Archaetnos Culture & Cultural
Resource Consultants
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A FINAL REPORT ON THE ARCHAEOLOGICAL MITIGATION OPEN-AIR STONE AGE SCATTERS IMPACTED ON BY THE THE PROPOSED IKWEZI DOORNKOP MINE DEVELOPMENT ON VARIOUS FARMS IN THE DANNHAUSER LOCAL MUNICIPALITY, AMAJUBA DISTRICT MUNICIPALITY, KWAZULU NATAL

For:

IKWEZI MINING
PRIVATE BAG X11
BIRNAM PARK
2015

REPORT: **AE01233P**

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Field Work conducted: ***May 2011*** Date of final report version: ***June 2012***

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The South African Heritage Resources Agency (SAHRA) or one of its subsidiary bodies needs to comment on this report and clients are advised not to proceed with any action before receiving these. It is the responsibility of the client to submit this report to the relevant heritage authority.

In this case Amafa aKwazulu Natali, the Heritage Authority in KwaZulu Natal needs to provide comments

I HEREBY DECLARE THAT I AM AN INDEPENDENT SPECIALIST APPOINTED BY THE CLIENT ON A CONSULTANCY BASIS

SUMMARY

During 2011 Archaetnos cc was requested by Ikwezi Mining to carry out a HIA for the proposed Ikwezi Doornkop Mine Development on various farms in the Dannhauser Local Municipality, Amajuba District Municipality of Kwazulu Natal. During the fieldwork for this assessment, a number of archaeological sites, including surface scatters of Stone Age artifacts, mainly located in erosion dongas in the area, were identified. As some of these sites were to be disturbed by the opencast coal mining operations, it was recommended that Phase 2 Archaeological Mitigation measures be implemented before the work could continue. Phase 2 Archaelogical Mitigation included mapping and the systematic recording and sampling of material from these sites. Other archaeological sites (Iron Age stone walled remains) will not be impacted on by the development and no mitigation was required.

In their Comments on the Heritage Impact Assessment Report (23 March 2011), Amafa agreed with the recommendations made by Archaetnos cc. As a result we were then appointed by Ikwezi Mining to conduct the Phase 2 Mitigation of the sites. After obtaining a permit from Amafa (**Permit Reference No. 0012/02**), the fieldwork was conducted during May 2012. Prof. Marlize Lombard, a Stone Age specialist, acted as our Principal Investigator and conducted the expert analysis of the material collected during the fieldwork.

During the mitigation an area containing a number of the sites (find spots) were chosen and mapped using a handheld GPS. All the Stone Age material (as well as some random finds of Iron Age pottery) in this area were then marked with pegs, either as individual objects or as denser concentrations, photographed and then representative stone tools were sampled to be analyzed in more detail. One control block of 5m x 5m was then also measured out on a concentration of material and the material sampled. One of the aims was to try and determine artifact density in the area. A total number of 146 Stone Artifacts were sampled and used in the expert analysis.

We believe that the work conducted, and the data retrieved through this work, was sufficient enough to enable us to make the necessary deductions. It is in line with the recommendations made during the HIA and the requirements of the permit issued by Amafa. Therefore it is recommended that the development can continue, taking cognizance of the final conclusions and recommendations at the end of this report. Finally, it is our recommendation that a Destruction Permit for the site area that will be developed be issued so that the development can continue.

CONTENTS

A FINAL REPORT ON THE ARCHAEOLOGICAL MITIGATION OPEN-AIR STONE AGE SCATTERS IMPACTED ON BY THE THE PROPOSED IKWEZI DOORNKOP MINE DEVELOPMENT ON VARIOUS FARMS IN THE DANNHAUSER LOCAL MUNICIPALITY, AMAJUBA DISTRICT MUNICIPALITY, KWAZULU NATAL

INTRODUCTION

During 2011 Archaetnos cc was requested by Ikwezi Mining to carry out a HIA for the proposed Ikwezi Doornkop Mine Development on various farms in the Dannhauser Local Municipality, Amajuba District Municipality of Kwazulu Natal. During the fieldwork (March 2011) for this assessment, a number of archaeological sites, including surface scatters of Stone Age artifacts, mainly located in erosion dongas in the area, were identified. As some of these sites were to be disturbed by the opencast coal mining operations, it was recommended that Phase 2 Archaeological Mitigation measures be implemented before the work could continue. Phase 2 Archaelogical Mitigation included mapping and the systematic recording and sampling of material from these sites. Other archaeological sites (Iron Age stone walled remains) will not be impacted on by the development and no mitigation was required.

In their Comments on the Heritage Impact Assessment Report (23 March 2011), Amafa agreed with the recommendations made by Archaetnos cc. Archaetnos cc was duly appointed by Ikwezi Mining to conduct the required Phase 2 Mitigation. After obtaining a permit from Amafa (**Permit Reference No. 0012/02**), the fieldwork was conducted during May 2012. Prof. Marlize Lombard, a Stone Age specialist, acted as our Principal Investigator and conducted the expert analysis of the material collected during the fieldwork.

The mitigation comprised mapping and the detailed recording of all Stone Age material in a pre-selected area and the collection of a representative sample of material for expert analysis on the sites that will be impacted on by the opencast coal mining operations that will be associated with Ikwezi Doornkop Mine development. A total number of 146 Stone Age tools were collected and used in the expert analysis. The result of this analysis is contained in the Expert Report (Appendix 1).

AIMS

The aims of the Archaeological Phase 2 Mitigation of the open-air Stone Age sites that will be impacted on by the Ikwezi Doornkop Mine development were as follows:

(a) to conduct detailed mapping and recording of the Stone Age sites and material present on them;

(b) to determine the age of the stone tools and the Stone Age technological designation they belong to;

(c) to collect a representative sample of stone age material from the area and to try and determine the approximate density of the archaeological “deposit” in the area;

(d) the proper curation of the material in a recognized institution. In this case the Ditsong Museum of Cultural History in Pretoria was identified and will be responsible for the curation of the archaeological sample;

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). The Permit was issued under the provisions of the KwaZulu-Natal Heritage Act (Act No.4 of 2008) and the National Heritage Act.

1.1 The National Heritage Resources Act

According to the above-mentioned 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 or 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 palaeontological importance
g. Graves and burial grounds
h. Sites of significance relating to the history of slavery
i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.)

Archaeology, palaeontology and meteorites

Section 35(4) of this 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 palaeontological site or any meteorite;

b. **destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological 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 palaeontological material or object, or any meteorite; or
d. bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and palaeontological 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), or in this case Amafa. In order to demolish such a site or structure, a destruction permit from SAHRA, or Amafa, will also be needed.

1.2 The National Environmental Management Act

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.

METHODOLOGY

The methodology comprised the following:

Photographic - Photo's of the site and area were taken, while individual objects were also photographed for recording purposes.

Mapping

The perimeter of a selected area containing the Stone Age sites that will be impacted on by the mining operations was walked and mapped using a handheld GPS device. The size of the area selected was calculated in this manner as well, helping with determining artifact density. Individual stone tools and concentrations of tools were also recorded and plotted onto this basic map of the area.

Sampling

After all the tools in the selected area was marked, mapped in and counted a representative sample of stone tools were collected for expert analysis purposes. A control block of 5m x

5m measured out over a concentration of material was also done and the material found in the block sampled. Finally, sampling of material in the larger geographical area on sites that will be impacted was also undertaken. The aims here were basically to obtain different types of tools, material types (the different materials used in the manufacturing of the tools) as well as a representative sample from the different Stone Age periods (Early through to Later Stone Ages).

Analysis & Documentation/Curation of cultural material

Prof. Marlize Lombard, a Stone Age specialist and the Principal Investigator on the project, undertook the expert analysis of the material and provided us with a report on her findings. The curation of the material will be handled by a recognized cultural institution, in this case the Ditsong Museum of Cultural History in Pretoria, who agreed to undertake this required activity. Her analysis was done on 146 collected pieces.

DESCRIPTION OF THE AREA AND SITE

The project area is located in the Dannhauser Local Municipality, which forms part of the Amajuba District Munipality of Kwazulu Natal, between Newcastle and Dannhauser. The HIA study area included a number of farms, namely Rooipoort 10745 HT, Alleen 2 4280 HT, Annie 8798 HT, Buhle Bomzinyathi 17495 HT, Cloneen 7591 HT, Diepsluiten 4270 HT, Doornsluiten 14366 HT, Drangan 8844 HT, Drooge Plaats 7681 HT, Goede Hoop 3857 HT, Kromdraai 8626 HT, Kaal Vlakte 7496 HT, Klip Rand 8627 HT, Omdraai 3855 HT, Rooi Poort B 7545 HT and Struisvogel Kop 4275 HT. Although these farms represent an area in excess of 12 000 hectares, we only concentrated on the areas that will be directly impacted on by the opencast mining pits, access routes/haul roads, stockpiles and other infrastructure.

The area is characterized by rolling hills, large erosion dongas and drainage lines (formed by the Buffels River and its tributaries). Portions have been used in the past for agricultural purposes (crop growing) and cattle grazing. Large sections have also been used for rural residential settlement. As a result very few large trees are found in the area, while the grass cover in the area is also relatively short. Archaeological visibility is therefore fairly good.

Evidence of recent mining and quarrying activities are also visible in the area.

The Stone Age sites are located in the erosion dongas and are characterized by scatters of tools in these locations. Although a number of sites were recorded during the initial survey, these sites are as a matter of fact one occurrence over the entire area.

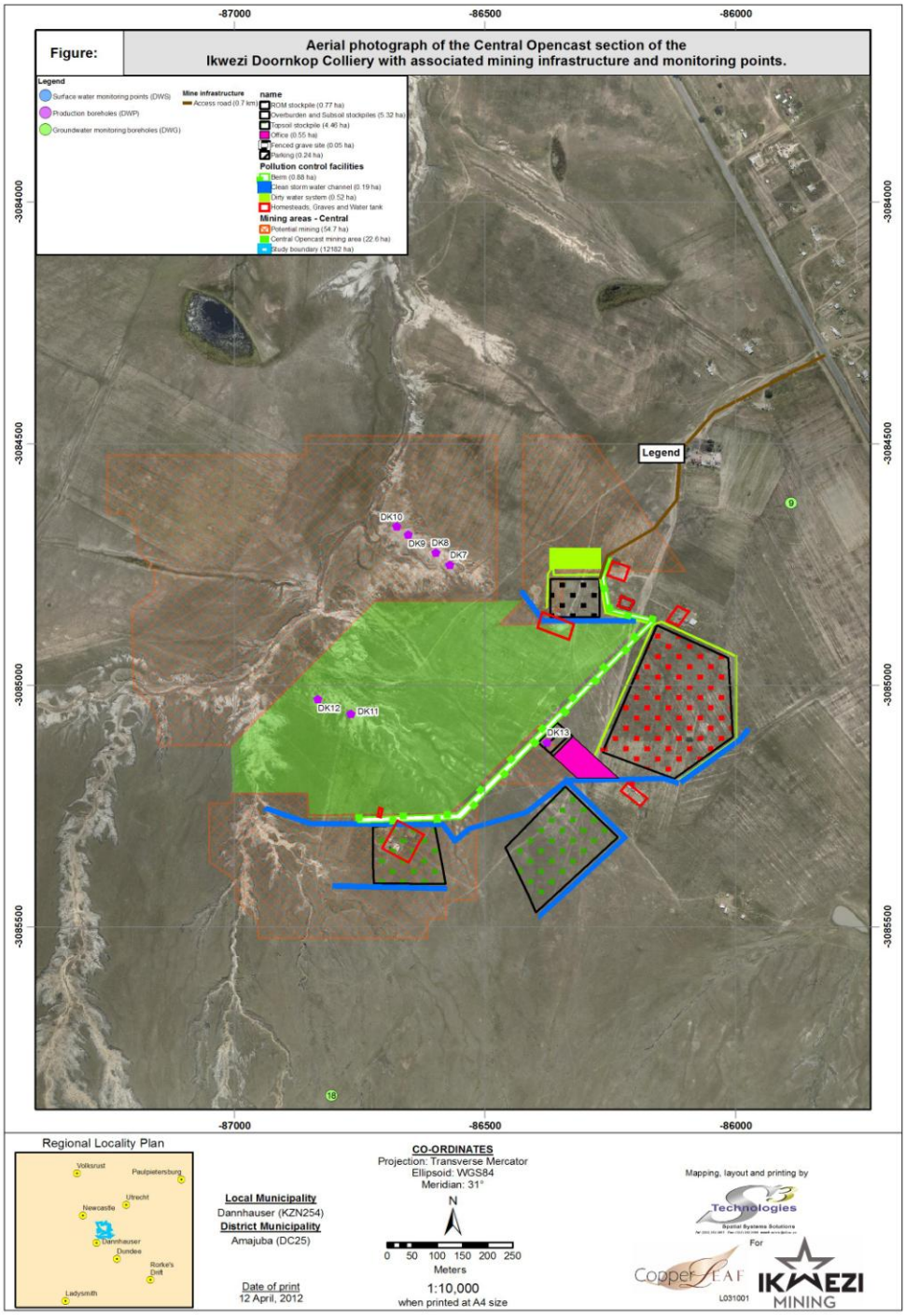

Figure 1: Development location and layout with archaeological sites indicated.

Figure 2: Aerial view of location of archaeological sites.
Note the erosion dongas (Google Earth 2012 – Image 12/23/2010).

Figure 3: General view of area near the archaeological sites.

Figure 4: View of Site 7 – Site 10 erosion donga.

DISCUSSIONS

The Stone Age of the area, in relation to that of southern Africa, will be discussed in detail in the Expert Analysis Report on the material sampled during the mitigation process. Archaeological evidence from KwaZulu-Natal shows that, similar to elsewhere in southern Africa, the region was occupied exclusively by Stone Age hunter-gatherers until the early centuries of the first millennium AD. The Later Stone Age (LSA) is associated with Khoesan people.

A number of the Stone Age sites also contained evidence of later Iron Age presence in the area, specifically containing scatters of undecorated pottery fragments.

Five sites as recorded during the 2011 assessment of the area (DK7-12) were investigated during the mitigation exercise. These sites were as a matter of fact only find-spots in the landscape, represented by different scatters of material, and it is clear that the whole area contains scatters of material of differing density. Site DK10 was a small scatter of undecorated later Iron Age pottery in an area where Stone Age material was also located.

For the mitigation the erosion donga in which sites DK7-10 were located was mapped and the material sampled. This was done in the following fashion. The outer perimeter of the area was walked and mapped using a handheld Garmin GPS device and the size of the area calculated (8520 square meters). Then each individual stone tool, piece of Iron Age pottery and denser concentrations of stone tools were marked with pegs and mapped onto this plot. The number of stone tools was counted and then a representative sample of the stone tools in the donga collected for purposes of expert analysis. One Control Block of 5m x 5m was also measured out on an area with a relatively dense concentration of stone tools and then these were marked, counted and collected in an attempt to help with determining the density of material in the donga.

Surface sampling was also done in the area where Sites DK11 and 12 are located with the aim of increasing the sample size and more specifically to find types of tools and materials not recorded in the controlled mapping and sampling of Sites DK7-10.

It is clear that the archaeological material is not in situ, but that it had eroded out and then was rolled/washed down the slopes of the erosion dongas over time. Some tools were found located higher up on the slopes in the process of being washed down to the floor of the donga. Many of the tools are heavily rolled and patinated as a result. In some cases tools were found covered by sand and silt being washed over it by water flow inside the donga. It is possible that "in situ" objects might be located in areas not eroded as yet. It is also possible that the erosion dongas are situated in old river or stream beds that were silted over in time and that are being exposed again through erosion caused by overgrazing. The tools might have been left here by hunter-gatherers who made and used these tools here. The denser concentrations of material in certain locations might be evidence of this and these could represent activity areas. No shelters or caves are known in the area, although some hills and outcrops do exist. During the assessment Late Iron Age stone walled sites (DK17-19) were found relatively close to these hills and the scatters of undecorated pottery and broken lower upper grinders on the sites in the erosion dongas is explained by this occurrence.

A total of 330 stone tools (of which 15 were found in the control block) were identified and recorded in the donga area represented by Sites DK7-10. Although this means that there are only 1 tool in every 25 square meters or so (a relatively low density) it should be considered that large portions of the donga area is still covered by grass, soil and heaps of washed down sandy deposit. Many more tools could therefore still be located in the area and unexposed.

The stone tools recorded in the area comprise to a large extent flakes and flake tools, points, scrapers, blades, cores and chunks. Three hand axes from the ESA were also recorded.

Control Block 1 was a 5m x 5m square measured out over a relatively dense concentration of material. The area is located in a smaller erosion gully within the donga where soil was deposited down hill from the side of the donga, creating a mound of sorts. All the tools were found on the sides of this mound. Some tools were found under the soil deposit when the area was brushed and cleaned. It is therefore possible that more tools could be found underneath the soil and sand deposited in the area by water flow, while in situ material could also be located in the undisturbed soil strata around the erosion donga. In total 15 stone tools were found in this control block area, including flakes, flake tools, scrapers and broken blades.

In total 7 pieces of undecorated Iron Age pottery and 3 broken upper grinders were also recorded on the sites.

Figure 5: Aerial view of area mitigated. The outer perimeter of the donga section is shown, as well as Sites DK7-10 and the individual tools and denser concentrations (Google Earth 2012 Image 12/23/2010).

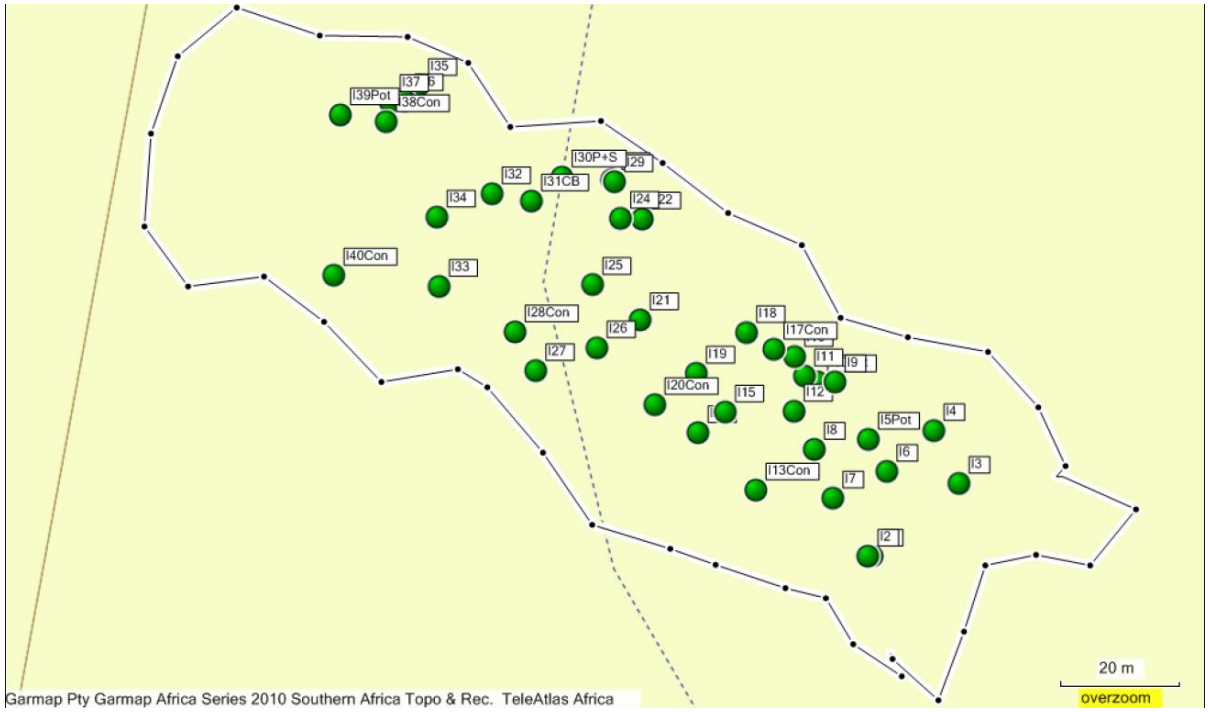

Figure 6: Map of site and individual tools and concentrations (Map Source 2010).

Key to the map:

I – Ikwezi

39 – GPS coordinate number

Con – Concentration of material

Pot – Pottery

P+S – Pottery and Stone tool.

Figure 7: Some undecorated pottery recorded.

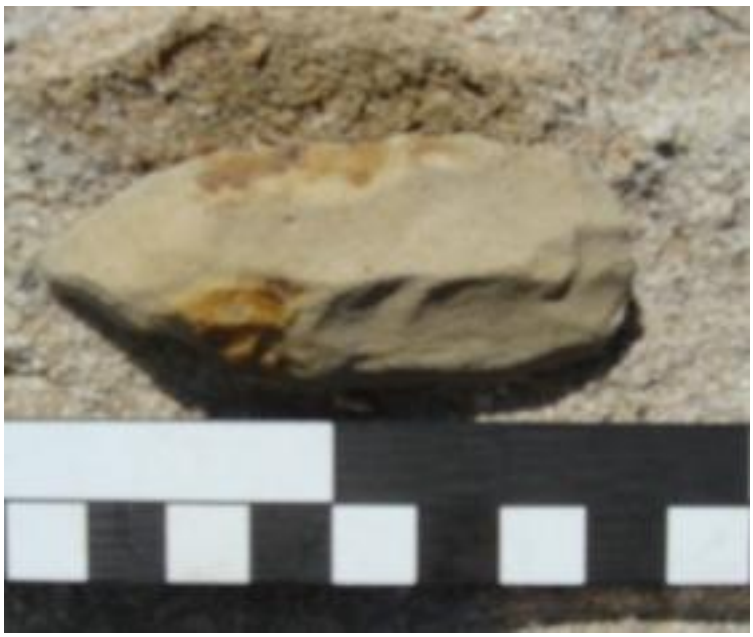

Figure 8: One of the points found.

Figure 9: A quartz blade found in the donga.

Figure 10: Another point/blade recorded.

Figure 11: One of the larger ESA handaxes found.

Figure 12: Possible hammer stone.

Figure 13: Broken Iron Age upper grinder.

Figure 14: A point from the site.

Figure 15: Control Block 1 before cleaning.

Figure 16: Control Block 1 after cleaning.

Figure 17: Some of the stone tools in Control Block 1 marked with red circles.

Figure 18: Red circles in this image show flags marking individual tools and concentrations of material in a section of the donga.

Results of Expert Analysis

Description of the analysed assemblages

A total of 146 pieces were recorded and collected by Archaetnos during mitigation. One hundred and thirteen pieces were collected from the surface of sites 7-10, 15 from a 25 m² control block associated with sites 7-10, and 18 from sites 11-12. The assemblage is predominantly Middle Stone Age with various stages represented (see Tables 2-4). No Later

Stone Age material was identified and only three pieces are clearly associated with the Acheulean stage of the Earlier Stone Age (see Tables 1 and 2 in Expert Report Appendix 1). It was possible to identify pieces with diagnostic characteristics, providing tentative resolution on ages and industrial affiliations as defined in Table 1. Hornfels was mainly used as knapping material, but in some instances the rock is so badly patinated/weathered that identification was not possible (Tables 2-4). The hornfels is generally of high quality and, based on the frequency of cores and core reduction/preparation pieces, it can be accepted that the area was used to source this material in the past. The presence of formal tools such as scrapers and points might indicate human occupation/activity other than material sourcing and knapping in the region.

Sites 7-10 surface collection (Table 2)

Except for three pieces all the material in this assemblage were probably produced during the Middle Stone Age. The three Earlier Stone Age artefacts indicate hominin presence on the landscape between about 300 thousand and 1.5 million years ago during the Acheulean technocomplex. These artefacts have been associated with various members of our genus, including *Homo habilis*, *Homo erectus*, *Homo ergaster* and/or, recently, *Homo gautengensis* (e.g., Kuman & Clarke 2000; Curnoe 2010). No dated or stratified Earlier Stone Age sites have thus far been recorded for KwaZulu-Natal.

The tentative interpretation of the Middle Stone Age material could indicate continued human (archaic/early *Homo sapiens* and *Homo sapiens*) use of the landscape from about 130 thousand to about 20 thousand years ago with all the techno complexes represented. This configuration is rare for assemblages collected from open-air scatters. All the stages/techno complexes have significant, international research value as the Middle Stone Age sequence represents the period during which modern *Homo sapiens* evolved in southern Africa. Potentially identifying the older stages such as the Klasies River and Mossel Bay (n = 5 and n = 4 respectively in assemblage) in KwaZulu-Natal will be an important step towards understanding the cultural sequence in the region. During the last decade the Still Bay techno complex (n = 4 in assemblage), previously believed only to be present along the Cape coast, was published for two stratified and dated KwaZulu-Natal sites; Sibudu Cave (Wadley 2007) and Umhlatuzana (Lombard et al. 2010). Together with the Howiesons Poort techno complex (n = 24 in assemblage), the Still Bay dominates current global debate regarding the evolution of human behavioural and cognitive complexity (e.g., Jacobs et al. 2008; Wadley et al. 2009; Henshilwood & Dubreuil 2011).

The Sibudu techno complex (n = 14 in assemblage) will be announced for the first time during June/July 2012 (Lombard et al. 2012; Mohapi 2012), and its potential presence on more sites in KwaZulu-Natal is stimulating. Other sites apart from the name site where the Sibudu techno complex is probably present include Umhlatuzana and Border Cave in KwaZulu-Natal, and Diepkloof, Klasies River Klein Kliphuis, Melikane, Ntloana Tsoana, Rose Cottage Cave and Sehonghong elsewhere in South Africa and Lesotho. The final Middle Stone Age (n = 9 in assemblage) is still poorly understood, but the KwaZulu-Natal sites of Sibudu (Wadley 2005) and Umhlatuzana (Kaplan 1990, Mohapi submitted) are some of the best recorded assemblages representing this stage in human history.

Sites 7-10 control block (Table 3)

Fifteen artefacts were collected from the 25 m² block, which is not an unusually dense scatter. Most of the artefacts can only be described as generic Middle Stone Age, but a few pieces probably represent the Howiesons Poort, Sibudu and final Middle Stone Age stages. In comparison with the material collected from the wider site 7-10 area it serves to illustrate the limitations of such selective sampling. Even though all the material was collected from this block, its analysis in isolation seem to indicate human presence only between about 66 thousand (the Howiesons Poort) and 20 thousand (the final Middle Stone Age) years ago, whereas the more comprehensive sampling also show much earlier human use of the landscape.

Sites 11-12 surface collection (Table 4)

The general interpretation for this assemblage is similar to that of sites 7-10, but no Earlier Stone Age pieces were identified.

CONCLUSIONS AND RECOMMENDATIONS

In conclusion it is possible to say that the Phase 2 Archaeological mitigation of the open-air Stone Age sites to be impacted on by the opencast mining operations of the Ikwezi Mining Development, located in the Dannhauser District of KwaZulu Natal was completed successfully. The aims were to map the sites and the stone tools located on these sites, as well the collection of a representative sample of Stone Age material from these sites for the purposes of the expert analysis of the Stone tools located here. Furthermore, it was aimed at determining the approximate density of archaeological material on these sites, as well as to determine the time-line of Stone Age use of and presence in the area.

The methodology comprised the mapping of a section of the erosion donga in which Sites DK7-10 was located, as well as the plotting of individual stone tools and denser concentrations of stone tools in this area. A selection of stone tools was then taken, while a single Control Block of 5m x 5m measured out over such a concentration of tools were also done. The recording process included photographs of individual tools as well. Finally, surface sampling of material was also undertaken on Sites DK11 & 12. A total of 330 stone tools were recorded, with around one third of this number collected for analysis. Although the density in an area of more than 8000 square meters is quite low (around 1 tool for every 25 square meters), it was indicated that this number is only an approximation as many more tools could still be covered by soil and sand washed into the erosion donga. In the Control Block of 25 square meters 15 tools were found – some covered by a layer of soil.

Over and above the stone tools some Iron Age material was also recorded. This included a small number of undecorated potsherds, as well as some broken upper grinders. The presence of Later Iron Age sites (stone walled settlements) are known in the area – these recorded during the 2011 assessment.

There are few areas in southern Africa with continuous Middle Stone Age occupation, and it is interpretation from the expert analysis that the area around the eroded open-air sites might be one of these, and should rock shelters with archaeological deposits be recorded in the future these could become prime research excavations.

All the artefacts from the mitigation were, however, collected from secondary contexts, a fact that greatly diminishes the potential heritage and/or research significance of the sites. Even though the open cast mine will permanently destroy the sites it is recommended that a destruction permit is granted.

An open cast mine in combination with the goodwill of the developer may even be beneficial in this case, as it will afford the possibility to observe any subterranean stratified deposits (even if stratification is a result of erosion it can contribute information). It is therefore recommended that an archaeologist monitor the sections of the open cast mine every six months or so for the first two years of operation. Should stratified layers with stone tools be exposed, strategic collection of such artifacts from the sections might provide valuable further information, and depending on substrate such layers may even be datable.

ACKNOWLEDGEMENTS

We would like to acknowledge the following companies and individuals:

Me. Leonie Berjak, on behalf of Ikwezi Mining, for her support of and interest in the work, as well as the liaising with the client

Ikwezi Mining for their appointment and for providing financial assistance for the required mitigation

Dr. Marlize Lombard, Principal Investigator for the project, for her expert advice and analysis of the Stone Age material collected during the fieldwork

Amafa, the KwaZulu-Natal Heritage Authority, for their interest in and support of the work and for providing the permit to conduct the archaeological mitigation work

The Ditsong Museum of Cultural History in Pretoria for agreeing to curate the archaeological material that were sampled during the fieldwork, and finally

Me.Jenny Halvatzis and Me. Felicia Gravett, for all their help and input during the fieldwork Your help and support is much appreciated.

REFERENCES

Site development and Layout Plans/Maps provided by Ikwezi Mining

Aerial views of site distribution: Google Earth

Maps/plot of erosion donga and archaeological finds: Google Earth and Map Source 2010.

Topographic location of development, archaeological sites, position of Control Blocks and Track Log: Map Source 2010

Pelser, A.J. and A.C.Van Vollenhoven. 2011**. A Report on a Heritage Impact Assessment (HIA) for the proposed Ikwezi Doornkop Mine Development on various farms in the**

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APPENDIX 1 – EXPERT REPORT

UNIVERSITY OF JOHANNESBURG
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05 June 2012

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RE: Stone Age expert (Principle Investigator) report

ANALYSIS AND INTERPRETATION OF THE STONE AGE MATERIAL COLLECTED DURING THE MITIGATION OF OPEN-AIR SCATTERS TO BE IMPACTED BY THE THE PROPOSED IKWEZI DOORNKOP MINE DEVELOPMENT ON VARIOUS FARMS IN THE DANNHAUSER LOCAL MUNICIPALITY, AMAJUBA DISTRICT MUNICIPALITY, KWA-ZULU NATAL

Introduction

Here I report on stone tool assemblages collected and recorded during the mitigation of open-air Stone Age sites by Archaetnos Culture & Cultural Resource Consultants (please see their report on location, recording and collecting procedures). I confirm that the assemblages were recorded and collected according to the minimum standards and specifications for professional archaeological practitioners, as set out by the Association of Southern African Professional Archaeologists. Analysis and interpretations of the archaeological material in this report are based on definitions and age estimations provided in the latest updated Stone Age cultural sequence for South Africa and Lesotho (Table 1; Lombard *et al*. 2012).

Table 1
Outline of the Stone Age cultural sequence of southern Africa for Cultural Resources Management purposes. The outline and other information presented here provide a simplified interpretation for the Stone Age sequence. Details may vary from region to region and from site to site. Most of the criteria such as dating, transitional phases, technological phenomena and recursions are currently being researched, so that the information cannot be considered static or final. Contract archaeologists should be able to distinguish at least between the Later, Middle and Earlier Stone Ages, but sometimes finer interpretations might be possible with the criteria provided in this table. The dates are not a neat fit because of variability and overlapping ages between sites.

Period	technocomplex or informal designation	Broadly associated typo/technological characteristics
Later Stone Age < 40 ka General characteristics: expect variability between assemblages, a wide range of formal tools, particularly scrapers (microlithic and macrolithic), backed artefacts, evidence of hafted stone and bone tools, borers, bored stones, upper and lower grindstones, grooved stones, ostrich eggshell (OES) beads and other ornaments, undecorated/decorated OES flasks/flask fragments, bone tools (sometimes with decoration), fishing equipment, rock art, and ceramics in the final phase	***ceramic final Later Stone Age*** ~ 100 years to < 2 ka	• Includes grit- or grass-tempered pottery • Ceramics can be coarse, or well-fired and thin-walled; sometimes with lugs, spouts and conical bases; sometimes with decoration; sometimes shaped as bowls • Stone tool assemblages are often microlithic • In some areas they are dominated by long end scrapers and few backed microliths; in others formal tools are absent or rare • Grindstones are common, ground stone artefacts, stone bowls and boat-shaped grinding grooves may occur • Ochre is common • OES is common • Metal objects, glass beads and glass artefacts also occur
	final Later Stone Age ~ 0.1 to 4 ka	• Much variability can be expected • Variants include macrolithic and/or microlithic assemblages • Assemblages are mostly informal • Often characterised by large untrimmed flakes • Sometimes microlithic with scrapers, blades and bladelets, backed tools and adzes • Worked bone is common • OES is common • Ochre is common • Iron objects are rare • Ceramics are absent
	Wilton ~ 4 to 8 ka	• Fully developed microlithic tradition with numerous formal tools • Highly standardised backed microliths and small convex scrapers OES is common • Ochre is common • Bone, shell and wooden artefacts occur
	Oakhurst ~ 7 to 12 ka	• Flake-based industry • Characterised by round, end, and D-shaped scrapers and adzes • Wide range of polished bone tools • Few or no microliths
	Robberg ~ 12 to18 ka	• Characterised by systematic bladelet (< 26mm) production and the occurrence of *outils écaillés* or scaled pieces (for definition of *outils écaillés* see Hayden 1980) • Significant numbers of unretouched bladelets and bladelet cores • Few formal tools • Some sites have significant macrolithic element
	early Later Stone Age ~ 18 to 40 ka	• Characterised by unstandardised, often microlithic, pieces and includes the bipolar technique • Described at some sites, but not always clear whether assemblages represent a real archaeological phase or a mixture of LSA/MSA artefacts
Middle Stone Age > 20 to < 300 ka General characteristics: Levallois or prepared core techniques occur in which triangular flakes with convergent dorsal scars, often with faceted striking platforms, are produced. Discoidal systems and intentional blade production from volumetric cores also occur; formal tools may include unifacially and bifacially retouched points, backed artefacts, scrapers, and denticulates; evidence of hafted tools; occasionally includes marine shell beads, bone points, engraved ochre nodules, engraved OES fragments, and grindstones	***final Middle Stone Age*** ~ 20 to 40 ka	• Characterised by high regional variability that may include, e.g., bifacial tools, bifacially retouched points, hollow-based points • Triangular flake and blade industries (similar to Strathalan and Melikane) • Small bifacial and unifacial points (similar to Sibudu and Rose Cottage Cave) • Sibudu point characteristics: short, stout, lighter in mass compared to points from the Sibudu technocomplex, but heavier than those from the Still Bay • Can be microlithic • Can include bipolar technology • Could include backed geometric shapes such as segments, as well as side scrapers
	Sibudu ~ 45 to 58 ka	• Most points are produced using Levallois technique • Most formal retouch aimed at producing unifacial points • Sibudu point (type fossil) characteristics: faceted platform; shape is somewhat elongated with a mean length of 43.9 mm), a mean breadth of 26.8 mm and mean thickness of 8.8 mm (L/B ratio 1.7); their mean mass is 11.8 g (Mohapi submitted) • Some plain butts • Rare bifacially retouched points • Some side scrapers are present • Backed pieces are rare
	Howieson's Poort ~ 58 to 66 ka	• Characterized by blade technology • Includes small (< 4 cm) backed tools, e.g., segments, scrapers, trapezes and backed blades • Some denticulated blades • Pointed forms are rare or absent

	Still Bay ~ 70 to 77 ka	• Characterised by thin (< 10 mm), bifacially worked foliate or lanceolate points with either a semi-circular or wide-angled pointed butt • Could include blades and finely serrated points
	pre-Still Bay ~ 72 to 96 ka	• Characteristics currently being determined / studied
	Mossel Bay ~ 77 to 105 ka	• Characterised by recurrent unipolar Levallois point and blade reduction • Products have straight profiles; percussion bulbs are prominent and often splintered or ring-cracked • Formal retouch is infrequent and restricted to sharpening the tip or shaping the butt
	Klasies River ~ 105 to 130 ka	• Recurrent blade and convergent flake production • End products are elongated and relatively thin, often with curved profiles • Platforms are often small with diffused bulbs • Low frequencies of retouch • Denticulated pieces
	early Middle Stone Age ~ 130 to 300 ka	• This phase needs future clarification regarding the designation of cultural material and sequencing • Includes discoidal and Levallois flake technologies, blades from volumetric cores and a generalized toolkit
Earlier Stone Age > 200 ka Early stages include simple flakes struck from cobbles, core and pebble tools; later stages include intentionally shaped handaxes, cleavers and picks; final or transitional stages have tools that are smaller than the preceding stages and include large blades	***ESA-MSA transition*** > 200 to 600 ka	• Described at some sites as Fauresmith or Sangoan • Relationships, descriptions, issues of mixing and ages yet to be clarified • Fauresmith assemblages have large blades, points, Levallois technology, and the remaining ESA components have small bifaces • The Sangoan contains small bifaces (< 100 mm), picks, heavy- and light-duty denticulated and notched scrapers • The Sangoan is less well described than the Fauresmith and seems to be broadly contemporaneous
	Acheulean ~ 300 ka to 1.5 Ma	• Bifacially worked handaxes and cleavers, large flakes > 10 cm • Some flakes with deliberate retouch, sometimes classified as scrapers • Gives impression of being deliberately shaped, but could indicate result of knapping strategy • Sometimes shows core preparation • Generally found in disturbed open-air locations
	Oldowan ~ 1.5 to 2 Ma	• Cobble, core or flake tools with little retouch and no flaking to predetermined patterns • Hammerstones, manuports, cores • Polished bone fragments/tools

Description of the analysed assemblages

I have scrutinised 146 pieces recorded and collected by Archaetnos during mitigation. One hundred and thirteen pieces were collected from the surface of sites 7-10, 15 from a 25 m² control block associated with sites 7-10, and 18 from sites 11-12. The assemblage is predominantly Middle Stone Age with various stages represented (see Tables 2-4). No Later Stone Age material was identified, and only three pieces are clearly associated with the Acheulean stage of the Earlier Stone Age (see Tables 1 and 2). It was possible to identify pieces with diagnostic characteristics, providing tentative resolution on ages and industrial affiliations as defined in Table 1. Hornfels was mainly used as knapping material, but in some instances the rock is so badly patinated/weathered that identification was not possible (Tables 2-4). The hornfels is generally of high quality and, based on the frequency of cores and core reduction/preparation pieces, it can be accepted that the area was used to source this material in the past. The presence of formal tools such as scrapers and points might indicate human occupation/activity other than material sourcing and knapping in the region.

Sites 7-10 surface collection (Table 2)

Except for three pieces all the material in this assemblage were probably produced during the Middle Stone Age. The three Earlier Stone Age artefacts indicate hominin presence on the landscape between about 300 thousand and 1.5 million years ago during the Acheulean technocomplex. These artefacts have been associated with various members of our genus, including *Homo habilis*, *Homo erectus*, *Homo ergaster* and/or, recently, *Homo gautengensis* (e.g., Kuman & Clarke 2000; Curnoe 2010). No dated or stratified Earlier Stone Age sites have thus far been recorded for KwaZulu-Natal.

The tentative interpretation of the Middle Stone Age material could indicate continued human (archaic/early *Homo sapiens* and *Homo sapiens*) use of the landscape from about 130 thousand to about 20 thousand years ago with all the technocomplexes represented. This configuration is rare for assemblages collected from open-air scatters. All the stages/technocomplexes have significant, international research value as the Middle Stone Age sequence represents the period during which modern *Homo sapiens* evolved in southern Africa. Potentially identifying the older stages such as the Klasies River and Mossel Bay (n = 5 and n = 4 respectively in assemblage) in KwaZulu-Natal will be an important step towards understanding the cultural sequence in the region. During the last decade the Still Bay technocomplex (n = 4 in assemblage), previously believed only to be present along the Cape coast, was published for two stratified and dated KwaZulu-Natal sites; Sibudu Cave (Wadley 2007) and Umhlatuzana (Lombard et al. 2010). Together with the Howiesons Poort technocomplex (n = 24 in assemblage), the Still Bay dominates current global debate regarding the evolution of human behavioural and cognitive complexity (e.g., Jacobs et al. 2008; Wadley et al. 2009; Henshilwood & Dubreuil 2011).

The Sibudu technocomplex (n = 14 in assemblage) will be announced for the first time during June/July 2012 (Lombard et al. 2012; Mohapi 2012), and its potential presence on more sites in KwaZulu-Natal is stimulating. Other sites apart from the name site where the Sibudu technocomplex is probably present include Umhlatuzana and Border Cave in KwaZulu-Natal, and Diepkloof, Klasies River Klein Kliphuis, Melikane, Ntloana Tsoana, Rose Cottage Cave and Sehonghong elsewhere in South Africa and Lesotho. The final Middle Stone Age (n = 9 in assemblage) is still poorly understood, but the KwaZulu-Natal sites of Sibudu (Wadley 2005) and Umhlatuzana (Kaplan 1990, Mohapi submitted) are some of the best recorded assemblages representing this stage in human history.

Table 2

Project	Ikwezi Doornkop Mine, Dannhauser Local Municipality, Amajuba District Municipality			
Context	Sites 7-10, surface collection			
Artefact type	**mm**	**Edge**	**Material**	**Condition**
Non-diagnostic stone artefacts				**1**
Hammerstone/spheroid	45		Undetermined	Patina, rolled/weathered
Later Stone Age				**0**
Middle Stone Age				**109**
Middle Stone Age; generic				49
Blade, thick	60		Hornfels	Patina, rolled/weathered
Blade	45	Scarring/utilisation	Hornfels	Rolled/weathered
Chip	15		Hornfels	Patina
Chunk	40	Scarring/utilisation	Hornfels	Patina
Chunk	25	Scarring/utilisation	Hornfels	Patina
Chunk	40	Scarring/utilisation	Hornfels	Rolled/weathered
Chunk	40	Scarring/utilisation	Hornfels	
Chunk	20	Scarring/utilisation	Hornfels	Patina
Chunk	35		Hornfels	Patina
Chunk	30		Hornfels	Patina, rolled/weathered
Core, discoidal	50		Hornfels	Patina, rolled/weathered
Core, discoidal	40		Hornfels	Patina
Core, discoidal	55		Undetermined	Patina, rolled/weathered
Core, Levallois	75		Hornfels	Patina, rolled/weathered
Core, Levallois	90		Hornfels	Patina, rolled/weathered
Core, Levallois	80		Hornfels	Patina, rolled/weathered
Core, volumetric	60		Hornfels	Rolled/weathered
Core, volumetric	40		Hornfels	Patina
Core, volumetric	65		Hornfels	Patina
Core, exhausted	45		Hornfels	Patina, rolled/weathered
Core, exhausted	60		Hornfels	
Core reduction/preparation piece	60		Quartzite	
Core reduction/preparation piece	50		Hornfels	Patina, rolled/weathered
Core reduction/preparation piece	40		Hornfels	Patina, rolled/weathered
Core reduction/preparation piece	40		Hornfels	Rolled/weathered
Core reduction/preparation piece	40		Hornfels	Rolled/weathered
Core reduction/preparation piece	55		Hornfels	
Core reduction/preparation piece	35		Hornfels	Patina

Core reduction/preparation piece	45		Hornfels	
Core reduction/preparation piece	70		Undetermined	Patina, rolled/weathered
Core reduction/preparation piece	50		Undetermined	Patina, rolled/weathered
Core reduction/preparation piece, elongated	50		Hornfels	Rolled/weathered
Flake	45	Bilateral scarring	Hornfels	Patina
Flake	50		Hornfels	Patina, rolled/weathered
Flake	45		Undetermined	Patina, rolled/weathered
Flake	50		Hornfels	Patina
Flake	30		Hornfels	Patina
Flake	25		Hornfels	Patina
Flake	35	Bilateral scarring	Hornfels	Patina, rolled/weathered
Flake	45		Hornfels	Patina, rolled/weathered
Flake	35		Hornfels	Patina, rolled/weathered
Flake	35		Hornfels	Rolled/weathered
Flake	25		Hornfels	Patina
Flake	35		Hornfels	Patina, rolled/weathered
Flake	35	Notch, scarring/utilisation	Hornfels	Patina
Flake, convergent	50	Unifacial scarring	Hornfels	Patina
Flake, convergent	45		Undetermined	Patina, rolled/weathered
Flake, side struck	30		Undetermined	Patina, rolled/weathered
Flake, side struck	50		Hornfels	
final Middle Stone Age				9
Flake, convergent	40		Hornfels	Patina
Flake, convergent	35		Hornfels	
Flake, convergent	40	Unifacial, bilateral retouch/scarring	Hornfels	
Flake, convergent	45		Hornfels	
Point	35	Bifacial, marginal retouch	Hornfels	
Point	35	Bifacial, marginal retouch	Hornfels	Patina, rolled/weathered
Point	40	unifacial, marginal retouch	Hornfels	Patina, rolled/weathered
Point fragment, distal	35	Unifacial, marginal retouch	Hornfels	
Scraper	30	Scarring/utilisation	Hornfels	
Sibudu				14
Flake, convergent, Levallois	50		Hornfels	
Flake, convergent, Levallois	55		Hornfels	
Flake, side struck	70		Hornfels	Patina, rolled/weathered
Flake, side struck	55	Distal scarring	Hornfels	Patina, rolled/weathered
Point	75	Unifacial retouch, butt removal	Hornfels	Patina, rolled/weathered
Point	75	Unifacial, invasive retouch	Hornfels	Patina
Point	55	Unifacial retouch	Hornfels	Patina, rolled/weathered
Point	35	Bifacial, marginal retouch	Hornfels	Patina, rolled/weathered
Point	45	Unifacial retouch	Hornfels	Patina, rolled/weathered
Scraper	35	Scarring along two edges	Hornfels	Patina
Scraper, side	65	Scarring along edges	Hornfels	Rolled/weathered
Scraper, side	45	Scarring along edges	Hornfels	Patina
Scraper, side	45	Retouch, scarring and utilisation along edges	Hornfels	Patina
Scraper, side	50	Scarring along edges	Hornfels	Patina, rolled/weathered
Howiesons Poort				24
Blade	40	Bilateral scarring/utilisation	Hornfels	Rolled/weathered
Blade	30	Bilateral scarring/utilisation	Hornfels	Patina, rolled/weathered
Blade	50	Bilateral scarring/utilisation	Hornfels	Rolled/weathered
Blade	40		Hornfels	Rolled/weathered
Blade	55		Hornfels	Rolled/weathered
Blade	40	Unifacial retouch around 3 edges	Crypto-crystalline silicate	
Blade	45	Unilateral scarring/utilisation	Hornfels	Rolled/weathered
Blade	65	Unilateral scarring/adzing	Hornfels	Patina, rolled/weathered
Blade	60		Hornfels	Patina, rolled/weathered
Blade	45	Proximal scarring	Hornfels	Patina, rolled/weathered
Blade	40		Hornfels	Patina
Blade	35		Hornfels	Patina
Blade	60		Hornfels	
Blade	30	Unilateral scarring/utilisation	Quartz	
Blade	55		Hornfels	Rolled/weathered
Blade fragment	30	Unilateral scarring/utilisation	Hornfels	Patina
Blade fragment	35		Hornfels	Patina
Blade fragment	40		Hornfels	Rolled/weathered
Core, blade	60		Hornfels	Rolled/weathered

Core reduction/preparation piece from blade core	35		Hornfels	Patina
Core reduction/preparation piece from blade core	55	Bilateral scarring/utilisation	Hornfels	
Core reduction/preparation piece from blade core	30		Hornfels	Patina
Core reduction/preparation piece from blade core	45		Hornfels	Patina
Segment, backed geometric	30		Hornfels	Patina, rolled/weathered
Still Bay				4
Point		Unifacial, invasive retouch, rounded butt	Hornfels	Patina
Point roughout	65	Bifacial reduction	Hornfels	Patina, rolled/weathered
Point roughout	45	Bifacial reduction	Hornfels	Rolled/weathered
Point roughout	45	Bifacial reduction	Hornfels	Patina, rolled/weathered
Mossel Bay				4
Flake, convergent, Levallois	50	Unilateral scarring	Undetermined	Patina, rolled/weathered
Flake, convergent, Levallois	50	Unilateral scarring	Undetermined	Patina, rolled/weathered
Flake, convergent, Levallois	50		Quartzite, fine-grained	
Convergent flake, elongated	50	Bilateral scarring	Hornfels	Patina
Klasies River				5
Blade	110	Distal scarring	Hornfels	Rolled/weathered
Convergent flake, elongated	75		Hornfels	Rolled/weathered
Convergent flake, elongated	65		Hornfels	Rolled/weathered
Point	80	Distal, unilateral retouch	Hornfels	Patina
Point	75	Distal, marginal retouch	Hornfels	Patina
Earlier Stone Age				**3**
Acheulean				3
Handaxe	190		Undetermined	Patina, rolled/weathered
Handaxe	130		Undetermined	Patina, rolled/weathered
Flake tool	155		Quartzite	
Total artefacts				**113**

Sites 7-10 control block (Table 3)

Fifteen artefacts were collected from the 25 m² block, which is not an unusually dense scatter. Most of the artefacts can only be described as generic Middle Stone Age, but a few pieces probably represent the Howiesons Poort, Sibudu and final Middle Stone Age stages. In comparison with the material collected from the wider site 7-10 area it serves to illustrate the limitations of such selective sampling. Even though all the material was collected from this block, its analysis in isolation seem to indicate human presence only between about 66 thousand (the Howiesons Poort) and 20 thousand (the final Middle Stone Age) years ago, whereas the more comprehensive sampling also show much earlier human use of the landscape.

Table 3

Project	Ikwezi Doornkop Mine, Dannhauser Local Municipality, Amajuba District Municipality			
Context	Site 7-10, control block 1			
Artefact type	**mm**	**Edge**	**Material**	**Condition**
Later Stone Age				**0**
Middle Stone Age				**15**
Middle Stone Age; generic				8
Chip	20		Hornfels	Patina, rolled/weathered
Chunk	25	Scarring	Hornfels	Patina, rolled/weathered
Chunk	45	Scarring	Hornfels	Patina, rolled/weathered
Core reduction/preparation piece	35	Scarring on one edge	Hornfels	Patina, rolled/weathered
Flake	40	Lateral scarring	Hornfels	Patina, rolled/weathered
Flake	40	Scarring around all edges	Hornfels	Patina, rolled/weathered
Flake	30		Hornfels	Patina, rolled/weathered
Flake, side struck	35	Notch	Hornfels	Rolled/weathered
final Middle Stone Age				1
Flake, convergent, Levallois	40	Notching	Hornfels	Patina, rolled/weathered
Sibudu				2
Flake, side struck	55	Scarring	Hornfels	Rolled/weathered
Flake, side struck	45		Hornfels	Rolled/weathered
Howiesons Poort				4

Blade	15		Hornfels	Patina, rolled/weathered
Blade	35		Hornfels	Patina, rolled/weathered
Blade fragment	20		Hornfels	Patina, rolled/weathered
Core reduction/preparation piece from blade core	35		Hornfels	Patina, rolled/weathered
Earlier Stone Age				**0**
Total artefacts				**15**

Sites 11-12 surface collection (Table 4)

The general interpretation for this assemblage is similar to that of sites 7-10, but no Earlier Stone Age pieces were identified.

Table 4

Project	Ikwezi Doornkop Mine, Dannhauser Local Municipality, Amajuba District Municipality			
Context	Site 11-12, surface collection			
Artefact type	**mm**	**Edge**	**Material**	**Condition**
Later Stone Age Middle Stone Age				**0**
Middle Stone Age; generic				5
Chunk	20		Hornfels	Patina
Core, discoidal	95		Hornfels	Patina, rolled/weathered
Core, exhausted	45		Hornfels	Rolled/weathered
Core reduction/preparation piece	70		Quartzite	
Flake, elongated, convergent, Levallois	55		Hornfels	
final Middle Stone Age				1
Point, Levallois	45	Bifacial, unilateral retouch	Hornfels	Patina, rolled/weathered
Sibudu				3
Point	50	Unifacial retouch	Hornfels	Patina, rolled/weathered
Flake, convergent, Levallois	45		Hornfels	Rolled/weathered
Flake, side struck	45	Distal and lateral scarring	Hornfels	Patina, rolled/weathered
Howiesons Poort				8
Blade	35		Hornfels	Patina, rolled/weathered
Blade	50		Hornfels	Patina, rolled/weathered
Blade	50		Hornfels	Patina, rolled/weathered
Blade	35	Notched	Hornfels	Patina, rolled/weathered
Blade	65	Unilateral scarring/utilisation	Hornfels	Patina
Blade fragment	30		Hornfels	
Blade fragment	45		Hornfels	Patina, rolled/weathered
Blade fragment	35		Hornfels	Patina, rolled/weathered
Mossel Bay				1
Flake, convergent, Levallois	50		Hornfels	Patina, rolled/weathered
Earlier Stone Age				**0**
Total artefacts				**18**

Summary and recommendation

There are few areas in southern Africa with continuous Middle Stone Age occupation, and it is my interpretation that the area around the eroded open-air sites might be one of these, and should rock shelters with archaeological deposits be recorded in the future these could become prime research excavations.

All the artefacts from the mitigation were, however, collected from secondary contexts, a fact that greatly diminishes the potential heritage and/or research significance of the sites. Even though the open cast mine will permanently destroy the sites I recommend that a destruction permit is granted.

An open cast mine in combination with the goodwill of the developer may even be beneficial in this case, as it will afford the possibility to observe any subterranean stratified deposits (even if stratification is a result of erosion it can contribute information). I therefore recommend that an

archaeologist monitor the sections of the open cast mine every six months or so for the first two years of operation. Should stratified layers with stone tools be exposed, strategic collection of such artefacts from the sections might provide valuable further information, and depending on substrate such layers may even be datable.

Regards,

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