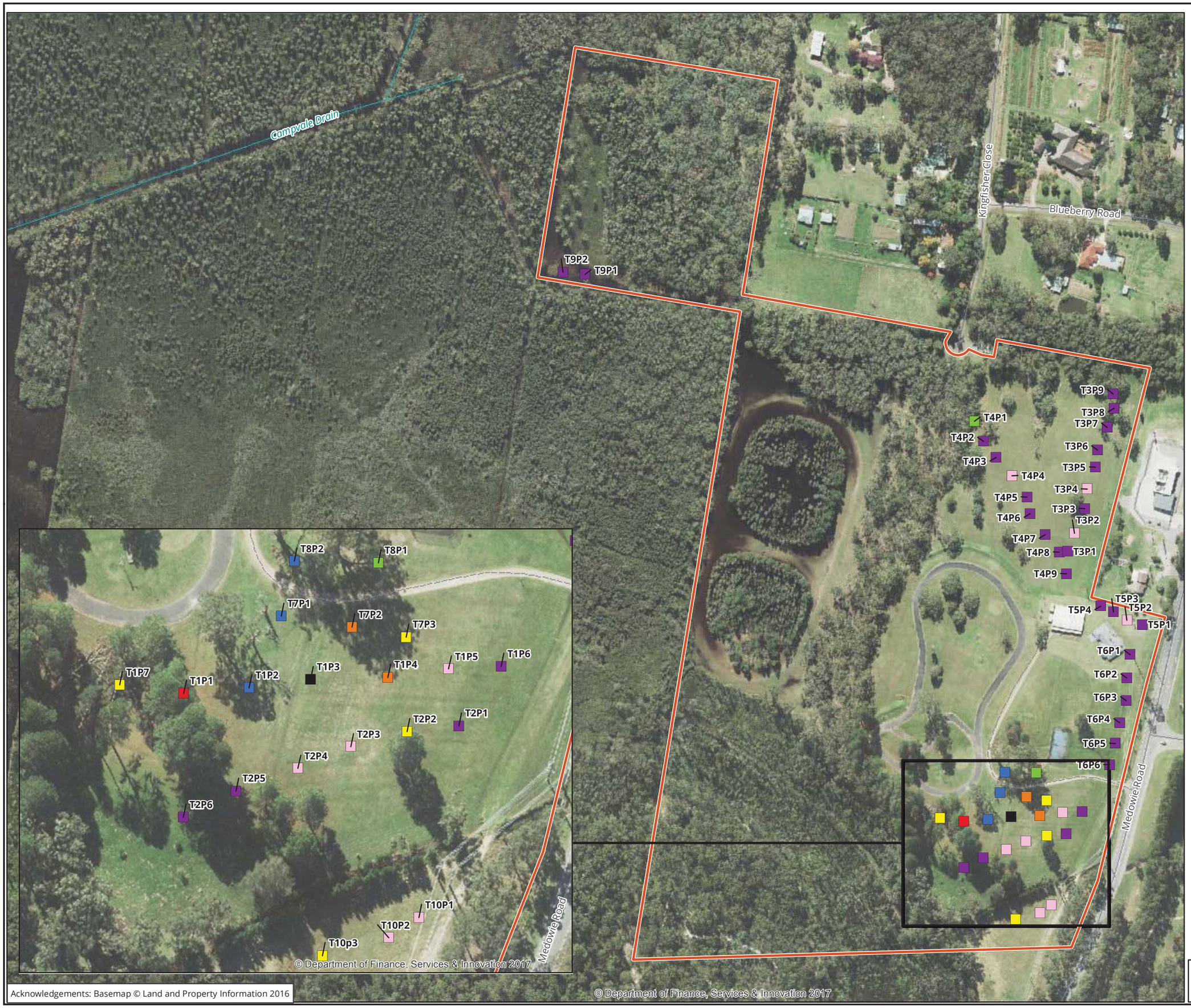
Plate 17 Medowie PAD 05 (Transect 4 Pit 4)

AHIMS 38-4-1975 / Medowie PAD 06

Medowie PAD 06 consists of a low density archaeological deposit (1 artefact) identified within T5 P2 on a crest landform in the northern portion of the study area (Plate 18). Soils at this location consisted of three separate stratigraphic contexts as described in section 5.3.3, and extended to a depth of 340 millimetres.

Plate 18 Medowie PAD 06 (Transect 5 Pit 2)



Acknowledgements: Basemap © Land and Property Information 2016

Legend

- Study area

Test Pit

Artefact density

- 0
- <5
- 5-10
- 11-15
- 21-20
- 31-40
- 41-50
- 51-60

Figure 12: Test Excavation Results

0 30 60 90 120 150

Metres

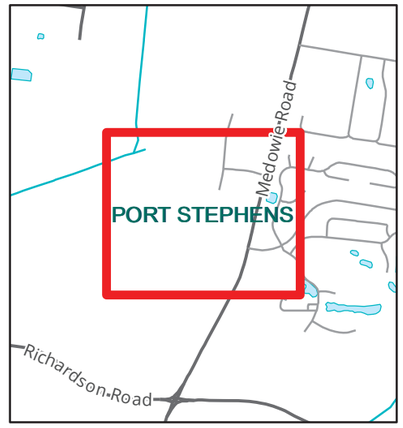
Scale: 1:3,200 @ A3

Coordinate System: GDA 1994 MGA Zone 56

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 26830
Date: 03 July 2018,
Checked by: CLA, Drawn by: LH, Last edited by: lharley
Location:P:\26800s\26830\Mapping
26830_F#_TestEx



Legend

- Study area
- AHIMS record
- Site extent

Figure 13: Aboriginal sites within the study area

0 30 60 90 120 150

Metres
Scale: 1:3,500 @ A3
Coordinate System: GDA 1994 MGA Zone 56

N

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 26830
Date: 05 July 2018,
Checked by: CLA, Drawn by: LW, Last edited by: lwilson
Location:P:\26800s\26830\Mapping
26830_FX_SiteExtents

6 Analysis

6.1 Sub-surface artefact analysis

The following analysis has been undertaken for the sub-surface assemblage of the study area excavated as part of the test excavation program. A total of 338 artefacts were identified and recorded from the test excavations.

The artefact analysis addresses a series of themes including:

- spatial distribution
- stone raw material procurement
- stone reduction technology.

Stone artefacts collected from the excavations were labelled by transect, pit and spit to locate them vertically and horizontally within the study area. Artefacts were collected and then individually analysed by Biosis. The recording form prompts the user to record all relevant artefact attributes; this enabled a comprehensive typological, technological and metrical analysis of the assemblage to be undertaken. Analysis was undertaken using a standard set of digital Vernier caliper, scale, and stereographic microscope. All measurements were recorded in millimetres to one decimal place. Appendix 2 contains the detailed sub-surface lithics recordings.

Collected artefacts were transported to a temporary storage location consisting of a locked storage cabinet in the Biosis Newcastle Office at 8/27 Annie Street Wickham NSW for lithic analysis.

The analysis of artefacts recorded during the sub-surface excavations has been undertaken as a whole assemblage in order to characterise the artefact assemblage present within the study area.

6.1.1 Artefact distribution

Intra-site distribution

The highest concentration of artefacts identified during the test excavations occurred within the flats landform within close proximity to Campvale Swamp in the southern portion of the study area. Transects excavated in this area include transects 1, 2, 7, 8, and 10. A total of 180 artefacts were identified within transect 1 (53.3%). This was followed by transect 7 located 20 metres north of transect 1, which contained 67 artefacts (19.8%); Transect 8, located 40 metres north of transect 1 at the intersection of the hillslope and flats landforms contained 46 artefacts (13.6%). Artefact counts dropped off in transect 2 (3.8%, n=13) and transect 10 (n=10). Transect 2 is located 20 metres south of transect 1 and approximately 25 metres to the north of the modified creek line in the southern portion of the study area. Transect 10 is located on the western side of the modified creek line approximately 25 metres south of transect 2.

Artefact counts were lower in transects located on hillslopes and crests within the study area. Transect 5, located on the hillcrest landform within the study area contained one artefact (0.3%), while transects 3 and 4 located across the hillslope and flats in the northern section of the study area contained six (1.8%) and 15 (4.4) artefacts respectively.

Table 10 gives a breakdown of the artefact distribution within the study area.

Table 10 Distribution of artefacts within the study area

Transect N.	Pit N.	Artefact count
1	1	50
1	2	38
1	3	59
1	4	26
1	5	1
1	7	6
2	2	7
2	3	4
2	4	2
3	2	3
3	4	3
4	1	14
4	4	1
5	2	1
7	1	39
7	2	23
7	3	5
8	1	15
8	2	31
10	1	1
10	2	4
10	3	5

An analysis of the artefact densities by transects shows a clear trend in the intensity of use within the study area, as demonstrated in Table 11. Artefact densities are highest in transect 1 (103 artefacts per m^2), followed by transect 8 (92 artefacts per m^2) and transect 7 (89 artefacts per m^2). This indicates the area of highest intensity occupation is within the flats landform in the southern portion of the study area. Artefact densities

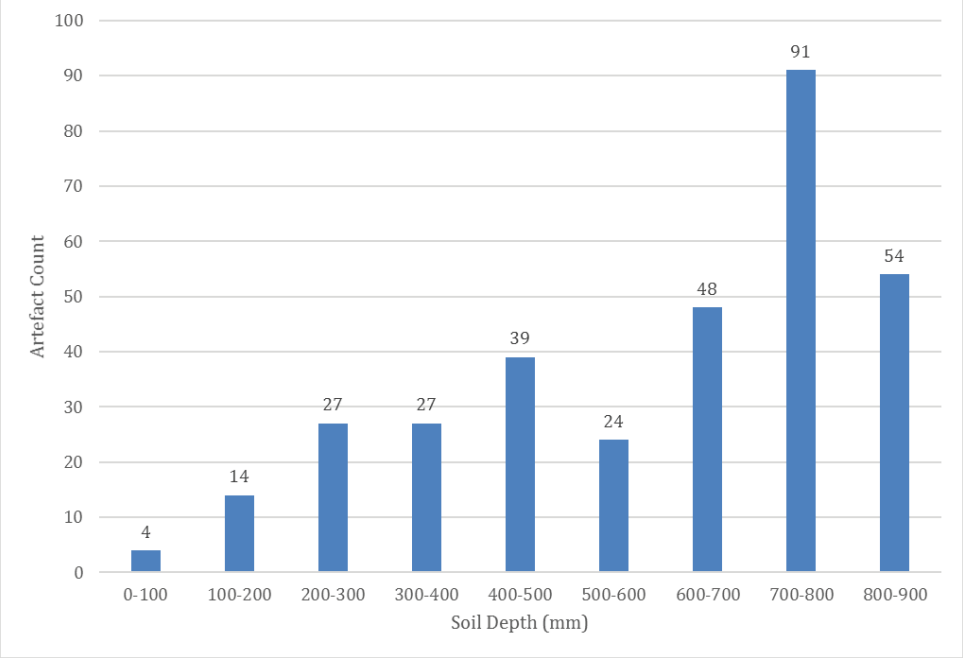
are much lower (below 10 artefacts per m^2) in transect 2, transect 3, transect 4 and transect 5 indicating lower levels of artefact discard and therefore suggesting lower levels of occupation in these areas.

Table 11 Artefact densities by Transect

Transect	Area excavated (m^2)	Artefacts (n)	Artefacts per m^2
1	1.75	180	103
2	1.5	13	9
3	2.75	6	2
4	2.75	15	5
5	1	1	1
7	0.75	67	89
8	0.5	46	92
10	0.75	10	13

Vertical distribution

In terms of vertical artefact distribution, the highest density of artefacts were recovered from a depth of 700 to 800 millimetres (27.7%, n=91), with artefact densities generally decreasing upwards and downwards in the soil profile from this depth (see Graph 1). This suggests that the period of highest density of occupation within the study area occurred during the deposition of the 700-800 millimetre soils, with occupation levels dropping off before and after this depositional period; although the presence of artefacts continuously from 0 to 900 millimetres suggests a long and continuous occupation of the study area.



Graph 1 Vertical distribution of artefacts

Artefact size in an assemblage can provide information about post depositional processes, raw material procurement and stone reduction. A useful guide to determining post-depositional processes such as trampling and bioturbation in a subsurface assemblage is the measurement of mean axial length. If the mean axial length (i.e. the size) of the artefacts decreases with depth, it is a good indicator that post-depositional processes have occurred and the stone artefacts have been displaced downwards in the soil (Richardson 1992, p. 408). Small artefacts are more likely to be affected by size sorting, for example larger numbers of smaller artefacts will occur at the base of an excavation (Baker 1978, pp. 288-289). The average axial lengths of artefacts by spit shows no clear trends with artefact size (Table 12).This suggests there is little to no post depositional movement occurring upwards or downwards in the soil profile.

Table 12 Vertical distribution of artefacts within the assemblage

Depth (mm)	Mean Axial length (mm)	Artefact Count	Percentage (%)
0-100	26.08	4	1.2
100-200	13.80071	14	4.3
200-300	14.63963	27	8.2
300-400	11.87889	27	8.2
400-500	15.84538	39	11.9
500-600	16.40083	24	7.3
600-700	12.92917	48	14.6
700-800	14.82923	91	27.7
800-900	13.185	54	16.5

6.1.2 Assemblage composition

Artefact types

The sub-surface assemblage is dominated by angular fragments, accounting for 42% (n=142) of the total assemblage. The next most recorded artefact type consists of complete flakes (25.1%, n=85), followed by distal flakes (16%, n=54. Proximal flake fragments made up 5.9% (n=20) of the assemblage. Medial flake fragments (4.4%, n=15), longitudinal flake fragments (1.88%, n=6) were also recorded in the assemblage in varying concentrations. A total of five cores were identified, three of which were single platform (0.9%) and two which were multiplatform (0.6%). A single tool was identified (0.3%) and 10 fragments of ochre were also present in the assemblage (3%) (Table 13).

During the analysis of artefacts seven instances of potlidding were observed indicating exposure to extreme heat such as fire. Potlidding occurred predominantly on angular fragments (n=6), although one complete flake also displayed potlidding (n=1).

Table 13 Artefact types within the assemblage

Complete	Count	Percentage (%)
Proximal fragment	20	5.9
Medial flake fragment	15	4.4

Complete	Count	Percentage (%)
Distal flake fragment	54	16.0
Longitudinal flake fragment	6	1.8
Single platform core	3	0.9
Multi platform core	2	0.6
Tool	1	0.3
Angular fragment	142	42.0
Complete flake	85	25.1
Ochre	10	3.0
TOTAL	**338**	**100**

Raw material

A total of seven different raw material types were recorded in the assemblage. The majority of the artefacts within the assemblage were comprised of silcrete (43.5%, n=147) or tuff (35.8%, n=121) with the remainder made up of chert (8.6%, n=29), mudstone (8%, n=27), ochre (3%, n=10), chalcedony (0.6%, n=2) and quartzite (0.6%, n=2) (Table 14).

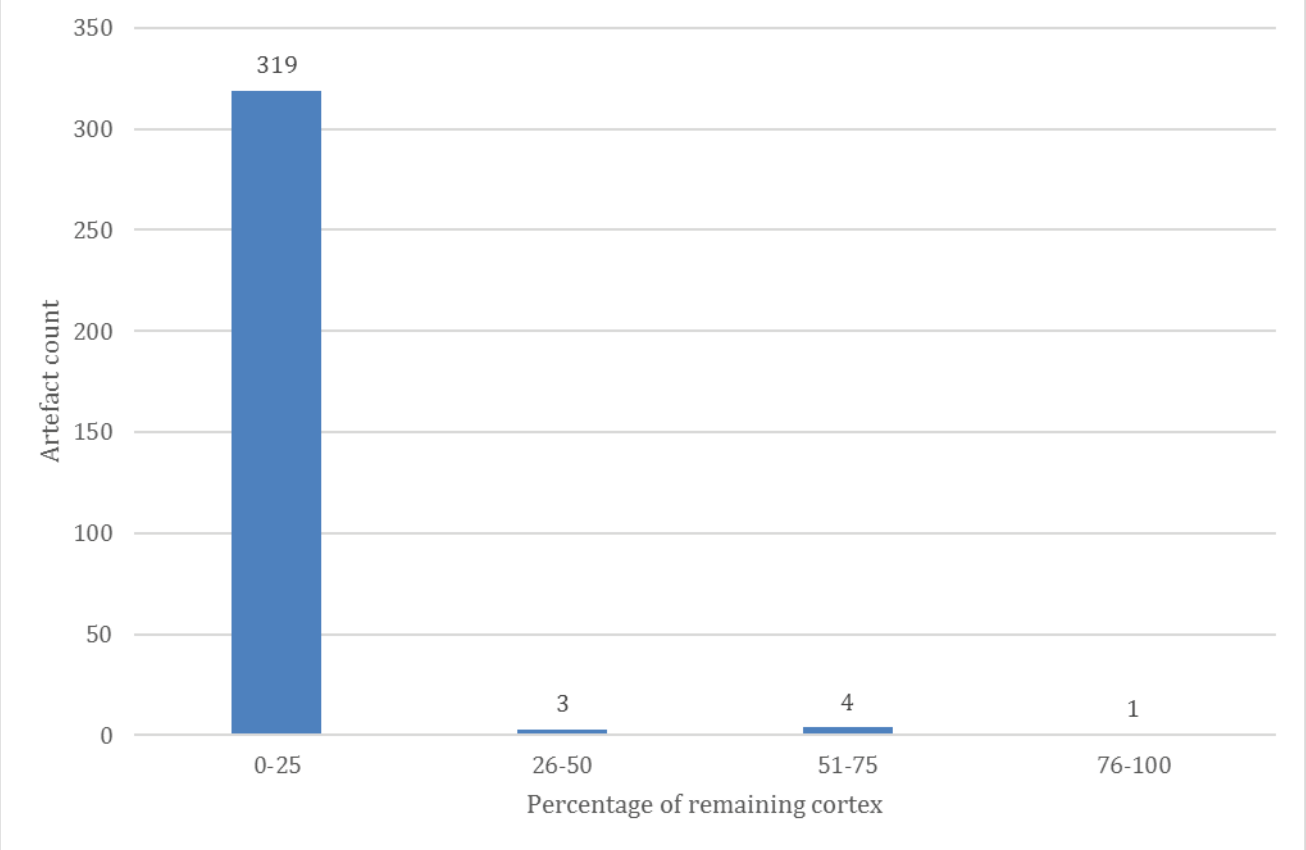
Table 14 Raw materials within the assemblage

Material	Frequency	Percentage (%)
chalcedony	2	0.6
chert	29	8.6
mudstone	27	8.0
quartzite	2	0.6
silcrete	147	43.5
Tuff	121	35.8
Ochre	10	3.0
Total	**338**	**100**

The cortex (weathered exterior of a rock) provides information about the origin of stone sources. Artefacts with a rough cortex were acquired from a primary source, such as an *in situ* outcrop. Artefacts with a smooth or water-rolled cortex originate from a secondary source, such as a river cobble from a waterway. The amount of cortex on an artefact often indicates the distance artefacts were transported from the source (Hiscock and Mitchell 1993, pp. 12-17). A high percentage of cortex on an artefact indicates that the source of stone was nearby; while artefacts with less cortex or no cortex were transported further from the source. As cores are transported away from the source they are typically highly reduced and the flakes from these cores are smaller. The amount of cortex present in an assemblage also provides information on the potential uses of a site, as cores and flakes with high cortex are often found at sites were raw material extraction was

occurring, whilst small flakes with lower percentages of cortex often dominate fauna and flora resource processing areas further from a raw material source (Odell 2004, pp. 126-127).

The levels of cortex within the assemblage was predominately low, with 97.6% (n=319) of artefacts containing less than 25% remaining cortex (Graph 2). Only 2.4% (n=8) of the artefacts within the assemblage contained more than 25% of remaining cortex. The lack of cortex indicates a highly reduced assemblage which could indicate that artefacts were transported from the raw material source following primary reduction. Observations of cortex present on artefacts showed a high degree of incipient cones present, suggesting raw material was being sourced from river cobbles and not quarried (Plate 19).



Graph 2 Percentage of cortex remaining on artefacts

Plate 19 Mudstone complete flake with cortex displaying incipient cones

Flakes

An analysis of flake features was undertaken and included an analysis of platform type, and termination type. This was done to characterise the nature of the flaked assemblage and to allow assumptions to be made on the level of the knapper's skill and technology strategies (Table 15).

Flake platforms are the remnants of a core from which a flake was removed and can provide useful information about the way a core was reduced, during what stage of reduction the flake was removed at and the skill of the knapper (Holdaway and Stern 2004, p 119). Platforms that are produced in the reduction of a raw material include a number of different types. Cortical platforms contain unmodified surfaces still containing the outer surface or cortex of a core and indicate early reduction (Holdaway and Stern 2004, p 119). Flaked platforms contain one to two flake scars and indicate a later stage of reduction compared to cortical flakes (Holdaway and Stern 2004, p 119-120). Facetted platforms contain more than two flake scars and are representative of, late stage reduction (Holdaway and Stern 2004, p 119). Crushed platforms occur when a flake platform has been damaged and no platform attributes can be recorded (Holdaway and Stern 2004, p 120). These platforms often occur when flakes are struck from unsuitable platforms and can indicate an inexperienced knapper.

The distribution of platform types shows a clear trend with flaked platforms the most common platform type (n=93, 83.8%) in the assemblage. Crushed platforms were the second most recorded platform type accounting for 12.6% (n=14) of the assemblage. Three facetted platforms (2.7%) and one cortical platform were also identified (0.9%).

The high number of flaked platforms in the assemblage indicates that cores were being heavily reduced as the platforms show evidence of previous flakes being removed from the core (Andrefsky 2005, p.97). The assemblage has a very low number of cortical platforms which shows that very few early stage reduction flakes were struck from the core at the site and is usually an indicator that reduction was occurring away from the raw material source.

Table 15 Platform types within the assemblage

Platform type	Count	Percentage (%)
cortical	1	0.9
crushed	14	12.6
facetted	3	2.7
flaked	93	83.8
Total	**111**	**100**

An analysis of termination types was also undertaken for those flakes exhibiting a termination (Table 16). The dominant termination type in the assemblage was feather termination (63.9%, n=94). Feather terminations are achieved when the knapper has struck the core at an appropriate distance from the core edge with the appropriate amount of force, meaning the knapper is showing some degree of control in the process (Holdaway and Stern 2004 pp.132-133). The second most common termination type consisted of hinge terminations (23.8%, n=35) which are most often produced when there is not enough force to detach a feather terminated flake, such as when a core is struck too far from the platform edge or an incorrect striking angle is used (Holdaway and Stern 2004, pp.132-133). Plunge terminations (7.5%, n=11) and axial terminations (2%, n=3) were present in the assemblage and occur more frequently when too much force is used in striking flakes from a core. Two step terminations were recorded (1.4%). Step terminations occur when platform and striking angles used to produce a flake are not correct. Step, hinge and plunge terminated flakes are not often a desirable product of the reduction process and can indicate whether an experienced knapper was removing flakes or not. One flake was recorded in the assemblage with a retouched termination, indicating the flake was modified for use (0.7%), and one with a bipolar termination indicating use of the bipolar flaking method of artefact production (0.7%).

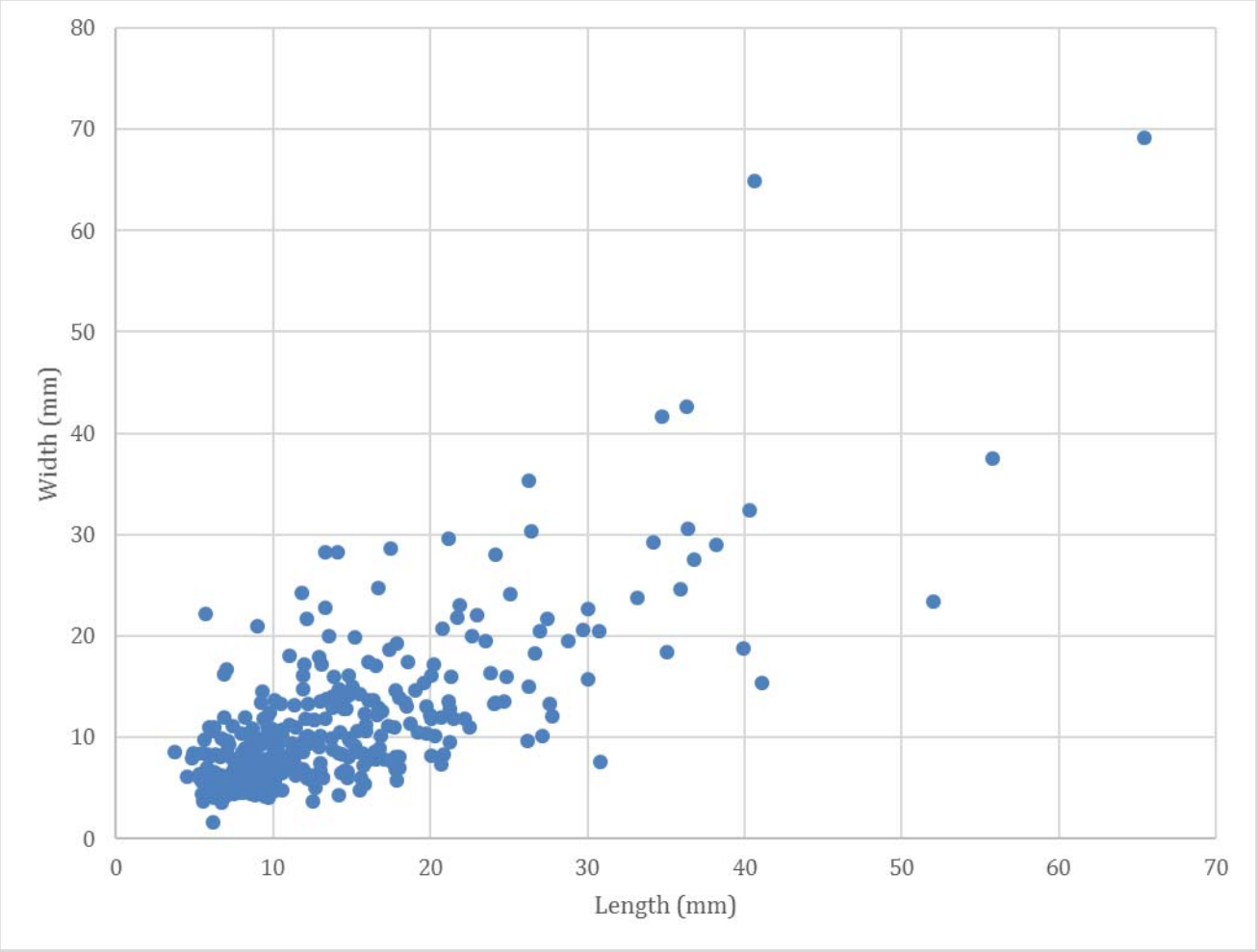
Table 16 Termination types within the assemblage

Platform type	Count	Percentage (%)
axial	3	2.0
bipolar	1	0.7
feather	94	63.9
hinge	35	23.8
plunge	11	7.5
retouched	1	0.7
step	2	1.4

Platform type	Count	Percentage (%)
Total	147	100

The overall size of artefacts within an assemblage can provide insight into the intensity and stages of reduction present at a site. Artefacts within the assemblage show a clear cluster of artefacts with less than 20 millimetres lengths and widths, suggesting the majority of artefacts are small in size and indicative of later stage or intensive reduction (Graph 3). One outlier is observable in the data showing a width and length both greater than 60 millimetres. This artefact is a result of an earlier stage of reduction than the majority of artefacts recorded in the assemblage (Plate 20).

Plate 20 Silcrete complete flake from Transect 8, Pit 2, Spit 8



Graph 3 Size distributions of artefacts

Cores

A total of five cores were identified from the test excavations, two located in transect 1, one in transect 2, one in transect 7 and one in transect 8. All cores were found within 60 metres of one another, on the southern flats landform. The core assemblage was made up of two multiplatform cores and three single platform cores, all of which displayed 0% cortex (Table 17). The average length of both core types was low, with both having average lengths less than 40 millimetres (multiplatform cores = 33.5 millimetres and single platform cores = 23.9 millimetres). Weights of cores was also quite low; although multiplatform cores (61.9 grams) were on average heavier than single platform cores (16.8 grams). The combination of low cortex, lengths and weights of cores all combine to indicate that they were highly reduced and representative of late stage reduction (Plate 21).

Table 17 Core attributes

	Count	Average Cortex %	Average Length (mm)	Average Wieght (gm)
multiplatform core	2	0	33.5	61.9
single platform core	3	0	23.9	16.8

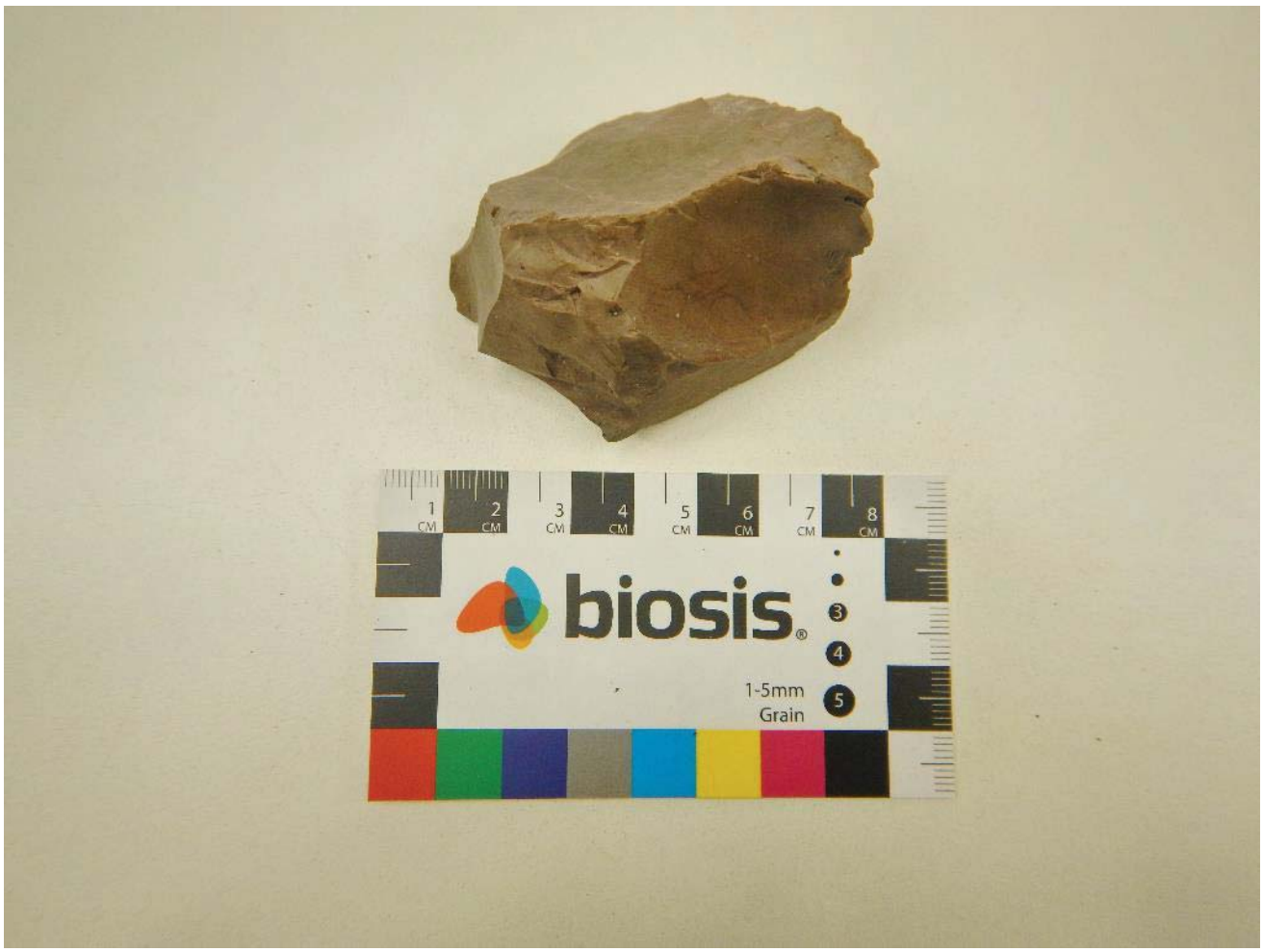


Plate 21 Tuff multiplatform core from Transect 8, Pit 1, Spit 6

Tool types

Tool analysis follows a typologically defined method of analysis where a tool type has been defined in such a way that the type is more than the sum of its attributes. This allows inferences to be made about technology, function and style of stone artefacts in an assemblage.

Recorded tools were identified by the presence of edges modified by retouch and placed into typological categories for ease of analysis. A single tool was recorded from the sub-surface excavations and consisted of a backed artefact that had been broken transversely, whether this tool was discarded during manufacture or use is not known (Plate 22).

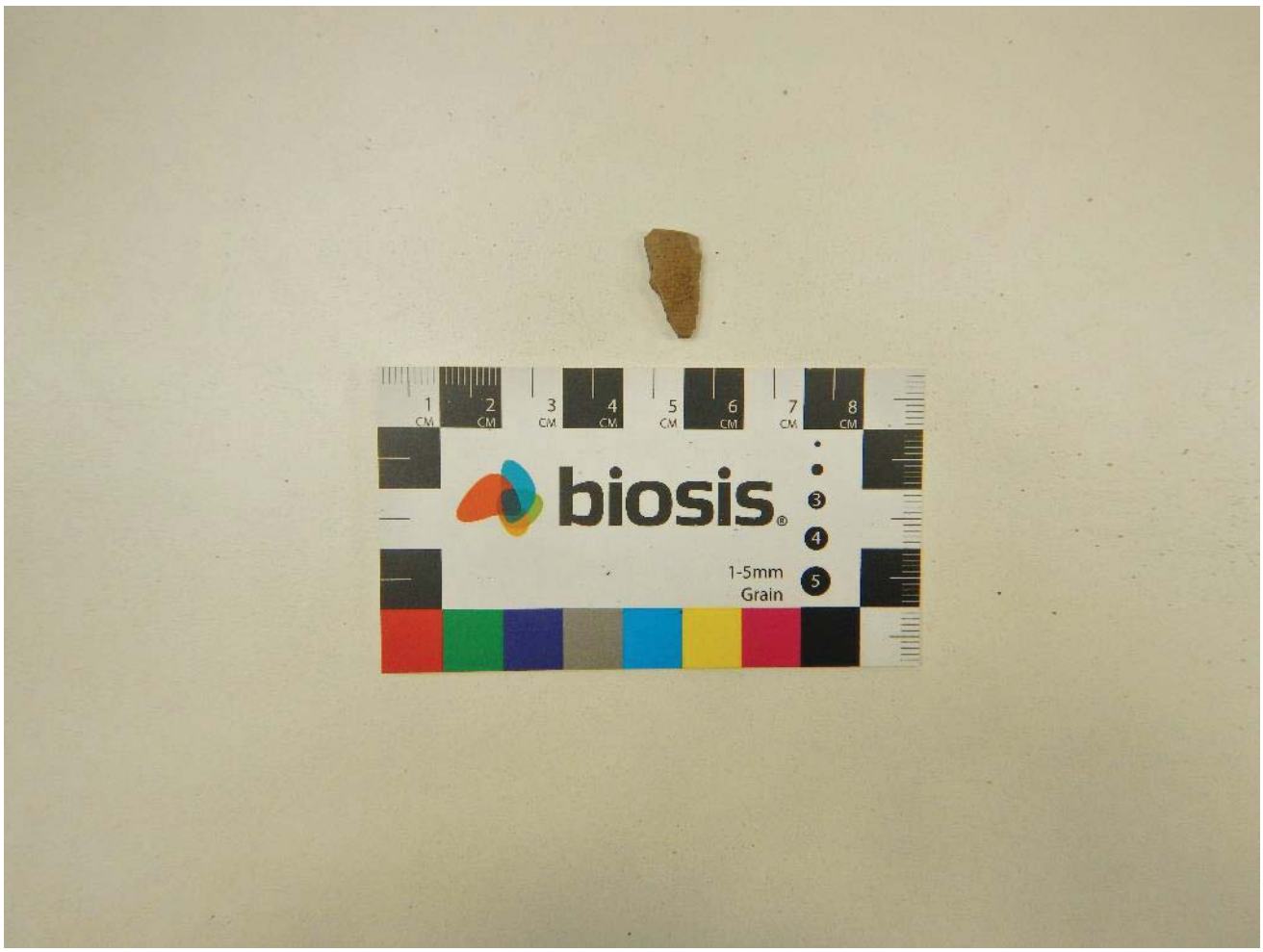


Plate 22 Transversley snapped tuff backed artefact from Transect 7, Pit 2, Spit 3

7 Discussion

A series of research questions were established prior to the commencement of archaeological test excavations. This discussion aims to answer the research questions listed below in order to achieve the test excavation aims and the overall assessment objectives outlined in Section 1.4.

- *Do artefact distributions show spatially separated occupation or activity areas?*
- *Do non-disturbed or minimally-disturbed soil profiles exist within the PADs identified in the study area?*
- *What is the nature of the lithic assemblages?*
- *Is the lithic typology similar to the assemblages from other subsurface excavations in the region?*
- *Is there an emphasis on the use of local lithic raw materials, or do non-local raw materials contribute substantially to the lithic assemblages?*
- *How old are the archaeological deposits within the study area?*
- *What management is appropriate? Does the area warrant further investigation, conservation, or could proposed development works proceed as planned?*

The above artefact analysis provides some understanding of the raw material procurement, tool manufacture and occupational patterns in the study area, allowing the research questions established as part of the test excavation methodology to be answered.

A total of 338 artefacts were recorded from the sub-surface excavations within the study area. Almost all artefacts recorded where obtained from Medowie PAD 01 (93.5%, n=306). Medowie PAD 01 is located on a flat landform bounded by a modified creek line and Campvale Swamp. The test excavations and subsequent artefact analysis have determined that this area was the most intensively occupied location within the study area. This area has been identified as a camp site exhibiting evidence of continuous long term Aboriginal occupation of the landform. This camp site has been defined as Medowie PAD 01; site boundaries for this camp site are shown in Figure 13.

Artefacts were also recorded in much lower densities in the northern section of the study area on a hillcrest and slope landform (6.5%, n=22). T4 P1 contained 14 Artefacts, while T3 P2, T3 P4, T4 P4, and T5 P2 all contained less than 5 artefacts each. These test pit locations contain low density subsurface deposits, and have been classified as Medowie PAD 02, Medowie PAD 03, Medowie PAD 04, Medowie PAD 05, and Medowie PAD 06 respectively. The presence of scattered, low density archaeological deposits throughout these landforms indicates that the entirety of the study area was utilised by Aboriginal people in the past; however, the slope and crest landform units within the study area were not the preferred location for campsites.

The soil profiles recorded during the archaeological test excavations are consistent with those described in the Tea Gardens and Medowie soil landscapes. Very few instances of observable disturbances through man made agents were noted within the test excavations. Those that were observed were restricted to the first 100-200 millimetres of deposits. Some natural disturbances such as bioturbation, and tree root activity were noted in test pits, however an analysis of artefact size sorting across spits (see Section 6.1.1), indicates there is little to no post depositional movement occurring upwards or downwards in the soil profile. This suggests that the archaeological deposits identified have been subject to low levels of post depositional disturbance.

Artefact types found in the assemblage predominately consist of unretouched flaked artefacts, including angular fragments, complete flakes, and assorted flake fragments (distal, medial, proximal and longitudinal). In addition to the flaked artefacts, five cores were identified in the study area, consisting of two multiplatform

cores and three single platforms cores. None of the cores displayed any cortex and were representative of later stage reduction. One tool was also identified, consisting of a backed artefact fragment.

The flaked assemblage was dominated by angular fragments (42%), followed by complete flakes (25.1%). Flaked artefacts were dominated by flaked platforms (83.8%) and feather terminations (63.9%). The high frequency of feather terminations indicates that the knappers had some idea of the reduction process and were able to consistently apply the correct amount of force and striking precision required to produce feather terminations. Sizes of flaked artefacts in the assemblage also indicate that the primary stage of reduction utilised at the site consisted of late stage reduction. This was evident in the lack of cortex and the general size of artefacts, most of which had length and widths less than 20 millimetres.

Raw materials used in the study area were dominated by silcrete (43.5%) and tuff (35.8%); although chert, quartzite, chalcedony and mudstone were also recorded, albeit in much smaller quantities. The levels of cortex present on artefacts and the type of cortex present showed that raw material was being transported to site after having undergone primary reduction and that river pebbles were being targeted for raw material. This was evident in the general lack of cortex on recovered artefacts with 94.4% of the assemblage having less than 25% cortex remaining, and the presence of incipient cones on cortex surfaces which is common to river cobbles.

The distribution of flakes across the study area displayed continuous concentrations throughout the soil profile. While the majority of artefacts were located between 700 and 800 millimetres, artefacts were found in all depths between 0 and 900 millimetres. The distribution of artefacts throughout the soil profile is unlikely to be the result of post-depositional processes. The amount of artefacts per spit decreased above and below the highest concentration of artefacts in the 700-800 millimetres depth range; however mean axial lengths of flakes by depth, which can indicate the degree of post-depositional disturbances (Richardson 1992, p. 408) where very similar and did not display clear trends in size sorting. This lack of post depositional disturbance combined with the extensive distribution of artefacts through the soil profile suggest that occupation of the site was continuous, with the highest period of occupation occurring during the deposition of soils present at a depth of 700-800 millimetres.

Umwelt (2011 & 2013) conducted test excavations along Medowie Road for proposed electricity supply upgrade works. The 2011 excavations were conducted in close proximity to the study area within similar landform units. The 2013 excavations were conducted both in the study area and in close proximity to the study area within similar landform units. The artefact assemblage from the Umwelt (2011) excavations is comparable to the current test excavations with a total of 370 artefacts being identified within 15 excavation areas. The Umwelt (2013) excavations identified 90 artefacts from 10 test excavation units.

The Umwelt (2011, p. 31) artefact assemblage was dominated by broken flakes (63%, n=234), which are assumed to be an all-encompassing classification for angular, distal, proximal, longitudinal and medial flake fragments, this was followed by flakes (25%, n=93). The Umwelt (2013, p. 7.13) artefact assemblage was also dominated by broken flakes (43.3% n=39) and flakes (40% n=36). Flaked pieces and heat shatter made up 10% (n=9) of the artefact assemblage, while retouched flakes including geometric microliths (n=1), bondi points (n=1), and amorphous retouched flakes (n=2) made up 4.4% of the assemblage. One manuport was also identified within the assemblage.

The Biosis assemblage contained 237 (70%) broken flakes and 85 flakes (25%) which is roughly congruent with the Umwelt 2011 excavations. The flake to broken flake ratio for the Umwelt 2013 artefact assemblage was roughly 1:1. This differs from both the Umwelt 2011, and Biosis artefact assemblages which were roughly 2:5, and 3:1 respectively. It is likely this discrepancy is a result of a much smaller sample size present within the Umwelt 2013 artefact assemblage.

Unlike the Biosis assemblage, the Umwelt (2011, p. 31) excavations identified 4 geometric microliths as well as two retouched broken flakes and six broken retouched flakes that also featured backing. This suggests geometric microlith manufacture was occurring in the Umwelt (2011) assemblage.

Silcrete was the dominant raw material type recorded by Umwelt (2011, p. 29) by a considerable margin, accounting for 93% (n=343); this was significantly higher than the Biosis excavations, although silcrete was also the most recorded by Biosis (43.5%). Silcrete was the second most recorded material type within the Umwelt (2013) assemblage at 26.7% (n=24). Tuff was the most recorded material within the Umwelt (2013, p. 7.11) assemblage at 68.8% (n=62); while it was the second most common raw material identified by Umwelt (2011, p. 29) (7%, n=26), and Biosis (35.8%).

The dominant raw material types present within the three assemblages were silcrete and tuff however, the distributions between each assemblage differed greatly. The range of raw material identified in the Biosis excavations was wider than the Umwelt excavations, with chert, mudstone and quartzite also identified by Biosis; although chert, quartzite, chalcedony and mudstone were also recorded in the Umwelt (2011) assemblage albeit in much smaller quantities. The Umwelt (2011) excavations were limited to the tea gardens soil landscape in the dune formations to the south of the current study area, while the Umwelt (2013), and Biosis excavations were conducted in both the tea gardens soil landscape and Medowie soil landscape, across the junction of the plains and lower slopes of the dune formation to the north of the Umwelt (2011) excavations. The differences between the raw material distributions between the three assemblages indicates that Aboriginal people were utilising different raw materials between camp sites. The differences in raw materials could indicate certain areas of the landscape were being utilised at different times of the year based on seasonal resources. The occupation of the landforms tested in the Umwelt (2011) excavations, may have coincided with resource gathering activities in areas where silcrete was readily available, while the occupation of the landforms tested in the Umwelt (2013), and Biosis excavations may have coincided with resource gathering activities in areas where tuff was more readily available.

The levels of cortex present on artefacts were similar in the Umwelt (2011 and 2013) and Biosis assemblages, with a generally low level of cortex present. Only six of the artefacts identified by Umwelt (2011) contained any form of cortex, while only five of the artefacts identified by Umwelt (2013, p. 7.14) contained cortex. This is similar to the Biosis assemblage which featured eight artefacts with cortex; additionally, all three assemblages featured cortex reminiscent of river pebbles. This indicates that river pebbles were being selected by Aboriginal people for reduction and that later stage reduction was occurring most predominately within all three assemblages.

No datable materials were identified during the test excavations. The presence of a backed artefact indicates that the deposits from 0-300 millimetres in depth are likely Holocene in age. Geometric microliths are generally considered to belong to the Australian small tool tradition and are commonly featured in mid-Holocene (7,000 - 4,000 BP) sites in the southern portions of Australia (Holdaway and Stern 2004, p. 17; Flood 2004, p. 224; Hiscock 1994, p. 268). Attempts to further refine the date of appearance and disappearance of backed artefacts in the archaeological record in Australia have been made (Hiscock 1994). Hiscock (1994, p. 274) however states that the only surety relating to the occurrence of backed artefacts is that they are early or mid-Holocene in age, and that they are widespread by 4,000 BP. Further detail regarding the possible age of the deposits is not possible at this stage.

8 Scientific values and significance assessment

The two main values addressed when assessing the significance of Aboriginal sites are cultural values to the Aboriginal community and archaeological (scientific) values. This report will assess scientific values while the Aboriginal Cultural Heritage Assessment Report will detail the cultural values of Aboriginal sites in the study area.

8.1 Introduction to the assessment process

Heritage assessment criteria in NSW fall broadly within the significance values outlined in the Australia International Council on Monuments and Sites (ICOMOS) *Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia ICOMOS 2013) (the Burra Charter). This approach to heritage has been adopted by cultural heritage managers and government agencies as the set of guidelines for best practice heritage management in Australia. These values are provided as background and include:

- **Historical significance** (evolution and association) refers to historic values and encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section. A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.
- **Aesthetic significance** (Scenic/architectural qualities, creative accomplishment) refers to the sensory, scenic, architectural and creative aspects of the place. It is often closely linked with social values and may include consideration of form, scale, colour, texture, and material of the fabric or landscape, and the smell and sounds associated with the place and its use.
- **Social significance** (contemporary community esteem) refers to the spiritual, traditional, historical or contemporary associations and attachment that the place or area has for the present-day community. Places of social significance have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods or events. Communities can experience a sense of loss should a place of social significance be damaged or destroyed. These aspects of heritage significance can only be determined through consultative processes with local communities.
- **Scientific significance** (Archaeological, industrial, educational, research potential and scientific significance values) refers to the importance of a landscape, area, place or object because of its archaeological and/or other technical aspects. Assessment of scientific value is often based on the likely research potential of the area, place or object and will consider the importance of the data involved, its rarity, quality or representativeness, and the degree to which it may contribute further substantial information.

The cultural and archaeological significance of Aboriginal and historic sites and places is assessed on the basis of the significance values outlined above. As well as the Burra Charter significance values guidelines, various government agencies have developed formal criteria and guidelines that have application when assessing the significance of heritage places within NSW. Of primary interest are guidelines prepared by the Australian Government, the NSW OEH and the Heritage Branch, and the NSW Department of Planning and Environment. The relevant sections of these guidelines are presented below.

These guidelines state that an area may contain evidence and associations which demonstrate one or any combination of the Burra Charter significance values outlined above in reference to Aboriginal heritage. Reference to each of the values should be made when evaluating archaeological and cultural significance for Aboriginal sites and places.

In addition to the previously outlined heritage values, the OEH *Guidelines to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011) also specify the importance of considering cultural landscapes when determining and assessing Aboriginal heritage values. The principle behind a cultural landscape is that 'the significance of individual features is derived from their inter-relatedness within the cultural landscape'. This means that sites or places cannot be 'assessed in isolation' but must be considered as parts of the wider cultural landscape. Hence the site or place will possibly have values derived from its association with other sites and places. By investigating the associations between sites, places, and (for example) natural resources in the cultural landscape the stories behind the features can be told. The context of the cultural landscape can unlock 'better understanding of the cultural meaning and importance' of sites and places.

Although other values may be considered – such as educational or tourism values – the two principal values that are likely to be addressed in consideration of Aboriginal sites and places are the cultural/social significance to Aboriginal people and their archaeological or scientific significance to archaeologists and the Aboriginal community. The determinations of archaeological and cultural significance for sites and places should then be expressed as statements of significance that preface a concise discussion of the contributing factors to Aboriginal cultural heritage significance.

8.2 Archaeological (scientific significance) values

Archaeological significance (also called scientific significance, as per the ICOMOS Burra Charter) refers to the value of archaeological objects or sites as they relate to research questions that are of importance to the archaeological community, including indigenous communities, heritage managers and academic archaeologists. Generally the value of this type of significance is determined on the basis of the potential for sites and objects to provide information regarding the past life-ways of people (Burke and Smith 2004, p 249; NPWS 1999). For this reason, the NPWS summarises the situation as 'while various criteria for archaeological significance assessment have been advanced over the years, most of them fall under the heading of archaeological research potential' (NPWS 1999, p. 26). The NPWS criteria for archaeological significance assessment are based largely on the ICOMOS Burra Charter.

Research potential

Research potential is assessed by examining site content and site condition. Site content refers to all cultural materials and organic remains associated with human activity at a site. Site content also refers to the site structure – the size of the site, the patterning of cultural materials within the site, the presence of any stratified deposits and the rarity of particular artefact types. As the site contents criterion is not applicable to scarred trees, the assessment of scarred trees is outlined separately below. Site condition refers to the degree of disturbance to the contents of a site at the time it was recorded. Table 18 and Table 19 outline the site content and site condition ratings used.

Table 18 Site contents ratings used for archaeological sites.

Rating	Description
0	No cultural material remaining.
1	Site contains a small number (e.g. 0–10 artefacts) or limited range of cultural materials with no evident

Rating	Description
	stratification.
2	Site contains a larger number, but limited range of cultural materials; and/or some intact stratified deposit remains; and/or are or unusual example(s) of a particular artefact type.
3	Site contains a large number and diverse range of cultural materials; and/or largely intact stratified deposit; and/or surface spatial patterning of cultural materials that still reflect the way in which the cultural materials were deposited.

Table 19 Site condition ratings used for archaeological sites.

Rating	Description
0	Site destroyed.
1	Site in a deteriorated condition with a high degree of disturbance; lack of stratified deposits; some cultural materials remaining.
2	Site in a fair to good condition, but with some disturbance.
3	Site in an excellent condition with little or no disturbance. For surface artefact scatters this may mean that the spatial patterning of cultural materials still reflects the way in which the cultural materials were laid down.

Pearson and Sullivan (1995, p. 149) note that Aboriginal archaeological sites are generally of high research potential because 'they are the major source of information about Aboriginal prehistory' Indeed, the often great time depth of Aboriginal archaeological sites gives them research value from a global perspective, as they are an important record of humanity's history. Research potential can also refer to specific local circumstances in space and time – a site may have particular characteristics (well preserved samples for absolute dating, or a series of refitting artefacts, for example) that mean it can provide information about certain aspects of Aboriginal life in the past that other less or alternatively valuable sites may not (Burke and Smith 2004: 247-8). When determining research potential value particular emphasis has been placed on the potential for absolute dating of sites.

The following sections provide statements of significance for the Aboriginal archaeological sites recorded during assessment. The significance of each site follows the assessment process outlined above. This includes a statement of significance based on the categories defined in the Burra Charter. These categories include social, historic, scientific, aesthetic and cultural (in this case archaeological) landscape values. Nomination of the level of value—high, moderate, low or not applicable—for each relevant category is also proposed. Where suitable the determination of cultural (archaeological) landscape value is applied to both individual sites and places (to explore their associations) and also, to the study area as a whole. The nomination levels for the archaeological significance of each site are summarised below.

Representativeness

Representativeness refers to the regional distribution of a particular site type. Representativeness is assessed by whether the site is common, occasional, or rare in a given region. Assessments of representativeness are subjectively biased by current knowledge of the distribution and number of archaeological sites in a region. This varies from place to place depending on the extent of archaeological research. Consequently, a site that is assigned low significance values for contents and condition, but a high significance value for representativeness, can only be regarded as significant in terms of knowledge of the regional archaeology. Any such site should be subject to re-assessment as more archaeological research is undertaken.

Assessment of representativeness also takes into account the contents and condition of a site. For example, in any region there may only be a limited number of sites of any type that have suffered minimal disturbance. Such sites would therefore be given a high significance rating for representativeness, although they may occur commonly within the region. Table 20 outlines the site representativeness ratings used.

Table 20 Site representativeness ratings used for archaeological sites

Rating	Description
1	Common occurrence.
2	Occasional occurrence.
3	Rare occurrence.

Overall scientific significance ratings for sites, based on a cumulative score for site contents, site integrity and representativeness are provided in Table 21.

Table 21 Scientific significance ratings used for archaeological sites

Rating	Description
1-3	Low scientific significance.
4-6	Moderate scientific significance.
7-9	High scientific significance.

Each site is given a score on the basis of these criteria – the overall scientific significance is determined by the cumulative score. The results are detailed in Table 22 below.

8.2.1 Statements of archaeological significance

The following archaeological significance assessment is based on Requirement 11 of the Code. Using the assessment criteria detailed in Scientific Values and Significance Assessment, an assessment of significance was determined and a rating for each site was determined. The results of the archaeological significance assessment are given in Table 22 below.

Table 22 Scientific significance assessment of archaeological sites recorded within the study area.

Site Name	Site Content	Site Condition	Representativeness	Scientific Significance
AHIMS 38-4-1618/ Site 38-4-1628	1	1	1	1 – low
AHIMS 38-4-1619/38-4-1627	1	1	1	1 – low
AHIMS 38-4-1970 / Medowie PAD 01	3	2	1	6 – moderate
AHIMS 38-4-1971 / Medowie PAD 02	1	1	1	3 – Low
AHIMS 38-4-1973 / Medowie PAD 03	1	1	1	3 – Low
AHIMS 38-4-1972 / Medowie PAD 04	1	1	1	3 – Low
AHIMS 38-4-1974 / Medowie PAD 05	1	1	1	3 – Low
AHIMS 38-4-1975 / Medowie PAD 05	1	1	1	3 – Low

Table 23 Statements of scientific significance for archaeological sites recorded within the study area.

Site Name	Statement of Significance
AHIMS 38-4-1618/ Site 38-4-1628	AHIMS site 38-4-1618/38-4-1628 is an open artefact site located on a crest landform unit approximately 170 metres east of a drainage line associated with permanent swampland. The site was identified during archaeological test excavations undertaken as part of an archaeological assessment for electricity supply upgrade works conducted by Ausgrid (Umwelt 2013). Two 1x1 metre test pits spaced 75 metres apart were excavated at the proposed sites of electricity transmission poles. Two flakes and one broken flake were recovered and considered to be in-situ. Test excavation undertaken by Biosis in the same landform identified a similar low density deposit, finding less than five artefacts in a test pit placed in the vicinity of the site. This site demonstrates sporadic occupation of the slope and crest landforms present within the study area. This site type is found frequently throughout the Port Stephens area and has therefore been assessed as having low archaeological significance. The site is of low historical and aesthetical value.

Site Name	Statement of Significance
AHIMS 38-4-1619/38-4-1627	AHIMS site 38-4-1619/ 38-4-1627 is an open artefact site identified within the lower slopes of a dune landform. The site was identified during archaeological test excavations undertaken as part of an archaeological assessment for electricity supply upgrade works conducted by Ausgrid. Three 1x1 metre test pits were excavated at the proposed sites of electricity transmission poles. These test pits are located approximately 20 metres from a modified drainage line associated with permanent swampland and identified a low to moderate density artefact deposit. Excavations undertaken by Biosis identified similar results. This site is located within the same landform unit as Medowie PAD 01 and likely marks the southern boundary of Medowie PAD 01. This site type is found frequently throughout the Port Stephens area and has therefore been assessed as having low archaeological significance. The site is of low historical and aesthetical value.
AHIMS 38-4-1970 / Medowie PAD 01	Medowie PAD 01 consists of a high density sub-surface artefact deposit located on a flat landform unit at the base of a slope in proximity to a modified creekline. A total of 306 artefacts were recovered from 19 test pits in an area measuring approximately 60 metres by 40 metres. The site contains a large number of materials including a range of tool types such as complete flakes, cores, and flake fragments made using different raw material types and largely intact stratified deposits. Medowie PAD 01 demonstrates ongoing long-term occupation of the study area by Aboriginal people. This site type has been identified frequently within the local region and has therefore been assessed as having moderate archaeological significance. The site has low historical and aesthetic value.
AHIMS 38-4-1971 / Medowie PAD 02	Medowie PAD 02 consists of a low density sub-surface artefact deposit located on a flat landform unit at the base of a slope. A total of 14 artefacts were recovered from a 50 centimetre by 50 centimetre test pit conducted at this location. Surrounding test pits conducted did not identify any further archaeological deposits. This site type occurs frequently in the region. This site demonstrates sporadic occupation of the flat landforms present within the study area. This site type is found frequently throughout the Port Stephens area and has therefore been assessed as having low archaeological significance. The site has been assessed as having low historical and aesthetical value.
AHIMS 38-4-1973 / Medowie PAD 03	Medowie PAD 03 consists of a low density sub-surface artefact deposit located on a flat landform unit at the base of a slope. A total of three artefacts were recovered from a 50 centimetre by 50 centimetre test pit conducted at this location. Surrounding test pits conducted did not identify any further archaeological deposits. This site demonstrates sporadic occupation of the slope and crest landforms present within the study area. This site type is found frequently throughout the Port Stephens area and has therefore been assessed as having low archaeological significance. The site has been assessed as having low historical and aesthetical value.
AHIMS 38-4-1972 / Medowie PAD 04	Medowie PAD 04 consists of a low density sub-surface artefact deposit located on a flat landform unit at the base of a slope. A total of three artefacts were recovered from a 50 centimetre by 50 centimetre test pit conducted at this location. Surrounding test pits conducted did not identify any further archaeological deposits. This site demonstrates sporadic occupation of the slope and crest landforms present within the study area. This site type is found frequently throughout the Port Stephens area and has therefore been assessed as having low archaeological significance. The site has been assessed as having low historical and aesthetical value.

Site Name	Statement of Significance
AHIMS 38-4-1974 / Medowie PAD 05	Medowie PAD 05 consists of a low density sub-surface artefact deposit located on a flat landform unit at the base of a slope. One artefact was recovered from a 50 centimetre by 50 centimetre test pit conducted at this location. Surrounding test pits conducted did not identify any further archaeological deposits. This site demonstrates sporadic occupation of the slope and crest landforms present within the study area. This site type is found frequently throughout the Port Stephens area and has therefore been assessed as having low archaeological significance. The site has been assessed as having low historical and aesthetical value.
AHIMS 38-4-1975 / Medowie PAD 05	Medowie PAD 06 consists of a low density sub-surface artefact deposit located on a flat landform unit at the base of a slope. One artefact was recovered from a 50 centimetre by 50 centimetre test pit conducted at this location. Surrounding test pits conducted did not identify any further archaeological deposits. This site demonstrates sporadic occupation of the slope and crest landforms present within the study area. This site type is found frequently throughout the Port Stephens area and has therefore been assessed as having low archaeological significance. The site has been assessed as having low historical and aesthetical value.

9 Impact Assessment

As previously outlined, the proposed works involve the construction of the Catherine McAuley Catholic College at 507 Medowie Road, Medowie NSW. The proposed works will include the following:

- demolition of existing dwelling, shed and out buildings
- construction of three stream primary school, seven stream high school, a place of worship, residential duplex, and child care centre
- associated works including car park, retaining walls, landscaping, footpaths, access roads, etc
- establishment and ongoing maintenance of Asset Protection Zones (APZs) necessary to meet bushfire protection requirements

The following avoidance strategies have been examined as part of this assessment in order to mitigate harm to archaeological AHIMS sites 38-4-1618/38-4-1628, 38-4-1619/ 38-4-1627, Medowie PAD 01, Medowie PAD 02 Medowie PAD 03, Medowie PAD 04, Medowie PAD 05, and Medowie PAD 06:

9.1 Complete or partial avoidance through redesign

The design plans and advice provided by Webber Architects indicate that impacts to the archaeological sites identified during this assessment cannot be avoided by the proposed development. The vast majority of the development footprint is contained to areas of low archaeological potential and previous disturbance. A number of ancillary structures and facilities such as tennis courts, access roads, and footpaths are proposed within the areas identified as containing subsurface archaeological deposits. The proponent has advised Biosis that a redesign in order to achieve complete or partial avoidance is not viable.

Total or partial avoidance through redesign is therefore not a practicable mitigation method.

9.2 Expected impacts

The impacts on AHIMS sites 38-4-1618/38-4-1628, 38-4-1619/ 38-4-1627, Medowie PAD 01, Medowie PAD 02 Medowie PAD 03, Medowie PAD 04, Medowie PAD 05, and Medowie PAD 06 cannot be avoided by the proposed works (Figure 14).

9.2.1 Partial

AHIMS site 38-4-1619/ 38-4-1627 extends outside of the study area, across Medowie Road towards the Pacific Dunes Golf Course. The eastern most portion of the site is located outside of the current study area and will therefore not be impacted on by the proposed works. The Diocese has indicated that the southern portion of the study area may be utilised as an overflow carpark in the future in order to accommodate for the growing school population. The use of this area as an overflow car park along with vegetation clearing activities for the purpose of maintaining the asset protection zone will impact on AHIMS site 38-4-1619/ 38-4-1627. Impacts to the site are not expected to extend beyond approximately 400 millimetres in depth. The artefact deposits within this site are known to extend to a depth of approximately 900 millimetres. The proposed works will therefore have a direct impact resulting in a partial loss of value at this site.

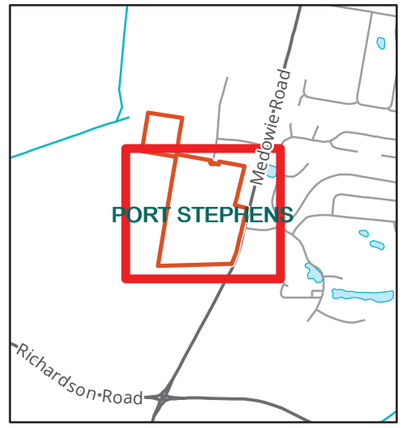
9.2.2 Total

AHIMS site 38-4-1618/38-4-1628, Medowie PAD 01, Medowie PAD 02 Medowie PAD 03, Medowie PAD 04, Medowie PAD 05, and Medowie PAD 06 cannot be avoided by the proposed works and are entirely contained within the proposed development area. Impacts to these sites will therefore be direct with a total loss of value.

A summary of impacts is provided below in Table 24.

Table 24 Summary of potential archaeological impacts

AHIMS Site No.	Site Name	Significance	Type Of Harm	Degree Of Harm	Consequence Of Harm
38-4-1618/ Site 38-4-1628	TP4 and TP5 Aboriginal Site 1	Low	Direct	Total	Total loss of value
38-4-1619/38-4-1627	TP7, TP9, TP10 – Medowie Power Aboriginal Site 2	Low	Direct	Partial	Partial loss of value
38-4-1970	Medowie PAD 01	Moderate	Direct	Total	Total loss of value
38-4-1971	Medowie PAD 02	Low	Direct	Total	Total loss of value
38-4-1973	Medowie PAD 03	Low	Direct	Total	Total loss of value
38-4-1972	Medowie PAD 04	Low	Direct	Total	Total loss of value
38-4-1974	Medowie PAD 05	Low	Direct	Total	Total loss of value
38-4-1975	Medowie PAD 06	Low	Direct	Total	Total loss of value



Legend

- Study area
- AHIMS records
- Site extent

Figure 14: Impacts to Aboriginal sites within the study area

0 25 50 75 100 125

Metres
Scale: 1:2,500 @ A3
Coordinate System: GDA 1994 MGA Zone 56

N

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 26830
Date: 03 July 2018,
Checked by: CLA, Drawn by: GD, Last edited by: lwilson
Location:P:\26800s\26830\Mapping
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9.3 Management and mitigation measures

Ideally, heritage management involves conservation of sites through the preservation and conservation of fabric and context within a framework of "*doing as much as necessary, as little as possible*" (Marquis-Kyle and Walker 1994, p. 13). In cases where conservation is not practical, several options for management are available. For sites, management often involves the salvage of features or artefacts, retrieval of information through excavation or collection (especially where impact cannot be avoided) and interpretation.

Avoidance of impacts to archaeological and cultural heritage sites through design of the development is the primary mitigation and management strategy, and should be implemented where practicable.

As noted above, the proposed works cannot avoid impacts to the archaeological sites identified within the study area. It is not feasible for the proposed works to completely avoid impacts to these sites; therefore, the following mitigation measures, which considered the principles of ecologically sustainable development (ESD) and intergenerational equity in their design, are proposed:

9.3.1 No further archaeological works at 38-4-1618/38-4-1628, 38-4-1619/ 38-4-1627, Medowie PAD 02 Medowie PAD 03, Medowie PAD 04, Medowie PAD 05, and Medowie PAD 06

Aboriginal sites 38-4-1618/38-4-1628, 38-4-1619/ 38-4-1627, Medowie PAD 02 Medowie PAD 03, Medowie PAD 04, Medowie PAD 05, and Medowie PAD 06 consist of low density subsurface artefact deposits. Impacts to these sites cannot be avoided by the proposed works. These sites have been tested as part the current and previous (Umwelt 2013) test excavation programs. The artefacts recovered during the test excavations have been catalogued and analysed which has contributed to our current knowledge of Aboriginal archaeological site type and distribution throughout the Port Stephens region. The test excavations have increased our current understanding of Aboriginal occupation in the region ensuring that any scientific and cultural information obtained can be accessed and used by future generations. Further testing and salvage of these sites is not recommended.

9.3.2 Salvage of AHIMS 38-4-1970 / Medowie PAD 01

Medowie PAD 01 site contains high density, intact subsurface archaeological deposits that cannot be avoided by the proposed works. This site should be salvaged through archaeological excavations under a CHMP prior to development (Figure 15). This ensures that the most information possible is obtained from the site prior to its destruction. Following salvage excavations an analysis of any potential archaeological objects or features identified will be undertaken to provide further information about the potential uses of the site by Aboriginal people. This not only increases current understanding of the site but increases our knowledge of Aboriginal occupation in the wider Port Stephens region and ensures that any scientific and cultural information that we obtain can be accessed and used by future generations.

9.3.3 Long term care agreement

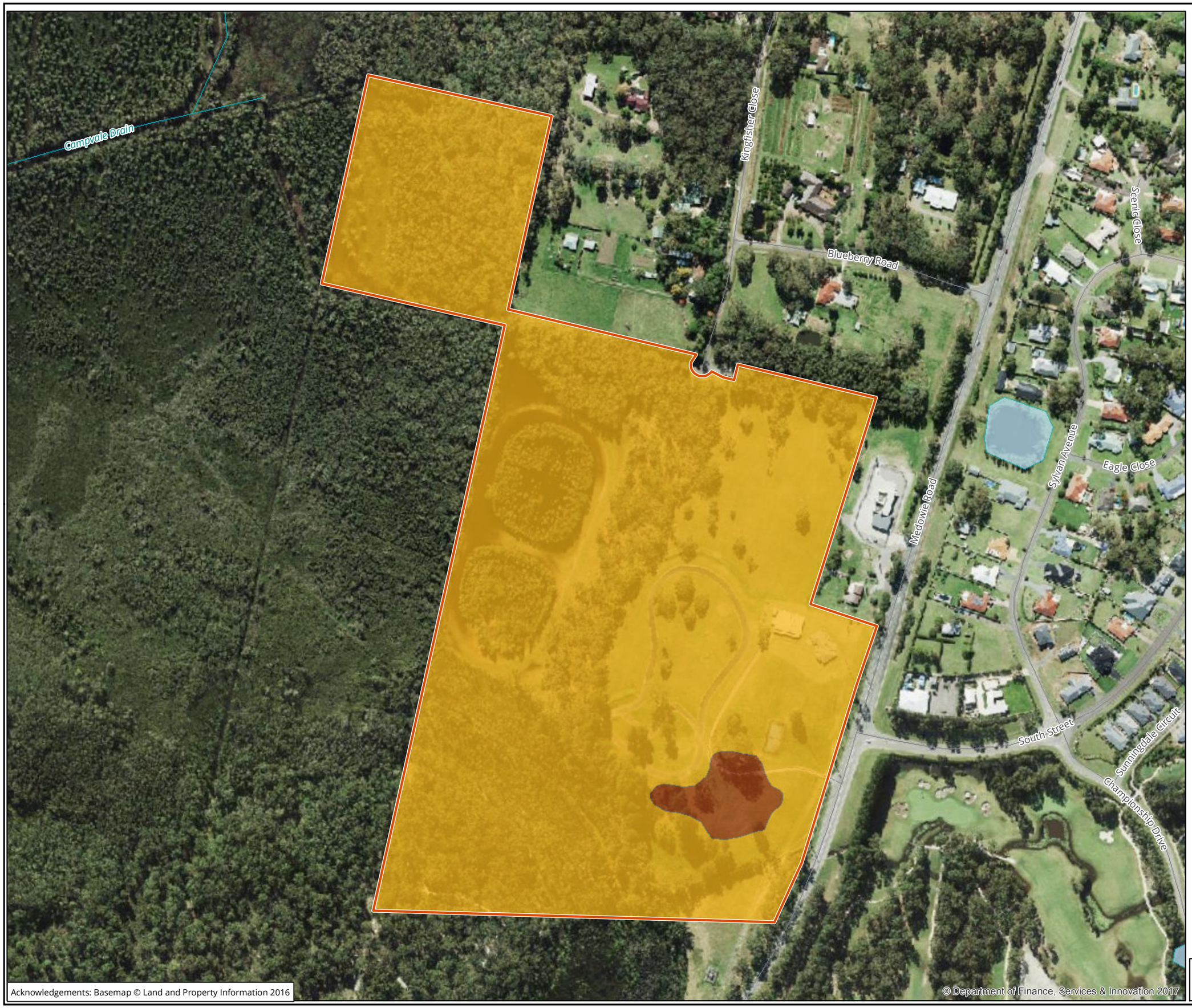
The establishment of a long term care agreement in consultation with RAPs should be developed in order to ensure the artefacts are adequately cared for. Several management options are possible depending on the wishes of RAPs. Artefacts recovered from the salvage excavations can be given back to the Aboriginal community through a long term care agreement where they can then be used to teach subsequent generations about Aboriginal culture or can be reburied in a culturally appropriate place. This approach considers the principles of ESD and intergenerational equity and more importantly ensures that recovered artefacts are managed according to the wishes of RAPs.

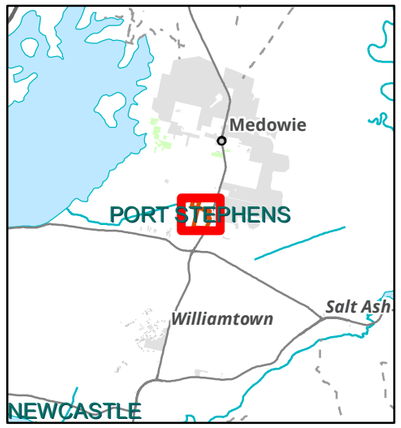
9.3.4 Fencing of archaeological sites

The archaeological sites identified during this assessment should be clearly fenced in order to prevent any unintentional impacts prior to the site being salvaged.

9.3.5 Heritage inductions

Heritage inductions for all site workers and contractors should be undertaken in order to prevent any unintentional harm to Aboriginal sites located within the study area and its surrounds.





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Study area

Salvage

Salvage not required

Area recommended for salvage

Figure 15: Recommended Salvage Area

0 30 60 90 120 150

Metres

Scale: 1:3,500 @ A3

Coordinate System: GDA 1994 NSW Lambert

N

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 26830
Date: 03 July 2018,
Checked by: AKE, Drawn by: LW, Last edited by: lharley
Location:P:\26800s\26830\Mapping
26830_F#_Salvage

10 Recommendations

The following management recommendations have been developed relevant to the study area and influenced by:

- predicted impacts to Aboriginal cultural heritage
- the planning approvals framework
- current best conservation practise, widely considered to include:
  - ethos of the Australia ICOMOS Burra Charter (2013)
  - the code.

Prior to any impacts occurring within the study area, the following is recommended:

Recommendation 1: Archaeological Salvage works

Archaeological salvage of AHIMS 38-4-1970 / Medowie PAD 01

Medowie PAD 01 has been identified as having moderate archaeological significance. The archaeological test excavations have identified a moderate to high density intact subsurface archaeological deposit (Medowie PAD 01) within a flat landform on the edge of a dune system.

If impacts on this site cannot be avoided this site should be salvaged through salvage excavations under an approved CHMP. Salvage excavations should focus on the areas of highest density along transect 1 (see Figure 15).

The boundary of Medowie PAD 01 should be fenced in order to ensure the site is not impacted on prior to the site being salvaged under an approved CHMP. Vehicle and pedestrian movement across this site should also be excluded.

No further archaeological works outside of AHIMS 38-4-1970 / Medowie PAD 01 salvage area

No further archaeological works are required within the development footprint outside of the area proposed for salvage in Figure 15. Works may proceed with caution in these areas in line with the approved CHMP.

Partial conservation of AHIMS site 38-4-1619/ 38-4-1627

The western portion of AHIMS site 38-4-1619/ 38-4-1627 is located within the study area. The first 400 millimetres of deposit within this site is expected to be impacted on by the proposed works. It is recommended the deposits below 400 millimetres in depth be conserved in order to preserve the archaeological value of this site.

Should impacts to the deposits below 400 millimetres be unavoidable, further archaeological works in the form of salvage excavations are not required.

The boundary of site 38-4-1619/ 38-4-1627 should be fenced in order to ensure the site is not impacted on prior to development approval. Vehicle and pedestrian movement across this site should also be excluded.

Recommendation 2: Development of a Cultural Heritage Management Plan (CHMP)

It is recommended that a CHMP be developed in consultation with the RAP's, DPE and OEH. The CHMP will outline Aboriginal site management requirements including the management of unexpected finds, and further works required prior to development, such as archaeological salvage works. The CHMP should also outline areas of low archaeological potential where development works are able to be undertaken without further archaeological works required.

Development of salvage methodology for AHIMS 38-4-1970 / Medowie PAD 01

The CHMP should outline a salvage methodology for Medowie PAD 01. The salvage methodology should be developed in consultation with the RAP's, DPE, and OEH.

Stop works provision – previously unidentified sites or objects

The CHMP should include a stop work provision for any potential heritage sites identified during construction, not identified as part of this assessment or the CHMP

All Aboriginal places and objects are protected under the NPW Act. This protection extends to Aboriginal objects and places that have not been identified but might be unearthed during construction. If construction proceeds, work must cease if Aboriginal objects or places are identified which have not previously been identified as part of this assessment or have not been approved for harm under a CHMP. OEH and the archaeologist must be notified to make an assessment of the find and advise on subsequent management.

Historical archaeological sites are protected under the relics provisions (s139 – 146) of the NSW *Heritage Act 1977*. Should any historical archaeological sites be identified during any phase of the proposed development, all works must cease in the vicinity of the find and the project archaeologist and OEH notified. Should the archaeological nature of the find be confirmed the Heritage Branch of the NSW Department of Planning, will require notification.

Stop works provision – Discovery of Aboriginal Ancestral Remains

The CHMP should also include a provision for the discovery of Aboriginal Ancestral Remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity the Diocese must:

- immediately cease all work at that location and not further move or disturb the remains
- notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location
- not recommence work at that location unless authorised in writing by OEH.

Heritage training and induction

The CHMP should develop a training and heritage induction for all employees, contractors and associated subcontractors working on site. The induction training should address elements related to:

- relevant legislation
- CHMP conditions
- location of identified heritage sites
- basic identification skills for Aboriginal and non-Aboriginal artefacts and human remains
- procedure to follow in the event of an unexpected heritage item find during construction works

- procedure to follow in the event of discovery of human remains during construction works
- penalties and non-compliance.

Long term care and control agreement

As part of the CHMP, a long term care agreement of artefacts should be developed for all Aboriginal artefacts identified during the test excavations and salvage works. This should be undertaken in consultation with the RAPs.

Recommendation 3: Continued consultation with the registered Aboriginal stakeholders

As per the consultation requirements, a copy of this report should be provided to the RAPs for their review and comment. The proponent must allow the registered Aboriginal parties **28 days** to provide any comments on this report. The proponent should continue to inform these groups about the management of Aboriginal cultural heritage sites within the study area throughout the life of the project.

A copy of the final report will be sent to:

- Registered Aboriginal Parties
- OEH
- AHIMS register.

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Appendices

Appendix 1 AHIMS search results

This Appendix is not to be made public.

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 26830

Client Service ID : 327732

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
38-4-0680	PAD 2: Tomaree to Tomago	AGD	56	397000	6375000	Open site	Valid	Potential Archaeological Deposit (PAD) : 0		98386,98387,100959
	Contact	**Recorders**	MCH - McCardle Cultural Heritage Pty Ltd,ERM - Thornton					**Permits**		
38-4-0678	Medowie ISF 1	AGD	56	393890	6373900	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**	1631	
38-4-0253	M D 3;	AGD	56	397300	6373700	Open site	Valid	Artefact : -	Open Camp Site	1845,102218
	Contact	**Recorders**	Ms.Bronwyn Conyers,Pam Dean-Jones,M Heath					**Permits**		
38-4-1281	Campvale AS1	GDA	56	389698	6373462	Open site	Valid	Artefact : 6		
	Contact Worimi Local Aboriginal Land	**Recorders**	Biosis Pty Ltd - Sydney,Ms.Jenni Bate					**Permits**		
38-4-0532	F1	AGD	56	393890	6373900	Open site	Valid	Artefact : -	Open Camp Site	97535
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists					**Permits**	1631	
38-4-1379	EA Williamtown 2	GDA	56	393142	6372986	Open site	Valid	Artefact : 40		102390
	Contact	**Recorders**	Umwelt (Australia) Pty Limited					**Permits**	3271,3444,4143	
38-4-1380	EA Williamtown 3	GDA	56	392867	6371655	Open site	Valid	Artefact : 2		102390
	Contact	**Recorders**	Umwelt (Australia) Pty Limited					**Permits**	3444,4143	
38-4-1597	OFOC Area 1	GDA	56	394288	6373114	Open site	Partially Destroyed	Artefact : 1		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited,Mr.Peter Saad					**Permits**	3621	
38-4-0517	Medowie Five	AGD	56	394075	6373725	Open site	Valid	Artefact : -	Open Camp Site	97535,102218
	Contact	**Recorders**	Mrs.Angela Besant					**Permits**	1631	
38-4-0518	Medowie Four	AGD	56	394000	6373745	Open site	Valid	Artefact : -	Open Camp Site	97535
	Contact	**Recorders**	Mrs.Angela Besant					**Permits**	1631	
19-4-0019	(REFER TO 38-4-0522)	AGD	56	394000	6373825	Open site	Valid	Artefact : -	Isolated Find	102218
	Contact	**Recorders**	Mrs.Angela Besant					**Permits**		
19-4-0020	(REFER TO 38-4-0521)	AGD	56	394125	6373725	Open site	Valid	Artefact : -	Isolated Find	
	Contact	**Recorders**	Mrs.Angela Besant					**Permits**		
38-4-0519	Medowie Two	AGD	56	394050	6373735	Open site	Valid	Artefact : -	Open Camp Site	97535,102218
	Contact	**Recorders**	Mrs.Angela Besant					**Permits**	1631	
38-4-0521	Medowie 1	AGD	56	394125	6373725	Open site	Valid	Artefact : -	Isolated Find	97535
	Contact	**Recorders**	Mrs.Angela Besant					**Permits**	1631	
38-4-0522	Medowie 3	AGD	56	394000	6373825	Open site	Valid	Artefact : -	Isolated Find	97535
	Contact	**Recorders**	Mrs.Angela Besant					**Permits**	1631	
38-4-0254	M D 4	AGD	56	394800	6372400	Open site	Valid	Artefact : -	Open Camp Site	1845,102218
	Contact	**Recorders**	Ms.Bronwyn Conyers,Pam Dean-Jones,M Heath					**Permits**		

Report generated by AHIMS Web Service on 13/02/2018 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 389895 - 397757, Northings : 6371940 - 6379230 with a Buffer of 1000 meters. Additional Info : For a due diligence assessment. Number of Aboriginal sites and Aboriginal objects found is 38

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
38-4-0255	M D 5	AGD	56	394500	6372300	Open site	Valid	Artefact : -	Open Camp Site	1845,102218
	Contact	**Recorders**	Ms.Bronwyn Conyers,Pam Dean-Jones,M Heath					**Permits**		
38-4-0256	M D 7	AGD	56	393100	6372300	Open site	Valid	Artefact : -	Open Camp Site	1845,102390
	Contact	**Recorders**	Ms.Bronwyn Conyers,Pam Dean-Jones,M Heath					**Permits**	3271,3444,4143	
38-4-0220	Galloping Swamp	AGD	56	391300	6372200	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Pam Dean-Jones					**Permits**		
38-4-0328	Moffats Dune;	AGD	56	396600	6374800	Open site	Valid	Artefact : -	Open Camp Site	2411,2559,102218
	Contact	**Recorders**	Mr.Matthew Barber					**Permits**	383,403,431	
38-4-0331	Moffats Swamp 2	AGD	56	394155	6373189	Open site	Partially Destroyed	Artefact : -	Open Camp Site	2578,102218
	Contact	**Recorders**	Mr.Neville Baker,Miss.Nicola Roche					**Permits**	3621	
38-4-0332	Moffats Swamp 3	AGD	56	393905	6373289	Open site	Partially Destroyed	Artefact : -	Open Camp Site	2578,102218
	Contact	**Recorders**	Mr.Neville Baker,Miss.Nicola Roche					**Permits**	469,3621	
38-3-0038	Tomago 2 TK2	AGD	56	389100	6373550	Open site	Valid	Artefact : -	Open Camp Site	1339,1964,102420
	Contact	**Recorders**	Hillary Du Cros,Laura-Jane Smith					**Permits**	3466	
38-4-0614	MS1	AGD	56	394180	6374120	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Ms.Louise Gay					**Permits**		
38-4-0615	MS2	AGD	56	394120	6374100	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Ms.Louise Gay					**Permits**	1378	
38-4-1206	EA Williamtown 1	GDA	56	393381	6373626	Open site	Valid	Artefact : 2		102390
	Contact	**Recorders**	Umwelt (Australia) Pty Limited					**Permits**	3271,3444,3644	
38-4-1634	Pole 4300-047	GDA	56	396623	6373649	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Baker Archaeology					**Permits**	4177	
38-4-1618	TP 4 & 5 Medowie Power	GDA	56	393611	6374448	Open site	Partially Destroyed	Artefact : 3		
	Contact	**Recorders**	Ms.Alison Lamond,Ms.Alison Lamond					**Permits**	3644	
38-4-1619	TP 7, 9 & 10 MedowiePower	GDA	56	393591	6374168	Open site	Partially Destroyed	Artefact : 12		
	Contact	**Recorders**	Ms.Alison Lamond,Ms.Alison Lamond					**Permits**	3644	
38-4-1620	TP3 MedowiePower	GDA	56	393476	6373883	Open site	Valid	Artefact : 10		
	Contact	**Recorders**	Ms.Alison Lamond					**Permits**	3644	
38-4-1627	TP7 9 103#########	GDA	56	393591	6374168	Open site	Partially Destroyed	Artefact : 1		

Report generated by AHIMS Web Service on 13/02/2018 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 389895 - 397757, Northings : 6371940 - 6379230 with a Buffer of 1000 meters. Additional Info : For a due diligence assessment. Number of Aboriginal sites and Aboriginal objects found is 38

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 26830

Client Service ID : 327732

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Umwelt (Australia) Pty Limited,Ms.Alison Lamond,Ms.Alison Lamond					Permits		
38-4-1628	TP5##########	GDA	56	393611	6374448	Open site	Partially Destroyed	Artefact : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Ms.Alison Lamond					Permits		
38-4-1930	HWC Pole 4318-10 access track AS	GDA	56	396055	6372571	Open site	Valid	Artefact : -		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Ms.Alison Lamond					Permits	4177	
38-4-1928	HWC Pole 4300-29 IF	GDA	56	394423	6372357	Open site	Valid	Artefact : -		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Ms.Alison Lamond					Permits	4177	
38-4-1929	RAAF Williamtown OLA Site	GDA	56	390764	6372358	Open site	Valid	Artefact : -		
	Contact	Recorders	Umwelt (Australia) Pty Limited,Ms.Alison Lamond					Permits	4177	
38-4-1904	EA Campvale 1	GDA	56	393033	6373353	Open site	Valid	Artefact : 1		
	Contact	Recorders	AMAC Group P/L,Mr.Benjamin Streat					Permits	4143	
38-4-1905	EA Campvale 2	GDA	56	392988	6373353	Open site	Valid	Artefact : 1		
	Contact	Recorders	AMAC Group P/L,Mr.Benjamin Streat					Permits	4143	
38-4-1906	EA Campvale 3	GDA	56	392988	6373353	Open site	Valid	Artefact : 1		
	Contact	Recorders	AMAC Group P/L,Mr.Benjamin Streat					Permits	4143	

Report generated by AHIMS Web Service on 13/02/2018 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 389895 - 397757, Northings : 6371940 - 6379230 with a Buffer of 1000 meters. Additional Info : For a due diligence assessment. Number of Aboriginal sites and Aboriginal objects found is 38

Appendix 2 Test excavation recordings and artefact analysis

Test Pit Number	Site	Start Depth	End Depth	Date	Landform	Notes	Inclusions	Easting	Northing
T1P1	Medowie PAD 01	0	100	21/05/2018	Flat	Lightly compacted dark grey (10YR 3/1) loamy sands. Grass roots and Humic soils for first 50 mm.	tree roots throughout test pits at spits 4-8	393499	6374231
		100	200			Lightly compacted dark grey (10YR 4/1) loamy sands.			
		200	300			Lightly compacted dark grey (10YR 4/1) loamy sands.			
		300	400			Lightly compacted dark grey (10YR 4/1) loamy sands.			
		400	500			Lightly compacted dark grey (10YR 4/1) loamy sands.			
		500	600			Lightly compacted dark grey (10YR 4/1) loamy sands, with pockets of heavily compacted sands.			
		600	700			Lightly compacted dark grey (10YR 4/1) loamy sands, with pockets of heavily compacted sands.			
		700	800			Lightly compacted dark grey (10YR 4/1) loamy sands, with pockets of heavily compacted sands.			
		800	810			Lightly compacted dark grey (10YR 4/1) sand lightly compacted with pockets of heavily compacted soil material onto coffee rock (massive organic pan)			

T1P2	Medowie PAD 01	0	100	21/05/2018	Flat	Lightly compacted dark grey (10YR 3/1) loamy sands. Grass roots and Humic soils for first 50 mm.	Grass roots. Water table disturbed base.	393521.3	6374233
		100	200			Lightly compacted dark grey (10YR 4/1) loamy sands.			
		200	300			Lightly compacted dark grey (10YR 4/1) loamy sands.			
		300	400			Lightly compacted dark grey (10YR 4/1) loamy sands.			
		400	500			Lightly compacted dark grey (10YR 4/1) loamy sands, with pockets of heavily compacted sands.			
		500	600			Lightly compacted dark grey (10YR 4/1) loamy sands, with pockets of heavily compacted sands.			
		600	700			Lightly compacted dark grey (10YR 4/1) loamy sands, with pockets of heavily compacted sands.			
		700	800			Lightly compacted dark grey (10YR 4/1) loamy sands, with pockets of heavily compacted sands.			
		800	900			Lightly compacted dark grey (10YR 4/1) loamy sands, with pockets of heavily compacted sands.			

		900	960			Lightly compacted dark grey (10YR 4/1) sand lightly compacted with pockets of heavily compacted soil material onto coffee rock (massive organic pan)			
T1P3	Medowie PAD 01	0	100	21/05/2018	Flat	Very fine sands throughout. Grass roots for first 10 cm. black sandy layer o to buff grey sandy layer finishing on coffee rock base.		393542.3	6374236
		100	200			Lightly compacted dark brown (5yr 2.5/1) sands. Grass roots and Humic soils for first 50 mm.			
		200	300			Lightly compacted dark brown (5yr 2.5/1) sands.			
		300	400			Lightly compacted dark brown (5yr 2.5/1) sands.			
		400	500			Lightly compacted buff coloured sands (5yr 6/1).			
		500	600			Lightly compacted buff coloured sands (5yr 6/1).			
		600	700			Lightly compacted buff coloured sands (5yr 6/1).			
		700	800			Lightly compacted buff coloured sands (5yr 6/1).			
		800	840			Lightly compacted buff coloured sands (5yr 6/1) finishing on Dark brown/blackish coffee rock.			

T1P4	Medowie PAD 01	0	100	21/05/2018	Flat	Lightly compacted brown (5r 4/1) sands. Grass roots and Humic soils for first 50 mm.		393568.7	6374237
		100	200			Lightly compacted brown (5r 6/1) sands.			
		200	300			Lightly compacted brown (5r 6/1) sands.			
		300	400			Lightly compacted brown (5r 6/1) sands.			
		400	500			Lightly compacted brown (5r 6/1) sands.			
		500	600			Lightly compacted brown (5r 6/1) sands.			
		600	700			Lightly compacted brown (5r 6/1) sands.			
		700	730			Moderately compacted brown (5r 3/1) sands. With increased gravel inclusions (10%). Finishing on dark brown/ blackish coffee rock.			
T1P5	Medowie PAD 01	0	100	21/05/2018	Flat	Lightly compacted black brown (7.5YR 3/1) sands. Some humic matter and grass roots in first 50mm.		393589.4	6374240
		100	200			Lightly compacted black brown (7.5YR 3/1) sands.			
		200	300			Lightly compacted grey black brown (7.5YR 3/1) sands, onto grey buff coloured (2.5yr 5/1) sands.			

		300	400			Lightly compacted onto grey buff coloured (2.5yr 5/1) sands.			
		400	500			Lightly compacted onto grey buff coloured (2.5yr 5/1) sands, onto moderately compacted onto grey buff coloured (2.5yr 5/1) sands.			
		500	600			Moderately compacted grey (2.5yr 5/1) sands.			
		600	630			Moderately compacted grey (2.5yr 5/1) sands. Finishing on compacted dark brown coffee rock layer.			
T1P6	Medowie PAD 01	0	100	21/05/2018	Flat	Lightly compacted grey sands (7.5 yr 2.5/1), humic matter and grass roots in first 50mm.		393607.3	6374240
		100	200			Lightly compacted black sands (7.5 yr 2.5/1),			
		200	300			Lightly compacted black sands (7.5 yr 2.5/1),			
		300	400			Lightly compacted black sands (7.5 yr 2.5/1),			
		400	500			Lightly compacted brown sands (7.5 yr 5/4)			
		500	600			Lightly compacted brown sands (7.5 yr 5/4)			
		600	700			Lightly compacted brown sands (7.5 yr 5/4)			

		700	720			Lightly compacted brown sands (7.5 yr 5/4). Finishing on water table.			
T1P7	Medowie PAD 01	0	100	29/05/2018	Flat	lightly compacted dark grey brown sands, humic layer and grass roots to 75mm.	tree roots throughout spits 2- 7	393477.2	6374234
		100	200			lightly compacted dark grey brown sands			
		200	300			lightly compacted dark grey brown sands			
		300	400			lightly compacted dark grey brown sands			
		400	500			lightly compacted dark grey brown sands			
		500	600			lightly compacted dark grey brown sands			
		600	700			lightly compacted dark grey brown sands			
		700	750			Lightly compacted dark grey brown sands. Compacted sand layer at 750 m			
T2P1	Medowie PAD 01	0	100	22/05/2018	Flat	Lightly Compacted mottled black brown (7.5yr 2.5/1) Sands		393592.9	6374220
		100	200			Lightly Compacted mottled black brown (7.5yr 2.5/1) Sands			
		200	300			Lightly Compacted mottled black brown (7.5yr 2.5/1) Sands			

		300	400			Lightly Compacted mottled black brown (7.5yr 2.5/1) Sands			
		400	500			Lightly Compacted mottled black brown (7.5yr 2.5/1) Sands, onto lightly compacted brown (7.5yr 3/2) sands with increased gravel inclusions (10%).			
		500	600			Lightly compacted brown (7.5yr 3/2) sands with increased gravel inclusions (10%).			
		600	700			Lightly compacted brown (7.5yr 3/2) sands with gravel inclusions (10%).			
		700	800			Lightly compacted brown (7.5yr 3/2) sands with gravel inclusions (10%).			
		800	850			Lightly compacted brown (7.5yr 3/2) sands with gravel inclusions (10%). Finishing on water table.			
T2P2	Medowie PAD 01	0	100	22/05/2018	Flat	Lightly Compacted mottled black brown (7.5yr 2.5/1) Sands	Tree roots throughout first 400 mm	393575.2	6374218
		100	200			Lightly Compacted mottled black brown (7.5yr 4/1) Sands			
		200	300			Lightly Compacted mottled black brown (7.5yr 4/1) Sands			
		300	400			Lightly Compacted mottled black brown (7.5yr 4/1) Sands			

		400	500			Lightly Compacted mottled black brown (7.5yr 4/1) Sands			
		500	600			Lightly Compacted mottled black brown (7.5yr 4/1) Sands			
		600	700			Moderately compacted brown grey (7.5yr 3/1) sands.			
		700	760			Moderately compacted brown grey (7.5yr 3/1) sands finishing on very uneven coffee rock.			
T2P3	Medowie PAD 01	0	100	22/05/2018	Flat	Lightly compacted brown sands (7.5 yr4/1).	Grass roots are present up to 100mm	393556	6374213
		100	200			Lightly compacted brown sands (7.5 yr4/1).			
		200	300			Lightly compacted brown sands (7.5 yr4/1).			
		300	400			Lightly Compacted brown sands (7.5 yr5/1).			
		400	500			Lightly Compacted brown sands (7.5 yr5/1).			
		500	600			Lightly Compacted brown sands (7.5 yr5/1).			
		600	700			Moderately Compacted Black sands (10yr 2/1).			
		700	800			Moderately Compacted Black sands (10yr 2/1).			

		800	900			Moderately Compacted Black sands (10yr 2/1).			
		900	1005			Moderately Compacted Black sands (10yr 2/1) finishing on very uneven coffee rock.			
T2P4	Medowie PAD 01	0	100	22/05/2018	Flat	Lightly compacted brown black sands (7.5yr 2.5/1).	Grass roots present for first 500mm.	393538	6374206
		100	200			Lightly compacted brown black sands (7.5yr 2.5/1).			
		200	300			Lightly compacted brown black sands (7.5yr 2.5/1).			
		300	400			Lightly compacted brown black sands (7.5yr 2.5/1) onto grey (7.5 yr 5/1) sands			
		400	500			Lightly compacted grey (7.5 yr 5/1) sands			
		500	600			Lightly compacted grey (7.5 yr 5/1) sands			
		600	700			Lightly compacted grey (7.5 yr 5/1) sands, onto moderately compacted Black sands (10 yr 2/1)			
		700	800			Lightly compacted grey (7.5 yr 5/1) sands, onto moderately compacted Black sands (10 yr 2/1)			
		800	900			Lightly compacted grey (7.5 yr 5/1) sands, onto moderately compacted Black sands (10 yr 2/1)			

		900	1001			Lightly compacted grey (7.5 yr 5/1) sands, onto moderately compacted Black sands (10 yr 2/1) finishing on coffee rock/water table.			
T2P5	Medowie PAD 01	0	100	22/05/2018	Flat	Lightly compacted Black (10yr 2/1) sands	Tree roots throughout to depths of 300 mm	393516.9	6374198
		100	200			Lightly compacted Black (10yr 2/1) sands			
		200	300			Lightly compacted Black (10yr 2/1) sands, onto grey sands (7.5 yr 5/2)			
		300	400			Lightly Compacted grey sands (7.5 yr 5/2)			
		400	500			Lightly Compacted grey sands (7.5 yr 5/2), onto lightly compacted black sands (10yr 2/1)			
		500	600			lightly compacted black sands (10yr 2/1)			
		600	700			lightly compacted black sands (10yr 2/1)			
		700	800			lightly compacted black sands (10yr 2/1)			
		800	900			Lightly compacted black sands (10yr 2/1) finishing on compacted coffee rock layer/water table.			
T2P6	Medowie PAD 01	0	100	22/05/2018	Flat	Lightly compacted Black (10yr 2/1) sands		393498.9	6374189

		100	200			Lightly compacted Black (10yr 2/1) sands	Small tree roots up to 200 mm in depth		
		200	300			Lightly compacted Black (10yr 2/1) sands			
		300	400			Lightly compacted Black (10yr 2/1) sands			
		400	500			Lightly compacted Black (10yr 2/1) sands onto greyish (7.5yr4/3) sands			
		500	600			Lightly compacted greyish (7.5yr4/3) sands			
		600	700			Lightly compacted greyish (7.5yr4/3) sands			
		700	780			Lightly compacted greyish (7.5yr4/3) sands, onto moderately compacted grey (7.5yr6/3) sands. Finishing on water table			
T3P1	N/A	0	100	24/05/2018	Simple slope	Moderately compacted light brown sandy silt (7.5yr3/2).	grass roots to 250 mm	393594.2	6374479
		100	200			Moderately compacted light brown sandy silt (7.5yr3/2).			
		200	300			Moderately compacted light brown sandy silt (7.5yr3/2) onto moderately compacted dark brown (7.2yr4/3) Silty Clay.			
		300	350			Moderately compacted dark brown (7.2yr4/3) Silty Clay. Finishing on brownish clays.			

T3P2	Medowie PAD 03	0	100	24/05/2018	Simple slope	Moderately compacted dark brown (7.2yr4/3) clayey silt.	grass roots to 150mm	393600.4	6374495
		100	200			Moderately compacted dark brown (7.2yr4/3) clayey silt.			
		200	260			Moderately compacted dark brown (7.2yr4/3) clayey silt. Finishing on brownish clays.			
T3P3	N/A	0	100	24/05/2018	Simple slope	Moderately compacted dark brown (7.2yr4/3) clayey silt.		393609.9	6374518
		100	200			Moderately compacted dark brown (7.2yr4/3) clayey silt.			
		200	300			Moderately compacted dark brown (7.2yr4/3) clayey silt.			
		300	340			Moderately compacted dark brown (7.2yr4/3) clayey silt. Finishing on brownish clays.			
T3P4	Medowie PAD 04	0	100	24/05/2018	Simple slope	Moderately compacted dark brown (7.2yr4/3) clayey silt.	grass roots to 100mm	393612	6374535
		100	200			Moderately compacted dark brown (7.2yr4/3) clayey silt.			
		200	280			Moderately compacted dark brown (7.2yr4/3) clayey silt. Finishing on brownish clays.			
T3P5	N/A	0	100	24/05/2018	Simple slope	Moderately compacted dark brown (7.2yr4/3) clayey silt.	grass roots to150mm	393619.5	6374556

		100	200			Moderately compacted dark brown (7.2yr4/3) clayey silt.			
		200	300			Moderately compacted dark brown (7.2yr4/3) clayey silt.			
		300	320			Moderately compacted dark brown (7.2yr4/3) clayey silt. Finishing on uneven brownish clays.			
T3P6	N/A	0	100	25/05/2018	Simple slope	Moderately compacted dark brown (7.2yr4/3) clayey silt.	grass roots to 150mm	393621.5	6374571
		100	200			Moderately compacted dark brown (7.2yr4/3) clayey silt.			
		200	250			Moderately compacted dark brown (7.2yr4/3) clayey silt. Finishing on brownish clays.			
T3P7	N/A	0	100	25/05/2018	Simple slope	Moderately compacted dark brown (7.2yr4/3) clayey silt.	grass roots to 100mm	393630.4	6374592
		100	200			Moderately compacted dark brown (7.2yr4/3) clayey silt.			
		200	210			Moderately compacted dark brown (7.2yr4/3) clayey silt. Finishing on brownish clays.			
T3P8	N/A	0	100	25/05/2018	Simple slope	Moderately compacted dark brown (7.2yr4/3) clayey silt.	grass roots to 100mm	393636.6	6374609
		100	200			Moderately compacted dark brown (7.2yr4/3) clayey silt.			

		200	230			Moderately compacted dark brown (7.2yr4/3) clayey silt. Finishing on brownish clays.			
T3P9	N/A	0	100	25/05/2018	Simple slope	Moderately compacted dark brown (7.2yr4/3) clayey silt.	grass roots to 100mm	393635.9	6374623
		100	200			Moderately compacted dark brown (7.2yr4/3) clayey silt.			
		200	240			Moderately compacted dark brown (7.2yr4/3) clayey silt. Finishing on brownish clays.			
T4P1	Medowie PAD 02	0	100	23/05/2018	Simple slope	Moderately compacted loamy clay (10yr2/1).	Soil profile indicates previous disturbance such as ploughing etc.	393508.7	6374597
		100	200			Moderately compacted loamy clay (10yr2/1).			
		200	300			Moderately compacted loamy clay (10yr2/1).			
		300	370			Moderately compacted loamy clay (10yr2/1), finishing on Brownish clay.			
T4P2	N/A	0	100	23/05/2018	Simple slope	Moderately compacted loamy clay (10yr2/1).	grass roots down to 100mm	393517.2	6374579
		100	200			Moderately compacted loamy clay (10yr2/1).			
		200	300			Moderately compacted loamy clay (10yr2/1), onto mottled clay (7.5 yr 3/3)			

		300	340			Mottled clay (7.5 yr 3/3). Finishing on clay.			
T4P3	N/A	0	100	23/05/2018	Simple slope	Moderately compacted loamy clay (10yr2/1).	grass roots down to 100mm	393528.5	6374564
		100	200			Moderately compacted loamy clay (10yr2/1).			
		200	250			Moderately compacted loamy clay (10yr2/1), finishing on Brownish clay.			
T4P4	Medowie PAD 05	0	100	23/05/2018	Simple slope	Moderately compacted loamy clay (7.5yr 2.5/1).	grass roots down to 100mm	393543.2	6374548
		100	200			Moderately compacted loamy clay (7.5yr 2.5/1).			
		200	300			Moderately compacted loamy clay (7.5yr 2.5/1).			
		300	320			Moderately compacted loamy clay (7.5yr 2.5/1) finishing on clay			
T4P5	N/A	0	100	23/05/2018	Simple slope	Moderately compacted Clayey loam (7.5yr 2.5/1).	grass roots down to 100mm	393557.1	6374528
		100	200			Moderately compacted Clayey loam (7.5yr 2.5/1).			
		200	290			Moderately compacted Clayey loam (7.5yr 2.5/1). Onto loamy clay (7.5 yr 4/4). Finishing on clay.			
T4P6	N/A	0	100	23/05/2018	Simple slope	Moderately compacted Clayey loam (7.5yr 2.5/1).	grass roots to 150mm	393559.6	6374513

		100	200			Moderately compacted Clayey loam (7.5yr 2.5/1).			
		200	300			Moderately compacted Clayey loam (7.5yr 2.5/1). Onto loamy clay (7.5 yr 4/4).			
		300	400			Moderately compacted loamy clay (7.5 yr 4/4)			
		400	460			Moderately compacted loamy clay (7.5 yr 4/4). Finishing on clay.			
T4P7	N/A	0	100	24/05/2018	Simple slope	Moderately compacted Clayey loam (7.5yr2.5/3).	grass roots to 150mm	393573.5	6374494
		100	200			Moderately compacted Clayey loam (7.5yr2.5/3). Onto loamy clay (7.5 yr 4/5).			
		200	300			Moderately compacted loamy clay (7.5 yr 4/5)			
		300	400			Moderately compacted loamy clay (7.5 yr 4/5)			
		400	420			Moderately compacted loamy clay (7.5 yr 4/5). Finishing on clay.			
T4P8	N/A	0	100	24/05/2018	Simple slope	Moderately compacted Clayey loam (7.5yr3/1).	Grass roots to 100 mm	393586.5	6374478
		100	200			Moderately compacted Clayey loam (7.5yr3/1).			
		200	300			Moderately compacted Clayey loam (7.5yr3/1). Onto loamy clay (7.5 yr 4/4).			

		300	330			Moderately compacted loamy clay (7.5 yr 4/4). Finishing on brown clays.			
T4P9	N/A	0	100	24/05/2018	Simple slope	Moderately compacted Clayey loam (7.5yr 2.5/1).	Grass roots to 100 mm	393593.1	6374458
		100	200			Moderately compacted Clayey loam (7.5yr 2.5/1).			
		200	300			Moderately compacted Clayey loam (7.5yr 2.5/1). Onto thin lenses of highly compacted sandy silt with charcoal inclusions likely from burnt tree stumps (7.5 yr 4/4). Finishing on clay.			
T5P1	N/A	0	100	25/05/2018	Crest	Moderately compacted loamy clay (7.5yr 2.5/1).	grass roots to 150mm, some evidence of burnt clay and charcoal on the eastern baulk	393662.6	6374411
		100	200			Moderately compacted loamy clay (7.5yr 2.5/1).			
		200	260			Moderately compacted loamy clay (7.5yr 2.5/1). Finishing on clay			
T5P2	Medowie PAD 06	0	100	25/05/2018	Crest	Moderately compacted loamy clay (7.5yr 2.5/1).	Molten glass fragment was recovered from spit 2 suggesting the deposit has	393648.5	6374415
		100	200			Moderately compacted loamy clay (7.5yr 2.5/1).			

		200	300			Moderately compacted loamy clay (7.5yr 2.5/1).	undergone disturbance in the past.		
		300	340			Moderately compacted loamy clay (7.5yr 2.5/1). Finishing on clay			
T5P3	N/A	0	100	25/05/2018	Crest	Lightly compacted loamy clay (7.5yr 2.5/1).	sparse charcoal and burnt clay to Between 300 mm and 310mm deep on the eastern baulk	393636.2	6374423
		100	200			Lightly compacted loamy clay (7.5yr 2.5/1).			
		200	300			Lightly compacted loamy clay (7.5yr 2.5/1).			
		300	400			Lightly compacted loamy clay (7.5yr 2.5/1).			
		400	420			Lightly compacted loamy clay (7.5yr 2.5/1). Finishing on clay.			
T5P4	N/A	0	100	25/05/2018	Crest	Moderately compacted loamy clay (7.5yr 2.5/1).	Grass roots to 100 mm	393624.5	6374428
		100	200			Moderately compacted loamy clay (7.5yr 2.5/1).			
		200	300			Moderately compacted loamy clay (7.5yr 2.5/1).			
		300	340			Moderately compacted loamy clay (7.5yr 2.5/1). Finishing on clay			
T6P1	N/A	0	100	27/05/2018	Simple slope	Moderately compacted Clayey loam (7.5yr 2.5/1).	grass roots to 100mm	393651.2	6374384

		100	200			Moderately compacted Clayey loam (7.5yr 2.5/1).			
		200	300			Moderately compacted clayey loam (7.5yr 3/2). Onto moderately compacted loamy clay (7.5yr 3/2) Finishing on clay			
T6P2	N/A	0	100	27/05/2018	Simple slope	Moderately compacted Clayey loam (7.5yr 2.5/1).	grass roots and small gravel (to 20mm) throughout the first 100mm then becoming sparse to 150mm	393648.2	6374363
		100	200			Moderately compacted Clayey loam (7.5yr 2.5/1).			
		200	300			Moderately compacted clayey loam (7.5yr 2.5/1)Onto moderately compacted loamy clay (7.5 3/2)			
		300	350			Onto moderately compacted loamy clay (7.5yr 3/2) Finishing on clay			
T6P3	N/A	0	100	27/05/2018	Simple slope	Moderately compacted loamy clay (7.5yr 2.5/1).	Grass roots to 80 mm	393647.9	6374342
		100	200			Moderately compacted loamy clay (7.5yr 2.5/1). Onto clay (5yr4/6)			
		200	270			A sondage was excavated in the southern section of the test pit to test the clay. 130mm of clay was removed with the clay still present when the excavation ceased			

T6P4	N/A	0	100	28/05/2018	Simple slope	Moderately compacted loamy clay (7.5yr 2.5/1).	grass roots to 150mm. slight lens of small (10mm) charcoal present at 350mm	393641.7	6374322
		100	200			Moderately compacted loamy clay (7.5yr 2.5/1).			
		200	300			Moderately compacted loamy clay (7.5yr 2.5/1).			
		300	400			Moderately compacted loamy clay (7.5yr 3/4).			
		400	420			Moderately compacted loamy clay (7.5yr 3/4). Finishing on clay			
T6P5	N/A	0	100	28/05/2018	Simple slope	Moderately compacted clayey loam (7.5yr 2.5/1).	grass roots to 150mm	393637.9	6374303
		100	200			Moderately compacted clayey loam (7.5yr 2.5/1).			
		200	300			Moderately compacted clayey loam (7.5yr 2.5/1).			
		300	400			Moderately compacted clayey loam (7.5yr 2.5/1).			
		400	500			Moderately compacted clayey loam (7.5yr 2.5/1) onto moderately compacted loamy clay (7.5yr 3/4).			
		500	520			Moderately compacted loamy clay (7.5yr 3/4). soil becomes clayeyer with depth before overlying very moist clay with some sand			

						penetrating the clay due to the moisture content			
T6P6	N/A	0	100	28/05/2018	Flat	Moderately compacted clayey loam (7.5yr 2.5/1).	grass roots to 100mm	393632.6	6374283
		100	200			Moderately compacted clayey loam (7.5yr 2.5/1).			
		200	300			Moderately compacted clayey loam (7.5yr 2.5/1).			
		300	400			Moderately compacted clayey loam (7.5yr 2.5/1).			
		400	500			Moderately compacted clayey loam (7.5yr 2.5/1).			
		500	600			Moderately compacted clayey loam (7.5yr 2.5/1). Onto lens of lightly compacted sand (5yr 6/1)			
		600	640			lightly compacted sand (5yr 6/1) overlying the clay layer			
T7P1	Medowie PAD 01	0	100	28/05/2018	Flat	Lightly compacted sands (7.5yr 5/1).	grass roots to150mm	393532.3	6374258
		100	200			Lightly compacted sands (7.5yr 5/1). Lightly compacted (5yr5/1) sands.			
		200	300			Lightly compacted (5yr5/1) sands.			
		300	400			Lightly compacted (5yr5/1) sands.			
		400	500			Lightly compacted (5yr5/1) sands.			

		500	600			Lightly compacted (5yr5/1) sands.			
		600	700			Lightly compacted (5yr5/1) sands.			
		700	800			Lightly compacted (5yr5/1) sands.			
		800	900			Lightly compacted (5yr5/1) sands.			
		900	1000			Lightly compacted (5yr5/1) sands.			
		1000	1090			Lightly compacted (5yr5/1) sands. Finishing on highly compacted sand/ coffee rock layer.			
T7P2	Medowie PAD 01	0	100	28/05/2018	Flat	Lightly compacted sands (7.5yr 5/1).	grass roots to 100mm	393556.5	6374254
		100	200			Lightly compacted sands (7.5yr 5/1). Lightly compacted (5yr 4/1) sands.			
		200	300			Lightly compacted (5yr 4/1) sands.			
		300	400			Lightly compacted (5yr 4/1) sands.			
		400	500			Lightly compacted (5yr 4/1) sands.			
		500	600			Lightly compacted (5yr 4/1) sands.			
		600	700			Lightly compacted (5yr 4/1) sands. Finishing on highly compacted sand/ coffee rock layer.			
T7P3	Medowie PAD 01	0	100	29/05/2018	Flat	Lightly compacted sands (7.5yr 5/1).	grass roots to 100mm	393575	6374250
		100	200			Lightly compacted sands (7.5yr 5/1).			
		200	300			Lightly compacted sands (7.5yr 5/1).			
		300	400			Lightly compacted sands (7.5yr 5/1).			

		400	500			Lightly compacted sands (7.5yr 5/1).			
		500	600			Lightly compacted sands (7.5yr 5/1).			
		600	700			Lightly compacted sands (7.5yr 5/1). Onto lightly compacted sands (7.5yr 2.5/2)			
		700	780			lightly compacted sands (7.5yr 2.5/2) overlying highly compacted sand/coffee rock layer			
T8P1	Medowie PAD 01	0	100	29/05/2018	Flat	Lightly compacted (5yr 4/1) sands.	grass roots to 100mm	393565.4	6374276
		100	200			Lightly compacted (5yr 4/1) sands.			
		200	300			Lightly compacted (5yr 4/1) sands.			
		300	400			Lightly compacted (5yr 4/1) sands.			
		400	500			Lightly compacted (5yr 4/1) sands.			
		500	600			Lightly compacted (5yr 4/1) sands.			
		600	700			Lightly compacted (5yr 4/1) sands.			
		700	800			Lightly compacted (5yr 4/1) sands. Onto lightly compacted sands (7.5yr 2.5/2)			
		800	850			Onto lightly compacted sands (7.5yr 2.5/2) overlying highly compacted sands/coffee rock			
T8P2	Medowie PAD 01	0	100	29/05/2018	Flat	Highly compacted sandy clay (7.5yr2.5/2).	Grass roots to 80mm, fill to	393536.7	6374276

		100	200			Highly compacted sandy clay (7.5yr2.5/2). Onto light grey natural sands (7.5r5/1)	120mm containing bullet shell.		
		200	300			Lightly compacted grey sands (7.5r5/1)			
		300	400			Lightly compacted grey sands (7.5r5/1)			
		400	500			Lightly compacted grey sands (7.5r5/1)			
		500	600			Lightly compacted grey sands (7.5r5/1)			
		600	700			Lightly compacted grey sands (7.5r5/1)			
		700	800			Lightly compacted grey sands (7.5r5/1)			
		800	900			Lightly compacted sands (7.5yr2.5/1)			
		900	920			Lightly compacted sands (7.5yr2.5/1) onto highly compacted red sands/coffee rock			
T9P1	N/A	0	100	29/05/2018	Flat	Lightly compacted silty loam (7.5 yr 3/1)	soil varies greatly throughout c2 is suggestive of formative peat	393152.3	6374732
		100	200			Lightly compacted silty loam (5yr5/8). highly mottled soil with a high vegetation content			

		200	300			Lightly compacted silty loam (5yr5/8). Highly mottled soil with a high vegetation content. Onto lightly compacted silty clay (7.5 yr 2.5/1)			
		300	400			lightly compacted silty clay (7.5 yr 2.5/1) has the appearance of peat			
		400	430			lightly compacted silty clay (7.5 yr 2.5/1) has the appearance of peat			
T9P2	N/A	0	100	29/05/2018	Flat	Lightly compacted silty loam (7.5 yr 3/1) onto lightly compacted silty loam (5yr5/8).	soil varies greatly throughout c2 is suggestive of formative peat	393132.2	6374734
T10P1	38-4-1619/38-4-1627	100	200			Lightly compacted silty loam (5yr5/8). highly mottled soil with a high vegetation content			
		200	300			Lightly compacted silty loam (5yr5/8). highly mottled soil with a high vegetation content Onto lightly compacted silty clay (7.5 yr 2.5/1)			
		300	400			lightly compacted silty clay (7.5 yr 2.5/1)			
		0	100	30/05/2018	Flat	Lightly compacted grey (2.5yr 2.5/1) sands. Some humic matter and grass roots in first 50mm.		393579.2	6374155
		100	200			Lightly compacted grey (2.5yr 2.5/1) sands.			

		200	300			Moderately compacted light grey sands (7.5yr 6/2).			
		300	400			Moderately compacted light grey sands (7.5yr 6/2).			
		400	500			Moderately compacted light grey sands (7.5yr 6/2).			
		500	600			Moderately compacted light grey sands (7.5yr 6/2) until 520 mm onto moderately compacted brownish (10 yr 2/1) loamy sands.			
		600	700			Moderately compacted brownish (10 yr 2/1) loamy sands which become redder with depth.			
		700	800			Highly compacted greyish (7.5 yr 2.5/3) sands.			
		800	900			Highly compacted greyish (7.5 yr 2.5/3) sands.			
		900	1000			Highly compacted greyish (7.5 yr 2.5/3) sands.			
		1000	1020			Highly compacted greyish (7.5 yr 2.5/3) sands. Finishing on ground water at base of spit 10			
T10P2	38-4-1619/38-4-1627	0	100	30/05/2018	Flat	Lightly compacted grey (2.5yr 2.5/1) sands. Some humic matter and grass roots in first 50mm.		393569	6374148
		100	200			Lightly compacted grey (2.5yr 2.5/1) sands.			

		200	300			Lightly compacted grey (2.5yr 2.5/1) sands to 220mm, onto moderately compacted light grey sands (7.5yr 6/2).			
		300	400			Moderately compacted light grey sands (7.5yr 6/2).			
		400	500			Moderately compacted light grey sands (7.5yr 6/2) until 440mm, onto moderately compacted brownish (10 yr 2/1) loamy sands which become redder with depth.			
		500	600			Highly compacted greyish (7.5 yr 2.5/3) sands.			
		600	700			Highly compacted greyish (7.5 yr 2.5/3) sands.			
		700	800			Highly compacted greyish (7.5 yr 2.5/3) sands.			
		800	900			Highly compacted greyish (7.5 yr 2.5/3) sands. Finishing on ground water at base of spit 9			
T10P3	38-4-1619/38-4-1627	0	100	30/05/2018	Flat	Lightly compacted grey (2.5yr 2.5/1) sands. Some humic matter and grass roots in first 50mm.		393546.4	6374142
		100	200			Lightly compacted grey (2.5yr 2.5/1) sands.			
		200	300			Lightly compacted grey (2.5yr 2.5/1) sands to 250mm, onto moderately			

						compacted light grey sands (7.5yr 6/2).			
		300	400			Moderately compacted light grey sands (7.5yr 6/2).			
		400	500			Moderately compacted light grey sands (7.5yr 6/2).			
		500	600			Moderately compacted light grey sands (7.5yr 6/2).			
		600	700			Highly compacted greyish (7.5 yr 2.5/3) sands.			
		700	800			Highly compacted greyish (7.5 yr 2.5/3) sands Finishing on ground water at base of spit 8.			

ID No.	Transect	Pit N.	Spit N.	Type	Raw material	Cortex (%)	Platform type	Platform width	Platform depth	Termination	Retouch type	Retouch location	Length (mm)	Width (mm)	Thickness (mm)	Flake scars	Tool type	Weight (gm)	Comments
1	**5**	2	2	complete	silcrete	10	crushed			feather			10.91	7.26	1.13	3		0.15	
2	**4**	1	5	complete	mudstone	0	crushed			feather	step platform preparation	dorsal	39.96	18.83	6.44	5		4.91	
3	**4**	1	5	angular fragment	silcrete	0							11.43	11.01	2.45	1		0.42	
4	**4**	1	5	distal	silcrete	0				feather			7.87	7.43	1.61	2		0.13	
5	**4**	1	5	ochre														1.78	red
6	**4**	1	5	ochre														0.74	red
7	**4**	1	5	ochre														0.76	red
8	**4**	1	5	ochre														0.52	red
9	**4**	1	5	ochre														0.31	red
10	**4**	1	5	ochre														0.17	red

11	**4**	1	6	medial	silcrete	0							24.16	28.04	7.69	3		7.86	
12	**4**	1	6	ochre														1.35	red
13	**4**	1	6	ochre														0.86	red
14	**4**	1	6	ochre														0.16	red
15	**4**	1	6	ochre														0.19	red
16	**4**	4	2	complete	silcrete	0	flaked	11.55	4.69	plunge			41.1	15.37	5.44	3	blade	4.43	
17	**10**	3	3	distal	tuff	0				hinge			21.18	29.62	6.19	3		2.18	finial
18	**10**	3	3	complete	silcrete	0	flaked	7.23	2.15	feather			12.04	11.83	2.52	1		0.45	
19	**10**	3	8	distal	mudstone	0				hinge			11.81	24.26	4.29	0		1.02	finial
20	**10**	3	8	angular fragment	mudstone	0							6.26	4.11	0.85	0		0.02	
21	**10**	3	6	complete	chert	0	flaked	12.94	1.13	hinge			15.86	12.33	4.28	2		0.81	
22	**10**	2	3	proximal	silcrete	0	flaked	4.06	0.91				10.2	9.6	2.13	2		0.17	
23	**10**	2	3	angular fragment	silcrete	0							10.08	7.27	7.27	1.82		0.15	
24	**10**	2	3	complete	silcrete	0	flaked	7.26	2.02	hinge			16.85	12.52	4.68	1		1.03	
25	**10**	2	6	angular fragment	chert	0							5.75	5.48	1.45	2		0.04	
26	**10**	1	5	medial	silcrete	0							8.06	8.57	3.08	2		0.23	
27	**1**	7	6	complete	chert	0	flaked	16.07	3.9	hinge			22.95	22.01	6.9	5		2.85	
28	**1**	7	5	complete	chert	0	flaked	8.91	3.63	feather			8.62	9.42	2.58	1		0.19	

29	**1**	7	5	distal	tuff	0				feather			13.06	17.15	4.71	2		1.12	
30	**1**	7	5	complete	quartzite	0	flaked	7.3	1.56	feather			8.69	10.82	2.16	1		0.17	
31	**1**	7	5	complete	tuff	0	flaked	8.79	2.61	step			13.53	20.01	3.19	2		0.69	
32	**1**	7	5	distal	silcrete	0				feather			9.23	9.29	1.6	0		0.14	
33	**7**	2	4	angular fragment	silcrete	0							20.23	17.18	7.25	2		2.85	
34	**7**	3	2	distal	chert	0				bipolar			21.69	21.81	6.59	6		2.64	
35	**7**	3	2	complete	chert	0	flaked	10.8	3.3	feather			8.22	11.93	3.28	1		0.4	
36	**7**	3	2	complete	silcrete	0	faceted	7.53	3.14	feather			9.46	7.86	2.91	0		0.23	
37	**7**	3	2	angular fragment	silcrete	0							11.23	9.36	1.56	0		0.32	
38	**7**	3	2	angular fragment	silcrete	0							27.75	12.11	2.87	0		1.04	heat shatter
39	**3**	4	1	complete	silcrete	0	flaked	3.56	1.51	feather			11.46	8.46	1.79	2		0.18	
40	**3**	4	1	complete	mudstone	0	faceted	18.11	5.31	plunge			25.07	24.13	4.68	3		2.63	
41	**3**	2	1	complete	mudstone	0	crushed			feather			11.98	17.16	2.78	0		0.55	
42	**3**	4	3	proximal	silcrete	0	flaked	30.38	8.79				26.46	30.37	9.78	3		10.28	
43	**3**	2	2	proximal	silcrete	0	crushed	4.38	1.5				8.93	9.09	2.88	2		0.29	
44	**3**	2	2	distal	silcrete	0				feather			11.38	7.51	2.72	3		0.23	
45	**2**	4	1	complete	silcrete	40	flaked-focal	5.83	4.14	plunge			55.81	37.54	17.82	3		30.84	
46	**2**	2	6	complete	tuff	40	flaked	10.34	6.28	feather			24.89	15.97	5.94	3		1.69	
47	**2**	2	6	angular fragment	tuff	70							33.18	23.8	14.62	0		9.83	

48	**2**	2	6	complete	silcreete	0	flaked	3.54	1.89	hinge			18.61	17.4	3.22	1		1.29	
49	**2**	2	6	angular fragment	tuff	0							7.95	8.37	3.72	0		0.24	
50	**2**	2	6	angular fragment	tuff	0							8.95	8.75	3.24	0		0.2	
51	**2**	2	6	angular fragment	tuff	0							6.76	4.97	2.29	0		0.08	
52	**2**	4	5	complete	quartzite	0	faceted	11.03	4.78	feather			17.49	28.61	4.56	1		1.47	
53	**1**	2	6	complete	tuff	0	flaked	3.08	1.37	feather			9.35	7.33	1.81	0		0.08	
54	**1**	2	6	complete	tuff		flaked	7.12	0.73	feather			7.44	6.41	1.19	2		0.06	
55	**1**	2	6	angular fragment	silcrete	0							7.27	5.18	1.63	1		0.06	
56	**1**	2	5	complete	tuff	0	flaked	21.1	5.8	feather			52.03	23.39	9.12	5		10.58	
57	**2**	3	3	single platform core	silcrete	0							36.31	42.67	23.1	2		41.41	LFS L 29.53 W 19.53
58	**2**	3	6	complete	chert	0	flaked	15.48	5.36	hinge			20.03	16.12	3.7	3		1.58	
59	**2**	3	4	angular fragment	silcrete	0							30.85	7.59	4.27	0		1.5	
60	**2**	3	4	angular fragment	chert	0							11.35	7.03	2.74	1		0.13	
61	**8**	2	7	angular fragment	silcrete	0							7.94	7.72	1.06	0		0.07	
62	**8**	2	3	complete	silcrete	0	flaked	6.84	1.92	feather			9.05	7.67	1.67	0		0.1	
63	**8**	1	5	longitudinal	silcrete	0	flaked	4.47	1.12	hinge			7.49	6.81	1.57	0		0.07	
64	**8**	1	8	angular fragment	silcrete	0							14.2	8.48	7.01	2		1.14	

65	**8**	1	8	angular fragment	silcrete	0	flaked	31.87	4.3	feather			13.31	28.22	4.16	0		1.9	
66	**8**	1	8	angular fragment	chert	0							17.33	11.17	5.21	7		0.99	
67	**8**	1	8	proximal	silcrete	0	flaked	4.84	2.07				9.6	7.49	1.45	1		0.15	
68	**8**	1	8	medial	silcrete	0							14.74	5.98	3.62	2		0.32	
69	**8**	1	8	angular fragment	chert	0							15.51	4.84	3.91	1		0.28	
70	**8**	1	8	angular fragment	silcrete	0							8.43	5.6	4.3	2		0.29	
71	**8**	1	8	complete	chert	0	crushed			feather			10.06	6.84	2.22	3		0.13	
72	**8**	1	7	angular fragment	tuff	0							7.56	5.14	0.81	0		0.04	
73	**8**	1	9	complete	silcrete	0	flaked	15.73	4.33	feather			36.78	27.51	8.5	3		7.94	
74	**8**	1	9	angular fragment	silcrete	0							14.78	9.93	6.1	1		1.1	
75	**8**	1	9	complete	mudstone	0	flaked	6.66	1.9	plunge			11.64	9.28	1.94	0		0.16	
76	**8**	1	6	multiplatform core	chert	0							40.6	64.93	42.94	4		94.12	LFS L 30.81 W 13.07
77	**8**	2	9	distal longitudinal	silcrete	0				feather			30.74	20.49	8.04	3		6.08	
78	**8**	2	9	complete	tuff	60	flaked	10.9	4.18	feather			36.38	30.55	11.58	2		9.66	
79	**8**	2	9	longitudinal	tuff	0	flaked	19.88	5.71	hinge			17.85	19.24	7.6	4		3.13	
80	**8**	2	9	angular fragment	tuff	0							15.63	8.44	6.41	2		0.96	
81	**8**	2	9	angular fragment	silcrete	0							15.94	10.59	5.94	2		1.04	

82	**8**	2	9	angular fragment	silcrete	0							8.57	7.74	4.07	0		0.37	
83	**8**	2	9	complete	tuff	0	flaked	3.54	1.55	feather			16.05	13.67	3.94	3		0.66	
84	**8**	2	9	longitudinal	chert	10	flaked	11.16	5.96	feather			11.01	11.26	5.41	0		1.08	
85	**8**	2	9	complete	tuff	0	flaked	8.59	1.4	feather			10.6	10.77	2.01	1		0.21	
86	**8**	2	9	angular fragment	mudstone	0							19.79	10.44	5.91	1		0.78	
87	**8**	2	9	complete	silcrete	0	flaked	10.09	2.81	hinge			14.26	10.47	3.93	2		0.82	
88	**8**	2	9	angular fragment	tuff	0							13.71	9.89	1.94	0		0.31	
89	**8**	2	9	angular fragment	silcrete	0							9.08	7.38	2.67	1		0.18	
90	**8**	2	9	angular fragment	silcrete	10							10.11	6.38	2.86	0		0.26	
91	**8**	2	9	angular fragment	silcrete	0							8.23	5.92	2.08	0		0.15	
92	**8**	2	9	angular fragment	chert	0							8.6	9.74	7.25	0		0.61	
93	**8**	2	9	complete	silcrete	0	crushed			feather			10.05	10.75	2.91	0		0.32	
94	**8**	2	9	angular fragment	mudstone	0							12.32	5.92	2.71	0		0.23	
95	**8**	2	9	medial	mustone	0							5.76	6.99	0.83	0		0.03	
96	**7**	2	4	angular fragment	silcrete	0							9.74	4.09	1.76	0		0.14	
97	**7**	2	4	distal	tuff	0				feather			15.75	7.22	2.65	1		0.21	
98	**7**	2	5	complete	silcrete	0	flaked	20.92	2.86	plunge			27.43	21.68	6.42	3		5.47	

99	**7**	2	5	angular fragment	tuff	0							14.87	9.71	8.27	0		0.79	
100	**7**	2	5	distal	tuff	0				feather			9.97	4.78	2.93	1		0.15	
101	**8**	2	8	complete	silcrete	0	flaked	31.76	13.35	hinge			65.43	69.11	14.25	3		104.31	
102	**8**	2	8	angular fragment	silcrete	0							19.22	10.45	5.79	2		0.91	
103	**8**	2	8	disal	tuff	0				feather			21.21	12.79	7.53	0		2.26	
104	**8**	2	8	complete	silcrete	0	flaked	16.47	11.19	feather			23.84	16.41	7.44	1		4.44	
105	**8**	2	8	distal	tuff	0				feather			22.65	20.02	4.06	0		2.07	
106	**8**	2	8	complete	tuff	0	flaked	15.36	6.09	hinge			16.61	12.17	7.44	2		1.13	
107	**8**	2	8	angular fragment	mudstone	0							6.75	6.23	4.06	0		0.11	
108	**8**	2	8	angular fragment	silcrete	0							8.21	7.21	5.3	2		0.29	
109	**8**	2	8	angular fragment	silcrete	20							12.09	10.02	3.81	2		0.37	
110	**8**	2	8	angular fragment	silcrete	0							8.57	6.14	3.06	0		0.17	
111	**7**	1	9	angular fragment	tuff	0							15.18	9.21	3.82	0		0.4	
112	**7**	1	9	angular fragment	tuff	0							12.9	9.02	4.07	0		0.59	
113	**7**	1	9	angular fragment	tuff	0							21.27	9.55	3.4	1		0.74	potlid
114	**7**	1	9	proximal		0	flaked	3.06	1.2				4.54	6.09	1.37	1		0.03	
115	**7**	1	9	angular fragment	tuff	0							11.08	8.4	1.54	0		0.1	

116	**7**	1	9	angular fragment	tuff	0							5.47	5.6	1.65	1		0.05	
117	**7**	1	9	angular fragment	tuff	0							13.02	13.56	3.12	0		0.55	
118	**7**	1	9	angular fragment	tuff	0							6.74	3.61	3.01	1		0.07	
119	**7**	1	9	angular fragment	tuff	0							6.94	4.14	2.86	0		0.09	
120	**7**	1	9	angular fragment	tuff	0							7.48	4.46	1.42	0		0.06	
121	**7**	1	9	proximal	silcrete	10	cortical	11.18	3.86				9.4	11.8	4.91	0		0.83	
122	**7**	1	9	angular fragment`	silcrete	0							16.56	7.88	1.99	0		0.41	
123	**7**	1	9	distal	silcrete	0				feather			35.09	18.4	6.1	0		3.75	
124	**7**	1	9	angular fragment`	tuff	0							15.35	10.58	3.11	0		0.41	
125	**7**	1	9	angular fragment`	tuff	0							13	7.45	2.75	1		0.22	
126	**7**	1	9	angular fragment`	tuff	0							9.12	7.15	1.95	0		0.09	potlid
127	**7**	1	9	distal	chert	0				feather			10.92	6.99	2.11	0		0.14	
128	**7**	1	9	distal	tuff	0				feather			13.79	8.85	1.46	2		0.18	
129	**7**	1	9	angular fragment	tuff	0							9.79	10.38	1.76	0		0.14	
130	**7**	1	9	angular fragment	tuff	0							8.83	4.33	0.5	0		0.03	
131	**7**	1	9	angular fragment	tuff	0							9.98	4.68	2.34	0		0.09	
132	**7**	1	7	compelte	chert	0	flaked	17.52	1.6	feather			9.8	12.41	2.29	1		0.35	

133	**7**	1	7	angular fragment	tuff	0							5.58	3.66	1.03	0		0.01	
134	**7**	1	5	medial	tuff	0							5.87	8.32	1.38	2		0.06	
135	**7**	1	2	angular fragment	tuff	0							9.47	6.13	4.55	3		0.31	
136	**8**	1	2	complete	tuff	0	flaked	3.68	1.55	hinge			4.81	7.98	1.19	0		0.05	
137	**7**	2	5	complete	silcrete	0	flaked	15.81	11.96	feather			20.01	12.22	7.07	0		2.4	
138	**7**	2	5	angular fragment	silcrete	0							16.74	8.95	2.51	0		0.43	
139	**7**	2	5	medial	silcrete	0							7.43	11.11	1.57	1		0.15	
140	**7**	2	5	angular fragment	mudstone	0							15.58	5.95	1.64	0		0.13	potlid
141	**7**	2	5	angular fragment	silcrete	0							16.49	8.55	1.14	0		0.25	
142	**7**	2	5	complete	silcrete	0	flaked	18.68	9.9	feather			20.77	20.77	23.22	0		5.96	
143	**7**	2	5	complete	silcrete	0	crushed			feather			21.88	23.06	4.6	3		3.31	
144	**7**	2	5	single platform core	silcrete	0							21.32	16.01	6.85	2		3.06	LFS L21.07 W 9.36
145	**7**	2	5	complete	mudstone	0	crushed			axial			30.01	22.68	6.19	3		3.08	
146	**7**	2	5	angular fragmetn	chert	30							22.19	11.88	9.8	2		1.8	
147	**7**	2	5	angular fragment	tuff	0							11.42	6.27	1.47	0		0.06	
148	**7**	2	3	distal	silcrete	0				feather			9.6	11.01	5.01	2		0.41	

149	**7**	2	3	distal tool	tuff	0				retouched	backing retouch	right lateral (3 flake scars)	17.77	8.12	3.96	2	backed artefact	0.53	
150	**2**	2	2	distal	tuff	0				hinge			6.31	5.66	1.63	0		0.06	
151	**7**	1	8	complete	silcrete	0	flaked	16.18	6.67	feather			14.79	16.16	6.27	2		1.19	
152	**7**	1	8	angular	silcrete	0							15.54	14.34	6.38	2		1.39	
153	**7**	1	8	angular	tuff	0							13.37	13.82	7.25	0		1.08	
154	**7**	1	8	distal	tuff	0				feather			7.12	9.71	1.01	0		0.05	
155	**7**	1	8	angular	silcrete	0							3.75	8.51	1.05	0		0.06	
156	**7**	1	8	angular	silcrete	0							17.99	7	4.97	0		0.61	
157	**7**	1	8	distal	tuff	0				feather			12.69	4.99	2.25	1		0.15	
158	**7**	1	8	angular	tuff	0							10.1	13.67	5.63	2		0.42	
159	**7**	2	6	complete	tuff	0	flaked	11.22	2.19	hinge			15.29	8.59	2.71	2		0.48	
160	**7**	2	6	complete	tuff	0	flaked	7.57	3.44	feather			4.9	8.43	3.12	1		0.12	
161	**7**	2	6	distal	tuff	0				hinge			6.73	9.94	4.01	2		0.22	
162	**7**	2	6	longitudinal	tuff	0	flaked	8.8	8.48	hinge			21.5	11.88	5.54	2		2.39	
163	**7**	1	3	complete	tuff	0	flaked	11.87	22.71	feather			12.12	21.65	6.16	1		1.65	
164	**7**	1	3	medial	tuff	0							19.78	13.03	2.87	3		0.72	
165	**7**	1	3	proximal	tuff	0	flaked	6.74	0.97				18.06	13.88	1.41	2		0.35	
166	**7**	1	3	proximal	tuff	0	flaked	7.04	2.85				5.32	5.95	1.89	0		0.11	

167	**7**	1	3	angular	tuff	0							7.46	7.88	0.55	0		0.03	
168	**7**	1	3	distal	silcrete	0				feather			15.97	7.75	2.98	0		0.25	
169	**1**	1	17	compelte	silcrete	0	flaked	16.12	9.32	feather			30.02	15.77	6.4	1		3.61	
170	**1**	1	17	complete	mudstone	0	flaked	21.15	9.26	feather			8.98	21.01	4.07	0		1.07	
171	**1**	1	17	proximal	mudstone	0	flaked	4.19	1.04				12.91	17.92	3.35	3		0.53	
172	**1**	1	17	distal	mudstone	0				feather			11.05	18.04	2.85	2		0.29	
173	**1**	1	17	angular	mudstone	0							14.42	8.36	1.69	0		0.21	
174	**1**	1	17	angular	mudstone	0							8.92	5.85	1.07	0		0.04	
175	**1**	1	17	angular	mudstone	0							12.36	9.47	3.09	0		0.26	
176	**1**	1	17	angular	tuff	0							14.16	13.55	2.79	0		0.34	
177	**1**	1	17	complete	mudstone	0	flaked	3.92	1.02	hinge			6.26	11.02	0.73	0		0.08	
178	**1**	1	17	angular	mudstone	0							12.5	3.7	2.07	0		0.06	
179	**1**	1	17	complete	silcrete	0	flaked	6.15	2.15	feather			9.2	13.4	2.33	1		0.21	
180	**1**	1	17	complete	tuff	0	flaked	12.47	1.95	feather			9.48	11.8	2.22	0		0.13	
181	**1**	1	17	angular	tuff	0							15.04	15.04	3.87	0		0.25	
182	**1**	1	17	angular	tuff	0							8.92	6.45	2.4	0		0.12	
183	**1**	4	7	complete	silcrete	0	flaked	15.72	9.59	feather			27	20.53	6.33	4		7	
184	**1**	4	7	medial	silcrete	0							11.88	14.77	4.36	0		1.06	
185	**1**	4	7	angular	silcrete	0							5.96	5.1	1.67	0		0..08	

186	**1**	4	7	angular	silcrete	0							7.95	7.82	4.92	0		0.19	
187	**1**	4	7	angular	silcrete	0							10.53	4.84	2.59	1		0.2	
188	**1**	4	7	angular	tuff	0							16.57	17.12	5.88	0		2.21	
189	**1**	4	7	distal	tuff	0				feather			5.67	22.14	3.42	0		0.36	
190	**1**	1	9	angular	silcrete	0							8.57	6.31	1.15	0		0.08	
191	**1**	1	9	proximal	silcrete	0	crushed						5.95	8.05	0.91	1		0.06	
192	**1**	1	9	angular	tuff	0							10.3	9.27	3.6	0		0.23	
193	**1**	1	9	distal	silcrete	0				feather			13.33	11.9	3.94	2		0.38	
194	**1**	1	9	angular	silcrete	0							10.66	8.02	2.32	1		0.14	
195	**1**	1	9	angular	silcrete	0							6.29	6.45	1.49	0		7.73	
196	**1**	1	9	distal	silcrete	0				feather			6.65	8.09	1.85	1		0.08	
197	**1**	1	9	distal	silcrete	0				feather			7.06	8.58	2.08	0		0.11	
198	**1**	1	9	angular	tuff	0							10.05	8.62	2.41	1		0.16	
199	**1**	1	13	compelte	tuff	0	flaked	12.54	3.46	feather	overhang removal		18.41	13.42	4.37	3		1.17	
200	**1**	1	13	distal	tuff	0				axial			7.64	7.5	1.9	2		0.14	
201	**1**	3	7	complete	chert	15	flaked	19.23	6.28	plunge			35.89	24.6	11.18	2		7.56	
202	**1**	3	7	distal	tuff	0				feather			17.11	7.79	2.7	2		0.33	
203	**1**	3	7	proximal	tuff	0	flaked	6.99	1.43				14.53	12.78	3.67	3		0.61	
204	**1**	3	7	complete	silcrete	0	flaked	5.37	1.21	feather			14.74	6.6	1.95	3		0.19	

205	**1**	3	7	angular	silcrete	0							9.99	6.77	1.27	1		0.16	
206	**1**	3	7	complete	silcrete	0	flaked	4.61	1.68	feather			8	10.34	2.54	1		0.19	
207	**1**	3	7	complete	chert	80	flaked	11.6	3.15	feather			9.59	12.05	2.51	0		0.35	
208	**1**	3	7	medial	chert	0							9.18	7.76	1.68	2		0.09	
209	**1**	3	7	angular	silcrete	0							8.9	4.64	2.24	0		0.06	
210	**1**	3	7	angular	tuff	0							17.99	8.02	6	2		0.64	
211	**1**	3	7	angular	chert	0							16.84	10.12	5.37	0		0.55	
212	**1**	3	7	complete	chert	0	flaked	5.88	2.4	hinge			11.47	6.46	2.26	1		0.18	
213	**1**	3	7	angular	tuff	0							13.13	5.98	3.57	0		0.18	
214	**1**	3	7	angular	silcrete	0							7.62	5.04	2.47	0		0.11	
215	**1**	3	7	angular	silcrete	0							9.46	4.23	2.98	2		0.14	
216	**1**	3	7	angular	silcrete	0							6.19	1.63	1.53	0		0.01	
217	**1**	1	12	proximal	silcrete	0	flaked	12.84	6.63				34.22	29.23	7.94	5		10.24	
218	**1**	1	11	angular	silcrete	0							10.26	6.27	2.6	2		0.12	
219	**1**	1	11	distal	silcrete	0				feather			8.68	7.03	1.4	0		0.08	
220	**1**	3	3	longitudinal	silcrete	0	flaked	12.21	4.08	plunge			19.06	14.6	4.72	2		1.64	
221	**1**	3	3	proximal	tuff	0	crushed						12.18	13.26	2.56	3		0.33	
222	**1**	3	3	proximal	silcrete	0	flaked	5.51	3.29				8.63	8.63	2.94	1		0.27	
223	**1**	3	3	medial	silcrete	0							14.58	6.69	1.92	2		0.23	

224	**1**	3	3	angular	silcrete	0							7.44	5.76	1.94	2		0.1	
225	**1**	3	3	distal	tuff	0				feather			10.11	5.67	1.38	0		0.09	
226	**1**	4	3	multiplatform core	chert	0							26.3	35.32	27.23	11		29.74	LFS L 10.84 W 25.74
227	**1**	4	3	single platform core	silcrete	0							14.16	14.74	17.91	3		5.92	LFS L 8.45 W 7.21
228	**1**	4	3	angular	chert	0							9.6	7.52	2.36	0		0.16	potlid
229	**1**	4	3	angular	silcrete	0							13.02	10.17	4.69	2		0.49	
230	**1**	4	3	distal	silcrete	0				feather			11.94	8.55	4.9	2		0.5	
231	**1**	3	8	complete	chert	0	flaked	6.94	2.31	hinge			7.06	9.48	2.06	0		0.18	
232	**1**	3	8	complete	tuff	60	flaked	18.39	5.02	fether			16.69	24.72	12.14	1		5.34	
233	**1**	3	8	angular	tuff	0							24.67	13.6	2.78	0		1.54	
234	**1**	3	8	proximal	tuff	0	flaked	9.1	7.52				10.51	13.36	5.77	4		0.82	
235	**1**	3	8	complete	tuff	0	crushed			hinge			13.75	14.03	2.3	2		0.3	
236	**1**	3	8	angular	tuff	0							17.86	5.81	4.82	0		0.28	
237	**1**	3	8	complete	silcrete	0	flaked	6.64	2.17	feather			7.78	6.75	2.28	2		0.15	
238	**1**	3	8	complete	tuff	0	flaked	9.41	4.11	hinge			15.84	5.39	3.93	0		0.46	potliddin g
239	**1**	3	8	complete	tuff	0	flaked	9.67	5.72	hinge			29.75	20.61	8.73	1		5.28	
240	**1**	3	8	angular	chalcedony	0							22.49	10.95	6.15	1		1.38	
241	**1**	3	8	compete	silcrete	0	flaked	10.04	4.83	feather			23.55	19.48	5.13	3		2.16	