage in the community or pattern of South Africa's history.	None.
2.	Scientific significance – Possession of uncommon, rare or endangered aspects of South Africa's cultural heritage.	None.
3.	Research/scientific significance – Potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage.	None.
4.	Scientific significance – Importance in demonstrating the principal characteristics of a particular class of South Africa's cultural places/objects.	None.
5.	Aesthetic significance – Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.	None.
6.	Scientific significance – Importance in demonstrating a high degree of creative or technical achievement at a particular period.	None.
7.	Social significance – Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.	None.
8.	Historic significance – Strong or special association with the life and work of a person, group or organization of importance in the history of South Africa.	None.
9.	The significance of the site relating to the history of slavery in South Africa.	None.

6 RECOMMENDATIONS

The proposed development may proceed from a general heritage perspective if the developers adhere to the mitigation suggestions for the two identified graveyards. This would entail maintaining a buffer zone of at least 10m around both graveyards. A good strategy to implement would be to avoid all homesteads along the road as these may harbour 'invisible graves.'

The paleontological desktop study, however, indicates that the project area has a high rating for palaeo-sensitivity as outcrops. Fossil bearing-mudstones and sandstones of the Tarkastad Subgroup make up the topography of the surrounding landscape. Therefore, before the proposed upgrade can go ahead there is a need for a Phase 2 PIA as it is possible that palaeontological material will be encountered within Drainage Line 1 and 2 where the project proposes to remove material from the watercourse to upgrade the existing water-flow structures beneath the road (Appendix 2).

It is important to take note of the KwaZulu-Natal Heritage Act that requires that any exposing of fossil material, graves, archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities.

7 MAPS AND FIGURES

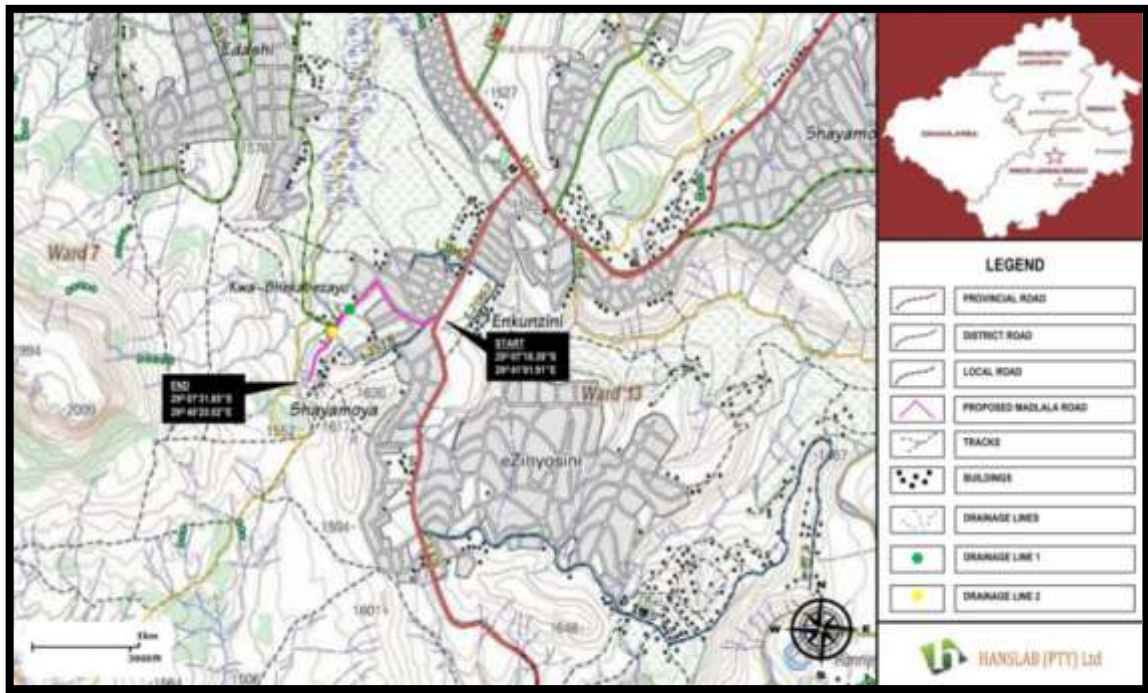


Figure 1. Map showing the location of the proposed Madlala Road upgrade (Source: Hanslab (PTY) Ltd).



Figure 2. Aerial photograph showing the location of the proposed road upgrade (Source: Hanslab (PTY) Ltd)

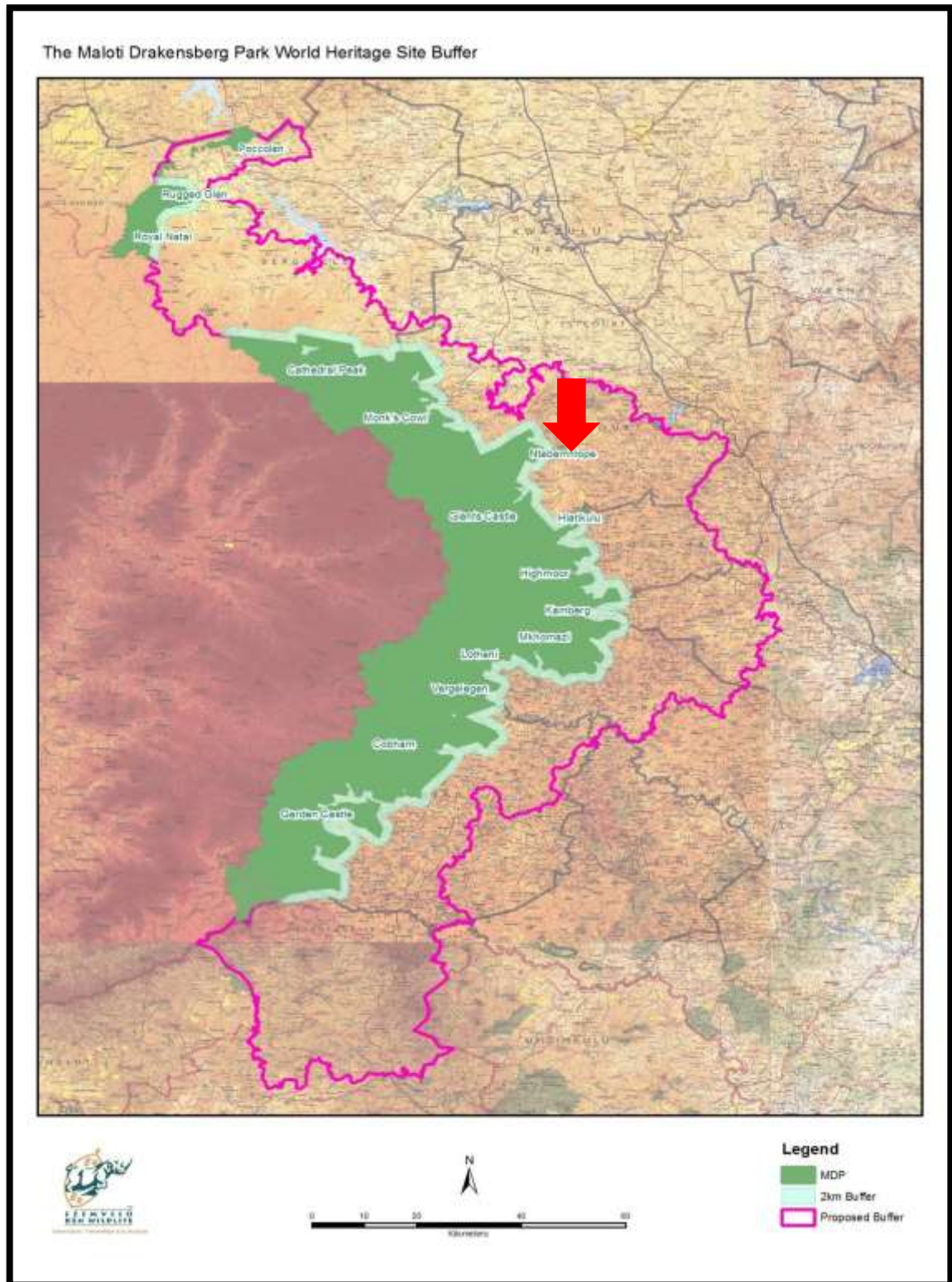


Figure 3. Map showing the proposed Buffer Zone of the Maloti Drakensberg World Heritage Site (Source: Ezemvelo KZN-Wildlife). The project area is indicated by the red arrow.



Figure 4. Google Earth imagery showing the distribution of known heritage sites in the foothills of the Central Drakensberg area. The purple polygons indicate archaeological (mostly rock art) sites and the yellow polygons indicate historical sites. The Thaba Mhlope Living Heritage Site is situated approximately 2km to the west of the project area.



Figure 5. Graves in the near vicinity of the proposed Madlala Road upgrade. Only two of these grave sites occur within 50m from the footprint (see below).



Figure 6. Google Earth imagery showing the location of Grave Site 1 adjacent to the proposed road upgrade.



Figure 7. Google Earth imagery showing the location of Grave Site 2 adjacent to the proposed road upgrade.



Figure 8. Homesteads situated near the start of the proposed road upgrade. Most of these are not associated with any grave sites.



Figure 9. The end section of the proposed Madlala Road upgrade.



Figure 10. Thaba Mhlope (White Mountain) is a prominent mountain with living heritage values. It is situated approximately 2m to the west of the proposed road upgrade at S 29° 07' 30.68" E 29° 39' 08.65"



Figure11. Grave Site 1



Figure 12. Grave Site 2.

8 REFERENCES

Anderson, G. 2007. Living Heritage Survey of the Ukhahlamba Drakensberg World Heritage Site. *Unpublished report conducted for the Maloti Drakensberg Transfrontier Project*: Howick.

Bryant, A. T. 1965. *Olden times in Zululand and Natal*. Cape Town: C. Struik.

Derwent, S. 2006. *KwaZulu-Natal Heritage Sites: A Guide to Some Great Places*. David Phillips: Cape Town

Huffman, T. N. 2007. *Handbook to the Iron Age: The Archaeology of Pre-colonial Farming Societies in Southern Africa*. University of KwaZulu-Natal Press. Pietermaritzburg.

Lewis-Williams, J. D. 2003. *Images of Mystery: Rock Art of the Drakensberg*. Double Storey Books: Cape Town

Lewis-Williams, J. D. & Dowson, T. 1992. Rock Paintings of the Natal Drakensberg. *Ukhahlamba Series, Number 5*. University of Natal Press: Pietermaritzburg

Maggs, T. The Iron Age farming communities. In Duminy, A. and Guest, B. 1989. *Natal and Zululand: from Earliest Times to 1910. A New History*. Pg. 28-46. University of Natal Press. Pietermaritzburg.

McCarthy, T. & Rubidge, B. 2005. *The Story of Earth and Life: A Southern African Perspective on a 4.6 billion year journey*. Struik Publishers: Cape Town

Mazel, A. The Stone Ages. In Duminy, A and Guest, B. 1989. *Natal and Zululand: from Earliest Times to 1910. A New History*. Pg. 1-27. University of Natal Press. Pietermaritzburg.

Mazel, A. 1989. People making history, the last ten thousand years of hunter-gatherer communities in the Thukela Basin. *Natal Museum Journal of Humanities*. 1: 1-168

Mitchell, P. 2002. *The Archaeology of Southern Africa*. Cambridge University Press: Cambridge

Prins, F. E. 2009. Secret San of the Drakensberg and their rock art legacy. *Critical Arts*. 23 (2): 190-208

SAHRA, 2005. *Minimum Standards for the Archaeological and the Palaeontological Components of Impact Assessment Reports, Draft version 1.4.*

Wright, J & Mazel, A. 2007. *Tracks in a Mountain Range*. Wits University Press: Johannesburg.

APPENDIX 1 RELOCATION OF GRAVES

Burial grounds and graves older than 60 years are dealt with in Article 36 of the NHR Act, No. 25 of 1999. The Human Tissues Act (Act No. 65 of 1983) protects graves younger than 60 years. These fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and reburial must be obtained from the relevant Provincial MEC as well as the relevant Local Authorities.

Below follows a broad summary of how to deal with graves in the event that they are identified within the footprint, or within 25m, of the proposed development.

- If the graves are younger than 60 years, an undertaker can be contracted to deal with the exhumation and reburial. This will include public participation, organising cemeteries, coffins, etc. They need permits, such as those relating to health and safety, and have their own requirements that must be adhered to.
- If the graves are older than 60 years old or of undetermined age, an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. This is a requirement by provincial heritage legislation.

Once it has been decided to relocate particular graves, the following steps should be taken:

- Notices of the intention to relocate the graves need to be put up at the burial site for a period of 60 days. This should contain information where communities and family members can contact the developer/archaeologist/public-relations officer/undertaker. All information pertaining to the identification of the graves needs to be documented for the application of a SAHRA permit. The notices need to be in at least 3 languages, English, and two other languages. This is a requirement by law.
- Notices of the intention needs to be placed in at least two local newspapers and have the same information as the above point. This is required by provincial heritage legislation.
- Local radio stations can also be used to try contact family members. This is not required by law, but is helpful in trying to contact family members.
- During this time (60 days) a suitable cemetery need to be identified close to the development area or otherwise one specified by the family of the deceased.
- An open day for family members should be arranged after the period of 60 days so that they can gather to discuss the way forward, and to sort out any problems. The developer needs to take the families requirements into account. This is a required by provincial heritage legislation.
- Once the 60 days has passed and all the information from the family members

have been received, a permit can be requested from SAHRA. This is a required by provincial heritage legislation.

- Once the permit has been received, the graves may be exhumed and relocated.
- All headstones must be relocated with the graves as well as any items found in the grave

APPENDIX 2: PALEONTOLOGY REPORT

**Desktop Palaeontological Impact Assessment (Phase 1) for the
proposed upgrade of the L2517 Local Road and the D2451 District
Road to form Madlala road, a type 7 A gravel road within the Inkosi
Langalibalele Municipality, KwaZulu-Natal**

**Conducted by Gary Trower (MSc in Environmental Management,
UFS)**

5 February 2018

Contents

1.Introduction.....page 3

2.Geology..... page 5

3.Palaeontology.....page 7

4.Contingency plan for possible discoveries.....page 8

6.Recommendations.....page 9

7.Assumptions and limitations.....page 10

8.References.....page 11

Figures

Figure 1: Satellite image of broader region of proposed upgrade (top view).....page 4

Figure 2: Satellite image of broader region (southern view).....page 4

Figure 3: Geological map showing lithology of the region.....page 6

Figure 4: SAHRIS palaeo-sensitivity map switched offpage 7

Figure 5: SAHRIS palaeo-sensitivity map switched on.....page 7

Figure 6: Zoomed in view of Drainage Line 1 & 2.....page 8

1. Introduction

In terms of the National Environmental Management Act 107 of 1998, Section 38 (8) of the National Heritage Resources Act 25 of 1999, and the KwaZulu-Natal Heritage Act 4 of 2008, all aspects of cultural heritage are protected and proposed developments that are likely to impact on any and all facets of heritage (i.e. historical, archaeological, palaeontological & cosmological) require a desktop study and/or field assessment in order to gauge the nature of potential heritage resources and to ensure that such resources are not damaged or destroyed through the activity which threatens them. If necessary, mitigation measures should be considered and if the observed heritage resources are ranked as highly significant and the proposed location cannot be shifted to a more suitable location, scientific researchers should be given the opportunity to excavate the site and recover as much of the material as possible.

The KZN Department of Transport proposes to upgrade portions of the existing Local Road L2517 and District Road D2451 to form Madlala road. The proposed upgrade will measure approximately 1.5 kilometres long and will be 6 metres wide. In addition, the upgrade will also include improvements to existing structures along the drainage lines coming down the slope in order to better facilitate them passing under the road by installing a concrete slab structure at Drainage Line 1 and one 900mm pipe culvert structure at Drainage Line 2. Furthermore, as per Activity 19 of the site investigation report, damage may occur to any potential palaeontological and/or archaeological material present at the site. This is due to the fact that the geology of the region is highly fossiliferous, therefore a desktop PIA study was required to ascertain the probability of encountering fossil specimens within the geological unit underlying the pathway of the proposed development. This study was carried out using a combination of Google Earth, updated paleontological maps, and available literature.

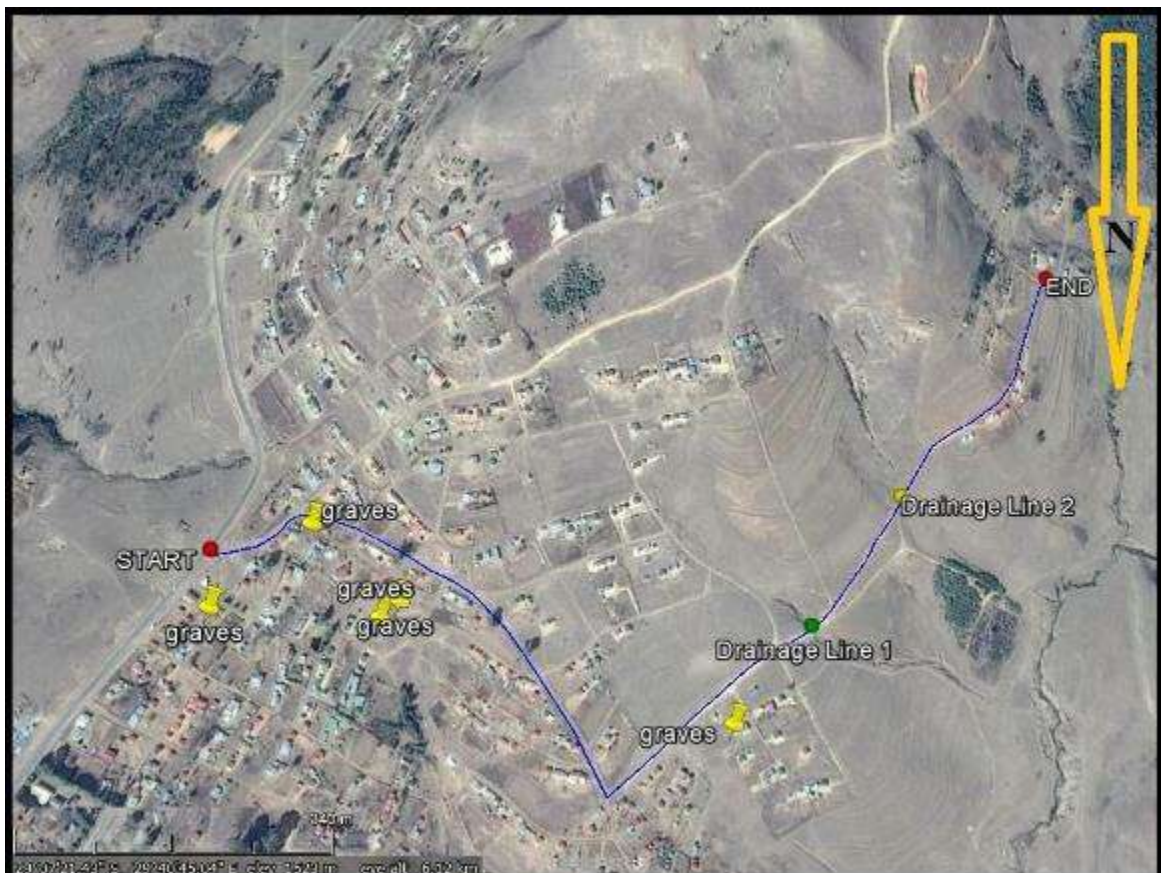


Figure 1 and 2: The site of the proposed upgrade, viewed from above in Figure 1 from an elevation of roughly 3km and from the south (Figure 2) from an altitude of approximately 6km. Through the desktop study, only graves were observed, the nearest being approximately 20m from the road. Erosion features are also visible along Drainage Line 1&2, exposing potentially fossiliferous beds within the Beaufort. Elevation is exaggerated to 3 (Modified Google Earth image, AfriGIS, 2018)

2. Geology

The geology in the vicinity of the site is dominated by late Permian argillaceous deposits of the Beaufort Groups (Figure 3). The Beaufort is represented by the Adelaide Subgroup and comprises of dark-grey shales which are carbonaceous in places, as well as grey mudstones, siltstone and sandstone. There are also several outcrops of dolerite in the region, representing Jurassic lava intrusions which gave rise to the dolerite dykes in the landscape, although none of these occur within the immediate vicinity of the proposed project. Adjacent to and west of the proposed development is a narrow flat-topped hill comprising of the Stormberg Group which is made up of the Molteno, Elliot and Clarens Formation. These are also fossiliferous sediments and are considered as having a high palaeo-sensitivity rating according to the SAHRIS map.

Considerably younger alluvial deposits occur alongside many of the drainage lines within the valleys and are Quaternary in age. The nature of the drainage in the landscape north of Edashi causes water to flow northwards via various streams leading into marshy ground, with the majority of these wetlands converted into forestry plantations (Figure 3, above blue circle). The sediment packages within these valley floors are predominantly alluvial deposits, representing the channel and overbank sediments of streams and rivers mixed with elements of colluvial material entering via the surrounding slopes of weathered bedrock and eroded top soil. A water source will naturally attract a lot of animal and human activity, therefore theoretically the alluvial deposits adjacent to these streams and marshy areas are likely repositories for archaeological and/or palaeontological material.

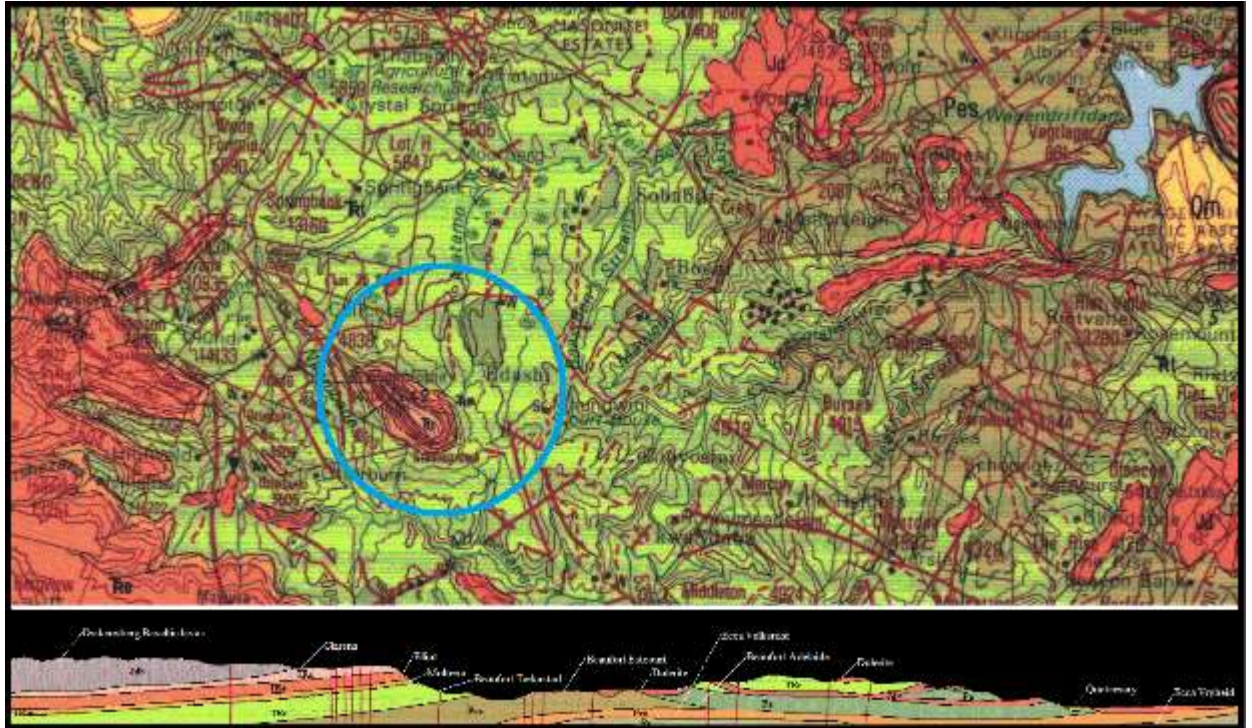
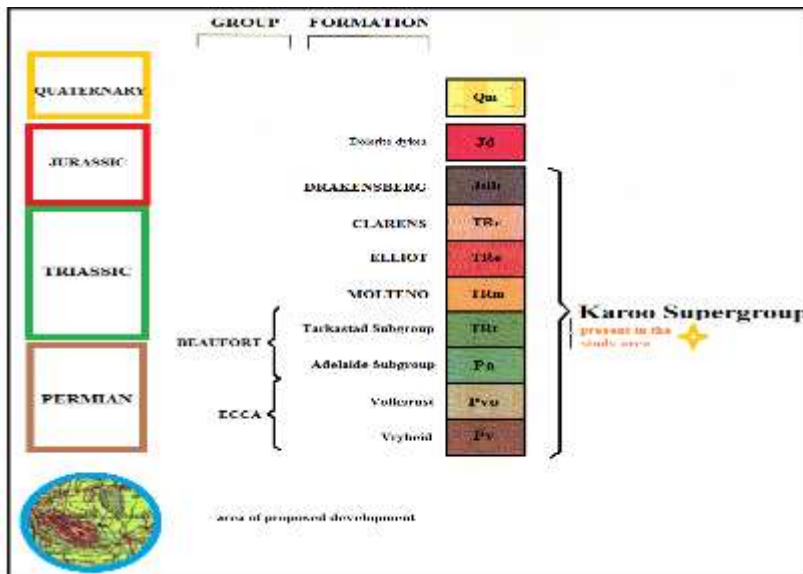


Figure 3: Geology map showing the lithology of the region surrounding the proposed development. Most elements of the Karoo Supergroup are present, including Ecca, Beaufort, Moltengo, Elliot and Clarens. The road to be upgraded is located within the blue circle, sitting on fossiliferous deposits of the Tarkastad Subgroup (TRt) of the Beaufort Group, a location ranked as “VERY HIGH” in terms of palaeo-sensitivity. With the exception of intrusive dolerites and basaltic lavas, all other rocks on the map are potentially fossil-bearing. (Modified from the 1:250 000 Geological Series. 2928 Drakensberg. Geological Survey Pretoria. 1981)



3. Palaeontology

When looking at Figures 5, it is clear than fossiliferous outcrops do occur in the region, from the mountain slopes right down to the surrounding valleys. When examining the location of the proposed development using the SAHRA (South African Heritage Resources Agency) SAHRIS PalaeoSensitivity Map (www.sahra.org.za/sahris/map/palaeo), the whole area is indicated in red, the highest sensitivity rating for potential fossil occurrences. Valley floors often contain a mixture of bedrock, top soil, alluvial and colluvial deposits. As the proposed development occurs along a mountain slope, the majority of the underlying sediments comprise shallow top soils on bedrock. Even though there is a drainage network of streams and marshes in the area, the chance of discovering fossil occurrences within these younger valley deposits is minimal with the greatest likelihood of palaeontological exposures occurring within the exposed bedrock eroding out at Drainage Line 1 & 2.



Figure 4 & 5: The SAHRIS PalaeoSensitivity map showing the area circled in blue in Figure 3. Figure 4 on the left shows the satellite image of the area of the proposed development when the PalaeoSensitivity is switched off, whereas Figure 5 on the right shows the exact same image with the PalaeoSensitivity switched on. This indicates that the proposed development is located on a highly sensitive area and that a field assessment and a protocol for finds is required (Modified from www.sahra.org.za/sahris/map/palaeo)





Figure 6: The erosional features coming down the mountain slope and leading up to Drainage Line 1 & 2 are the areas most likely to expose fossiliferous material. The red arrows indicate sections of exposed Beaufort leading up to the proposed road that are most at risk of damage or/destruction.

5. Contingency plan for possible fossil discoveries

The normal procedure for recovering palaeontological material would be to identify areas which are dense in fossils and whose recovery and preparation could address certain scientific questions. The process would then entail obtaining permission from the landowner and applying to SAHRA (South African Heritage Resources Agency) to remove blocks of bedrock and prepare them with a pressured rock drill in the lab.

This is a slow and time-consuming process which requires the skills of a field palaeontologist to spot worthy material within rock exposures and a qualified fossil preparator who can successfully recover fossils from slabs of bedrock. Therefore, the probability of construction workers operating heavy earth moving equipment and

working to a strict time schedule spotting fossils amongst tons of quarried riverbed material is unlikely. If fossils are present, they may be difficult to identify as many geological formations superficially resemble palaeontological material. Pseudo-fossils such as concretions, nodules, dendrites, calcrete and other mineral deposits often form into a variety of shapes which may closely resemble plant and animal fossils, making it more difficult for laypersons to positively identify chance finds in the field.

If by chance fossils were discovered, construction would need to cease immediately and a protocol should be followed whereby the relevant heritage custodians in KwaZulu-Natal (Natal Museum or Amafa) would need to be informed. Developers would also need to acquire the services of a palaeontologist to conduct a field assessment so that if anything relevant is discovered scientists could be given the opportunity to record and/or recover the specimens if they are ranked as significant and likely to make a positive contribution to the field of palaeontology.

6. Recommendations

The fact that an existing road is already present along the route of the proposed upgrade indicates that the landscape has already been disturbed and modified during the construction of this feature. This road sits on a thin layer of top soil, which may serve as a protective buffer for subterranean fossils against construction activities above. However, renewed activities relating to this project at Drainage Line 1 and 2 will disturb sediments of the fossiliferous Tarkastad Subgroup which are already exposed at the surface. This is apparent in Listing Notice 1, Listed Activity 19 of the Site Investigation Report which mentions: “The infilling or depositing of any material of more than 10 cubic metres into, or the **dredging, excavation, removal or moving of soil, sand, shells, shell**

grit, pebbles or rock of more than 10 cubic metres from [—(i)] a watercourse”. Due to the fact that the project requires the removal of more than 10 cubic metres of soil from the watercourse, it is probable that the erosional features at Drainage Line 1 and 2 may harbour palaeontological material likely to be damaged or destroyed during construction activities.

In conclusion, this area has a high rating for palaeo-sensitivity as outcrops of fossil bearing-mudstones and sandstones of the Tarkastad Subgroup make up the topography of the surrounding landscape. Therefore, before the proposed upgrade can go ahead there is a need for a Phase 2 PIA as it is possible that palaeontological material will be encountered within Drainage Line 1 and 2 where the project proposes to remove material from the watercourse to upgrade the existing water-flow structures beneath the road.

7. Assumptions and limitations

According to the amended 2017 EIA regulations, various assumptions and limitations need to be stated when reporting on proposed developments. The professional opinion given in this report is based on the results of a desktop PIA. As such, a field assessment has not yet been conducted, and the results reported herein are very preliminary and require a follow-up ground survey to accurately gauge the fossiliferous potential of the exposed bedrock within the observed erosional features of Drainage Line 1 & 2. In addition and as a general rule, Phase 2 field observations are based on recording palaeontological and/or archaeological material which is visible on the surface. As many developments require a degree of digging down into the soil and/or underlying stratigraphy, heritage objects will only be exposed once they have been disturbed from their original positions. In addition, the results reported herein are based upon careful

scrutiny of the best available maps and data sets and all attempts are made to take a holistic, informed decision. Yet in spite of this, certain predictions or suggestions may prove to be less severe than predicted and may need revising once new information comes to light.

Furthermore, it is assumed that the developers will respect the guidelines set out in the law of South Africa with regards to good environmental management practices and policies, and will immediately cease all construction if any fossiliferous material is discovered. It is also assumed that developers will practice integrity and embrace an unwavering mind-set with regards to respecting and protecting all aspects of heritage, including due consideration for the fact that such objects cannot simply be sacrificed to meet project deadlines.

8. References

- 1) KwaZulu-Natal Heritage Act 4 of 2008
- 2) Neveling, J (2003). Stratigraphy and sedimentological investigation of the contact between the Lystrosaurus and Cynognathus Assemblage Zones (Beaufort Group: Karoo Supergroup). Council for Geoscience, Bulletin 137, 165pp
- 3) National Environmental Management Act 107 of 1998
- 4) Section 38 (8) of the National Heritage Resources Act 25 of 1999