Diamond Kopje

Surface and Sub-surface Reconnaissance

Report to-
De Beers Consolidated Mines

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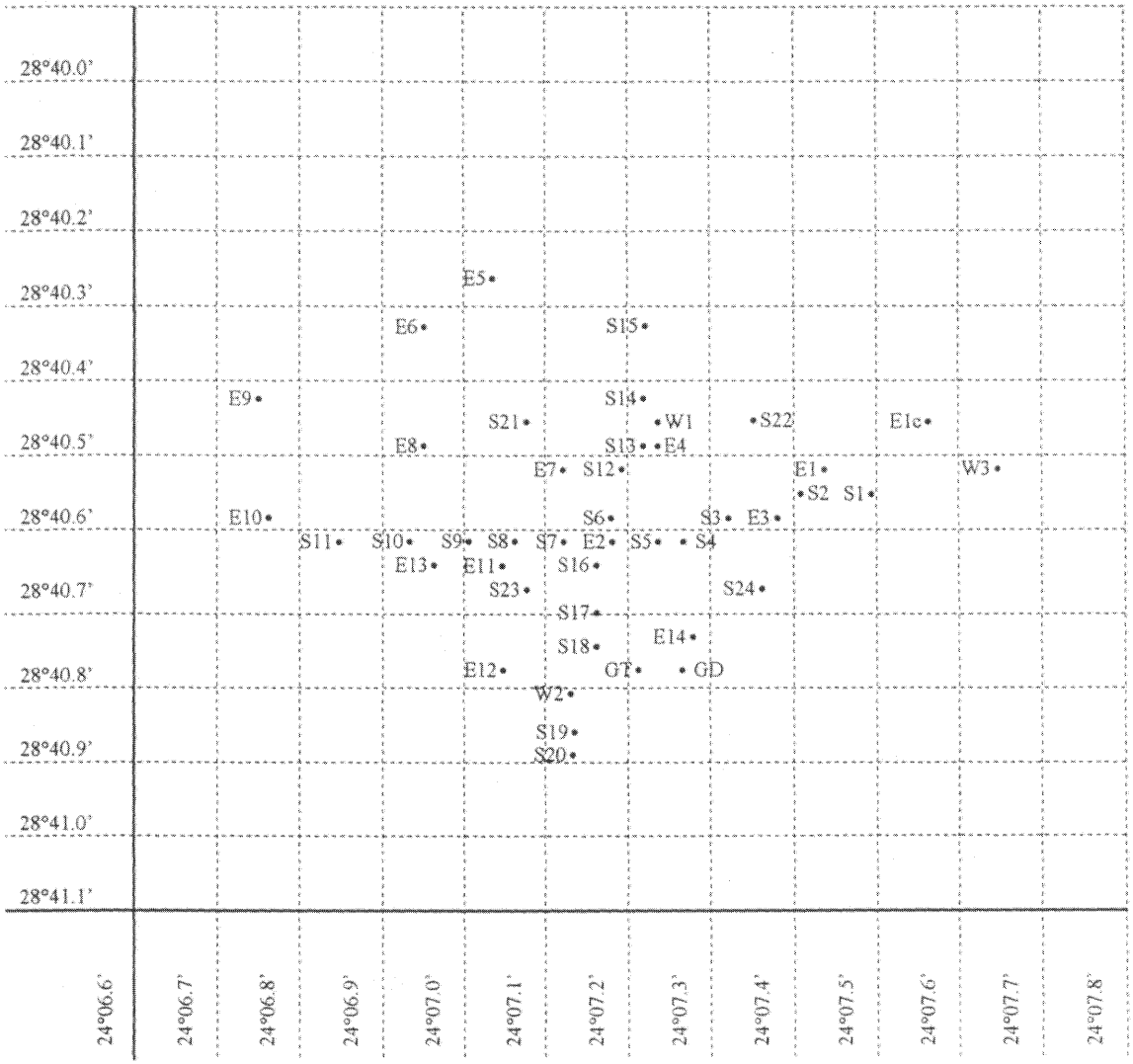

E1-14	Sub-surface exploration points 1-14
GD	Geological dumping area
GT	Geological trench
S1-24	Surface research areas 1-24
W1-3	Water points 1-3

Abbreviations used

AD		*Anno Domini* (after the year 1)
BP		Before the present (1950)
cm		centimetres
ESA		Earlier Stone Age
kya		Thousands of years ago
Level	C	In calcrete solution
	E	Everything (no stratigraphic divisions)
	L	Lower
	M	Middle
	U	Upper
LSA		Later Stone Age
m		metres
mm		millimetres
MSA		Middle Stone Age
Mya		Millions of years ago
OIS		Oxygen Isotope Stage

Glossary:

Chaines operatoirs	Sequence of reduction events.
Fossiles directeurs	Fossils/specimens so typical that their presence designate a specific period or industry.
In situ	In three-dimensional context.

1) Introduction

As a result of proposed future bulk sampling/mining at Diamond Kopje, Vogelstruispan 101, Northern Cape (2814CA Schmidtsdrift 1:50 000) the Archaeology Department, McGregor Museum, Kimberley, was approached to conduct a Phase 1 archaeological impact assessment. Observations made are reported in this report.

2) Fieldwork

Two initial site visits (December 2002, April 2003) led Morris (2003) to conclude that "the veneer of gravels overlying calcrete on Diamond Kopje contains relatively high densities of stone tools in a workshop context of probable Fauresmith age." He regarded the assortment of raw materials available in the gravels as an important draw card to the site.

A further more extensive survey operation was conducted (28 July - 2 September 2003), focussing on surface as well as sub-surface inspections.

The systematic surface survey involved the controlled collection of artefactual material in relation to a raw material sample in a cross-section across, and a squared section atop, the hill. Sample areas of 5x5 square meters were targeted. Altogether 24 such research areas form the basis of analysis (indicated as S1-S24 on the map). In addition surface occurrences outside this sample area were recorded for a surface analysis.

The sub-surface survey involved the collection of artefactual material from fourteen pick and shovel test pits located at identified points across the surface of the hill (indicated as E1-E14 on the map). Analyses of the contents of these pits form the basis of the sub-surface analysis and interpretation.

Both the surface and sub-surface survey demonstrated a wealth of Stone Age material, predominantly of MSA character. A historic presence is also evident but restricted to the eastern part of the hill.

3) Literature Research

3.1) The Stone Age

Goodwin & van Riet Lowe (1929) classified the southern African Stone Age into and ESA, MSA and LSA based on the technological and typological analysis of stone tools.

- **The ESA**

Two culture stratigraphic units represent the ESA, namely the Oldowan and the Acheulean. The southern African Oldowan can be dated to 2-1.7/1.5 Mya (Klein 2000) with definite archaeological traces restricted to the Sterkfontein Valley (Kuman 1998). The Acheulean can be dated to 1.7/1.5 Mya and lasted until about 250 kya and no later than 200 kya (Klein 2000). *Fossiles directeurs*, handaxes and cleavers, are bifacially flaked large cutting tools. Acheulean deposits are geographically widespread in South Africa but almost all assemblages come from disturbed open-air locations. Rockshelter locations are generally lacking with a few exceptions including Cave of Hearths and Olieboompoort (Mason 1962), Wonderwerk (Beaumont 1990) and Montagu Cave (Keller 1973).

- **The MSA**

The succeeding MSA, characterised by a variety of prepared cores and retouched flakes, lasted broadly until 40 kya (Volman 1984) although in southern Africa dates of 27-23 kya are probably more accurate (McBrearty & Brooks 2000).

Often referred to as the First Intermediate, assemblages which occur mostly in the interior of South Africa and incorporate prepared cores, flake tools such as blades, flake-blades and convergent flakes (points) often in association with small, broad handaxes are classified as Fauresmith. The Fauresmith at Wonderwerk Cave is in excess of 200 kya (Beaumont 1990) while Rooidam has a minimal age of 174 kya (Butzer 1974). Based on the interstratification of sites containing Acheulean, Sangoan, Fauresmith and MSA in the Kapturin Formation, Kenya, Tyron & McBrearty (2000) are of the opinion that these technologies were contemporary and can date to 258-235 kya.

Foley & Lahr (1997) associate the widespread occurrence of classified MSA deposits across Africa and its spread into much of Eurasia in OIS 7 (251-195 kya). This they regard as part of a process of population dispersal, associated on the one hand with the ancestors of later Neanderthals in Eurasia and on the other with anatomically modern humans in Africa. Most surviving MSA occurrences however date to the Last Interglacial (OIS 5: 128-75 kya).

In South Africa well dated, long sequence MSA sites are few. The cultural stratigraphy from Klasies River Mouth therefore remains crucial. Singer & Wymer (1982) proposed five culture stratigraphic sub-stages as divisions within the MSA based on the sequence at Klasies River main site. Volman's (1984) fourfold extension of this scheme currently offers the best subdivision of southern African MSA lithic assemblages.

MSA 1: This is the most problematic of the MSA stages and some of the assemblages may be considerably older than the following MSA 2. Assemblages are characterised by very little formal retouch, small, broad flakes with few facetted buts and a high proportion of cores in relation to flakes. Retouched points are absent and denticulates and scraper retouch rare, with a low percentage of crude bifacially retouched examples.

The MSA 1 has been identified at Duinefontein 2 (Klein 1976), Peers Cave (Anthony 1967) and Elands Bay Cave (Butzer 1979). Suggested dates relate to OIS 6 (195-128 kya).

MSA 2: The MSA 2 is divided into an older MSA 2a and a younger MSA 2b. A clear continuity exists between these sequences. Overall the MSA 2 is characterised by relatively large, narrow flakes, which decrease in average length through time. The variety and abundance of formally retouched pieces increase from the MSA 2a to the MSA 2b, while denticulates decrease. Unifacial and bifacial points appear for the first time but are more typical of MSA 2b assemblages. Sidescrapers increase relative to endscrapers and tanged and proximally retouched pieces suggest hafting. Large, partially backed flake-blades also occur; occasional small backed/truncated pieces are more typical of the MSA 2b.

MSA 2 assemblages are present at the Cave of Hearths (Sampson 1968), in the Klasies River sequence (Singer & Wymer 1982), Bushman Rockshelter (Eloff 1969), Apollo 11 (Wendt 1972) and Border Cave (Beaumont 1979). Suggested dates relate to OIS 5e-5c (128-105 kya).

Howiesonspoort: The Howiesonspoort was once considered a Second Intermediate or transitional industry between the MSA and LSA. However, at some sites the Howiesonspoort is preceded or succeeded or both by MSA deposits, emphasising its definite MSA allocation. Examples include Klasies River (Singer & Wymer 1982), Border Cave (Beaumont 1979), Peers Cave (Anthony 1967) and Apollo 11 (Wendt 1972).

The assemblages are characterised by relatively numerous segments, trapezoids and backed/truncated forms. Flakes are generally smaller, broader and with lower proportions of facetted butts than flakes in MSA 2 or MSA 3 deposits. Small backed/truncated pieces were probably hafted and perhaps part of composite tools. Bifacial and unifacial points may/may not be present and denticulates are rare.

Suggested dates relate to OIS 5b-5a (105-75 kya) but may well have persisted in areas into OIS 4 (≤ 75 kya).

MSA 3: Assemblages are quite varied, both typologically and in primary stone working techniques. On the basis of the artefacts alone, they are not readily distinguishable from the MSA 2, especially the MSA 2b. In general the MSA 3 is characterised by fairly large flake-blades.

Suggested dates relate to OIS 5a-3 (82-32 kya). Sites with good temporal controls include Boomplaas (Deacon 1979), where the MSA lasted until 30 kya. At Apollo 11 dates may be even more recent (Wendt 1972), while the Border Cave MSA sequence ends before 49 kya (Beaumont 1979). It is thus possible that the MSA lasted longer in the coastal regions than it did in the interior. In general MSA 3 assemblages are less abundant than the MSA 2 and Howiesonspoort.

Mitchell (2002) emphasises the generally low proportion of formally retouched artefacts in most MSA assemblages. He suggests that the largely neglected aspects of stone tool production, such as core reduction techniques, patterns of utilisation and the reconstruction of *chaines operatoires* need to be addressed.

- **The LSA**

The LSA (< 40 kya) is marked by a series of technological innovations characterised by a greater variety of formal tools, often in association with new items of material culture including rock art (both paintings and engravings), deliberate burial of the dead and decorative items such as beads and pendants.
The LSA can be sub-divided into:

Late Pleistocene microlithic assemblages: Clear evidence for the use of a microlithic flaking technique exists with single platform and bipolar cores yielding numerous bladelets less than 25 mm long. Assemblages are characterised by few formal tool and few backed bladelets.

Sites include Border Cave (Beaumont 1979), Boomplaas, Melkhoutboom (Deacon 1969) and Byneskranskop (Schweitzer & Wilson 1978) with approximate dates of 40-12 kya.

Termimal Pleistocene/early Holocene macrolithic assemblages: Microlithic flaking techniques are absent or very rare in these assemblages. Cores are generally large and irregular with quadrilateral flakes, many being larger than those in preceding or succeeding assemblages. The few formal tools that are present mostly consist of large circular and end scraper forms.

Macrolithic assemblages are known from Wonderwerk Cave (Thackeray *et al.* 1981), Apollo 11 and Pockenbank (Wendt 1972). Estimated dates range between 12-8 kya.

Holocene microlithic assemblages: These belong to a fully developed microlithic tradition with numerous formal tools including highly standardised backed microliths and small convex scrapers.

Microlithic assemblages are present at Diana's Vow (Cooke 1979), Wilton (Deacon 1972) and Melkhoutboom (Deacon 1969). Dates range from 8 kya to a few hundred years BP.

Late Holocene assemblages with pottery: In some areas pottery is associated with microlithic assemblages. In the Northern Cape, Limpopo Province and Kwa-Zulu/Natal pottery is associated with assemblages dominated by long end scrapers and few backed microliths. Coastal middens with pottery in which formal tools are either absent or very rare express a different facies.

Sites include Driel (Maggs & Ward 1980), Boomplaas (Deacon *et al.* 1978), Jeffreys Bay and Kleinsee (Rudner 1968). Dates are within the last 2.5 kya, with most sites dating to the last 2 kya.

3.2) The historical period

The historical period in South Africa began with visits by early voyagers some 200 years before the founding of the Dutch settlement at the Cape in 1652, and records and archaeological evidence indicate Arab contacts at the East coast of South Africa from about 950 AD.

From the early 1700's many settlers expanded inland over the Cape Fold Mountain Belt. In the Northern Cape this large-scale movement involved trekboers, Bastaard and displaced Khoisan communities. They interacted with resident Tswana-speaking people in many areas.

In the 1830's white settlement in the area was still sparse but by 1854 Hopetown had developed on the farm Duvenaarsfontein. In 1859 Cape Government surveyor W.F.J. von Ludwig visited the area with the purpose of surveying the Crown lands between Hopetown and the junction of the Vaal and Orange rivers. As a keen amateur minerologist, his survey led him to believe that the area was diamondiferous, although he might not have been the first to suggest so (Roberts 1976).

Important early diamond discoveries include the 1866 'Eureka' and the 1869 'The Star of South Africa'. These and other finds lured more and more diggers to the area. By 1870 the 'rush' gained momentum, focussing on the farms Bultfontein and Du Toitspan and, closer to the river, Klipdrift and Pniel. In 1871 attention shifted to Johannes Nicolaas De Beer's farm Vooruitzigt, and soon thereafter to Colesberg Kopje, also on De Beer's farm. Here thousands of diggers joined the headlong race for claims (Robers 1976).

Mining activities escalated and by 1877 Kimberley was the second largest town in South Africa and represented by a strong cosmopolitan community. As mines became deeper and deeper it was realised that heavier equipment was needed and company mining became the order of the day, setting the stage for mining as it is still known today (Roberts 1976).

The last decade has seen increasing destruction of deposits along the banks of the Vaal River, resulting in the destruction of literally hundreds of fossil and archaeological sites.

4) Surface and sub-surface reconnaissance

4.1) Surface survey

Within each of the 24 surface research areas three visiting scientists collected lithic artefacts for a short max. period of 7 min. per site. Collected material was then analysed and a summary of the analysis is given in accordance with the specific research square in the indexes of Appendix 1. Data reads as A-B-C-D where:

A: represents the total number of artefactual material collected
B: represents the total number of cores collected
C: represents the total number of formal tools (excluding microliths), and
D: the number of collected pieces displaying use-wear.

- **Discussion**

Artefactual material collected from the 24 surface research areas varied in quantity. This possibly indicates that certain areas on the hill were more preferable to others in the past. Low-density research areas (< 20 collected pieces), represented by S2, S3, S5, S6, S14 and S15, are concentrated on the northeastern part of the hill. High-density areas (> 40 collected pieces), represented by S9, S12, S13, S16, S17 and S21, are scattered across the hill, but concentrated on the central part of the hill. The highest densities (> 65 collected pieces) are represented by S1 and S23, with 69 and 117 pieces respectively. No clear pattern of high or low concentrations is thus discernable.

Lithic material collected from the 24 research areas displays a mixture of MSA as well as both macrolithic and microlithic LSA. It is difficult to assign collected material to any of the MSA or LSA stages described. Regarding the MSA, no typical Howiesonspoort material was collected and surface occurrences may rather relate to Volman's (1984) MSA 2 or MSA 3. The total absence of ceramic material indicates that the LSA at Diamond Kopje relates to the Pleistocene-Holocene macrolithic and microlithic industries.

Two bifaces (handaxes) were collected during additional surface surveys, testifying to an Acheulean presence at Diamond Kopje. Both were collected at the southern side of the hill. They were found relatively far apart and their presence is therefore interpreted as findspots rather than potential sites. Assigning these to any phase within the Acheulean is difficult. Both are crude examples. Morphologically they can readily be assigned to the earlier part of the Acheulean although the possibility exists that they can be 'roughouts', a production phase in the manufacturing of handaxes throughout the Acheulean.

One small handaxe/bifacially flaked tool and some large flakes were found in the area of the Ventersdorp Lava outcrops, which at the northwestern part of the hill run in a predominantly north-south direction. The handaxe could indicate a Fauresmith industry, although this crude example could also be assigned to the rough bifacial samples sometimes present in the MSA 1. Large flakes present in the area may or may not be associated with the Fauresmith/MSA 1, since they could also represent a production stage for later material visibly present on the surface in the area.

On the northern slope of Diamond Kopje concentrations of raw material and artefacts were easily discernable, which can predominantly be assigned to the MSA with some macrolithic LSA. Calcrete is often visible on the surface, so that *in situ* sub-surface deposits related to surface material seems not to be substantial in this area.

In the vicinity of E1 a variety of historical artefacts were found. Metal and other objects are indicative of a domestic set-up, confirmed by the discovery of two spoons (Vorster: Pers. comm.). Stone walling, situated down-slope in a northeasterly direction from E1 is associated with the historical surface occurrences. Just north of E14 old fence posts and the remains of an old padlock probably relate to the historical occupation, which can relatively securely be dated as post-1830, but, perhaps more likely, more recent.

Across the surface of the hill recent prospecting pits were observed. Older prospecting pits showed as circular features of about 1 m in diameter, generally displaying a mixed reversed stratigraphy. A concentration of these was identified in the general area of E14 together with 3 bilobial features displaying the same stratigraphy. Curiously stacked stones around the features did not exclude the possibility of these being graves of the form typically noted on local farms and mining properties and associated with labourer settlements (e.g. Morris & Barbour 1996; Morris 2000). A small test trench was made in one to test the hypothesis. At a level of 35 cm *in situ* sub-surface gravels were encountered without any sign of bone, teeth or grave-lines. It seems as though these features are nothing more than closely situated earlier prospecting pits.

Further evidence of recent prospecting activities is a large geological trench (indicated as GT on the map) with the associated dumping site situated just south of E14 (indicated as GD on the map). Both these features relate to activities in the mid-1990's (Vorster: Pers. comm.).

4.2) Sub-surface survey

Sub-surface exploration points were located to test the variety of possible archaeological occurrences on the top, crest and slope of the hill, in calcrete rich, hutton sand and surface raw material outcrop situations.

Artefactual material were collected from pick and shovel test pits using a 3 mm screen. Collected material was then analysed. Summaries of the analyses are provided in indexes.

No *in situ* faunal, organic or other artefactual material was encountered. Sub-surface collections seem to be restricted to MSA lithic material only. No Howiesonspoort component seems to be present.

- **Discussion**

E1 is situated on the crest of Diamond Kopje in a calcrete rich area. Sub-surface information proved that the artefactual context has largely been eroded away, leaving a collapsed single stratigraphic surface layer of artefacts. Similar surface features indicate that this interpretation applies to most of the northern part of the hill.

E2 is centrally located in a rich hutton sand area. Deep sub-surface gravel was encountered. Despite the potential of rich gravel deposits as a raw material source, the test pit displayed a low artefactual component. The archaeological value of this area is more closely related to the use of landscape in the past; too centrally located areas were perhaps not preferable.

E3 and E4 is both located in areas covered by red hutton sands. Both are relatively centrally located. In situ archaeological material is quite substantial. However, extremely undulated calcrete surfaces and disturbed stratigraphy indicate that post-depositional solution largely destroyed the archaeological value of these deposits.

E5 and E6 are situated in the area of Ventersdorp Lava outcrops on the slope of the hill. At E5 post-depositional solution definitely played an important part. Both E5 and E6 showed low index values. Despite clear evidence for manufacturing, hill-wash probably transported most of the archaeological material down slope.

E7, E8, E9, E12 and E13 are all situated in the southwestern area of mixed raw material outcrops either atop, on the crest or slightly down hill. Artefact indexes are extremely stable indicative of a stable in situ context. E13 showed some archaeological stratigraphy. Considering the size of this seemingly stable deposit representative samples should be collected.

E9 is situated right next to a small mixed raw material outcrop at the foot of the hill. The area was chosen to test the depth of the deposit. The deposit showed little depth and was artefactually equally uninformative.
E10 is situated on the slope of the hill with a view over the drainage system. Artefacts however appeared very rolled and their presence is interpreted as the result of hill wash.

E14 is situated in an area of hutton sands in the southeastern part of the hill. Morphologically material from E14 is rather different from collections elsewhere on the hill, with its 'flaked' appearance compared to the generally crude retouched

examples encountered. Further research in this area will thus address both questions of time depth; does the collection represent an earlier phase of the MSA, and use of the palaeo-landscape; did different groups, with different technologies, simultaneously made use of the resources at Diamond Kopje?

- **Summary**

The southern part of Diamond Kopje seems to be archaeologically the most sensitive. In the southwestern part mixed raw material outcrops dominate the archaeology, which was exploited by the early humans/humans. Sub-surface deposits in this area seem to be very stable. In the southeastern part a flaked industry was encountered. In morphology this industry is different from the retouched material that dominate the Diamond Kopje assemblage.

4.3) Interpretation and conclusion

Both raw materials and water sources are interpreted as important early draw cards to Diamond Kopje. Two water holes are situated on top of the hill (W1-2). Though these are probably not of palaeo-origin, the possibility that similar features were present in the past cannot be excluded. A waterhole, situated down slope, to the west of the hill has a confirmed palaeo-origin (W3). Morris (2002) reported a range of Stone Age material in the immediate vicinity of this water source. A drainage system situated southwest of the hill may also be of palaeo-origin.

A wealth of Stone Age lithic material is present at Diamond Kopje. Collections indicated an overall use of the hill. A more undulated palaeo-surface and the transport of raw material sources may explain widespread artefactual material. The most informative *in situ* sub-surface material is concentrated in the south.

Surface material includes samples ranging from the ESA to the LSA, indicative of long periods of use. The topmost archaeological layers seem to have been eroded away. Surface material represents a collapsed sequence, today found in one single surface component. On the southern part of the hill sub-surface material represents deeper, as yet undisturbed, MSA layers.

In situ material generally consists of rough, crudely made samples with a rich component of cores and informal tools. Retouched collections are present in the southwestern area of raw material outcrops; a flaked industry is situated in the southeastern part. Representative samples of these collections should be salvaged for further study.

5) Recommendations

Proposed phase 2 archaeological salvage work will be restricted to:

i. A test trench from point E1 (located at S 28°40.536' & E 24°07.409') to point E1c (located at S 28°40.469' & E 24°07.548') to test site formation processes. This trench will be subdivided into 4 areas of excavation namely one located

at E1 and 3 smaller units situated at intervals down slope with the last of these at point E1c.

ii. Excavations of 3x4 square meters at points E8 and E13 respectively, to salvage representative samples of the retouched MSA deposits situated in the area of raw material outcrops at the southwestern side of the hill.

iii. An excavation of 3x4 square meters at point E14 to salvage a representative sample of the flaked MSA deposit.

Salvage excavations can start as soon as a permit has been obtained in terms of the National Heritage Resources Act (No25 of 1999).

In the event of trenching/mining at Diamond Kopje:

i. A recommended 10 m radius protected area should be set around proposed salvage points. Protected areas should be clearly marked.

ii. No mining/trenching activities, storing of heavy machinery or traffic be allowed in demarcated protected areas.

iii. Mining/trenching activities will commence in protected areas only once salvage excavations have been completed and all necessary archaeological site information has been collected.

iv. Regular archaeological inspection of mining/trenching profiles be done.

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Appendix 1

Surface Research Areas 1-24

S1	Location	28°40.552'S	Index	69-2-17-61
		24°07.497'E	Surface	5x5 m

Cores comprise 6.89%, formal tools 24.64% and utilised pieces 88.41% of the collected sample from this high-density area. Formal tools and utilised pieces are relatively small with an average length/width ratio of 39-22 mm. Tools appear to be of an MSA character, a macrolithic LSA admixture cannot be excluded and 1 microlith indicates a microlithic LSA presence.

S2	Location	28°40.569'S	Index	12-1-1-12
		24°07.412'E	Surface	5x5 m

Both cores and formal tools comprise 8.33% of the collected sample. Utilisation was found on all pieces. Formal tools and utilised pieces have an average length/width ratio of 48-31 mm. Artefacts collected are of an MSA character although 2 microliths indicate a mixed presence in the low density surface material.

S3	Location	28°40.509'S	Index	6-2-0-4
		24°07.324'E	Surface	5x5 m

Cores comprise 33% of the collected sample. No formal tools were found and utilisation was present on 66% of the collected artefacts. Artefacts have a MSA character with an average length/width ratio of 55-30 mm. No microliths were found in the low density S3 research area.

S4	Location	28°40.597'S	Index	20-5-3-17
		24°07.271'E	Surface	5x5 m

Cores comprise 25%, formal tools 15% and utilised pieces 85% of the collected sample. Artefacts have an average length/width ratio of 44-25 mm. Two relatively large artefacts can securely be assigned to the MSA. Smaller tools may be of a later MSA (perhaps macrolithic LSA). An LSA presence is secured by 1 microlith.

S5	Location	28°40.606'S	Index	14-5-0-11
		24°07.228'E	Surface	5x5 m

Cores comprise 35.7% and utilised pieces 78.57% of the collected sample. No formal tools or microliths were collected. Artefacts have an average length/width ratio of 40-34 mm. One relatively large tool can securely be assigned to the MSA. The collection of only 14 pieces in this research area indicates a low surface density.

S6	Location	28°40.591'S	Index	16-5-2-15
		24°07.202'E	Surface	5x5 m

Cores comprise 31.25%, formal tools 12.5% and utilised pieces 93.75% of the collected sample. Artefacts have an average length/width ratio of 42-30 mm. Predominantly of MSA character, 1 microlith secures a LSA presence in this low-density surface area.

S7	Location	28°40.613'S	Index	32-2-7-31
		24°07.142'E	Surface	5x5 m

Cores comprise 6.25%, formal tools 21.88% and utilised pieces 96.88% of the collected sample. An average length/width ratio of 53-40 mm indicates an MSA allocation with one large scraper having a ratio of 160-80 mm together with a strong presence of broken blades. Four LSA microliths indicate a disturbed surface context.

S8	Location	28°40.611'S	Index	23-3-0-21
		24°07.078'E	Surface	5x5 m

Cores comprise 13.04% and utilised pieces 91.3% of the collected sample. No formal tools were collected. The average length/width ratio of the collection is 38-32 mm. Two microliths indicates a disturbed MSA/LSA mixture.

S9	Location	28°40.613'S	Index	54-12-12-48
		24°07.018'E	Surface	5x5 m

Both cores and formal tools comprise 22.22% of the collected sample. 88% of the pieces collected displayed utilisation. The average length/width ratio is 56-40 mm, with two convergent flakes securing a definite MSA presence. One microlith indicates MSA/LSA mixture in this relatively dense surface sample.

S10	Location	28°40.620'S	Index	27-6-2-26
		24°06.938'E	Surface	5x5 m

Cores comprise 22.22%, formal tools 7.41% and utilised pieces 96.3% of the collected sample. No microliths were collected. The average length/width ratio of selected pieces is 54-42 mm. Artefacts can well be a MSA/macrolithic LSA mixture.

S11	Location	28°40.638'S	Index	29-3-11-29
		24°06.882'E	Surface	5x5 m

Cores comprise 10.34% and formal tools 34.93% of the collected sample. All pieces collected were utilised. The collection has an average length/width ratio of 34-22 mm. No microliths were collected. Morphologically collected pieces can be assigned to the later MSA/macrolithic LSA.

S12	Location	28°40.538'S	Index	41-3-9-38
		24°07.193'E	Surface	5x5 m

Cores comprise 7.34%, formal tools 21.96% and utilised pieces 92.68% of the collected sample. The collection has an average length/width ratio of 44-34 mm. A single convergent flake and high quantity of blades (mostly only the proximal ends), together with 3 microliths indicates a MSA/LSA mixture.

S13	Location	28°40.482'S	Index	41-6-8-38
		24°07.203'E	Surface	5x5 m

Cores comprise 14.63%, formal tools 19.51% and utilised pieces 92.68% of the collected sample. The average length/width ratio is 46-45 mm. One convergent flake and 3 microliths indicate a mixed context.

S14	Location	28°40.423'S	Index	5-1-0-5
		24°07.209'E	Surface	5x5 m

Cores comprise 20% of this very low-density sample. No formal tools were collected. All collected pieces displayed use-wear. The average length/width ratio is 33-24 mm. Without any formal tools it is difficult to assign the assemblage to any specific period. A single microlith indicates at least a microlithic LSA presence.

S15	Location	28°40.331'S	Index	11-1-1-10
		24°07.222'E	Surface	5x5 m

Both cores and formal tools comprise 9.09% and utilised pieces 90.9% of the collected sample in this extremely low-density area. The collection has an average length-width ratio of 32-18 mm. Morphologically tools can be assigned to either the MSA or macrolithic LSA.

S16	Location	28°40.643'S	Index	41-10-4-36
		24°07.169'E	Surface	5x5 m

Cores comprise 24.39%, formal tools 9.67% and utilised pieces 87.8% of the collected sample. The collection has an average length/width ratio of 55-37 mm. No microliths were found. A single convergent flake together with relatively large scrapers (80-73, 83-36 mm) is characteristic of the MSA.

S17	Location	28°40.700'S	Index	45-9-3-37
		24°07.168'E	Surface	5x5 m

Cores comprise 20%, formal tools 6.67% and utilised pieces 88.46% of the collected sample. The collection has an average length/width ratio of 34-24 mm. No microliths were found. One convergent flake together with a relatively large flake-blade (78-44 mm) indicates a definite MSA character.

S18	Location	28°40.753'S	Index	26-2-4-23
		24°07.165'E	Surface	5x5 m

Cores comprise 7.7%, formal tools 15.38% and utilised pieces 88.46% of the collected sample. An average length/width ratio of 34-24 mm is present. A single convergent flake together with 2 microliths indicates a mixed presence.

S19	Location	28°40.821'S	Index	34-10-3-28
		24°07.163'E	Surface	5x5 m

Cores comprise 29.41%, formal tools 8.82% and utilised pieces 82.35% of the collected sample. The collection has an average length/width ratio of 38-21 mm. A single convergent flake, together with 3 microliths indicates a mixed MSA, probably macrolithic, and microlithic LSA mixture.

S20	Location	28°40.874'S	Index	22-8-1-19
		24°07.164'E	Surface	5x5 m

Cores comprise 36.36%, formal tools 4.54% and utilised pieces 86.36% of the collected sample. A relatively small average length/width ratio of 33-26 mm is difficult to assign to any period; probably of MSA character with 1 microlith indicating a LSA presence.

S21	Location	28°40.472'S	Index	48-3-4-39
		24°07.078'E	Surface	5x5 m

Cores comprise 6.25%, formal tools 8.33% and utilised pieces 81.25% of the collected sample. The average length/width ratio is 33-26 mm. Formal tools can be assigned to the later MSA, macrolithic LSA. A high quantity of 7 microliths was collected.

S22	Location	28°40.464'S	Index	21-7-5-18
		24°07.338'E	Surface	5x5 m

Cores comprise 33.33%, formal tools 8.33% and utilised pieces 81.25% of the collected sample. The collection has an average length/width ratio of 55-47 mm. No microliths were found. Two crude bifacially flaked tools and a large flake-blade with a ratio of 91-54 mm may indicate a Fauresmith/MSA 1 component.

S23	Location	28°40.689'S	Index	117-22-37-106
		24°07.100'E	Surface	5x5 m

Cores comprise 18.8%, formal tools 31.62% and utilised pieces 90.6% of the collected sample in this high density research area. The collection has an average length/width ratio of 44-36 mm. A strong MSA character is confirmed by 5 convergent flakes as well as a high quantity of blades (of which mostly only the proximal ends are present). Three microliths indicate a LSA admixture.

S24	Location	28°40.677'S	Index	31-0-10-29
		24°07.364'E	Surface	5x5 m

Formal tools comprise 32.26% and utilised pieces 74.19% of the collected sample. No cores were found. A relatively small length/width ratio of 37-27 mm is present. The presence of broken blades indicates a MSA/macrolithic LSA. One microlith attests to a microlithic LSA mixture.

Appendix 2

Sub-surface Exploration Points 1-14

E1	Location	28°40.536'S	Index	N/A
		24°07.409'E	Size	90x70x14 cm
E1E	Level	1-14	Index	N/A
E1	is situated in an area with a rich surface scatter of Fauresmith/MSA artefacts. Sub-surface depth is very shallow; at an average depth of 14 cm the calcrete level was reached, at 74 cm basal shales was reached. The calcrete did not contain any artefacts and no artefact member was found between the calcrete and the shale. Sub-surface exploration yielded a few larger flakes, together with a great quantity of smaller flakes, flaking debris and microlithic tools. In this area it seems as though the once existed archaeological context has largely been weathered away. Smaller flakes and flaking debris collected sub-surface while most of the larger tools are found on the surface. No artefactual material has been collected from this test pit. A test trench, to test site formation processes, is proposed in this area.			

E2	Location	28°40.612'S	Index	3714-123-38-3572
		24°07.173'E	Size	190x100x87 cm
E2U	Level	0-27 cm	Index	1121-37-14-1018
E2M	Level	27-54 cm	Index	1456-44-12-1430
E2L	Level	54-87 cm	Index	1137-42-12-1124
E2	is situated in an area with relatively rich but crudely manufactured surface material. Artefactual basal calcrete was reached at a level of 87 cm. The context is a rich, dense gravel. Cores comprise 3.31%, formal tools 1.72% and utilised pieces 96.18% of the material. The Upper level displayed a mixture of MSA and LSA material. Stratigraphy is a possibility but artefacts are crude and not easily discernable. Average length/width ratios of E2M and E2L are 55-43 and 62-48 respectively. E2M and E2L material is more typical of the MSA with a very well made convergent flake from E2L. Utilised pieces comprise a large quantity of cobbles with one or two flake scars. The possibility exist that many of these can be due to natural processes or trampling and their artefactual context is therefore dubious.			

E3	Location	28°40.958'S	Index	98-4-7-95
		24°07.372'E	Size	100x100x22 cm
E3E	Level	0-22 cm	Index	98-4-7-95
E3	is situated in an area with a relatively low density of surface material. Artefactual basal calcrete was reached at an average depth of 22 cm. The calcrete surface was extremely undulated. Cores comprise 4.08%, formal tools 7.14% and utilised pieces 96.14% of the collected sample. The average length/width ratio of formal tools is 23-18 mm. No stratigraphy was visible. Artefacts found closer to the calcrete have a calcrete surface deposit. Formal tools are mostly rough side and end scraper forms, rolled in appearance. Material can be assigned to the later MSA/macrolithic LSA.			

E4	Location	28°40.499'S	Index	214-12-14-205
		24°07.255'E	Size	90x70x34 cm
E4U	Level	0-10 cm	Index	43-1-2-40
E4M	Level	10-20 cm	Index	69-4-3-67
E4L	Level	20-34 cm	Index	102-7-9-98
E4	is situated in an area with a relatively dense surface scatter of artefactual material. Artefactual basal calcrete was reached at an average depth of 34 cm. This surface was extremely undulated. Cores comprise 5.61%, formal tools 6.54% and utilised pieces 95.79% of the total sample collected. Formal tools have an average length/width ratio of 44-30 mm. The stratigraphy seems to be very disturbed; some collected pieces are very rolled in appearance while others display crisp flaking edges. E4L contained both a large bifacially flaked point together with 2 microliths, indicating post-depositional disturbance.			

E5	Location	28°40.282'S	Index	311-8-23-169
		24°07.048'E	Size	90x70x72 cm
E5U	Level	0-12 cm	Index	62-0-4-59
E5M	Level	12-50 cm	Index	195-7-16-96
E5L	Level	50-72 cm	Index	54-1-3-14
E5	is situated between 2 Ventersdorp Lava outcrops. A range of MSA/LSA material was scattered on the surface with some relatively large flakes in the immediate vicinity of the outcrops. Clear stratigraphy was noted between E5U and layers E5M and E5L, which consisted of a crumbly calcrete. Basal shales were reached at an average depth of 72 cm. In E5U formal tools comprised 6.5% and utilised pieces 59.16% of the collected sample. No cores were collected. The formal tool length/width ratio is 32-22 mm. 50% of the formal tools were however broken. In appearance the tools from this sandy member is similar to those on the surface and can belong to a later MSA/macrolithic LSA. In E5M and E5L cores comprised 0.03%, formal tools 7.63% and utilised pieces 44.18% of the collected sample. The formal tool length/width ratio is 49-36 mm. Being situated between raw material outcrops, the low percentage of cores is surprising. The low percentage of utilised pieces is ascribed to the rolled appearance of artefactual material and a calcrete deposit on most of the pieces, making it difficult to identify utilisation. Morphologically formal tools can be assigned to the MSA.			

E6	Location	28°40.307'S	Index	417-24-33-399
		24°06.941'E	Size	100x65x46 cm
E6U	Level	0-15 cm	Index	134-6-8-131
E6M	Level	15-30 cm	Index	135-10-13-126
E6L	Level	30-46 cm	Index	148-8-12-142
E6	is situated in the centre of a semicircular Ventersdorp Lava outcrop formation. The area was chosen to test the use of raw materials in the area. In the immediate vicinity a relatively high density of artefactual surface material was present. No clear stratigraphy could be discerned. The context was relatively gravel rich. Basal Ventersdorp Lava was reached at an average depth of 46 cm. Cores comprise 5.76%, formal tools 7.91% and utilised pieces 93.05% of the total collected sample. The formal tool length/width ratio is 44-34 mm. Side and end scraper forms predominate with a later MSA character.			

E7	Location	28°40.502'S	Index	444-47-38-397
		24°07.127'E	Size	90x70x86 cm
E7U	Level	0-35 cm	Index	206-25-21-198
E7M	Level	35-74 cm	Index	189-19-15-181
E7L	Level	74-86 cm	Index	49-3-2-18
E7	is situated in an area with a rich surface scatter of artefactual material. Basal artefactual calcrete was reached at an average level of 86 cm. The context is a rich gravel, stratigraphically visibly similar to the present day surface. No clear stratigraphy could be identified between levels E7U and E7M. E7L is a crumbly calcrete mixture, with calcrete often adhering to the surface of artefactual material. Context stratigraphic layers do not indicate change in the archaeological deposit. Cores comprise 11.1%, formal tools 9.11% and utilised pieces 95.94% of material collected from E7U and E7M. Formal tools have an average length/width ratio of 51-39 mm. An MSA allocation is indicated by a high percentage of broken blades. Level E7L is interpreted as belonging to E7M, but which, through a process of post-depositional solution became incorporated in a crumbly calcrete context.			

E8	Location	28°40.498'S	Index	349-35-28-289
		24°06.959'E	Size	120x100x47 cm
E8U	Level	0-15 cm	Index	121-11-8-107
E8M	Level	15-30 cm	Index	98-14-19-87
E8L	Level	30-47 cm	Index	130-10-11-95
E8	is situated in an area of rich raw and artefactual surface material. The context is a rich gravel. The artefactual calcrete basal layer was reached at an average level of 47 cm. Basal shales were reached at 80 cm. No artefact member was present between the calcrete and the basal shale. Cores comprise 10.03%, formal tools 8.02% and utilised pieces 82.8% of the total collected sample. Formal tools have an average length/width ratio of 52-39 mm. A high percentage of broken blades and side and end scraper forms secure an MSA allocation.			

E9	Location	28°40.341'S	Index	102-3-8-94
		24°06.761'E	Size	110x70x38 cm
E9U	Level	0-20 cm	Index	47-2-2-46
E9M	Level	20-30 cm	Index	42-1-4-38
E9L	Level	30-38 cm	Index	13-0-2-10
E9	is situated next to a small raw material outcrop at the western foot of the hill. Three stratigraphic layers were identified. E9U has a sandy, E9M a dense gravel and E9L a crumbly calcrete context. Artefactual basal calcrete was reached at an average depth of 38 cm. Cores comprise 2.94%, formal tools 7.84% and utilised pieces 92.16% of the total collected sample. The low quantity of formal tools, mostly represented by broken pieces renders a length/width ratio not relevant to interpretation. Smaller pieces were present in E9U and E9L. E9M contained on average larger material.			

E10	Location	28°40.598'S	Index	136-4-11-97
		24°06.766'E	Size	130x60x56 cm
E10U	Level	0-25 cm	Index	54-1-3-30
E10M	Level	25-45 cm	Index	62-2-4-48
E10L	Level	45-56 cm	Index	20-1-4-19
E10	is situated on the hillslope. A relatively low density of surface material was visible and largely confined to shallow dongas. Three stratigraphic layers were identified: E10U has a sandy, E10M a mixed crumbly calcrete/gravel and E10L a crumbly calcrete context. No clear artefactual stratigraphy was identified. Artefactual material has a rolled appearance. Basal calcrete was reached at an average level of 56 cm. Cores comprise 2.94%, formal tools 8.08% and utilised pieces 71.32% of the collected sample. Length/width ratios seem uninformative due to the small formal tool sample. Artefacts seem to be in a secondary context; primarily the result of hill-wash.			

E11	Location	2840.646'S	Index	348-38-35-331
		2407.069'E	Size	120x70x35 cm
E11U	Level	1-10 cm	Index	108-12-11-106
E11M	Level	10-20 cm	Index	87-15-17-83
E11L	Level	20-35 cm	Index	153-11-7-142
E11	Is situated in an area with a rich raw and artefactual surface collection. The context is a dense gravel and no clear stratigraphy could be discerned. Basal calcrete was reached at an average depth of 35 cm. This calcrete surface was undulated. Cores comprise 10.9%, formal tools 10.05% and utilised pieces 95.11% of the total sample. Formal tools have an average length-width index of 57-49 mm. Artefacts have a definite MSA character, with a high degree of broken blades.			

E12	Location	28°40.790'S	Index	1828-96-59-1286
		24°07.068'E	Size	110x70x57 cm
E12TTU	Level	0-20 cm	Index	527-29-14-518
E12TTM	Level	20-40 cm	Index	361-37-22-348
E12TTL	Level	40-57 cm	Index	414-30-23-420
E12	is situated in an area with a rich surface scatter of smaller and larger flakes, cores and a variety of later formal tools. Sub-surface deposits reached a level of 57 cm in a rich gravel context. Cores comprise 5.25%, formal tools 3.22% and utilised pieces 70.35% of the collected sample. Average length/width ratios vary from level U: 42-36, M: 46-39 and L: 53-41. A strong presence of convergent flakes and broken blades assures a MSA allocation. Artefacts are overall relatively crude but with a definite presence of retouch. No clear stratigraphy could be discerned.			

E13	Location	2840.630'S	Index	2256-218-213-2146
		2406.967'E	Size	130x60x153 cm
E13U	Level	0-40 cm	Index	789-81-74-721
E13M	Level	40-8- cm	Index	643-62-71-620
E13L	Level	80-120 cm	Index	732-68-64-718
E13C	Level	120-153 cm	Index	92-7-4-87
E 13	Is situated in an area with a rich surface deposit of raw and artefactual material. The context is a dense gravel. Layer E13C indicates post-depositional solution processes. No clear stratigraphy was discernable. However larger artefacts in lower levels indicate some stratigraphy, making this a prime area for further research. The artefactual assemblage reached a depth of 153 cm. Cores comprise 9.66%, formal tools 9.44% and utilised pieces 95.12% of the collected sample. Formal tools have an average length/width ratio of 57-46 mm. Convergent flakes, blades and prepared cores assures a MSA allocation. One crude bifacially flaked tool was also found in E11L.				

E14	Location	2840.722'S	Index	898-85-84-194
		2407.289'E	Size	90x70x90 cm
E14U	Level	0-12 cm	Index	49-0-2-33
E14M	Level	12-50 cm	Index	412-37-40-78
E14L	Level	50-9- cm	Index	437-48-42-83
E14	Is situated in an area with a low surface scatter of artefactual material. E14U seems to be an in situ deposit of the current surface member. E14M and E14L are in a loose gravel context. Basal calcrete was reached at an average level of 90 cm. In layers E14M and E14L cores comprise 10.01%, formal tools 9.66% and utilised pieces 18.96% of the collected sample. Formal tools have an average length/width ratio of 53-41 mm. The assemblage has a unique flaked appearance with a definite MSA allocation.				