CULTURAL HERITAGE IMPACT ASSESSMENT OF THE PROPOSED MHLABATHINI ROAD EXTENSION, UMVOTI DISTRICT MUNICIALITY, KWAZULU-NATAL.

ACTIVE HERITAGE cc.

For: Hanslab (PTY) Ltd

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Declaration of Consultants independence

Frans Prins is an independent consultant to green Door Environmental 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

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 cultural heritage survey of the proposed Mhlabathini Road Extension identified no heritage sites and graves on the footprint. The area is also not part of any known cultural landscape. Due to the metamorphic and igneous nature of the rocks underlying the development site, no fossils are expected and no further mitigation for Palaeontological Heritage is recommended. However, 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 should cease immediately, pending evaluation by the provincial heritage agency.

1 BACKGROUND INFORMATION ON THE PROJECT

Table 1. Background information

Consultants:	Frans Prins of Active Heritage cc conducted the general Heritage Impact Assessment study. Active Heritage cc was sub-consulted by Hanslab (PTY) Ltd. Dr Gideon Groenewald conducted a desktop paleontological study of the project area (Appendix 1).
Type of development:	The KZN Department of Transport (Applicant) proposes to extend the existing Mhlabathini Road to a type 7A gravel road. The proposed extension route follows an existing mud track with a 2m to 3 m width reducing to a footpath. The proposed road extension will be approximately 3.2km in length, will be 6m in width with a 20m road reserve as per the Department of Transport type 7A gravel road standards. The proposed extension route traverses several water crossings, therefore the applicant proposes to construct pipe culverts, a slab structure and causeway structures within the water crossing points to allow for the natural flow of water within the water crossings
Rezoning or subdivision:	Not applicable
Terms of reference	To carry out a 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 KZN Department of Transport (Applicant) proposes to extend the existing Mhlabathini Road to a type 7A gravel road. The road trajectory runs through a rural area with traditional Zulu homesteads scattered over the landscape and along some sections of the Mhlabathini Road Extension (Figs 1 & 2). The footprint is located in the central section of the Thukela River Basin (Fig 3). The route follows an existing mud track (Figs 4 & 5) with a 2m to 3 m width reducing to a footpath. The proposed road extension will be approximately 3.2km in length, will be 6m in width with a 20m road reserve as per the Department of Transport type 7A gravel road standards. The proposed extension route

traverses several water crossings, therefore the applicant proposes to construct pipe culverts, a slab structure and causeway structures within the water crossing points to allow for the natural flow of water within the water crossings. The proposed construction of structures within the water crossings forms the focus of the report, as it triggers the respective listed activities as outlined in this report.

The GPS coordinates for the Mhlabathini Road Extension are:

Start: 28°47´24.34″S 30°50´7.26.58″ E

End: 28°46´39.48″S 30°52´5.90″E

The GPS coordinates for the proposed structures along the road extension are:

Water crossing 1: 28°47´14″S 30°50´35″ E
Water crossing 2: 28°47´0.78″S 30°50´42.32″ E
Water crossing 3: 28°46´50.36″S 30°50´50.78″ E
Water crossing 4: 28°46´44.92″S 30°51´14.61″ E
Water crossing 5: 28°46´47.05″S 30°51´19.03″ E
Water crossing 6: 28°46´58.71″S 30°51´43.70″ E
Water crossing 7: 28°46´44.79″S 30°52´2.03″ E

2 BACKGROUND TO ARCHAEOLOGICAL HISTORY OF AREA

The archaeological history of the Province of KwaZulu-Natal (KZN) dates back to about 2 million years and possibly older, which marks the beginning of the Stone Age. The Stone Age in KZN was extensively researched by Professor Oliver Davies formerly of the Natal Museum. The Stone Age period has been divided in to three periods namely: Early Stone Age (ESA) dating between 2 million years ago to about 200 000 years ago, Middle Stone Age (MSA) dating between 200 000 years ago to about 30 000 years ago, and the Later Stone Age (LSA) which dates from 30 000 to about 2 000 year ago. The Stone Age period ends around approximately 2 000 years ago when Bantu speaking Age farmers from the north arrived in southern Africa. The Iron Age is also divided into three periods, namely:

Early Iron Age (EIA) dating between AD 200 and AD 900, Middle Iron Age (MIA) dating between AD 900 and AD 1300, Late Iron Age (LIA) dating between AD 1 300 and 1 820.

2.1 Stone Age

2.1.1 Early Stone Age (ESA)

The ESA is considered as the beginning of the stone tool technology. It dates back to over 2 million years ago until 200 000 years ago. This period is characterised by Oldowan and Acheulean industries. The Oldowan Industry, dating to approximately between over 2 million years and 1.7 million years predates the later Acheulean. The Oldowan Industry consists of very simple, crudely made core tools from which flakes are struck a couple of times. To date, there is no consensus amongst archaeologists as to which hominid species manufactured these artefacts. The Acheulean Industry lasted from about 1.7 million years until 200 thousand years ago. Acheulean tools were more specialized tools than those of the earlier industry. They were shaped intentionally to carry out specific tasks such as hacking and bashing to remove limbs from animals and marrow from bone. These duties were performed using the large sharp pointed artefacts known as handaxes. Cleavers, with their sharp, flat cutting edges were used to carry out more heavy duty butchering activities (Esterhuysen, 2007). The ESA technology lasted for a very long time, from early to middle Pleistocene and thus seems to have been sufficient to meet the needs of early hominids and their ancestors. Although not identified on the footprint, ESA tools occurrence have been reported in other sites in KZN. Apart from stone artefacts, the ESA sites in this Province have produced very little as regards other archaeological remains. This has made it difficult to make inferences pointing to economical dynamics of the ESA people in this part of the world. The diet of ESA peoples has therefore had to be reconstructed on the basis of evidence from elsewhere that it comprised primarily of animal and plant foods (Mazel 1989).

2.1.2 Middle Stone Age (MSA)

The MSA dates to between 200 000 and 30 000 years ago, coinciding with the emergence of modern humans. The MSA technology is therefore believed to have been manufactured by fully modern humans known as *Homo sapiens* who emerged around 250 000 years ago. While some of the sites belonging to this time period occur in similar contexts as those of ESA, most of the MSA sites are located in rock shelters. Palaeoenvironmental data suggest that the distribution of MSA sites in the high lying Drakensberg and

surrounding areas was influenced by the climate conditions, specifically the amount and duration of snow (Carter, 1976). In general, the MSA stone tools are smaller than those of the ESA. Although some MSA tools are made from prepared cores, the majority of MSA flakes are rather irregular and are probably waste material from knapping exercises. A variety of MSA tools include blades, flakes, scrapers and pointed tools that may have been hafted onto shafts or handles and used as spearheads. Between 70 000 and 60 000 years ago new tool types appear known as segments and trapezoids. These tool types are referred to as backed tools from the method of preparation. Residue analyses on the backed tools from South African MSA sites including those in KZN indicate that these tools were certainly used as spear heads and perhaps even arrow points (Wadley, 2007). A few sites with impressive MSA deposits have been excavated in KZN. Perhaps the best known ones are Sibudu Cave and Umhlatuzana Cave to the south of the study area, and Border Cave to the north of the study area. All these sites provided impressive evidence for fine resolution data and detailed stratigraphy (Wadley & Jacobs, 2006).

2.1.3 Late Stone Age (LSA)

Compared to the earlier MSA and ESA, more is known about the LSA which dates from around 30 000 to 2 000 (possibly later) years ago. This is because LSA sites are more recent than ESA and MSA sites and therefore achieve better preservation of a greater variety of organic archaeological material. The Later Stone Age is usually associated with the San (Bushmen) or their direct ancestors. The tools during this period were even smaller and more diverse than those of the preceding Middle Stone Age period. LSA tool technology is observed to display rapid stylistic change compared to the slower pace in the MSA. The rapidity is more evident during the last 10 000 years. The LSA tool sequence includes informal small blade tradition from about 22 000 – 12 000 years ago, a scraper and adze-rich industry between 12 000 – 8 000 years ago, a backed tool and small scraper industry between 8 000 – 4 000 years and ending with a variable set of other industries thereafter (Wadley, 2007). Adzes are thought to be wood working tools and may have also been used to make digging sticks and handles for tools. Scrapers are tools that are thought to have been used to prepare hides for clothing and manufacture of other leather items. Backed tools may have been used for cutting as well as tips for arrows It was also during Later Stone Age times that the bow and arrow was introduced into southern Africa – perhaps around 20 000 years ago. Because of the bow and arrow and the use of traps and snares, Later Stone Age people were far more efficient in exploiting their natural environment than Middle Stone Age people. Up until 2 000 years ago Later Stone Age

people dominated the southern African landscape. However, shortly after 2 000 years ago the first Khoi herders and Bantu-speaking agro pastoralists immigrated into southern Africa from the north. This led to major demographic changes in the population distribution of the subcontinent. San hunter-gatherers were either assimilated or moved off to more marginal environments such as the Kalahari Desert or some mountain ranges unsuitable for small-scale subsistence farming and herding. The San in the coastal areas of KZN were the first to have been displaced by incoming African agro pastoralists. However, some independent groups continue to practice their hunter gatherer lifestyle in the foothills of the Drakensberg until the period of white colonialisation around the 1840's (Wright & Mazel, 2007). According to the KwaZulu- Natal Museum archaeological database Later Stone Age sites have been located in the Tugela River in the past but these are mostly restricted to surface scatters. Also dating to the LSA period is the impressive Rock Art found on cave walls and rock faces. Rock Art can be in the form of rock paintings or rock engravings. The province of KZN is renowned for the prolific San rock painting sites concentrated in the Drakensberg. Rock art sites do occur outside the Drakensberg including Zululand, however, these sites have not been afforded similar research attention as those sites occurring in the Drakensberg. However, there are no rock art sides found within the immediate vicinity of study area, which may be due to the lack of the suitable geology.

2.2 Iron Age

2.2.1 Early Iron Age (EIA)

Unlike the Stone Age people whose life styles were arguably egalitarian, Iron Age people led quite complex life styles. Their way of life of greater dependence on agriculture necessitated more sedentary settlements. They cultivated crops and kept domestic animals such as cattle, sheep, goats and dogs. Pottery production is also an important feature of Iron Age communities. Iron smelting was practised quite significantly by Iron Age society as they had to produce iron implements for agricultural use. However no smelting sites were discovered in the study area as it is the northern KZN that is rich in abandoned iron smelting sites (Maggs, 1989). Although Iron Age people occasionally hunted and gathered wild plants and shellfish, the bulk of their diet consisted of the crops they cultivated as well as the meat of the animals they kept. EIA villages were relatively large settlements strategically located in valleys beside rivers to take advantage of the fertile alluvial soils for growing crops (Maggs, 1989). The EIA sites in KZN date to around

AD 500 to AD 900. Extensive research in the province of this period led to it being divided in the following time lines according to ceramic styles (Maggs, 1989; Huffman 2007):

_ Msuluzi (AD 500);

_ Ndondondwane (AD 700 – 800);

_ Ntshekane (AD 800 – 900).

The archaeological data base of the KwaZulu-Natal Museum indicates that ten Early Iron Age sites occur in the near vicinity of the study area. The well known and researched site of Ndondondwane (Van Schalkwyk et al 1997) occurs approximately 10 km upstream from the project area. Other well known Early Iron Age sites such as Mamba (Van Schalkwyk 1994a), and Woshi (Van Schalkwyk 1994b) occurs within 15 km's from the project area on the banks of the Tugela River.

2.2.2 Late Iron Age (LIA)

The LIA is not only distinguished from the EIA by greater regional diversity of pottery styles but is also marked by extensive stone wall settlements. However, in this part of the world, stone walls were not common as the Nguni people used thatch and wood to build their houses. This explains the failure to obtain sites from the aerial photograph investigation of the study area. Trade played a major role in the economy of LIA societies. Goods were traded locally and over long distances. The main trade goods included metal, salt, grain, cattle and thatch. This led to the establishment of economically driven centres and the growth of trade wealth. Keeping of domestic animals, metal work and the cultivation of crops continued with a change in the organisation of economic activities. Evidence for this stems from the fact that iron smelting evidence was not found in almost every settlement (Maggs, 1989; Huffman 2007).

2.3 Historic Period

Oral tradition is the basis of the evidence of historical events that took place before history could be recorded. This kind of evidence becomes even more reliable in cases where archaeology could be utilised to back up the oral records. Sources of evidence for socio political organization during the mid-eighteenth to early nineteenth century in the study area and the larger former Natal Province suggest that the people here existed in numerous small-scale political units of different sizes, population numbers and political structures (Wright & Hamilton, 1989). This period was largely characterised by rage and instability as political skirmishes broke due to the thirst for power and resources between

chiefdoms. During the 2nd half of the eighteenth century, stronger chiefdoms and paramouncies emerged. However, these were not fully grown states as there was no proper formal central political body established. This changed in the 1780's when a shift towards a more centralized political state occurred. This shift was mainly characterized by population growth and geographical expansion of states. The most important and largest and strongest states at the time were the Mabhudu, Ndwandwe and Mthethwa. However, other smaller states, also established themselves in the greater Tugela Region. These included in the south the Qwabe, Bhaca, Mbo, Hlubi, Bhele, Ngwane and many others (Wright & Hamilton, 1989). The Zulu kingdom, established by King Shaka however remained the most powerful in the region in the early years of the 19th century. Shaka fought ruthlessly and often defeated his rivals and conquered their cattle, wives and even burnt their villages.

These wars are often referred to as Difaqane and this period was characterised by rage and blood shedding. Shaka was assassinated in 1828 at which time he had transformed the nature of the society in the Natal and Zululand regions. He was succeeded by Dingaan (Wright & Hamilton, 1989). Dutch farmers unhappy with the British rule in Cape Town decided to explore into the interior of the country, away from British rule. Some groups remained in the Eastern Cape, others kept going and a few settled in the Orange Free State and the Transvaal. A great number, led by Piet Retief and Gerrit Maritz, crossed the Drakensberg into Natal.

Here they encountered the Zulus who lured them into a trap and brutally massacred many of them. This was only one of the many failures of the white settler expeditions in the frontier areas and when the shocking news reached the Cape, more groups were sent to the interior to revenge. A series of battles were fought but the most notable was the Battle of Blood River in 1838 where the Boers defeated the Zulus. This ended the Zulu threat to the white settlers and a permanent and formal settlement in Natal was established. However the Zulu kingdom remained independent for a couple of decades. The Republic of Natalia was annexed by the British in 1845 and in 1879 the Zulu kingdom was also invaded (Wright & Hamilton, 1989). The Anglo-Zulu War has been well recorded and an important occurrence took place at Keates Drift and Jamesons Drift, near the project area, when a few British soldiers attempted to cross the Tugela River after their defeat at the battle of Isandlwana. Although no relicts or artefacts survive from this encounter the surrounding landscape is still imbued with the meaning of this important period in the

colonial history of KwaZulu-Natal. The Bambata Rebellion of 1906 saw various incidents in the close vicinity of the project area. The most significant is perhaps the Bambata Rock Ambush that occurred approximately 20 km from the project area.

3 BACKGROUND INFORMATION OF THE SURVEY

3.1 Methodology

A desktop study was conducted of the heritage databases housed in the KwaZulu-Natal Museum. In addition, the available archaeological and historical literature covering the greater Kranskop area was also consulted. The SAHRIS website was consulted to obtain information on previous heritage surveys and site data near the study area.

A ground survey, following standard and accepted archaeological procedures, was conducted by the consultant on the 5th November 2017. The consultant also interviewed local residents on the location of graves and other potential heritage sites adjacent to the proposed road upgrade (Fig 6).

3.2 Restrictions encountered during the survey

3.2.1 Visibility

Visibility was good

3.2.2 Disturbance

No disturbance of any heritage sites 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
Town: Kranskop
Municipality: Umvoti Local Municipality

4.2 Heritage Sites Located during the Survey

4.2.1 Background

A desktop survey of the central section of the greater Tugela River Basin indicated that a wide range of heritage sites and features may occur in the area. These include stone age, iron age, rock art sites, historical period sites, and potential 'living heritage' sites. However, the ground survey did not locate any heritage sites on the footprint. This observation was confirmed by local residents who were not aware of any sites (including modern graves) that occurs within 50m from the proposed road upgrade (Fig 3). The area is also not part of any known cultural landscape (Table 2).

The paleontologist reports that the footprint is underlain by metamorphic and intrusive rocks of the Natal Structural and Metamorphic Province. No significant fossils are expected from these rocks and no further mitigation for Palaeontological Heritage is recommended (Appendix 1).

Table 2. Evaluation and statement of significance of identified heritage sites in the project area.

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.

5 STATEMENT OF SIGNIFICANCE (HERITAGE VALUE)

5.1 Field Rating

The field rating system as developed by SAHRA (Table 3) is not applicable as no heritage sites occur on the footprint.

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

6 RECOMMENDATIONS

The proposed upgrade of the Mhlabathini Road Extension near Kranskop, Umvoti Local Municipality, may proceed from a heritage perspective as no heritage sites and graves occur on the footprint. The area has a low paleontological sensitivity and there is no need for mitigation. It must be noted, however, that the Provincial Heritage Act requires that operations exposing paleontological material, archaeological sites, historical residues, as well as graves, should cease immediately pending an evaluation by the heritage authorities.

7 MAPS AND FIGURE

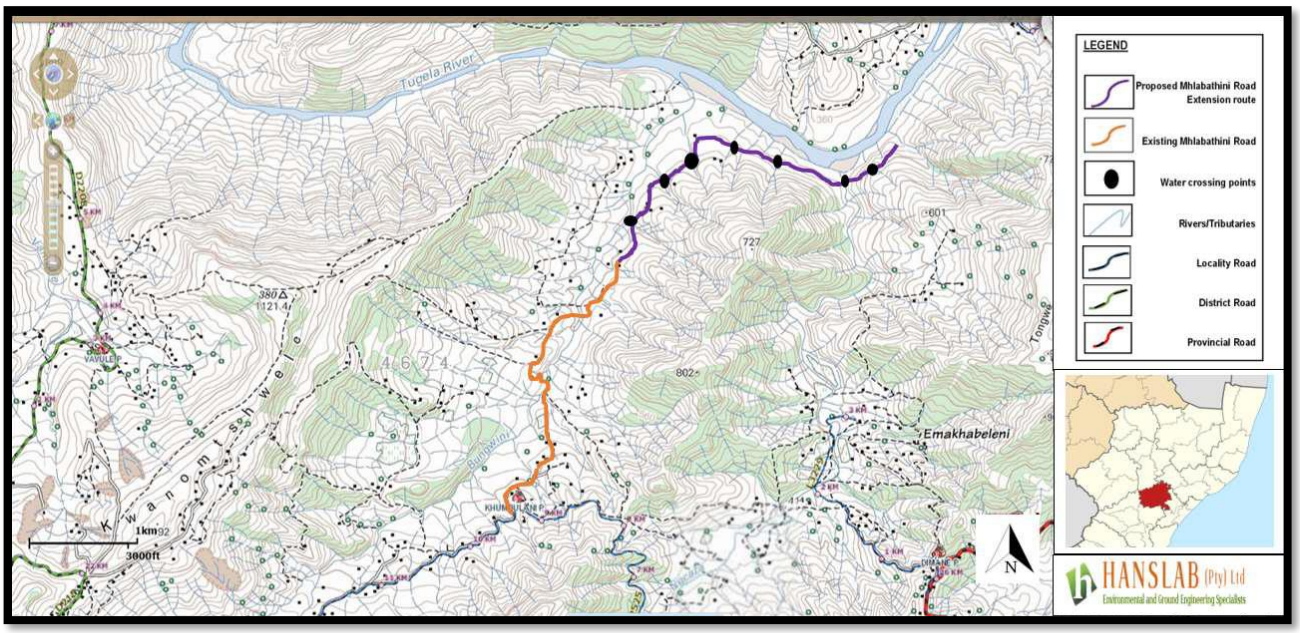

Figure 1. Map of the project area (Source: Hanslab).

Figure 2. Google Earth Imagery showing the location of the Mhlabatheni Road Extension (Source: Hanslab).

Figure 3. The project area is located in the Central Thukela River Basin.

Figure 4. The Mhlabathini Road Extension track. Most of the track runs through veld with little evidence of human habitation.

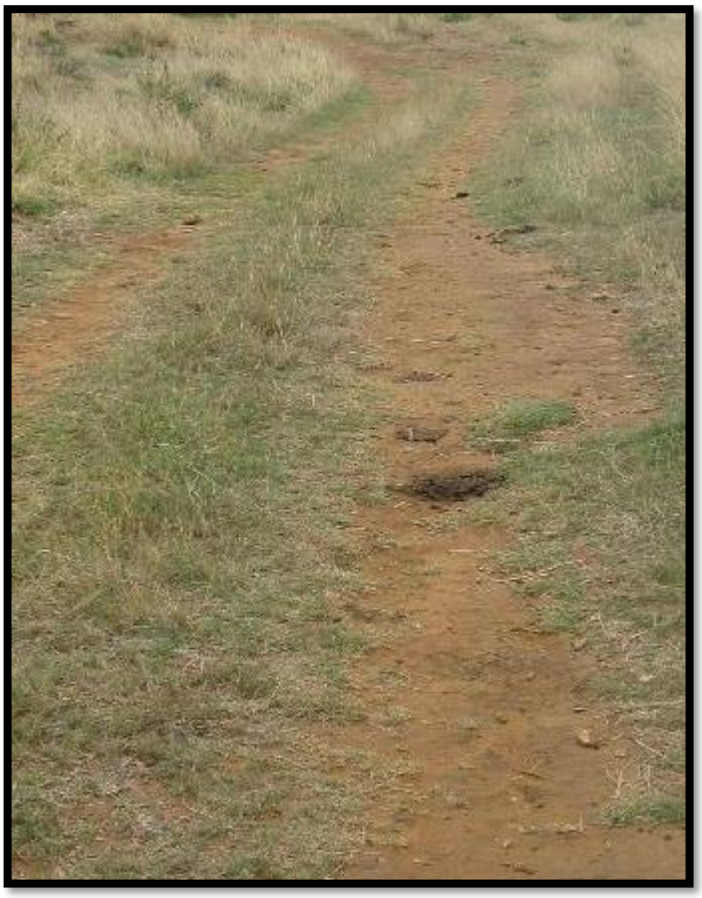

Figure 5. No heritage sites or graves occur adjacent to the Mhlabathini Extension Track.

Figure 6. Khulani Zuma and John Sithole, two local residents, had no knowledge of any heritage sites or graves adjacent to the Mhlabathini Extension Road Upgrade.

9 REFERENCES

Carter, P.L. 1976. 'The Effect of Climatic Change on Settlement in Eastern Lesotho during the Middle and Later Stone Age.' World Archaeology, 8, 198 – 206.
Clegg, J. 1979. Ukubuyisa Isidumbu - Bringing Back the Body": An Examination into the Ideology of Vengeance in the Msinga and Mpofana Rural Locations. (1882-1944) Unversity of the Witwatersrand, African Studies Institute. African Studies Seminar Paper.

Clegg, J. 1979. Ukubuyisa Isidumbu – bring back the body. An examination into the ideology of vengeance in the Msinga and Mpofana Rural Locations (1882 -1944). African Studies Seminar. University of the Witwatersrand, African Studies Institute. Seminar paper.

Cousins, B et al 2011. Living Law of Land in Msinga. Unpublished paper.

Esterhuysen, A., 2007. The Earlier Stone Age. In Bonner, P., Esterhuysen, A., Jenkins, T. (eds.): *A Search for Origins: Science, History and South Africa's 'Cradle of Humankind'.* Johannesburg: Wits University Press. Pg 110 -121.

Fowler, K. 2006. The Zulu Ceramic tradition in Msinga, South Africa. SAHJ (2)2

Guest, B.(eds). 1989 Natal and Zululand: From Earliest Times to 1910 – A new history: 49 – 82. University of KwaZulu-Natal Press.

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

Jolles, F. 1993. Traditional Zulu Beadwork in the Msinga area. African Art 26(1):42-53, 101-102.

Maggs, T. 1989. The Iron Age farming communities. In Duminy. A. & Guest, B.(eds). *Natal and Zululand: From Earliest Times to 1910 – A New History*: 28 - 48. University of KwaZulu-Natal Press.

Maggs T & Ward, V. 1984. Early Iron Age sites in the Muden area of Natal. Annals of the Natal Museum. 26(1): 105-144

Mazel, A. 1989. The Stone Age peoples of Natal. In Duminy, A & Guest, B.(eds). *Natal and Zululand: From Earliest Times to 1910 – A New History*: 1 - 27. University of KwaZulu-Natal Press.

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

Van Schalkwyk, L. O. 1994a. Wosi: an Early Iron Age village in the Lower Thukela Basin, Natal. Natal Museum Journal of Humanities 6: 65-117.

Van Schalkwyk, L. O. 1994b. Mamba confluence; a preliminary report on an Early Iron Age industrial centre in the lower Thukela Basin, Natal. Natal Museum Journal of Humanities 6: 119-153

Van Schalkwyk, L. O. Greenfield, H. J. & Jongsma, T. L. 1997. Ndondondwane: preliminary report on the 1995 survey and excavations. Southern African Field Archaeology 6: 61-79

Voigt, E. A 1984. Annals of the Natal Museum. The faunal remains from Magogo and Mhlopeni: small stock herding in the Early Iron Age of Natal. (1) 26:141-164

Wadley, L & Jacobs, Z. 2006. Sibudu Cave:background to the excavations, stratigraphy and dating. *Southern African Humanities*. 18 (1): 1-26.

Wadley. L., 2007. The Middle Stone Age and Later Stone Age. In Bonner, P., Esterhuysen, A., Jenkins, T. (eds.): *A Search for Origins: Science, History and South Africa's 'Cradle of Humankind'*. Johannesburg: Wits University Press. Pg 122 -135.

Whelan, D. 2001. The Recent transmutation of the Indigenous Vernacular Architecture of the People of KwaMthembu and kwaMchunu, Msinga District, KZN, South Africa. Unpublished MA thesis submitted to the University of Natal, Durban.

Wright, J. and Hamilton, C. 1989. Tradition and transformations – The Phongolo-Mzimkhulu region in the late eighteenth and early nineteenth centuries. In Duminy, A &

APPENDIX 1.

DESKTOP PALAEONTOLOGICAL ASSESSMENT FOR THE PROPOSED UPGRADING AND EXTENSION OF THE MHLABATHINI ROAD, UMVOTI LOCAL MUNICIPALITY, UMZINYATHI DISTRICT MUNICIPALITY, KWAZULU-NATAL PROVINCE.

FOR

Active Heritage

DATE: 21 October 2017

By

Gideon Groenewald

Cell: 078 713 6377

10 EXECUTIVE SUMMARY

Gideon Groenewald was appointed to undertake a Desktop Palaeontological Assessment survey and to propose a "Chance Find Protocol", for the Proposed Upgrading and Extension of the Mhlabathini Road, Umvoti Local Municipality, Umzinyathi District Municipality, Kwazulu-Natal Province.

The development site applicable to the application for the proposed Upgrading and Extension of the Mhlabathini Road, Umvoti Local Municipality, Umzinyathi District Municipality, Kwazulu-Natal Province is underlain by metamorphic and intrusive rocks of the Natal Structural and Metamorphic Province.

No significant fossils are expected from these rocks and no further mitigation for Palaeontological Heritage is recommended.

It is recommended that:

- The EAP and ECO must be informed of the fact that a Very Low Palaeontological Sensitivity is allocated to the study area underlain by the Natal Structural and Metamorphic Province geological formations and no further mitigation for Palaeontological Heritage is recommended for this study area.

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INTRODUCTION

Gideon Groenewald was appointed to undertake a Desktop Palaeontological Assessment survey and to propose a “Chance Find Protocol”, for the Proposed Upgrading and Extension of the Mhlabathini Road, Umvoti Local Municipality, Umzinyathi District Municipality, Kwazulu-Natal Province (Figure 1).

Figure 1 Locality of the Mhlabathini Road upgrade Project

12.1.1 Legal Requirements

This Palaeontological Assessment forms part of the Heritage Impact Assessment (HIA) and complies with the requirements of the South African National Heritage Resource Act No 25 of 1999 as well as the KwaZulu-Natal Heritage Act No 4 of 2008 as well as the KwaZulu-Natal Heritage Act No 4 of 2008. In accordance with Section 38 of the National Resources Act No 25 of 1999 (Heritage Resources Management), a HIA is required to assess any potential impacts to palaeontological heritage within the development footprint.

Categories of heritage resources recognised as part of the National Estate in Section 3 of the Heritage Resources Act, and which therefore fall under its protection, include:

- geological sites of scientific or cultural importance;
- objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens; and
- objects with the potential to yield information that will contribute to an understanding of South Africa’s natural or cultural heritage.

12.1.2 Aims and Methodology

A Desktop investigation is often the only opportunity to record the fossil heritage within the development footprint. These records are very important to understand the past and form an important part of South Africa’s National Estate.

Following the "*SAHRA APM Guidelines: Minimum Standards for the Archaeological & Palaeontological Components of Impact Assessment Reports*" the aims of the palaeontological impact assessment are:

- to identifying exposed and subsurface rock formations that are considered to be palaeontologically significant;
- to assessing the level of palaeontological significance of these formations;
- to comment on the impact of the development on these exposed and/or potential fossil resources and
- to make recommendations as to how the developer should conserve or mitigate damage to these resources.

Prior to a field investigation a preliminary assessment (desktop study) of the topography and geology of the study area is made using appropriate 1:250 000 geological maps (2830 Dundee) in conjunction with Google Earth. Potential fossiliferous rock units (groups, formations etc) are identified within the study area and the known fossil heritage within each rock unit is inventoried from the published scientific literature, previous palaeontological impact studies in the same region and the author's field experience.

Priority palaeontological areas are identified within the development footprint to focus the field investigator's time and resources. The aim of the desktop survey is to document any exposed fossil material and to assess the palaeontological potential of the region in terms of the type and extent of rock outcrop in the area.

The likely impact of the proposed development on local fossil heritage is determined on the basis of the palaeontological sensitivity of the rock units concerned and the nature and scale of the development itself, most notably the minimal extent of fresh bedrock excavation envisaged. The different sensitivity classes used are explained in Table 1 below.

Table 2 Palaeontological sensitivity analysis outcome classification

PALAEONTOLOGICAL SIGNIFICANCE/VULNERABILITY OF ROCK UNITS	
The following colour scheme is proposed for the indication of palaeontological sensitivity classes. This classification of sensitivity is adapted from that of Almond et al (2008) and Groenewald et al., (2014)	
RED	Very High Palaeontological sensitivity/vulnerability. Development will most likely have a very significant impact on the Palaeontological Heritage of the region. Very high possibility that significant fossil assemblages will be present in all outcrops of the unit. Appointment of professional palaeontologist, desktop survey, phase I Palaeontological Impact Assessment (PIA) (field survey and recording of fossils) and phase II PIA (rescue of fossils during construction) as well as application for collection and destruction permit compulsory.

ORANGE	High Palaeontological sensitivity/vulnerability. High possibility that significant fossil assemblages will be present in most of the outcrop areas of the unit. Fossils most likely to occur in associated sediments or underlying units, for example in the areas underlain by Transvaal Supergroup dolomite where Cenozoic cave deposits are likely to occur. Appointment of professional palaeontologist, desktop survey and phase I Palaeontological Impact Assessment (field survey and collection of fossils) compulsory. Early application for collection permit recommended. Highly likely that a Phase II PIA will be applicable during the construction phase of projects.
GREEN	Moderate Palaeontological sensitivity/vulnerability. High possibility that fossils will be present in the outcrop areas of the unit or in associated sediments that underlie the unit. For example areas underlain by the Gordonia Formation or undifferentiated soils and alluvium. Fossils described in the literature are visible with the naked eye and development can have a significant impact on the Palaeontological Heritage of the area. Recording of fossils will contribute significantly to the present knowledge of the development of life in the geological record of the region. Appointment of a professional palaeontologist, desktop survey and phase I PIA (ground proofing of desktop survey) compulsory.
BLUE	Low Palaeontological sensitivity/vulnerability. Low possibility that fossils that are described in the literature will be visible to the naked eye or be recognized as fossils by untrained persons. Fossils of for example small domal Stromatolites as well as micro-bacteria are associated with these rock units. Fossils of micro-bacteria are extremely important for our understanding of the development of Life, but are only visible under large magnification. Recording of the fossils will contribute significantly to the present knowledge and understanding of the development of Life in the region. Where geological units are allocated a blue colour of significance, and the geological unit is surrounded by highly significant geological units (red or orange coloured units), a palaeontologist must be appointed to do a desktop survey and to make professional recommendations on the impact of development on significant palaeontological finds that might occur in the unit that is allocated a blue colour. An example of this scenario will be where the scale of mapping on the 1:250 000 scale maps excludes small outcrops of highly significant sedimentary rock units occurring in dolerite sill outcrops. Collection of a representative sample of potential fossiliferous material recommended. At least a Desktop Survey and “Chance Find Protocol” is compulsory. The Chance Find Protocol must be included in the EMPr for the project.

GREY	Very Low Palaeontological sensitivity/vulnerability. Very low possibility that significant fossils will be present in the bedrock of these geological units. The rock units are associated with intrusive igneous activities and no life would have been possible during implacement of the rocks. It is however essential to note that the geological units mapped out on the geological maps are invariably overlain by Cenozoic aged sediments that might contain significant fossil assemblages and archaeological material. Examples of significant finds occur in areas underlain by granite, just to the west of Hoedspruit in the Limpopo Province, where significant assemblages of fossils and clay-pot fragments are associated with large termite mounds. Where geological units are allocated a grey colour of significance, and the geological unit is surrounded by very high and highly significant geological units (red or orange coloured units), a palaeontologist must be appointed to do a desktop survey and to make professional recommendations on the impact of development on significant palaeontological finds that might occur in the unit that is allocated a grey colour. An example of this scenario will be where the scale of mapping on the 1:250 000 scale maps excludes small outcrops of highly significant sedimentary rock units occurring in dolerite sill outcrops. It is important that the report should also refer to archaeological reports and possible descriptions of palaeontological finds in Cenozoic aged surface deposits. At least a Desktop Survey and "Chance Find Protocol" document is compulsory. The Chance Find Protocol must be included in the EMPr of the project.

When rock units of moderate to high palaeontological sensitivity are present within the development footprint, palaeontological mitigation measures must be incorporated into the Environmental Management Plan. All projects falling on Low to Very Low Palaeontological sensitivity geology must be discussed in a Phase 1 or a Chance Find Protocol document that must form part of the EMPr of the project.

Scope and Limitations of the Desktop Study

The study will include: i) an analysis of the area's stratigraphy, age and depositional setting of fossil-bearing units; ii) a review of all relevant palaeontological and geological literature, including geological maps, and previous palaeontological impact reports; iii) data on the proposed development provided by the developer (e.g. location of footprint, depth and volume of bedrock excavation envisaged) and iv) where feasible, location and examination of any fossil collections from the study area (e.g. museums).

The key assumption for this scoping study is that the existing geological maps and datasets used to assess site sensitivity are correct and reliable. However, the geological maps used were not intended for fine scale planning work and are largely based on aerial photographs

alone, without ground-truthing. There is also an inadequate database for fossil heritage for much of the RSA, due to the small number of professional palaeontologists carrying out fieldwork in RSA and the Kingdom of Lesotho. Most development study areas have never been surveyed by a palaeontologist.

These factors may have a major influence on the assessment of the fossil heritage significance of a given development and without supporting field assessments may lead to either:

- an underestimation of the palaeontological significance of a given study area due to ignorance of significant recorded or unrecorded fossils preserved there, or
- an overestimation of the palaeontological sensitivity of a study area, for example when originally rich fossil assemblages inferred from geological maps have in fact been destroyed by weathering, or are buried beneath a thick mantle of unfossiliferous “drift” (soil, alluvium etc.).

12.1.3 Locality and Proposed Development

The Mhlabathini Road Development is situated to the east of Tugela Ferry in the rural parts of KwaZulu-Natal. The development falls in rugged terrain underlain by shallow clayey soils of mainly weathered metamorphic rocks of the Tugela Thrust System (Figure 2).

Figure 2 Locality and planning of the Mhlabathini Road Upgrade Project in KZN

13 GEOLOGY

The site of the development falls mainly on Namibian aged metamorphic and intrusive rocks of the Natal Structural and Metamorphic Province that are related to the Tugela Nappe structure (Figure 3).

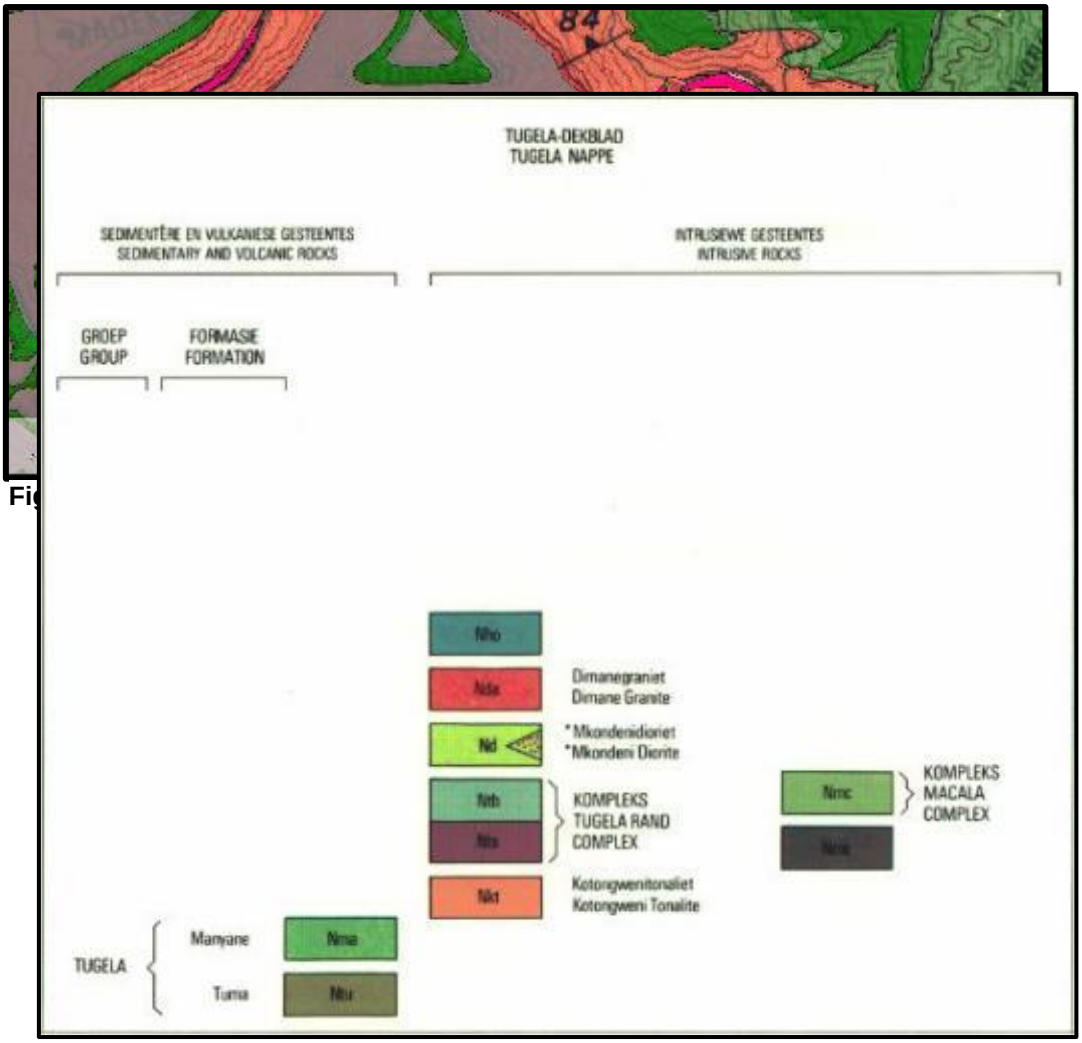

Figure 4 Geological Legend for formations in the study area

14 TUGELA NAPPE

14.1 Tugela Group

14.1.1 Manyane Formation (Nma)

The Namibian aged Tugela Group is represented by the Manyane Formation (Nma) that consists primarily of a sequence of Amphibolite.

14.2 Kotongweni tonolite (Nkt)

Namibian aged Tonalite comprises the bulk of this intrusive group of rocks.

14.3 Mkondeni diorite (Nd)

The Namibian aged intrusive rock underlies part of the development.

The Tugela Nappe structure forms part of the larger Natal Structural and Metamorphic Province and this Namibian aged metamorphic belt represents a highly deformed sequence of rocks that can contain intrusive elements of very old rock formations (Johnson et al, 2009).

15 PALAEONTOLOGY

16 NATAL STRUCTURAL AND METAMORPHIC PROVINCE

16.1 Tugela Nappe and Tugela Group with associated intrusive rocks

16.2 Tugela Group

16.2.1 Manyane Formation (Nma)

The Manyane Amphibolites will not contain any fossils.

16.3 Kotongweni tonolite (Nkt)

Due to the intrusive nature of this rock type it will not contain fossils.

16.4 Mkondeni diorite (Nd)

Due to the intrusive nature of this rock type it will not contain fossils

17 PALAEONTOLOGICAL IMPACT AND MITIGATION

The predicted palaeontological impact of the development is based on the initial mapping assessment and literature reviews as well as information gathered during the desktop investigation. The desktop investigation confirms that the study area is underlain by relatively deep (>2m) clay soil associated with the Natal Structural and Metamorphic Province.

Due to the metamorphic and igneous nature of the rocks underlying the development site, no fossils are expected and no further mitigation for Palaeontological Heritage is recommended.

Figure 5 Palaeontological sensitivity of the rocks underlying the development site. For colour coding see Table 1

18 CONCLUSION

The development site applicable to the application for the proposed Upgrading and Extension of the Mhlabathini Road, Umvoti Local Municipality, Umzinyathi District Municipality, Kwazulu-Natal Province is underlain by metamorphic and intrusive rocks of the Natal Structural and Metamorphic Province.

No significant fossils are expected from these rocks and no further mitigation for Palaeontological Heritage is recommended.

It is recommended that:

- The EAP and ECO must be informed of the fact that a Very Low Palaeontological Sensitivity is allocated to the study area underlain by the Natal Structural and Metamorphic Province geological formations and no further mitigation for Palaeontological Heritage is recommended for this study area.

19 REFERENCES

Almond J.E. and Pether J. 2008. *Palaeontological Heritage of the Western Cape.* Internal Report Heritage Western Cape.

Almond J.E., De Klerk B. and Gess R., 2009. *Palaeontological Heritage of the Eastern Cape*. Internal Report, SAHRA.

Groenewald GH., 2012. *Palaeontological Technical Report for Kwazulu-Natal. Internal Report, AMAFA.*

Groenewald G.H., Groenewald D.P. and Groenewald S.M., 2014. *Palaeontological Heritage of the Free State, Gauteng, Limpopo, Mpumalanga and North West Provinces*. Internal Palaeotechnical Reports, SAHRA.

Johnson MR , Anhaeusser CR and Thomas RJ (Eds). 2009. The Geology of South Africa. GSSA, Council for Geoscience, Pretoria.

MacRae C. 1999. Life Etched in Stone. Geological Society of South Africa, Linden, South Africa.

McCarthy T and Rubidge BS. 2005. Earth and Life. 333pp. Struik Publishers, Cape Town.

20 QUALIFICATIONS AND EXPERIENCE OF THE AUTHOR

Dr Gideon Groenewald has a PhD in Geology from the University of Port Elizabeth (Nelson Mandela Metropolitan University) (1996) and the National Diploma in Nature Conservation from Technicon RSA (the University of South Africa) (1989). He specialises in research on South African Permian and Triassic sedimentology and macrofossils with an interest in biostratigraphy, and palaeo-ecological aspects. He has extensive experience in the locating of fossil material in the Karoo Supergroup and has more than 20 years of experience in locating, collecting and curating fossils, including exploration field trips in search of new localities in the southern, western, eastern and north-eastern parts of the country. His publication record includes multiple articles in internationally recognized journals. Dr Groenewald is accredited by the Palaeontological Society of Southern Africa (society member for 25 years).

21 DECLARATION OF INDEPENDENCE

I, Gideon Groenewald, declare that I am an independent specialist consultant and have no financial, personal or other interest in the proposed development, nor the developers or any of their subsidiaries, apart from fair remuneration for work performed in the delivery of palaeontological heritage assessment services. There are no circumstances that compromise the objectivity of my performing such work.

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