

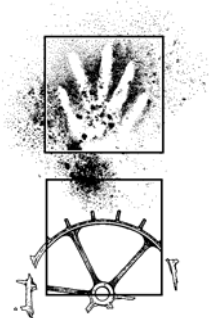


# Proposed Subdivision Lots 1 and 4 Narrawallee, NSW

## Archaeological Subsurface Testing Program



August 2004



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A Report to Rygate & West Pty Ltd

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# 1. SUMMARY

- Hazcorp Pty Ltd proposes to develop approximately 23 ha of wooded land at Narrawallee on the NSW south coast as a residential subdivision.
- The area proposed for subdivision was surveyed for Aboriginal sites by Navin Officer Heritage Consultants in 2002. Three Aboriginal sites, an open artefact scatter (site NW1) and two isolated finds (NW2 and NW3), were identified in the course of the field inspection of the study area. An area of potential archaeological deposit (PADNW1) was also identified in the northwest corner of the study area
- It was recommended that if development activities were anticipated in the identified area of archaeological potential (PADNW1), then a program of archaeological subsurface testing should be conducted to ascertain the presence/absence, integrity and significance of archaeological material in the area.
- Subsequently a program of archaeological subsurface testing was conducted at the proposed Narrawallee subdivision site.
- Nineteen test pits were excavated by a backhoe using a straight-edged 1000 mm toothless bucket. Spit depths had an interval range of between 5 cm and 25 cm. with most being between 15 cm and 20 cm in depth. Pits had a final length of between 2.2 m to 2.8 m.
- A total of four hundred and fifteen (415) lithic items were recovered from thirteen of the nineteen test pits excavated in the identified area of archaeological potential at Narrawallee (PADNW1). One hundred and twenty nine (129) lithic items were identifiable Aboriginal artefacts. These items were retrieved from eight test pits. Two hundred and eighty six (286) items, ie 69% of the total assemblage, were nondescript lithic fragments or heat shatter.
- Four geological types were identified in the lithic assemblage, comprising silcrete, quartzite, quartz and chalcedony with a further unidentified category.
- Fifteen categories of lithic item type were identified in the Narrawallee assemblage. By far the largest category was heat shatter, while flakes, or portions and fragments of flakes, was the largest technological type.
- A limited range of activities was represented by the recovered artefact assemblage. Evidence for stone knapping was present in eight of the nineteen test pits. Microblade production was evident in six pits, and implement discard was evident in one pit.
- The assemblage is characterised as 'microlithic' in character (knapping debris and microblades). The 'diagnostic' elements in the assemblage, such as microblades, are typical of the Late Phase.
- Artefact densities varied from 1.96/m<sup>2</sup> to 90.2/m<sup>2</sup>. The average artefact density for the total area was 31.62/m<sup>2</sup> for pits containing artefacts. This represents a medium artefact density for south coast sites.
- The general lack of other retouched and utilised pieces would suggest the site was not used as a major base camp but represents more transient occupation and artefact manufacture.
- **Conclusions**

The subsurface investigation of the previously identified potential archaeological deposit (PADNW1) has shown that the Aboriginal cultural material is mainly found on the northern terminal end and crest of the spurline. The site, identified as *Narrawallee 5 (NW5)*, contains variable densities of artefacts, with the highest artefact concentrations situated on the gentle slopes of the spur, elevated well above drainage lines.

It is highly likely that most of the northern section of the spurline contains additional cultural material of similar densities and composition.

The nature of the archaeological material detected, and the consequent low local archaeological significance assessment, means that site NW5 is unlikely to pose a long-term constraint to the proposed residential development at Narrawallee.

Given the low to moderate density of artefactual material, and the limited range of activities represented, further salvage of artefacts using controlled archaeological methodologies is not considered to be warranted or cost-effective, based on scientific objectives. It is considered unlikely that a further program of archaeological investigation would significantly increase our understanding of the activities and distribution of artefacts across the study area.

- **Recommendations**

No further archaeological assessment is required for the Narrawallee study area.

If the Aboriginal sites NW4 or NW5, identified in the course of this investigation, are likely to be impacted by the proposed residential development at Narrawallee, then application should be made to the Director General of the NSW DEC [NPWS] for *Consent to Destroy* (Section 90) the sites.

- **Note**

No activities can occur in the proposed development area that may disturb either known surface artefacts or subsurface archaeological deposits, without the receipt of an appropriate permit (a Section 90 Consent to Destroy) from the DEC

## **2. INTRODUCTION**

### **2.1 Background to the Subsurface Testing Program**

Hazcorp Pty Ltd proposes to develop approximately 23 ha of wooded land at Narrawallee on the NSW south coast as a residential subdivision. The subject area comprises Lots 1 and 4 and is situated south of Narrawallee Creek and directly to the west of Leo Drive (Figure 1.1).

The area proposed for subdivision was surveyed by Navin Officer Heritage Consultants in 2002. Three Aboriginal sites, an open artefact scatter (site NW1) and two isolated finds (NW2 and NW3), were identified in the course of the field inspection of the study area. An area of potential archaeological deposit (PADNW1) was also identified in the northwest corner of the study area.

It was recommended that if development activities are anticipated in the identified area of archaeological potential PADNW1, then a program of archaeological subsurface testing should be conducted to ascertain the presence/absence, integrity and significance of archaeological material in the area.

This report documents the results of the program of archaeological subsurface testing conducted at the proposed Narrawallee subdivision site.

The report fulfils the requirement of the above recommendation and was commissioned by Rygate and West.

### **2.2 Project Personnel**

Fieldwork was conducted by Matthew Barber, Rebecca Parkes and Lindsay Smith (archaeologists), Mr Barry Carriage (Ulladulla Local Aboriginal Land Council representative) and Daniel Powell and Tom Taverner (field assistants). Plant was provided by M.J. & D. Bayley.

Dr Johan Kamminga conducted the lithic identification.

This report was prepared by Kerry Navin, Matthew Barber and Rebecca Parkes.

## **3. ABORIGINAL PARTICIPATION AND CONSULTATION**

The Narrawallee study area falls within the boundaries of the Ulladulla Local Aboriginal Land Council (ULALC). Approval for the subsurface testing program was given by the Land Council prior to submission of the Preliminary Research Permit (PRP) application to the NSW DEC.

The Land Council was subsequently contacted by phone when the PRP was issued. A representative of the Land Council was invited to participate in the field work and subsequently ULALC Sites Officer, Mr Barry Carriage, participated in the field program and represented the interests of the Land Council in the study.

A copy of this report will be forwarded to the Ulladulla Local Aboriginal Land Council.

*A Record of Aboriginal Participation* is provided in Appendix 1.



**Figure 1.1** General location of study area and archaeological subsurface testing area.  
(Milton 1:25,000 topographic maps 2<sup>nd</sup> Eds, Land Information Centre)



## 4. ENVIRONMENTAL CONTEXT

The Narrawallee study area is located within the coastal landforms, estuarine inlets, and low ranges of the NSW south coast hinterland. The study area is situated in hilly terrain directly to the west of Narrawallee Beach.

The surface geology of the small coastal catchments between Narrawallee Creek and the Burrill Lake entrance are dominated by undifferentiated Tertiary sediments, including gravels, sands and clays, sandstone and conglomerates. These facies overlay the Conjola beds that are exposed along the coastline as cliffs along projecting and rocky headlands. Silica-rich rocks such as silcrete and quartzite occur as surface outcrops within the Tertiary sediments, particularly in association with small areas of olivine basalt north of Ulladulla. The Tertiary facies have formed relatively low gradient slopes with open valley floors that include recent aeolian mantles of dune sands.

The nearby coastline is characterised by a sequence of rocky headlands and sandy embayments. Bannisters Point, Ulladulla Head, Warden Point and Lagoon Head project into the ocean up to one kilometre and include extensive cliff-lines and intertidal rock platforms. Most of the sandy embayments are associated with freshwater streamlines, and the larger beaches are associated with dune and estuarine barriers behind which coastal lakes and estuaries have formed. Tabourie and Burrill Lakes are all examples of creek valleys which were 'drowned' as a result of the last sea level rise at around 5000-6000 BP (years before present). Following the sea level rise, the formation of sand barriers extending from adjacent headlands promoted the development of estuaries and their associated flats.

Soils consist of grey sands on the low gradient ridge sides, with the underlying gravelly orange brown clays being apparent at or near the surface along the more exposed ridge top.

Topographically the Narrawallee study area encloses a ridgeline with gently sloping sides and a broad crest. The ridgeline comprises a substantial local geographic feature in that it provides a natural route between the elevated terrain around Mollymook to the south, and the low-lying country adjacent to Narrawallee Creek and Narrawallee Inlet to the north. While no readily definable creeklines occur within the study area, a drainage line roughly parallels the area's western boundary.

The ridgeline has been subject to forestry activities in the past and several locations along the elevated feature have been quarried. An old quarry is evident at the study area's southern end.

Vegetation consists of forest regrowth dominated by turpentine (*Syncarpia spp.*), *Eucalyptus* and *Angophora* species. While the area has been extensively logged in the past, a number of old growth trees remain scattered along the ridge.



Plates 4.1 and 4.2: Typical dense vegetation on the study area



## 5. ARCHAEOLOGICAL CONTEXT

### 5.1 Ethno-history

Tindale's compilation of tribal boundary information places Milton, Ulladulla and the surrounding hinterlands in the Wandandian Aboriginal tribal territory. The Wandandian extended down the coast from the Lower Shoalhaven to approximately the Ulladulla region, and westward as far as the Shoalhaven north of Braidwood (Tindale 1974).

The language of the Milton Ulladulla region is placed, with reasonable confidence, in the middle of the Dhurga distribution (Tindale 1974, Eades 1976). Samples of the language spoken by members of the 'Ulladulla tribe' and 'Wandandian tribe' are identified by Mackenzie as *Mudthung* or *Thurumba*, now considered to be a northern dialect of Dhurga (Mackenzie 1874, Ridley 1877, Eades 1976). The distribution of the Dhurga language appears to have extended from Jervis Bay down the coast to around Narooma.

The Wandandian were part of a larger inter-tribal group, (termed the '*Murring*' by Howitt), which formed a community with shared ceremonial obligations and a common initiation lore and cosmology (Howitt 1883, 1904). The Murring extended northward up the NSW coast from around Double Bay to the Shoalhaven, and inland to the Wiradjuri eastern boundary.

On initial white settlement the total Aboriginal population of the Milton-Ulladulla region was estimated to be about 600 (Cambage 1916). There is little reference to the relations between the Aboriginal and colonising European cultures. One remaining story relates how the murder of a party of whites, led by Thomas Kendall, an original settler at Narrawallee Creek, was contemplated by a group of Aborigines camped at Ulladulla. The Aborigines had apparently been 'offended' by the actions of a sailor in the party. The party was saved by the warnings of a 'friendly' native who was later favoured by the Kendall family (Cambage 1916:22). The nature of the particular 'offence' can only be guessed at, though the alienation from the most productive tribal hunting grounds must have quickened the dependence of the Aborigines on European foods and the establishment of permanent camps on the fringes of their towns.

Thomas Kendall stated that the region's Aboriginal population was divided into two tribes, the Coastal tribe and the Pigeon House tribe, whose territory extended inland to include Braidwood (Hilder 1982, Cambage 1916). He also noted a 'blacks' camp on the north side of Millards Creek which flows into the [Ulladulla] harbour' (Bayley 1983:34).

By the 1840's, and certainly the 1850's, the region's Aboriginal population had been reduced to remnant groups either wandering large tracts of the coast, or subsisting at the edge of the now permanent European settlements (Egloff 1981). In 1848 Townsend describes Ulladulla Aborigines employed by settlers to reap crops and fell timber (Townsend 1848).

Between 1870 and 1904 various ethnographers and other recorders documented some fragments of traditional life communicated to them by Wandandian People. These people were, at that time, resident at Ulladulla and possibly Wandandian (Mackenzie 1874, Mathews 1904, Etheridge 1904). In 1900 Aborigines camped at the south head of Ulladulla Harbour (Bayley 1975:36).

J. E. Mathews (c.1960) recorded that there was no recollection in contemporary local Koori traditions for the use of 'Wandandian' as a tribal name. Nor was there any mention of Aborigines around that time being known by the name 'Wandandian'. Mackenzie (1874) however, has recorded several stories and word lists from individuals he states as belonging to the Wandandian and Ulladulla tribes. It seems possible that these two forms were roughly equivalent to the territorial areas of two different tribal bands on the coastal plain with which the informants identified.

During the first decades of the twentieth century most European references to the local Wandandian were to note the 'final' passing of a generation of '*full blood*' and initiated tribal members (Cambage 1916). However a large Koori population remains in the Milton Ulladulla region today.

## 5.2 Local Context

The archaeology of the Narrawallee/Ulladulla area is comprehensively summarised in a number of reports (eg. Navin and Officer 1997, Navin Officer Heritage Consultants 2000). This material will not be re-presented in full in this report and the reader is referred to the 1997 and 2000 reports for more detail on the archaeological context of the Milton Ulladulla region.

Provided below is contextual information relevant to the proposed subdivision site.

The earliest Aboriginal site recording in the Ulladulla area was carried out in 1918 by Etheridge. A carved tree associated with a bora ground (NPS Site #58-1-31) was recorded about '4 miles WNW of Ulladulla'. According to Etheridge the tree was carved in the 1850's and 'was incised by rings above one another and a spiral cut extended some 10 feet up the tree. The incisions were about four inches broad' (1918:88). The tree is no longer in existence (Bell 1982).

In 1971 Lampert conducted excavations into a rock shelter at Burrill Lake which provided basal dates of 20,760 ± 800 years BP (ANU 336), making it the oldest dated site on the NSW south coast. The site provided evidence for 'intensive seaboard exploitation of resources allowing optimum density of settlement' (Mulvaney 1975:244). The earliest dated occurrence of unifacial pebble tools in eastern Australia is from the Burrill Lake rockshelter and the earliest backed blades in the Burrill Lake excavation were dated to around 5300 years BP (Before Present) (Lampert 1971). This date is consistent with the introduction of lithic technologies associated with the 'Bondaian' throughout southeastern Australia.

The Burrill Lake Rockshelter site is listed on the Register of the National Estate (Australian Heritage Commission).

Australian National University students participating in field school surveys have located numerous sites in the coastal hinterland and forests around Kioloa and to the west of Burrill Lake/Ulladulla. The results of these surveys have been synthesised by Tom Knight (1996).

Cane (1985) carried out a survey of proposed reservoir sites and four water pipeline routes between Lake Conjola and Lake Tabourie. One of these routes (the water pipeline was eventually placed along this route) traverses the proposed Ulladulla STP area. No sites were located in the study area by Cane.

Kuskie (1995 & addendum) compiled a predictive study for several areas which were under consideration as sites for a landfill facility in the Shoalhaven area. One of these options 'the Kings Point Drive option' included much of the present STP area. Kuskie concluded that there was 'moderate potential for artefact scatters to occur in the Kings Point Drive option .... the potential for other sites types is low with the possible exception of scarred trees, which may occur in stands of mature vegetation' (addendum May 1995:1).

Navin (1996) conducted a survey of a proposed Sewage Treatment Plant (STP), access road and a pipeline from the existing Sewage Treatment Plant to a proposed STP site located west of Ulladulla. The STP area consisted of approximately 23 ha of forested ridgeline crest and mid-slopes, and the proposed road and pipeline easements had a combined length of 2.25 km. Two possible Aboriginal scarred trees, Racecourse Creek 1 (NPS Site #58-1-643) and Racecourse Creek 2 (#58-1-644), were identified within the general area of the proposed access road and pipeline easements. This STP site was subsequently superseded.

Four Aboriginal sites, comprising two scarred trees and two artefact scatters were located in the field inspection of a preferred easement for the proposed Milton Ulladulla Bypass in 1997. Four areas of potential archaeological deposit (PADs) were also identified in the road easement (Navin & Officer 1997). The easement was approximately 120 m wide and 17 km long and traverses the defined buffer zone around the proposed STP area to the east of the site.

In 1998 Officer & Navin conducted an archaeological assessment of the proposed STP site 8a (the current STP site) and associated sewerage and reclaimed water pipeline route options in order to identify any Aboriginal heritage issues relevant to the proposed development.

A review of Aboriginal site registers and archaeological literature indicated that no Aboriginal sites had been recorded as occurring within the study area although sections of the STP area and pipelines had previously been subject to archaeological survey.

Four Aboriginal sites, comprising two possible scarred trees (USTP1 and USTP3) and two low density scatters of stone artefacts (USTP2 and USTP4) were located in the course of the field inspection of the study area. Three of these sites were located within the proposed STP Site 8a.

The scarred tree USTP3 was considered to have moderate archaeological significance in a local context. The visible extent of artefact scatters USTP2 and USTP4 were considered to have low archaeological significance in a local context. However it was noted that the presence and significance of potential archaeological material occurring subsurface and to the east of the visible extent of sites USTP2 and USTP4 was unknown.

This area was then defined as an area of potential archaeological deposit (a PAD). It was noted that if significant impact was anticipated to the upper ridge slopes to the east of the existing quarry boundary and east of sites USTP2 and USTP4 then the status of any potential archaeological deposits in these areas would require clarification.

Consequently a program of archaeological subsurface testing was conducted at the proposed STP site in April 2003 (Navin Officer Heritage Consultants 2003a). A total of thirteen lithic items were recovered from four of the six test pits excavated in the identified area of archaeological potential at the Ulladulla STP site. The lithic assemblage was dominated by silcrete (7 items), although quartz (3 items) and quartzite (3 items) were also present. Artefact types included microblade cores, and microblades as well as flakes and flake portions. The archaeological deposit detected during this test pitting program was considered to be a northern extension of the previously recorded site USTP4 (Ulladulla Sewerage Treatment Plant Four), NPWS site number 58-1-726. It was assessed to have low archaeological significance within a local context and it was recommended that an application should be made for a Section 90 Consent to Destroy for those area of the deposit to be impacted by the treatment plant works development (Navin Officer heritage Consultants 2003).

In 2000 Navin Officer Heritage Consultants conducted a cultural heritage assessment for the EIS for the proposed sewerage augmentation works between Milton and Ulladulla. Two new Aboriginal site recordings (both midden sites: MU1 & MU2), and one isolated find (MU IF1), were recorded during the field investigation for the sewerage augmentation works, and eleven areas of assessed archaeological subsurface potential were identified (PAD2-12). Five of these locations were assessed to have high to moderate archaeological potential, while the remainder have moderate to low potential (Navin Officer Heritage Consultants 2000).

A program of archaeological subsurface testing was conducted in Stage 1 of *The Dairy* at Burrill Lake in 2003 (Navin Officer Heritage Consultants 2003b). A total of 1339 stone artefacts were recovered from the 36 test pits excavated at the site. The recovered stone artefact assemblage comprised 42 distinctive assemblage elements made from a range of local and non-local raw materials. Midden deposit was encountered within two locations and dating of the midden deposits yielded consistent dates of around 900 BP (**B**efore **P**resent). It was argued that the peak in stone artefact deposition across the site was also around this age, given that both occur at the same depth interval.

### **5.3 The Narrawallee Study Area**

An archaeological assessment of the Narrawallee study area, including site register searches, literature review, Aboriginal consultation and field inspection of the study area, was conducted in December 2002 (Navin Officer Heritage Consultants 2002). Background research indicated that three previously recorded Aboriginal sites, including an open campsite, a midden and an isolated find were located within a kilometre of the study area. No sites had previously been recorded as occurring in the actual area. Three Aboriginal sites, an open artefact scatter (site NW1) and two isolated finds (NW2 and NW3), were subsequently identified in the course of the field inspection of the area. An area of potential archaeological deposit (PADNW1) was also identified in the northwest corner of the study area – this is the area under investigation in this report.

## **6. METHODOLOGY**

### **6.1 Objectives of the Subsurface Testing Program**

The aims of the subsurface testing program were to determine if Aboriginal sites or relics (as defined by the NPW Act) were located subsurface within the identified area of potential archaeological deposit at the Narrawallee subdivision site.

Specific aims were to:

1. Determine if subsurface artefacts are present within the defined areas.
2. Characterise the nature of any archaeological deposits encountered (within the limitations of the sampling and processing methodology).
3. Identify the need for any further archaeological work, such as salvage excavation.
4. Provide informed mitigative measures and management recommendations for any sites located within the proposed easement.

### **6.2 Investigation Approach**

The following approach was followed for the investigation at Narrawallee.

- Obtain a Preliminary Research Permit from the DEC (Permit #1601).
- Conduct initial surface survey of test areas and establish premium locations for a series of testpits.
- Excavate a series of nineteen (19) backhoe test pits across the subject area.
- Sieve a systematic sample of spoil recovered from successive spit (levels) (around 15 cm deep) from each test pit.
- Test pits to be concluded when bedrock, dense clay, or sediments which are indicative of an environment with low archaeological potential, are encountered.
- Backfill all testpits.
- Describe and analyse all recovered artefactual material.

### **6.3 Excavation Methodology**

The following excavation methodology was followed for backhoe pits.

1. Mark out and record the required location of backhoe pits. Nineteen test pits were marked out off a baseline that followed the western boundary of the study area. The initial aim was to locate pits along two transects parallel to this baseline at intervals of 100 m and 50 m. Due to vegetation constraints and previous land disturbance, the actual location of pits varied up to 20 m from this objective. As testing proceeded it became clear that artefact densities were higher along the eastern transect, and as such, permission was sought from DEC [NPWS] to extend testing onto the spur crest. Permission was granted, and Pits 15, 16, 17, 18 and 19 were subsequently located on the spur crest. (Figure 6.1, Figure 6.2).

## 2. Excavate backhoe pit.

Test pits were excavated by a backhoe using a straight-edged 1000 mm toothless bucket. Spit depths had an interval range of between 5 cm and 25 cm. with most being between 15 cm and 20 cm in depth. Pits had a final length of between 2.2 m to 2.8 m.

The following excavation sequence was followed:

excavation of spit one along an interval averaging 2.0 m in length.

following removal of spoil, the section of pit where the pit one (and all subsequent spits) was excavated was widened by the removal of 10cm from one side of the pit. This is done to ensure that the bucket will not touch the pit sides when excavating the next spit. This minimises the potential for contamination from upper levels.

excavation of spit 2 (and all subsequent spits), beginning approximately 200-300 mm from the far end of the previous spit. This was done in order to create a 'clean' end-wall and prevent contamination from sediments from upper levels.

following spit 2 (and after all subsequent spits), the near end of the pit was extended by up to 300 mm in order to remove any fallen sediment from upper levels and to provide a 'clean' end point for the backhoe bucket.

following each spit excavation, a sample of the removed sediment, consisting of at least 8 x 10 litre buckets of was taken from the middle of the backhoe bucket, prior to the emptying of the bucket. Removing the sample from the middle of the bucket further minimised the potential for contamination from sediments falling to lower levels from the pit sides. If artefacts were detected then a further two buckets (if available) were sieved to provide a ten bucket sample.

Excavation ceased according to an on-site appreciation of testing requirements.

Initially all sieving was conducted with the aid of pressurised water from a water truck, however due to access constraints (mostly dense vegetation and trees – see Plates 4.1 and 4.2) the sieving for pits 3, 4, and 6 through 19 was conducted without the aid of water.

All material was sieved through 3 mm mesh, with use of a top 5 mm mesh.

All identified or suspected cultural material recovered from sieving was retained, bagged and labelled. In addition a reference collection of natural gravels was collected to aid in lithic interpretation, where appropriate.

## 3. Following cessation of excavation, the soil profile and characteristics was described and checked with the separately documented incremental spit descriptions.

PH measurements were taken from representative pits at various locations in the profile.

## 4. All pits were backfilled with the remaining excavated and sieved spoil.

### 6.4 Lithic Analysis Methodology

The primary aim of the analysis of the lithic items retrieved from the Narrawallee site was to assist in the assessment of the significance of the site/s in terms of information potential and contribution to archaeological research.

Lithic items were examined at low magnification under reflected light using a Wild Leitz stereoscopic microscope. The lithic analysis was conducted by lithic specialist, Dr Johan Kamminga.

A basic analysis of lithic technology variables within the sample assemblage, such as rock type, lithic types, size distribution, utilisation and secondary flaking characteristics, etc. was conducted to a level

concomitant with the stated aims of the investigation, and the number of artefacts recovered. Mass as measured with an ISCO balance (precision of 0.005 grams) has been recorded. Observations about technological attributes and other relevant data have been documented.

#### **6.4.1 Standard recording of properties and variables**

Four basic variables were recorded for each lithic item:

- size class, in one centimetre units;
- weight, as measured with an ISCO balance (precision of  $\pm 0.005$  grams). Lithic item weights of less than 0.01 grams are accorded this nominal value;
- stone material type or category. To the extent possible, specific stone types were identified, including colour and fabric characteristics. Some stone materials cannot be identified with confidence, even when magnified and viewed under reflected light. Such materials have been described as 'unidentified stone type';
- item type or category (with further details entered into the comments section of the database);

Observations about notable technological attributes and other pertinent data such as specific characteristics of the stone material, any evidence of use-wear and potential tool-use residues, are recorded.

#### **6.4.2 Rationale for lithic item classification**

The artefact categories defined for this report constitute polythetic groupings, which are defined by a constellation of attributes and for which no single attribute is essential or sufficient for membership (see Sokal and Sneath 1963:13; Clarke 1978:36; Hayden 1980:3; Kamminga 1985:10). These categories are not rigidly bounded. An artefact attributed to a type or category needs to have only some of the defining attributes of that category, such as a particular shape, presence of retouch on a certain part, or particular attributes of use-wear, and any such attributes may be shared with other artefacts categories. Fragments of artefacts are often allocated to a general category because they do not have sufficient attributes for them to be allocated with confidence to a more specific category.

In this report the term 'lithic item' denotes pieces of stone exhibiting fracture surfaces and not identified as natural pieces of stone.

#### **6.4.3 Lithic item size class**

Artefact size is recorded in categories numbered from 1 to 7, representing the maximum size (diameter) in any direction as measured on a grid (see Table 6.1).

**Table 6.1: Artefact size classes used in this analysis**

Code	Size category
1	$5 < x \leq 10$ mm
2	$11 < x \leq 20$ mm
3	$21 < x \leq 30$ mm
4	$31 < x \leq 40$ mm
5	$41 < x \leq 50$ mm
6	$51 < x \leq 60$ mm
7	$61 < x \leq 70$ mm
8	$x \geq 71$ mm

The size measure is a discrete form of the continuous variable diameter, which is the greatest distance in a straight line between any two points on the surface of a lithic item. The unit for size is the centimetre, as it is for diameter. The size class increments are whole centimetres. When applied



to size the average function produces a continuous variable, also measured in centimetres. Therefore, the average may take on values that are intermediate between classes. Thus a group of artefacts ranging between size classes 1 and 2 may have hypothetically an average of say 1.5 cm. It should be noted that maximum size as measured by this method does not necessarily reflect general plan shape characteristics of artefact.

## 6.5 Curation of the lithic artefact collection

The lithic items after examination and measurement have been stored individually in standard resealable plastic bags. These containers are labelled in permanent black pen with the item's unique identification number and details of its provenance within the excavation.

Following completion of the analysis of the assemblage, all the lithic items will be lodged with the Australian Museum, Sydney, or with a local representative Aboriginal group.



Plate 6.1: Excavating the deposit



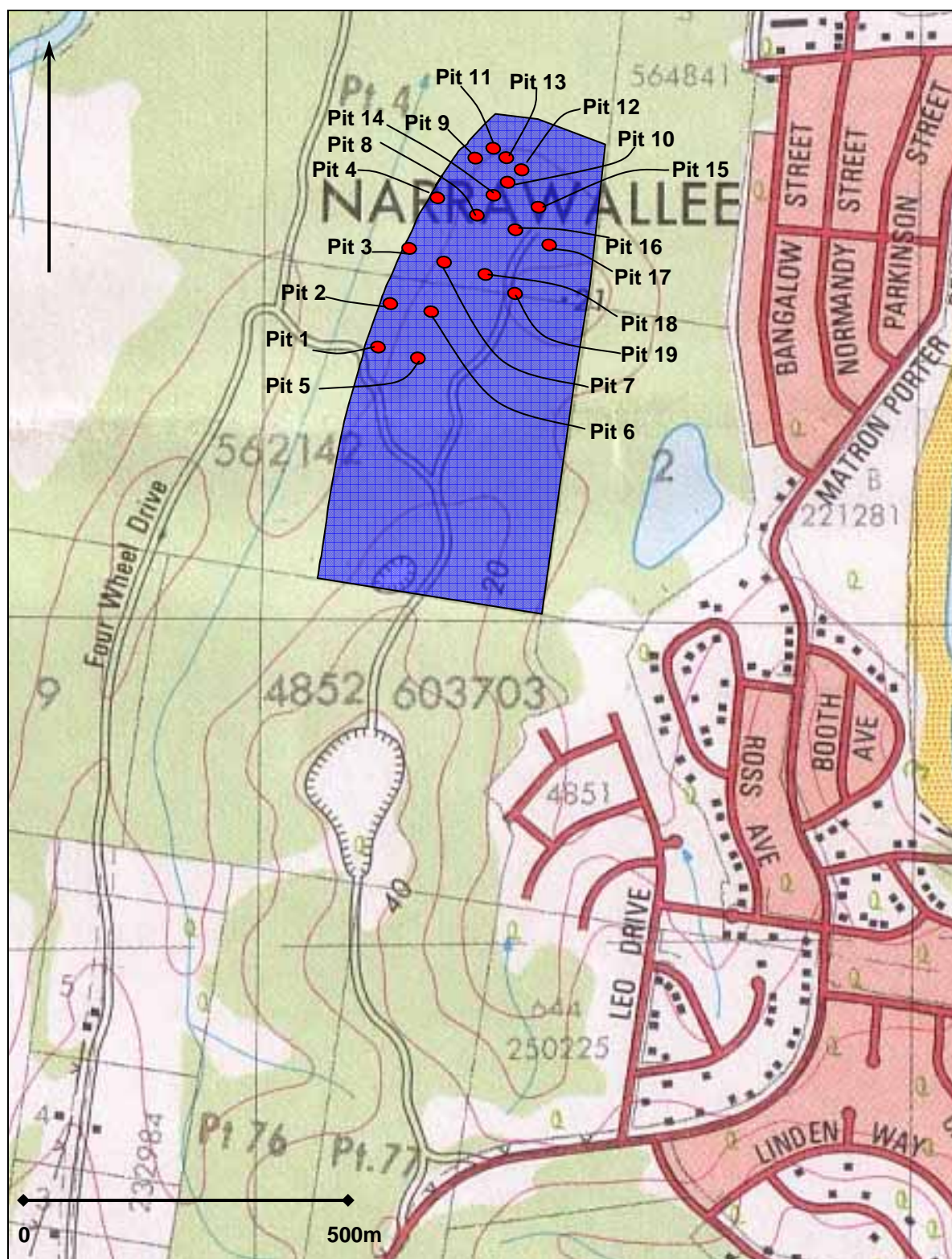
Plate 6.2: Excavating the deposit



Plate 6.3: Wet sieving excavated deposit

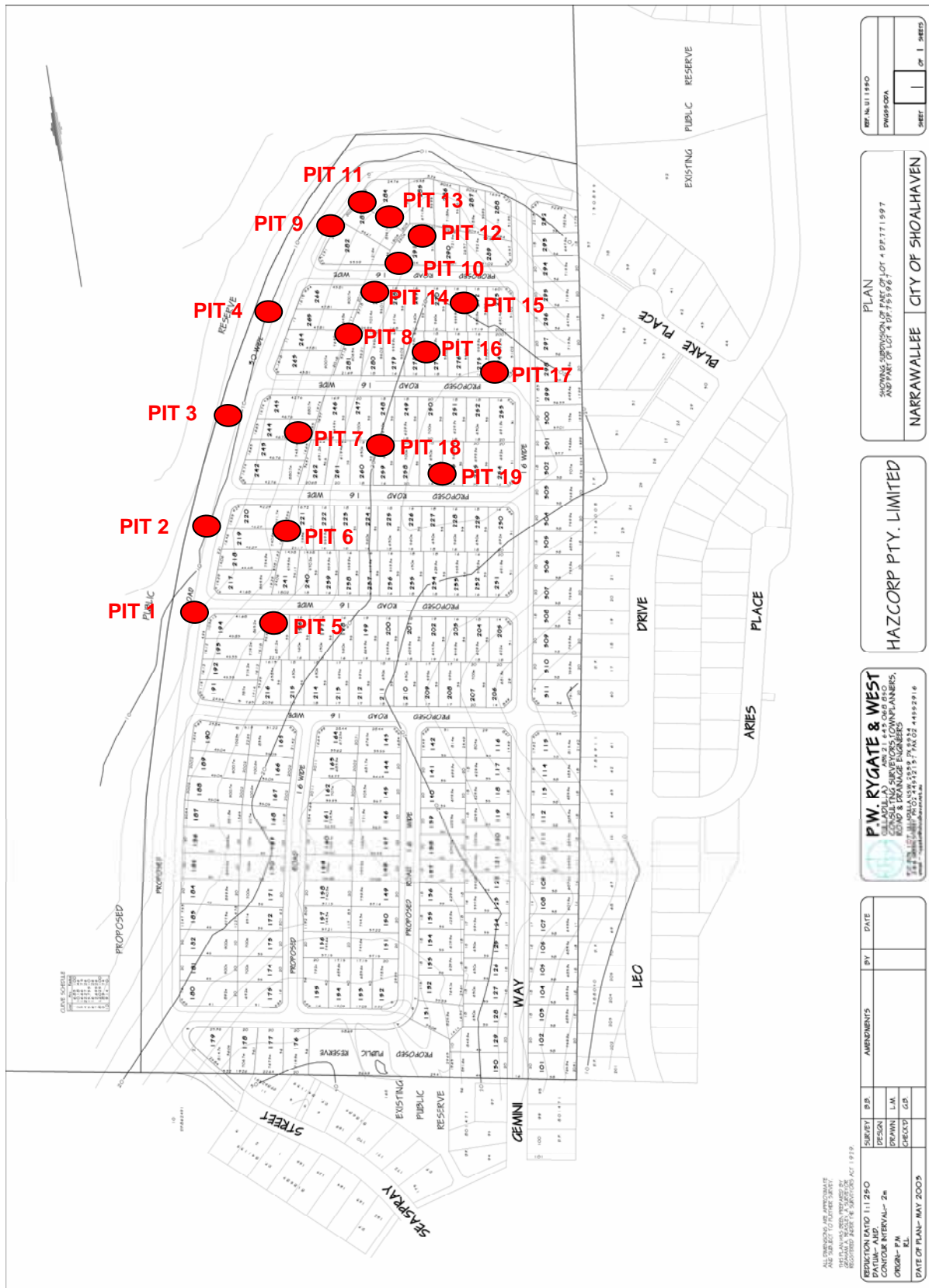


Plate 6.4: Dry sieving excavated deposit



**Figure 6.1** Location of the test pits  
(Milton 1:25,000 topographic maps 2<sup>nd</sup> Eds, Land Information Centre)





**Figure 6.2** Location of the test pits relative to the proposed subdivision

## 7. RESULTS

A total of four hundred and fifteen (415) lithic items were recovered from thirteen of the nineteen test pits excavated in the identified area of archaeological potential at Narrawallee (PADNW1).

Six test pits contained no lithic items.

One hundred and twenty nine (129) lithic items were identifiable Aboriginal artefacts. These items were retrieved from eight test pits.

Two hundred and eighty six (286) items, ie 69% of the total assemblage, were nondescript lithic fragments or heat shatter.

The location of the test pits and artefact finds are shown in Figure 7.2.

Lithic items are described in Section 7.4, Table 4 (below) and in Appendix 5.

### 7.1 Soil Profile

Generally the soil profile in the study area comprised grey/dark grey loamy sand becoming lightly mottled with light grey sand overlying a coarser yellow/brown, sometimes gravelly, sand overlying yellow brown gravelly clayey sand which gave onto decomposing sandstone bedrock at base.

### 7.2 Stone Materials Types and Categories

Four geological types (Table 7.1) have been identified in the lithic assemblage, comprising silcrete, quartzite, quartz and chalcedony with a further unidentified category. Colour difference is a major criterion for subdividing geological types to assist in identifying potential relationships between lithic items (such as conjoins and 'associations'), technological processes, and for general descriptive purposes. It should be noted that similarity in colour within a geological type does not necessarily indicate that such lithic items found in close stratigraphic association are derived from the same original nucleus, or that colour difference indicates in all instances that artefacts are from different nuclei. Any possible associations of artefacts were noted during the recording.

**Table 7.1: Lithic item stone material types**

Stone Material Type	Number	%
Quartz	20	4.8
Silcrete	348	83.9
Quartzite	37	8.9
Chalcedony	8	1.9
Indeterminate	2	0.5
<b>Total</b>	<b>415</b>	<b>100</b>

The local geology of the Ulladulla area is well known for the availability of silcrete and quartzite. The great dominance of silcrete within the assemblage is to be expected given the general proximity and easy availability of silcrete within the local area. There are extensive outcrops of silcrete at Bannisters Point, about 3 km to the southeast of the study area. This is a well-known outcrop with silcrete cobbles eroding from the cliff line and scattered along the beach at the base of the cliff line. Access to the cobbles is relatively easy and although there has been extensive quarrying of the material in historic times it has been postulated that the material would also have been exploited by Aborigines in prehistory.

It was also noted during the investigations that there was natural silcrete present within the deposits. The material was of varying quality but its presence indicates that Aboriginal people may have been able to obtain raw material for flaking in the immediate study area.

The rarity of some stone types in the assemblage such as chalcedony and the absence of sources for this material in the local area point to long distance importation of small numbers of artefacts. Quartz material may have been obtained locally but clear preference in silcrete is shown in the assemblage. Of particular interest is the lack of cortex on the silcrete items, while six pieces (30%) of quartz exhibited pebble cortex. The lack of cortex may suggest the silcrete material was more heavily reduced than quartz or that the cortex was removed prior to carrying it to the site.

There is evidence for core reduction at the site as might be expected close to a source, and high rates of microblade artefact production. Most of the silcrete artefacts are small and heavily decorticated.

### 7.3 Classification of lithic items

There were fifteen categories of lithic item type identified in the Narrawallee assemblage (Table 7.2). By far the largest category was heat shatter, while flakes or portions and fragments of flakes was the largest technological type.

**Table 7.2: Lithic item types recovered from Narrawallee**

Lithic item type	Number	%
<b>Indeterminate fragments</b>		
Lithic fragment	48	11.6
Heat shatter	238	57.4
<b>Flake products</b>		
Flake	50	12.1
Flake fragment	17	4.1
Flake portion – proximal	10	2.4
Flake portion – distal	6	1.5
Core	1	0.2
Microblade core	4	1
Microblade	11	2.7
Bipolar compression flake	1	0.2
Microblade portion	18	4.3
Flake portion – longitudinal	2	0.5
Microlith backing flake	6	1.5
Core fragment	2	0.5
Bondi preform portion	1	0.2
<b>Total</b>	<b>415</b>	<b>100</b>

Closer examination of the identified types shows that the heat shatter was concentrated in pit 19, where 162 pieces (68.1%) were recorded, and pit 17, where 50 pieces (21%) were recorded. The remaining 26 (10.9%) heat shattered pieces came from pits 1, 4, 10, 12, 15 and 18. With respect to the lithic fragments, 19 came from pit 12 (39.6%) and 10 from pit 17 (20.8%), the remaining 16 (39.6%) came from pits 2, 8, 9, 10, 11, 15 and 19.

Thus all 166 items recorded from pit 19 were not definitive artefacts, while 60 of the 93 items (64.5%) from pit 17 and 32 of 78 items (41%) from pit 12 were also non artefactual.

All lithic fragment and heat shatter pieces are not considered definitive artefacts and have been removed from the following analyses. This leaves a total of 129 artefacts.

#### 7.4 Chronology of the Assemblage

There is no identifiable stratigraphic change in the overall character of the lithic assemblage from the Narrawallee site. There is only a very slight change in the proportion of the microblade industry represented through the profile, where the upper three spits contain 94.9% of the microblade assemblage and 90.7% of the entire artefact assemblage.

The assemblage is characterised as 'microlithic' in character (knapping debris and microblades). The 'diagnostic' elements in the assemblage, such as microblades, are typical of the Late Phase and such items are located through spits 1 to 5, with no such items in spit 6.

Given the composition of diagnostic elements it is inferred that the assemblage accumulated at some time within the last 3,000 years, after microliths had been adopted along the south coast of New South Wales.

#### 7.5 Activities

A limited range of activities is represented by the recovered artefact assemblage. These are summarised in Table 7.3. Evidence for stone knapping is present in eight of the nineteen test pits. Microblade production is evident in six pits and implement discard is evident in only one pit.

**Table 7.3: Site activities indicated by the recovered artefacts**

Test Pit #	Nature of Human Activity			
	human presence	stone knapping	microblade production	discard of implements
1				
2				
3				
4	✓	✓		
5				
6				
7				
8	✓	✓		
9	✓	✓	✓	
10	✓	✓	✓	
11				
12	✓	✓	✓	
13	✓	✓	✓	
14				
15	✓	✓	✓	
16				
17	✓	✓	✓	✓
18				
19				



## 7.6 Artefact density

A total of 129 Aboriginal artefacts were recovered from eight test pits positioned across the crest and slopes of a major spurline of the development area. Three of the test pits contained 87.6% of the artefactual material recovered from the excavations. Pit 12 contained 46 artefacts, pit 15 contained 34 artefacts and pit 17 contained 33 artefacts (these pits also contained heat shatter material).

Table 7.4 shows the number of artefacts and densities for all pits with artefacts.

There were some artefacts from pit 9 that appeared to come from the same nucleus and probably represent a flaking event at that location. Similarly, there were artefacts of the same raw material in pit 15 that also represented a flaking event.

The test pits containing artefacts all were situated at the northern end of the spurline. The non-diagnostic objects from the test pits were not included in the density figures. Density figures were produced through calculation of the equivalent volume of sieved material to a level, square metre area. This figure was then multiplied by the number of artefacts per pit to produce a density based on square metres.

Artefact densities varied from 1.96/m<sup>2</sup> to 90.2/m<sup>2</sup>. The average artefact density for the total area is 31.62/m<sup>2</sup> for pits containing artefacts. This represents a medium artefact density for south coast sites (as compared to average densities of 67/m<sup>2</sup> for Sandon Point, 38/m<sup>2</sup> for Lagoon Restaurant at Wollongong, 116/m<sup>2</sup> for Gerroa, 21/m<sup>2</sup> for Dolphin Point and high densities of 318/m<sup>2</sup> for 'Coila Lake 1').

**Table 7.4: Artefact densities per test pit**

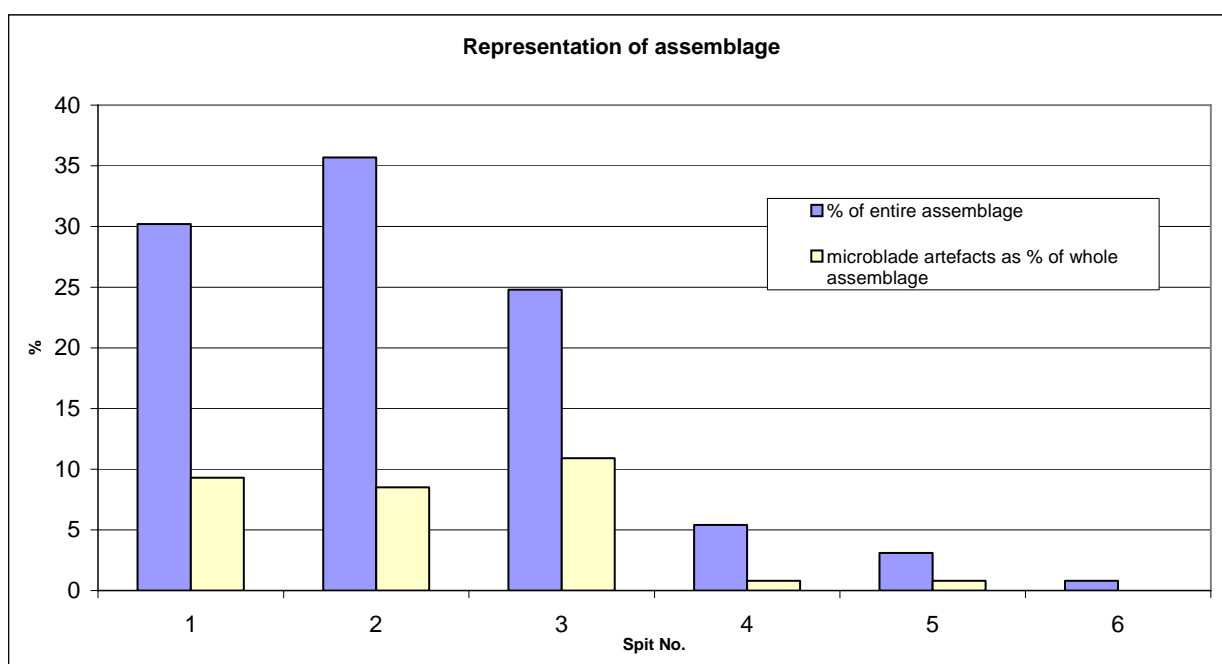
<b>Pit Number</b>	<b>Number of artefacts</b>	<b>Artefact 'density' (a/m<sup>2</sup>)</b>
<b>4</b>	1	1.96
<b>8</b>	1	1.96
<b>9</b>	6	11.77
<b>10</b>	7	13.73
<b>12</b>	46	90.2
<b>13</b>	1	1.96
<b>15</b>	34	66.67
<b>17</b>	33	64.71

## 7.7 Vertical and horizontal artefact distribution

Artefacts were encountered between 0 cm and about 90 cm below the current ground level, with most artefacts (90.7%) occurring in the first three spits ie. from 0 cm to about 40 cm below ground level. This is consistent with Aboriginal occupation on the overlying topsoil (the upper A horizon), and subsequent gradual vertical displacement of the artefacts to the lower layers. There was no evidence for more than one modal distribution of the vertical location of artefacts in any of the pits (ie more than one layer of artefact concentration in a test pit).

Figure 7.1 shows that spits 1, 2, and 3 contains the majority (90.7%) of artefacts recovered, with spits 4, 5 and 6 containing only a small proportion of artefacts.

The figure also shows that there is a slight increase in the amount of artefactual material recovered from spit 2, compared to spit 1 and spit 3. The microblade component of the assemblage shows a generally constant pattern in line with the overall artefact numbers, although with a slightly higher proportion of microblade artefacts in spit 3. The minor differences are not considered to represent any significant change in site use or artefact distribution through the profile.



**Figure 7.1** Graph showing proportion of representation of microblade artefacts by spit.

The spatial distribution of material as shown in the map of the study area (Figure 7.2) indicates that the northern end of the spurline was where Aboriginal occupation was concentrated. The highest density of material was situated on the sloping termination of the spur, although surface artefacts were obviously also identified at site NW4 on the crest. It is clear from the distribution of the cultural material that the central western portion of the spurline sloping down towards the drainage line was not an area favoured for Aboriginal occupation.

The microblade material was also fairly evenly distributed across the pits. All pits with more than one artefact (pits 9, 10, 12, 15 and 17) contained microblade and/or microlith artefacts. The microblade elements represented between 28% and 42% of these pit assemblages, providing an indication that about a third of the artefacts were associated with this technology.

## 7.8 Previously Unrecorded Surface Site

During the course of site survey for the marking out of test pits an additional surface scatter of artefacts was located on the eastern boundary of the study area; this scatter was recorded as site *Narrawallee 4*.

### **Narrawallee 4 (NW4)**

(AGD 269498. 6089487)

Site NW4 is located on a vehicular track that runs behind the yards of an existing residential development on the eastern boundary of the study area (Plate 7.1). The site comprises an estimated 15 to 20 artefacts visible on an open spur crest of low gradient; the visible scatter extends for approximately 20 m by 3 m. Surface visibility along the track is approximately 75%, while surrounding visibility is generally less than 5% due to thick vegetation.

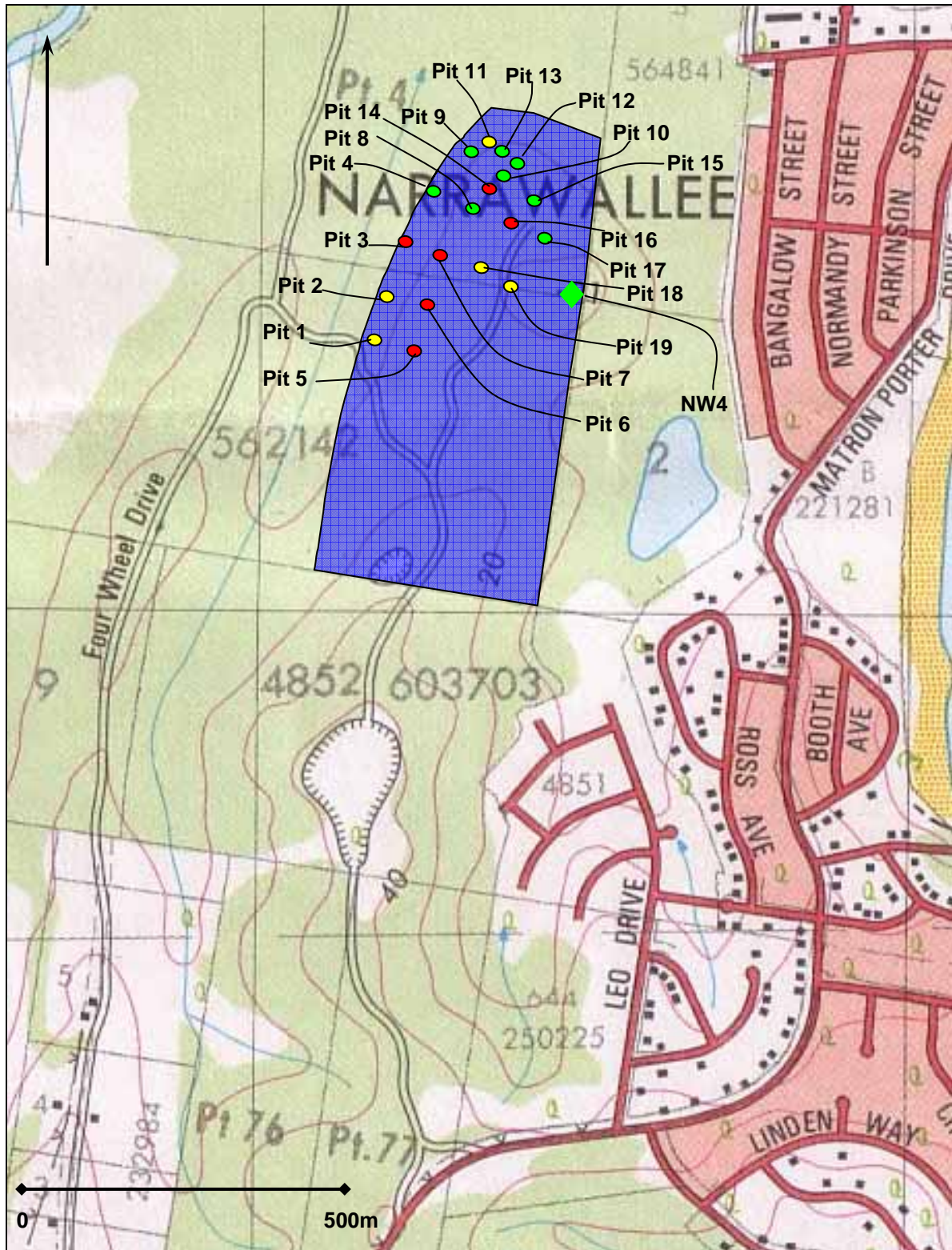
Based on the results of testing along the western boundary of the spur crest there is considered to be a high potential for this site to be larger than recorded and for the site to contain subsurface archaeological deposits. Table 7.5 below provides details of a sample of the artefacts found at this location.

**Table 7.5: Artefacts identified at NW4**

Artefact Number	Description	Dimensions (mm)
1	grey silcrete flake	19 x 18 x 11
2	dark grey silcrete flake	21 x 15 x 12
3	grey silcrete flake portion – distal	19 x 29 x 9
4	grey silcrete flake	18 x 11 x 5
5	grey silcrete lithic fragment	19 x 12 x 6
6	pink silcrete lithic fragment	26 x 20 x 16
7	grey silcrete core – 2 platforms, 12 scars	26 x 30 x 17
8	grey silcrete flake	20 x 16 x 5
9	grey/pink silcrete lithic fragment	34 x 24 x 14
10	grey silcrete lithic fragment	30 x 22 x 14



**Plate 7.1: Site NW4 facing south**



**Figure 7.2:** Location of the test pits: test pits that contained artefacts are coloured green  
test pits that contained non artefactual material are coloured yellow.  
test pits with no artefactual material are coloured red.  
the location of newly recorded site NW4 is indicated by a green diamond  
(Milton 1:25,000 topographic maps 2<sup>nd</sup> Eds, Land Information Centre)

## 8. SIGNIFICANCE ASSESSMENT

### 8.1 Assessment Criteria

The Burra Charter of Australia defines cultural significance as 'aesthetic, historic, scientific or social value for past, present and future generations' (Aust. ICOMOS 1987). The assessment of the cultural significance of a place is based on this definition but often varies in the precise criteria used according to the analytical discipline and the nature of the site, object or place.

In general, Aboriginal archaeological sites are assessed using five potential categories of significance:

- significance to contemporary Aboriginal people;
- scientific or archaeological significance;
- aesthetic value;
- representativeness; and
- value as an educational and/or recreational resource.

Many sites will be significant according to several categories and the exact criteria used will vary according to the nature and purpose of the evaluation. Cultural significance is a relative value based on variable references within social and scientific practice. The cultural significance of a place is therefore not a fixed assessment and may vary with changes in knowledge and social perceptions.

Aboriginal significance can be defined as the cultural values of a place held by and manifest within the local and wider contemporary Aboriginal community. Places of significance may be landscape features as well as archaeologically definable traces of past human activity. The significance of a place can be the result of several factors including: continuity of tradition, occupation or action; historical association; custodianship or concern for the protection and maintenance of places; and the value of sites as tangible and meaningful links with the lifestyle and values of community ancestors. Aboriginal cultural significance may or may not parallel the archaeological significance of a site.

Scientific significance can be defined as the present and future research potential of the artefactual material occurring within a place or site. This is also known as archaeological significance.

There are two major criteria used in assessing scientific significance:

1. The potential of a place to provide information which is of value in scientific analysis and the resolution of potential research questions. Sites may fall into this category because they: contain undisturbed artefactual material, occur within a context which enables the testing of certain propositions, are very old or contain significant time depth, contain large artefactual assemblages or material diversity, have unusual characteristics, are of good preservation, or are a constituent of a large significant structure such as a site complex.
2. The representativeness of a place. Representativeness is a measure of the degree to which a place is characteristic of other places of its type, content, context or location. Under this criteria a place may be significant because it is very rare or because it provides a characteristic example or reference.

The value of an Aboriginal place as an educational resource is dependent on: the potential for interpretation to a general visitor audience, compatible Aboriginal values, a resistant site fabric, and feasible site access and management resources.

The principal aim of cultural resource management is the conservation of a representative sample of site types and variation from differing social and environmental contexts. Sites with inherently unique features, or which are poorly represented elsewhere in similar environment types, are considered to have relatively high cultural significance.



The cultural significance of a place can be usefully classified according to a comparative scale that combines a relative value with a geographic context. In this way a site can be of low, moderate or high significance within a local, regional or national context. This system provides a means of comparison, between and across places. However it does not necessarily imply that a place with a limited sphere of significance is of lesser value than one of greater reference.

## **8.2 The Narrawallee Study Area**

### **8.2.1 Scientific Values**

The scientific or archaeological significance of the archaeological deposit within the NWPAD1 (the Narrawallee subsurface testing area) can be assessed according to the following criteria:

#### *Extent of deposit disturbance*

Apart from immediate surface disturbance and local bioturbation factors, the deposit does not appear to be particularly disturbed.

#### *Stratigraphic integrity*

There appears to be no temporal differentiation within the deposit. Most, if not all of the observed vertical distribution of lithic items, is likely to be the result of bioturbation factors.

#### *Presence of cultural features*

No evidence of cultural features, such as hearths, pits, lenses of shell or other cultural organic material, or micro-stratigraphy was detected.

#### *Potential for dating*

No potentially datable material, relative to the cultural occupation of the area, was encountered in the excavations.

#### *Rarity of site type*

The site type revealed by test excavation within the PADNW1 (now referred to as site NW5) is an open-air, variously low to moderate density subsurface cultural deposit of lithic artefacts. The human activities carried out at this site, identifiable by direct evidence, are stone knapping, manufacture of microliths, and the limited discard of implements.

Open sites of this type, and displaying evidence of microlith manufacturing are the most common site type within southeastern Australia.

#### *Density of artefacts*

The overall density of lithic items is low to moderate, ranging from 0 to 90 artefacts per square metre. The average artefact density for the total area is 32 per square metre for pits containing artefacts

#### *Conclusion*

Based on the above outline, the subsurface archaeological deposits investigated within the proposed Narrawallee development area are assessed as having low archaeological significance within a local context only.

### **8.2.2 Aboriginal Cultural Values**

Based on discussions between the consultants and representatives of the local Aboriginal community, it is understood that the potential for Aboriginal cultural values in the Narrawallee study area rest principally with the archaeological resource, rather than oral traditions or other forms of cultural evidence.



A written statement regarding the potential Aboriginal cultural values of the archaeological deposits detected in the current testing program has been requested from the Ulladulla Local Aboriginal Land Council.

The DEC [NPWS] will require a statement from the Land Council regarding their views on any proposed destruction of the deposit, prior to any consideration of an application for a Section 90 Consent to Destroy.

## 9. STATUTORY REQUIREMENTS

### 9.1 The National Parks and Wildlife Act 1974

The following summary is based on:

- the provisions of the current National Parks and Wildlife Act 1974 (as amended). It should be noted that amendments to this Act were passed by both houses of the NSW State Government in 2001 (no.130, assented 19/12/2001). Some of these amendments are yet to be proclaimed.
- Department of Environment and Conservation policy as presented in the 1997 Standards and Guidelines Kit for Aboriginal Cultural Heritage provided by the NSW NPWS, and as communicated orally to the consultants on a periodic basis. The 1997 Standards and Guidelines Kit is currently under review and subject to change in the near future.

The guideline documents presented in the 1997 Standards and Guidelines Kit were stated to be working drafts and subject to an 18 months performance review. The Standards Manual was defined not to be a draft and subject to periodic supplements.

The National Parks and Wildlife Act 1974 (as amended) provides the primary basis for the legal protection and management of Aboriginal sites within NSW. The implementation of the Aboriginal heritage provisions of the Act is the responsibility of the Department of Environment and Conservation (DEC).

The rationale behind the Act is the prevention of unnecessary or unwarranted destruction of relics, and the active protection and conservation of relics that are of high cultural significance.

With the exception of some artefacts in collections, or those specifically made for sale, the Act generally defines all Aboriginal artefacts to be 'Aboriginal Objects' and to be the property of the Crown. An Aboriginal object has a broad definition and is inclusive of most archaeological evidence. The Act then provides various controls for the protection, management and disturbance of Aboriginal Objects.

An Aboriginal object is defined as:

'any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal occupation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.' [Section 5(1)].

In practice, archaeologists use a methodology that groups 'Aboriginal Objects' into various site classifications according to the nature, occurrence and exposure of archaeological material evidence. The archaeological definition of a site may vary according to survey objectives, however a site is not recognised or defined as a legal entity in the Act. It should be noted that even single and isolated artefacts are protected as Aboriginal Objects under the Act.

Generally it is an offence to do any of the following without a Permit from the Director-General of the Department of Environment and Conservation under Section 87: disturb or excavate any land for the purpose of discovering an Aboriginal Object; disturbing or moving an Aboriginal Object; take possession of or removing an Aboriginal Object from certain lands; and erecting a building or structure to store Aboriginal Objects on certain land (Section 86). The maximum penalty is \$11,000 for individuals and \$22,000 for corporations. Section 175B outlines circumstances where corporation directors may be taken to have contravened these provisions, based on the acts or omissions of that Corporation.

Consents regarding the use or destruction of Aboriginal Objects are managed through a system of Permits and Consents under the provisions of Sections 87 and 90 of the Act. The processing and assessment of Permit and Consent applications is dependent upon adequate archaeological review

and assessment, together with an appropriate level of Aboriginal community liaison and involvement (refer Standards for Archaeological Practice in Aboriginal Heritage Management in 1997 NPWS Standards and Guidelines Kit).

The Minister may declare any place which, in his or her opinion, is or was of special Aboriginal significance with respect to Aboriginal culture, to be an Aboriginal place (Section 84). The Director-General has responsibility for the preservation and protection of the Aboriginal place (Section 85). An area declared to be an Aboriginal place may remain in private ownership, or be acquired by the Crown by agreement or by a compulsory process (Section 145).

The Director General may make an interim protection order and order that an action cease where that action is, or is likely to, significantly affect an Aboriginal object of Aboriginal place. Such an order is current for 40 days (Section 91AA, Schedule 3[10]). Such an order does not apply to certain actions, such as where they are in accordance with development consents or emergency procedures.

## **9.2 The National Parks and Wildlife Amendment Bill 2001**

Although this Act was passed by both houses of the NSW parliament in 2001, a number of its provisions with regard to Aboriginal cultural heritage have yet to be gazetted and are not yet law. These include the following provisions:

- The requirement for a section 90 'Consent to Destroy' from the Director General will be replaced by a 'heritage impact permit' (Schedule 3[1], 3[3-8]).
- The offence under section 90 of the Principal Act of 'knowingly' destroying, defacing or damaging Aboriginal objects and Aboriginal Places without Consent will be changed so that the element of knowledge will be removed (Schedule 3 [2]). The amended section 90, subsection 1 will read:

'A person must not destroy, deface, damage or desecrate, or cause or permit the destruction, defacement, damage or desecration of, an Aboriginal object or Aboriginal place.'
- Section 90 subsection 1 will not apply when an Aboriginal object or Aboriginal place is dealt with in accordance with a heritage impact permit issued by the Director-General (Schedule 3[3], Section 90(1B) in amended Act).
- It will be a defence to a prosecution for an offence against subsection 1 if the defendant shows that:
  - (a) 'he or she took reasonable precautions and exercised due diligence to determine whether the action constituting the alleged offence would, or would be likely to, impact on the Aboriginal object of Aboriginal place concerned, and
  - (b) the person reasonably believed that the action would not destroy, deface, damage or desecrate the Aboriginal object or Aboriginal place.' (Schedule 3[3], Section 90(1C) in amended Act)
- A court will be able to direct a person to mitigate damage to or restore an Aboriginal object or an Aboriginal place in appropriate circumstances when finding the person guilty of an offence referred to in section 90 of the Principal Act (Schedule 3[9]).
- Schedule 4[8] of the Bill provides for the Director-General to withhold in the public interest specified documents in the possession of the NPWS which relate to the location of Aboriginal objects, or the cultural values of an Aboriginal place or Aboriginal object.

### 9.3 Statutory constraints arising from artefacts which constitute background scatter

Background scatter is a term used generally by archaeologists to refer to artefacts that cannot be usefully related to a place or focus of past activity. There is no single concept for background 'scatter' or discard, and therefore no agreed definition. The recognition of background material within a particular study area is dependent on an appreciation of local contextual and taphonomic factors. Artefacts within a 'background' scatter can be found in most landscape types and may vary considerably in density.

Standard archaeological methodologies cannot effectively predict the location of individual background scatter artefacts. Surface survey may detect background material either as individual artefacts ('isolated finds'), or even as small, low-density 'sites'. Subsurface testing may sample, and through analysis, characterise background material. However, beyond the scope of archaeological sampling, the potential to encounter background artefacts within the context of development related ground disturbance will always remain.

Most previous cultural resource management archaeological methodologies have acknowledged that there is little scientific justification for the conduct of archaeological salvage or ground disturbance monitoring to effect the recovery of background artefacts. The intrinsic scientific value of any recovered artefacts does not, in general, outweigh the expense of conducting the monitoring. However, low density distributions of artefacts are a current subject of interest by some heritage practitioners and DEC policy regarding this issue may change in the future. The monitoring of construction related ground works by Aboriginal groups is now increasingly practiced. The recovery of background scatter artefacts is often a probable outcome of such monitoring exercises.

Given the nature of statutory and DEC policy requirements in NSW (refer Section 9), the detection of background artefacts during monitoring can be problematic. Unless the Aboriginal object is covered by a current Consent or Permit (or Heritage Impact Permit (HIP)), from DEC, all further impact to the find, and the ground in its immediate vicinity, must cease until one is gained. It may take up to eight weeks for this to occur. In the past, however, DEC has not as a general rule granted Consents to cover artefacts within background scatters. This is because DEC only provide Consents where the significance and location of the Aboriginal Objects to be impacted can be reliably defined. By their very nature, this cannot be done for artefacts that constitute a background scatter.

The present policies of DEC do not provide an effective or proactive means of dealing with the statutory constraints posed by the detection of background scatter artefacts during development works. It should therefore be noted, that in the event that an Aboriginal artefact ('Aboriginal object') is detected during monitoring of ground disturbance within a development study area, and that area is not covered by a Consent to Destroy (or Heritage Impact Permit), there may be considerable delays to development works while an application for a Consent to Destroy is processed.

### 9.4. Implications for the Proposed Narrawallee Residential Development

The presence of *Aboriginal Objects* (as defined under the NPW Act) within the Narrawallee Residential Development area (identified as sites NW1, NW2, NW3, NW4 and NW5) has the following implications:

- No activities can occur in the proposed development area that may disturb either known surface artefacts or subsurface archaeological deposits, without the receipt of an appropriate permit (a Section 90 Consent to Destroy) from the DEC.

## 10. CONCLUSIONS AND RECOMMENDATIONS

The presence of subsurface Aboriginal archaeological cultural material within the proposed Narrawallee residential development area has been identified and confirmed. The subsurface investigation of the previously identified potential archaeological deposit (PADNW1) has shown that the cultural material is mainly found on the northern terminal end and crest of the spurline. The site, identified as *Narrawallee 5 (NW5)*, contains variable densities of artefacts, with the highest artefact concentrations situated on the gentle slopes of the spur, elevated well above drainage lines.

The site contains evidence of artefact manufacture, most notably flaking for microblades and possibly the manufacture of Bondi points. The presence of only a single Bondi preform portion was identified in the assemblage, although six microblade backing flakes were recorded. The implication is that people were manufacturing microblades and possibly backing artefacts but they carried them away from the site for use elsewhere. The artefacts were mostly manufactured from local silcrete material, either obtained from local sources such as Bannisters Point, or possibly pieces within the study area.

The general lack of other retouched and utilised pieces would suggest the site was not used as a major base camp but represents more transient occupation and artefact manufacture. A limited number of activities are indicated by the artefact types including generalised stone knapping, microlith production, and a low incidence of tool use and discard.

It is highly likely that most of the northern section of the spurline contains additional cultural material of similar densities and composition.

The nature of the archaeological material detected, and the consequent low local archaeological significance assessment, means that site NW5 is unlikely to pose a long-term constraint to the proposed residential development at Narrawallee. This conclusion is dependent upon the representatives of the Ulladulla Aboriginal community also returning an assessment of Aboriginal cultural values which do not preclude the issuing of a Section 90 Consent to Destroy by the DEC [NPWS].

Given the low to moderate density of artefactual material, and the limited range of activities represented, further salvage of artefacts using controlled archaeological methodologies is not considered to be warranted or cost-effective, based on scientific objectives. It is considered unlikely that a further program of archaeological investigation would significantly increase our understanding of the activities and distribution of artefacts across the study area.

### **It is recommended that:**

1. No further archaeological assessment is required for the Narrawallee study area.
2. If the Aboriginal sites NW4 or NW5, identified in the course of this investigation, are likely to be impacted by the proposed residential development at Narrawallee, then application should be made to the Director General of the NSW DEC [NPWS] for *Consent to Destroy* (Section 90) the sites.
3. Three copies of this report should be forwarded to the NSW DEC at the following address:

Cultural Heritage Officer  
NSW DEC  
Southern Aboriginal Heritage Unit  
PO Box 2115  
QUEANBEYAN NSW 2620

4. One copy of this report should be forwarded to the Ulladulla Local Aboriginal Land Council.

The Secretary  
Ulladulla Local Aboriginal Land Council  
PO Box 520  
Ulladulla NSW 2539

## 11. REFERENCES

- Australia ICOMOS 1987 *The Australia Icomos Charter for the Conservation of Places of Cultural Significance (The Burra Charter), Guidelines to the Burra Charter: Cultural Significance and Conservation Policy*. Pamphlet, Australia Icomos (Inc).
- Bayley, W. A. 1975 *Shoalhaven* South Coast Printers, Port Kembla, NSW.
- Cabbage, R. H. 1916 *Captain Cook's Pigeon House, and the Early South Coast Exploration*. Samuel E. Lees Printers and Stationers, Sydney, 24pgs.
- Cane, S. 1985 An Archaeological Survey of Pipeline Routes and Reservoir Sites Between Lake Conjola and Lake Tabourie, NSW. Report to Shoalhaven City Council.
- Clarke, D. L. 1978 *Analytical archaeology*. Second edition. Methuen, London.
- Eades, D. K. 1976 *The Dharawal and Dhurga Languages of the New South Wales Coast*. Australian Aboriginal Studies, Research and Regional Studies no. 8, Australian Institute of Aboriginal Studies, Canberra.
- Egloff, B. J. 1981 *Wreck Bay an Aboriginal Fishing Community*. Australian Institute of Aboriginal Studies, Canberra.
- Etheridge, R. 1904 A Remarkable Rock-Shelter in the Milton District, New South Wales. *Records of the Australian Museum* 5:80-85.
- Etheridge, R. 1918 *Memoirs of the Geological Survey of NSW*. Ethnological Soc. No 3, p88.
- Hayden, B. 1980 Confusion in the bipolar world: bashed pebbles and splintered pieces, *Newsletter of Lithic Technology*, 9(1):2-7.
- Hilder, W. 1982 Historical Background. In Watson, C. (Ed.) *Pigeon House and Beyond: A Guide to the Budawang Range and Environs*. The Budawang Committee, Eastwood, NSW. Ch.1 pp21-42.
- Kamminga, J. 1985 The pirri graver. *Australian Aboriginal Studies* 11:2-25.
- Howitt, A. W. 1883 On Some Australian Beliefs. *Journal Anthropological Institute* 13:185-198.
- Howitt, A. W. 1904 *The Native Tribes of South-East Australia*. Macmillan & Co. London.
- Knight, T. 1996 The Batemans Bay Forests Archaeological Project - Site Distribution Analysis. Research Report. Unpublished report, Department of Archaeology and Anthropology, The Faculties, ANU, Canberra.
- Kuskie, P. 1995 A Predictive Archaeological Study of options for the Proposed Southern Shoalhaven Landfill Facility, South Coast New South Wales. Report to Shoalhaven City Council.
- Lampert, R. 1971 Burrill Lake and Currarong. Coastal Sites in Southern NSW. *Archaeology and Physical Anthropology in Oceania* 9: 226-235.
- Mackenzie, A. 1874 Specimens of Native Australian Languages. *Journal Royal Anthropological Institute of Great Britain and Ireland* 3:247-261.
- Mathews, R. H. 1904 Ethnological Notes on the Aboriginal Tribes of New South Wales and Victoria. Part I. *Journal of the Royal Society of New South Wales*. 38:203-381.
- Mulvaney, D. J. 1975 *The Prehistory of Australia*. Pelican Books.



- Navin, K. 1996 Proposed Milton/Ulladulla STP Racecourse Creek Aboriginal Archaeological Assessment. Report to CMPS&F.
- Navin, K. & K. Officer 1997 Milton Ulladulla Bypass Route Options Study Cultural Heritage. Report to Ove Arup & Partners.
- Navin Officer Heritage Consultants 2000 Milton-Ulladulla Sewerage Scheme Augmentation EIS Cultural Heritage Assessment. Report to Brown & Root Services Asia Pacific Pty Ltd.
- Navin Officer Heritage Consultants 2002 Proposed Subdivision Lots 1 and 4, Narrawallee, NSW. Archaeological Survey for Aboriginal Site. Report to Rygate & West Pty Ltd.
- Officer, K. & K. Navin 1998 Archaeological Survey of Proposed STP Site and Associated Pipeline Routes Milton/Ulladulla Sewerage Scheme Augmentation. A Report to NSW Department of Public Works & Services.
- Ridley, W. 1877 Australian Languages and Traditions. *Journal Royal Anthropological Institute of Great Britain and Ireland* 7:232-274.
- Sokal, R. R. & P. H. A. Sneath 1963. *Principles of numerical taxonomy*. W. H. Freeman, London.
- Tindale, N. B. 1974 *Aboriginal Tribes of Australia* Australian National University Press, Canberra.
- Townsend, J. P. 1848 *Rambles and Observations in NSW*. Chapman & Hall, London.

## **APPENDIX 1**

### **RECORD OF ABORIGINAL PARTICIPATION**

### Record of Aboriginal Representative Participation\*

Name(s) of Aboriginal Representative: BARRY CARRIAGE

Name of Aboriginal Organisation: ULLADULLA LOCAL  
ABORIGINAL LAND COUNCIL

Archaeologist(s): name & address REBECCA PARKES

Navin Officer Heritage Consultants Pty Ltd

4/71 Leichhardt Street, Kingston, ACT 2604

Project Name: NARRAWALLEE SUBSURFACE TESTING

Client: name & address GRAHAM BEASLEY

(please send your invoice RYKATE & WEST  
to this address) P.O. Box 107 ULLADULLA 2539

- Type of participation:
- ☐ Guided inspection of study area and sites
  - ☐ Accompanied/participated in archaeological survey
  - ☐ Separate inspection or survey
  - ☒ Accompanied/participated in excavation program

Period of participation:

Date(s)	Start	Finish
<u>15/6/04</u>	<u>10AM</u>	<u>5PM</u>
<u>16/6/04</u>	<u>8AM</u>	<u>5PM</u>
<u>17/6/04</u>	<u>8AM</u>	<u>5PM</u>
<u>18/6/04</u>	<u>8AM</u>	<u>5PM</u>
<u>19/6/04</u>	<u>8AM</u>	<u>9-30AM</u>

Issues raised:

Signed (archaeologist): R Parkes

Signed (Aboriginal representative(s)): B. Carrage

\* please note this form is not an invoice. For payment, please send an invoice from your organisation to the client name and address provided above.

## **APPENDIX 2**

### **SUMMARY OF PIT DATA AND SOIL PROFILE DESCRIPTIONS**

Pit Number	Spit Number	Depth (cm)	Description	pH	Artefacts (Total)	Artefacts (Minus lithic fragments)
1	1	0-8/13	Grey loamy sand lightly mottled with light grey; numerous roots and rootlets		0	0
	2	8/13-27/33	Grey sand, intermittent mottling of light grey sand; roots decreasing		0	0
	3	27/33-33/40	Very fine medium grey sand, broad mottling of light grey, intermittent and isolated charcoal flecks; increasing compaction		0	0
	4	33/40-42/53	c.38 cm transition to light grey sand, becoming lighter with depth, patches of brown staining at base	4.5	0	0
	5	42/53-55/65	Continuation of same, with a sharp transition to medium brown clayey sand with mottling of very compact orange clayey sand at base of spit		0	0
	6	55/65-57/70	Orange clayey sand – very compact, mottled with medium brown clayey sand; angular and subangular quartz and ironstone gravels (<50 mm) at base of spit		0	0
	7	57/70-64/80	Continuation of same with a mottling of yellow sandy clay coming through at the base; increase in gravels		0	0
	8	64/80-74/88	Yellow sandy clay mottled with orange clayey sand; increase in gravel content and size (<250 mm - subrounded)	5.0	0	0
2	1	0-11/12	0-2 cm light grey sand, leaf litter 2 cm onwards – dark grey loamy sand		0	0
	2	11/12-17/19	Continuation of dark grey loamy sand		1	0
	3	17/19-24/35	Dark grey sand (grain size c. 0.5mm-1mm); intermittent roots <10 cm		0	0
	4	24/35-30/43	As above, grading to lighter grey sand with isolated quartz gravels (<3 mm)		0	0
	5	30/43-38/51	Light grey sand, poorly sorted, mottled with dark grey sand		0	0
	6	38/51-45/55	As above with pockets of dark grey-brown staining and gravels (<5 mm)		0	0

Pit Number	Spit Number	Depth (cm)	Description	pH	Artefacts (Total)	Artefacts (Minus lithic fragments)
	7	45/55-50/64	Staining expanding from east wall across two thirds of the pit; appears to be a very humic dark grey-brown sandy peat; isolated pockets of very compact orange mottling	5.0	0	0
	8	50/64-54/68	As above, dark grey-brown expanded a further 15 cm across to the west, increasing compaction		0	0
	9	54/68-56/74	As above, increase in orange sand mottling; also a mottling of yellow-grey clayey sand appearing at base		0	0
	10	56/74-60/78	As above; increase in yellow-grey clayey sand and increasing compaction		0	0
	11	60/78-86/99	Yellow-grey sandy clay with orange concretions		0	0
<b>3</b>	1	0-10/13	Very fine grey sand, grass and leaf litter; insect hole (c.50 mm) in centre of pit; roots <10 mm		0	0
	2	10/13-22/27	Grading to darker grey sand, more insect holes		0	0
	3	22/27-36/43	Grading to grey-brown sand mottled with light grey to cream; no insect holes		0	0
	4	36/43-44/54	Continuation of same with rounded ironstone, and sandstone gravels (<30 mm); charcoal flecks		0	0
	5	44/54-55/62	Grey yellow-brown sand; quartz and ironstone/sandstone gravels, rounded and subangular (<20 mm)		0	0
	6	55/62-66/76	As above, gravels decreasing. Orange sandy concretions (<50 mm) coming through at base		0	0
	7	66/76-72/82	Grey yellow-brown sand mottle with more compact orange sand; gravels continuing; occasional charcoal flecks		0	0
	8	72/82-76/85	As above, grading to yellow brown colour; more ironstone gravels coming through		0	0

Pit Number	Spit Number	Depth (cm)	Description	pH	Artefacts (Total)	Artefacts (Minus lithic fragments)
	9	76/85-79/88	Continuation of same; increasing compaction; increasing iron/sandstone gravels (<80 mm) = beginning of decomposing bedrock?		0	0
4	1	0-10/15	Leaf litter, light grey sand; insect holes (<50 mm)		0	0
	2	10/15-22/26	As above, tree roots (c. 50 mm) across centre, charcoal flecks		0	0
	3	22/26-31/39	Grey sand mottled with light grey sand, intermittent grey brown staining and charcoal flecks		0	0
	4	31/39-42/53	Light grey sand with yellow brown mottling, charcoal flecks		0	0
	5	42/53-60/65	As above, yellow brown becoming more prevalent; orange brown concretions (<10 mm) appearing at base		1	1
	6	60/65-69/71	Yellow brown sand, ironstone and quartz gravels (poorly sorted - <50 mm) coming through at base		0	0
	7	69/71-73/75	As above, becoming more yellow in colour; increasing compaction, gravel increasing – and increasing in size		0	0
5	1	0-10/27	Grass and leaf litter, medium to light grey sand		0	0
	2	10/27-29/38	c.20 cm – indistinct boundary with yellow grey sand with cream mottling		0	0
	3	29/38-40/50	Grading to slightly darker yellow grey mottled with light yellow grey; patches of orange sand (<15 mm) appearing at base at north end; intermittent charcoal flecks		0	0
	4	40/50-53/68	Medium grain yellow brown sand and numerous orange sand concretions (<20 mm)		0	0
	5	53/68-63/75	Yellow brown clayey sand, tree roots, ironstone/sandstone pieces (subangular <80 mm)		0	0

Pit Number	Spit Number	Depth (cm)	Description	pH	Artefacts (Total)	Artefacts (Minus lithic fragments)
	6	63/75-75/85	Grading to yellow sandy clay with orange concretions, isolated quartz gravels (rounded, c.30 mm), pocket of grey sand (c.20 cm across) in northwest corner		0	0
	7	75/85-83/92	As above, pocket of grey sand disappearing at base, clay content increasing		0	0
<b>6</b>	1	0-10/15	Grass and leaf litter, grey sand with intermittent mottling of very fine and powdery light grey sand		0	0
	2	10/15-27/34	Grades to yellow grey sand; tree roots (<20 mm), rounded quartz gravels (c. 5 mm)		0	0
	3	27/34-35/48	Grading to yellow/yellow-brown sand with lighter yellow grey mottling; tree roots are more numerous (<40 mm)		0	0
	4	35/48-50/60	As above, less mottling, orange concretions coming through around 60 cm depth		0	0
	5	50/60-60/68	Yellow brown sand (very slight clay content), charcoal flecks, intermittent orange concretions, rounded quartz gravels (<40 mm)		0	0
	6	60/68-71/76	As above, gravels increasing and size increasing; also slight increase in clay content		0	0
	7	71/76-80/90	Grades to more compact yellow brown clayey sand with orange concretions, gravels decreasing, some ironstone coming through		0	0
	8	80/90-85/95	As above, gives onto decomposing sandstone bedrock at base		0	0
<b>7</b>	1	0-7/14	Dark grey humic loamy sand with quartz gravels (<5 mm)	5.0	0	0
	2	7/14-25/37	As above to c. 30 cm where there is a sharp transition to yellow brown sand with intermittent roots (<15 mm)		0	0



Pit Number	Spit Number	Depth (cm)	Description	pH	Artefacts (Total)	Artefacts (Minus lithic fragments)
	3	25/37-45/56	Continuation of yellow brown sand with rounded quartz and iron/sandstone gravels – poorly sorted (<80 mm)		0	0
	4	45/56-60/67	As above, gravels decreasing and size decreasing; charcoal flecks, orange concretions (<10 mm) coming through at base		0	0
	5	60/67-69/75	Continuation of same, orange concretion increasing; occasional charcoal flecks		0	0
<b>8</b>	1	0-13/19	Leaf litter and grass, grey brown sand mottled with creamy grey; insect holes		1	0
	2	13/19-21/30	As above with roots c. 10 mm		1	1
	3	21/30-38/42	Grey brown sand mottled with yellow brown; charcoal flecks		0	0
	4	38/42-48/50	Grading to a coarse, more yellow brown sand with small amount of grey brown mottling; tree root across centre (c. 50 mm); sandstone pieces and gravels coming through at base on south side		0	0
	5	48/50-56/57	Yellow brown sand with orange concretions (c.15 mm) and charcoal flecks and sandstone gravels (<50 mm)		0	0
	6	56/57-59/67	As above with quartz gravels		0	0
	7	59/67-61/70	Yellow brown gravelly sand with orange concretions; charcoal flecks; numerous sandstone pieces (<80 mm) = beginning of decomposing bedrock layer)		0	0
<b>9</b>	1	0-15/20	Grey brown sand grading to light grey; insect holes (c.50 mm across)	4.5	1	1
	2	15/20-30/38	Grades to yellow-grey sand with rounded and subangular poorly sorted sandstone gravels (<60 mm)		6	4
	3	30/38-38/51	Yellow brown gravelly sand (quartz gravels also coming through) with tree roots (<40 mm)		0	0

Pit Number	Spit Number	Depth (cm)	Description	pH	Artefacts (Total)	Artefacts (Minus lithic fragments)
	4	38/51-50/67	As above, increase in quartz gravels (poorly sorted - <80 mm); also some orange brown nodules (<15 mm) = decomposing iron/sandstone?	5.5	2	0
	5	50/67-60/72	As above, gravels decreasing in size, sand grains becoming coarser		2	1
	6	60/72-66/76	Grading to a more orange-yellow brown, charcoal flecks; Decomposing sandstone pieced coming through at base (NB can trowel through the decomposing sandstone)		0	0
	7	66/76-73/78	Grading to yellow brown gravelly sandy clay with decomposing sandstone; also occasional tree roots (<25 mm)	5.5	0	0
<b>10</b>	1	0-10/18	Grass, leaf litter and grey brown gravelly sand; gravels are rounded sandstone pieces (<80 mm)		9	7
	2	10/18-20/28	Yellow-grey brown gravelly sand with sandstone pieces up to 250 mm across; tree roots (<25 mm)		0	0
	3	20/28-37/39	As above		2	1
	4	37/39-45/60	As above, increasing gravel/rock content; mottling of light yellow sand at north end coming through at base		0	0
	5	45/60-60/70	Continuation of same, rock increasing in size (<500 mm), at least 50% sandstone = decomposing bedrock.		0	0
<b>11</b>	1	0-18/24	Yellow grey sand with occasional charcoal flecks; insect holes and roots (<30 mm)		0	0
	2	18/24-29/32	Continuation of same, lighter grey sand coming through at base in southwest; intermittent pieces of sandstone (<60 mm)		1	0
	3	29/32-39/49	Slightly darker yellow-grey brown sand in eastern two thirds, light grey (leached) sand in western third – irregular boundary between the two; poorly sorted quartz and sandstone gravels throughout; tree roots (<60 mm)		1	0

Pit Number	Spit Number	Depth (cm)	Description	pH	Artefacts (Total)	Artefacts (Minus lithic fragments)
	4	39/49-50/62	Yellow grey gravelly sand mottled with grey brown; yellow brown pocket in southwest (c.30 cm across); slight decrease in gravel content and size – gravels are mainly sandstone (very fragile); tree roots continuing		0	0
	5	50/62-62/72	Yellow brown gravelly sand becoming coarser, mottled with light yellow brown; orange nodules and charcoal throughout; tree roots continuing		0	0
	6	62/72-70/79	Yellow brown gravelly clayey sand, gives onto predominantly sandstone layer at base of pit; tree roots continuing		0	0
<b>12</b>	1	0-14/17	0-5 cm – grey sand and leaf litter; 5 cm onwards - creamy yellow brown gravelly (quartz <5 mm) sand; numerous sandstone pieces (<500 mm); tree roots (c.20 mm across)		29	21
	2	14/17-25/35	Continuation of creamy yellow brown gravelly sand, rock (sandstone) increasing – causing mixing of spits as pieces lift up from spit below		19	16
	3	25/35-39/59	As above, becoming more yellow in colour		12	6
	4	39/59-55/74	Continuation of same, rock pieces becoming slightly smaller (mostly c. 100-150 mm); tree roots also thinning out		1	1
	5	55/74-78/82	Sand becoming slightly darker and coarser; lots of well rounded sandstone gravels – poorly sorted		4	2
	6	78/82-84/94	As above		1	1
	7	84/94-96/103	As above; sandstone pieces increasing again		0	0
<b>13</b>	1	0-10/26	0-2/5 cm – grey sand, leaf litter, rootlets, grass 2/5 cm onwards – yellow grey sand, intermittent sandstone pieced (<80 mm)		1	1

Pit Number	Spit Number	Depth (cm)	Description	pH	Artefacts (Total)	Artefacts (Minus lithic fragments)
	2	10/26-28/38	Continuation of same with patches of brown staining, more rock coming through (<150 mm)		0	0
	3	28/38-49/57	Grading to yellow brown gravelly sand mottled with grey brown sand; gravels consist of rounded, poorly sorted quartz and sandstone; larger sandstone pieces also continuing		0	0
	4	49/57-58/62	As above with intermittent charcoal pieces (<10 mm) and isolated quartz pebbles (<100 mm)		0	0
	5	58/62-66/70	Grading to a more yellow/yellow brown sand mottled with grey brown sand; becoming coarser, mottling decreasing		0	0
	6	66/70-77/82	Yellow brown sand, gravels decreasing; sandstone continuing in larger pieces		0	0
	7	77/82-80/90	Yellow brown sand with charcoal flecks; increasing compaction		0	0
	8	80/90-84/94	Yellow brown sand with noticeable increase in sandstone at base = decomposing bedrock?		0	0
<b>14</b>	1	0-8/14	Grass, leaf litter and roots; very fine grey sand, tree root (c.60 mm) across centre		0	0
	2	8/14-19/30	Grey sand, insect holes (10 mm across); tree roots continuing.		0	0
	3	19/30-33/39	As above; c.35 cm – irregular boundary with light grey to cream sand, small amount of sandstone and quartz gravels (<5 mm); sandstone pieces (c.100 mm) coming out at base		0	0
	4	33/39-40/49	Grading to yellow grey gravelly sand with sandstone pieces continuing and tree roots continuing		0	0
	5	40/49-52/64	Grading to a more yellow colour with a sparse mottling of light grey sand; compaction is noticeably lower at southern end, sparse charcoal flecks throughout; tree roots decreasing		0	0

Pit Number	Spit Number	Depth (cm)	Description	pH	Artefacts (Total)	Artefacts (Minus lithic fragments)
	6	52/64-59/69	Continuation of same with an increase in sandstone pieces and quartz gravels		0	0
	7	59/69-61/70	Grading to yellow brown clayey sand at base of spit; isolated charcoal flecks; sandstone continues to increase		0	0
<b>15</b>	1	0-6/18	Grey brown sand (leaf litter and grass); tree roots (c.30 mm); sandstone pieces (<20 mm); isolated pockets of yellow grey sand coming through at base (c. 100 mm across)		10	10
	2	6/18-21/28	Grading to yellow grey-brown sand, increase in sandstone, particularly at western end		23	20
	3	21/28-31/37	Yellow brown gravelly sand; sandstone increasing across whole pit (pieces c. 100 mm); tree stump at western end		3	3
	4	31/37-38/46	As above, becoming more yellow-yellow brown in colour; tree stump continuing		1	1
	5	38/46-52/60	As above, sandstone becoming quite dense across the base of the spit; tree stump (c.400-500 mm across) continuing in western end (removed by excavator before digging spit 6)		0	0
	6	52/60-60/63	Sharp transition at base of spit to orange brown gravelly sandy clay; at least 50% is sandstone, tree roots continue through this spit and beyond		0	0
<b>16</b>	1	0-6/14	Grass and leaf litter; grey brown sand with a couple of pieces of sandstone (c. 150 mm); pocket (100-150 mm across) of leached cream sand at north end		0	0
	2	6/14-17/21	As above, pocket in north expanding to around 500 mm by 200 mm; sandstone pieces up to 250 mm across; tree roots (<50 mm)		0	0
	3	17/21-19/26	As above; pocket not expanding further; sandstone increasing and intruding into spits below (<300 mm)		0	0

Pit Number	Spit Number	Depth (cm)	Description	pH	Artefacts (Total)	Artefacts (Minus lithic fragments)
	4	19/26-24/32	Continuation of very fine grey sand, pocket disappearing at northern end, sandstone continuing to increase; charcoal flecks; NB rock is causing mixing of spits during digging		0	0
	5	24/32-27/33	Grey gravelly sand, sparse mottling of light grey sand; charcoal flecks; numerous sandstone pieces – higher percentage of rock than sand		0	0
17	1	0-7/15	0-3 cm – leaf litter, humic material and fine grey sand 3 cm – fine/powdery light grey to cream sand mottled with light yellow grey sand and charcoal flecks		0	0
	2	7/15-22/30	Yellow grey sand mottled with light grey and grey brown sand; charcoal flecks; Large tree root (c. 100 mm across) at western end		6	5
	3	22/30-32/45	As above, charcoal decreasing		31	23
	4	32/45-40/54	Yellow grey sand with orange sand concretions (<10 mm across); occasional charcoal flecks		6	5
	5	40/54-55/62	As above, yellow brown clayey sand just coming through at base – is a very sharp transition; sandstone, silcrete and quartz gravels (<20 mm) also appearing		0	0
	6	55/62-56/64	Yellow brown sandy clay/clayey sand; poorly sorted angular and subangular silcrete gravels (<50 mm); charcoal flecks		0	0
18	1	0-13/18	Grass and leaf litter; grey sand mottled with yellow grey; tree roots (<50 mm)	5.0	0	0
	2	13/18-30-33	Yellow grey sand mottled with grey; small amount of quartz gravels (<5 mm); tree roots continuing		0	0
	3	30/33-42/52	c. 44 cm – transition to yellow brown sand with angular silcrete and quartz gravels, tree roots continuing		0	0
	4	42/52-58/62	As above; increase in gravels, and increase in size (<70 mm)	5.5	0	0

Pit Number	Spit Number	Depth (cm)	Description	pH	Artefacts (Total)	Artefacts (Minus lithic fragments)
	5	58/62-68/72	As above; gravels also include sandstone (<80 mm), angular and subrounded		0	0
	6	68/72-78/80	Grading to yellow brown clayey sand; charcoal flecks; gravels decreasing		0	0
	7	78/80-82/84	Yellow brown sandy gravelly clay with red nodule concretions (,10 mm)	5.5	0	0
<b>19</b>	1	0-8/20	Leaf litter, grey sand grading to grey brown sand mottled with light grey sand; insect holes (c.30mm across); tree roots (c.40mm)		3	0
	2	8/20-24/34	As above with sandstone pieces (<100 mm), silcrete gravels and an increase in insect holes		1	0
	3	24/34-25/42	Grading to yellow grey/brown sand mottled with brown and grey; sandstone pieces along eastern face at base of spit (<500 mm); angular and subangular silcrete gravels (<25 mm); decrease in tree roots		0	0
	4	25/42-48/54	Yellow brown to yellow grey sand; sandstone cobbles and silcrete gravels continuing; also silcrete and quartz gravels and silcrete cobbles (<150 mm)		0	0
	5	48/54-58/61	As above with charcoal flecks		0	0
	6	58/61-61/67	Yellow brown sand with continuation of same gravels, charcoal flecks and pieces (<10 mm) continuing		0	0
	7	61/67-75/77	Light yellow brown sand mottled with dark yellow brown clayey sand; gravels, cobbles and charcoal continuing		0	0



## **APPENDIX 3**

### **GLOSSARY**

<b>alluvial -</b>	pertaining to alluvium and fluvial processes.
<b>alluvium -</b>	unconsolidated deposit of gravel, sand, mud etc., formed by water flowing in identifiable channels. Commonly well-sorted and stratified.
<b>archaeological site -</b>	A site is defined as any material evidence of past Aboriginal activity which remains within a context or place which can be reliably related to that activity. Usually a site classification requires a minimum of two detected artefacts.
<b>artefact -</b>	an object, normally portable, made or modified by human hand (see 'stone artefact').
<b>assemblage -</b>	see lithic assemblage.
<b>background discard -</b>	<p>There is no single concept for background discard or 'scatter', and therefore no agreed definition. The definitions in current use are based on the postulated nature of prehistoric activity, and often they are phrased in general terms and do not include quantitative criteria. Commonly agreed is that background discard occurs in the absence of 'focused' activity involving the production or discard of stone artefacts in a particular location. An example of unfocussed activity is occasional isolated discard of artefacts during travel along a route or pathway. Examples of 'focussed activity' are camping, knapping and heat-treating stone, cooking in a hearth, and processing food with stone tools.</p> <p>In practical terms, over a period of thousands of years an accumulation of 'unfocussed' discard may result in an archaeological concentration that may be identified as a 'site'. Definitions of background discard comprising only qualitative criteria do not specify the numbers (numerical flux) or 'density' of artefacts required to discriminate site areas from background discard.</p>
<b>background lithic material -</b>	natural stone (in the form of pebbles and/or fragments) of types used by Aborigines to make artefacts (such as quartz, tuff, silcrete, chalcedony and quartzite) and occurring in or near a prehistoric archaeological site.
<b>background scatter -</b>	can be generally defined as manuport and artefactual material which is <i>insufficient either in number or in association</i> with other material to suggest focused activity in a particular location. However, a specific definition of 'background scatter' is inappropriate because it may imply more than simply a pattern of dispersed isolated finds.
<b>backing (retouch) -</b>	abruptly angled flaking (retouch) which has shaped a thick back part to an implement such as an elouera or microlith. The process of flaking varies from bipolar impact (on some eloueras) to delicate application of pressure with a small stone ('chimbling' used to make microliths).
<b>bending initiation -</b>	the commencement of a fracture by the application of a bending load or force, as in breaking a bar of chocolate, where the load is applied away from the point at which the object breaks. Bending initiation is common in the fracture of a tool's cutting edge during its use, and is commonly caused by human treadage at a site. It normally occurs on thin edges (see also 'snap fractures or flakes').

<b>bioturbation</b> -	the process of mixing soil materials or sediments by living organisms.
<b>bipolar core</b> -	A core (nucleus) that is supported on a stone anvil surface and struck repeatedly with a hammerstone from above. Diagnostic attributes of bipolar fracture damage are point or sinuous ridge type initiation platforms, crushing, cracks, and concentrated overlapping step fractures emanating from areas of hammer impact.
<b>bipolar flake</b> -	(and broken bipolar flake) -a flake retaining evidence of bipolar fracture damage on at least one end. Some of these are 'compression flakes' formed by substantial compressive force. A broken bipolar flake has a transversely oriented breakage.
<b>bipolar flaking</b> -	a method of making flakes or retouched flake tools by smashing a piece of stone, often a quartz pebble, rested on a stone surface and repeatedly striking the core from above with a stone hammer.
<b>broken bipolar flake</b> -	Transversely broken flake from a bipolar core.
<b>broken flake</b> -	A flake with two or more breakages but retaining its area of flake initiation.
<b>chalcedony</b> -	a compact variety of silica, formed of quartz crystallites, often fibrous in form and with sub-microscopic pores which contain water (about 1% of weight). Coloured varieties include carnelian (yellow brown), sard (brown), agate (varicoloured) and jasper (red). Chalcedony can form veins or can occur as pseudomorphs, resulting from silica-charged solution infiltrating voids or cavities in rock, sometimes by gradually replacing decaying organic matter. Chalcedony, like fine quality chert, was a valued stone tool material. Mohs hardness always registers within half a point of 7. Chalcedony appears very fine-grained to the naked eye and can be translucent, banded and include a wide variety of colours. This rock type breaks by the process of conchoidal (shell-like) fracture and provides flakes that have sharp durable edges.
<b>chert</b> -	a highly siliceous rock type formed biogenically from the compaction and precipitation of the silica skeletons of diatoms. Normally there is a high percentage of cryptocrystalline quartz. This rock type breaks by the process of conchoidal (shell-like) fracture and provides flakes that have sharp durable edges.
<b>clast</b> -	a grain or crystal with a finer grained matrix (usual in silcrete).
<b>colluvium</b> -	an unconsolidated deposit of gravel, sand, mud etc., formed by water flowing across a hillslope surface (slopewash, sheetwash, rainwash) and/or by mass movement. Commonly poorly sorted and stratified.
<b>cobble</b> -	waterworn stones of diameter greater than 64 mm (about the size of a tennis ball) and less than 256 mm (about the size of a basketball). Archaeologists often refer to cobbles as pebbles (see also 'pebble').

<b>conchoidal flake -</b>	a flake created by Hertzian initiation (a cone crack). This is the most common type of flake produced by tool making, but occasionally also occurs in nature. It is distinguished by a partial or complete cone crack and a bulb of force; other fracture surface features are éraillure scar, lances and undulations (see these other glossary entries, and Cotterell and Kamminga 1987, 1992). The inside fracture surface of a well-formed conchoidal flake is similar to that of a bivalve shell, hence the term 'conchoidal'. 'Conchoidal fracture' refers to the process of this flake formation.
<b>concretion and nodules -</b>	a mineral forming in isolated aggregates, sometimes as spherical or ellipsoidal forms. Concretions display a concentric zonation of matrix components, whereas nodules display an undifferentiated internal fabric.
<b>cone crack initiation -</b>	a Hertzian cone initiation which leads to the formation of a conchoidal flake. A Hertzian cone is similar in shape to the neck of a milk bottle with the top of this cone being the initiation of the circular fracture. On a flake surface the cone is not fully formed and is represented by one side, because the fracture-initiating force was applied from above at an angle of about forty five degrees, not ninety degrees. Other terms in current usage are 'focussed initiation' and 'split cone'.
<b>conjoin analysis -</b>	piecing together or 'conjoining' artefacts helps in reconstructing prehistoric 'events' (such as tool manufacture, tool use activities and cutting-edge rejuvenation), determining chronology and assessing site integrity.
<b>core (synonymous with nucleus) -</b>	a piece of stone, often a pebble or cobble but also quarried stone, from which flakes have been struck for the purpose of making stone tools. (see also 'tabular nucleus'). The core (or core fragment) is generally amorphous in shape. Flakes removed from a core are called 'primary flakes' and may be further shaped by finer flaking, called 'retouch'. The term 'nucleus' refers to cores and flakes or cores that have been retouched.
<b>core rotation -</b>	rotation of a core so that another surface is presented from which to initiate fractures that create flakes or blades. Usually this occurs when the previously flaked part of the core became unsuitable for further flake removals. Core rotation may be in any direction. The process may be opportunistic or planned, and is aimed at maximising the number of suitable flakes detached from the core.
<b>cortex -</b>	cortex is the weathered exterior of rocks formed by long periods of exposure to chemical and physical weathering. The percentage of cortex remaining on either the dorsal (if limited to the dorsal), the platform (if limited to the platform) or both dorsal and platform (if occurring on both) is recorded in 10% increments. On flaked pieces, cortex is recorded as an estimation of the total surface area covered
<b>cortex type -</b>	cortex type varies according to the environment in which it formed and the subsequent processes by which it came to be transported to its current position. Three types of cortex are recorded for all artefacts preserving a cortical remnant. These are angular, rounded and irregular.

<b>debitage</b> -	commonly used French word for the stone refuse from flaking activity. Usually there is a large quantity of flakingdebitage for every finished stone implement.
<b>discard</b> -	when referring to lithic scatters the term discard means the incidental, intended and unintended scatter of artefacts on the ground surface or directly into a sediment.
<b>distal portion or end</b> -	the end of a flake or microblade (the opposite end to the that of the point of fracture origin on the ventral (or inside) surface. Tabular cortex is the weathered surface of a tabular shaped nucleus (core).
<b>dorsal face/facet</b> -	the outside surface(s) of a flake, the inside surface of the flake being one side of the fracture created during the formation of the flake. The speed at which these fracture formed ranges from about 200 m to over one kilometres a second (see also 'ventral face').
<b>edge-ground axe</b> -	Implement shaped on at least one margin by grinding against another surface. Such implements are often shaped by flaking, pecking, flaking and pecking or grinding and/or burnishing around much of their exterior.
<b>end scraper</b> -	A flake with a flat ventral surface and steeply retouched distal end.
<b>Éraillure flake</b> -	a secondary flake, always very thin in cross-section, that usually remains attached by a fine bridge of stone to the bulbar surface of a conchoidal negative flake scar. The fine attachment is easily removed by applying a very small force. A negative éraillure scar is left on one side of the bulb of force, which is in the upper part of the ventral surface of the primary flake from which it was detached, and is often referred to as 'bulbar scar'. This flake type has no initiation platform, is round or ovoid in plan view, and is always very thin. This flake type is not significant for the purposes of analysis other than to indicate conchoidal flaking.
<b>flake</b> -	<p>(General) a piece of stone detached from a nucleus such as a core. A complete or substantially complete flake of lithic material usually with evidence of hard indenter initiation, or occasionally bending initiation. A general category for substantially complete conchoidal flakes, and rarely bending-initiated flakes.</p> <p>The most common type of flake is called 'conchoidal flake'. In certain circumstances flakes (especially conchoidal flakes) may be the result of natural fracture of stone. The flake's primary fracture surface (the ventral or inside surface) exhibits features such as fracture initiation, bulb of force, and undulations and lances that indicate the direction of the fracture front. Very occasionally a conchoidal flake comprises only a bulb of force (see also 'core', 'fracture initiation', 'bulb or force', 'lances' and 'undulations', and specific flake types).</p>

<b>flake portion -</b>	multiple breaks/proximal, distal/longitudinal, indicting the portion of the original flake. Multiple breakages indicates a fragment of a flake exhibiting more than one breakage but still retaining at least some of its initiation area. Proximal portion of a flake is synonymous with 'step-terminated flake'. This variety of flake sustains a breakage at its distal end either because it was detached from the nucleus by a bending force that created a second, transverse break or was broken transversely by a bending force after it was detached (such as when it struck the ground during knapping or subsequently by treadage at the site).
<b>flake fragment -</b>	A category comprising flake fragments without areas of fracture initiation but which display sufficient fracture surface attributes (normally conchoidal markings) for identification as a lithic artefact fragment.
<b>flake rotation contact damage -</b>	the fine flake scars damage on the distal end of a flake (such as a microlith backing flake) a fraction of a second after it has been created and before it separates fully from the nucleus. This fracturing is caused by the continued application of load or force to the flake as its upper part moves outwards and away from the nucleus.
<b>flaked piece -</b>	A flaked piece is defined as any piece of rock clearly derived from the process of conchoidal fracture, but for which no attributes exist to identify it as a core, a flake or any other identifiable technological category.
<b>flake from bipolar core -</b>	A flake retaining evidence of bipolar fracture damage on at least one end. Some of these are 'compression flakes' formed by substantial compressive force.
<b>flake portion -</b>	a proximal portion retains the area of flake initiation, a distal portion exhibits a flake termination. Longitudinally broken flakes and ones with an oblique break are also recognised.
<b>flat -</b>	a landform element which is planar or near horizontal; creek flat - flat adjacent to a creek usually a floodplain.
<b>floodplain -</b>	valley floor flat adjacent to a stream which is flooded by the 'annual' flood (often considered to be the flood with a recurrence interval of about 1.6 years).
<b>fluvial -</b>	pertaining to a stream or river.
<b>fracture or flake initiation -</b>	the point or area defining the beginning of a flake-forming fracture (always found at the top of the top of the flake scar or ventral (inside) surface of the flake (see also 'initiation surface').
<b>fresh breakage or fracture -</b>	fracturing of a lithic item during archaeological excavation or sieving. Such fracture, which has no adhering sediment or sediment stain, may be caused by trowel, pick, shovel or earth moving machinery.

<b>heat fracture -</b>	fractures caused by heating the stone, either from natural causes, a campfire, or intentional heat treatment. Generally, these are undesirable effects though larger pieces of stone fractured by heat sometimes are used as cores or made into implements because of their convenient shape or size. Attributes indicating heat fracture include colour change, cracking, crazing, pitting and creation of highly irregular fracture surface topography (often referred to as 'crenation' or 'crenulation').
<b>hammerstone /anvil -</b>	A piece of stone with such evidence of use in the form of diagnostic abrasion and other fracture damage.
<b>heat treatment -</b>	the intentional slow heating of stone, such as silcrete, above 300°C to improve its flaking properties.
<b>hinge termination -</b>	when the end of the flake or fracture continuously turns at ninety degrees to the surface of the nucleus or outside surface of the flake (see also 'retroflexed hinge termination').
<b>indeterminate retouched piece</b>	in artefact or piece of an artefact with retouch along at least one margin. The purpose of this retouch cannot be determined, though some items are probably fragments of microlithic items, scrapers or utilised flakes listed above
<b>implement (of stone) -</b>	synonym for a stone tool, usually denoting a tool that has been shaped by flaking (retouch).
<b>initiation -</b>	see 'fracture or flake initiation'.
<b>initiation platform -</b>	see 'initiation surface'.
<b>initiation surface -</b>	the surface of a stone (sometimes called a platform) that is struck with a hammerstone at low angle for the purpose of detaching a flake. This surface is where a flake-forming crack commences; commonly part of it is retained on the flake. The load applied to this surface may be delivered by a hammerstone or by continuous increasing pressure with a length of dense wood or bone (a pressor or pressure flaking tool).
<b>isolated find -</b>	a single stone artefact, not located within a rock shelter, and which occurs without any associated evidence of Aboriginal occupation within a specified radius, such as 60 metres (depending on which archaeological convention is used). This term is normally useful only in the context of surface archaeological survey results and subsurface testing results. Isolated finds may be constituent components of background discard, or indicative of obscured, remnant and disturbed sites.
<b>knapping episode -</b>	a series of flaking events (see also 'knapping event')
<b>knapping event -</b>	a single act of flaking a piece of stone resulting in the <i>in-situ</i> deposition of stone flaking debris. Such an event may occur as part of a series of events
<b>lamination -</b>	a fine layer within the matrix of a lithic material. This layer is less than 2 mm thick.
<b>lateral margin (of a flake) -</b>	the edge along the side of a flake, running from the flake's initiation surface to its termination.



<b>lithic</b> -	in an archaeological context, items of a hard, usually siliceous, stone of a type selected by Aborigines for tool making. These items are often nondescript fragments but some also finely shaped implements.
<b>lithic assemblage</b> (of stone) -	a collection of whole and fragmentary stone artefacts and manuports obtained from an archaeological site, either by collecting items scattered on the present ground surface (see lithic scatter) or by controlled excavation (see also 'stone artefact').
<b>lithic fragment</b> -	a nondescript lithic item that does not have sufficient morphological attributes to identify it as a complete artefact or a portion of an artefact. The lithic fragment category comprises items which are identified only to the level of manuport fragments, even though it contains nondescript flaking shatter and fragments of flakes not individually identifiable as such. Some fragments exhibit attributes characteristic of heat stress, such as occurs during bushfire, hearth fire or intentional heat treatment. Evidence of heat fracture on lithic fragments (and identifiable artefacts) has been recorded in the comments for each entry. Depending on the nature of the cultural sediment and non-Aboriginal land-use practices this group may also contain a small number of non-artefactual fragments exhibiting fresh fracture surfaces.
<b>lithic item</b> -	a piece of stone exhibiting fracture surfaces and not identified as a natural piece of stone.
<b>manuport</b> -	an object or fragment of an object (called item in this report) carried by human agency to the locality in which it is found.
<b>margin</b> -	the surface immediately adjacent to an edge, the latter being the intersection of two margins.
<b>microdebitage</b> -	flaking waste or debris (debitage) up to 10 mm in maximum size. There is no uniform metrical definition of micro-debitage and some archaeologists specify a maximum size of 5 mm.
<b>microlith</b> (synonym 'backed blade') -	a variety of small, delicately retouched implements of various shapes such as asymmetric (bondi) point, segment, crescent, triangle, trapeze, rectangle and oblique ended. These implements are commonly thought to have been spear barbs.
<b>microlith preform</b> -	a microblade with some degree of initial backing retouch, often along the distal end. Recognised portions are proximal, distal and fragment.
<b>mottles (on stone surface)</b> -	masses or blotches of subdominant colours in an area of stone surface.
<b>mottles (in soil/sediment)</b> -	masses or blotches of subdominant colours within a soil mass. Often evidence of poor drainage or extensive bioturbation.
<b>nondescript core or core fragment</b>	A core (or core fragment) of generally amorphous shape.
<b>nucleus</b>	see 'core', 'polyhedral core', 'tabular nucleus'.








<b>outrépasse termination</b> -	a flake ending that turns inwards within the nucleus taking off part of its base. This occurs when the fracture front approaches the bottom of a nucleus and must turn in one direction or the other, as the stresses on either side of the fracture front cannot be equal. If the fracture front turns sharply towards in the other direction the flake will terminate in a hinge. A modest to pronounced outrépasse termination is common on microlith backing flakes and occasionally is seen on microblades.
<b>pebble</b> -	by geological definition, a waterworn stone less than 64 mm in diameter (about the size of a tennis ball). Archaeologists often refer to waterworn stones larger than this as pebbles though technically they are cobbles.
<b>pH</b> -	acidity or alkalinity of soil or water. Expressed in logarithmic units either side of 7 which is neutral, <7 = acid, >7 = alkaline.
<b>pit</b> -	a below ground level ('subsurface') testing location, either excavated by hand and sometimes referred to as a <i>spade pit</i> or <i>shovel pit</i> , or excavated by machine, such as with a backhoe or machine auger and sometimes referred to as a <i>trench</i> .
<b>porphyry</b> -	An igneous rock rich in phenocrysts. The term 'porphyritic' refers to ones in which relatively large crystals are set in a fine-grained or glassy groundmass.
<b>potlid</b> -	A piece of lithic material that has a generally convex or dome-shaped ventral surface, often with evidence of fracture initiation from a location within the surface and not from the edge.
<b>preform</b> -	a flake or blade selected for shaping by retouch into an implement. For inclusion in this category an artefact must have some degree of retouch (see also 'retouch' and 'blank').
<b>primary fracture surface</b>	One of the two conjoining fracture surfaces created on a nucleus and flake after the flake has detached. The primary fracture surface on the flake is called the ventral surface.
<b>proximal</b> -	the top part of a flake beginning with the initiation surface or ridge. It is the same for an implement (or tool). The opposite end of flake is called the distal end.
<b>quarry</b> -	a site where stone was obtained by excavation from bedrock with extraction tools of simple design (see also Stone procurement site or place).
<b>quartz</b> -	a mineral composed of crystalline silica SiO <sup>2</sup> . Quartz is a very stable mineral that does not alter chemically during weathering or metamorphism. It is hard, usually colourless or white ('milky'). In its massive form quartz occurs as geodes or veins, from which pebbles are formed by weathering. Despite the often unpredictable nature of fracture in quartz the flakes often have sharp cutting edges. Quartz is common and abundant, and the Aborigines used it throughout Australia to make convenient light-duty cutting tools.








<b>quartzite -</b>	A hard, silica rich stone formed from a sandstone that has been recrystallised by heat (meta-quartzite) or strengthened by slow infilling of silica in the voids between sand grains (orthoquartzite). The essential difference between sandstone and quartzite is that major fracture will propagate around the larger grains in sandstone and through the grains in quartzite.
<b>Quaternary -</b>	The most recent geological time period. Divided into the Holocene and the Pleistocene. Began 1.8 million years ago (see also 'stone procurement site').
<b>reduction process -</b>	the process of removing flakes from a core, or of manufacturing an implement by flaking and/or grinding, or progressively rejuvenating a tool's working edge.
<b>reduction strategy -</b>	strategy of flaking and/or grinding a piece of stone in predetermined stages to produce an implement.
<b>residues on stone tools -</b>	residue analysis concerns the identification of tool use activities from preserved organic and inorganic residues of worked materials. These residues may be compacted into small flake scars on the edges of utilised artefacts or adhere strongly to their surfaces. Routine examination of residues is aided by low-magnification microscopy.
<b>retouch or retouching -</b>	an area of flake scars on an artefact resulting from intentional shaping, resharpening, or rejuvenation after wear or breakage. In resharpening a cutting edge the retouch is invariably found only on one side (see also 'indeterminate retouched piece', retouch flake' etc).
<b>sandstone -</b>	a cemented or compacted rock consisting of detrital grains which range in size from 2 mm. Because of its chemical stability quartz often comprises the majority of the grains. The nature of the cement is denoted by terms such as argillaceous (clayey), calcareous, ferruginous and tuffaceous sandstone.
<b>sieve damage -</b>	fracture damage on lithic items caused by abrasive contact with the sieve mesh during the process of sieving. This occurs more commonly with wet sieving of clayey sediment.
<b>silcrete -</b>	<p>(also known as 'porcellanite' and 'grey billy') A hard, fine grained siliceous stone flaking properties similar to quartzite and chert. It is formed by the cementation and/or replacement of bedrock, weathering deposits, unconsolidated sediments, soil or other material by a low temperature physico-chemical process.</p> <p>Silcrete is essentially composed of quartz grains cemented by microcrystalline silica (SiO<sup>2</sup>). Mineral composition is highly variable, but it comprises more than 85% silica, and includes aluminium, iron and titanium in small but significant amounts. The bonding matrix is often composed of microcrystalline quartz or chalcedony. Clasts are most often quartz grains but may also include chert or chalcedony or some other hard mineral particle. Mechanical properties and texture are equivalent to the range exhibited by chert at the fine-grained end of the scale to silcrete at the coarse-grained end. Silcrete is used by Aborigines for stone tool manufacture throughout most of Australia.</p>
<b>site integrity -</b>	the degree of post-depositional disturbance to a site.*

<b>spit -</b>	an arbitrary interval of excavated depth in an archaeological excavation, such as in: spit 2 was the layer of deposit excavated between 10 and 20cm below ground level.
<b>stone artefact -</b>	a piece or fragment of stone showing evidence of intentional human creation or modification.
<b>stone layer -</b>	a sheet or layer of gravel sized materials found within a body of soil material. Commonly formed at the lower limit of bioturbation and often contains a concentration of artefacts.
<b>stone material -</b>	(synonymous with 'lithic material', 'stone type' and 'raw material' which is a less specific but commonly used term).
<b>stone procurement place (or site) -</b>	a place where stone is obtained for making into artefacts. As a prehistoric site type in Australia, stone procurement places range on a continuum, from pebble beds in watercourses (where there may be little or no archaeological evidence of human activity) to extensively quarried outcrops of bedrock where there is clear evidence of procurement activity, such as quarry pits, discarded hammerstones and large consolidated cultural deposits of primary flaking debris. (See also quarry)
<b>stone tool -</b>	a piece of flaked or ground stone used in an activity or fashioned for use as a tool. A synonym of stone tool is implement, which is more often used by archaeologists to describe a flake tool fashioned by more delicate flaking (retouch).
<b>technological attributes analysis -</b>	methods of reconstructing reduction sequences in stone technology (see reduction sequence). Discrete and metrical attributes of artefacts are identified, recorded and examined mathematically.
<b>termination (of a flake) -</b>	the distal end
<b>use fractures -</b>	breakages on the edges of stone tools resulting from tool use (see also 'use-wear').
<b>use-wear -</b>	microscopic and macroscopic damage to the surfaces of stone implements resulting from its use. Routine examination for use-wear is aided by low-magnification microscopy. Major use-wear forms are edge fractures, use-polish and smoothing, abrasion, and edge rounding and bevelling.
<b>ventral face -</b>	the inside surface of a flake created during the flake's formation. The speed of the fracture ranges from about 200 metres to over one kilometres per second (see also 'dorsal face').
<b>volcanic stone -</b>	rock types formed by volcanic activity display a wide range of mechanical and flaking properties. Freshly fractured volcanic stone tends not to have fine, durable edges suitable for cutting. Only a few types are utilised for making stone tools, often ones that are shaped by grinding.
<b>working edge -</b>	the edge of a tool in contact with the worked substance or material during its usage.






## **APPENDIX 4**

### **PIT PROFILES**

Pit 1	Pit 2	Pit 3	Pit 4	Pit 5	Pit 6	Pit 7
						

Pit 8	Pit 9	Pit 10	Pit 11	Pit 12	Pit 13	Pit 14
						



Pit 15	Pit 16	Pit 17	Pit 18	Pit 19
				

## **APPENDIX 5**

### **LITHIC DATABASE**

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
1	1	4	grey	silcrete	heat shatter	7	274.75	
2	1	4	grey	silcrete	heat shatter	3	3.24	
3	2	2	milky	quartz	lithic fragment	1	0.15	Pebble cortex
4	4	4	grey	silcrete	heat shatter	3	4.64	
5	4	5	grey	silcrete	flake	2	0.48	
6	8	1	grey	quartzite	lithic fragment	3	2.15	
7	8	2	milky	quartz	flake portion - proximal	2	0.25	
8	9	1	milky	quartz	bipolar compression flake	2	1.2	
9	9	2	grey	silcrete	microblade	5	12.64	Very fine textured ground mass; associated with # 10, 11 - clearly from the same nucleus
10	9	2	grey	silcrete	microblade	3	2	
11	9	2	grey	silcrete	flake portion - longitudinal	2	0.17	
12	9	2	milky	quartz	lithic fragment	1	0.16	
13	9	2	milky	quartz	lithic fragment	2	0.14	
14	9	2	milky	quartz	flake fragment	1	0.06	
15	9	4	milky	quartz	lithic fragment	3	3.48	
16	9	4	milky	quartz	lithic fragment	5	125	broken quartz pebble; cracked along a line of weakness; possibly a broken manuport
17	9	5	milky	quartz	lithic fragment	2	1.89	fragment of quart pebble
18	9	5	milky	quartz	flake	2	0.99	

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
19	10	1	grey	quartzite	flake fragment	3	8.05	
20	10	1	grey	silcrete	flake	3	3.33	
21	10	1	grey	silcrete	flake fragment	2	0.23	
22	10	1	grey	silcrete	flake	2	0.43	
23	10	1	grey	silcrete	microlith backing flake	1	0.32	
24	10	1	white	silcrete	microblade portion	2	0.74	distal portion
25	10	1	grey	silcrete	heat shatter	2	1.37	some pink colouration
26	10	1	red	chalcedony	lithic fragment	1	0.19	
27	10	1	milky	quartz	lithic fragment	1	0.08	
28	10	2	grey	silcrete	heat shatter	2	2.62	
29	10	3	grey	silcrete	microblade portion	2	0.91	proximal portion
30	10	3	milky	quartz	lithic fragment	1	0.1	pebble cortex; possibly natural
31	11	2	milky	quartz	lithic fragment	1	0.36	pebble cortex; possibly natural
32	11	3	grey	quartzite	lithic fragment	1	0.18	possibly heat fracture
33	12	1	grey	silcrete	flake	6	36.03	some snap fracturing along acute lateral margin; possibly from use but not diagnostic
34	12	1	grey	silcrete	flake	4	11.6	
35	12	1	grey	silcrete	flake	3	5.44	
36	12	1	grey	silcrete	core fragment	4	15.04	

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
37	12	1	grey	silcrete	flake	3	6.38	
38	12	1	grey	silcrete	heat shatter	3	2.44	
39	12	1	grey	silcrete	flake	2	1.21	
40	12	1	grey	silcrete	microblade	2	2.12	
41	12	1	grey	silcrete	microblade	2	1.55	
42	12	1	grey	silcrete	heat shatter	2	1.25	
43	12	1	grey	silcrete	microblade portion	2	0.62	mid section
44	12	1	grey	silcrete	Bondi preform portion	2	0.88	proximal portion
45	12	1	grey	silcrete	heat shatter	2	0.32	
46	12	1	grey	silcrete	flake portion - distal	2	0.31	
47	12	1	grey	silcrete	microblade portion	2	0.55	proximal portion
48	12	1	grey	silcrete	flake	2	2.06	
49	12	1	grey	silcrete	flake	2	1.13	
50	12	1	grey	silcrete	heat shatter	2	0.95	
51	12	1	grey	silcrete	heat shatter	1	0.68	
52	12	1	grey	silcrete	heat shatter	1	0.23	
53	12	1	grey	silcrete	microblade portion	1	0.08	proximal portion
54	12	1	grey	silcrete	lithic fragment	1	0.14	
55	12	1	grey	silcrete	flake fragment	1	0.17	

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
56	12	1	grey	silcrete	flake fragment	1	0.08	
57	12	1	grey	silcrete	heat shatter	1	0.11	potlid flake portion
58	12	1	grey	silcrete	lithic fragment	1	0.12	probably heat fracture
59	12	1	grey	silcrete	heat shatter	1	0.13	
60	12	1	grey	silcrete	heat shatter	1	0.17	
61	12	1	grey	silcrete	lithic fragment	1	0.11	
62	12	1	white	unidentified	flake portion - proximal	2	0.64	extremely fine grained silicious with red mineral component giving spotted red appearance
63	12	1	grey	quartzite	lithic fragment	2	0.44	either artefact or heat shatter
64	12	1	grey	quartzite	flake	1	0.08	
65	12	1	grey	quartzite	lithic fragment	2	0.81	
66	12	1	red	quartzite	flake fragment	1	0.09	
67	12	1	white	quartzite	lithic fragment	1	0.15	either artefact or heat shatter
68	12	1	white	quartzite	lithic fragment	1	0.07	colour grades to red
69	12	1	milky	quartz	flake	1	0.05	
70	12	1	milky	quartz	lithic fragment	1	0.22	
71	12	2	grey	silcrete	microblade core	5	57.69	2 platforms;
72	12	2	grey	silcrete	lithic fragment	5	10.66	probably got heat fracture - ruggose surface
73	12	2	grey	silcrete	heat shatter	3	7.9	grades to red

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
74	12	2	grey	silcrete	flake	2	0.99	
75	12	2	grey	silcrete	flake	2	0.98	
76	12	2	grey	silcrete	heat shatter	1	0.32	
77	12	2	grey	silcrete	microlith backing flake	2	0.36	
78	12	2	grey	silcrete	flake portion - proximal	1	0.36	
79	12	2	grey	silcrete	flake	1	0.14	
80	12	2	grey	silcrete	flake portion - longitudinal	1	0.15	
81	12	2	grey	silcrete	lithic fragment	1	0.15	probably heat fracture
82	12	2	grey	silcrete	flake portion - distal	2	0.31	
83	12	2	grey	silcrete	flake portion - proximal	2	0.77	
84	12	2	grey	silcrete	flake	1	0.1	
85	12	2	grey	silcrete	flake	1	0.12	from a microblade core
86	12	2	grey	silcrete	flake	1	0.09	
87	12	2	white	silcrete	flake portion - proximal	1	0.09	extremely fine grained ground mass
88	12	2	red	quartzite	flake	1	0.07	
89	12	2	white	silcrete	heat shatter	1	0.15	potlid
90	12	2	grey	quartzite	flake portion - distal	2	0.94	
91	12	2	red	quartzite	microblade	3	0.91	
92	12	2	white	quartzite	lithic fragment	1	0.04	potlid scars on one surface

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
93	12	3	white	silcrete	core	7	38.04	fine grained
94	12	3	milky	quartz	lithic fragment	2	2.72	split pebble
95	12	3	grey	silcrete	microlith backing flake	1	0.09	
96	12	3	grey	quartzite	flake	2	1.19	
97	12	3	red	quartzite	lithic fragment	1	0.11	
98	12	3	grey	silcrete	heat shatter	1	0.09	
99	12	3	grey	silcrete	lithic fragment	1	0.14	probably heat fracture
100	12	3	grey	silcrete	lithic fragment	1	0.07	probably potlid flake fragment
101	12	3	red	quartzite	flake	2	0.38	
102	12	3	grey	silcrete	lithic fragment	1	0.09	probably potlid flake fragment
103	12	3	grey	silcrete	microblade	3	1.11	
104	12	3	grey	quartzite	lithic fragment	1	0.1	
105	12	4	grey	silcrete	microblade portion	1	0.07	proximal portion
106	12	5	grey	silcrete	microblade portion	2	0.92	mid section
107	12	5	grey	quartzite	flake fragment	2	0.75	
108	12	5	white	silcrete	lithic fragment	1	0.38	
109	12	5	red	quartzite	lithic fragment	2	1.51	
110	12	6	grey	quartzite	flake portion - proximal	1	0.11	
111	13	1	grey	quartzite	flake	3	5.9	from a microblade core; fine grained



Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
112	15	1	grey	silcrete	microblade	4	1.57	
113	15	1	grey	silcrete	microblade core	5	28.1	single plain platform
114	15	1	grey	silcrete	core fragment	5	18.1	probably a microblade core
115	15	1	grey	silcrete	flake portion - proximal	3	4.56	
116	15	1	grey	silcrete	flake	3	0.81	
117	15	1	grey	silcrete	flake fragment	2	0.49	
118	15	1	grey	silcrete	flake	1	0.02	
119	15	1	grey	silcrete	microlith backing flake	1	0.04	
120	15	1	grey	silcrete	microblade	2	0.45	
121	15	1	grey	silcrete	microblade	1	0.06	
122	15	2	grey	silcrete	microblade core	4	34.62	clear example of platform faceting to create arrises for the initiation of bladelets; classic example of microblade core suitable for public exhibition or education, single platform
123	15	2	grey	quartzite	flake	6	35.62	
124	15	2	red	quartzite	lithic fragment	4	5.6	possibly heat fracture
125	15	2	red	silcrete	microblade	5	14.95	
126	15	2	grey	silcrete	flake portion - distal	3	5.97	
127	15	2	grey	silcrete	microblade portion	2	0.3	proximal portion
128	15	2	white	silcrete	flake	2	1.02	

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
129	15	2	grey	quartzite	flake fragment	2	0.68	grey quartzite appears not to be from pebbles but from quartzite layer, similarly the silcrete appears not to be from pebbles but primary exposure from locations such as Bannisters Point
130	15	2	grey	silcrete	flake portion - proximal	3	0.86	
131	15	2	grey	silcrete	flake fragment	2	0.73	
132	15	2	milky	quartz	lithic fragment	1	0.53	
133	15	2	grey	silcrete	microblade	2	0.29	
134	15	2	grey	silcrete	flake portion - distal	1	0.19	
135	15	2	grey	silcrete	microblade portion	2	0.58	proximal portion
136	15	2	pink	silcrete	heat shatter	1	0.14	potlid; possibility that the grey silcrete will turn pink or red upon heat treatment
137	15	2	grey	silcrete	flake fragment	1	0.18	
138	15	2	red	silcrete	flake	2	0.42	redirecting flake
139	15	2	grey	silcrete	flake	2	0.5	groundmass grades to red; probably found naturally grading grey to red - colour change probably from natural fires
140	15	2	red	silcrete	heat shatter	1	0.26	
141	15	2	grey	silcrete	flake portion - distal	2	0.21	
142	15	2	grey	silcrete	microblade portion	2	0.8	proximal portion
143	15	2	milky	quartz	lithic fragment	1	0.12	
144	15	2	grey	silcrete	flake fragment	2	0.82	

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
145	15	2	grey	silcrete	flake fragment	1	0.01	
146	15	2	grey	silcrete	flake fragment	1	0.01	
147	15	3	grey	quartzite	flake	8	36.45	associated with #148, 149
148	15	3	grey	quartzite	flake	4	9.26	
149	15	3	grey	quartzite	flake fragment	2	1.63	
150	15	4	grey	silcrete	flake	1	0.04	probable microlith backing flake
151	17	2	grey	silcrete	lithic fragment	4	6.58	probably heat fracture
152	17	2	grey	silcrete	heat shatter	2	0.2	potlid portion
153	17	2	grey	quartzite	flake	2	1.72	
154	17	2	grey	silcrete	flake portion - proximal	2	1.13	
155	17	2	grey	silcrete	flake	2	1.41	
156	17	2	grey	silcrete	flake	2	0.81	
157	17	2	grey	silcrete	flake fragment	1	0.06	
158	17	2	grey	silcrete	heat shatter	2	1.49	
159	17	2	grey	silcrete	heat shatter	2	0.49	potlid
160	17	2	red	chalcedony	heat shatter	1	0.01	potlid scars on one surface
161	17	3	grey	silcrete	flake	5	20.24	
162	17	3	grey	silcrete	microblade core	4	15.37	single platform, platform faceting
163	17	3	grey	silcrete	flake	4	4.41	marginal retouch and probable use fractures along a short

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
								section of one edge; light duty cutting or scraping
164	17	3	grey	silcrete	lithic fragment	2	0.39	probable flake fragment
165	17	3	grey	silcrete	microblade portion	2	0.45	distal portion
166	17	3	grey	silcrete	flake	2	0.4	
167	17	3	grey	silcrete	microblade portion	2	0.97	proximal portion; chert clasts; platform faceting
168	17	3	red	chalcedony	heat shatter	1	0.22	
169	17	3	grey	silcrete	heat shatter	2	0.54	
170	17	3	milky	quartz	flake	1	0.55	
171	17	3	red	chalcedony	heat shatter	2	0.75	grading to translucent
172	17	3	grey	silcrete	microblade portion	2	0.44	mid section
173	17	3	grey	silcrete	heat shatter	2	0.31	
174	17	3	red	chalcedony	heat shatter	2	0.39	
175	17	3	white	silcrete	heat shatter	2	0.32	
176	17	3	grey	silcrete	lithic fragment	1	0.29	possibly heat fracture
177	17	3	grey	silcrete	heat shatter	2	0.56	
178	17	3	grey	silcrete	lithic fragment	2	0.22	
179	17	3	red	silcrete	flake	1	0.2	
180	17	3	white	silcrete	lithic fragment	1	0.37	
181	17	3	red	chalcedony	heat shatter	1	0.13	potlid; this material grades from clear semi-translucent to

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
								strong red
182	17	3	grey	silcrete	microlith backing flake	1	0.12	
183	17	3	grey	silcrete	flake	1	0.24	
184	17	3	red	chalcedony	heat shatter	2	0.13	potlid scars on one surface
185	17	3	grey	silcrete	flake fragment	1	0.08	
186	17	3	white	silcrete	heat shatter	1	0.16	
187	17	3	white	silcrete	lithic fragment	1	0.18	probably heat fracture
188	17	3	grey	silcrete	flake portion - proximal	1	0.04	
189	17	3	white	silcrete	heat shatter	1	0.2	
190	17	3	grey	silcrete	microblade portion	2	0.08	mid section
191	17	3	white	unidentified	heat shatter	1	0.05	material spotted with red; same as #62
192	17	3	white	silcrete	lithic fragment	2	0.38	
193	17	3	grey	silcrete	lithic fragment	1	0.15	
194	17	3	grey	quartzite	flake	1	0.02	associated with # 195-202; represents a flaking episode in which microblades are produced and at least one implement was backed, most probably a bondi point.
195	17	3	grey	quartzite	microblade portion	1	0.06	proximal portion
196	17	3	grey	quartzite	microlith backing flake	1	0.28	
197	17	3	grey	quartzite	microblade portion	2	0.1	distal portion
198	17	3	grey	quartzite	microblade portion	2	0.47	proximal portion

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
199	17	3	grey	quartzite	microblade portion	1	0.29	proximal portion
200	17	3	grey	quartzite	flake	2	0.39	
201	17	3	grey	quartzite	flake	2	0.57	backing flake
202	17	3	grey	quartzite	flake	2	0.42	
203	17	3	white	silcrete	lithic fragment	2	0.14	
204	17	4	grey	silcrete	heat shatter	4	5.96	
205	17	4	grey	silcrete	heat shatter	3	4.96	
206	17	4	grey	silcrete	heat shatter	2	2.72	
207	17	4	grey	silcrete	heat shatter	2	1.68	
208	17	4	grey	silcrete	heat shatter	3	2.3	
209	17	4	grey	silcrete	heat shatter	1	2.02	
210	17	4	grey	silcrete	heat shatter	2	1.15	
211	17	4	grey	silcrete	heat shatter	1	0.85	
212	17	4	grey	silcrete	heat shatter	1	0.87	
213	17	4	grey	silcrete	heat shatter	2	0.66	
214	17	4	grey	silcrete	heat shatter	2	0.57	
215	17	4	grey	silcrete	heat shatter	1	0.65	
216	17	4	grey	silcrete	heat shatter	2	0.67	
217	17	4	grey	silcrete	heat shatter	1	0.63	

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
218	17	4	grey	silcrete	heat shatter	1	0.54	
219	17	4	grey	silcrete	heat shatter	1	0.57	
220	17	4	grey	silcrete	heat shatter	1	0.69	
221	17	4	grey	silcrete	heat shatter	1	0.51	
222	17	4	grey	silcrete	heat shatter	1	0.64	
223	17	4	grey	silcrete	heat shatter	1	0.39	
224	17	4	grey	silcrete	heat shatter	1	0.46	
225	17	4	grey	silcrete	heat shatter	1	0.25	
226	17	4	grey	silcrete	heat shatter	1	0.19	
227	17	4	grey	silcrete	heat shatter	2	0.62	
228	17	4	grey	silcrete	heat shatter	1	0.31	
229	17	4	grey	silcrete	heat shatter	1	0.15	
230	17	4	grey	silcrete	heat shatter	1	0.16	
231	17	4	grey	silcrete	heat shatter	1	0.13	
232	17	4	grey	silcrete	heat shatter	1	0.11	
233	17	4	grey	silcrete	heat shatter	1	0.05	
234	17	4	grey	silcrete	heat shatter	1	0.01	
235	17	4	grey	silcrete	lithic fragment	1	0.1	
236	17	4	red	chalcedony	flake	1	0.17	

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
237	17	4	red	silcrete	flake	1	0.08	probably a MBF
238	17	4	grey	silcrete	flake	1	0.22	
239	17	4	grey	silcrete	flake	1	0.24	
240	17	4	grey	silcrete	heat shatter	1	0.09	
241	17	4	milky	quartz	flake	1	0.01	possibly a microblade
242	17	5	grey	silcrete	heat shatter	4	60.59	
243	17	5	grey	silcrete	heat shatter	4	31.16	
244	18	1	grey	silcrete	heat shatter	1	0.45	
245	18	1	grey	silcrete	heat shatter	1	0.07	
246	18	1	grey	silcrete	heat shatter	1	0.17	
247	18	3	grey	silcrete	heat shatter	3	8.96	
248	18	3	grey	silcrete	heat shatter	1	0.34	
249	18	3	grey	silcrete	heat shatter	1	0.15	
250	19	1	grey	silcrete	lithic fragment	2	0.14	
251	19	1	grey	silcrete	heat shatter	1	0.12	potlid
252	19	1	grey	silcrete	lithic fragment	1	0.05	probably heat fracture
253	19	1	grey	silcrete	heat shatter	1	0.03	
254	19	1	grey	silcrete	heat shatter	1	0.04	
255	19	1	grey	silcrete	heat shatter	1	0.01	



Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
256	19	1	grey	silcrete	lithic fragment	1	0.05	
257	19	2	grey	silcrete	heat shatter	3	8.53	
258	19	2	grey	silcrete	heat shatter	3	4.33	
259	19	2	grey	silcrete	heat shatter	2	5.31	
260	19	2	grey	silcrete	heat shatter	2	2.41	
261	19	2	grey	silcrete	heat shatter	2	1.01	
262	19	2	grey	silcrete	heat shatter	2	0.41	
263	19	2	grey	silcrete	heat shatter	2	1.01	
264	19	2	grey	silcrete	heat shatter	2	1.08	
265	19	2	grey	silcrete	heat shatter	2	0.48	
266	19	2	grey	silcrete	heat shatter	2	1.43	
267	19	2	grey	silcrete	heat shatter	1	0.86	
268	19	2	grey	silcrete	heat shatter	2	0.97	
269	19	2	grey	silcrete	heat shatter	1	0.18	
270	19	2	grey	silcrete	heat shatter	2	0.62	
271	19	2	grey	silcrete	heat shatter	2	0.46	
272	19	2	grey	silcrete	heat shatter	2	0.45	
273	19	2	grey	silcrete	heat shatter	2	0.58	
274	19	2	grey	silcrete	heat shatter	2	0.13	

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
275	19	2	grey	silcrete	heat shatter	1	0.23	
276	19	2	grey	silcrete	heat shatter	2	0.31	
277	19	2	grey	silcrete	heat shatter	1	0.43	
278	19	2	grey	silcrete	heat shatter	1	0.36	
279	19	2	grey	silcrete	heat shatter	1	0.3	
280	19	2	grey	silcrete	heat shatter	1	0.14	
281	19	2	grey	silcrete	heat shatter	1	0.05	
282	19	2	grey	silcrete	heat shatter	1	0.25	
283	19	2	grey	silcrete	heat shatter	1	0.47	
284	19	2	grey	silcrete	heat shatter	1	0.43	
285	19	2	grey	silcrete	heat shatter	1	0.24	
286	19	2	grey	silcrete	heat shatter	1	0.17	
287	19	2	grey	silcrete	heat shatter	1	0.24	
288	19	2	grey	silcrete	heat shatter	2	0.26	
289	19	2	grey	silcrete	heat shatter	1	0.28	
290	19	2	grey	silcrete	heat shatter	1	0.21	
291	19	2	grey	silcrete	heat shatter	1	0.09	
292	19	2	grey	silcrete	heat shatter	1	0.14	
293	19	2	grey	silcrete	heat shatter	1	0.11	

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
294	19	2	grey	silcrete	heat shatter	1	0.08	
295	19	2	grey	silcrete	heat shatter	1	0.09	
296	19	2	grey	silcrete	heat shatter	1	0.11	
297	19	2	grey	silcrete	heat shatter	1	0.33	
298	19	2	grey	silcrete	heat shatter	1	0.28	
299	19	2	grey	silcrete	heat shatter	1	0.37	
300	19	2	grey	silcrete	heat shatter	1	0.34	
301	19	2	grey	silcrete	heat shatter	1	0.21	
302	19	2	grey	silcrete	heat shatter	1	0.46	
303	19	2	grey	silcrete	heat shatter	2	0.68	
304	19	2	grey	silcrete	heat shatter	1	0.38	
305	19	2	grey	silcrete	heat shatter	1	0.16	
306	19	2	grey	silcrete	heat shatter	1	0.07	
307	19	2	grey	silcrete	heat shatter	1	0.22	
308	19	2	grey	silcrete	heat shatter	1	0.1	
309	19	2	grey	silcrete	heat shatter	1	0.12	
310	19	2	grey	silcrete	heat shatter	1	0.1	
311	19	2	grey	silcrete	heat shatter	1	0.1	
312	19	2	grey	silcrete	heat shatter	1	0.22	

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
313	19	2	grey	silcrete	heat shatter	1	0.08	
314	19	2	grey	silcrete	heat shatter	1	0.14	
315	19	2	grey	silcrete	lithic fragment	1	0.05	
316	19	3	grey	silcrete	heat shatter	5	19.86	
317	19	3	grey	silcrete	heat shatter	4	11.57	
318	19	3	grey	silcrete	heat shatter	3	8.22	
319	19	3	grey	silcrete	heat shatter	4	5.72	
320	19	3	grey	silcrete	heat shatter	2	3.08	
321	19	3	grey	silcrete	heat shatter	4	12	
322	19	3	grey	silcrete	heat shatter	2	1.37	
323	19	3	grey	silcrete	heat shatter	2	0.62	
324	19	3	grey	silcrete	heat shatter	2	0.46	
325	19	3	grey	silcrete	heat shatter	2	0.61	
326	19	3	grey	silcrete	heat shatter	1	0.83	
327	19	3	grey	silcrete	heat shatter	2	0.12	
328	19	3	grey	silcrete	heat shatter	1	0.38	
329	19	3	grey	silcrete	heat shatter	2	0.41	
330	19	3	grey	silcrete	heat shatter	2	0.21	
331	19	3	grey	silcrete	heat shatter	1	0.3	

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
332	19	3	grey	silcrete	heat shatter	2	0.37	
333	19	3	grey	silcrete	heat shatter	2	0.45	
334	19	3	grey	silcrete	heat shatter	1	0.28	
335	19	3	grey	silcrete	heat shatter	1	0.28	
336	19	3	grey	silcrete	heat shatter	1	0.28	
337	19	3	grey	silcrete	heat shatter	1	0.14	
338	19	3	grey	silcrete	heat shatter	1	0.06	
339	19	3	grey	silcrete	heat shatter	1	0.07	
340	19	3	grey	silcrete	heat shatter	1	0.16	
341	19	3	grey	silcrete	heat shatter	1	0.08	
342	19	3	grey	silcrete	heat shatter	1	0.1	
343	19	3	grey	silcrete	heat shatter	1	0.07	
344	19	4	grey	silcrete	heat shatter	5	41.63	
345	19	4	grey	silcrete	heat shatter	3	6.29	
346	19	4	grey	silcrete	heat shatter	3	6.84	
347	19	4	grey	silcrete	heat shatter	4	5.93	
348	19	4	grey	silcrete	heat shatter	3	2.3	
349	19	4	grey	silcrete	heat shatter	2	1.68	
350	19	4	grey	silcrete	heat shatter	2	0.88	

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
351	19	4	grey	silcrete	heat shatter	2	1.09	
352	19	4	grey	silcrete	heat shatter	1	0.7	
353	19	4	grey	silcrete	heat shatter	2	0.94	
354	19	4	grey	silcrete	heat shatter	2	0.56	
355	19	4	grey	silcrete	heat shatter	2	0.41	
356	19	4	grey	silcrete	heat shatter	2	0.33	
357	19	4	grey	silcrete	heat shatter	2	0.41	
358	19	4	grey	silcrete	heat shatter	2	0.47	
359	19	4	grey	silcrete	heat shatter	2	0.23	
360	19	4	grey	silcrete	heat shatter	2	0.18	
361	19	4	grey	silcrete	heat shatter	1	0.29	
362	19	4	grey	silcrete	heat shatter	1	0.23	
363	19	4	grey	silcrete	heat shatter	2	0.26	
364	19	4	grey	silcrete	heat shatter	1	0.09	
365	19	4	grey	silcrete	heat shatter	1	0.29	
366	19	4	grey	silcrete	heat shatter	1	0.22	
367	19	4	grey	silcrete	heat shatter	1	0.12	
368	19	4	grey	silcrete	heat shatter	1	0.14	
369	19	4	grey	silcrete	heat shatter	1	0.22	

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
370	19	4	grey	silcrete	heat shatter	1	0.15	
371	19	4	grey	silcrete	heat shatter	1	0.1	
372	19	4	grey	silcrete	heat shatter	1	0.14	
373	19	4	grey	silcrete	heat shatter	1	0.21	
374	19	4	grey	silcrete	heat shatter	1	0.19	
375	19	4	grey	silcrete	heat shatter	1	0.01	
376	19	4	grey	silcrete	heat shatter	8	350	
377	19	4	grey	silcrete	heat shatter	7	168.42	
378	19	4	grey	silcrete	heat shatter	4	9.68	
379	19	4	grey	silcrete	heat shatter	3	6.19	
380	19	5	grey	silcrete	heat shatter	2	0.76	
381	19	5	grey	silcrete	heat shatter	2	0.31	
382	19	5	grey	silcrete	heat shatter	2	0.45	
383	19	5	grey	silcrete	heat shatter	1	0.25	
384	19	5	grey	silcrete	heat shatter	2	0.56	
385	19	5	grey	silcrete	heat shatter	1	0.19	
386	19	5	grey	silcrete	heat shatter	1	0.2	
387	19	5	grey	silcrete	heat shatter	1	0.24	
388	19	5	grey	silcrete	heat shatter	1	0.22	

Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
389	19	5	grey	silcrete	heat shatter	1	0.1	
390	19	5	grey	silcrete	heat shatter	1	0.1	
391	19	5	grey	silcrete	heat shatter	1	0.05	
392	19	5	grey	silcrete	heat shatter	1	0.07	
393	19	5	grey	silcrete	heat shatter	1	0.09	
394	19	5	grey	silcrete	heat shatter	3	5.3	
395	19	6	grey	silcrete	heat shatter	3	2.12	
396	19	6	grey	silcrete	heat shatter	2	0.82	
397	19	6	grey	silcrete	heat shatter	3	2.18	
398	19	6	grey	silcrete	heat shatter	2	0.66	
399	19	6	grey	silcrete	heat shatter	2	0.57	
400	19	6	grey	silcrete	heat shatter	2	0.27	
401	19	6	grey	silcrete	heat shatter	2	0.32	
402	19	6	grey	silcrete	heat shatter	1	0.16	
403	19	6	grey	silcrete	heat shatter	1	0.17	
404	19	6	grey	silcrete	heat shatter	1	0.11	
405	19	6	grey	silcrete	heat shatter	1	0.18	
406	19	6	grey	silcrete	heat shatter	1	0.18	
407	19	7	grey	silcrete	heat shatter	3	3.1	



Ref #	Pit	Spit	Colour	Stone	Type	Size	Weight (g)	Comments
408	19	7	grey	silcrete	heat shatter	2	0.66	
409	19	7	grey	silcrete	heat shatter	3	1.44	
410	19	7	grey	silcrete	heat shatter	2	2.65	
411	19	7	grey	silcrete	heat shatter	2	0.97	
412	19	7	grey	silcrete	heat shatter	2	0.49	
413	19	7	grey	silcrete	heat shatter	1	0.49	
414	19	7	grey	silcrete	heat shatter	1	0.19	
415	19	7	grey	silcrete	heat shatter	1	0.33	