

An Archaeological Impact Assessment for a proposed Mountain Fun Park Luge on Portion 38 of the Farm Olifantsvlei 327 IQ, Johannesburg, Gauteng Province

Phase 1 Archaeological Impact Assessment

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Declaration of Independence

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

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List of acronyms

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

Glossary of terms

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

Executive Summary

Introduction

Drs Tim Forssman and Matt Lotter were appointed by Aquastrat Solutions (Pty) Ltd to conduct an Archaeological Impact Assessment of the Farm Olifantsfontein 327 IQ, Portion 38, for the development of a Mountain Fun Park (Pty) Ltd Luge. The aim of the assessment was to determine the potential development impact on archaeological resources.

Methods

The entire portion of land was investigated on foot for any surface traces of cultural heritage. Subsurface heritage preservation was assessed in areas where surface sediments were disturbed (e.g., alongside road cuttings and/or excavations). All finds and/or sites were recorded following standard archaeological procedures. A specially designed site recording form was used to notate any observable traits, including cultural heritage types, deposit information and assemblage or site context, and this was graded following a set rating criteria. All survey routes were GPS recorded and every find was photographed along with the landscape.

Results

A single archaeological site was identified. It contains stone walls and no cultural material. A possible grave site was located with a single burial location. Presently, the property is being used by religious visitors. These visitors use several areas of the farm and leave behind scatters of broken earthenware ceramics, fireplaces and refuse.

Conclusions

The eastern area of the property (east of the R82) with the single possible burial should be avoided. In addition, the central area of the property with the archaeological site should also be avoided by implementing buffer zones around the area. Should these areas need to be destroyed/impacted during development, then a more detailed Phase II mitigation programme will be required to map their extent and preserve the archaeological remains. If development is approved and commences, and if any heritage resources are identified, activities should be halted and a specialist consulted immediately following the chance finds protocol at the end of this report. Given the current use of the local landscape by religious visitors, we recommend

that an assessment by a suitably qualified social specialist is acquired to ensure adequate public participation and engagement.

Heritage site locations:

1. Stonewalled structure (Site 030): 26°17'50.22"S 27°59'39.87"E (also including 033: 26°17'51.14"S 27°59'38.81"E, and 036: 26°17'50.94"S 27°59'39.93"E)
2. Possible human grave (Site 001): 26°17'53.20"S 27°59'49.77"E

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1. Introduction

a. Scope of the study

Drs Tim Forssman and Matt Lotter were appointed by Aquastrat Solutions (Pty) Ltd to conduct an Archaeological Impact Assessment (AIA) of the Farm Olifantsfontein 327 IQ, Portion 38, for the development of a Mountain Fun Park (Pty) Ltd Luge. The aim of the assessment was to determine the potential impact development would have on heritage resources within the farm boundary.

b. Project description

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

c. Specialist expertise

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

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

d. South African legislation

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

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

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

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

Heritage resources are graded following Section 7 of the NHRA. The following ratings are applicable:

- Grade I: Heritage resources with qualities so exceptional that they are of special national significance

- Grade II: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or region
- Grade III: Other heritage resources worthy of conservation
- General Protected: i.e. generally protected in terms of Sections 33 to 37 of the NHRA.

2. Archaeological and historical background: desktop study

a. Overview of the local archaeological sequence

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

i. Stone Age

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

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

thousand years ago are generally thought to possess cultural traits that indicate the appearance of modern thought or cognition, sometimes called complexity (Wadley 2015).

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

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

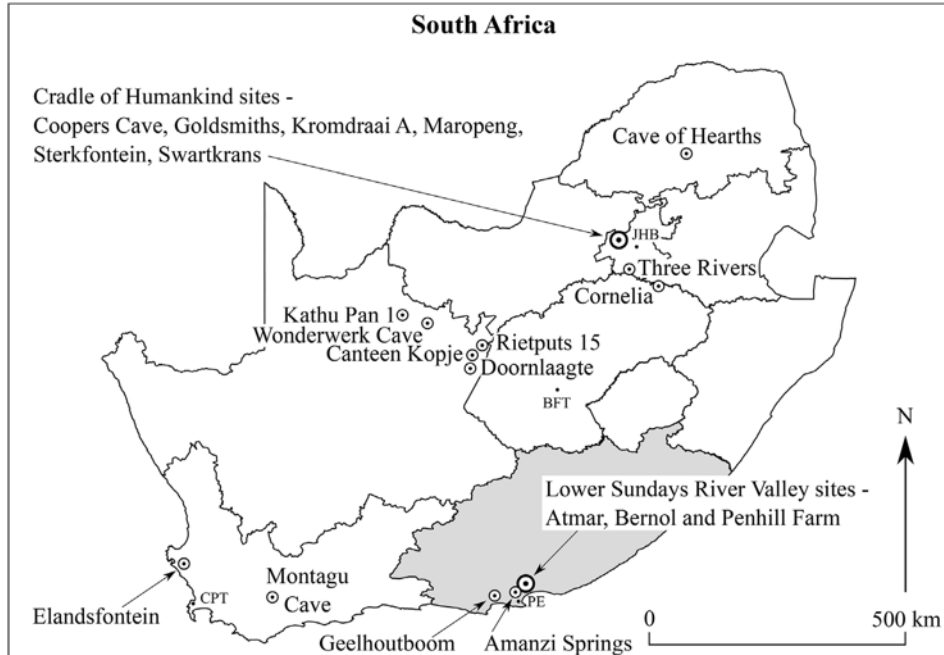


Figure 1: The distribution of Acheulean sites >0.5 million years in South Africa (from Lotter & Kuman 2018: 44).

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

Rock art was produced by many communities, but the best known is the rock art of hunter-gatherers who were also the producers of the LSA. The art typically captures trance experiences, which is when a shaman enters the spirit world through a trance dance. While in it, he or she will heal the sick, control game, ward off evil spirits and travel to neighbours or to God's village, as well as perform other tasks. Rock art generally depicts these scenes as well as folklore and mythology (Forssman & Gutteridge 2012). Khoekhoe herders had their own

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

painting tradition, which is less well-understood, although at least some of it relates to girls' initiation. Bantu-language speaking groups also painted and generally their depictions are to do with initiation and conflict during the colonial era (Mitchell 2002). While their art is fairly well-studied, it is their occupation sequence of southern Africa that has dominated Iron Age research.

ii. Iron Age

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

The most significant developments that occurred in the southern African region, at least at first, were those that began around AD 900 in northern South Africa. Here, farmers began exchanging local trade wealth for exotic items like glass beads from the Mozambique coastline where travelling merchants from the north based themselves. These items supported the local growth of wealth, which was initially based on cattle and on locally sourced value items. This growth led to the beginning of elite communities based at what came to be prominent settlements. These then developed into political centres where social stratification appeared. Around AD 1220, these developments, along with several others, resulted in the establishment of Mapungubwe, southern Africa's first state-level society. When it declined, around AD 1300, Great Zimbabwe rose to prominence, which was succeeded by Khami and Thulamela (Huffman 2009). Although this gives the impression of a fairly straightforward developmental process, it was in fact fairly heterogeneous.

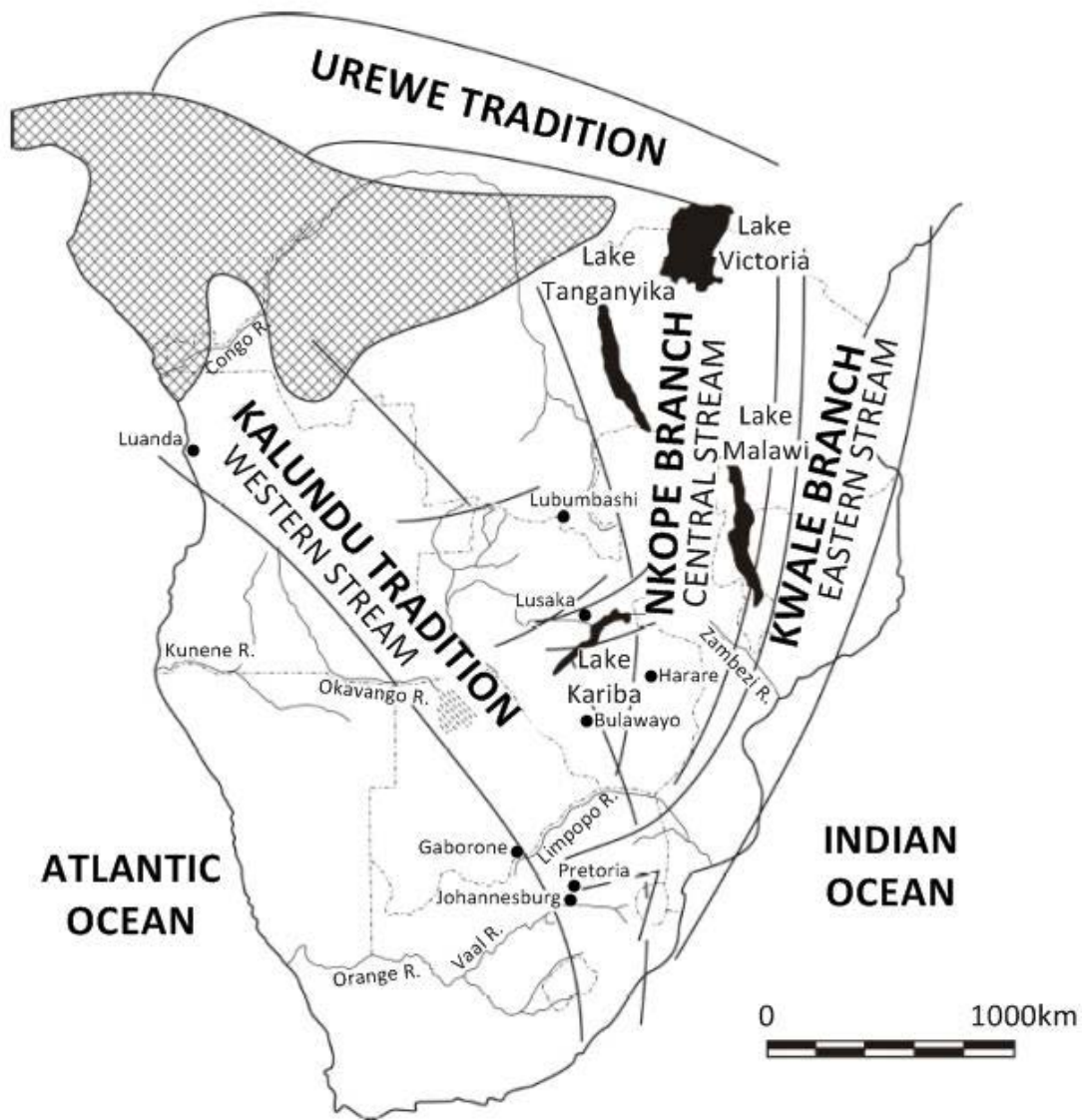


Figure 2: The appearance of farmer communities (Bantu-language speaking groups) in southern Africa (from Huffman 2007: 336).

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

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

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

iii. Historic period

Prior to the Dutch establishing a refreshment station in what is now the Western Cape in 1652, Portuguese traders and travellers had made contact with local communities. Trading along almost the entirety of southern Africa's coastline for supplies and what to them was exotica, they encountered many of the communities mentioned in the text here. Their interactions included often detailed note-taking and mapping of certain regions, which are hugely valuable to this day in terms of understanding the local social landscape. For example, their accounts of Sofala are highly valuable since this immensely influential trading post on the Mozambique coastline has not been re-discovered. The Portuguese and also Arabic records are all we have of its existence and role in local economies (Wood 2000). From the settlement of the Western Cape, though, the influence of European colonisation was increasingly felt.

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

uncovered (Figure 3) (Markell et al. 1995). Interactions with local communities were highly nuanced and variable.

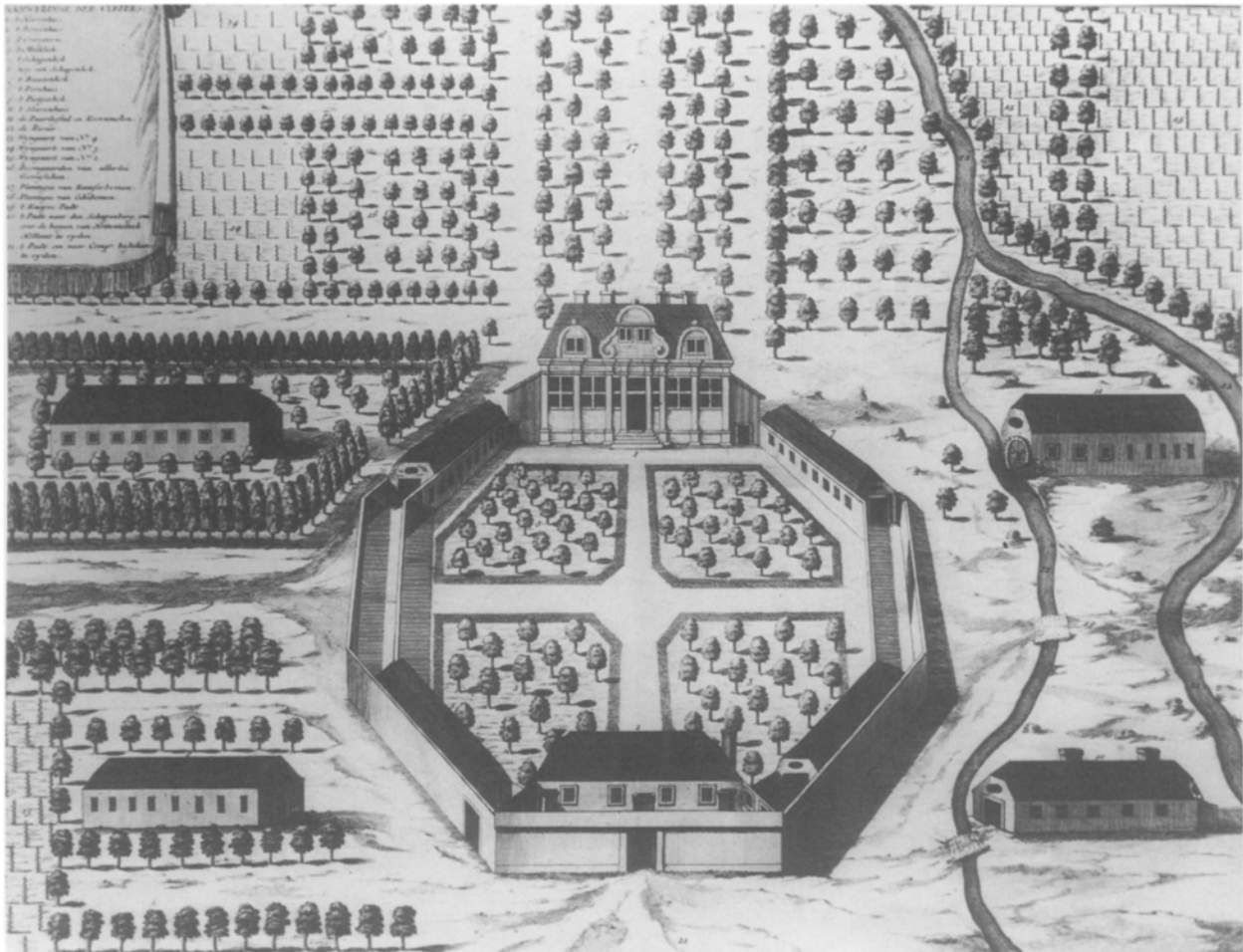


Figure 3: A depiction of Simon van der Stel's Vergelegen compound with the surrounding lodges (from Markell et al. 1995: 14).

The British took control of the Cape Colony in 1795 after the Battle of Muizenberg. This began a process of social disintegration with many European locals unwilling to contribute to the British government and crown (although from 1803 to 1806 the Dutch regained authority temporarily). The end result was the Great Trek. In 1832, Dr Andrew Smith and William Berg, an Englishman and a Boer, set-off on an early exploratory trek along the coast towards what is now KwaZulu-Natal. On returning, they convinced Boer leaders of the potential the land held for farming, livestock and settlement. After a larger exploratory trek in 1834, the first wave of trekkers left in 1835 followed in 1836 by more. About 6000 people in total left on the trek led by now historically recognised figures such as Louis Tregerdt, Hans van Renburg and Hendrik Potgieter, among others. This led to the widespread settlement of Boers and others in the

eastern and northern territories of South Africa, as well as conflicts with the Matabele and Zulu; a notable battle was held at the contested Ncome/Blood River site (Ngobese & Mukhuba 2018).

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

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

b. Archaeology and history of the study area and surrounds

It is important to note the archaeological importance of the Suikerbosrand and Klipriviersberg areas in the immediate vicinity. In both, a number of Iron Age settlements have been identified. These are largely part of the Late Iron Age, which is more-or-less the last 600 years. Of these sites, a recent find in Suikerbosrand is of particular interest. Sadr (2019a) reports on a large, widespread stonewalled settlement called Kweneng, dating to the second half of the second millennium AD. The site was connected via trade and economic and political networks to large settlements in the North-West Province, such as Molokwane and Kaditshwene. It is not the only site identified in the area, which includes a range of stonewalled settlements. Many of these occur on ridges or hills overlooking low-lying areas (e.g., Sadr 2019b).

Relatively little is known of the more recent sequence of the now southern Johannesburg area. William Cornwallis Harris arrived in the area in 1936 (Bergh 1999: 13). However, it was only from the late '30s that European farmers settled the area (Bergh 1999: 15). Despite this,

Johannesburg, then a town, was only established in 1886 and a district in 1902. The purpose for this was largely the discovery of gold (Bergh 1999: 21-23, 147).

According to historic records, the first gold was found at Paardekraal in 1852, but some reports suggest it may have been earlier in 1834 on the Witwatersrand (Liebenberg 1999: 315; Von Ketelhodt 2007: 3). Nonetheless, it was in 1886 that George Harrison discovered the gold reef in the Witwatersrand, a very rich reserve of gold on the farm Langlaagte (Tempelhoff 1999: 313; Pistorius 2007: 19; Von Ketelhodt 2007: 7). Following this, public prospecting areas were declared by the government on: Doornfontein, Driefontein, Elandsfontein, Langlaagte, Turffontein, (Klein) Paardekraal, Randjieslaagte, Roodepoort, and Vogelstruisfontein. In the year that followed, several additional farms were added to this: Klipportje, Leeuwpoort, Luipaardsvlei, Paardeplaats/Groot Paardekraal, Vogelfontein and Witpoortje, and then Rietvlei in 1888 (Liebenberg 1999: 316-317). Over time, more farms were included.

Following the discovery of gold in the Witwatersrand was a gold rush. Foreign and local diggers and prospectors fled into the area seeking riches. They settled in informal settlements consisting of rapidly erected camps and tents and corrugated buildings along the Witwatersrand (Pistorius 2007: 20). Soon after, larger companies bought out individual miners and established mining syndicates (Liebenberg 1999: 317).

Early methods to extract ore from the less rich deposits on the Witwatersrand were troublesome. They also required significant capital. Partly, this was because of their depth. Boreholes indicated that gold reserves were as deep as 729m below the surface (Liebenberg 1999: 317). It was in 1896 that miners realised these deposits were in fact far lower at around 2000m. Companies began exploiting these deposits, which contained a higher yield (Liebenberg 1999: 318).

The onset of the South African War in 1899 led to the closing of many mines. In the area some South African War sites have been identified, although none with significance (e.g., Huffman & Calabrese 2007). Needless-to-say, South African War activities are known of in the area, including associated heritage remains, but none with research potential have been identified within Johannesburg.

The pause to mining was temporary, and in 1901, after the British took over Johannesburg in 1900, mining resumed (Liebenberg 1999: 319). Two years later, a shortage of labourers led to a crisis. To alleviate this, Chinese miners were brought into Johannesburg from 1904 who stayed until their repatriation in 1907. The worker crisis led to an emphasis on large machinery to relieve the mines' dependence on labour force (Liebenberg 1999: 319; Von Ketelhodt 2007:19-

21). In 1908, deep-shaft mines were sunk, with Robinson Deep thought to be one of the deepest, and from 1910 labour demands increased. Poor white farmers who had been dispossessed of their land during the South African War were some of the labourers that entered the mining industry during this time (Pistorius 2007: 21).

c. Database consultation

The South African Heritage and Resources Agency's (SAHRA) online database, SAHRIS, was consulted to assess the nature of previous development and mitigation reports that will provide additional clarity on the archaeological richness of the area. Several studies, forming part of impact assessments, scoping reports and basic assessments, have been conducted in the nearby region.

Northwest of Olifantsvlei, and west of Klipriviersberg, a proposed water reservoir in Meredale required an AIA (2.5km). Field surveys revealed a single stonewalled, Late Iron Age settlement (Coetzee 2015), which itself is 2.7km from the study area in a west-northwest direction and clearly visible on Google Earth. This finding is unsurprising as it is located on a rise, which is typical of such settlement locations (e.g., Sadr 2019b), and in an assessment of the entire mountain range van Schalkwyk and Pelsler (1999) noted a rich archaeological sequence. No Stone Age or historic developments were found, but some modern cement structures were recorded.

Huffman (1999) performed a survey for the Thaba Ya Batswana development (3.5km east) and identified six stonewalled sites. He recommended that all would need mitigation, including mapping and excavations, if they were to be impacted by developments. The sites date to after the sixteenth century AD.

East and on the opposite side of the Klipriviersberg Nature Reserve (5.1km), Fourie (2006) conducted a survey for the Stone Ridge Arch development in the Mulbarton area. He identified a large cemetery with numerous graves (N=48) and four Iron Age, stonewalled structures in the lower altitudes of the premises. These were all of medium significance but mitigation was recommended should they be in the development area.

In the Eikenhof area, however, Huffman (2008) performed a survey for the Eye of Africa development and found no archaeological remains in the northern portion (6.2km south), even though environmentally it is an area one might expect stonewalled sites to occur. To the south, though, in a smaller development area, an ESA site was identified as well as a European farm complex with a small cemetery that he recommended for mitigation.

Van Schalkwyk (2016) conducted a basic assessment for the proposed corridor conduit outfalls for the storm water management system for CJM in the Turfontein area, 7.3km northeast. He did not identify any heritage items largely because the landscape has been heavily modified by urban development. However, he notes that there may be some Stone Age remains particularly around the streams and stream beads. None were noted in the Olifantsvlei assessment.

To the north (8.6km), van der Walt (2013) performed an assessment for the Crown filling station. He identified a row of Plane trees but no other items of any significance.

Stonewalled sites have been located in the Meyersdal area, 10.2km east-northeast. Van Schalkwyk (2017) surveyed an area for a new overflow pipeline. He located three distinct settlements on the hill slopes. Here, however, were many more sites along the mountain range and it was an important settlement location during the Late Iron Age.

Northwest of the study area (10.7km), Huffman and Calabrese (1999) surveyed an area for a proposed development for Baralink. The land was highly disturbed, limiting the identification of heritage remains, but a potential South African War-period site was recorded among five other modern religious sites. Only the South African War-period site was recommended for mitigation if it was to be disturbed, but an assessment by a social specialist was recommended for the area if it were to be impacted given its use by modern groups.

Northeast of Olifantsvlei (14.5km), a survey was conducted by Smeyatsky (2018) for the proposed Ergo reprocessing project of mine tailing dumps. He identified four sites mostly with low significance, and one with medium/high (one was to be impacted by the development). These were an old brickwork structure, a concrete foundation, the old Rosherville Dam wall, and a stonewalled structure and kraal. None were deemed to have high significance.

3. Materials and methods

a. Site location and description

The Mountain Fun Park Luge is proposed for Portion 38 of Farm Olifantsvlei 327 IQ. The property is approximately 16ha and it occurs adjacent to the R82 (Vereeniging Rd) where it meets Pierpont Drive (see Figures 4 and 5 below). The property is west of the Klipriviersberg Nature Reserve and falls within the Eagles Nest suburb. The Afrisam Eikenhof Quarry is west of the property and the Kibler Park suburb occurs to the south. Adjacent to the R82 (east and west), the immediate landscape is characterised by illegal dumping and the redistribution of local deposits likely from the construction of the road. The eastern portion of the property occurs at the lowest elevation and comprises an open landscape with a small stream flowing north to south. In the western portion, the landscape rises considerably in elevation (particularly in the southwest) above the R82 and consists of several dome-like outcrops (exposures of the Ventersdorp and Witwatersrand Systems occur locally). These outcrops are sparsely vegetated, and shallower valleys occur in between where grasses and trees are abundant. The northern portion of the property contains part of an old tarred road leading to an unoccupied and degraded modern multi-compound structure (just beyond the northern property boundary), and the entire area reflects occupation in the recent past. Walking paths occur across all portions of the property, suggesting its use as a thoroughfare. Collectively, the landscape has been disturbed by recent activities.

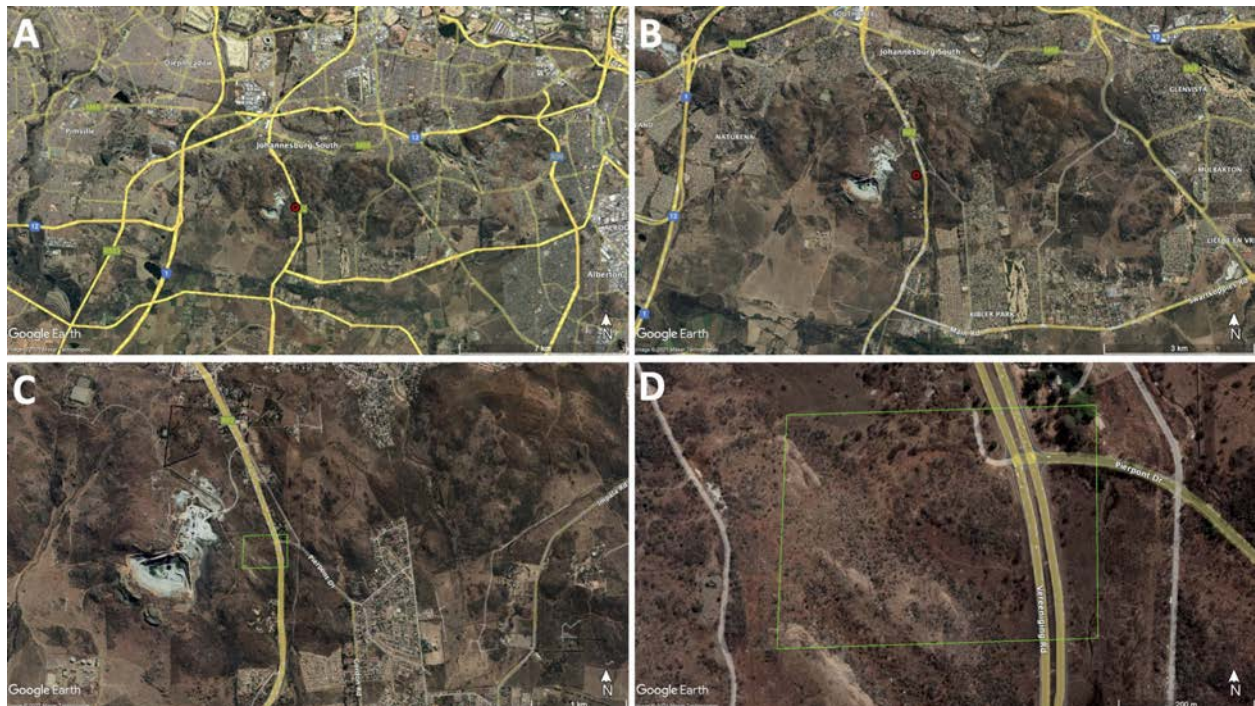


Figure 4: Google Earth images showing the proposed development area. Property location in relation to Johannesburg (A; red point=property location), Johannesburg South and Kibler Park (B; red point=property location), Kibler Park and the Vereeniging (R82) Road (C; property

boundary shown in green) and the nearest major intersection (D; property boundary shown in green).

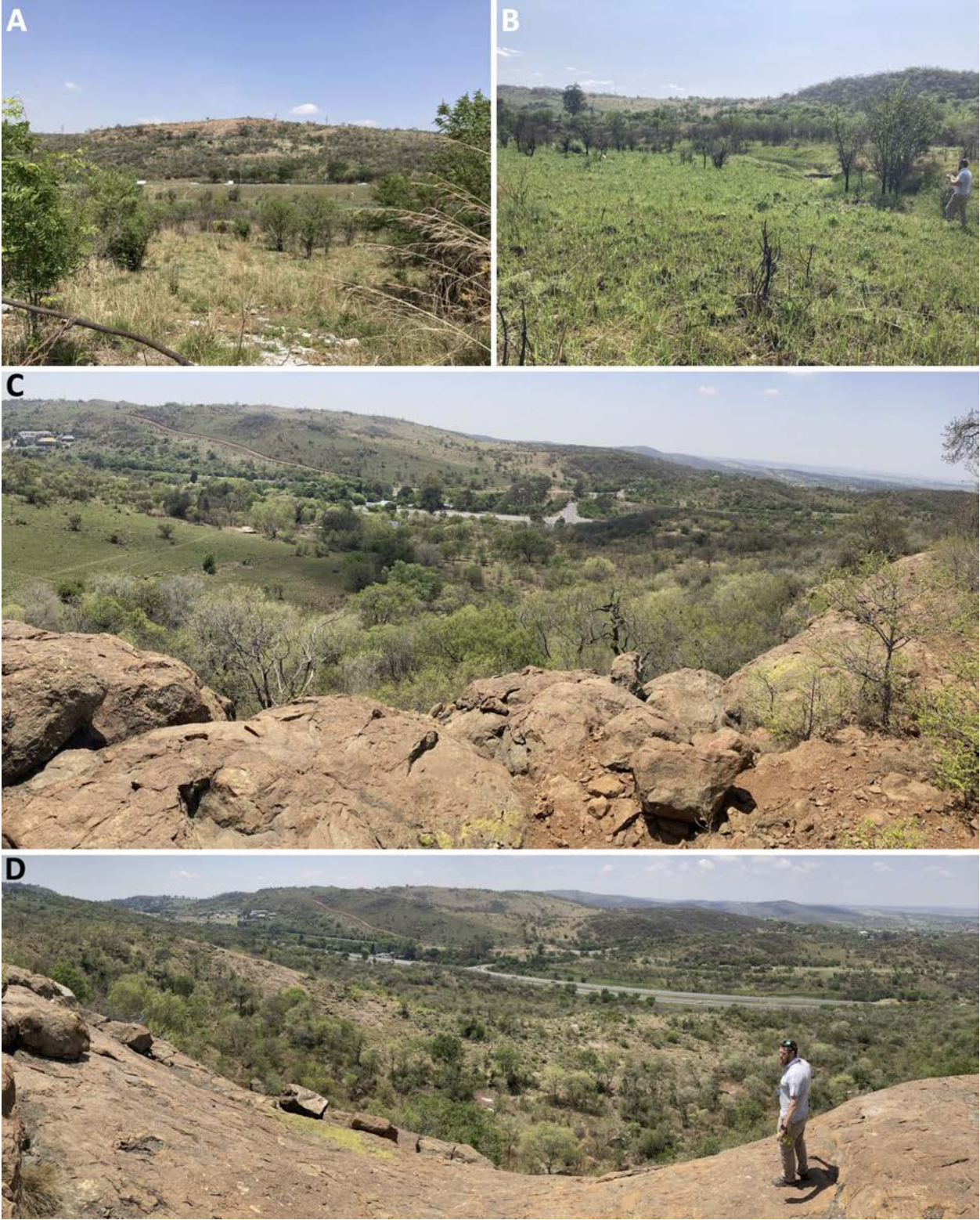


Figure 5: General views of the property. A: in the east portion of the property facing west; B: in the southeast facing north; C: in the west facing east; D: in the southwest facing northeast.

b. Study methods

i. Archival study: background literature review

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

ii. Site visit and survey

The site visit was conducted on October 19th, 2021. This involved a foot survey across the property as indicated by the supplied location information (property delineation; Figure 6). A systematic sampling method was employed during the survey, in which high profile areas and areas most likely to contain preserved archaeology were visited. All archaeological occurrences were sufficiently recorded, photographed and described and a GPS (Garmin 64s) was used to record the surveyed tracks.



Figure 6: The tracklogs illustrate the survey route with complete coverage of the property.

The following equipment was utilised during the field assessment:

- Garmin GPS Oregon
- Canon D70 DSLR camera
- Field journal and stationery
- Photographic scales
- Compass
- Cellular telephones
- Tape measures

c. Significance grading

To record heritage remains, a standard site recording form designed by the consultants was relied on in order to ensure consistency. Moreover, each is scored against a standard grading scale in order to assess significance (see Table 2). We discuss measuring significance after outlining the recorded variables.

i. Excavatable squares

At every archaeological site, the extent is recorded and, based on this and the deposit, it is established how many squares can be excavated. This figure, however, is based on the number of squares expected to be needed to understand the site's sequence and history rather than the total area of the site alone. Determining the excavatability of a site is valuable for a number of reasons: it helps determine how much time would be required to complete the work and the resources needed, including excavators; it assists in developing an appropriate methodological approach; and it aids in determining the scientific potential of the site.

ii. Assemblage diversity

Artefact diversity is a measure of the range of artefact types at a site, or in an assemblage, that may indicate distinct or multiple cultures. These are highly valued markers because they may indicate chronological periods, cultural groups, or even people. Having multiple cultures, or types, at a site is important because it may indicate multiple uses or visits to the site, a lengthy occupation history, or other social relations.

iii. Artefact density

Density is measured per square metre and is based on an average across the site. Site densities tend to decline as one moves away from the centre or main/primary occupation/activity area, and so these areas are used in this measure. Density is useful because it may relate to the amount of finds preserved or present at a site, which will aid in understanding that specific site or culture's history.

iv. Cultural residues

Cultural residues are a measure of the potential diagnostic components of an assemblage. These are important because they assist with defining a chronology, culture, type, and possibly even identity. The greater the chance of doing so increases the scientific potential of the site and in particular, its chances of contributing to our knowledge in a related field.

v. Deposit

The importance of a site's deposit cannot be understated. Therefore, a measure of the deposit's context is taken in order to better understand the artefact-bearing units at the site and whether they have been disturbed, altered, or relocated as well as if they exhibit some indication of good depth.

vi. Impact

The impact represents the anticipated negative influence that development will have on the site. This ranges from none (Points: 0) to High (Points: 4) and then a final category, Total loss (Points: 5). Any site considered to have any impact, regardless of the grading total, will be re-reviewed to assess further mitigation recommendations. Similarly, a site with no impact will not be considered for mitigation interventions no matter the grading total, but recommendations will be made should the site be impacted at a later stage, or due to a change in the development footprint, and a buffer zone will be instituted.

vii. Scientific potential

The scientific potential of a site is based on five variables:

1. That there is sufficient evidence to be studied at the site
2. That the site is not heavily disturbed or altered

3. That the site is part of a broader set of sites that have not been well-studied in the area
4. That the site contains cultural heritage atypical of the site type
5. That the site is unique

If these conditions are met it is anticipated that the site will contribute to, develop, or alter our understanding of the human past for that region but also within a southern African framework.

Table 2: Significance rating system, where points from the grade scale are awarded to each archaeological find. Where no conditions of the category are met, zero points are awarded (e.g., no deposit).

Category	Grade scale					Value taken
	1	2	3	4	5	
Excavatable squares (1x1m)	1-5	6-10	11-15	16-20	>21	x1
Assemblage diversity	Non-diagnostic	Single culture	Two basic types	Two cultures	Multiple cultures	x0.5
Artefact density (/m ²)	<5	6-15	16-30	31-50	>51	x1
Cultural residues	Few	None diagnostic	Possible diagnostic	Formal artefacts	Diagnostic artefacts	x2
Deposit	Eroded	Shallow	Slight erosion	Intact, deep	Pristine, deep	x2
Impact	Low	Medium	Med-high	High	Total loss	x2
Scientific potential	Low	Medium	Med-high	High	Unique	x1

To represent specific categories better that are considered more valuable in the context of grading sites that are to be potentially impacted by development, different values are taken for each category. Those that receive double the value are **cultural residues**, **deposit** and **impact**, whereas **assemblage diversity** receives half as it has less bearing on the potential of a site due to modern interference. The maximum grading value a site can receive is 47.5. A site's grading value is divided by the total and then multiplied by 10, making all values out of 10.

Table 3 below illustrates how the grading values translate into significance ratings. Sites with a value less than four have a **LOW** significance and no intervention is recommended. Those between four and six are considered to possess **MEDIUM** significance and should be closely monitored. Although these sites are not graded as having high significance, they still may possess important heritage items that, should they be identified, may need to be examined and studied by a specialist (see Appendix for protocol). All sites with a grading value higher than six are considered **HIGH**, but those above eight are **HIGHEST** and must be mitigated. **HIGH** sites may only need monitoring should there be no impact from development. In such cases, a buffer zone around these sites will need to be established by a specialist to ensure that the site remains safe from development and related influences (e.g., erosion, water run-off etc.). **It should be noted that any site regardless of its significance may be recommended for mitigation depending on the anticipated impact.** For example, **MEDIUM** sites that are to be heavily impacted may be recommended for mitigation, such as an archaeological excavation, or preservation, which would involve avoiding the site or area altogether.

Table 3: Relationship and summary of significance, grading value and action (recommendation).

Significance	None	Low			Medium			High		Highest	
Value	0	1	2	3	4	5	6	7	8	9	10
Action	None				Monitor			Monitor/ mitigate		Mitigation	

To record these variables, a standardised record form is used that notes: location, site and deposit context, human and animal interference, cultural material, chronological markers, deposit depth and cultural material diversity.

Human burials, **under no circumstances**, can be relocated or tampered with until additional measures and community engagement is undertaken. Any burial area must be avoided. Should human remains appear during development, activities in the immediate vicinity must be halted and the area should be cordoned off until a specialist can conduct an assessment.

Points of interest (POI), if any, are also recorded. These are locations that have some items of interest, which may be cultural heritage (tangible and intangible) but also could include geological or environmental features.

viii. Reporting

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

d. Constraints and limitations

During the field assessment, visibility was difficult due to the thick vegetation growth in certain areas. All attempts were made to identify surface residues/artefacts but the considerable grass coverage in areas made this difficult.

Regular, modern human activities on the premises potentially disturb archaeological finds, making them harder to identify. In places used by people, the movement, trampling, disturbing, sweeping-up, and removal of artefacts may make a site appear less dense, on the surface, and therefore be determined as having less significance.

4. Results and discussion

Figures 7 and 8 below provide an indication of the points of interest (POI) located during the survey. Only a single archaeological point of interest was identified that reflects a stone walled structure and a (possibly associated) nearby terrace. In addition, a single possible burial was identified in the eastern portion of the property. The remaining points of interest reflect modern activities on the landscape. We present the sites in three sections below.



Figure 7: Waypoint map showing points/sites of interest.



Figure 8: Waypoint maps showing all POI/site locations for modern/recent features (A; e.g., multi-compound structure, anti-erosion stone stacking and walling, hearths, etc.); possible burial (B); and a stone walled structure with nearby terracing (C).

a. Modern hearths/fireplaces and activities

The most abundant finds on Olifanstvlei were modern hearths/fireplaces (Figure 9). These were located in several locations mostly on the dome-like outcrop. Some appeared still in use, possibly by people visiting the farm for what appears to be religious activities. Additional items identified at some hearths/fireplaces include candles, broken ceramics and refuse (Figure 10). At POI 030, an erected flag was recorded with a stone-packed crucifix nearby and a hearth/fireplace (Figure 11). This occurs in a cleared area within POI 033, discussed below (**Section 4.c.**). Individuals present on the farm during the AIA explained that these hearths/fireplaces were linked to religious activities on the property that included fasting and prayer sessions. These are modern activities still taking place. A Google Earth historic survey shows that these hearths/fireplaces appear between 2013 and 2015, suggesting that this use of the farm started in the last decade (Figure 12).

In addition to the hearths/fireplaces that indicate a contemporary use of the farm, recent dumping and refuse tipping has taken place (Figure 13). In particular, this occurs along the northern boundary, on the western side of the R82. It is here that a road accessible to the public leads into the premises, along which most of the dumping has taken place. Further along the road, but just outside the property boundary to the north, is an abandoned and dilapidated non-historic building (Figure 14 A), around which several dump sites and refuse tips were recorded (Figure 14 B & C). A walled trench was recorded in this area, possibly to direct water flow or for agricultural purposes, and an old road with stone-packing, possibly a previous access road to the buildings (Figure 14 D). Finally, occupation of the property is evident by people in small groups. This takes place under temporary structures and large boulders (Figure 15).



Figure 9: Fireplaces/hearths present on the property, with associated candles (A), stone stacking (B), informal stone walling (C) and a possible sheltering area (nearby boulder; F). Hearths are predominantly associated with modern rubbish (e.g., glass, plastic, items of clothing, etc.).



Figure 10: Ceramic pots (non-archaeological) in multiple locations across the property. In certain instances, the vessels are whole and have names etched into them (E) whereas the majority are broken. The ceramics are frequently associated with modern items such as glass, items of clothing, rubbish and candles.



Figure 11: Flat area in the centre of the property with a large hearth and stone arrangement (cross) with a flag (POI 030). There are additional hearths nearby and it appears to be located within a stone walled structure. Stone terracing and packing occur nearby to the south.

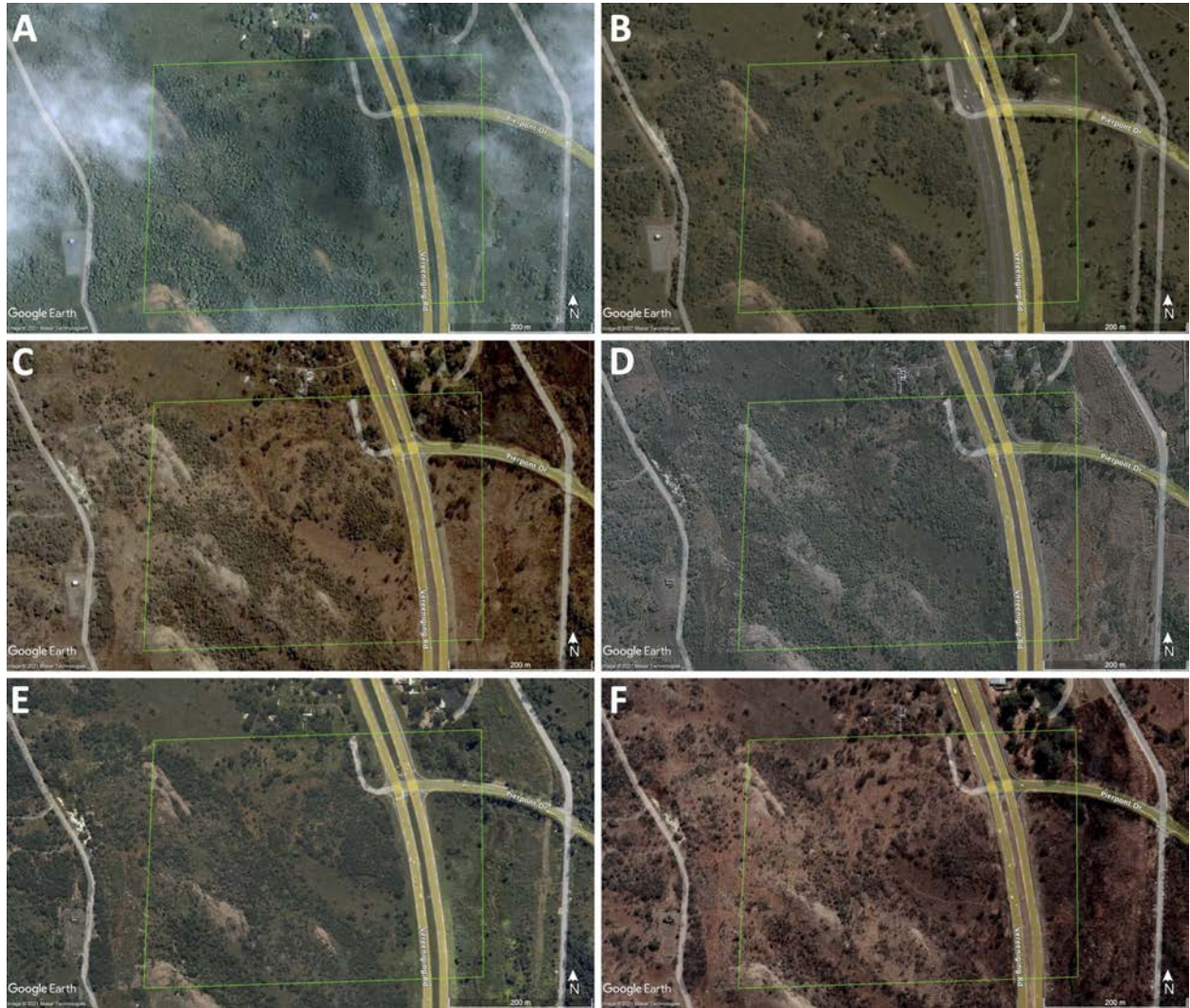


Figure 12: Aerial images of property from 2000 (A), 2004 (B), 2008 (C), 2013 (D), 2015 (E) and 2019 (F), all reflecting minimal (visible) activity on the property since 2000. Note the buildings to the north of the property that begin to degrade between 2004-2008. Visible hearths (greying of surface deposits due to ash/fireplaces) start to occur between 2013-2015.

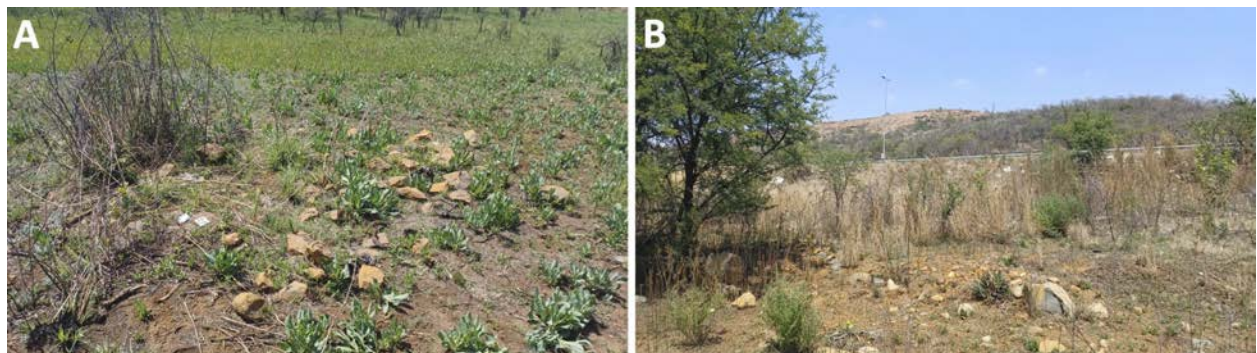


Figure 13: POI 002, another informal collection of rocks that may comprise a stone platform or stone clearing (A). The R82 is nearby and these rocks may be associated with road/rock clearing during road construction. In addition, evidence of refuse dumping is prevalent in this area.

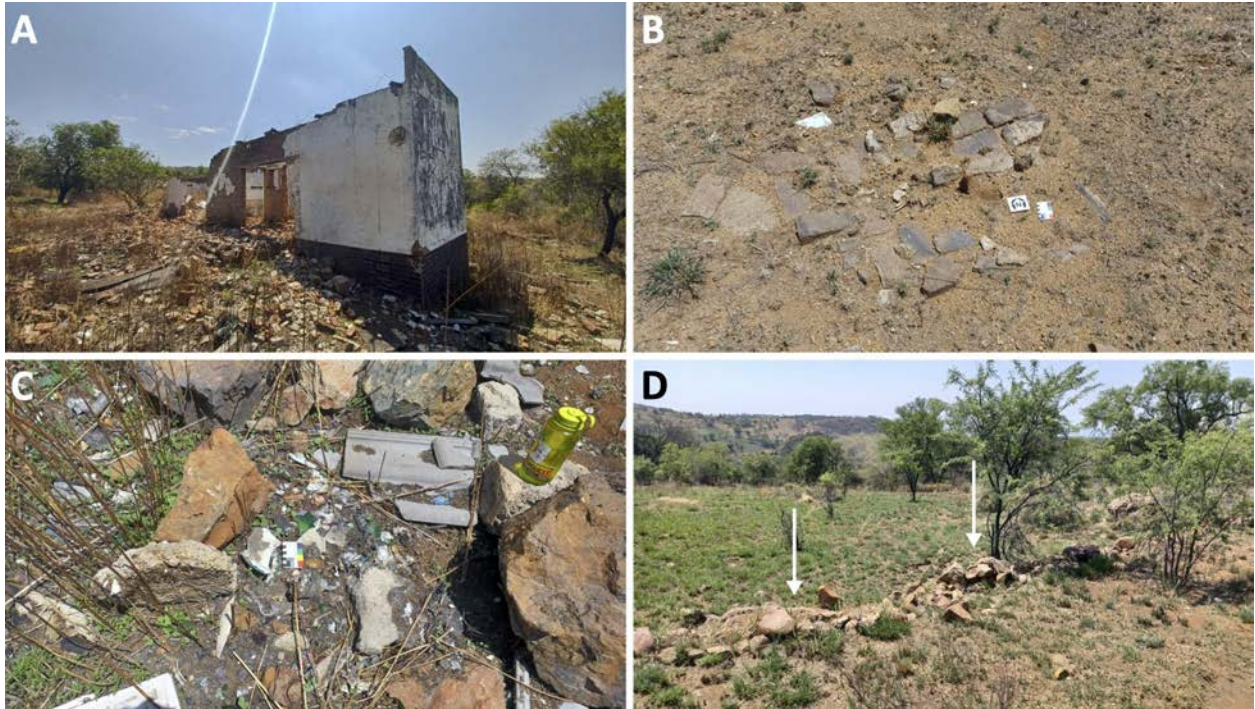


Figure 14: Recent activities evident on the property. Modern multi-compound structure to the north of the property (POI 004; A), with a nearby assortment of bricks that may indicate a small rubble dump (POI 005; B). Rubbish occurs throughout the area (e.g., glass, plastic; C), and some informal stone stacking occurs west of the structure close to a dirt road (POI 006; D, white arrows indicate stone stacking). In places, these stones are stacked in erosion channels to prevent erosion (anti-donga walling).



Figure 15: POI 019 from a distance, where occupation occurs under large boulders and temporary structures/shelters.

b. Possible human burial

In the farm portion east of the R82 is a stone structure of possible significance (Figure 16). POI 001 is a collection of rocks in a roughly elongated shape. The structure is approximately 2 x 0.5m and orientated in a west-east fashion. At the western end is a concrete block. The block has no discernible features but its location is suspicious. The rock structure resembles a historic method of human burial, in which a body is placed into the ground and rocks are packed on top of the grave with a possible headstone. If this is a human burial, the site is of **HIGH SIGNIFICANCE** and cannot be disturbed or interfered with under any circumstances until additional consultations take place, which would involve confirming that it is a grave and then possible repatriation in consultation with relevant stakeholders and communities.



Figure 16: POI 001, an informal collection of rocks and modern debris (e.g., concrete blocks and bricks) that could indicate a burial. Other than the rocks and debris, no other items were found in the immediate area.

c. Archaeological remains

The only archaeological site identified on Olifantsvlei is a stone-walled structure, or settlement, with no cultural material on the surface (site 030, including 033 and 036; grading value 5.05; Figure 17). The site is located more-or-less in the middle of the farm (see Figure 8 C). It includes at least three sections surrounded by stonewalling. The stonewalling resembles typical Tswana-like walls, which are roughly coursed and used as boundary walls and for internal divisions. These appear in southern Africa after AD 1450 and the practice of using stone walls in such a manner continues into the mid-1800s. However, at this stage, it is not possible to establish a chronology for the site.

The central area, marked 030 in Figure 8 C, is currently being used by religious groups visiting the farm. A flag has been erected in the centre of the walled area with a stone crucifix at its base. There are also remains of modern hearths/fireplaces and dumping/tipping in the area. None of this is contemporaneous with the wall builders and their use of the site. The wall is most prominent in the southern perimeter of this area but arches around, both the eastern and western flanks, to the north. Large parts of the wall are disturbed and not presently visible. Further reconnaissance will make it possible to establish the extent and shape of this perimeter wall.

To the south of 030, a large walled terrace exists (036). The walling occurs mostly on the eastern boundary and appears to create a retaining wall for the terraced area upslope. Modern refuse here and a lack of any other features or clear walling make it difficult to ascertain whether this area is associated with 030, although the possibility is highly likely as they are alongside one another and appear to join.

West of 036, is 033, a walled area with low but clear stonewalling in a circular shape. A footpath between 033 and 030 has damaged portions of walling in both areas, including where they would presumably meet. Nonetheless, these areas are certainly associated and part of the same larger stone-walled structure. 033 is mostly overgrown with grass and trees that make identifying the walls difficult and possibly also obstruct identifying cultural material on the ground. Despite this, the stonewalling here appears the most intact.

As this is the only archaeological site identified on Olifantsvlei, a table of grading values per site is not presented. Instead, the grading of the 030 complex is presented alone and are as follows: excavatable squares 3 (it is estimated that 12 in total could be excavated), assemblage diversity 2 (the walling indicates a single culture), artefact density 0 (no artefacts were identified), cultural residues 2 (the walling is the only cultural residue), deposit 6 (slight erosion highly

likely), impact 8 (high) and scientific potential 3 (med-high). This totals 24 and 5.05 out of 10, making it of **MEDIUM** significance and with a recommendation to monitor the site. However, if the site is to be destroyed or impacted, mitigation must take place. To avoid this, no developments, including roads or footpaths, should be carried out within 15m of the site.



Figure 17: Archaeological stone terracing (A & B) and walling (C & D) indicated by the arrows. No archaeological artefacts were found at the surface. The walling is poorly preserved, but where favourable, clear straight-edge arrangements are evident (C) and possible infilling (D).

5. Development impact and proposed mitigation

a. Development impact

Based on the current proposed development footprint, impacts on cultural heritage are foreseeable. In particular, this concerns the northern luge track (track 2), with its proposed route running west to east downslope that will intercept the identified stone walled settlement (030). Impacts are also foreseeable for the planned future expansion of the luge tracks, which will see the joining of tracks 2 with 3. Impact on the potential grave is not foreseeable based on the current proposed development footprint, since all development has been earmarked for the western portion of the property due west of the R82 (the possible burial is due east of this road).

In addition, impacts are foreseeable across the property when considering the location of the luge park infrastructure (i.e., viewing deck, restaurant, upper cable station and launch site, amongst others) and the presence of modern on-site activities by religious visitors both occupying and traversing the landscape. The development plans need to consider these impacts to modern groups and establish suitable solutions in conjunction with the affected parties.

b. Recommendations

Overall, the heritage sensitivity of the area is low. Archaeologically speaking the only areas of concern are the stone-walled structure and the possible grave in the east. Both of these areas should be avoided if possible (i.e., rerouting luge tracks where necessary), and no activities should be carried out within 15m of the sites (Figure 18). If this is not possible, we recommend a more detailed Phase II mitigation to map the extent of 030 and to investigate the possibility of subsurface archaeology (through small excavations). If the possible burial area is to be disturbed, further heritage work is required to assess if it is a burial, and if confirmed, additional community engagement is needed to identify descent groups and to then determine a repatriation protocol.

A further finding that must be considered is the present use of the property by religious groups. Attempts have been made to contact affected parties and those who use the premises but no-one has been forthcoming (this was carried out through the EAP). However, as this is potentially a sensitive matter, consultation with the local community regarding use of the

property for religious purposes is recommended, in addition to acquiring the services of a social specialist to coordinate an assessment on the property and to establish suitable solutions in and around development footprint sensitivities.

Developers should also be cognisant of the possibility that once development commences, cultural heritage buried underground may be exposed. Should this occur, the development in the vicinity of the find should be halted and a specialist must be consulted to examine the finds. A chance finds protocol (see Appendix) outlines the necessary steps to be taken in this regard.



Figure 18: Sensitive archaeological and human burial areas of the property, with 15m buffer zones.

6. Conclusions

Drs Tim Forssman and Matt Lotter were appointed by Aquastrat Solutions (Pty) Ltd to conduct an Archaeological Impact Assessment (AIA) of the Farm Olifantsfontein 327 IQ, Portion 38, for the development of a Mountain Fun Park (Pty) Ltd Luge. The aim of the assessment was to determine the potential impact development would have on heritage resources within the farm boundary.

A single archaeological site was identified. It contains stone walls and no cultural material. The structure has multiple stonewalled areas. Should the site need to be destroyed, it is recommended that a mitigation programme be carried out, involving excavating the settlement, and a destruction permit be applied for through SAHRA. Alternatively, a 15m buffer zone should be instituted around the site and no development should take place within this zone.

A possible grave site was located with a single burial location. This should not be interfered with under any circumstances. Should the need to remove the burial arise, specialist consultation is required to assist with the process of relocating human remains.

Lastly, presently the property is being used by religious visitors to the farm. These visitors use several areas of the farm and leave behind scatters of broken earthenware ceramics, fireplaces and refuse. Although consultation and notifications have been conducted, the limited success in meeting with affected parties is concerning and attempts to engage with these groups should continue. The services of a social specialist should be sought to ensure adequate community participation and engagement.

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8. Appendix

Chance Finds Protocol

The following guidelines should be implemented by Mountain Fun Park (Pty) Ltd and all associated contractors (e.g., developers, builders, landscapers, etc.) should heritage resources be encountered during the development activities. This applies to all archaeological and palaeontological heritage, in addition to graves and burial grounds. Given that heritage resources have been identified on the property, and based on the SAHRIS low palaeontological sensitivity for the property that requires a finds protocol, the following steps should be implemented. Where necessary, Mountain Fun Park (Pty) Ltd should enlist the services of a suitably-qualified heritage professional to assist with any mitigation work or to implement the recommendations provided by additional heritage and/or professional bodies.

Steps:

- 1) All development activities should be halted and the heritage resource should be avoided.
- 2) The individual (e.g., staff member, contractor, etc.) who identified the heritage resource should immediately notify the appropriate person (i.e., assigned individual who is managing or supervising on site activities, such as the Site Foreman, Site Manager, or Environmental Control Officer).
- 3) All information pertaining to the chance find should then be recorded by both the individual and the appropriate person, namely:
 - a) The exact site location (preferably using a GPS)
 - b) Photos of the find in the landscape prior to removal (i.e., if artefacts have to be removed, photos of their location should be taken before they are moved).
 - c) Photos using an appropriate scale should also be taken (i.e., placing a pen or ruler next to the finds)
 - d) Time and date of the discovery
 - e) A brief description of the discovery and, if possible, the level of preservation (i.e., pristine or disturbed).

- f) In the case of any loose artefacts/fossils at the surface that are at risk of being destroyed and/or removed, and if this destruction/modification cannot be avoided, they should be put aside and protected (placed in appropriate storage bags/boxes with suitable labels and information on their original location). In the case of grave/burial goods, these should be left as is
- 4) The appropriate person should then contact a suitable specialist/s (e.g., archaeologist, palaeontologist, etc.) to assess the significance of the identified heritage resources. Photos of the discovery/resources can be sent to the specialist/s for preliminary assessment. In the case of burials/graves, the appropriate person should notify the South African Police Services (SAPS), in addition to the Burial Grounds and Graves (BGG) Unit of the South African Heritage Resources Agency (SAHRA).
 - 5) If, after preliminary assessment, the specialist deems the discovery to be significant/sensitive, then the appropriate person should coordinate a site visit/inspection with the relevant specialist/s. For burials/graves, an inspection by SAPS and the SAHRA BGG Unit will be required to assess the age of the burial and whether it is archaeological, historic, or forensic. Generally speaking, the BGG Unit will allow a suitably-qualified specialist to inspect and report on the burial/grave on their behalf, and Mountain Fun Park (Pty) Ltd should appoint a qualified professional to perform the inspection in conjunction with SAPS.
 - 6) During the site visit, the appropriate person should show the specialist/s the location of the discovery, and they should also make available all the collected artefacts/fossils for further assessment by the specialist/s. The specialist/s should also be shown any other areas of interest, where applicable, that have been affected by the development activities.
 - 7) Palaeontological heritage, if deemed significant and of scientific value by the specialist/s, should be removed and curated wherever appropriate (local repository) for future study. A permit for removal is required by the specialist/s, for which an application needs to be made to SAHRA. In addition, local Heritage Resource Authorities (HRAs) may need to be contacted. For archaeological heritage of the same nature, the same will apply and a Phase II mitigation programme may be established to record, document, and preserve the encountered sites and/or heritage. As per SAHRA regulations, all reporting guidelines must be followed by the relevant specialist/s when receiving permits for mitigation work. For burials/graves, SAPS and the BGG Unit will make the Mountain Fun Park (Pty) Ltd aware of any additional measures they should put in place to mitigate future impacts to the discovery.
 - 8) Once the development activities continue post-mitigation/assessment, future site inspections by specialists will only be needed if additional heritage resources are identified.