FINAL ARCHAEOLOGICAL MITIGATION REPORT FOR THE GAMSBERG ZINC MINE, AGGENEYS, NORTHERN CAPE

Prepared for

ERM Southern Africa
2nd floor, The Great Westerford
240 Main Road, Rondebosch, 7725

On behalf of
Black Mountain Mining Pty Ltd

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Prepared by

Jayson Orton

ACO Associates cc
8 Jacob's Ladder
St James
7945

Phone (021) 706 4104
Fax (086) 603 7195
Email: Jayson.Orton@aco-associates.com

EXECUTIVE SUMMARY

ACO Associates cc was appointed by ERM Southern Africa, on behalf of their client Black Mountain Mining (Pty) Ltd (BMM), to conduct archaeological mitigation work ahead of the planned open cast zinc mine at the Gamsberg Inselberg 10 km east of Aggeneys and 43 km west-southwest of Pofadder in the Northern Cape Province.

Although additional mitigation work may be required during implementation phase of the project, this report is a final report on the findings to date.

GI1: This is a large, open scatter of artefacts on top of the mountain. Three areas were sampled and the deposits found to vary between 30 and 78 cm deep. The site is a very dense accumulation of Middle Stone Age artefacts which as yet cannot be dated. Further work at this rich site is required during the implementation phase of the project.

GI2: This site is a small rock shelter that did not appear to have any obvious surface signs of prehistoric occupation. A small test excavation was anticipated. However, it turned out to contain about 30 cm of Later Stone Age archaeological deposit. Just less than half the floor area was excavated in the time available and another two to four square metres should still be removed before destruction of the site can be permitted. Although oil had been spilled in the site in the past, clean deposits were located along the western side of the cave. The finds included stone artefacts, animal bones, ostrich eggshell fragments, ostrich eggshell beads and pottery. The site likely reflects occupation during the last 1000 years, although the small possibility of an ephemeral earlier occupation does exist. The rarity of rock shelter sites in the Northern Cape adds to the significance of this site.

GI3: This open scatter contained a very low density artefact scatter of mixed origin and in very poor context. Most artefacts probably pertain to the Middle Stone Age. All visible artefacts were photographed *in situ* so as to create a record of the type of material present there.

GI4: This site could not be relocated and no mitigation was carried out there. David Morris, who originally recorded the site, suggests that it would not have been any more significant than GI3 and GI5 and that its mitigation can thus be overlooked. This approach has been agreed to by SAHRA.

GI5: Three scatters of Early Stone Age artefacts were located and recorded *in situ* by means of photography. The artefacts included cores, flakes and blades along with a single hand-axe.

GI1 and GI2 both require further mitigation during the pre-construction phase of the project. Both sites carry high significance. In addition to the excavation, site GI2 should be radiocarbon dated.

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1. INTRODUCTION

ACO Associates cc was appointed by ERM Southern Africa, on behalf of their client Black Mountain Mining (Pty) Ltd (BMM), to conduct archaeological mitigation work ahead of the planned open cast zinc mine at the Gamsberg Inselberg. Gamsberg lies 10 km east of Aggeneys and 43 km west-southwest of Pofadder in the Northern Cape Province (Figure 1). An original Heritage Impact Assessment (HIA) was conducted by Morris (2013) and mitigation of five archaeological sites was suggested.

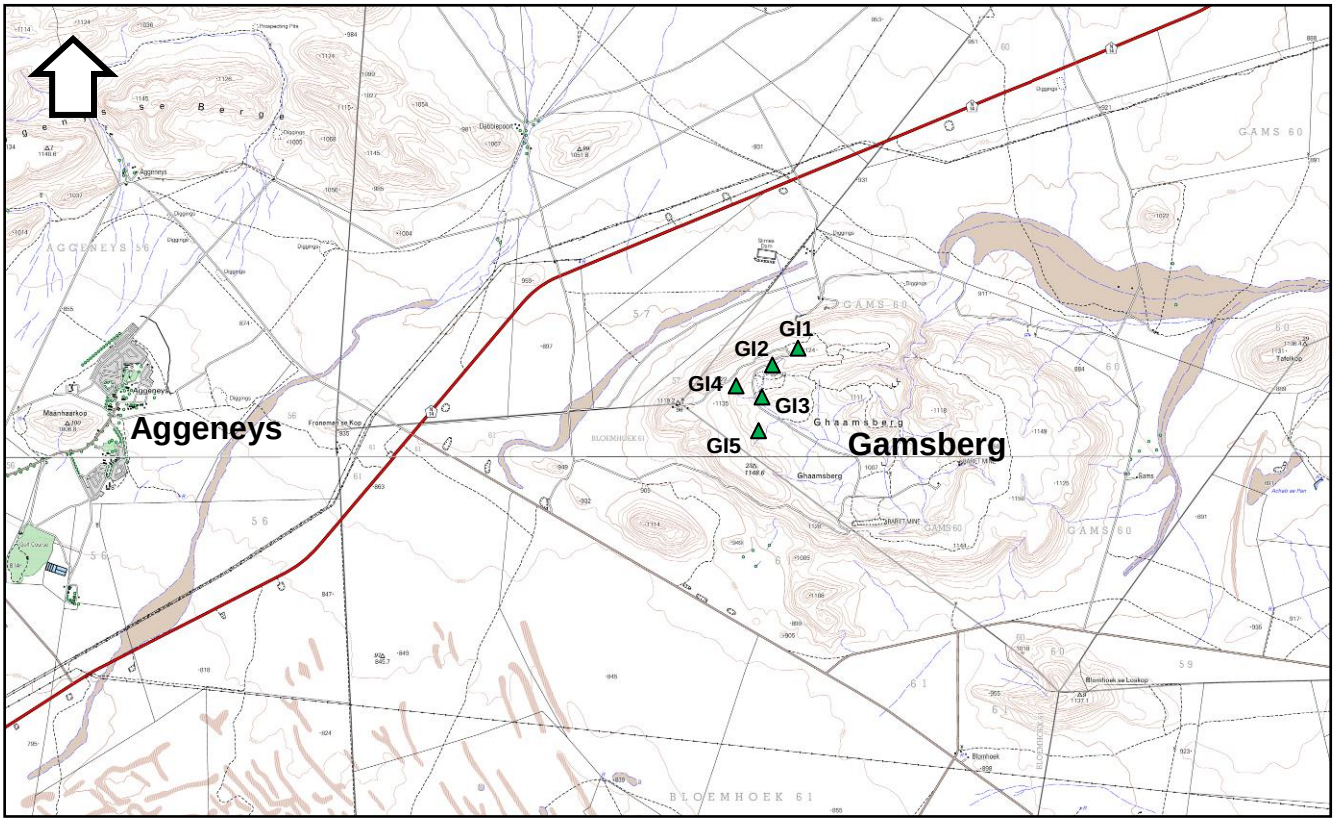

Figure 1: Map showing the location of the Gamsberg Inselberg relative to Aggeneys and the N14 freeway that passes between them.

This report is a final report on the findings thus far. It describes the work carried out to date and presents the findings of the excavations and recording. It also explains for the further work that is required to complete the mitigation.

1.1. Terms of reference

ACO Associates cc was asked to undertake a regulatory Phase 2 archaeological salvage and mitigation process. This should include, inter alia:

1. Compilation and submission of permit application to SAHRA for review and approval;
2. Coordinate and undertake site visit to completed Phase 2 archaeological mitigation, as per the Morris (2013) report; and
3. Compile and distribute Permit Report (ERM, SAHRA), outlining the artefacts that have been recorded and/ or translocated.

2. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA) No. 25 of 1999 protects a variety of heritage resources including palaeontological, prehistoric and historical material (including ruins) more than 100 years old (Section 35), human remains older than 60 years and located outside of a formal cemetery administered by a local authority (Section 36) and non-ruined structures older than 60 years (Section 34). Landscapes with cultural significance are also protected under the definition of the National Estate (Section 3 (3.2d)). Section 38 (2a) states that if there is reason to believe that heritage resources will be affected then an impact assessment report must be submitted. The Morris (2013) report fulfilled that requirement and the present report seeks to describe the mitigation of archaeological resources. This report is required in terms of the permit issued for the purpose.

3. METHODS

3.1. Literature survey

A survey of published and unpublished work was carried out in order to better understand the archaeological context of the material excavated during the present mitigation project.

3.2. Field work

Two types of mitigation were carried out.

- *In situ* recording: This was proposed for sites GI3 and GI5 where the context and quality of the sites was low. This involved examining the sites and photographing the context and artefactual material on site without collecting anything; and
- Formal excavation: This was proposed for sites GI1, GI2 and GI4. Site GI4 could not be located despite considerable searching so no mitigation was carried out here.

Excavation was conducted following standard archaeological techniques. At GI1 we excavated in arbitrary spits since there was no discernible stratigraphy, while at GI2 depositional units were followed as closely as possible.

3.3. Limitations

- GI1: The site was found to be very large and considerably deeper (maximum depth 78 cm) than the estimate (10 cm) reported in Morris (2013). This depth meant that only a small area could be sampled.
- GI2: This small rock shelter had unfortunately had oil dumped in it at some point in the past (presumably during prospecting activities) which meant that the deposits were partially contaminated. Furthermore, two metal poles were inserted through the deposits into the floor of the shelter. The one exposed so far does not appear to have been dug in. A boulder in the southwest corner of the site likely covers clean deposits and this would have to be broken up and removed before further excavation.
- GI4: This site could not be relocated and hence could not be mitigated.

4. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The Gamsberg Inselberg is a roughly oval quartzite mountain with a hollow in the centre drained by a deeply incised valley exiting the inselberg to the north. The central area is gently undulating but with steeper edges leading up to the rim of the mountain. Dry water courses cross the basin and lead to the main gorge. Rock outcrops occur in many places and these vary from very quartz-rich quartzites to more typical quartzites, while banded iron formation outcrops occur in some places. The latter were particularly noticeable around site GI1 in the north. Figures 2 to 5 show aspects of the interior of the inselberg. The sites themselves will be illustrated in the findings section below.

Figure 2: View towards the northeast across the basin. The deep valley draining the basin is visible.

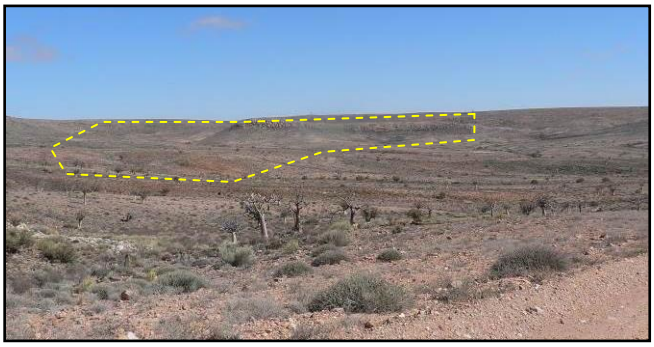

Figure 3: View across the interior of the basin towards the northwest where the mine pit (yellow outline) will be situated.

Figure 4: Panoramic view towards the northwest and northeast showing the gently undulating terrain in the centre of the basin. The mine will be in the left hand part of this image.

Figure 5: Vegetation and substrate within the inselberg.

5. HERITAGE CONTEXT

Little archaeological research has been conducted in northern Bushmanland but in recent years several impact assessment studies have been carried out. These form the basis of this background review. Of most direct relevance are the reports dealing with Gamsberg itself and describing the sites currently under investigation. However, because these sites are described in detail below, they will not be discussed here, suffice to say that Early (ESA), Middle (MSA) and Later (LSA) Stone Age sites have been found on the mountain. Sites found on the plains around the mountain are described though.

In general, ESA and MSA artefacts are located in gravel-rich areas throughout Bushmanland: "Thousands of square kilometres of Bushmanland are covered by a low density lithic scatter" (Beaumont *et al.* 1995). In sandy areas, however, they are absent. Due to their deflated and eroded context such sites usually have limited archaeological significance but the more recent LSA sites can have higher research potential. On the south side of Gamsberg Morris (2013) located two late LSA sites with stone artefacts, ostrich eggshell, bone (on one site) and pottery. Further away to the south he found several granite outcrops to have associated artefact scatters, 'waterbakke' and, in one case, a grinding groove. Pelser (2011) reported MSA and Later Stone Age (LSA) material in an area around the Paulputs Substation near Pofadder, although his illustrations appear to only be of LSA artefacts made on quartz. He also mentions the presence of ostrich eggshell. East of Aggeneys, Webley and Halkett (2012) found a background scatter predominantly of quartz, but including some quartzite artefacts. Although diagnostic MSA features were absent, the general size of the artefacts suggested them to pertain to the Middle Stone Age.

Morris (2011a) considers LSA sites to be the most frequent type of archaeological trace found during surveys in the Aggeneys-Pofadder region. Although Morris (2010) found little LSA material on the northern slopes of the Gamsberg, he did find three LSA settlements on the plains below the mountain. To the northwest of the Gamsberg were two stone cairns, possibly representing graves, as well as an LSA site with pottery. These sites probably represent transient settlement by transhumant hunter-gatherers or herders that moved through the area. Beaumont *et al.* (1995:263) noted that most LSA sites then known in Bushmanland appeared to be ephemeral occupations by small groups of people in the hinterland both north and south of the Orange River. This was in sharp contrast to the substantial herder encampments along the Orange River floodplain itself. Away from the river, LSA material, mainly quartz flakes, appears to often be focused around the base of granite hills (Morris 2011a, 2011b & 2011c; Pelser 2011; Webley & Halkett 2011; Orton & Webley 2013) or around pans (Orton & Webley 2012b). Beaumont *et al.* (1995) further add that red dunes and the margins of seasonal pans also served as foci for LSA occupation. Rock shelter deposits have yet to be reported from the region.

Rock art is known from the region but is uncommon. Rudner and Rudner (1968) note the scarcity of suitable rock canvases and the sparse distribution of art. Engravings occur along the Orange River (Morris 1998) where suitable rock exists, while in the rocky areas away from the river there are rare rock paintings. One is known at Aggeneys, while a possible second painted site occurs at the northern exit of the Gamsberg ravine (Morris 2013). Rudner and Rudner (1968) described the paintings on the farm Kangnas 60 km to the southwest of Aggeneys but their descriptions were somewhat inaccurate. The sites were re-recorded by Orton and Webley (2012a; Orton 2013). The art is geometric tradition art, a style thought to have been painted by herders. Three sites in that area contain rock art, two in a small ravine and one alongside a large pan.

Historical accounts of travels through southern Africa frequently provide clues to the pre-colonial occupation of the land. In this case, two travellers, John Barrow and George Thompson, passed through this area leaving observations on the local population.

Barrow (1801:387) wrote of the plains between the Kamiesberg Mountains and the Orange River that:

> "These plains are now desolate and uninhabited. All those numerous tribes of Namaaquas, possessed of vast herds of cattle, are, in the course of less than half a century, dwindled away to four hordes, which are not very numerous, and in a great measure subservient to the Dutch peasantry, who dwell among them."

Thompsom (1824:288) noted the following:

> "The extensive plains, lying between the Gariep and the Kamiesberg, are represented, by old writers, as occupied by a numerous race of people, possessed of large flocks and herds, and living in ease and abundance. Of these, the tribe now resident at Pella and its vicinity, is the only one remaining."

Both texts show that the area was well inhabited in the past but that colonial expansion was taking its toll on the indigenous inhabitants. Nevertheless, these observations suggest that archaeological remains, at least pertaining to the more recent prehistoric period, should be abundant on the landscape if one looks in the right places.

6. FINDINGS

6.1. GI1

Thus far, three excavations have been carried out at GI1 and a surface observation made at a fourth point. These are discussed in turn below. The remaining exposure of the site is cut approximately in half by the access road on to the top of the inselberg (Figure 6).

The excavation, although very small relative to the overall size of the site, has yielded a large collection of artefacts. The site is unusually dense with the majority of the stone in the site actually being artefactual. No full analysis has taken place as this would be an exceedingly large and costly job. However, an MSA specialist (Wesley Flear) has briefly examined the material, listed the characteristic artefact types found, and provided a brief overview of the assemblage.

6.1.1. GI1-1

The first excavation was carried out at the eastern end of the remaining exposure of the site as follows:

- 6 m^2 were collected from the surface;
- 1 m^2 was excavated to 21 cm depth with three sub-surface spits; and
- 0.25 m^2 was excavated to 78 cm depth with nine subsurface spits (at this point the deposit became sterile).

Artefacts became progressively less dense with depth until at 78 cm the deposit appeared to be totally sterile and excavation was ceased. The upper parts were very rocky but became more calcrete-rich lower down with very few banded iron formation rocks near the base (Figure 7). No anthropogenic stratigraphy was evident.

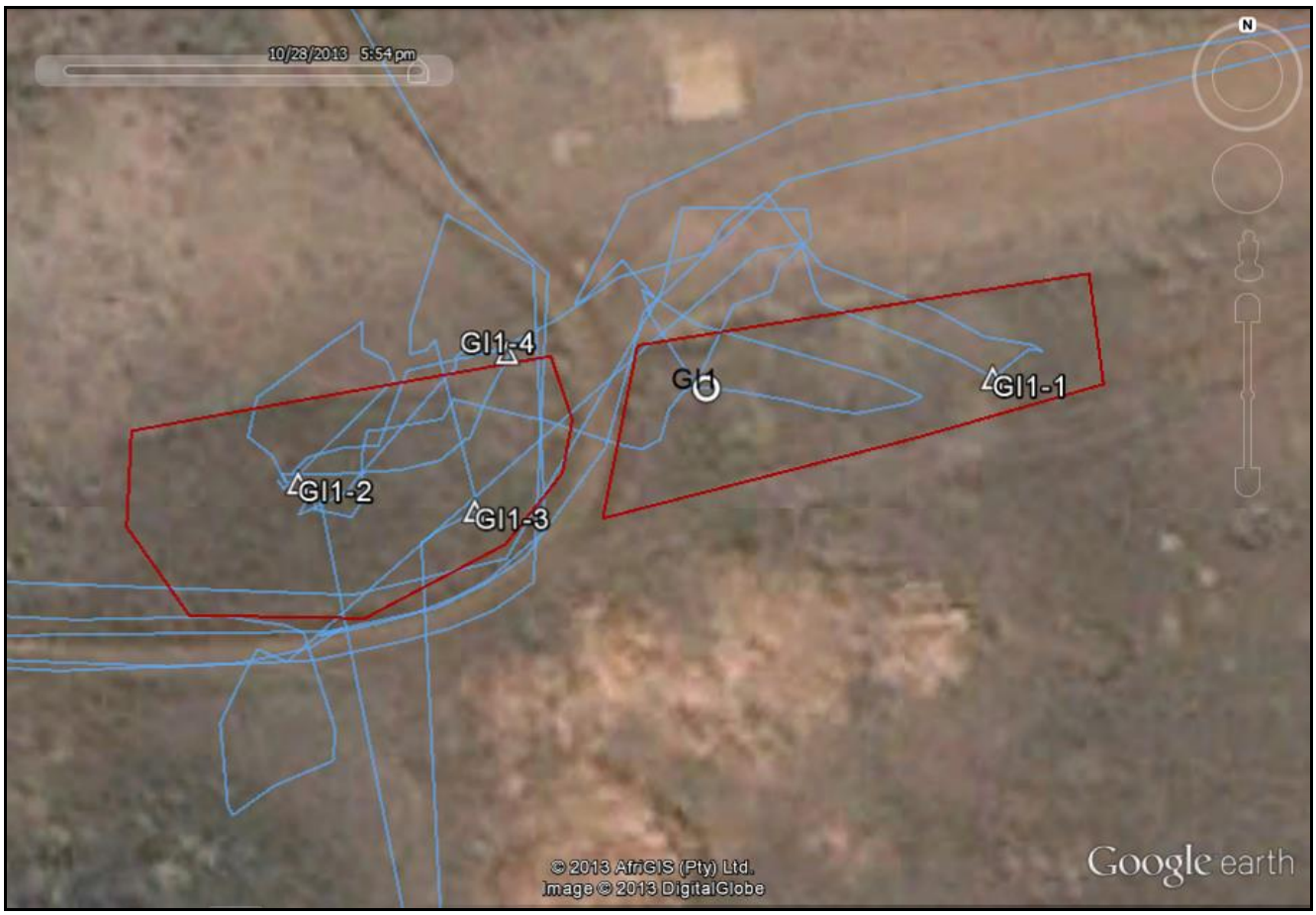

Figure 6: Aerial view from Google Earth of the GI1 site. The round symbol shows the original location as mapped by Morris (2013) and the triangular symbols are locations sampled/recorded during the present work.

The characteristic and more interesting artefacts and features found in the deep sounding excavation, square L100NW, are as follows:

<u>L100NW - Surface</u>
- Denticulate Blade
- Retouch
- Notch
- Platform core
- Blade

<u>L100NW - Spit 2</u>
- Many blades
- Recurrent Levallois core
- Platform preparation
- 2 Rotated cores
- Retouch (heavily reworked pieces)
- Notch

<u>L100NW - Spit 3</u>
- Recurrent levallois core
- Rotated core
- Heavy retouch and usewear (Adze like)

- 2 Blades
- Platform preparation

L100NW - Spit 4
- 6 Rotated cores
- Platform levallois core
- Notch
- Bifacially worked piece (lots of use)
- 2 Platform cores
- Recurrent levallois core
- Retouch
- 5 Blades
- Platform preparation
- Notch
- Convergent Blade

L100NW - Spit 5
- Hammerstone fragment
- Recurrent levallois core
- 3 Platform cores (1 core appears to be set up for small blade removals)
- Retouch
- End scraper
- Blade
- Large convergent flake

L100NW - Spit 6
- Lots of Blades
- 3 Rotated cores
- Long retouch blade
- Preferential Levallois
- Retouch
- 2 Denticulates

L100NW - Spit 7
- Recurrent levallois core
- Convergent levallois flake
- 2 Rotated cores
- Radial core
- 2 Blades
- Many artefacts, although not much diagnostic

L100NW - Spit 8
- Platform levallois core
- Alternate core
- Rotated core
- Notched piece
- Retouch

L100NW - Spit 9

- 3 Blades

L100NW - Spit 10
- Soft hammer flake

The characteristic and more interesting artefacts and features found in the deep sounding excavation, square M100 are as follows:

M100 - Surface & Spit 2
- A number of non-descript flakes, and rotated cores: Nothing diagnostic of a time period.

M100 - Spit 3
- Platform preparation (multiple instances)
- Retouch
- Nice notched piece with 2 large notches 1 at the distal and the other on the left lateral (forms a point)
- Steep scraper retouch
- 2 Small notched pieces
- Rounded end scraper
- Rotated core
- Blade
- 5 recurrent Levallois cores
- Large notch

M100 - Spit 4
- 3 Retouched pieces – one is pointed and almost a unifacial point.
- Platform preparation (multiple instances)
- 2 Convergent flakes (thin, look like soft hammer flake production)
- Convergent flake with long invasive scar on ventral (thinning)
- 2 Small radial cores
- Notched piece

Notable finds in the squares with only shallow excavations are as follows:

L101 - Surface
- Denticulate retouch
- Rough convergent scraper
- Some flakes have prepared platforms
- Ome cores are rotated
- Nothing particularly diagnostic

L101 - Spit 2
- Small end scraper
- Convergent scraper
- Recurrent Levallois Core
- Platform Levallois Core
- 2x Rotated Core
- Scraper retouch
- Notch piece

N100 - Surface

- Interesting denticular retouch.
- Chunky retouched piece, heavily reworked.
- Platform preparation with flake being heavily reworked.

N101 - Surface

- Notched piece with retouch at distal tip.
- Many pieces have been retouched, although it is not typically diagnostic. A few invasive scars, but nothing systematic such as is seen with scraper retouch.
- A number of flakes and cores, with some platform preparation among the flakes, while the cores are rotated and therefore not diagnostic of any particular technological system or time period.

Figure 7: View of the GI1-1 excavation. The scale bar is 0.5 m long. The abundant natural gravel and artefacts can be seen on the surface to the right and the calcrete formation can be seen in the full square meter excavation.

6.1.2. GI1-2

The second excavation was carried out in the western part of the site. One square metre was excavated to 36 cm depth with four subsurface spits. Although the upper part was rocky, the base of the excavation was almost pure calcrete powder (Figure 8). Again, no anthropogenic stratigraphy was evident.

Figure 8: View of the GI1-2 excavation. The scale bar is 0.5 m long.

The characteristic and more interesting artefacts found in the 1 m^2 excavation are as follows:

<u>Surface</u>
- Initially doesn't look very MSA
- Retouch, almost Adze like
- Notch
- Denticulate
- Radial core (short tabular flakes removed)
- Convergent flake
- Convergent scraper
- Recurrent Levallois core

<u>Spit 2</u>
- 3 Convergent flakes – These are common in MSA assemblages, but are found throughout the MSA. They are products from preferential Levallois.
- 2 >70mm blades – These also form part of the MSA, but are typically later,
- Extensive Retouch including 3 notched pieces and 6 scrapers
- 4 platform Levallois cores with: 2 blade removals, 2 blade removals, 2 flake removals and 2 blade removals respectively.
- 2 preferential Levallois cores with a single convergent removal from each
- 1 recurrent Levallois core with multiple short tabular removals.

<u>Spit 3</u>

- 3 Platform cores
- Retouch, 2 nice notches
- Recurrent Levallois core
- Scraper
- Radial core
- Rotated core
- Large amounts of retouch

Spit 4
- Platform preparation (multiple instances)
- Convergent scraper
- 2 very clear notches
- Nice retouched piece.

6.1.3. GI1-3

The third excavation was also carried out in the western part of the site, but 20 m to the east of GI1-2. This hole followed a similar course to GI1-2 but it was stopped at 30 cm depth where the substrate was just powdery calcrete (Figure 9).

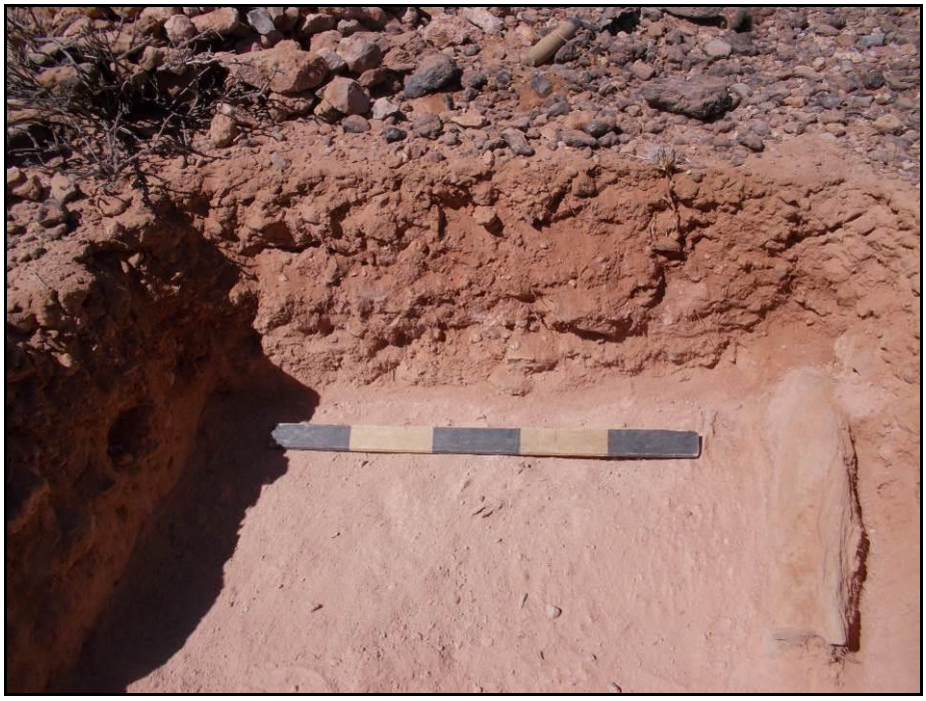

Figure 9: View of the GI1-3 excavation. The scale bar is 0.5 m long.

The characteristic and more interesting artefacts found in the 1 m^2 excavation are as follows:

Surface
- Large platform core, with regular flake removals.
- 3 Convergent scrapers
- Notched piece
- 2 small scrapers
- Platform preparation present on many of the flakes

Spit 2

- Very few cores relative to the high number of flakes.
- Large notch
- Convergent scraper
- Denticulate
- Notched levallois flake
- Possible small levallois preferential core
- Small platform core, almost robberg
- Very nice scraper retouch on distal and lateral margins.
- Convergent scraper (almost a unifacial point)
- Adze-like retouch/use

Spit 3

- Non-descript flakes.
- 1 bipolar flake (outils-like)
- Retouched piece
- Convergent flake
- Single large notch on flake
- 1 artefact with signs of heating (potlid fracture)

Spit 4

- A number of non-descript flakes with platform preparation, otherwise nothing special.

6.1.4. GI1-4

No excavation as carried out at this point but an outcrop of banded iron formation with evidence of quarrying was located here (Figures 10 & 11). Flakes had been removed directly from the outcrop.

Figure 10: View of the banded iron formation outcrop at GI1-4.

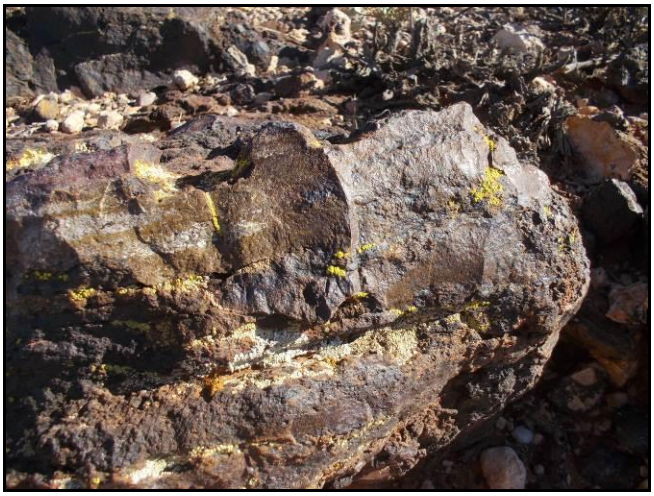

Figure 11: Close-up showing the flaked edge of the outcrop at GI1-4.

6.1.5. Summary

The excavations at GI1 revealed that the artefact scatter reached variable depth across the site but was deepest in the east. It is clear that the rock here was strongly favoured for

artefact production and that the site must have been extensively used over a long period of the Middle Stone Age as a source of stone. The common occurrence of faceted platform flakes supports an ascription to the MSA. Preliminary examination of the material from the excavations has allowed some characterisation of the assemblage. Faceted platform flakes are common, while the cores include Levallois and discoidal cores. Although blades are relatively rare, a number of broken blades were noted. Retouched artefacts are common (perhaps more so than expected in what appears to be a quarry site assemblage), but their identification is complicated by the presence of extensive amounts of edge-damage. Retouch in general seemed more common near the surface and the assemblage included scrapers, notches and adze-like pieces. The abundant edge-damage may well relate to trampling damage during the prehistoric use of the site.

The presence of convergent flakes and long blades (> 70 mm) could indicate a relatively late period of the MSA dating before about 35 000 years ago, but such artefacts can be found on occasion throughout the MSA. The denticulates could suggest a greater age, but there is nothing diagnostic like backed artefacts or Still Bay points. A single unifacial point could support an age around 45 000 years ago, but again this is not a given.

6.2. GI2

This site is a small rock shelter in a low, south-facing cliff on the inside slope of the inselberg (Figure 12). It was noted by Morris (2013) as having very little evidence of prehistoric human occupation – he recorded a single quartz flake. However, examination of the talus slope showed that a number of stone artefacts were present and that evidence of occupation of the shelter should certainly be expected.

Figure 12: View towards the north showing the location of the shelter at GI2.

Figure 13: View of the entrance of the shelter at GI2.

We collected all the visible artefacts from the talus slope. These included fifteen of quartz and eleven of other materials (banded iron formation and quartzite; Table 1). A small test excavation just outside the mouth of the shelter and the generally rocky nature of the substrate showed that there was no deposit in this area. No attempt was made to map the artefacts as this would not provide any meaningful information. However, some MSA characteristics and the degree of patination/weathering of some artefacts suggest material of

that age, while one flake was clearly an LSA flake. The remaining artefacts are too generic in character to assign an age to.

Table 1: Stone artefacts from the GI2 talus slope.

	Quartz	Banded Iron Formation	Quartzite
Bipolar core	1		
Irregular core		1	
Edge-damaged flake	3	4	
Blade		1	
Flake	10	3	1
Chunk	1		

Within the rock shelter a grid of 1 m^2 squares was laid out as shown in Figure 14. Six squares were excavated, although two of these were not full square meters (Figures 14 & 15). Excavation followed natural stratigraphy, although this was found to be very difficult due to the heavily compacted and consolidated nature of the deposits. In one layer it was even difficult to chip the deposit out with a spade. The deposit was very shallow towards the rear (north) where bedrock rose to meet the walls of the shelter, but towards the front (south) the deposit reached a maximum depth of about 30 cm (Figure 16). Unfortunately oil had been dumped in the shelter at some point in the past with the result that much of the excavated deposit was contaminated. The oil has dried sufficiently to enable excavation but no doubt this has added to the compaction and consolidation of the deposits. The two westernmost squares (A2 and A3) were found to be free of oil and it is anticipated that the deposits beneath the rocks in the south-western corner will also be clean. This meant that radiocarbon dating samples had to be hand-picked from the deposits in the western side of the shelter. Only two good samples, a charcoal nodule and a wad of grass, could be obtained in this manner.

6.2.1. Stratigraphy

Altogether nine stratigraphic layers were identified, although, as noted above, it was not always easy to separate these during excavation. Table 2 presents a brief description of these layers.

Table 2: Description of identified stratigraphic layers in GI2. The grey shading indicates the way in which these layers have been grouped for the purposes of the analysis that follows. From top to bottom they are Layer 1, 2 and 3.

Layer	**Description**
1. Surface (Surf)	Loose, powdery surface deposit with modern rubbish and some gravel content.
1. Below Surface (BSu)	Harder soil with gravel and many insect cocoons and still some modern rubbish.
1. Brown Sticks (BSt)	Soft deposit with much vegetation in it. Limited to area of intersection of squares B2, B3, C2 and C3. Still some modern rubbish.
2. Hard Layer (HL)	Compact deposit with rock fragments and still some cocoons. Some areas incredibly hard and some modern rubbish still noted.
2. Soft Grassy (SG)	Small patch of softer grass containing a fair bit of grass. Limited to square C2.
2. Hard Orange Brown (HOB)	Variable hardness, but extremely hard towards the south. Towards the north the orange parts seem to be due to decomposing bedrock.
2. Hard But Softer (HBS)	Variable hardness, paper fragment in C2.
3. Dark Organic (DO)	Soft deposit with small sticks and droppings.
3. Softer Brown (SB)	Generally soft, chocolate brown deposit but some extremely hard patches. Does not reach the north edge of C2.
3. Hard Base (HB)	Hard, lighter brown deposit with much decomposing bedrock.

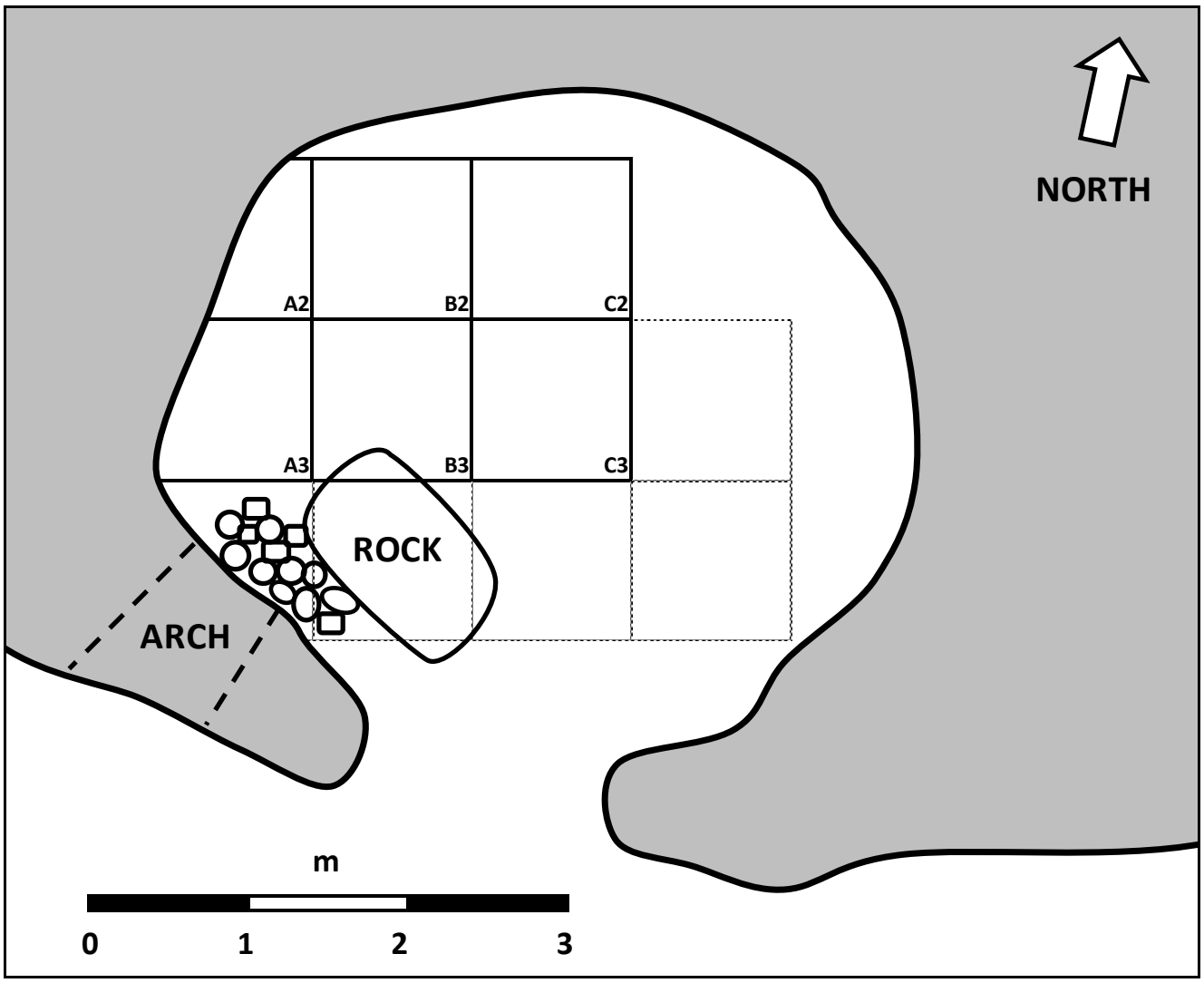

Figure 14: Schematic plan of the rock shelter showing squares excavated (solid lines) and squares proposed for future excavation (dotted lines). The large rock and smaller rocks behind it are assumed to have been from a collapse that resulted in the arch opening up. They lie on the surface. The roof is dome-shaped with a high point above the southeast corner of square C2 at 2.3 m above the deposit surface.

Figure 15: View towards the west showing the excavation area on completion of work. Scale bar in 10 cm intervals.

Figure 16: View of the southern section of square A3, the only section not contaminated by oil. Scale bar in 10 cm intervals.

6.2.2. Stone artefacts

Flaked stone artefacts were the most common cultural items recovered from the excavation, although there were only 144 in all. Table 3 shows the typological break down per layer. As is generally expected in western South Africa, quartz dominates, but banded iron formation (BIF), cryptocrystalline silica (CCS), silcrete (Silc) and quartzite (Qzite) all also occur in smaller frequencies (Figure 17). What is clear from the graph is that in Layer 1 there is far less diversity in materials with quartz used in more than 90 % of artefacts. The overall numbers of artefacts are also far greater in the lower levels of the deposit. Retouched artefacts are generally expected to be more frequent in deposits pre-dating 2000 years ago, but in the hinterland of the Northern Cape this is not always the case (Beaumont *et al.* 1995). The CCS backed bladelet in Layer 3 had evidence of mastic adhering to it suggesting that the artefact was once mounted in handle of some sort (Figure 18).

Table 3: Stone artefacts from GI2.

	Layer 1					**Layer 2**					**Layer 3**				
Artefact type	**Qtz**	**BIF**	**CCS**	**Silc**	**Qzite**	**Qtz**	**BIF**	**CCS**	**Silc**	**Qzite**	**Qtz**	**BIF**	**CCS**	**Silc**	**Qzite**
Bipolar core						1					2[c]				
Irregular core	1[a]														
Blade	1														
Bladelet	1										5				
Flake	10		1		1	12	5	1		5	37	7	2	1	2
Chunk	3					1	1				2	1			1
Chip	5					8		1	2[b]		12	3	1	1	
Endscraper												1			
Scraper fragment			1												
Backed bladelet													1[d]		
Ochre, n (g)	2 (0.3 g)					-					-				
Shiny black rock	1					3					-				
Other items	• 1 water worn qtz pebble • 1 qtz crystal					• 1 tiny water worn qtz pebble • 1 small, dark, heavily worn/worked rock fragment, possibly pigment					• 1 ground stone pendant on a thin slab of mica-rich rock.				

Notes:
[a] Layer 1 qtz irregular core may also be a hammerstone.
[b] Layer 2 silcrete is red and might be CCS.
[c] Layer 3 has one quartz flake with crystal facet cortex.
[d] Layer 3 CCS backed bladelet has mastic stains.

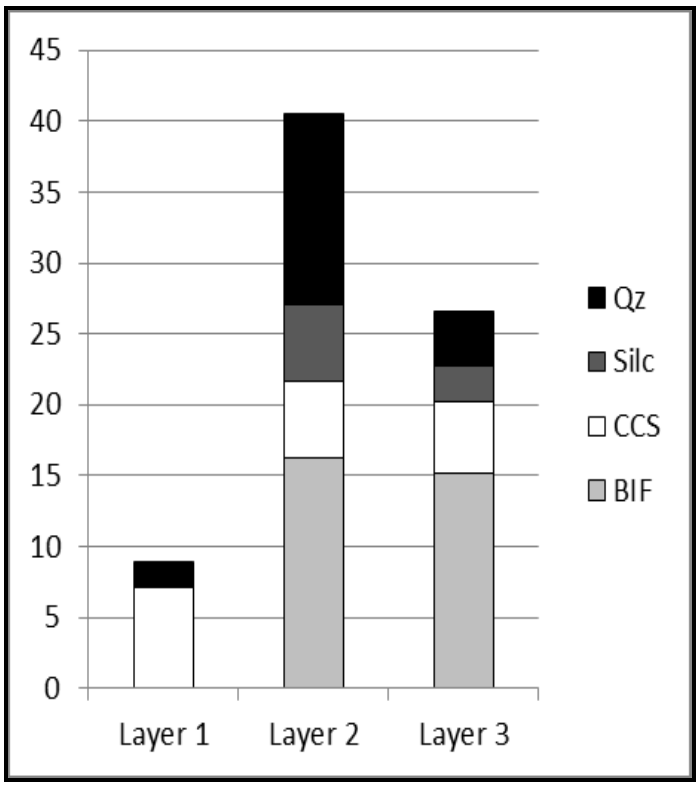

Figure 17: Stone material frequencies in the three layers of GI2. Quartz has been omitted and comprises the remainder to 100 % in each case.

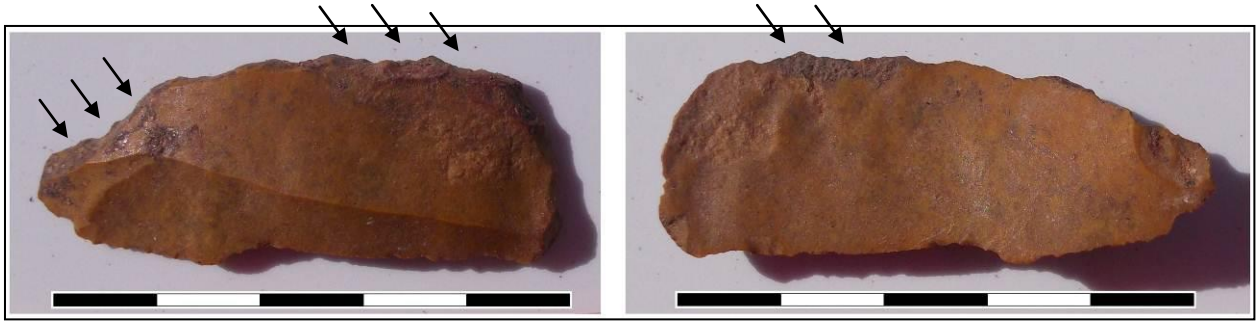

Figure 18: The dorsal (left) and ventral (right) surface of the CCS backed bladelet with mastic adhering to it (arrowed) from Layer 3. Scale in 5 mm intervals.

A stone pendant was found in Layer 3. Such finds are very unusual but a few have been found in South Africa (Dart 1949; Fitz-Simmons 1926; Heese 1926; Orton & Halkett 2007; Rudner 1953). Unfortunately this one has had its upper and perforated end broken off and lost – it might perhaps even have been reused with the break smoothed off again.

Figure 19: View of the intact end of the stone pendent found in Layer 3. Scale in 5 mm intervals.

6.2.3. Ostrich eggshell fragments

Ostrich eggshell fragments were common in the excavation, although the 120 fragments found only weighed a total of 69.6 g, substantially less than the weight of one whole egg. Figure 20 shows their distribution through the three layers. In Layer 3 one small fragment of OES was found to have been engraved with a single straight line (Figure 21).

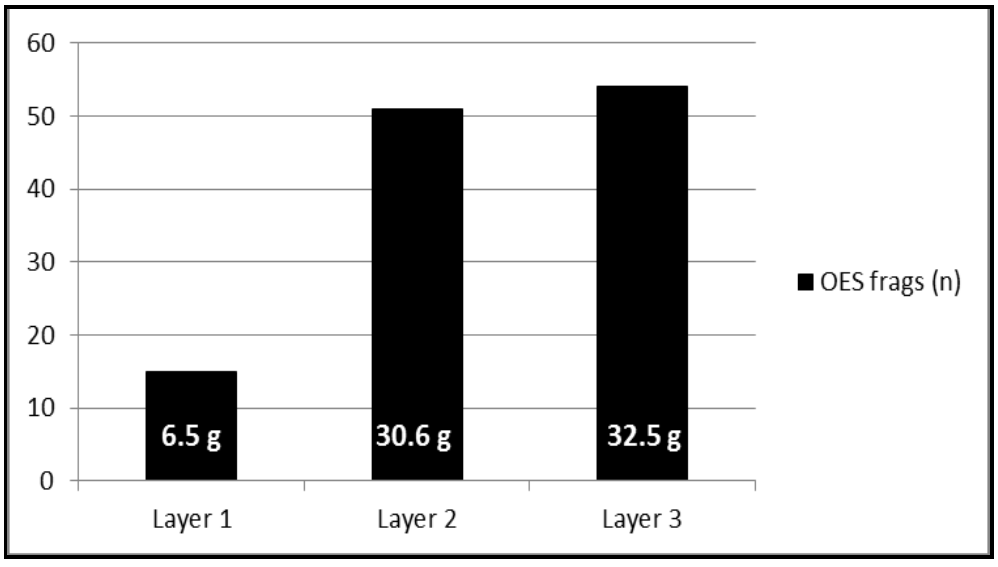

Figure 20: Graph showing the distribution of ostrich eggshell fragments in the three layers of GI2.

Figure 21: The engraved ostrich eggshell fragment from Layer 3 of GI2. Scale in 5 mm intervals.

6.2.4. Ostrich eggshell beads

Five OES beads were found, two in each of Layers 1 and 2 and one more in Layer 3. Figure 22 shows the size distribution of these beads as well as their aperture diameters and thicknesses. Following Orton (2012), there are one medium bead, three large beads and one very large bead. This kind of size signature is typical of relatively recent sites dating within, perhaps, the last 1000 years.

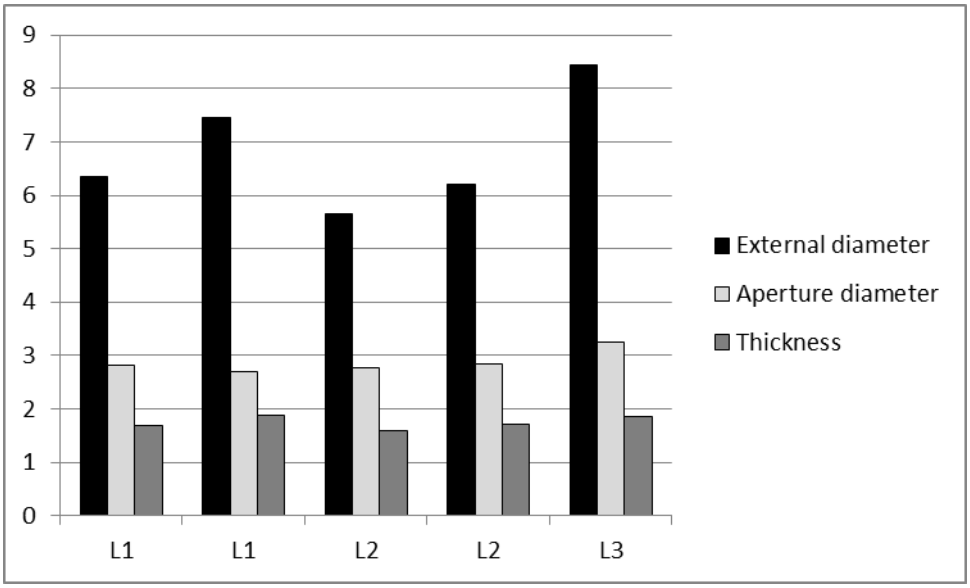

Figure 22: Graph showing the ostrich eggshell bead size distribution in the three layers of GI2.

6.2.5. Pottery

Three mineral tempered pot sherds were found in Layer 2. Their statistical data are shown in Table 4. All three are body sherds. The sherd from B2, HL shows evidence of coil manufacture.

Table 4: Statistical data for the three potsherds from Layer 2 of GI2.

Provenience	Weight	Min. thick	Max. thick	Ave. thick	Colour
B2, HL	12.9	5.26	5.96	5.61	dark brown to black
B3, HBS	6	6.91	8.52	7.715	dark brown to black
C3, HBS	0.6	4.48	4.86	4.67	dark brown to black

6.2.6. Other finds

Among the botanical material recovered from the site were two small fragments of cut reed (Figure 23). They are from the genus Phragmites and may have originated from a reed mat or some other item made from reeds.

Figure 23: One of the cut reed fragments from Layer 2 of GI2. Scale in 5 mm intervals.

There were also many fragments of bone and micro-mammal bones from all three layers. The micro-mammal bones may well have originated from a bird of prey roosting on a small ledge in the cave. The bones have yet to be analysed but this will be done for publication purposes once an appropriate specialist is available. It is likely that many are klipspringer (*Oreotragus oreotragus*) since many hairs matching those on a dead animal found nearby were also found in the deposit. Some droppings that are likely from an animal the size of klipspringer or sheep were found in Layer 1, while some larger droppings were found in all three layers. A piece of porcupine quill was also found in Layer 1

The site also contained fragments of charcoal but these were only retained at times because of the contamination arising from the oil spill.

A variety of modern materials were also found. The vast majority were in layer 1 and included many matches and cigarette butts, some newspaper bearing a closing date in the jobs section of 27th January 1978, a sawed bone and some glass. Layer 2 contained modern material in its uppermost excavation unit only, while in Layer 3 the only modern item found was a small metal cog. In addition, there were two metal poles that had been hammered into the deposit and bedrock. Not all of the modern materials were collected. It is assumed that these items relate to some sort of activity from earlier mining and that this activity likely took place in late 1977.

6.3. GI3

This site was a very low density artefact scatter located on both sides of a small stream bed (Figure 24). The scatter is clearly of mixed origin and a total of just 31 artefacts could be found (Figures 25 & 26). The stone materials recorded include quartz, banded iron formation, quartzite, sandstone and a material that might be either silcrete or some other type of rock in a degraded state (the yellow artefact in Figure 25).

One artefact appeared to have been retouched and used such that a well damaged edge was present (Figure 27). Another artefact was a large nodule of rock that had had many flakes removed from various parts of it where the stone was of sufficient quality (Figures 28 & 29). The stone type was uncertain, since the material looks like silcrete but this material is not expected here. It could be a very light coloured piece of banded iron formation. While one flake at this site was almost certainly from the ESA, other artefacts seem most likely to date to the MSA.

Figure 24: The vicinity of the artefact scatter at GI3 as viewed towards the east. The stream bed runs from left to right and is marked by the line of denser bushes in the middle ground.

Figure 25: Stone artefacts from the northeast side of the stream bed. Scale in cm.

Figure 26: Stone artefacts from the southwest side of the stream bed. Scale in cm.

Figure 27: A retouched and edge-damaged artefact from the northeast side of the stream bed. Scale in 5 mm intervals.

Figure 28 & 29: Two views of a core from the southwest side of GI3. It shows flaking of the better quality parts of the rock. The material is either banded iron formation or silcrete.

6.4. GI4

This site was said by Morris (2013:19) to be comprised of “several places with isolated or weakly clustered artefacts of Pleistocene age… One of these in the approximate location indicated suggests an Acheulean (Earlier Stone Age) workshop site focussed on what was apparently a favoured raw material source outcropping there.” Despite an extensive search, we were unable to locate any of the artefact scatters at this site. Approximately one hour of searching with two people yielded just three flakes in quartzite. Figure 30 illustrates the search path of one person (only one GPS was taken to site as no survey work was anticipated) but two people were conducting the search. While looking for the site we visited every rock outcrop that was visible within about a 200 m radius of the provided GPS co-ordinate. Nothing further can be said of this site. Conversation with David Morris suggests that it would not have been any more significant than GI3 and GI5 and that mitigation could thus be overlooked for the site. This approach has been agreed to by SAHRA.

Figure 30: Aerial view of the vicinity of GI4 (as recorded by Morris (2013)) showing the walk paths recorded by one member of the team (blue lines). The yellow bar for scale is 100 m long.

6.5. GI5

At this site we located three clusters of artefacts and numbered them GI5-1, GI5-2 and GI5-3. The three clusters were found some 80 m to the north-east of the GPS co-ordinate contained in Morris (2013). Figure 31 shows an aerial view relating the scatters to one another and Figures 32 and 33 show the surroundings of the site.

The vast majority of the artefacts were very weathered and no doubt belong to the ESA; all these were on quartzite. One fresh quartzite flake (GI5-1) and a fresh quartz core (GI5-3) are likely younger, probably pertaining to the MSA or even the LSA.

Figures 34 to 47 illustrate a selection of the artefacts found at the site.

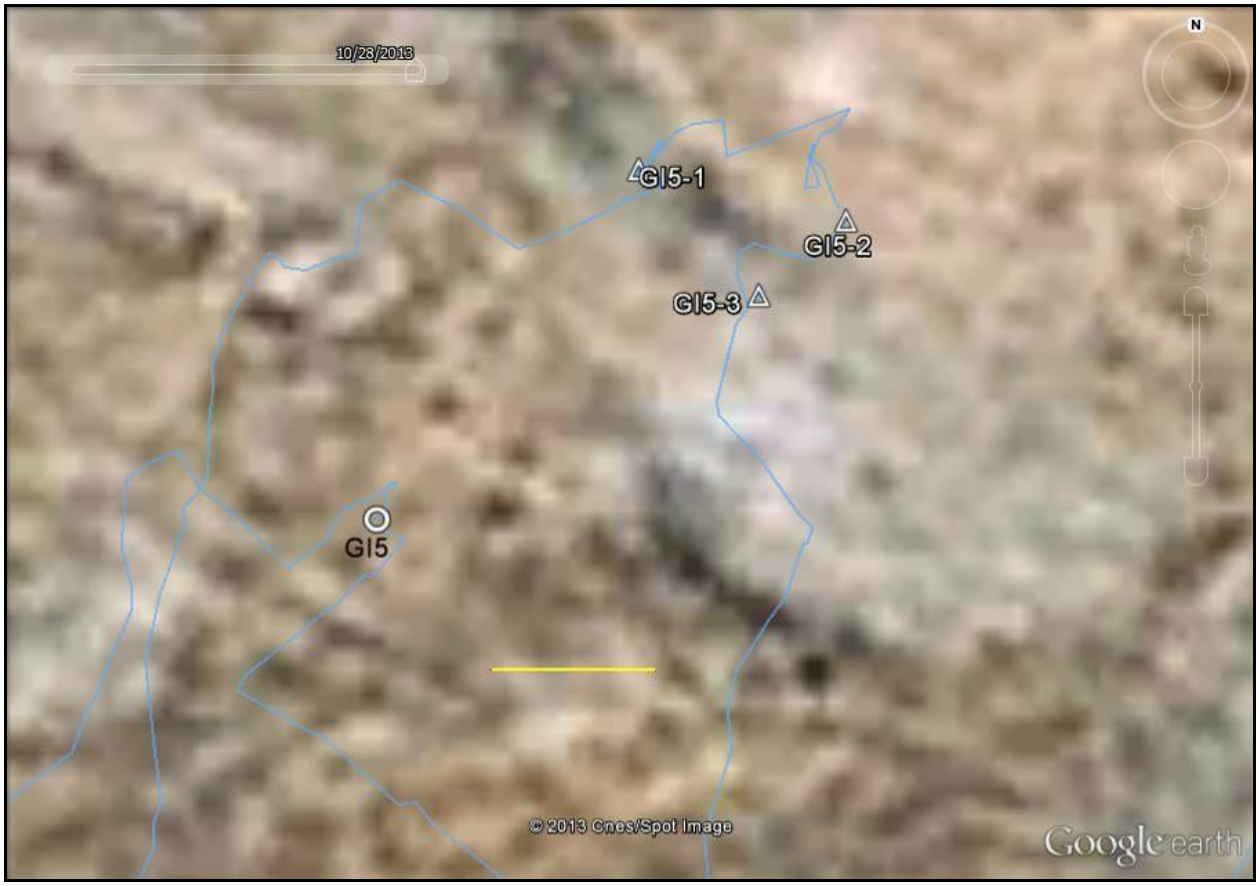

Figure 31: Aerial view of the vicinity of GI5 (as recorded by Morris (2013)) showing the three scatters recorded during the mitigation work. The yellow bar for scale is 50 m long. The blue lines indicate walk paths.

Figures 32 & 33: Two views of the vicinity of GI5 showing the landscape and substrate at the site.

6.5.1. GI5-1

At this scatter we found and photographed 34 artefacts. A selection of these is illustrated below. They included large flakes and a blade (Figures 34-36), smaller flakes (Figure 37) and a few cores, including radial cores (38 & 39).

Figure 34: Ventral (left) and dorsal (right) surface of a large flake from GI5-1. Scale in cm.

Figure 35: Ventral (left) and dorsal (right) surfaces of a large flake from GI5-1. Scale in cm.

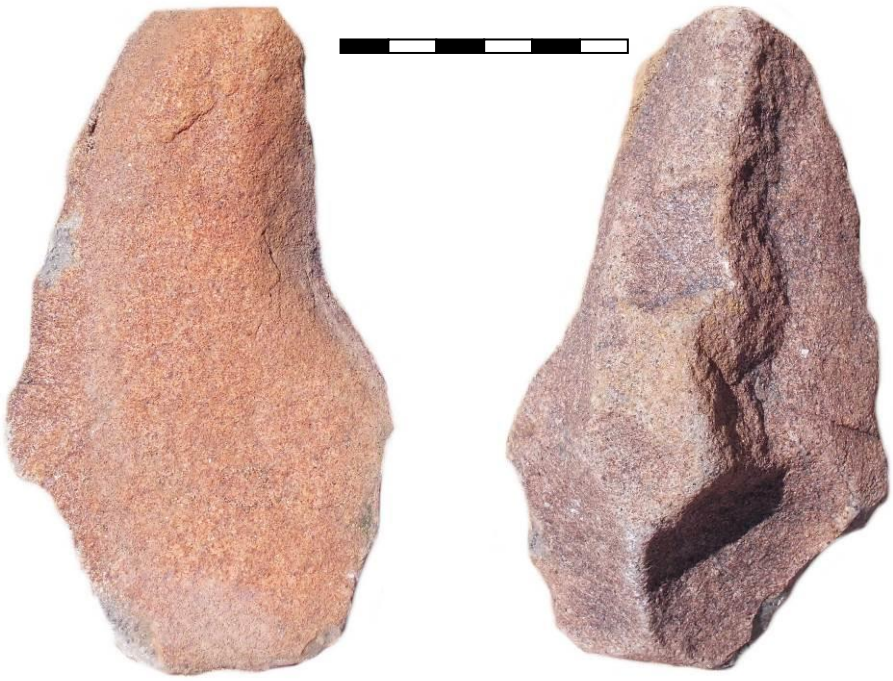

Figure 36: Ventral (left) and dorsal (right) surfaces of a large blade from GI5-1. Scale in cm.

Figure 37: Ventral surfaces of two smaller flakes from GI5-1. The flake on the right is unpatinated and likely far younger. Scale in cm.

Figure 38: Opposing sides of a large radial core from GI5-1. Scale in cm.

Figure 39: A large radial core from GI5-1. Scale in cm.

6.5.2. GI5-2

This smaller scatter produced just eight artefacts, three of which are illustrated below. Two (Figures 40 & 41) may well have been unfinished hand-axes, one of which appears to have been subjected to two flaking episodes and quite possibly made on a natural fragment of rock rather than a large flake. Recent flaking of a heavily weathered cobble shows the great difference between the fresh and patinated rock surface (Figure 42).

Figure 40: Three views of an interesting artefact that is certainly a core but could be a hand-axe. It appears to have been reworked at a later stage as evidenced by the fresher scars visible along the one edge. Scale in cm.

Figure 41: Three views of what looks like an unfinished hand-axe from GI5-2. Scale in cm.

Figure 42: Close-up of an older, well patinated rock with at least two flakes removed from its edge. This was presumably to test the material.

6.5.3. GI5-3

At this scatter we located and photographed twenty-two artefacts. Interestingly there were several large blades (Figure 43) along with a selection of flakes (Figure 44), cores (Figures 45 & 46) and one hand-axe with its tip missing (Figure 47). The hand-axe is slightly less patinated than the most of the other artefacts on the site as evidenced by the brown colour

Figure 43: The ventral (above) and dorsal (below) surfaces of four large blades from GI5-3. Scale in cm.

Figure 44: The dorsal surfaces of six smaller flakes from GI5-3. Scale in cm.

Figure 45: Two views of a core from GI5-3. Scale in cm.

Figure 46: Two views of a core from GI5-3. Scale in cm.

Figure 47: Both faces and both edges of the hand-axe located at GI5-3. The tip is missing (top) while the base has not been fully shaped such that part of the platform of the original flake blank remains intact. Scale in cm.

6.6. GI8

This is not a site listed in Morris (2013) but since we located it one evening on our way out it seemed pertinent to list it for the record. It is a rock art site located in the southern end of the deep valley that drains the inselberg. It is well away from the mining area and thus will be protected. However, its location should be noted for any potential future expansion of the mine.

The painting lies on a vertical wall above a long ledge just above the dry stream bed (Figure 48). It is comprised of a finger painted circle with a brush-painted mark and a possibly finger painted smudge above and right of the circle (Figure 49). There appears to be something

inside the circle as well but this is very faint. It is unusual to find finger and brush-painted markings in the same “composition”. Although this is just one circle, similar geometric images are thought to have been painted by Khoekhoe herders, while brush-painted imagery is commonly accepted to be the work of hunter-gatherers.

Figure 48: The location of the rock art site. The painting is on the wall between the two large trees.

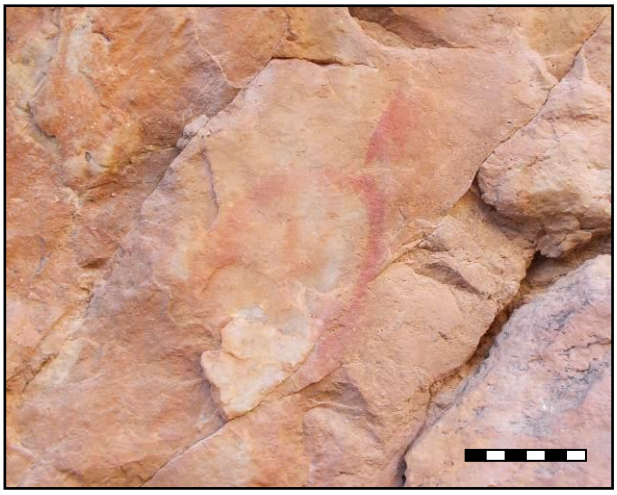

Figure 49: Close-up of the painted image. Scale in 2 cm intervals.

7. CONCLUDING SUMMARY OF FINDINGS

At **GI1** the excavations revealed a deposit up to 78 cm deep and containing vast quantities of MSA artefacts. The excavation certainly justifies the original high significance attributed to the site (Morris 2013) and given that the entire site will be destroyed by the mining it is prudent to obtain a larger sample than what we were able to excavate – at least one more location just east of the road should have one column excavated to full depth.

The rock shelter at **GI2** was thought by Morris (2013) to be of low significance because there was almost no evidence of prehistoric human occupation. However, excavation into the deposits revealed an archaeological deposit up to about 30 cm deep. The majority of the finds are late Holocene, but indications of a slightly earlier occupation were also noted at the very base. Despite the disturbance that has taken place in the site over the years and the relatively low density of finds, the deposits remain scientifically valuable because rock shelters are incredibly rare in the Northern Cape. Again, because the entire site will be destroyed by mining, further work should be carried out. It is proposed that at least squares B4 and C4 should be excavated and preferably also squares A4, D3 and D4. Square B4 is particularly important to the understanding of the deposits because it is anticipated that this square will contain no contaminating oil and that stratigraphy will be more intact over the maximum depth of the deposit. For these reasons it is anticipated that this square will produce reliable radiocarbon dating samples. Although the deposit is fairly shallow, the possibility of a human burial within the cave cannot be discarded and excavation of these extra squares will ensure that if any burial was present it would be recovered and removed from harm.

Site **GI3** was an open scatter containing a mixed assemblage of mostly MSA material. It was of limited value and mitigated through *in situ* recording of the artefacts.

GI4 could not be relocated, despite extensive searching, and hence no mitigation was carried out there. Conversation with David Morris who originally recorded the site suggests that it would not have been any more significant than GI3 and GI5 and that mitigation can thus be overlooked for the site. This approach has been agreed to by SAHRA.

GI5 was another open scatter but this time containing a fairly extensive collection of well-weathered ESA artefacts. These too were mitigated through *in situ* recording on site.

8. RECOMMENDATIONS

Owing to the difficulties of predicting the depth and significance of buried archaeological deposits, sites GI1 and GI2 could not be fully mitigated. This difficulty was compounded through having different consultants carrying out the original assessment and subsequent mitigation. It is therefore necessary to complete the mitigation of these two sites before mining commences. It is recommended that the mitigation be completed during the pre-construction phase of the project. At GI1 it is recommended that one further column be excavated to full depth, while at GI2 at least two but preferably four or five more squares should be excavated. Radiocarbon dating of the deposits also needs to take place such that the occupation sequence can be properly understood and interpreted. Two dates will suffice.

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10. INVESTIGATION TEAM

Fieldwork:	J. Orton R. Lyall-Jennings
Report:	J. Orton