REPORT ON PHASE 2 ARCHAEOLOGICAL EXCAVATIONS AT THE NAMAKWA SANDS PROJECT (FIRST PHASE) VREDENDAL DISTRICT NAMAQUALAND

Prepared for Namakwa Sands Ltd

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EXECUTIVE SUMMARY

The Archaeology Contracts Office, University of Cape Town was commissioned by Namakwa Sands to excavate and sample archaeological sites threatened by both direct and indirect impacts resulting from the first phase of heavy mineral mining at Brand se Baai. Four sites were located and excavated under a permit issued by the National Monuments Council.

Three of the four sites consist of open scatters of stone artefacts and shellfish food remains. In all three instances formal artefacts characteristic of the Late Stone Age (LSA) period were found. Artefacts found on these sites indicate that they date to older than 2000 years ago. Evidence of spatial patterning was present on one LSA site indicating that it accumulated as a result of a short term camp by a small group of prehistoric hunter-gatherers. The fourth site was located at a large silcrete (quartzitic) outcrop where Early Stone Age (ESA) people came to collect raw materials for making stone tools. In doing this they substantially modified the shape of the outcrop and left a vast accumulation of stone flakes and other artefacts. Much of this is now covered with aeolian sands. The artefact forms found on this site indicate that it could be 200 000 years (or more) old.

The three LSA sites have been sampled adequately enough to minimise the impact of mining. The ESA site is too large to be cleared in its entirety. Monitoring and photographic recording is suggested as a means of mitigating its destruction once mining is underway. It is also recommended that as the mining area expands in future years, archaeological sites should continue to be sampled. All mitigatory measures taken and recommendations made as a result of this study are subject to the approval of the National Monuments Council.

1. INTRODUCTION

The Archaeology Contracts Office of the University of Cape Town was commissioned by Namakwa Sands Limited to locate and conduct archaeological rescue excavations on Stone Age Sites that lie in the first phase of the heavy mineral sands mining area at Brand se Baai, Namaqualand. (Figure 1, Plate 1). All stone age archaeological sites are protected by the National Monuments Act which requires a permit to be issued for their excavation. Four archaeological sites which would have been negatively impacted by the mining operation have been subject to mitigatory excavations in terms of a excavation permit awarded to the Archaeology Contracts Office. An Early Stone Age (ESA) quarry site was sampled, while three Late Stone Age (LSA) open sites were extensively excavated with a view to collecting enough information to place them in a local context and record any spatial patterning that was present. The excavated material was transported to the Department of Archaeology (UCT) where analysis and curation was undertaken.

This report describes the excavated sites and the archaeological work that has taken place. The findings are discussed and measures to conserve cultural resources in the mining area are presented. Extensive appendices which may be of use to other researchers are attached. These contain detailed archaeological data (Appendices 1-4) and a background document on the history of research in Namaqualand placing the sites excavated in the context of current research (Appendix 5).

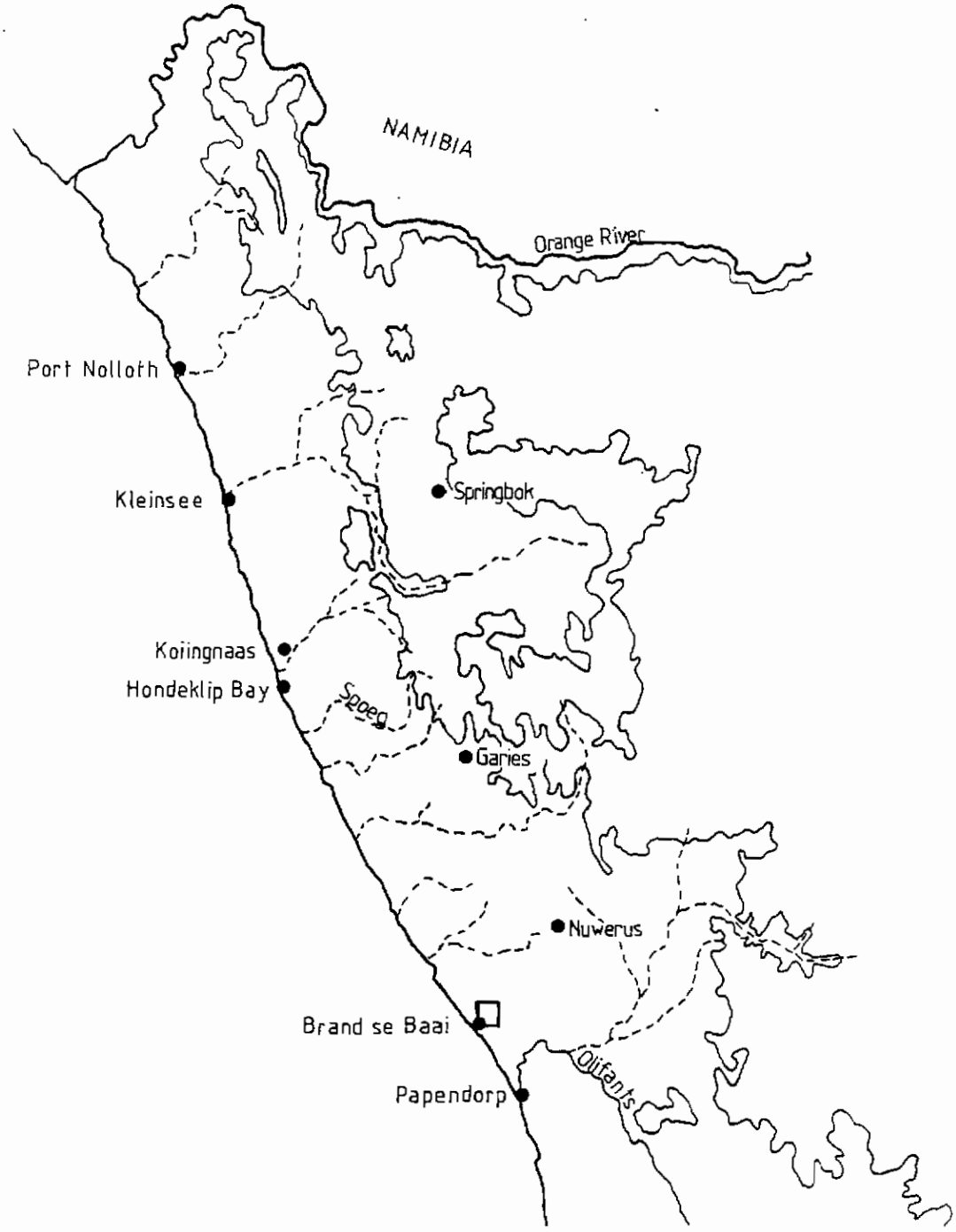
2. FIELDWORK

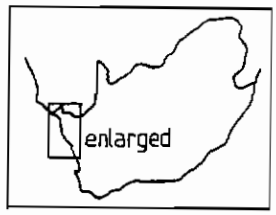
The area to be effected by the first phase of mining was thoroughly foot searched for all archaeological occurrences (Figure 2) following on the initial survey by Parkington and Poggenpoel (1993). All the sites located were plotted by taking GPS fixes. In this way it was established that site BSB 13 (a silcrete outcrop with associated artefacts) first located by Parkington and Poggenpoel (1990) had already been destroyed as a result of construction work at the Secondary Concentration Plant. Site BSB 14 (Parkington and Poggenpoel 1990) was located in the mining area close to the primary concentration plant and was excavated as part of this programme (Figure 2). In addition to the sites recorded by Parkington and Poggenpoel (1990) 3 more sites were found which would be negatively impacted on by the mine. All of these have now been sampled.

3. EXCAVATION METHOD

Excavations in the Namakwa Sands mining area, and subsequent analyses were conducted according to standard archaeological procedures. A meter square grid system imposed on the surface of the sites was used to record the horizontal provenance of artefacts and features. Excavations then proceeded by the removal of natural stratigraphic units or spits of pre-determined depth. All 3 LSA sites lay in deflated areas where most of the archaeological material lay on the surface. Where recognisable occupation layers were visible, these were assigned identities, removed separately, sieved through a 1.5mm mesh and bagged according to provenance.

The excavation of an archaeological site is generally followed by a lengthy period of laboratory analysis. In this case, the material was sorted into a series of separate components, namely stone artefacts, special artefact finds, bone, ostrich egg shell, rock lobster mandibles and shellfish (where present). The stone artefacts have been


NAMIBIA
Orange River
Port Nolloth
Kleinsee
Springbok
Koiingnaas
Hondeklip Bay
Spoeg
Garies
Nuwerus
Brand se Baai
Olifants
Papendorp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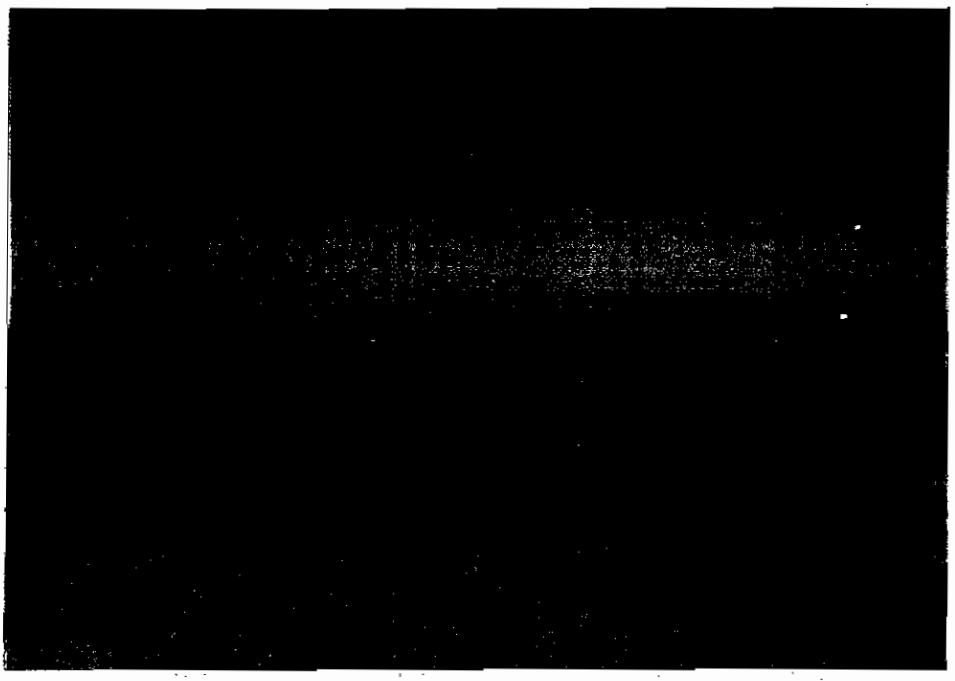


PLATE 1 View of mining zone and area of archaeological investigation.

analysed in terms of raw material, tool or waste type and then compared with assemblages from other dated sites. The small amounts of bone that have been preserved, were sorted by species (when preservation allowed) to obtain an indication of the kinds of animals represented on the site. Likewise, shellfish have been sorted by species, measured and counted. The accumulated measurements and observations (when sample size allowed) were then analysed for their spatial and chronological patterning as a basis for the reconstruction of the behaviour of pre-colonial people and the environment in which they lived. These observations, besides being the basis for this report, add to the body of regional information available to archaeologists and other interested parties for future research. Data and diagrams are included in the appendices 1-4 of this report.

4. ARCHAEOLOGICAL SITES

4.1 MS 1 LATE STONE AGE SITE

31°15'5282 S
17°54'3904 E

This site is located on a large but low silcrete (quartzitic) outcrop. The outcrop itself has been subject to large scale Early Stone Age (ESA) quarry activity which is separately described as site MS 4 in this report (Figure 2). Windblown sand has accumulated on the east side and summit of the outcrop which is partly vegetated by grasses and bushes. The presence of a few fragments of shell lying in a small deflation in the windblown sands was an indicator that other less visible LSA material existed on and below the surface. The subsequent excavation showed that windblown sand had accumulated in a hollow area on the east side of the outcrop in the millennia after it was favoured as a quarry.

The site was gridded and the surface deposits excavated to a depth of 5cm (Plate 2). All the soil from 128m^2 was passed through a 1.5mm sieve and the resulting material initially sorted on site. Measures to check for further buried material involved a second scrape in selected areas, and a 1m^2 deep sounding. This revealed that virtually all the finds were confined to the top 5cm of windblown sands.

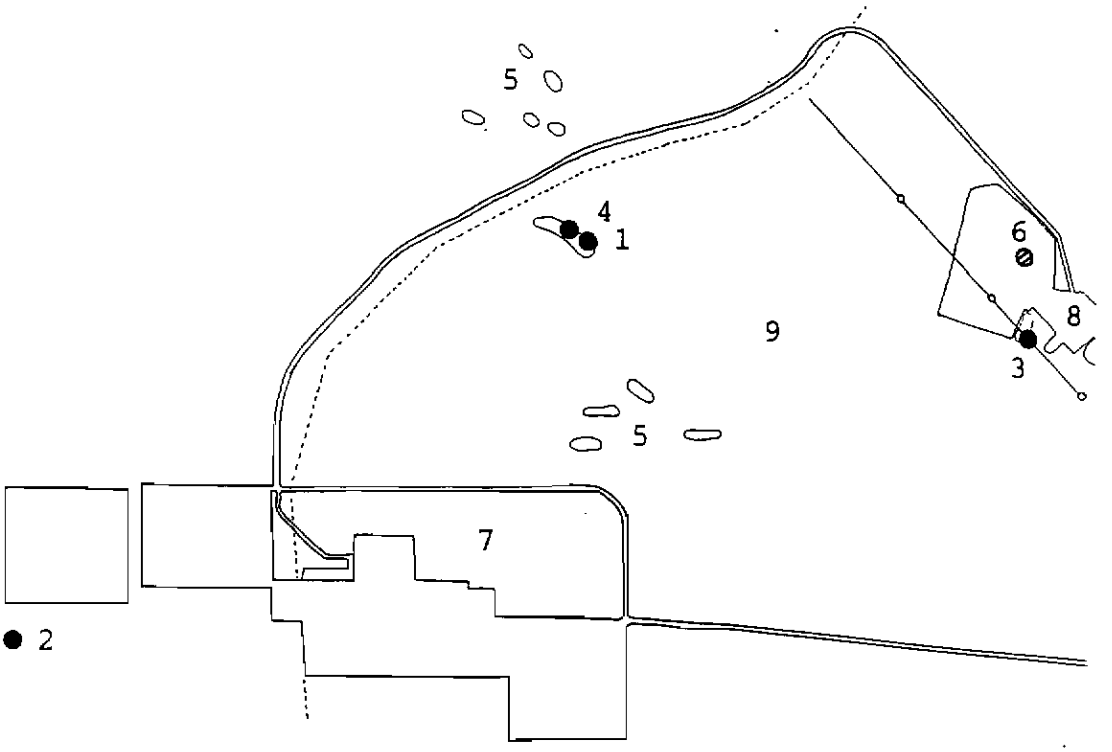
4.1.1 Artefacts:

No artefacts made from organic materials were preserved. The analysis has revealed the presence of an interesting stone tool assemblage as well as vestiges of spatial patterning (see Appendix 1).

The analysis had to take into account that many fragments of older stone artefactual material from the ESA quarry were mixed with the LSA material on the periphery of the sandy hollow. In addition many small chips of older silcrete had accumulated with the aeolian sand on the LSA site. Silcrete utilised by LSA people had to be separated from the general "noise" of earlier material. Differences in the degree of patination and wind erosion on the surface of the artefacts enabled us to isolate the younger material to an extent. This was easily accomplished with the larger artefacts, but became more difficult on pieces with a maximum dimension of less than 10mm.

4.1.2 Raw materials:

Quartz was favoured by the LSA inhabitants for making small artefacts (57%). The immediately abundant quartzitic silcrete (which produces a sharp edge when flaked) was also used for the manufacture of expedient artefacts (42.1%) but not for making



1. Site MS 1
2. Site MS 2
3. Site MS 3
4. Site MS 4
5. Silcrete outcrops (ESA scatters)
6. Site BSB 13 (destroyed)
7. Secondary concentration plant
8. Primary concentration plant
9. Mining area

2

0 1000 m

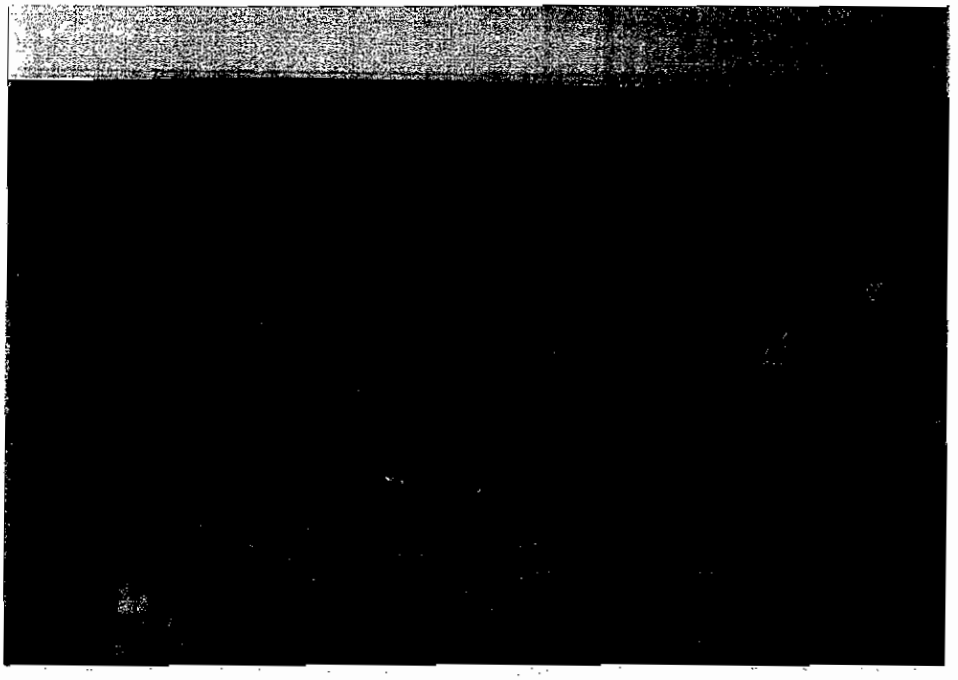


PLATE 2 Site MS 1 after excavation.

formal tools. Raw materials such as opaline and crypto-crystaline silicates (CCS) make up less than 1% of the assemblage.

4.1.3 Formal tools:
Although most of the stone artefacts are the debris of stone working (waste), a number of formal microlithic artefacts occur in the assemblage. Of these, segments are dominant, followed by a variety of backed artefacts including backed points, backed bladelets, miscellaneous backed pieces (MBPs) and miscellaneous retouched pieces (MRPs). No scrapers were found on the site which is unusual. The favoured raw material for making microliths was clear quartz with occasional instances of use of other raw materials such as crypto-crystaline silicates (CCS) and opaline. In all, formal stone artefacts formed 0.6% of the stone assemblage.

4.1.4 Animal bone:
Animal bone in exposed surface contexts as well as in acidic siliceous soils such as those at Brand se Baai do not survive easily. Bone found during previous excavations on the coast had been preserved in context by the shell rich (alkaline) deposits characteristic of immediate coastal sites.

Although a number of small fragments of bone were found, these consist of mainly microfauna which died on the site in recent years. It likely that if a faunal assemblage had been preserved, it would have contained terrestrial elements similar to the assemblages of the coastal sites excavated in 1992 (Hart, Halkett and Parkington 1993).

4.1.5 Shellfish:
The presence of small quantities of shellfish on the site are an indicator that the inhabitants were exploiting coastal resources on a limited scale as a result of their short term occupation of the site and its distance from the shore. The whole shell count was too low provide a reliable measurable sample. The collection was analysed, with the results showing that *Patella granatina* and *Patella granularis* were the dominant species eaten. *Choromytilus meridionalis*, *Burnupena* sp and *Patella argenvillei* although present in the sample, were minimally exploited. Specific information about comparative shellfish quantities are contained in Appendix 1.

4.1.6 Spatial patterning:
One of the most interesting features of this site is the presence of what can be regarded as the remnants of spatial arrangement. Appendix 1 contains diagrams showing the various components of the site plotted on the $1m^2$ excavated blocks.

The horizontal distribution of the various components of an archaeological assemblage, if well preserved, reflect the way that people were organising their living areas. Most of the artefacts on MS 1 are concentrated within a fairly definable area. Furthermore the plotted distribution of formal artefacts forms a roughly circular arrangement some 9-10 m in diameter. Within this circle are increased amounts of artefactual waste material while formal tools and large manuports are distributed around the periphery. The distribution of shellfish falls mostly within the bounds of the area defined by the stone artefacts but with increased density on the south side of the site. *C. meridionalis* is confined to a cluster on the west extent of the scatter, while *Burnupena sp* are restricted to the eastern side.

Modern ethnographic studies of Kalahari San hunter gatherer studies have provided archaeologists with analogous information about the way that people may have been organising their home space in the past (Lee 1979, Brooks *et al* 1984 and Yellen 1977). Kalahari San camps are arranged in a circular fashion with huts facing inward towards

a common central area. The greater the number of huts, the larger the size of the camp and the common central area. The number of family units within a camp varies according to season and the availability of resources (Halkett 1991). During the dry season nuclear families would aggregate close to water sources thus forming large camps containing between 12 and 15 huts (Yellen 1977). In the wet season the converse would apply with extended families dispersing into smaller camps with between 2 and 7 huts. According to the established ethnographic patterns MS 1 would fall within the category of a small dispersal camp consisting of 3 or 4 nuclear families who inhabited the outcrop for a very small period of time.

4.1.7 Dating:
The presence of backed microliths on this site indicate that it has both cultural and temporal affinities with site BSB 2 excavated on the coast by the ACO in 1992 (Hart, Halkett & Parkington 1993). This site was dated to 4510 ± 50 BP (Pta-6053) which means that it accumulated some 4100 years ago. Samples of shellfish from MS 1 have been submitted to the Quaternary Dating Research Centre at the CSIR for radiocarbon dating. It is expected that these will produce a date older than 2000 years ago.

4.1.8 Conclusion:
The size of the scatter at site MS 1 corresponds roughly to the size of area occupied by 3-4 huts in terms of the Kalahari ethnographic pattern (Halkett 1991). People were probably living in a circularly arranged fashion. The actual position of individual huts is not clear as no hearths were preserved on MS 1, but it may be postulated that the distribution of the formal tools may equate the positions of family activity areas. It would appear that the central area was used as a communal area and a toss zone for artefactual waste and organic debris that are no longer visible. Although no plant or bone fragments have been preserved on the site, it must be assumed that the occupants gathered plant foods, tortoises, eggs and were hunting and snaring animals. The shellfish component of the site is minimal and unlikely to represent any more than one or two seafood meals eaten on site by the group.

4.2 MS 2 LATE STONE AGE SITE

31°16'2628S
17°53'4412E

This site lies on a low deflated mound on the edge of the land cleared for the Secondary Processing Plant (Figure 2). Although the area is not due to be mined, the site is very close to a focus of human activity which means that it is liable to be negatively impacted. The site was gridded into 1m² blocks, and areas where archaeological material was visible on the surface were excavated to a depth of 5cm. All the excavated surface deposits of the 44m² were passed through a 1.5mm sieve. Deeper test excavations (10cm spits) were then positioned in various parts of the site to test for archaeological material below the surface of the dune body. A dispersed lens of shellfish and stone artefacts were located between 30 and 40 cm below the surface. The underlying soils were damp which meant that this material had to be passed through a 3mm sieve. The below-surface deposits were not exhaustively excavated as it was necessary to devote the bulk of field time available to sites in the mining area which faced total destruction. Plots of the distribution of archaeological material is shown in Appendix 2.

4.2.1 Artefacts:
No artefacts made from organic materials were preserved on the site. Some stone artefacts were found and analysed.

Despite the presence of high quality quartzitic silcrete outcrops in the vicinity, the preferred raw material used by Late Stone Age occupants of the site was quartz. Silcretes are present in the assemblage but were not used for the manufacture of formal artefacts. Clear quartz and crypto-crystaline silicates (CCS) were favoured raw materials for formal tools.

4.2.2 Animal bone:
The small quantity of bone found was highly fragmented and mostly adiagnostic. Bones of small mammals, microfauna, and small birds are present in the sample. It is likely that the presence of these is result of natural factors and not related to the human occupation.

4.2.3 Shellfish:
The quantities of marine food remains found on the site are small in comparison to sites located directly on the coast where the main component of people's diet was marine food. Compared with the other inland sites we have excavated during this season, the sample from MS 2 is comparatively large with shellfish fragments found in every excavated square. The number of complete individual specimens is too small for the in-depth analysis such as that normally undertaken on the coastal material.

The sample of shellfish from the surface deposits is dominated in weight by *Choromytilus meridionalis*, followed by *Patella granatina* and *Patella granularis*. No *Patella argenvillei* was found in the surface deposits.

The excavation of the deeper test excavations showed fragments of shellfish continued to a depth of 50cm below the surface. The concentration of shells increased between 30-50 cm below surface indicating the presence of a dispersed buried lens. This too, was dominated by *Choromytilus meridionalis*.

The relatively large sample of shellfish from this site is a function of its commanding dune top position. Such locations were favoured by prehistoric people and often re-used as camping places resulting in an accumulation of material over the years. Although it is closer to the shore than the other excavated sites described in this report, it is not close enough for habitual collection of shellfish. It is likely that people were relying on the collection and hunting terrestrial foods - the remains of which have not been preserved. The shellfish species represented are those that can be easily obtained in the inter-tidal zone at times of normal low tide. Very few deeper water species such as *Patella argenvillei* are present.

4.2.4 Dating:
The fact that no ceramics were found on any part of the site is a strong indicator that it was occupied before 2000 years ago. The presence of a number of formal microlithic stone tools in the artefactual assemblage would argue for a date by association of 3000 years ago or older. Samples of shellfish have been submitted to the Quaternary Dating Research Centre at the CSIR.

4.2.5 Conclusion:
It is known that locations with the combination of shelter from prevailing winds and a "view" of the surrounding landscape attracted prehistoric people. People who lived on MS 2 would have probably constructed small shelters in the deflation hollows on

the dune top. The distribution diagrams (Appendix 2) of the components of the site show that the main concentration of *Choromytilus meridionalis* is concentrated towards the northern portion while the converse applies to the distribution of formal artefacts and whelks. Due to the fact that the full extent of the site was not excavated, it is difficult to determine whether the distribution is a function of the deflationary effect of wind and sand movement or whether it is a direct result of the human occupation pattern. The fact that there is a vertical sequence of archaeological material in the dune body would suggest that this location was a natural focus that was occupied several times. The quantities and density of the archaeological material would argue for short term occupations by fairly small groups of people.

4.3 MS 3 LATE STONE AGE SITE

31°16'0169S
17°55'2155E

This site (previously identified as site no 14 by Parkington and Poggenpoel (1990)) lies in a large deflation hollow (Plate 3) very close to the Primary Concentration Plant (Figure 2). As the site lay directly on the alignment of a conveyor, a decision was made to remove as much as possible of the archaeological material. The entire deflation hollow was gridded into 1m^2 blocks. An area of 192m^2 was excavated to a depth of 5cm and passed through a 1.5mm sieve.

4.3.1 Artefacts:

The artefactual assemblage is summarised in Appendix 3.
No artefacts besides those made of stone were preserved. Quartz was the dominant raw material used with quartzitic silcrete making up less than 6% of the assemblage (although the site was within easy walking distance of the quartzitic silcrete outcrops). Clear quartz and less common fine silcretes, CCS and opaline were favoured raw materials for the manufacture of microliths. The dominant formal artefacts are segments followed by backed bladelets and points. Scrapers are present but are not of the backed variety (Hart, Halkett & Parkington 1993) found on the coastal site BSB 3.

4.3.2 Animal bone:

Very little bone survived on the site besides some microfauna (not related to the human occupation) and a few fragments of tortoise carapace. The remaining material is highly fragmented and adiagnostic.

4.3.3 Shellfish:

Small quantities of shellfish were found and analysed. The sample was too small to provide any worthwhile comparative statistical analysis but the weights of species found are contained in Appendix 3. *Patella argenvillei* dominated the sample while *Patella granatina* were present in smaller quantities. The quantity present does not account for more than a single collecting event showing that the role that shellfish played in the diets of people who were living on inland sites was minimal.

4.3.4 Dating:

Samples of shellfish have been submitted to the Quaternary Dating Research Center at the CSIR for radiocarbon dating. The artefactual assemblage contains microlithic stone artefacts characteristic of the period before 2000 years ago.

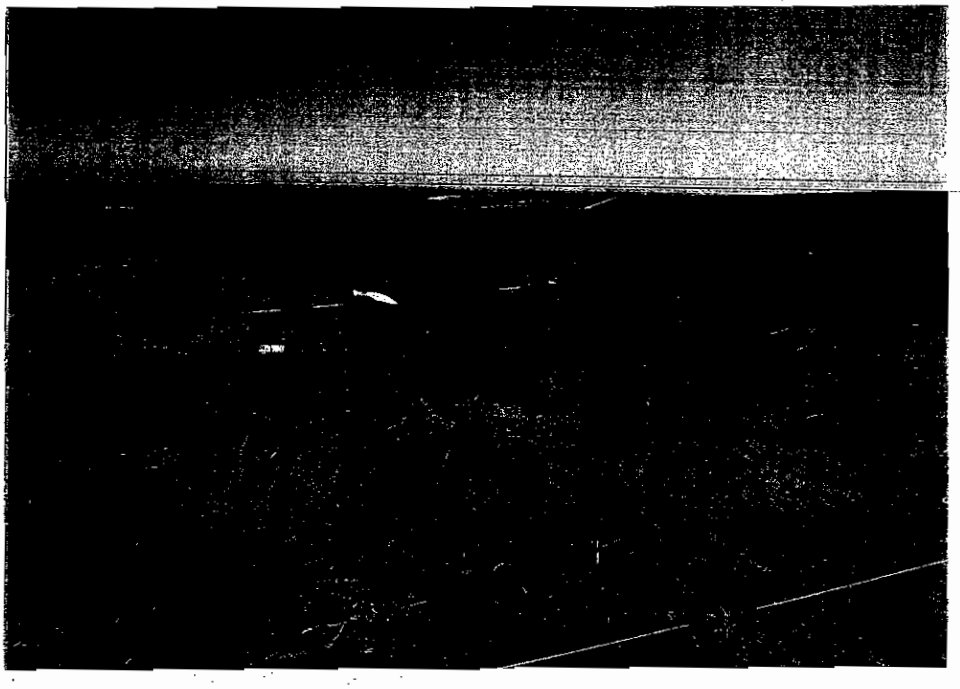


PLATE 3 Site MS 3 during excavation.

4.3.5 Conclusion:
Visible spatial patterning in the deflation hollow has been blurred by erosion and sand movement for a long time. All the artefactual material has been conflated into the first 2cm of surface sands. The positions of formal artefacts correlate with dense waste concentrations on the northern portion of the site. The distribution of shellfish shows a broad concentration on the west side of the site. The fact that the dispersed fragments of shell amount to a small number of individual specimens argue for post-depositional movement as a result of wind and sand movement.

Deflation hollows are features of the landscape that are often erroneously attributed to the effects of modern overgrazing. Many of these, of which MS 3 is an example, are in fact ancient and often contain the remnants of camps of prehistoric people who sought shelter behind the dunes.

4.4 MS 4 ESA SITE

31°15'5172S
17°54'3503E

The cluster of silcrete outcrops (Figure 2) on the west side of the mining area were inspected by the team at the beginning of the programme. Most of these outcrops showed evidence of quarrying by prehistoric people who required fine quality raw material for the manufacture of stone artefacts. One of these outcrops was selected for test excavation and archaeological sampling.

The outcrop in question rises some 5m above the red aeolian sands (Plate 4). Its surface is partly vegetated where wind blown sand has accumulated in hollows in the rock. Site MS 1 (already described) lay in one of these areas. The entire surface of the site is covered with stone artefacts and debris. Furthermore, there is scarcely any visible part of the bedrock that is not covered with flake scars and percussion cones related to ancient quarrying (Plate 5). Formal artefacts were scarce on the surface of the site with most of the material being identified as by-products of stone tool manufacture. A few bi-faces, rare *levallois* cores, and disc cores were an initial indication that the outcrop had been subject to collection of raw material for artefact manufacture a very long time ago.

4.4.1 Sampling strategy:
A base line was established extending from the summit of the outcrop down the slope onto the windblown sands. At first surface sampling of a transect was attempted, but was abandoned once it became apparent that vast quantities of artefacts had accumulated in hollows on the surface of the outcrop. Sampling was then continued by test excavations at three places down the baseline (A, B, C). The relative positions and elevations of the test excavations are indicated in Figure 3.

Test A
An excavation of 1m^2 was opened to check the depth and density of material below a sandy surface close to the top of the outcrop. Below the surface sands was a dense accumulation of stone artefacts which continued without any stratigraphic break to a depth of 70 cm at which point bedrock was reached. The bed rock itself had been heavily scarred as a result of prehistoric quarrying. Approximately 300 kg of artefactual material was excavated. This was sub-sampled and the material transported to the University of Cape Town for analysis.

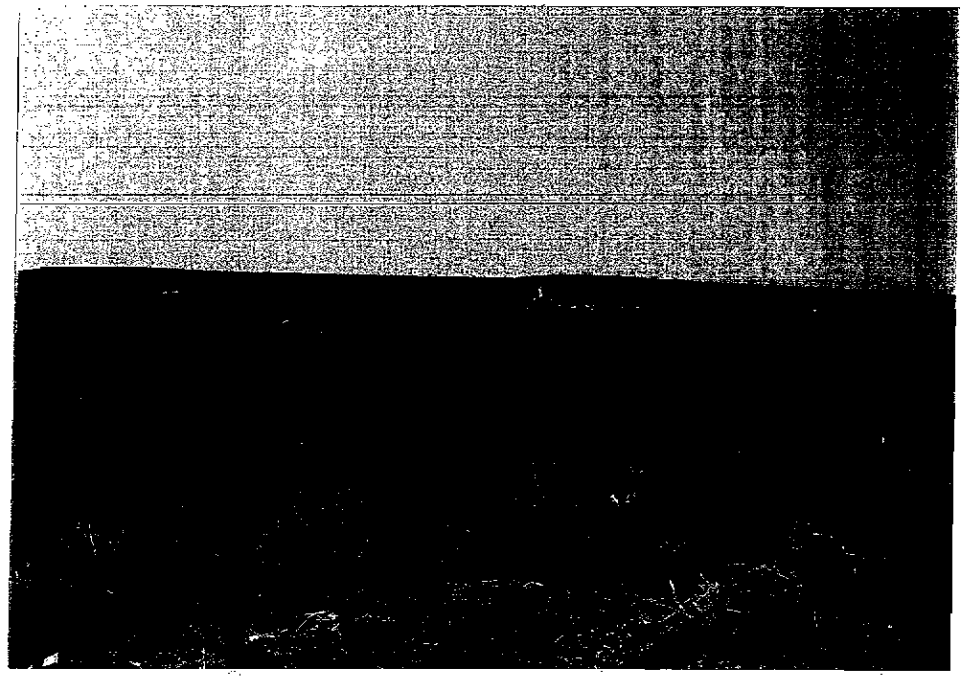


PLATE 4 View of the low silcrete outcrop on which sites MS 1 and the Early Stone Age site MS 4 are located.

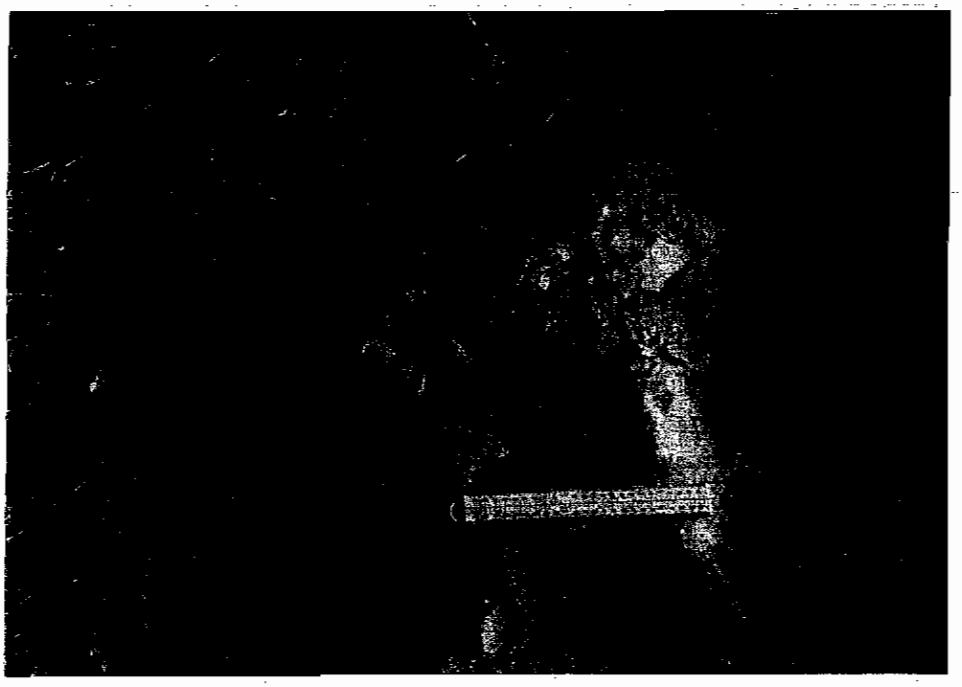
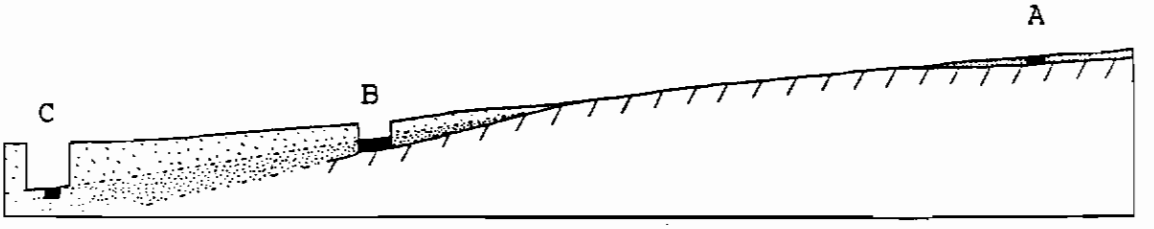


PLATE 5 Site MS 4. Detail of bedrock showing percussion bulbs and flake scars caused by ancient quarrying activity.



Windblown sands

Artefact rich deposits

Bedrock

Sampled areas

3

0 5 10 20 m

Test B
This 2m² excavation penetrated the aeolian sands 47m down slope from test A (just off the edge of the outcrop). The object of positioning the test at this point was to establish whether firstly, artefactual material was present below the aeolian sands, and secondly, to check for the presence of any calcretes that could contain fossil bone associated with the site. The excavation penetrated through 110cm of sterile aeolian sand before reaching a dense horizon of artefactual material and debitage (Plate 6). This continued for a further 75cm until bedrock was reached. This bedrock had also been subject to heavy battering by prehistoric people. The large amount of material excavated rendered it impractical to retain the entire sample for analysis. The sequence was sub-sampled to determine whether the assemblage differed through its sequence of accumulation.

Test C.
Since test B established that both the silcrete outcrop and the associated artefactual debris continued below the surface of the aeolian sands, a further 6m² excavation was positioned in the aeolian sands 32m (67m from test A) from the edge of the outcrop to establish the lateral extent of the site. After excavating through 2.5m of sterile aeolian sand, a dense bed of artefactual material was discovered and sampled. We were unable to ascertain the thickness of the lens or depth to bedrock as collapsing of the soft aeolian sand made it impossible to excavate any deeper. It is expected the ESA material is widely distributed beneath the aeolian sands between the silcrete outcrops.

4.4.2 Analysis
Representative samples from 2 of the test excavations were examined in an attempt to establish the chronological identity of the assemblage. Samples from tests A and B were analysed in terms of a simplified version of the method established by Volman (1981) for the analysis of Middle Stone Age assemblages in South Africa. A breakdown of the analytical categories is included in Appendix 5.

Waste: The artefactual assemblage of MS 1 quarry site is characterised by large quantities of waste material ranging from fragments of less than 10mm in maximum dimension to large flakes in excess of 14cm. The bulbs of percussion on whole flakes are very pronounced and have characteristically obtuse platform angles. The incidence of platform preparation is low. Although the raw material is suited to blade production, these are not present in the assemblage. Most of the cores are irregular or minimal, with very few falling into other recognizable categories. The method of flake removal was crude - flake removal being accomplished by "block on block" and "hard hammer' techniques.

Formal tools: Formal tools include a single small ovate biface. Biface rough-outs are not present in the sample. Retouched tools are present in both samples. Favoured sizes for retouched flakes are between 3 and 8cm maximum diameter. Retouch is characteristically anywhere on the flake but usually on the dorsal side. There is a tendency towards the production of retouched flakes with notched, beaked and nosed attributes.

4.4.3 Chronology
A perusal of literature of Early Stone Age assemblages has revealed that very few assemblages of this kind have been described in southern Africa. A European Lower Paleolithic industry, known as the "Clactonian" which shows similar artefactual attributes (Wymer 1968) is considered by archaeologists to be one of the oldest European assemblages and thought to have existed quarter of a million years ago.

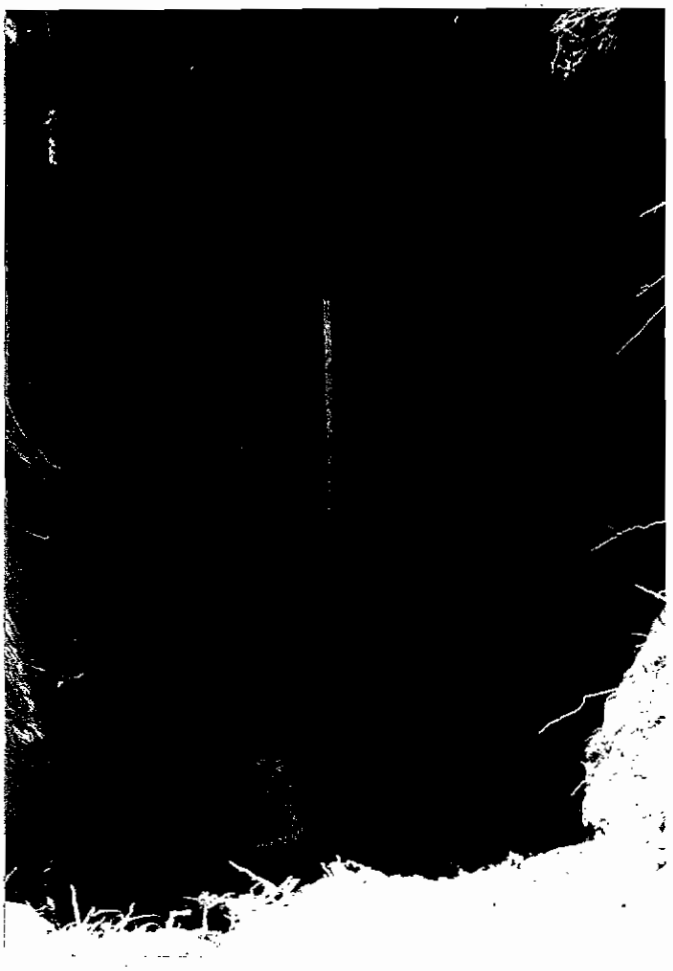


PLATE 6 Site MS 4, test excavation B. Aeolian sands overly a dense artefact lens above bedrock.

Southern African Acheulian sites such as those described by Van Riet Lowe (1952) and Sampson (1974) are characterised by specific artefact forms that are not present on MS 4 quarry site. A possible South African equivalent is the "Smaldeel" variant of the Acheulian described by Sampson (1985). The type site for this assemblage is a quarry on the border of the Orange Free State. Formal tools are scarce as are classifiable core forms. Other similar characteristics are the presence of large flakes with obtuse platform angles and retouched artefacts. Sampson believes that the "Smaldeel" is a biface-less Acheulian. He suggests that the reason for this is that Early Stone Age people were not manufacturing formal tools on quarry sites but were transporting chunks of raw material to other living sites. Sampson (1985) has indicated a relative date for the Karoo Acheulian at between 200 000 and 250 000 years ago.

4.4.4 Conclusion:
Our observations have led us to conclude that the site is an Early Stone Age quarry which could be 200 000 years (or more) old. The period of time in for which the quarry was in use is unknown as none of the test excavations showed any stratigraphic differentiation in the artefact producing levels.

The rock outcrop on which the site of MS 4 is located, is one of a number of localised manifestations of a high quality quartzitic silcrete that evidently attracted prehistoric people. The excavations have shown that the scale of quarrying that took place is vast. It is estimated that many hundreds of tons of artefactual material are buried deep under the aeolian sands between the various rock outcrops, the height of these having been considerably reduced by the prehistoric activity. It would appear that at first the lower slopes of the outcrop were quarried. When these became covered with unwanted debris, activities gradually progressed upslope. We do not know the actual extent of the quarries or depth of the deposits as most of the site is deeply buried. Perhaps this will only be revealed once the mineral mining operation is in progress and the earth moving operation exposes the ESA horizons on a greater scale.

It is known that quartzitic silcretes from these outcrops exist on an MSA site south of Brand se Baai indicating that people were prepared to travel a number of kilometers to collect raw materials from these sources. Unfortunately very little is known of the general settlement patterns of this and earlier periods in the Brand se Baai region, meaning that the true area of influence of the quarry cannot be established at this time.

5. DISCUSSION

The series of excavations described in this report and those completed in 1992 on the coastal strip south of Brand se Baai enable the compilation of a number of observations about the archaeology of this area.

1. In total, 8 LSA sites have now been excavated in the Brand se Baai coastal strip and Namakwa Sands Mining area. Of these, only 2 have been identified as post-dating the introduction of ceramics after 2000 years ago. Indications are that this part of the Namaqualand coast was intensively occupied during the mid-late Holocene. These observations are in contrast to Webley *et al* (1993) who argues that the most of the occupation of Namaqualand took place after 2000 years ago.

2. LSA Coastal sites excavated in 1992 showed signs of intense occupation with fairly deep stratified deposits. The inland sites excavated up to now are small,

and fairly ephemeral representing short term occupations of deflation hollows and dunetop blow-outs. It would appear that during the mid-late Holocene, the coastal areas were very attractive to prehistoric people. In contrast inland sites appear to be rather more transitory.

3. LSA people living on the coast and inland used mainly quartz for making stone tools. More exotic materials and clear quartz were favoured for making small microlithic stone tools. The large quartzitic silcrete outcrops so favoured by Early Stone Age humans for their large crude stone artefacts were of little importance to the modern hunter-gatherers of the late-mid Holocene unless the source of the quartzitic silcrete was immediately available such as at site MS 1.

4. Bone preservation on the 3 excavated inland LSA sites is very poor which means we have been unable fully to reconstruct diet. In the case of the LSA sites, we can extrapolate information from the coastal sites where preservation was better (Hart, Halkett and Parkington 1993). The kinds of terrestrial animals that people were eating on the coastal sites includes tortoises, common duiker (*Sylvicapra grimmia*), steenbok/grysbok (*Raphicerus sp*), springbok (*Antidorcas marsupialis*) or vaal rehbok (*Pelea capriolus*), hares (*Lepus capensis*), African wild cat (*Felis lybica*), and black backed jackals (*Canis mesomelas*). A number of these species are still present in the area today. Of interest is the lack of some of the larger bovids which are known to have been hunted by Late Stone Age people. It is possible that these animals did not inhabit this area.

   Hunter gatherers are known to have habitually exploited large amounts of vegetable foods which they would dig up and collect within a manageable walking radius from their camps. The remains of plant foods are not often found on open sites but it must be assumed that they were an important component of the diet.

5. We have established that large outcrops of quartzitic silcrete were extensively quarried a long time ago. The stone artefact industry associated with the outcrops is enigmatic in that there is not enough comparative information available to securely fit the assemblage into a regional sequence. The presence of rare crude bi-faces, retouched flakes and hard-hammer manufacturing methods has led us to believe that this is an early industry dating from the Early Stone Age period and may be in excess of 200 000 years old. The full extent of the quarry sites are unknown as the depth of windblown sand covering them is beyond the scope of conventional archaeological excavation. Very little information has been published on the ESA industries of the west coast. This particular site is the only one of its kind documented by archaeologists operating from the University of Cape Town.

6. RECOMMENDATIONS

Four specific recommendations have been generated from this series of excavations at Brand Se Baai.

A. We have sampled all the visible LSA sites in the areas to be mined as indicated in Figure 2 . We are satisfied that further mitigation of these sites is not required and mining may proceed.

B. We have sampled material from a large Early Stone Age quarry site in the mining area but have been unable to determine its extent under the windblown sands. The site should be considered important as it is unique and nothing similar has been documented on the West Coast. It would be desirable that once mining of the area of the quarry sites is underway and soil profiles have been opened, a monitoring program be negotiated. This would involve commissioning an archaeologist to photograph, record, measure sections and make collections at negotiated intervals while this particular area is being mined. (See recommendation B in phase 1 report, Parkington and Poggenpoel 1990).

C. The provisions of the first recommendation of Parkington and Poggenpoel (1990) should continue to be applied until a suitable sample of archaeological sites have been investigated in the entire mining area. Furthermore, any new facilities, pipe lines (especially the salt-water pipe from Floor se Gat) or roads planned (other than those already archaeologically surveyed) should be subject to a minimum of a phase 1 archaeological investigation. A further contract should be negotiated with an archaeologist before new mining areas are opened.

D. New proceedures adopted by the National Monuments Council (NMC) require that developers must apply to the NMC for permits to destroy archaeological sites. In keeping with this, Namakwa Sands Limited must submitt an application to destroy archaeological sites that exist in the mining area. Applications should be directed to Mr A. Lillie of the Western Cape Regional Office, PO Box 4637, (111 Harrington Street), Cape Town, 8000. The NMC will assess the degree to which archaeological sites have been mitigated and issue permits for their destruction accordingly. The findings of this report and the recommendations made are therefore subject to the approval of the relevant committee of the National Monuments Council.

The sample of excavated sites from the Brand se Baai coast and mineral sands mining area together have produced enough archaeological evidence to promote some initial ideas about human settlement patterns in the Namaqualand area. We have established that the local sequence in the Brand se Baai region is of considerable time depth. The findings of this report contrast with those of other archaeologists working on Namaqualand, and will no doubt stimulate a general reappraisal of current knowledge so far. The key to resolving the history of this area is obtaining a good sample of radiocarbon dates from carefully excavated archaeological sites and well resolved sequences. The loss of sites through insensitive development activities represents the extinction of knowledge. This is verified by the fact that an increasingly large proportion of what is known about the history of this area has resulted from impact and mitigation studies commissioned by environmentally concerned organisations.

7. INVESTIGATION TEAM

Consultant	John Parkington
Principal investigators	Dave Halkett Tim Hart
Fieldwork and analysis	Dave Halkett Tim Hart Envor Jephta Mzwondile Sasa Mzumzima Mjikelezi
Report preparation	Tim Hart Dave Halkett

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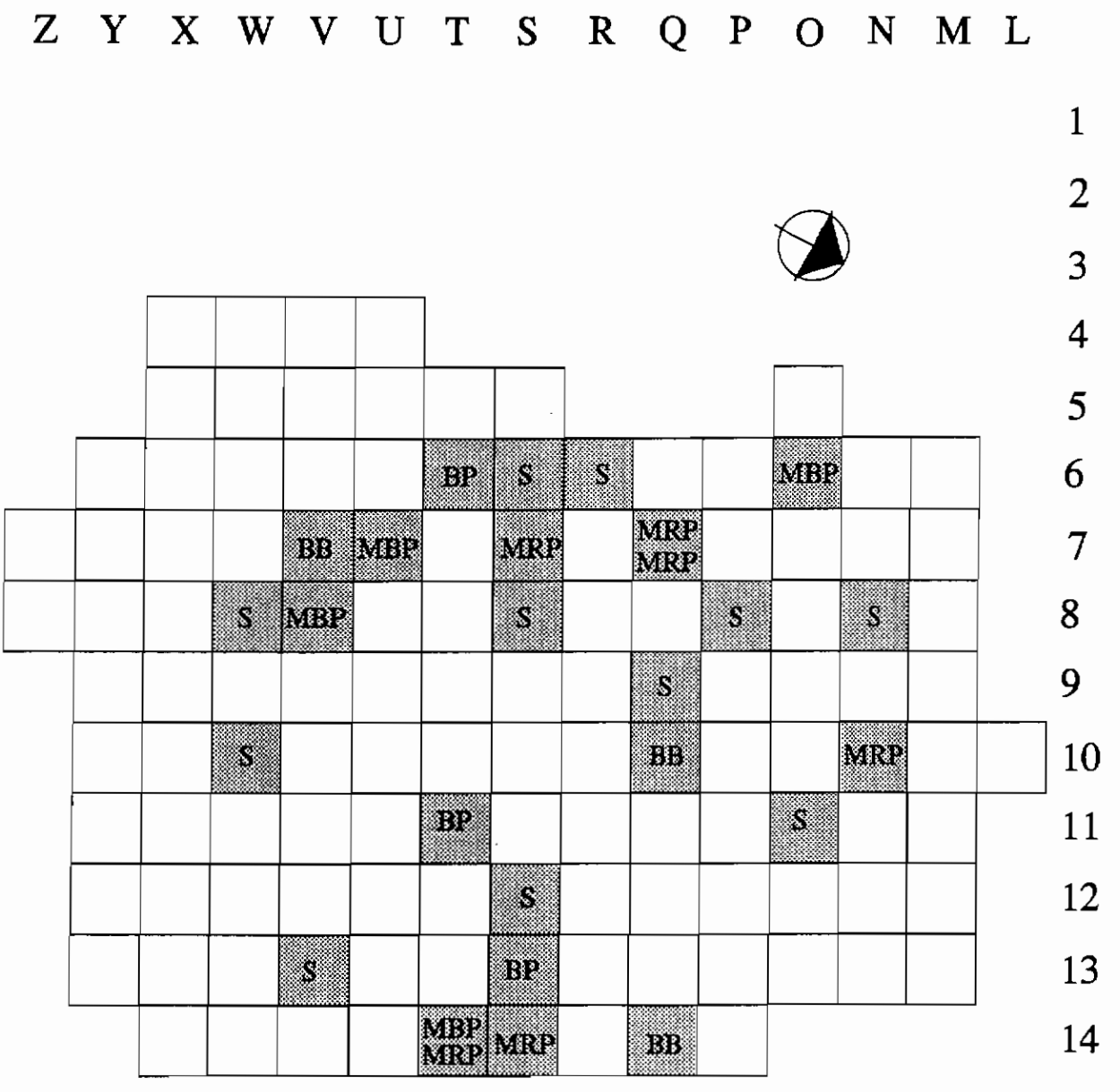
APPENDIX 1

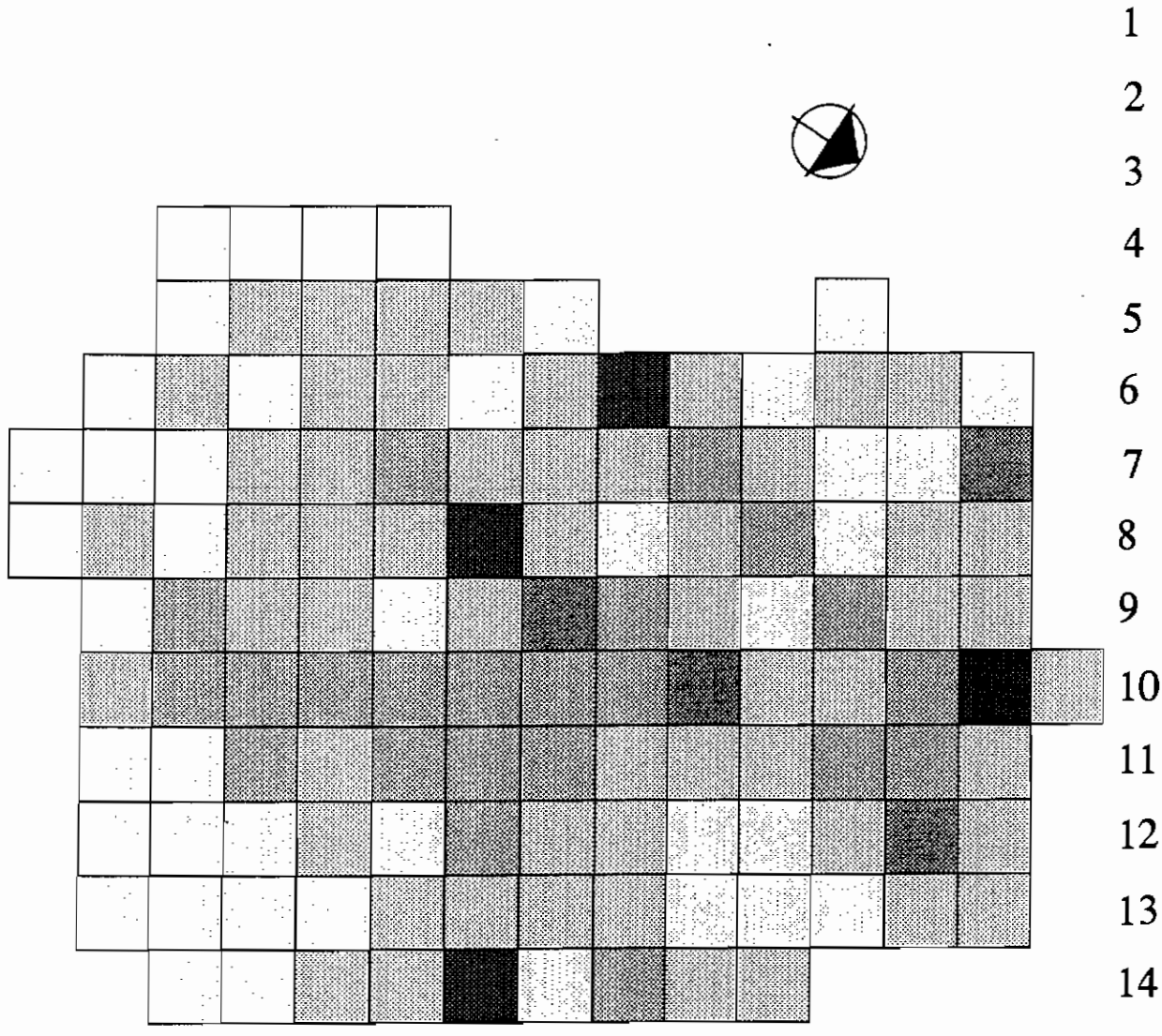
Contents:
Site MS 1



MS 1

Formal and retouched artefacts

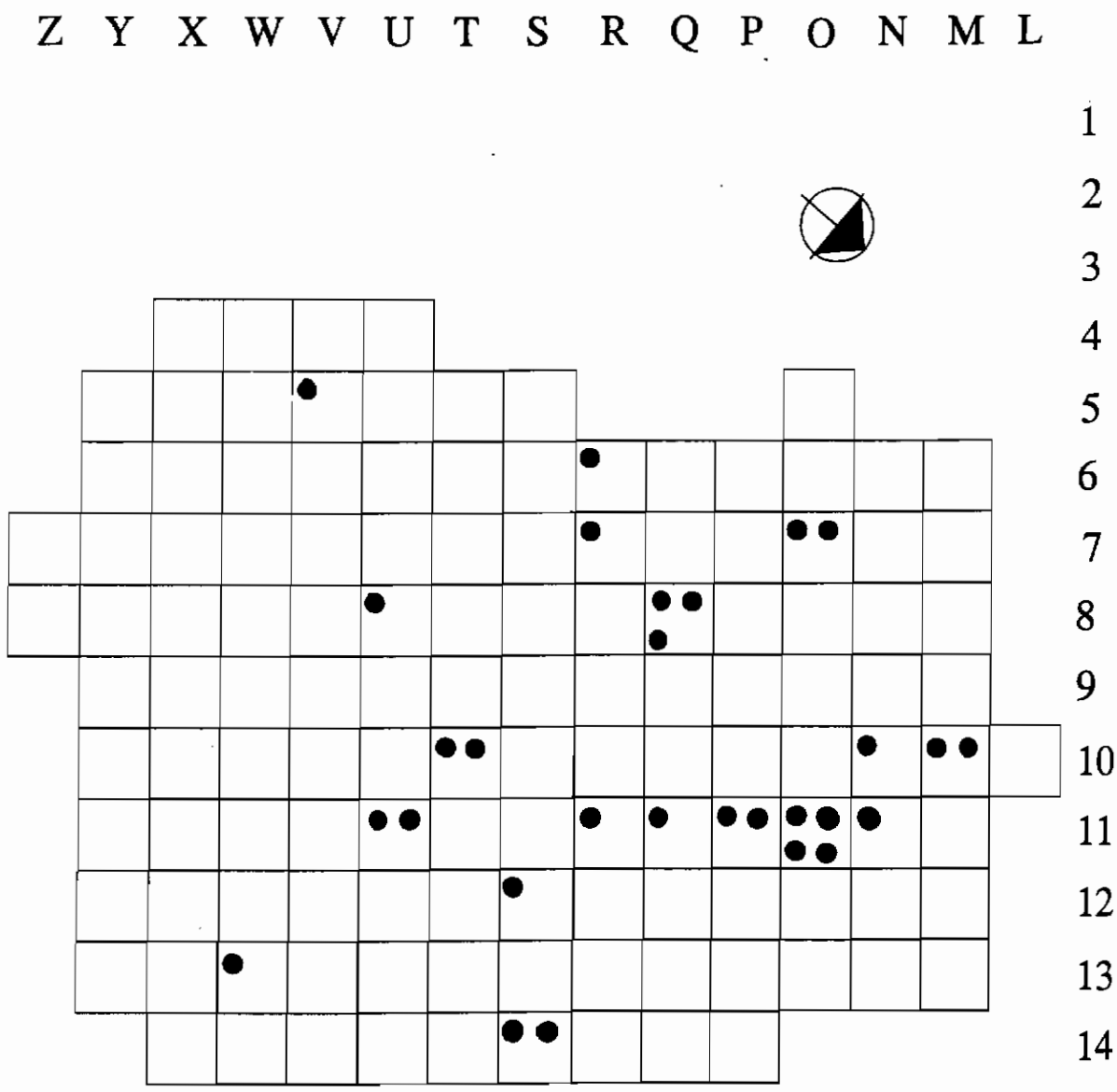
S	Segment
BB	Backed bladelet
BP	Backed point
MBP	Miscellaneous backed piece
MRP	Miscellaneous retouched piece



MS 1

LSA Stone artefacts - surface scrape (frequency plot)

0-19
20-39
40-59
60-79
80-99
100+



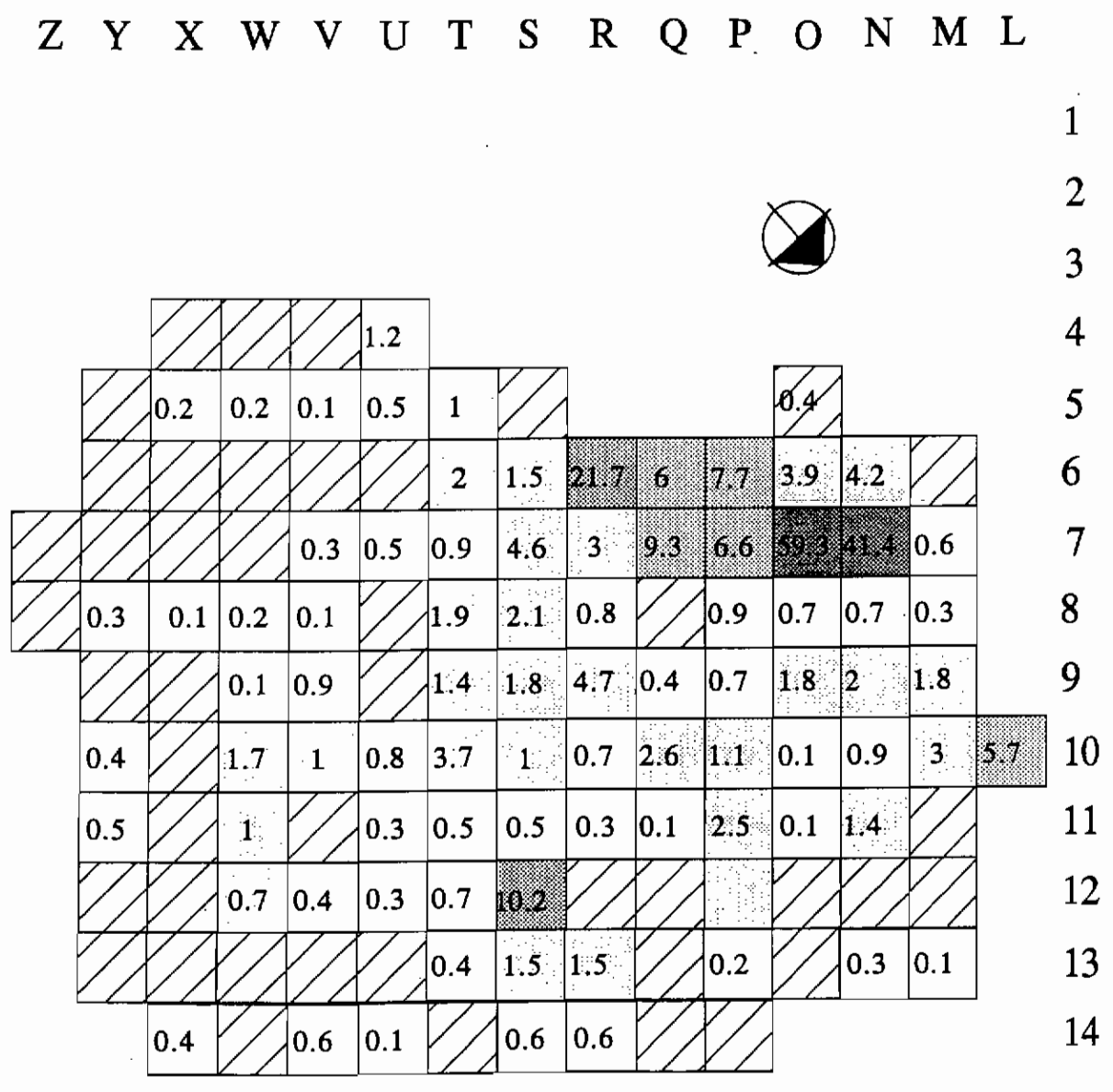
MS 1 Large chunks and manuports

SITE MS 1
Surface scrape
Stone artefacts - raw materials and frequencies

	QTZ	Q.SIL	CCS	OPA	SIL	TOTAL	%
CHIPS	1243	706	2	1	1	1953	50.9
CHUNKS	200	138	0	4	2	344	9.0
FLAKES	708	765	3	2	1	1479	38.6
BLADES						0	0.0
BLADELETS	33	23		2	1	59	1.5
sub-total	2184	1632	5	9	2	3835	100.0
%	56.9	42.6	0.1	0.2	2.0	100.0	98.5
BP-CORE	4					4	12.5
IRR-CORE	21	5				26	81.3
SP-CORE	1	1				2	6.3
sub-total	26	6	0		0	32	100.0
%	81.3	18.8	0.0	0.0	0.0	100.0	0.8
BKD SCRAPER						0	0.0
SCRAPER						0	0.0
SEGMENT	9		1			10	41.7
BKD BLADELET	2		1			3	12.5
BKD POINT	1		1			2	8.3
MBP	4					4	16.7
MRP	4	1				5	20.8
sub-total	20	1	3		0	24	100.0
%	83.3	4.2	12.5	0.0	0.0	100.0	0.6
HS		1				1	100.0
US						0	0.0
LGS						0	0.0
HS/GS						0	0.0
sub-total	0	1	0		0	1	100.0
	0.0	100.0	0.0	0.0	0.0	100.0	0.0
TOTAL	2230.0	1640.0	8.0	9.0	2.0	3892.0	
%	57.3	42.1	0.2	0.2	0.1	100.0	

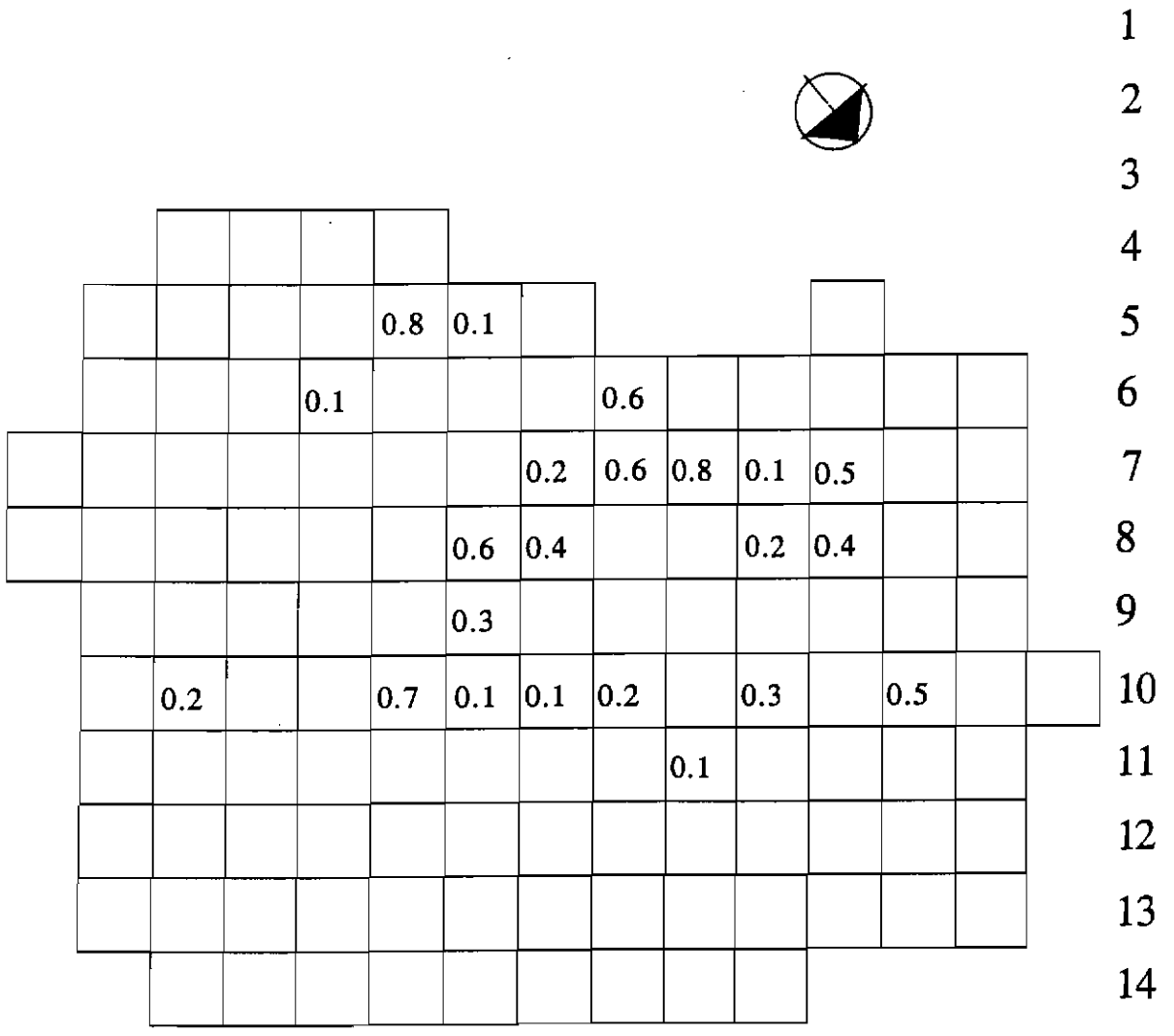
SITE MS 1
Below surface scrape
Stone artefacts - raw materials and frequencies

	QTZ	Q.SIL	CCS	OPL	SIL	TOTAL	%
CHIPS	82	3				85	45.7
CHUNKS	24	7	8			39	21.0
FLAKES	46	12				58	31.2
BLADES						0	0.0
BLADELETS	4					4	2.2
sub-total	156	22	8	0	0	186	100.0
%	83.9	11.8	4.3	0.0	0.0	100.0	97.9
BP-CORE	1					1	100.0
IRR-CORE						0	0.0
SP-CORE						0	0.0
sub-total	1	0	2		0	1	100.0
%	100.0	0.0	2.0	0.0	0.0	100.0	0.5
BKD SCRAPER						0	0.0
SCRAPER						0	0.0
SEGMENT				1		1	33.3
BKD BLADELET						0	0.0
BKD POINT	1		1			2	66.7
MBP						0	0.0
MRP						0	0.0
sub-total	1	0	1		0	3	100.0
%	33.3	0.0	33.3	0.0	0.0	100.0	1.6
HS						0	0.0
UGS						0	0.0
LGS						0	0.0
HS/GS						0	0.0
sub-total	0	0	0	0	0	0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	158.0	22.0	11.0		0.0	190.0	
%	83.2	11.6	5.8	0.0	0.0	100.0	



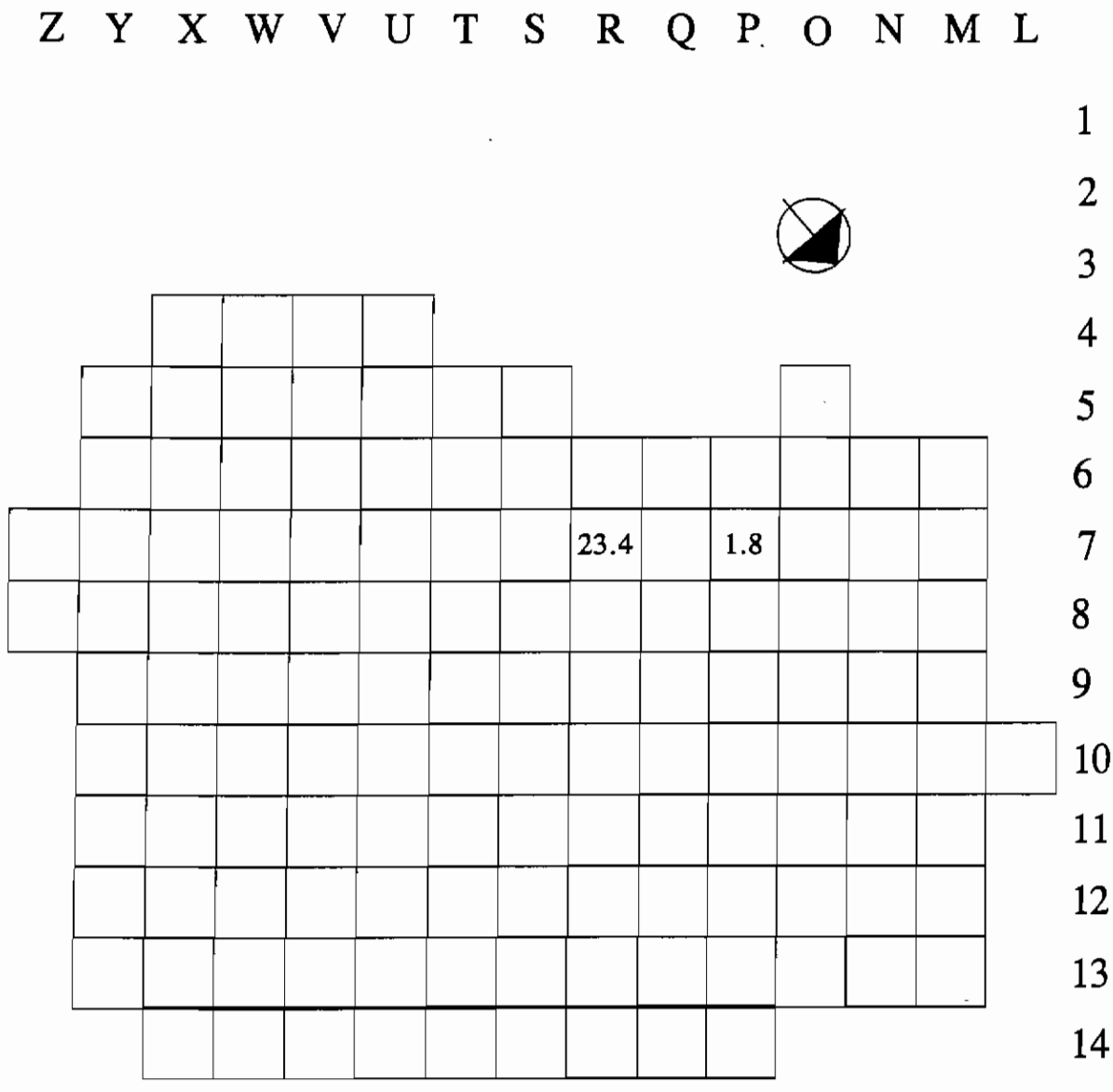
MS 1 Patella granatina (grams)

- 0.0 grams
- 0.1-0.9 grams
- 1.0-4.9 grams
- 5.0-9.9 grams
- 10.0-29.9 grams
- 30.0-60.0 grams



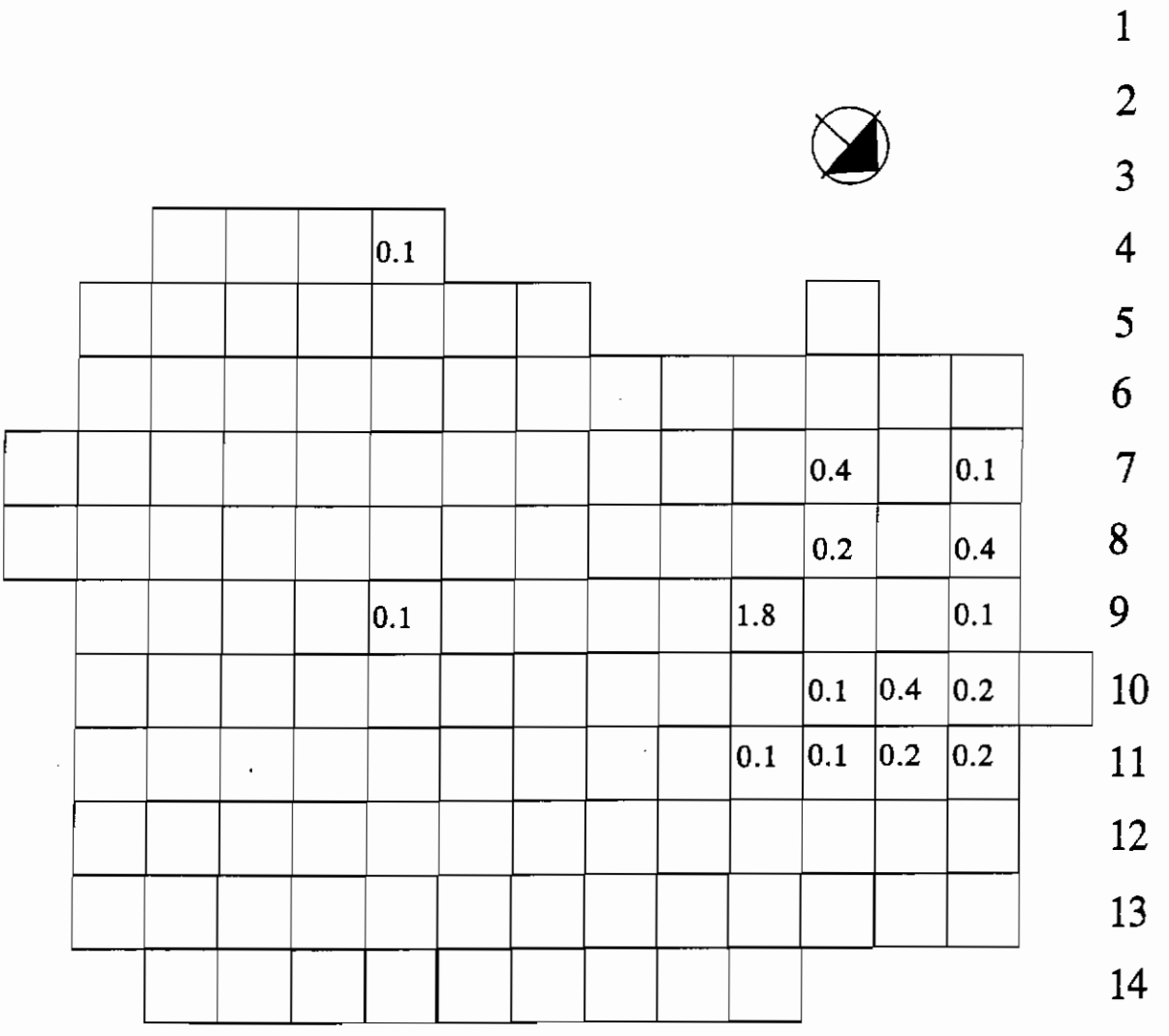
MS 1 Patella granularis

(grams)



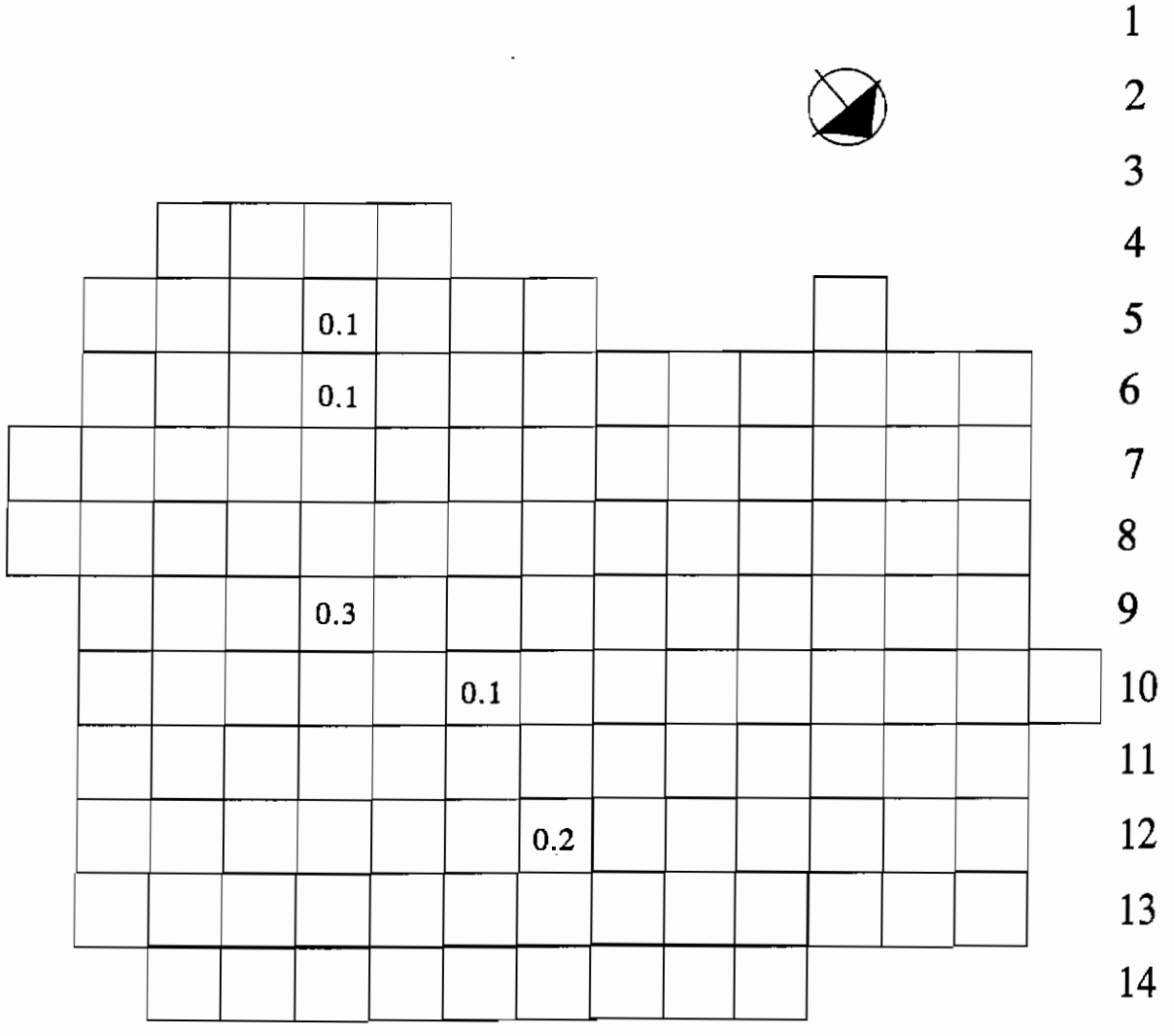
MS 1 Patella argenvillei

(grams)



MS 1 Choromytilus meridionalis

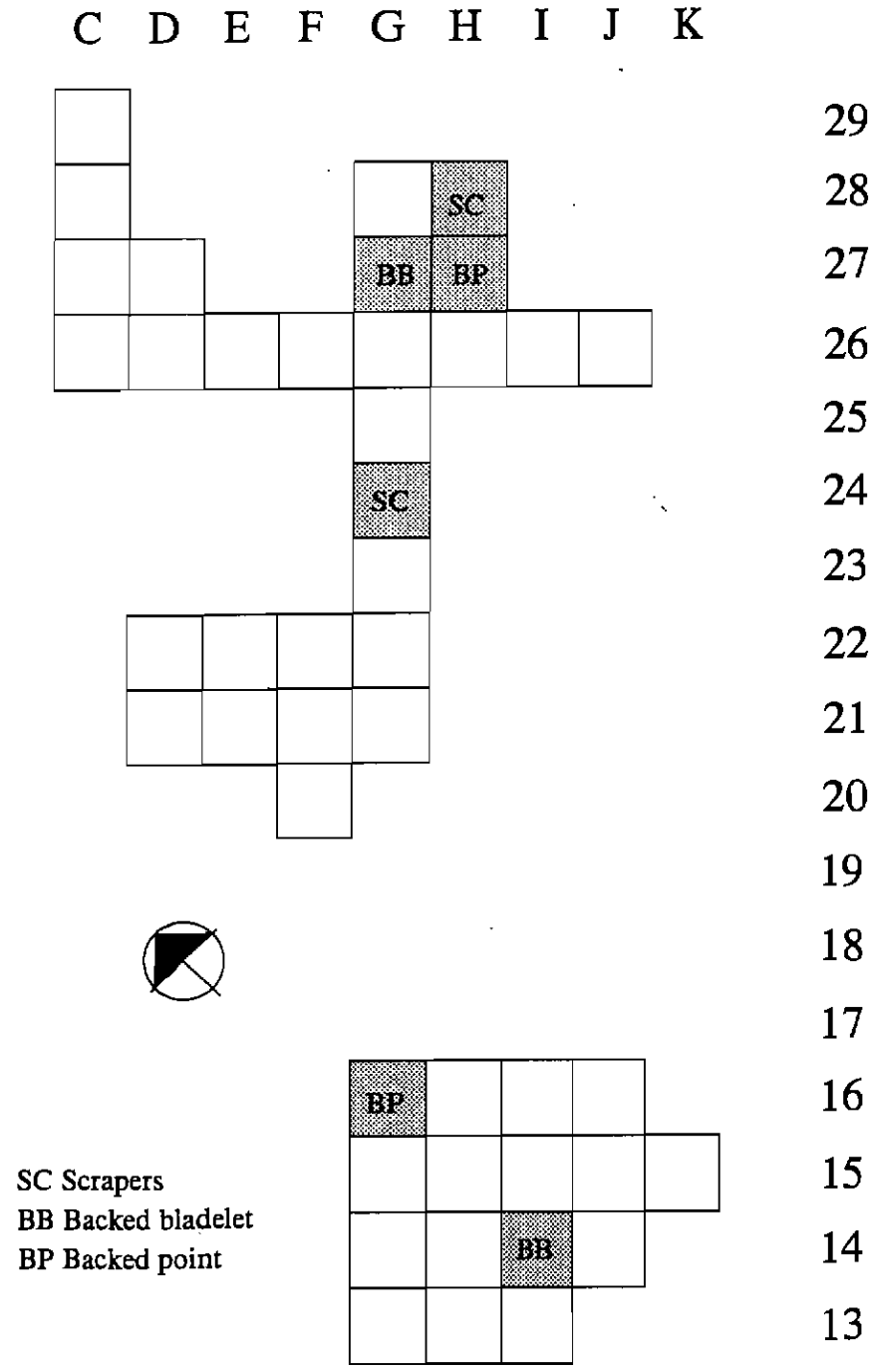
(grams)



MS 1 Whelks
(grams)

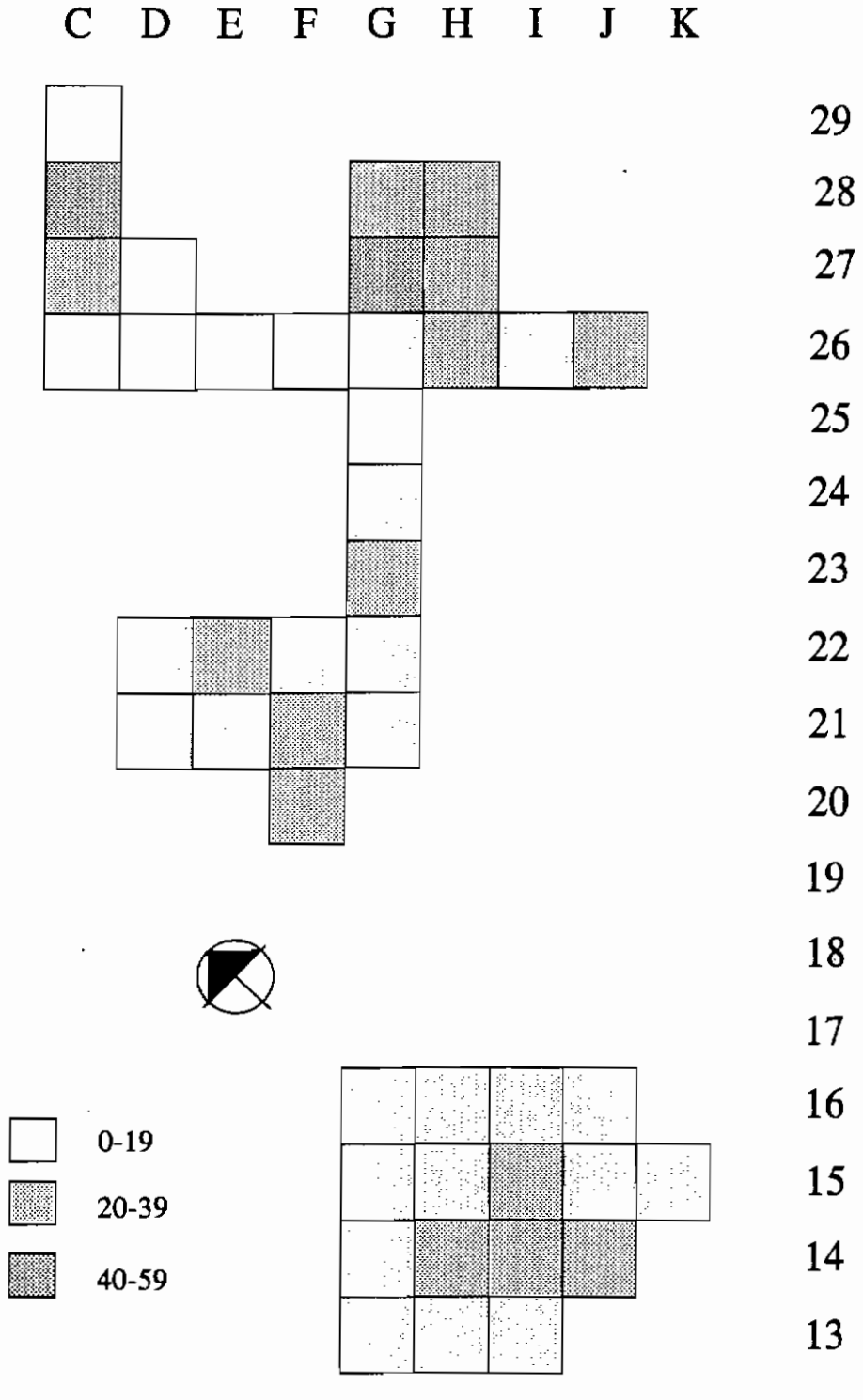
APPENDIX 2

Contents:
Site MS 2



MS 2

Formal and retouched artefacts



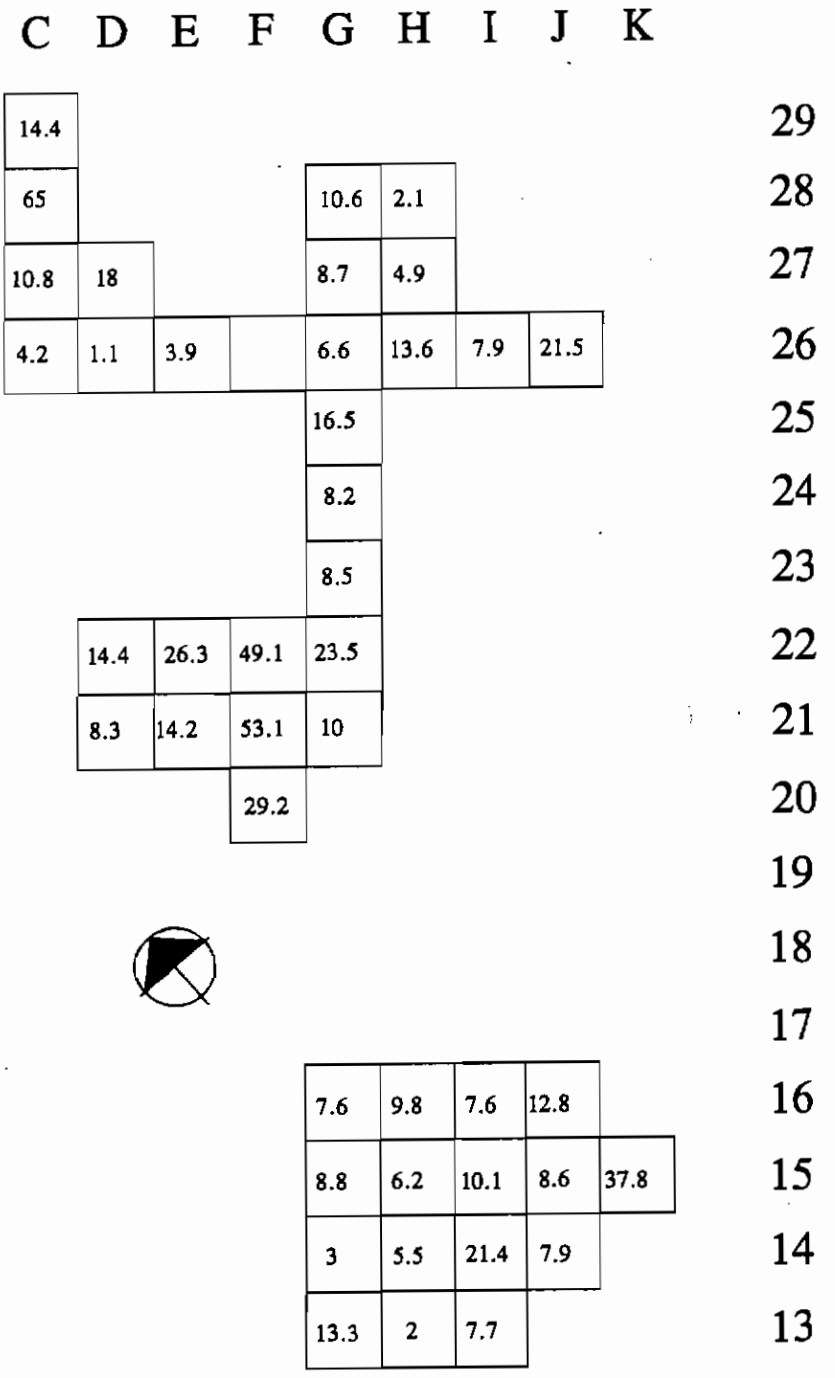
MS 2 LSA Stone artefacts - surface scrape (frequency plot)

SITE MS 2
Below surface scrape
Stone artefacts - raw materials and frequencies

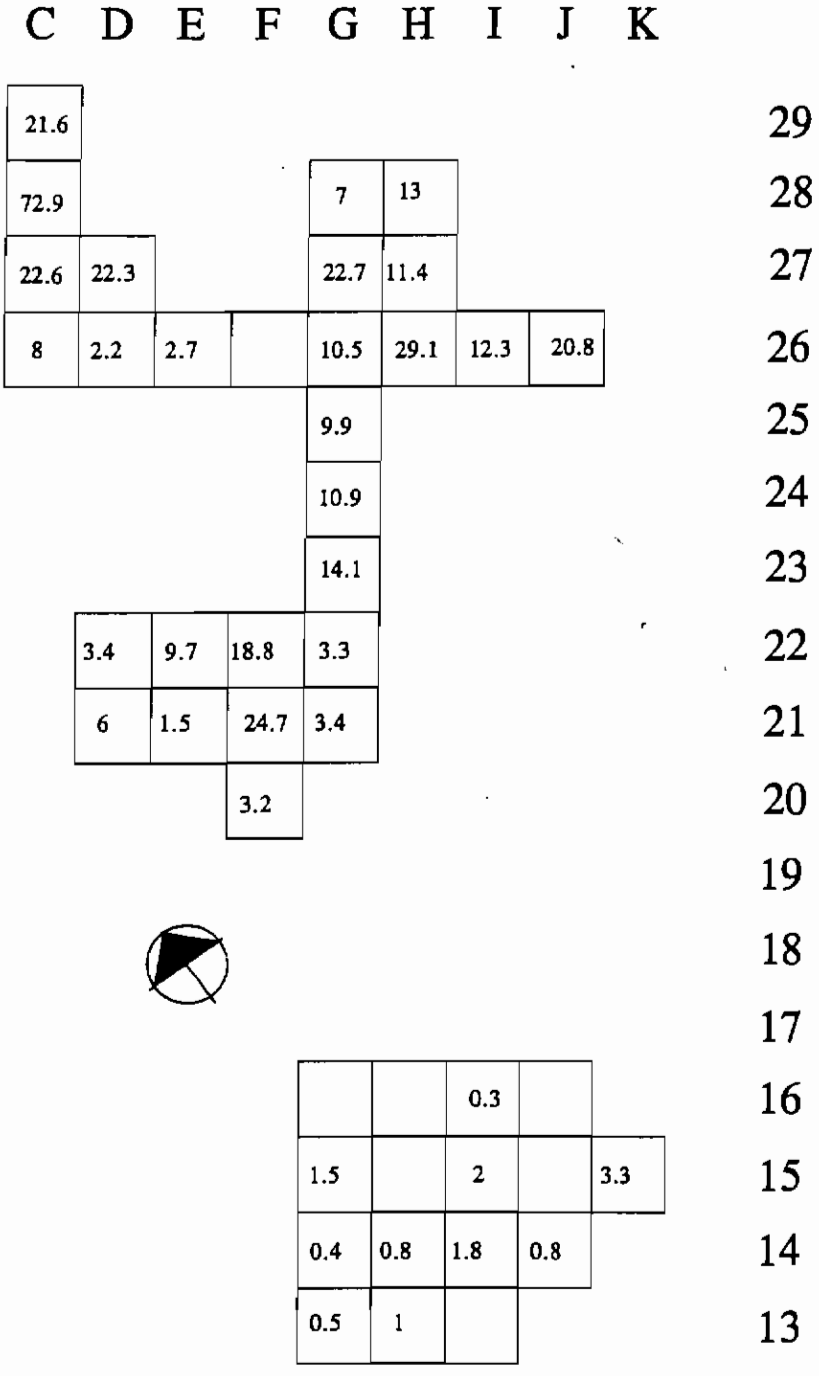
	QTZ	Q.SIL	CCS	OPA	SIL	TOTAL	%
CHIPS	29					29	72.5
CHUNKS	3	1				4	10.0
FLAKES	5					5	12.5
BLADES						0	0.0
BLADELETS	2					2	5.0
sub-total	39	1	0	0	0	40	100.0
%	97.5	2.5	0.0	0.0	0.0	100.0	97.6
BP-CORE							0.0
IRR-CORE	1						0.0
SP-CORE							0.0
sub-total	1	0	0	0	0	1	100.0
%	100.0	0.0	0.0	0.0	0.0	100.0	2.4
BKD SCRAPER						0	0.0
SCRAPER						0	0.0
SEGMENT						0	0.0
BKD BLADELET						0	0.0
BKD POINT						0	0.0
MBP						0	0.0
MRP						0	0.0
sub-total	0	0	0	0	0	0	0.0
%	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HS						0	0.0
UGS						0	0.0
LGS						0	0.0
MANU						0	0.0
HS/GS						0	0.0
sub-total	0	0	0	0	0	0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	40.0	1.0	0.0	0.0	0.0	41.0	
%	97.6	2.4	0.0	0.0	0.0	100.0	

SITE MS 2
Surface scrape
Stone artefacts - raw materials and frequencies

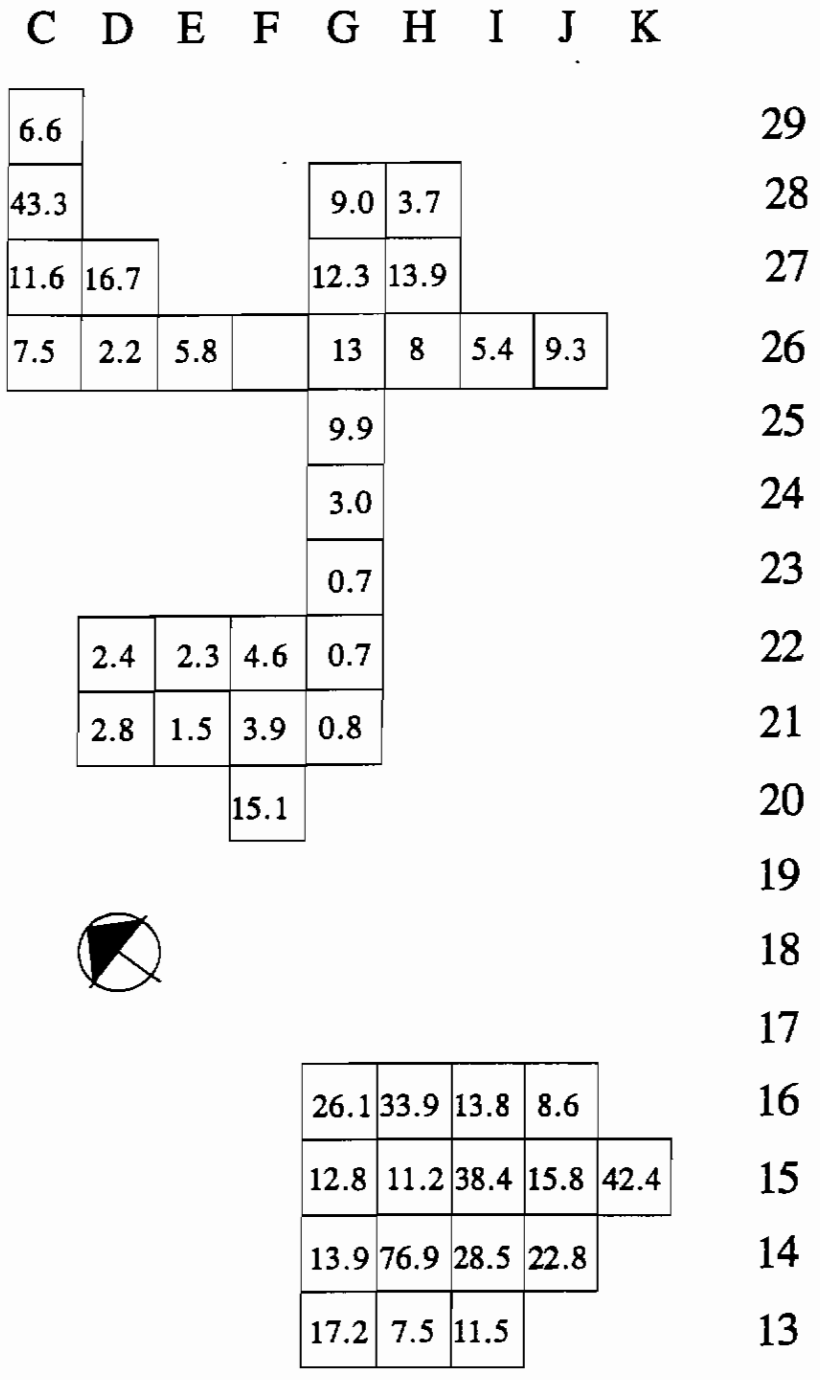
	QTZ	Q.SIL	CCS	OPA	SIL	TOTAL	%
CHIPS	488	12	2		3	505	64.0
CHUNKS	45	6	1			52	6.6
FLAKES	199	11	1			211	26.7
BLADES						0	0.0
BLADELETS	21					21	2.7
sub-total	753	29	4	0	3	789	100.0
%	95.4	3.7	0.5	0.0	0.4	100.0	98.5
BP-CORE						0	0.0
IRR-CORE	4	1				5	100.0
SP-CORE						0	0.0
sub-total	4	1	0		0	5	100.0
%	80.0	20.0	0.0	0.0	0.0	100.0	0.6
BKD SCRAPER						0	0.0
SCRAPER	1		1			2	33.3
SEGMENT						0	0.0
BKD BLADELE	2					2	33.3
BKD POINT	2					2	33.3
MBP						0	0.0
MRP						0	0.0
sub-total	5	0	1		0	6	100.0
%	83.3	0.0	16.7	0.0	0.0	100.0	0.7
HS						0	0.0
UGS						0	0.0
LGS						0	0.0
MANU		1				1	100.0
HS/GS						0	0.0
sub-total	0	1	0	0	0	1	100.0
	0.0	100.0	0.0	0.0	0.0	100.0	0.1
TOTAL	762.0	31.0	5.0		3.0	801.0	
%	95.1	3.9	0.6	0.0	0.4	100.0	



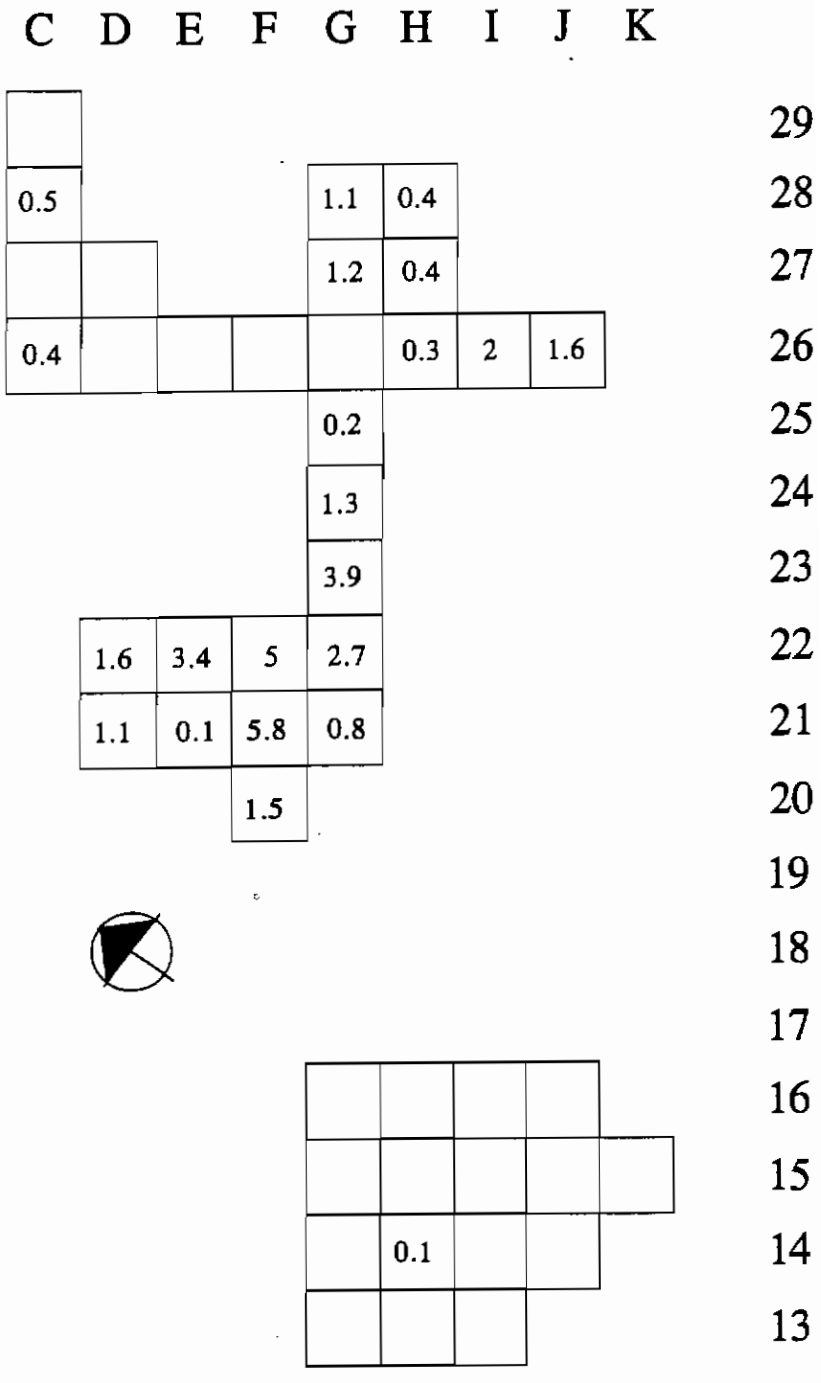
MS 2 Patella granatina (grams)



MS 2 Patella granularis
(grams)



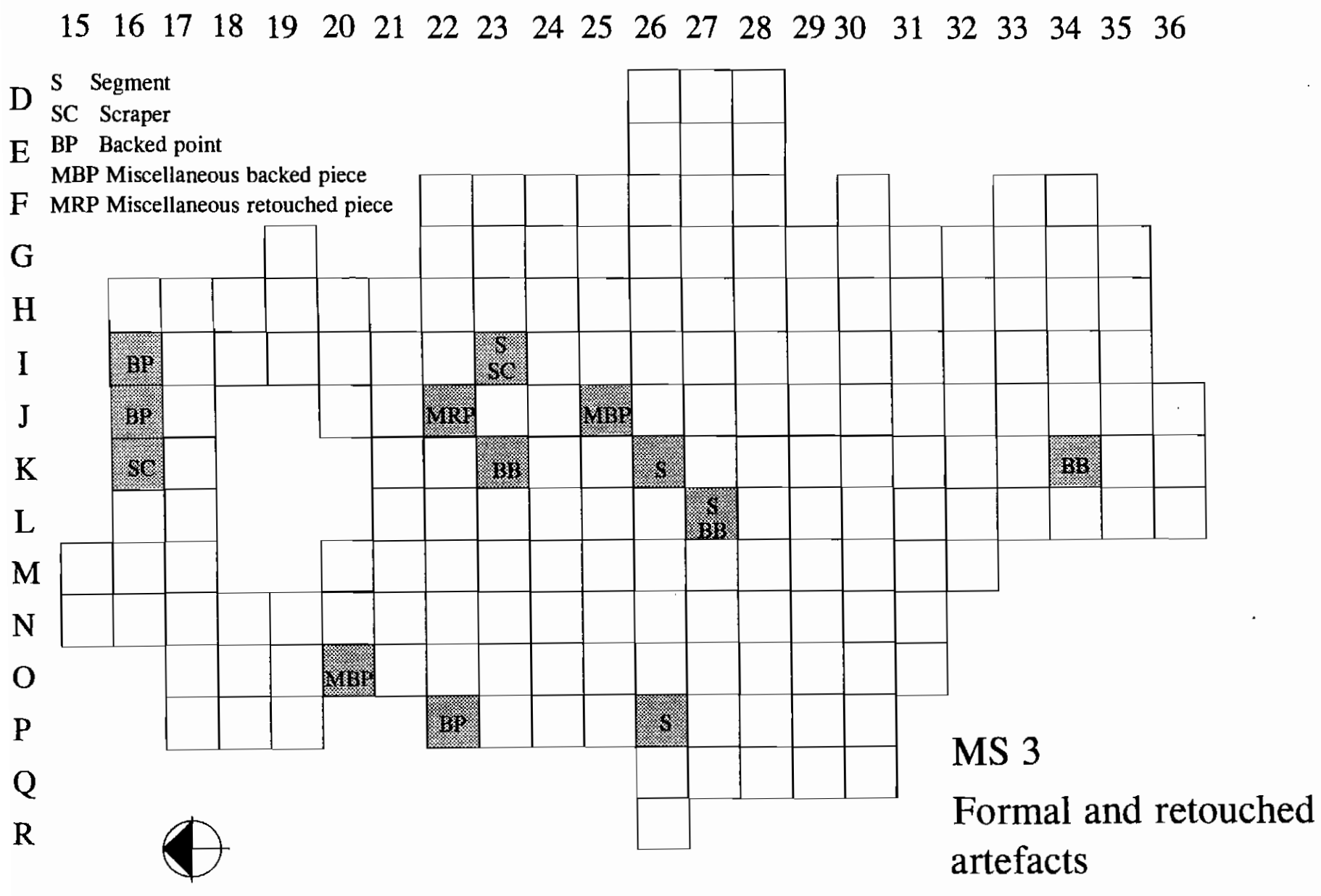
MS 2 Choromytilus meridionalis (grams)



MS 2 Whelks
(grams)

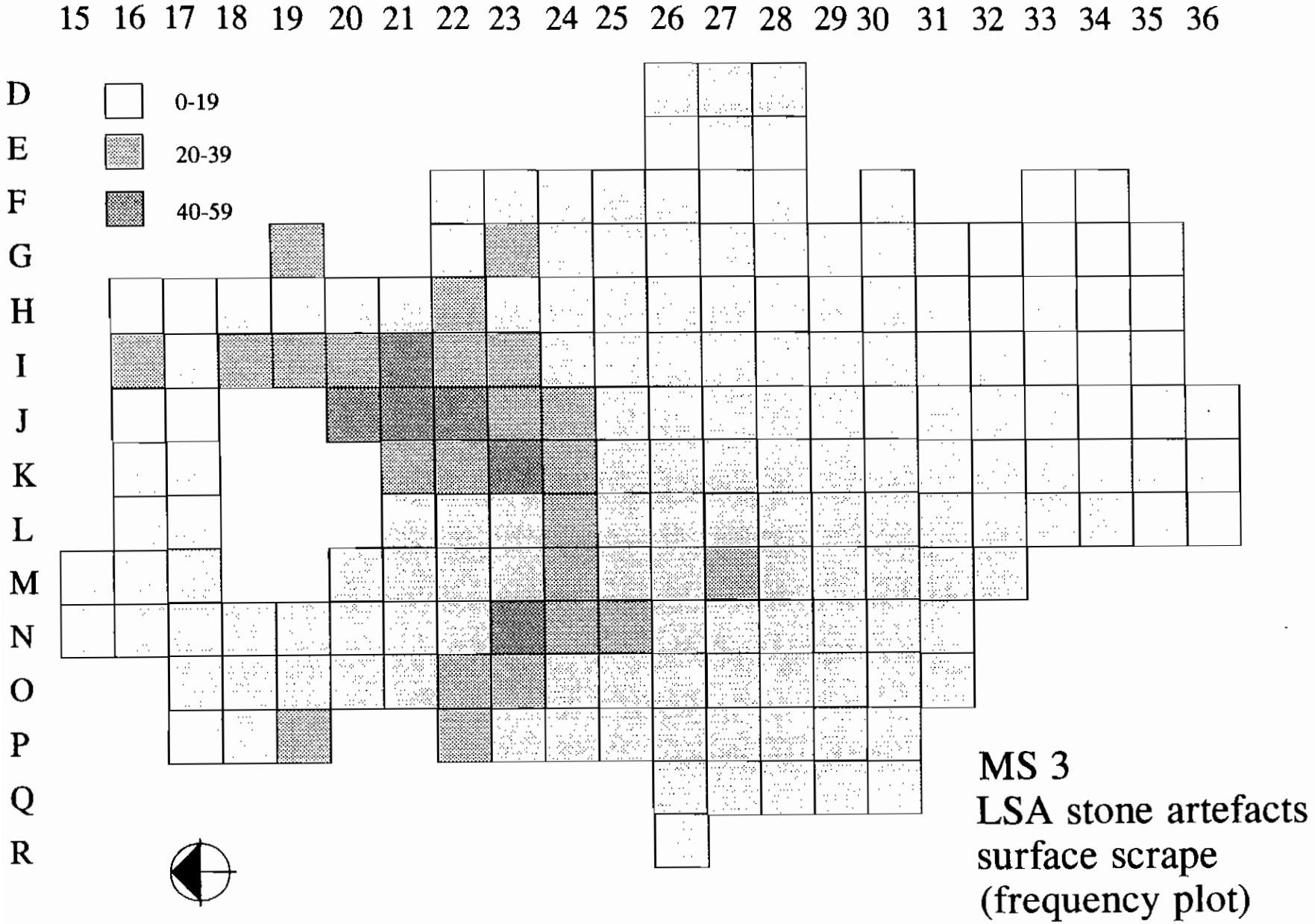
APPENDIX 3

Contents:
Site MS 3:



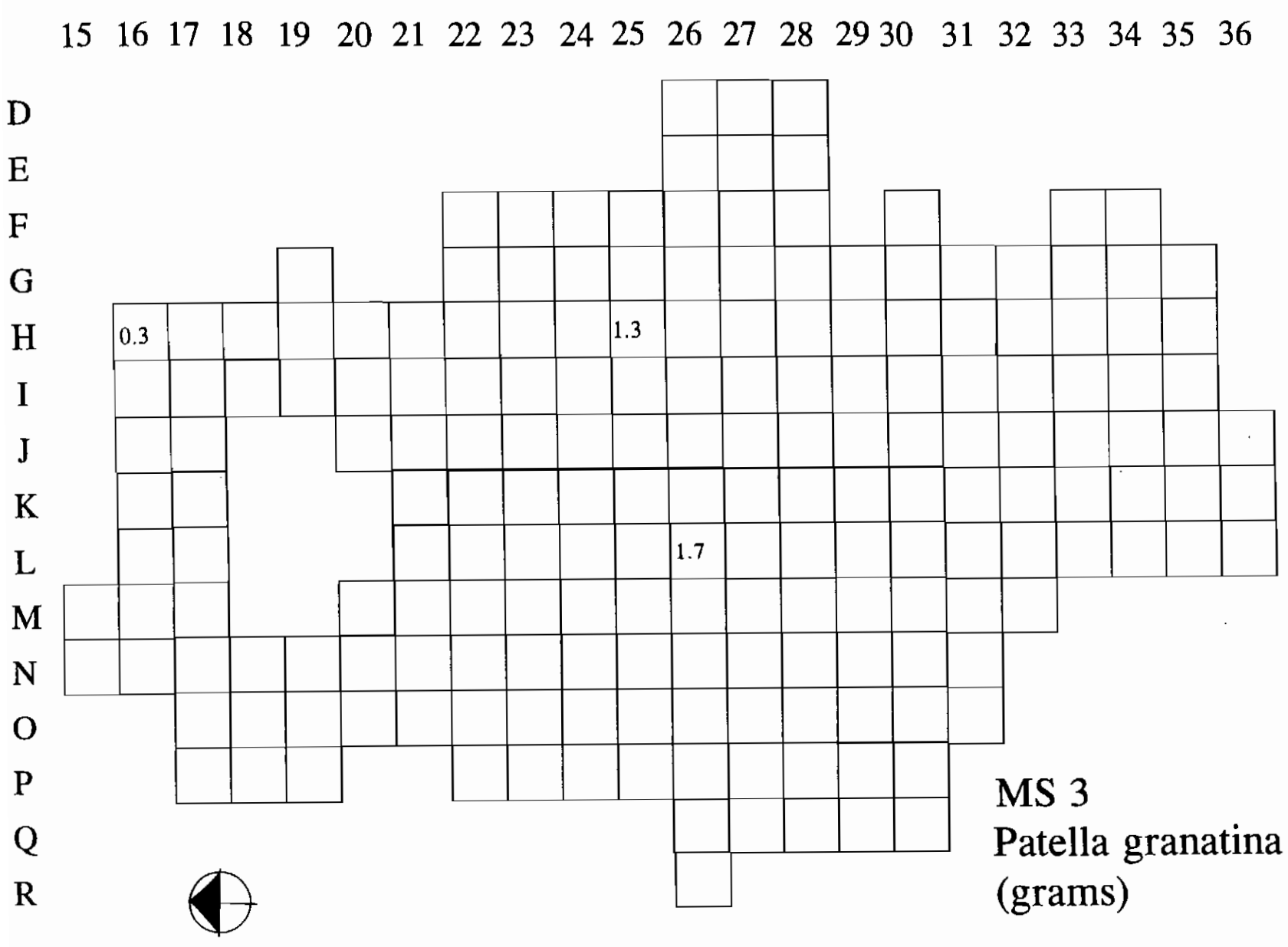
MS 3

Formal and retouched artefacts

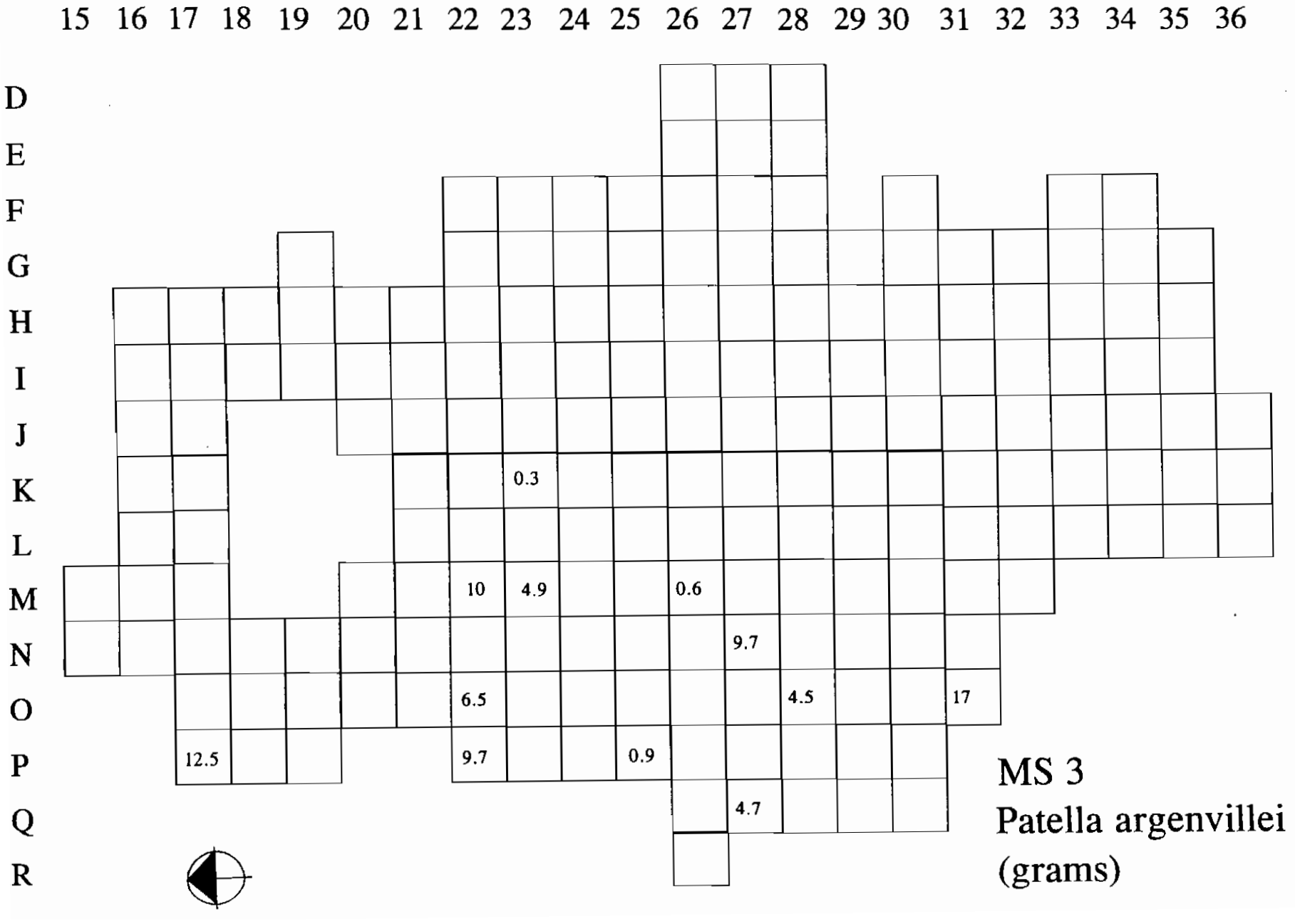

15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
0-19
20-39
40-59
MS 3
LSA stone artefacts
surface scrape
(frequency plot)

SITE MS 3
Surface scrape
Stone artefacts - raw materials and frequencies

	QTZ	Q.SIL	CCS	OPA	SIL	SNDS	HNFL	TOTAL	%
CHIPS	1145	51	2		4		1	1202	52.3
CHUNKS	183	23		3	1			210	9.1
FLAKES	758	64	4		2			828	36.0
BLADES								0	0.0
BLADELETS	55				2			57	2.5
sub-total	2141	138	6	3	9	0	1	2297	100.0
%	93.2	6.0	0.3	0.1	0.4	0.0	0.0	100.0	98.7
BP-CORE								0	0.0
IRR-CORE	12				1			13	92.9
SP-CORE					1			1	7.1
sub-total	12	0	0	0	2	0	0	14	100.0
%	85.7	0.0	0.0	0.0	14.3	0.0	0.0	100.0	0.6
BKD SCRAPER								0	0.0
SCRAPER			1		1			2	13.3
SEGMENT	3			1				4	26.7
BKD BLADELET	2		1					3	20.0
BKD POINT	3							3	20.0
MBP	1		1					2	13.3
MRP			1					1	6.7
sub-total	9	0	4	1	1	0	0	15	100.0
%	60.0	0.0	26.7	6.7	6.7	0.0	0.0	100.0	0.6
HS	1						1	2	100.0
US									0.0
LGS									0.0
HS/GS									0.0
sub-total	1	0	0	0	0	0	1	2	100.0
	50.0	0.0	0.0	0.0	0.0	0.0	50.0	100.0	0.1
TOTAL	2163.0	138.0	10.0	4.0	12.0	0.0	2.0	2328.0	
%	92.9	5.9	0.4	0.2	0.5	0.0	0.1	100.0	



MS 3
Patella granatina
(grams)


15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
D E F G H I J K L M N O P Q R
0.3
10
4.9
0.6
9.7
6.5
4.5
17
12.5
9.7
0.9
4.7
MS 3
Patella argenvillei
(grams)

APPENDIX 4

Site MS 4: contents

MS 4

TRANSECT: SURFACE COLLECTION

SIZE CLASS (mm)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL	%
CHIPS	271														271	32.00
CHUNKS		42	42	30	34	20		5							173	20.43
FLAKES																
Simple		62	113	55	42	18	12	8	2	4					316	37.31
Single facet				1	2	1									4	0.47
Multiple facet			1	3	1		3								8	0.94
BLADE FLAKES																
Simple				2		2									4	0.47
Single facet																
Multiple facet																
RETOUCH: FLAKES																
Ventral					3	3									6	0.71
Dorsal				3		5	1	3	3						15	1.77
Alternate																
Bifacial																
Proximal																
RETOUCH: BLADE FLAKES																
Ventral																
Dorsal																
Alternate																
Bifacial																
Proximal																
CORES																
Core on flake								3	1		1	1			6	0.71
Minimal			4				9		3	2	1	1	1		21	2.48
Irregular							3		2	1	1				7	0.83
Adjacent platform																
Radial																
Single platform																
Opposed platform												12			12	1.42
Levallois																
Blade																
FORMAL TOOLS																
Burin																
Notched				1	1										2	0.24
Strangulated flake																
Denticulate																
End scraper							1								1	0.12
Side scraper																
Bifacial																
Drill/beak												1			1	0.12
TOTAL	272	106	163	99	88	55	36	27	20	17	14	27	14	14	847	

MS 4

TEST EXCAVATION A

SIZE CLASS (cm)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL	%
CHIPS	3133														3133	57.41
CHUNKS		181	455	99	72	21	28								856	15.69
FLAKES																
Simple	326	451	158	100	38	9	10	17	6	1		1			1117	20.47
Single facet				2					1						3	0.05
Multiple facet			5	1			2								8	0.15
BLADE FLAKES										1			1		2	0.04
Simple																
Single facet																
Multiple facet																
RETOUCH: FLAKES																
Ventral				6	2	2			1		1				12	0.22
Dorsal			21	45	36	41	19	10	6	4					182	3.34
Alternate				1		3	8								12	0.22
Bifacial																
Proximal																
RETOUCH: BLADE FLAKES																
Ventral																
Dorsal										1		1			2	0.04
Alternate																
Bifacial																
Proximal																
CORES																
Core on flake											1				1	0.02
Minimal			3	6	7	14	7	13	15	5		1	1		72	1.32
Irregular																
Adjacent platform																
Radial							2		1						3	0.05
Single platform			1			4	7		3		2				17	0.31
Opposed platform																
Levallois																
Blade																
FORMAL TOOLS																
Burin																
Notched				5	3		2	4	4						18	0.33
Strangulated flake																
Denticulate									1						1	0.02
End scraper			1	11	1										13	0.24
Side scraper				1											1	0.02
Bifacial																
Drill/beak					2				2						4	0.07
TOTAL	3459	632	644	277	161	94	85	44	40	12	4	3	2		5457	

MS 4

TEST EXCAVATION B

SIZE CLASS (cm)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL	%
CHIPS	5506														5506	73.54
CHUNKS		143	438	63	20	10	5	5	4		4				692	9.24
FLAKES																
Simple		206	370	106	167	58	39	21	13	9	3	1	2	3	998	13.33
Single facet												1			1	0.01
Multiple facet					1	2	2	1							6	0.08
BLADE FLAKES																
Simple							4	2	3	1					10	0.13
Single facet																
Multiple facet																
RETOUCH: FLAKES																
Ventral						2		2							4	0.05
Dorsal			19	12	23	9	3	1	1	1	1				70	0.93
Alternate					2			1							3	0.04
Bifacial																
Proximal																
RETOUCH: BLADE FLAKES																
Ventral																
Dorsal					2										2	0.03
Alternate																
Bifacial																
Proximal																
CORES																
Core on flake								7							7	0.09
Minimal					103	17	11	2	6	3					142	1.90
Irregular					5		1			7	2	1		1	17	0.23
Adjacent platform																
Radial									1						1	0.01
Single platform					3		1	1							5	0.07
Opposed platform																
Levallois																
Blade																
FORMAL TOOLS																
Burin																
Notched			1		2	1	1	4	1	1					11	0.15
Strangulated flake																
Denticulate																
End scraper					1	1									2	0.03
Side scraper				1											1	0.01
Bifacial											1			1	2	0.03
Drill/beak						1	3	1			1			1	7	0.09
TOTAL	5506	349	828	182	329	101	70	48	29	22	12	3	2	6	7487	

APPENDIX 5

THE ARCHAEOLOGY OF NAMAQUALAND

The Namaqualand coast is one of the least documented parts of South Africa in archaeological terms. Until recently, no archaeological sites had been excavated nor had any systematic surveys been undertaken. This is despite the fact that a number of archaeologists and historians had identified Namaqualand as a key research area in terms of understanding the earliest appearance of domestic stock (sheep, goats and cattle), and ceramic technology in the Cape shortly after 2000 years ago. This critical series of events helped shape later pre-colonial South African history, and determined, in large part, the social arrangements among hunters and herders encountered by European colonists. Pre-colonial hunter gatherers are known as bushmen or San, whilst the herders referred to themselves as Khoi or Khoi khoi.

The route by which herding was introduced into a region previously occupied exclusively by people with a hunting and gathering economy has been the focus of debate among linguists, historians and archaeologists since early this century. The debate has been summarised by Richard Elphick (1977, 1985), who notes two schools of thought. Robertshaw (1978) and Deacon *et al* (1978) support the hypothesis that the herding economy had its origin in Botswana whence it entered the Cape via the west coasts of Namibia and Namaqualand. The alternative, supported by Elphick himself (1985), is that the Khoi entered southern Africa via the Orange River and through the interior of the country, spreading only later around the coastlines. By 1990 the balance of archaeological evidence favoured the west coast as the route of introduction. Excavation of sites on Elphick's proposed central route (Hart 1989, Sampson *et al* 1989) showed that the advent of herding was far later here than expected, in contrast to early dates (about 2000 years ago) in Namibia (Kinahan 1989).

Curiously, in the face of years of theoretical debate, no archaeological sequences had ever been excavated on the Namaqualand coast until Webley (1992) tested the west coast model with her excavations at Spoeg River Mouth. Not only did she recover the remains of early domestic sheep and ceramics, but she also dated the bones (albeit present in small numbers) to as early as 1920 years ago, about the beginning of the fist millennium AD. Webley concluded that the introduction of herding took place gradually, with stock rearing reaching a peak and then declining after 500 AD as a result of increasing aridity. Webley went on to hypothesise that the bulk of recent human occupation of the Namaqualand coast took place after the appearance of domestic stock. This, she felt, was coincident with a gradual change in stone tool technology involving a departure from the manufacture of carefully retouched tools in the direction of expediently produced artefacts. Although Webley pioneered the description of the archaeological sequence of the last 2000 years in the region, many questions remain unanswered. Apart from the fact that her findings need to be replicated on other archaeological sites, little is known of the distribution of archaeological sites across the landscape, the time depth of particular sites or the details of human activities on them.

Recently, a number of further studies in Namaqualand, undertaken by archaeologists from the University of Cape Town, have provided more information about the time depth of human occupation. Members of the Archaeology Contracts Office (ACO) were commissioned by De Beers Namaqualand Mines to undertake a survey of De Beers-owned properties along the Namaqualand coast with a view to producing an inventory of sites for cultural resource management purposes. The survey, which has

been completed from Port Nolloth as far south as Mitchells Bay (after which it had to be adjourned until further funding can be raised), resulted in the recording of over eight hundred archaeological sites, many of which were excellently preserved and should be considered a cultural resource of national importance. The observations from this survey support a number of hypotheses about the nature of human occupation of the Namaqualand coast, supplementing and expanding on those from Spoeg River Mouth cave. Perhaps the most significant observation has been that many of the shell middens are associated with retouched artefacts including microlithic ones that, in the south west Cape, usually pre-date the appearance of herding some 2000 years ago. Although none of these open sites had been dated at this time, this implied that the later Stone Age occupation of Namaqualand was of longer duration than suggested by Webley (1992).

Corroborating evidence for this has come in the form of a study undertaken by Jerardino, Yates, Morris and Sealy (1992), which involved the analysis of a human burial excavated at Groen River Mouth. The results of the study showed that the individual buried was an adult female who had included a number of small rodents in her last meal. Stable carbon isotope analysis of one of the bones showed that the woman had consumed a mixed marine and terrestrial diet. The ribs gave a radiocarbon date of 2720 ± 60 BP (lab number Pta-5617) which is a clear indicator that there were at least some people living on the Namaqualand coast before 2000 years ago. A further burial excavated by colleagues from the South African Museum near Kleinsee has been dated to 3750 ± 60 BP (lab number Pta-2267), while recently Webley *et al* (1993) have dated a hunter gatherer assemblage in the Richtersveld to between 3100 and 3800 years ago establishing without doubt that human occupation extended to the mid-late Holocene. The Archaeology Contracts Office of the University of Cape Town excavated at 6 localities in the diamond mining area at Brand se Baai in 1992 (ACO 1993) producing more information about the cultural sequence in Namaqualand.

Sites recently excavated by the ACO at Brand se Baai included a Pleistocene Middle Stone Age (MSA) deposit (up 120000 years old) and a series of 5 Late Stone Age (LSA) sites that span the mid-Holocene period (4000 years ago) to just before historic times. A lengthy analysis of the finds from the five LSA sites show that Late Stone Age people have been living on the Namaqualand coast for at least 4000 years. As far as could be established from the small excavated samples, their subsistence strategy involved snaring/hunting of small terrestrial mammals and sea birds. They also exploited large amounts of marine foods such as shellfish and rock lobsters but apparently did not hunt seals which are common in the area today. Evidence from a ceramic period site of 1700 years ago shows that people collected the most inaccessible of shellfish when conditions were suitable. The stone tool assemblages from one of these sites that hint at changes in technology that may have involved a transition from an assemblage that contains microliths to a more informal one after 3000 years ago (Hart, Halkett and Parkington 1993).

The 1992 excavations enabled the compilation of a hypothetical sequence for the last 4000 years for the immediate coastal strip. The latest series of excavations in the mineral sands mining area has provided an opportunity to widen and test existing knowledge, and develop a chronology of prehistoric land use that include sites further inland. As yet, the LSA sequence beyond 4000 years ago is entirely undocumented. Apart from the little that is known about the Late Stone Age (LSA), the Middle (MSA) and Early Stone Age (ESA) periods remain entirely un-investigated, although isolated finds such as the disturbed MSA site (BSB 5) close to Brand se Baai, are known.

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