

Comprehensive and Professional Solutions for all Heritage Related Matters
CK 2006/014630/23 **VAT NO.: 4360226270**

**A PHASE 1 HERITAGE IMPACT ASSESSMENT & REPORT FOR THE
PROPOSED KOLOMELA & SISHEN AGRICULTURAL PIVOTS
ON PORTION 0 OF THE FARM KAMEELHOEK 478
EAST OF POSTMASBURG (TSANTSABANE LOCAL MUNICIPALITY) IN THE
ZF MGCWU DISTRICT MUNICIPALITY OF THE NORTHERN CAPE PROVINCE**

For:

EXM Environmental Advisory (Pty) Ltd
31 Elim Oord, Duiker Street
Kathu
8446

REPORT: **APAC022/119**

by:

A.J. Pelsler
Accredited member of ASAPA
Member No: 106

December 2022

Assisted by: Me. Heidi Fivaz
UBIQUE Heritage Consultants

P.O.BOX 73703
LYNNWOOD RIDGE
0040

Tel: 083 459 3091

Fax: 086 695 7247

Email: apac.heritage@gmail.com

©Copyright

APELSE ARCHAEOLOGICAL CONSULTING

The information contained in this report is the sole intellectual property of APELSE Archaeological Consulting. It may only be used for the purposes it was commissioned for by the client.

DISCLAIMER:

Although all efforts are made to identify all sites of cultural heritage (archaeological and historical) significance during an assessment of study areas, the nature of archaeological and historical sites are as such that it is always possible that hidden or subterranean sites, features or objects could be overlooked during the study. APELSE Archaeological Consulting can't be held liable for such oversights or for costs incurred as a result thereof.

Clients & Developers should not continue with any development actions until SAHRA or one of its subsidiary bodies has provided final comments on this report. Submitting the report to SAHRA is the responsibility of the Client unless required of the Heritage Specialist as part of their appointment and Terms of Reference

A handwritten signature in black ink, appearing to be 'A. El' or similar, located at the bottom center of the page.

SUMMARY

APelser Archaeological Consulting (APAC) was appointed by EXM Environmental Advisory (Pty) Ltd to conduct a Phase 1 Heritage Impact Assessment for the proposed development of an Agricultural Pivot and associated irrigation on Portion 0 of the farm Kameelhoek 478. As part of the agricultural development the planting and establishment of Pecan Nut trees will also be undertaken. The study & proposed development area is located west of the town of Postmasburg (Tsantsabane Local Municipality) in the ZF Mgcawu District Municipality of the Northern Cape Province. As part of the study a Desktop Palaeontological Impact Assessment was also undertaken, with this report submitted separately to the client.

The fieldwork was conducted on the 3rd of December 2022 by Me. Heidi Fivaz of Ubique Heritage Consultants, accompanied by a representative of Anglo American/Kolomela.

Background research indicates that there are some cultural heritage (archaeological & historical) sites and features in the larger geographical area within which the study area falls, with no known ones located in the specific study area. One Middle Stone Age/early Later Stone Age artifact (find-spot) was recorded just outside the study focus area. This report discusses the results of both the background research and physical assessment and provides recommendations on the way forward.

From a Cultural Heritage point of view it can be concluded that the proposed Kolomela/Sishen Agricultural Pivot and related activities development should be allowed to continue taking into consideration the recommendations provided at the end.

CONTENTS

1. INTRODUCTION	5
2. TERMS OF REFERENCE	5
3. LEGISLATIVE REQUIREMENTS	6
4. METHODOLOGY	9
5. DESCRIPTION OF THE AREA	9
6. DISCUSSION.....	11
7. CONCLUSIONS AND RECOMMENDATIONS	28
8. REFERENCES	29
APPENDIX A: DEFINITION OF TERMS:.....	31
APPENDIX B: DEFINITION/ STATEMENT OF HERITAGE SIGNIFICANCE.....	32
APPENDIX C: SIGNIFICANCE AND FIELD RATING:	33
APPENDIX D: PROTECTION OF HERITAGE RESOURCES:.....	34
APPENDIX E: HERITAGE IMPACT ASSESSMENT PHASES.....	35

1. INTRODUCTION

APelser Archaeological Consulting (APAC) was appointed by EXM Environmental Advisory (Pty) Ltd to conduct a Phase 1 Heritage Impact Assessment for the proposed development of an Agricultural Pivot and associated irrigation on Portion 0 of the farm Kameelhoek 478. As part of the agricultural development the planting and establishment of Pecan Nut trees will also be undertaken. The study & proposed development area is located west of the town of Postmasburg (Tsantsabane Local Municipality) in the ZF Mgcawu District Municipality of the Northern Cape Province. As part of the study a Desktop Palaeontological Impact Assessment was also undertaken.

Background research indicates that there are some cultural heritage (archaeological & historical) sites and features in the larger geographical area within which the study area falls, with no known ones located in the specific study area. One Middle Stone Age/early Later Stone Age artifact (find-spot) was recorded just outside the study focus area.

The client indicated the location and boundaries of the study & development area and the assessment focused on this. The report was drafted and developed in line with Appendix 3 of the EIA Regulations. The overall aim of the study was to determine if there are any sites, features or material of cultural heritage (archaeological and/or historical) origin or significance in the area that had to be assessed and if the proposed development will impact on these resources negatively. Mitigation measures to negate these impacts would then be recommended in the report. The fieldwork was conducted on the 3rd of December 2022 by Me. Heidi Fivaz of Ubique Heritage Consultants, accompanied by a representative of Anglo American/Kolomela.

2. TERMS OF REFERENCE

The Terms of Reference for the study was to:

1. Identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located on the portion of land that will be impacted upon by the proposed development;
2. Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value;
3. Describe the potential impact of the proposed development on these cultural remains, according to a standard set of conventions;
4. Propose suitable mitigation measures to minimize possible negative impacts on the cultural resources; and
5. Review applicable legislative requirements.

3. LEGISLATIVE REQUIREMENTS

Aspects concerning the conservation of cultural resources are dealt with mainly in two Acts. These are the National Heritage Resources Act (Act 25 of 1999) and the National Environmental Management Act (Act 107 of 1998).

3.1. The National Heritage Resources Act

According to the Act the following is protected as cultural heritage resources:

- a. Archaeological artifacts, structures and sites older than 100 years
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
- c. Objects of decorative and visual arts
- d. Military objects, structures and sites older than 75 years
- e. Historical objects, structures and sites older than 60 years
- f. Proclaimed heritage sites
- g. Grave yards and graves older than 60 years
- h. Meteorites and fossils
- i. Objects, structures and sites of scientific or technological value.

The National Estate includes the following:

- a. Places, buildings, structures and equipment of cultural significance
- b. Places to which oral traditions are attached or which are associated with living heritage
- c. Historical settlements and townscapes
- d. Landscapes and features of cultural significance
- e. Geological sites of scientific or cultural importance
- f. Sites of Archaeological and paleontological importance
- g. Graves and burial grounds
- h. Sites of significance relating to the history of slavery
- i. Movable objects (e.g. archaeological, paleontological, meteorites, geological specimens, military, ethnographic, books etc.)

A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon. An Archaeological Impact Assessment (AIA) only looks at archaeological resources. A HIA must be done under the following circumstances:

- a. The construction of a linear development (road, wall, power line, canal etc.) exceeding 300m in length
- b. The construction of a bridge or similar structure exceeding 50m in length
- c. Any development or other activity that will change the character of a site and exceed 5 000m² or involve three or more existing erven or subdivisions thereof

- d. Re-zoning of a site exceeding 10 000m²
- e. Any other category provided for in the regulations of SAHRA or a provincial heritage authority

Structures

Section 34(1) of the Act state that no person may demolish any structure or part thereof that is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

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

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

Archaeology, palaeontology and meteorites

Section 35(4) of the Act deals with archaeology, palaeontology and meteorites. The Act states that no person may, without a permit issued by the responsible heritage resources authority (national or provincial)

- a. destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site or any meteorite;
- b. destroy, damage, excavate, remove from its original position, collect or own any archaeological or paleontological material or object or any meteorite;
- c. trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or paleontological material or object, or any meteorite; or
- d. bring onto or use at an archaeological or paleontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and paleontological material or objects, or use such equipment for the recovery of meteorites.
- e. alter or demolish any structure or part of a structure which is older than 60 years as protected.

The above mentioned may only be disturbed or moved by an archaeologist, after receiving a permit from the South African Heritage Resources Agency (SAHRA). In order to demolish such a site or structure, a destruction permit from SAHRA will also be needed.

Human remains

Graves and burial grounds are divided into the following:

- a. ancestral graves
- b. royal graves and graves of traditional leaders
- c. graves of victims of conflict

- d. graves designated by the Minister
- e. historical graves and cemeteries
- f. human remains

In terms of Section 36(3) of the National Heritage Resources Act, no person may, without a permit issued by the relevant heritage resources authority:

- a. destroy, damage, alter, exhume or remove from its original position of otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
- b. destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- c. bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation, or any equipment which assists in the detection or recovery of metals.

Human remains that are less than 60 years old are subject to provisions of the Human Tissue Act (Act 65 of 1983) and to local regulations. Exhumation of graves must conform to the standards set out in the **Ordinance on Excavations (Ordinance no. 12 of 1980)** (replacing the old Transvaal Ordinance no. 7 of 1925).

Permission must also be gained from the descendants (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated to) before exhumation can take place.

Human remains can only be handled by a registered undertaker or an institution declared under the **Human Tissues Act (Act 65 of 1983 as amended)**.

3.2. The National Environmental Management Act (Act 107 of 1998)

This Act states that a survey and evaluation of cultural resources must be done in areas where development projects, that will change the face of the environment, will be undertaken. The impact of the development on these resources should be determined and proposals for the mitigation thereof are made.

Environmental management should also take the cultural and social needs of people into account. Any disturbance of landscapes and sites that constitute the nation's cultural heritage should be avoided as far as possible and where this is not possible the disturbance should be minimized and remedied.

The specific requirements that specialist studies and reports must adhere to are contained in Appendix 6 of the EIA Regulations.

4. METHODOLOGY

4.1. Survey of literature

A detailed review of available literature was undertaken in order to place the development area in an archaeological and historical context. The sources utilized, including i.e. previous Heritage Assessment and government databases, are indicated in the bibliography.

4.2. Field survey

The field assessment section of the study was conducted on the 3rd of December 2022 according to generally accepted HIA practices contained in the SAHRA 2007 Minimum Standards related to the Archaeological & Paleontological Components of Impact Assessments & Reports. The assessment aimed at locating all possible objects, sites and features of heritage significance in the area of the proposed development. The location/position of all sites, features and objects is determined by means of a Global Positioning System (GPS) where possible, while detailed photographs are also taken where needed.

4.3. Documentation

All sites, objects, features and structures identified are documented according to a general set of minimum standards. Co-ordinates of individual localities are determined by means of the Global Positioning System (GPS). The information is added to the description in order to facilitate the identification of each locality. The significance of each site is assessed and documented.

5. DESCRIPTION OF THE AREA

The study & proposed development area is located approximately 20km west of Postmasburg in the Northern Cape Province, and on Portion 0 of the farm Kameelhoek 478.

The development footprint size measures approximately 40 ha. The previous and current land use is agricultural. The study area falls within the Postmasburg Thornveld vegetation type. The terrain is predominantly an open, flat, disturbed agricultural landscape. The soil within the study area is red aeolian sand of the Kalahari Group, with calcrete deposits.

The vegetation is a typical shrubby thornveld with a dense, low shrub layer with a karroid affinity and a few isolated camelthorn and shepherd trees. The intrusion of a thick grass layer points to past soil disturbances. There are no natural rivers or waterways in the area, but there are two recorded boreholes. Fences bound the site footprint with open farmlands and veld to the north, east, south and west. There is no visible natural erosion present in the site area. Agricultural activities such as crop cultivation and repeated grass cutting have

disturbed the surface soil layer. In addition, several small borrow pits and trenches for irrigation pipes were observed.

According to the land manager, the area was severely flooded in the mid-1970s. As a result, boreholes and irrigation schemes were implemented on-site after this time.



Figure 1: General location of the study & development area (Google Earth 2022).

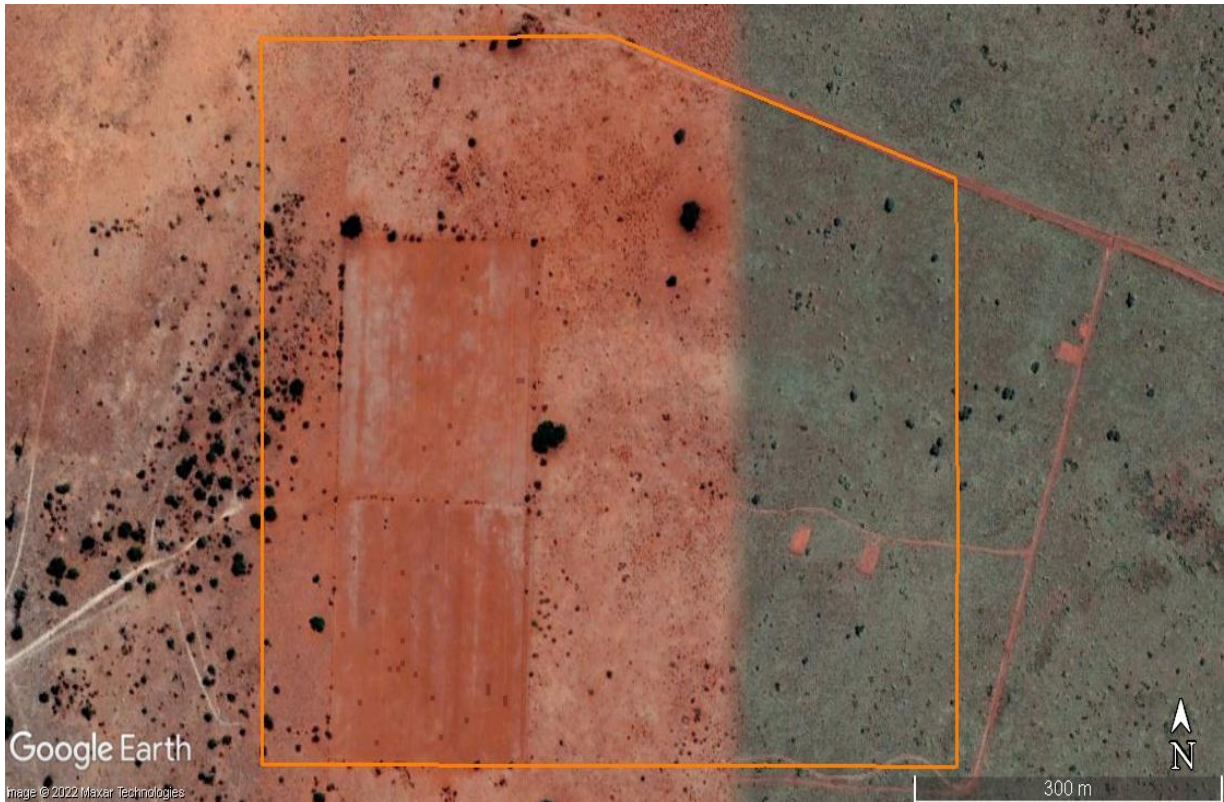


Figure 2: Closer view of the study & development area footprint (Google Earth 2022).

6. RESULTS AND DISCUSSION

6.1 Literature Review

The Stone Age is the period in human history when lithic (stone) material was mainly used to produce tools. In South Africa the Stone Age can be divided basically into three periods. It is however important to note that dates are relative and only provide a broad framework for interpretation. A basic sequence for the South African Stone Age (Lombard et.al 2012) is as follows:

- Earlier Stone Age (ESA) up to 2 million – more than 200 000 years ago
- Middle Stone Age (MSA) less than 300 000 – 20 000 years ago
- Later Stone Age (LSA) 40 000 years ago – 2000 years ago

It should also be noted that these dates are not a neat fit because of variability and overlapping ages between sites (Lombard et.al 2012: 125).

The archaeology of the Northern Cape is rich and varied, covering long spans of human history. The Karoo is particularly bountiful. Some areas are richer than others, and not all sites are equally significant. The significance of sites encountered in the study area may be assessed against previous research in the region and subcontinent. The region's remoteness from research institutions accounts for a relative lack of archaeological research in the area. The area has probably been relatively marginal to human settlement for most of its history,

yet it is in fact exceptionally rich in terms of Stone Age sites and rock art, as a number of studies have shown (Morris 2006).

Stone Age sites are known to occur in the larger geographical area, including the well-known Wonderwerk Cave in the Kuruman Hills, Tsantsabane, an ancient specularite working on the eastern side of Postmasburg, Doornfontein, another specularite working north of Beeshoek and a cluster of important Stone Age sites near Kathu (including the Kathu Pan sites). Additional specularite workings with associated Ceramic Later Stone Age material and older Fauresmith sites (early Middle Stone Age) are known from Lylyfeld, Demaneng, Mashwening, King, Rust & Vrede, Paling, Gloucester and Mount Huxley to the north. Rock engraving sites are known from Beeshoek and Bruce (Morris 2005: 3). A large number of Stone Age sites have been identified during previous studies in the Kolomela Mine Area not far from the study area (Morris 2005, van der Ryst 2011, Miller 2011, Küsel 2011, PGS: 2015 and 2021). During a previous HIA for the Kolomela Mine Airport on the Remaining Extent of the Farm Kalkfontein 474 not far from the current study area a number of open-air Stone Age sites were also recorded (PGS 2020).

As discussed in the subsequent section, a single Stone Age artifact were identified and recorded just outside of and to the west of the study & development area footprint during the December 2022 assessment.

The Iron Age is the name given to the period of human history when metal was mainly used to produce metal artifacts. In South Africa it can be divided in two separate phases (Bergh 1999: 96-98), namely:

- Early Iron Age (EIA) 200 – 1000 A.D
- Late Iron Age (LIA) 1000 – 1850 A.D.

Huffman (2007: xiii) however indicates that a Middle Iron Age should be included. His dates, which now seem to be widely accepted in archaeological circles, are:

- Early Iron Age (EIA) 250 – 900 A.D.
- Middle Iron Age (MIA) 900 – 1300 A.D.
- Late Iron Age (LIA) 1300 – 1840 A.D.

The expansion of early farmers, who, among other things, cultivated crops, raised livestock, made ceramic containers (pots), mined ore and smelted metals, occurred in this area between AD 400 and AD 1100 and brought the Early Iron Age (EIA) to South Africa. They settled in semi-permanent villages (De Jong 2010: 35).

While there is some evidence that the EIA continued into the 15th century in the South African Lowveld, on the escarpment it had ended by AD1100. The Highveld became active again from the 15th century onwards due to a gradually warmer and wetter climate. From here communities spread to other parts of the interior. This later phase, termed the Late Iron Age (LIA), was accompanied by extensive stonewalled settlements, such as the Thlaping capital Dithakong, 40 km north of Kuruman (De Jong 2010: 35-36).

Sotho-Tswana and Nguni societies, the descendants of the LIA mixed farming communities, found the region already sparsely inhabited by the Late Stone Age (LSA) Khoisan groups, the so-called 'first people'. Most of them were eventually assimilated by LIA communities and only a few managed to survive, such as the Korana and Griqua. This period of contact is sometimes known as the Ceramic Late Stone Age and is represented by the Blinkklipkop specularite mine near Postmasburg and finds at the Kathu Pan (De Jong 2010: 36).

No Iron Age sites, features or objects were found during the December 2022 field assessment.

Factors such as population expansion, increasing pressure on natural resources, the emergence of power blocs, attempts to control trade and penetration by Griquas, Korana and white communities from the south-west resulted in a period of instability in Southern Africa that began in the late 18th century and effectively ended with the settlement of white farmers in the interior. This period, known as the difaqane or Mfecane, also affected the Northern Cape Province, although at a relatively late stage compared to the rest of Southern Africa.

Here, the period of instability, beginning in the mid-1820s, was triggered by the incursion of displaced refugees associated with the Tlokwa, Fokeng, Hlakwana and Phuting tribal groups. The difaqane coincided with the penetration of the interior of South Africa by white traders, hunters, explorers and missionaries. The first was P.J. Truter's and William Somerville's journey of 1801, which reached Dithakong at Kuruman. They were followed by Cowan, Donovan, Burchell and Campbell and resulted in the establishment of a London Mission Society station near Kuruman in 1817 by James Read.

The Great Trek of the Boers from the Cape in 1836 brought large numbers of Voortrekkers up to the borders of large regions known as Bechuanaland and Griqualand West, thereby coming into conflict with many Tswana groups and also the missionaries of the London Mission Society. The conflict between Boer and Tswana communities escalated in the 1860s and 1870s when the Korana and Griqua communities became involved and later also the British government. The conflict mainly centered on land claims by various communities. For decades the western border of the Transvaal Boer republic was not fixed. Only through arbitration (the Keate Arbitration), triggered by the discovery of gold at Tati (1866) and diamonds at Hopetown (1867) was part of the western border finally determined in 1871. Ten years later, the Pretoria Convention fixed the entire western border, thereby finally excluding Bechuanaland and Griqualand West from Boer domination (De Jong 2010: 36).

No recent historical sites, features or material were identified and recorded in the study area in December 2022.

6.2 Results of the December 2022 Field Assessment

The area was surveyed from the access point southwest of the footprint. The survey was conducted via vehicle and on foot, in wide transects, as it was obvious that the site's surface had already been previously disturbed by agricultural activities. Therefore, it was deemed unlikely that any sites with archaeological integrity were present.

Since the project will require the excavation of trenches to install the irrigation scheme, existing borrow pits, excavated trenches and animal burrows were inspected to gain insight into the sub-surface matrix of the site. These inspections showed a deep red aeolian sand layer with CCS-type rocks and a calcrete deposit predominantly in the western part of the footprint. No cultural material was recorded in these exposed "walls" or amongst the removed excavated material.

Therefore, it was the surveyor's professional opinion that the proposed project will not have a detrimental impact on any heritage resources.



Figure 3: View from site access in the southwest of the footprint (courtesy Ubique).



Figure 4: Another view of the area from the site access in the southwest of the footprint (courtesy Ubique).



Figure 5: Calcrete deposit example (courtesy Ubique).



Figure 6: Pecan nut saplings with irrigation (courtesy Ubique).



Figure 7: Borehole in the northwest of the footprint (courtesy Ubique).



Figure 8: View of the area from the north-northwest of the footprint (courtesy Ubique).



Figure 9: Another view of the area from the north-northwest of the footprint (courtesy Ubique).



Figure 10: Borrow pit investigated for sub-surface deposits (courtesy Ubique).



Figure 11: View from the northern perimeter road (courtesy Ubique).



Figure 12: Another view of the area from the northern perimeter road (courtesy Ubique).



Figure 13: View from the middle to the eastern half of the development footprint (courtesy Ubique).



Figure 14: Another views from the middle to the eastern half of the development footprint (courtesy Ubique).



Figure 15: View from the northeastern part of the development footprint (courtesy Ubique).



Figure 16: Brick and cement platform, which might have housed a generator or pump relating to borehole irrigation. Younger than 60 years of age and outside of the western footprint boundary (courtesy Ubique).



Figure 17: View of the road on the western side outside of the footprint boundary (courtesy Ubique).



Figure 18: Irrigation pipe trench investigated for sub-surface deposits on the western footprint boundary (courtesy Ubique).



Figure 19: Another section of the irrigation pipe trench investigated for sub-surface deposits on the western footprint boundary (courtesy Ubique).

6.2.1 Stone Age Sites

Only 1 Stone Age site (a find-spot) was identified during the December 2022 field assessment. The small red jasper (CCS) retouched flake is similar to a scraper, but only one side shows signs of retouching. It was found as an isolated occurrence without any archaeological context outside the western boundary of the development footprint. It has little scientific or cultural significance, is considered of Low significance and not conservation-worthy (NCW). Therefore, no further mitigation recommendations are made regarding this isolated find, and the impact on the heritage resource will be negligible.

GPS Location: S28°16'40.43 E22°51'21.99

Cultural Significance: Low

Heritage Significance: None

Field Ratings: General protection C (IV C): Phase 1 is seen as sufficient recording and it may be demolished (Low significance)

Mitigation: None required

6.2.2 Iron Age & Historic Sites

None identified

6.2.3 Site Photographs



Figure 20: The MSA/LSA retouched flake/scrapper recorded during the field assessment (courtesy Ubique).

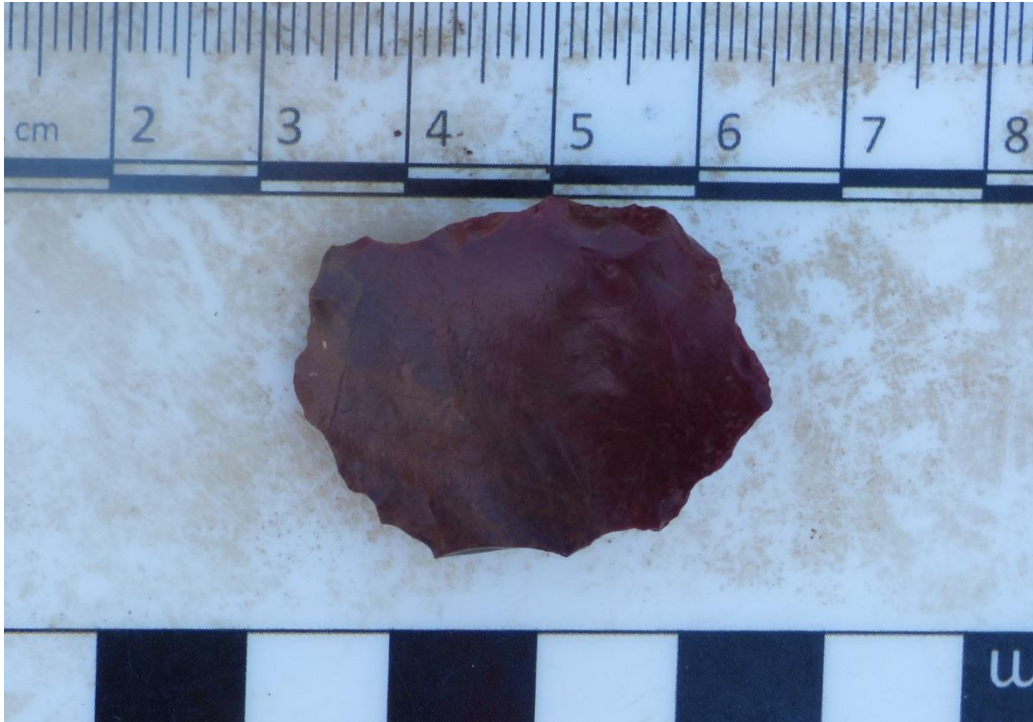


Figure 21: A closer view of the Stone Age artifact (courtesy Ubique)

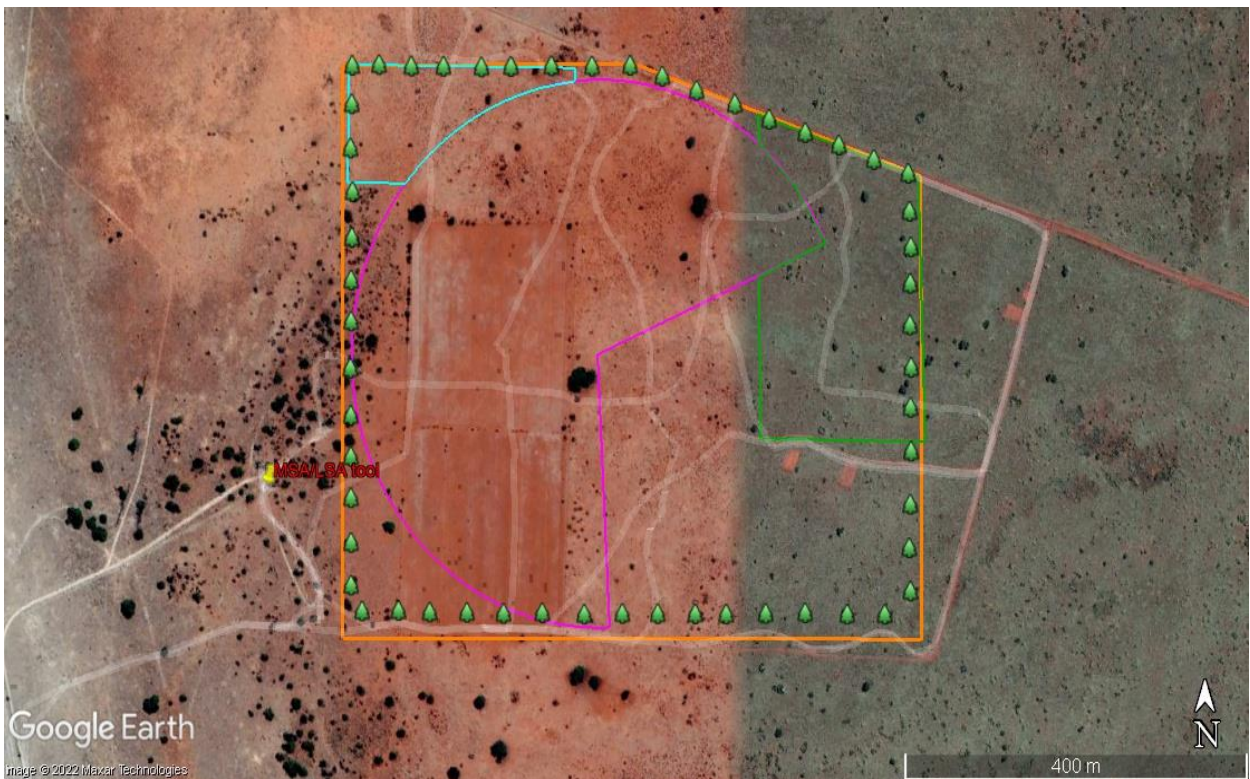


Figure 22: Aerial view showing the proposed layout & location of the Agricultural Pivot and related irrigation and pecan nut trees. The tracks followed during the December 2022 assessment and location of the Stone Age material is also shown (Google Earth 2022).

Impact Assessment and Mitigation Measures

The significance of impacts is determined using the following criteria:

Probability: describes the likelihood of the impact actually occurring

- **Improbable:** the possibility of the impact occurring is very low, due to the circumstances, design or experience.
- **Probable:** there is a probability that the impact will occur to the extent that provision must be made therefore.
- **Highly probable:** it is most likely that the impact will occur at some stage of the development.
- **Definite:** the impact will take place regardless of any prevention plans and there can only be relied on mitigation measures or contingency plans to contain the effect.

Duration: the lifetime of the impact

- **Short Term:** the impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.
- **Medium Term:** the impact will last up to the end of the phases, where after it will be negated.
- **Long Term:** the impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
- **Permanent:** the impact is non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

Scale: the physical and spatial size of the impact

- **Local:** the impacted area extends only as far as the activity, e.g. footprint
- **Site:** the impact could affect the whole or measurable portion of the abovementioned property.
- **Regional:** the impact could affect the area including the neighboring residential areas.

Magnitude/Severity: Does the impact destroy the environment, or alter its function

- **Low:** the impact alters the affected environment in such a way that natural processes are not affected.
- **Medium:** the affected environment is altered, but functions and processes continue in a modified way.
- **High:** function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

Significance: This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

- **Negligible:** the impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.

- **Low:** the impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.
- **Moderate:** the impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.
- **High:** The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

The significance is calculated by combining the criteria in the following formula:

Sum (Duration, Scale, Magnitude) x Probability

S = Significance weighting; Sc = Scale; D = Duration; M = Magnitude; P = Probability

Although some sites, features and material of cultural heritage origin and significance were found in the area during the assessment, the current site layout provided will not impact any of these sites. The impact of the proposed development on the recorded and known heritage sites is therefore deemed as Low.

Aspect	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short Term	1
	Medium Term	3
	Long Term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	Sum (Duration, Scale, Magnitude)	x Probability
	Negligible	≤20
	Low	>20≤40

	Moderate	>40≤60
	High	>60

Results: 1+1+2×1 = 4 i.e.≤20

The impact of the proposed development on the recorded and known cultural heritage sites in the area is therefore deemed as Negligible based on the Impact Assessment criteria used. However, there is always a possibility of sites, features and material being missed as a result of various factors such as vegetation cover hampering visibility on the ground, as well as the often subterranean nature of cultural heritage resources (including low stone-packed or unmarked graves). With the study and development area having been fairly extensively impacted in the recent past through agricultural activities this is however seen as highly unlikely.

7. CONCLUSIONS AND RECOMMENDATIONS

APelser Archaeological Consulting (APAC) was appointed by EXM Environmental Advisory (Pty) Ltd to conduct a Phase 1 Heritage Impact Assessment for the proposed development of an Agricultural Pivot and associated irrigation on Portion 0 of the farm Kameelhoek 478. As part of the agricultural development the planting and establishment of Pecan Nut trees will also be undertaken. The study & proposed development area is located west of the town of Postmasburg (Tsantsabane Local Municipality) in the ZF Mgcawu District Municipality of the Northern Cape Province. As part of the study a Desktop Palaeontological Impact Assessment was also undertaken, with this report submitted separately to the client.

Background research indicated that there are some cultural heritage (archaeological & historical) sites and features in the larger geographical area within which the study area falls, with no known ones located in the specific study area. Only 1 Stone Age site (a find-spot) was identified during the December 2022 field assessment. The small retouched flake/scrapper was found as an isolated occurrence without any archaeological context outside the western boundary of the development footprint. It therefore has little scientific or cultural significance, and is considered of Low significance and not conservation-worthy. No further mitigation measures are required and the impact of the proposed development on the heritage resource will be negligible.

To conclude it can be said that the Phase 1 Heritage Impact Assessment for the proposed Kolomela/Sishen Agricultural Pivot and related irrigation and Pecan Nut trees development on Portion 0 of Kameelhoek 478 was conducted successfully. From a Cultural Heritage point of view there should be no objection to the proposed development.

The often subterranean nature of cultural heritage resources (including low stone-packed or unmarked graves) should also be taken into consideration. Should any previously unknown or invisible sites, features or material be uncovered during any development actions then an expert should be contacted to investigate and provide recommendations on the way forward.

8. REFERENCES

General and Closer views of study & development area location, footprint & Sites recorded: Google Earth 2022.

Proposed development layout: Courtesy EXM Environmental Advisory (Pty) Ltd.

Field Report & Assessment Photos: Provided by Ubique Heritage Consultants

Bergh, J.S. (red.). 1999. **Geskiedenisatlas van Suid-Afrika. Die vier noordelike provinsies**. Pretoria: J.L. van Schaik.

Birkholtz, P & MM van der Ryst. 2015. **Kolomela Amendment Project. Amendment of Existing Mining Activities**. Unpublished Report PGS Heritage. For: Synergistics Environmental Services. March 2015.

De Bruyn, C. 2021. **The proposed development of an Airport for Kolomela Mine in Postmasburg, Northern Cape: Heritage Impact Assessment**. Unpublished Report PGS Heritage. For: EXM Advisory Services (Pty) Ltd. August 2020.

De Jong, R.C. 2010. **Heritage Impact Assessment report: Proposed Manganese and Iron Ore Mining Right Application in respect of the Remainder of the farm Paling 434, Hay Registration Division, Northern Cape Province**. Unpublished Report Cultmatrix Heritage Consultants Project 2010/23 May 2010 for Kai Batla.

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

Knudson, S.J. 1978. **Culture in retrospect**. Chicago: Rand McNally College Publishing Company.

Kusel U.S & S.U Kusel. **November 2011. Heritage Management Plan for Kolomela Mine In the Postmasburg District Municipality of the Northern Cape Province**. An unpublished report by U.S. Kusel U & S.U Kusel. Kumba Iron Ore Kolomela Mine.

Mann, N. & Fourie, W. 2021. **KOLOMELA MINE EXPANSION: Amendment of Existing Mining Activities for Kolomela Mine located South-west of Postmasburg, Northern Cape**. Unpublished Report PGS Heritage. For: EXM Environmental Advisory (Pty) Ltd. October 2021.

Miller S. July 2011. **Phase 2 Documentation Of Architectural Elements On The Farms Leeuwfontein, Kapsteevel, Welgevonden And Strydfontein In The Postmasburg District Municipality Of The Northern Cape Province**. An unpublished report for African Heritage Consultants.

Morris, David. 2005. **Report on a Phase 1 Archaeological Impact Assessment of proposed**

mining areas on the farms Ploegfontein, Klipbankfontein, Welgevonden, Leeuwfontein, Wolhaarkop and Kapstevel, west of Postmasburg, Northern Cape. Kimberley: McGregor Museum.

Morris, David. 2006. **Archaeological Specialist Input to the EIA Phase for the proposed Aries-Garona Eskom Transmission Power Line, Northern Cape and Comment on the Garona Substation Extension.** Unpublished Report September 2006 for Tswelopele Environmental.

Republic of South Africa. 1999. **National Heritage Resources Act (No 25 of 1999).** Pretoria: the Government Printer.

Republic of South Africa. 1998. **National Environmental Management Act (no 107 of 1998).** Pretoria: The Government Printer.

Van der Ryst M. August 2011. **Specialist report on the Stone Age and other heritage resources at Kolomela, Postmasburg, Northern Cape.** An unpublished report.

APPENDIX A: DEFINITION OF TERMS:

Site: A large place with extensive structures and related cultural objects. It can also be a large assemblage of cultural artifacts, found on a single location.

Structure: A permanent building found in isolation or which forms a site in conjunction with other structures.

Feature: A coincidental find of movable cultural objects.

Object: Artifact (cultural object).

(Also see Knudson 1978: 20).

APPENDIX B: DEFINITION/ STATEMENT OF HERITAGE SIGNIFICANCE

Historic value: Important in the community or pattern of history or has an association with the life or work of a person, group or organization of importance in history.

Aesthetic value: Important in exhibiting particular aesthetic characteristics valued by a community or cultural group.

Scientific value: Potential to yield information that will contribute to an understanding of natural or cultural history or is important in demonstrating a high degree of creative or technical achievement of a particular period

Social value: Have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.

Rarity: Does it possess uncommon, rare or endangered aspects of natural or cultural heritage.

Representivity: Important in demonstrating the principal characteristics of a particular class of natural or cultural places or object or a range of landscapes or environments characteristic of its class or of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province region or locality.

APPENDIX C: SIGNIFICANCE AND FIELD RATING:

Cultural significance:

- Low: A cultural object being found out of context, not being part of a site or without any related feature/structure in its surroundings.
- Medium: Any site, structure or feature being regarded less important due to a number of factors, such as date and frequency. Also any important object found out of context.
- High: Any site, structure or feature regarded as important because of its age or uniqueness. Graves are always categorized as of a high importance. Also any important object found within a specific context.

Heritage significance:

- Grade I: Heritage resources with exceptional qualities to the extent that they are of national significance
- Grade II: Heritage resources with qualities giving it provincial or regional importance although it may form part of the national estate
- Grade III: Other heritage resources of local importance and therefore worthy of conservation

Field ratings:

- i. National Grade I significance: should be managed as part of the national estate
- ii. Provincial Grade II significance: should be managed as part of the provincial estate
- iii. Local Grade IIIA: should be included in the heritage register and not be mitigated (high significance)
- iv. Local Grade IIIB: should be included in the heritage register and may be mitigated (high/medium significance)
- v. General protection A (IV A): site should be mitigated before destruction (high/medium significance)
- vi. General protection B (IV B): site should be recorded before destruction (medium significance)
- vii. General protection C (IV C): phase 1 is seen as sufficient recording and it may be demolished (low significance)

APPENDIX D: PROTECTION OF HERITAGE RESOURCES:

Formal protection:

National heritage sites and Provincial heritage sites – Grade I and II

Protected areas - An area surrounding a heritage site

Provisional protection – For a maximum period of two years

Heritage registers – Listing Grades II and III

Heritage areas – Areas with more than one heritage site included

Heritage objects – e.g. Archaeological, palaeontological, meteorites, geological specimens, visual art, military, numismatic, books, etc.

General protection:

Objects protected by the laws of foreign states

Structures – Older than 60 years

Archaeology, palaeontology and meteorites

Burial grounds and graves

Public monuments and memorials

APPENDIX E: HERITAGE IMPACT ASSESSMENT PHASES

1. Pre-assessment or Scoping Phase – Establishment of the scope of the project and terms of reference.
2. Baseline Assessment – Establishment of a broad framework of the potential heritage of an area.
3. Phase I Impact Assessment – Identifying sites, assess their significance, make comments on the impact of the development and makes recommendations for mitigation or conservation.
4. Letter of recommendation for exemption – If there is no likelihood that any sites will be impacted.
5. Phase II Mitigation or Rescue – Planning for the protection of significant sites or sampling through excavation or collection (after receiving a permit) of sites that may be lost.
6. Phase III Management Plan – For rare cases where sites are so important that development cannot be allowed.