

# Calga Sand Quarry Southern Extension

## Aboriginal Heritage Assessment

Prepared by:  
Archaeological Surveys and Reports Pty Ltd

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Specialist Consultant Studies Compendium  
Part 4



# Calga Sand Quarry Southern Extension

## Aboriginal Heritage Assessment

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## **EXECUTIVE SUMMARY**

This investigation was performed for R.W. Corkery & Co. Pty Limited (RWC) on behalf of Rocla Materials Pty Ltd (Rocla), the Proponent. Rocla has contracted RWC to prepare an Environmental Assessment for the proposed southern extension of the Calga Sand Quarry.

The Project Site is approximately one kilometre to the northwest of the Calga Interchange, at the junction of Peats Ridge Road and the Newcastle Freeway (F3), approximately 11km to the west of Gosford on the NSW Central Coast. The Project Site covers an area of 130 ha, and comprises three parcels of land, Lots 1 and 2, DP 805358 and Lot 2, DP 229889 at Calga, Parish of Cowan, County of Northumberland. Rocla has identified an area of approximately 56ha within the Project Site for potential sand extraction.

The scope of works provided to Archaeological Surveys & Reports Pty Ltd (ASR) was to conduct an archaeological investigation of the Project Site with the assistance of a representative/s of the Darkinjung Local Aboriginal Land Council (LALC), and to identify any Aboriginal sites and relics that might be present that may constrain sand extraction on the Project Site. The results of the investigation were to be presented in a report, which was to include an assessment of the significance of any cultural relics or places identified, an appraisal of the options and opportunities arising from the discoveries, and clear recommendations for the management of those cultural resources identified.

Five sites were recorded during the investigation, a group of axe grinding grooves, two rock engravings, a stone arrangement, and a shelter with art and occupation deposits. The axe grinding groove site was previously recorded on the AHIMS site register as Site #45-3-132, and duplicated in error and listed as Site #45-3-2196, and one of the rock engravings was listed as Site #45-3-2195 and also as Site #45-3-0119. The art site and the stone arrangement are new sites, and Site Recording Forms will be lodged with DECC to list the sites on the AHIMS site register. None of the sites occur within the proposed sand extraction area or within the footprint of likely impacts from ancillary works.

As a consequence of this investigation, the survey area is believed to contain five sites of Indigenous cultural significance, comprising of three previously recorded sites and two new sites, a shelter with art and occupation deposits, and a stone arrangement. None of the sites occurs within the footprint of the proposed sand extraction area.

Darkinjung LALC made the following recommendations.

- That some form of burn off be implemented so as to assist with the investigation of sites not found.
- There should be a buffer zone at least 20m wide around any sites that exist within *(the vicinity of)* the impact zone.
- There should be sedimentation controls emplaced to limit sedimentation of the creeks that would otherwise adversely affect any Aboriginal sites in the creeks.
- Those whose job it is to remove any vegetation within the Project Zone should be informed of the site types that might be present, and what to do if any such sites are observed.
- That Darkinjung LALC should be informed if and when any sites are found.

ASR agrees with the land council's recommendations and adds the following additional recommendation.

- The Quarry Manager should give Darkinjung LALC at least 5 days notice of any future clearing or earthmoving activities within the Project Site.

In addition, the Proponent is advised that they are legally obliged to comply with the following provisions of the National Parks and Wildlife Act 1974 (as amended), which state that.

The owners, and their employees, earthmoving contractors, subcontractors, machine operators and their representatives, whether working in the survey area or elsewhere, should be instructed that in the event of any bone or stone artefacts, or discrete distributions of shell, or any objects of cultural association, being unearthed during earthmoving, work should cease immediately in the area of the find.

In the event that any bone cannot be clearly identified by a qualified archaeologist as being of animal remains the Gosford police station is to be informed of its discovery, and officials and/or their representatives of the Darkinjung Local Aboriginal Land Council, and the Department of Environment and Climate Change, Dubbo, advised that the bone is subject to police investigation.

Work should not recommence in the area of the find, until both the police (if bone has been found) and those officials or representatives have given their permission to do so. Those failing to report a discovery and those responsible for the damage or destruction occasioned by unauthorised removal or alteration to a site or to archaeological material may be prosecuted under the National Parks and Wildlife Act 1974, as amended.



# **1 INTRODUCTION**

## **1.1 Scope, Objectives and Report Format**

This investigation was performed for R.W. Corkery & Co. Pty Limited (RWC) on behalf of Rocla Materials Pty Ltd (Rocla), the Proponent. This report has been completed to provide an assessment of the potential impact of the proposed southern extension of the Calga Sand Quarry ("the Project") on Aboriginal heritage and to meet the Director-General's requirements issued by the Department of Planning for the preparation of the *Environmental Assessment* for the Project. Rocla has contracted RWC to prepare an *Environmental Assessment* for the Project.

### **Scope**

The scope of works provided to Archaeological Surveys & Reports Pty Ltd (ASR) was to conduct an archaeological investigation of the land on which the proposed quarry extension would be undertaken ("the Project Site" - see Section 1.3) with the assistance of a representative of the Darkinjung Local Aboriginal Land Council (LALC), and to identify any Aboriginal sites and relics that might be present, which may constrain sand extraction on the Project Site. The results of the investigation are presented in a report, which includes an assessment of the significance of any cultural relics or places identified, an appraisal of the options and opportunities arising from the discoveries, and clear recommendations for the management of those cultural resources identified.

### **Objectives**

The objectives of this report are to describe the archaeological investigation of the Project Site and to record the archaeological relics and sites that were identified. Further, the report documents consultation process with the Aboriginal community, the participation of the Darkinjung LALC (and other archaeologists) in the field survey, and their recommendations as to the future management of the sites identified during this investigation as well as those identified by others during previous investigations. In addition, the report includes a discussion of the results of the investigation in the context of other known sites in the area. Finally, the report includes a series of recommendations for the future development of the proposed southern extension of the Calga Sand Quarry.

### **Report Format**

The report is presented in the following format.

- |    |                           |     |                         |
|----|---------------------------|-----|-------------------------|
| i  | Executive Summary         |     |                         |
| ii | Contents                  |     |                         |
| 1. | Introduction              | 6.  | The Survey              |
| 2. | Aboriginal Consultation   | 7.  | The Results             |
| 3. | The Environmental Context | 8.  | Discussion              |
| 4. | The Archaeological Record | 9.  | Significance Assessment |
| 5. | Models for Site Location  | 10. | Recommendations         |

## 1.2 The Project Site and Survey Area

For the purposes of this document, the area of land, which is the subject of the application for Project Approval, is referred to as the "Project Site". This area covers both the existing Stages 1, 2 and 3 within the Calga Sand Quarry operation on Lot 2, DP229889, and Stages 4 and 5 of the proposed Southern Extension on Lots 1 and 2, DP805538 in the Parish of Cowan and County of Northumberland, owned by Rocla.

The Project Site is located approximately one kilometre to the north-northwest of the Calga Interchange, at the junction of Peats Ridge Road and the F3, approximately 11km to the west of Gosford on the NSW Central Coast. The Project Site covers an area of 130ha and includes the already approved extraction area and associated processing, maintenance and facilities areas on Lot 2, DP229889, as well as a southerly extension of the extraction area (to be developed as two separate extraction areas), additional processing, maintenance and facilities areas and a new entrance to the Project Site off Peats Ridge Road. Access from the Project Site to the adjoining Peats Ridge Road would traverse the Peats Ridge Road reserve, which is currently owned by the NSW Roads and Traffic Authority but which is under the care and control of Gosford City Council.

An archaeological survey and assessment was completed over Lot 2, DP229889 during 2004 and 2005 as part of a successful application to extend the Calga Sand Quarry to the north (Stage 3). Therefore, for the purposes of this report, the boundaries of the survey area coincide with the boundaries of Lots 1 and 2, DP805538, ie. the land to be developed as the proposed southern extension to the already approved Calga Sand Quarry. The roughly rectangular-shaped blocks are bounded by the existing Calga Sand Quarry to the north, by Peats Ridge Road to the northeast, and by shared property boundaries to the east, south and west. A portion of the southern boundary is shared with Popran National Park.

Figures on the following pages present the local setting of the Project Site. **Figure 1** places the Project Site in its regional context while **Figure 2** places the Project Site in its local setting on a 1:25 000 scale topographic map. **Figure 3** identifies that area of archaeological investigation on the Project Site and **Figure 4** presents an aerial photograph of the Project Site identifying the areas of proposed disturbance.

## 1.3 Project Overview and Summary of Potential Impact

**Figure 4** displays the following principal components of the Project.

- The Stage 3 extraction area where sand extraction will proceed generally in a manner consistent with the current approved operation.
- Two new extraction stages, namely Stages 4 and 5. Stage 4 would be a direct southerly extension of the existing Calga Sand Quarry and Stage 5 would be developed as a separate extraction stage.





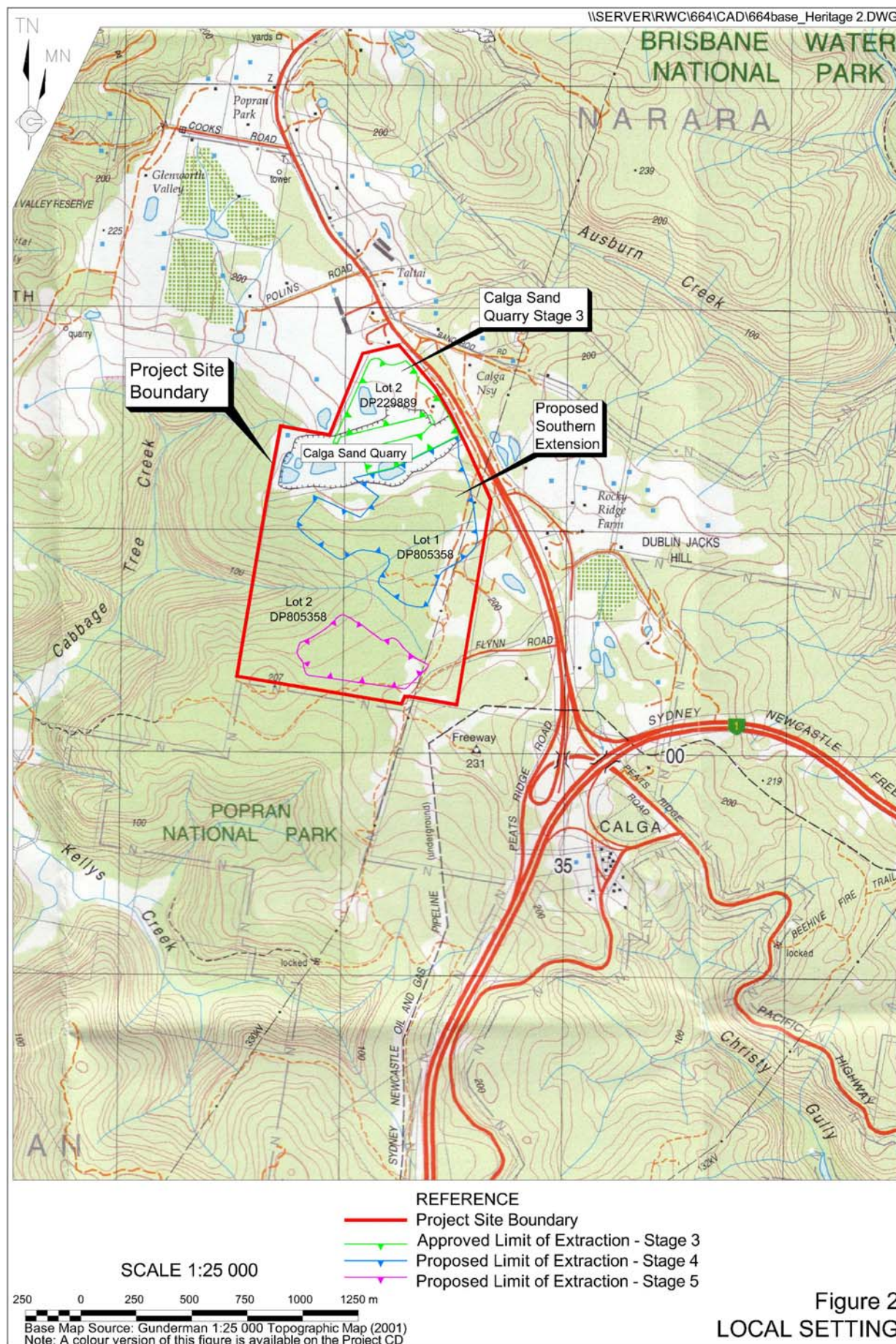
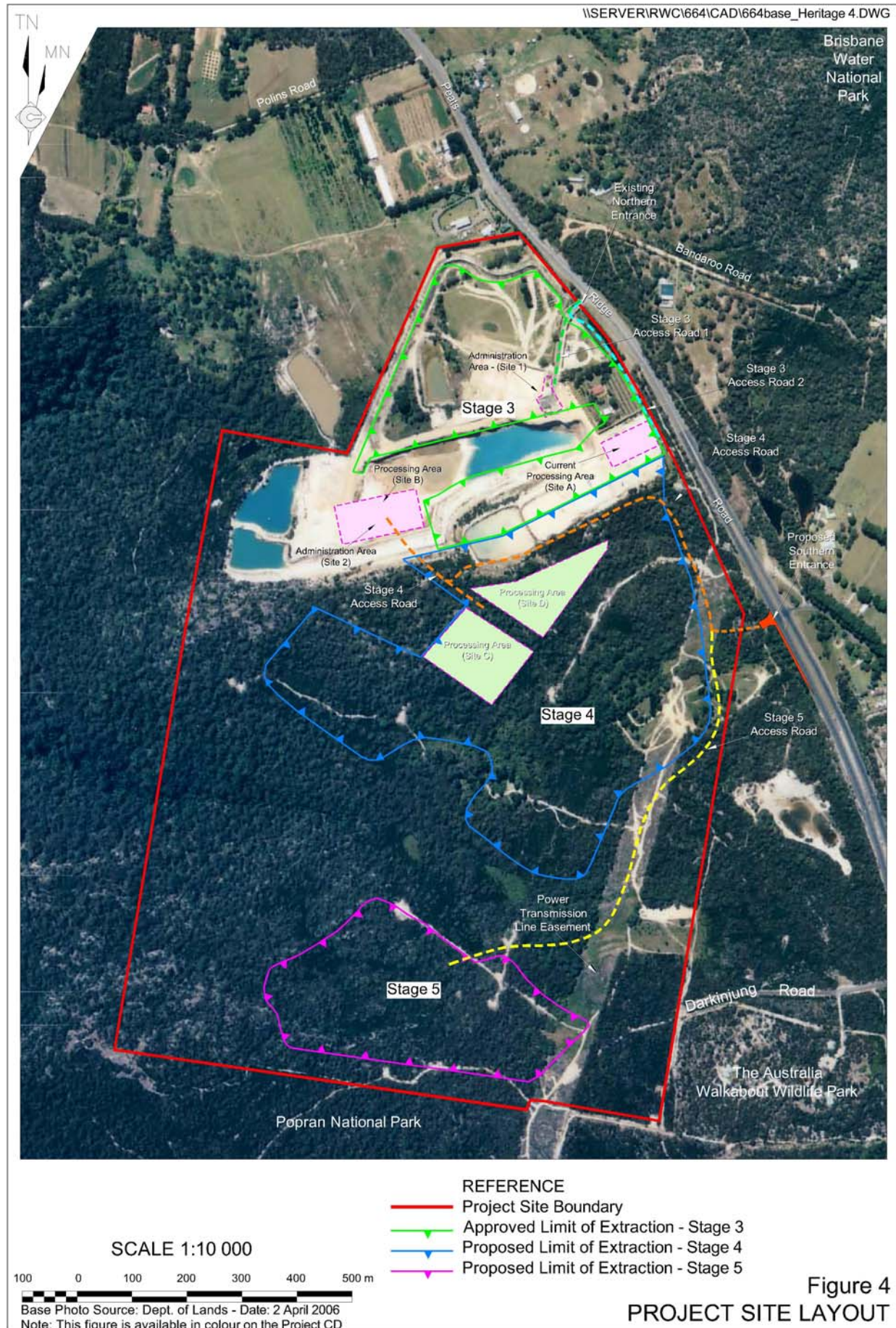


Figure 2  
LOCAL SETTING









- Four proposed sand processing areas. The existing 400 000tpa sand processing plant would be replaced by a 600 000tpa plant within Stage 1. As the northern area of Stage 4 is developed, a second processing plant capable of producing 600 000tpa would be established at a temporary central location within Stage 4. Both processing plants would ultimately be combined or replaced by a single processing plant capable of processing 1Mtpa at a long-term location on the floor of a completed section of Stage 4. No processing is proposed within Stage 5 as all raw sand materials would be transported to the plant(s) in Stage 4.
- Access to the Project Site would continue via the existing site entrance (referred to as the northern entrance) and site access road off Peats Ridge Road. During the early stages of extraction within Stage 4, a new site entrance (the “southern entrance”) and access road would be constructed from Peats Ridge Road to create a specific access point and road for activities within Stages 4 and 5.
- The Project Site administration area (including workshops and fuel storage) would initially be retained in its current location before being relocated adjacent to the wash plant on the floor of Stage 1 to accommodate extraction from Stages 3/3 and 3/4. In the long term, the administration area would be relocated to Stage 4/2 or 4/3, coinciding with the consolidation of processing operations within the Southern Extension.

The Project Site would be progressively rehabilitated with Stage 4 incorporated into the final landform of the existing Calga Sand Quarry. It is proposed that Stage 5 is rehabilitated to provide long-term nature conservation and water storage.

Limits on the disturbance of the approved Stage 3 and proposed Stages 4 and 5 of the Project are as follows (see **Figure 3**).

### **Stage 3**

The design of the Stage 3 extraction area includes six extraction stages (Stage 3/1 to Stage 3/6), with their boundaries controlled by the following parameters.

- A setback of 30m from the western and northern boundary of Stage 3 to accommodate an acoustic bund wall.
- A setback of 30m from Peats Ridge Road or the northeastern property boundary, whichever is closer.
- A setback of 30m from the southern boundary (of Stages 1, 2 and 3) to be consistent with the limit set under Development Consent No. 10604, given the occurrence of native vegetation beyond that boundary.

### **Stage 4**

The design of Stage 4 (and 5) reflects Rocla’s intent to maximise the recovery of the friable sandstone resource whilst developing it in such a manner that reflects the environmental and community constraints affecting the area of the proposed extension. The proposed limits of extraction within Stage 4 have been set with the following parameters.

- A large proportion of the northern perimeter joins directly to Stage 3, providing for a continuation of the Stage 3 extraction area.
- An excision of an area of approximately 2.6ha from the northwestern perimeter to provide a buffer of in excess of 50m and ensure the in-situ management of an

identified Aboriginal location and a stone arrangement. The identification of this location is described in Section 7 and its significance discussed in Section 8.

- A southwestern perimeter setback at least 50m from an ephemeral drainage line (referred to as Creek B on **Figures 2 and 3**). The southwestern perimeter is set back slightly where Creek B joins with a second ephemeral drainage line (Creek A) to form Creek C to avoid disturbance to an Aboriginal heritage site (see Sections 7 and 8) and habitat of the threatened Red-Crowned Toadlet. The remainder of the southwestern limit of extraction is defined (approximately) by the 165m AHD contour line where the depth of friable sandstone reduces less than 20m in depth.
- With the exception of the northeastern corner of Stage 4 where the extraction area is limited by the property boundary (offset by at least 30m), the eastern limit of Stage 4 is representative of where the sandstone either becomes too hard to be extracted by ripping, or the limit of the sandstone itself.

## Stage 5

Similar to Stage 4, the design of the Stage 5 extraction area reflects Rocla's intent to maximise the recovery of the friable sandstone resource whilst developing it in such a manner that reflects the environmental and community constraints affecting the area of the proposed extension. The proposed limits of extraction within Stage 5 have been set with the following parameters.

- A northwestern perimeter approximating the outcropping of hard sandstone where the topography drops towards Cabbage Tree Creek to the west.
- A setback of at least 50m from the banks of Creek B along the northeastern perimeter of the extraction area.
- A setback of at least 50m from the southern boundary of Lot 2, DP 805358.
- A setback of at least 30m from the easement for Darkinjung Road.
- A small excision of approximately 1ha has been designed along the northern perimeter to limit disturbance to potential habitat of the threatened Giant Burrowing Frog.

There is a potential for any archaeological contexts occurring within the footprint of the Project to be severely impacted upon.

As a consequence of this survey, it is unlikely that the same area will ever be surveyed again, thus from an archaeological perspective, this was an opportunity to observe and record any sites that might be present, and to propose a strategy for the management of any known or potential archaeological and/or cultural material in the future development of the area.

## 2 ABORIGINAL CONSULTATION

### 2.1 Darkinjung Local Aboriginal Lands Council

Prior to the investigation, ASR contacted the Darkinjung LALC to arrange for a Sites Officer to assist in the survey. As a consequence, Ms Jodi Cameron assisted in the survey, which was undertaken on the 8<sup>th</sup> and 9<sup>th</sup> December 2005. Ms Cameron was not aware of any specific Aboriginal associations with the Project Site but knew of sites previously recorded within the



Australia Wildlife Walkabout Park (formerly operated under the name of Calga Springs Sanctuary).

Prior to the survey, Appleton (ASR) briefed Ms Cameron on the results of previous investigations in the area undertaken by others. Both prior to and during the survey, Ms Cameron and Appleton (ASR) discussed the potential for particular site types to be present, and the particular environments in which they might occur.

The survey strategy and results were considered and discussed throughout the survey and at the completion of each survey transect or survey unit. At the conclusion of the survey, the results were discussed with particular attention paid to sites that had previously been recorded in the area, but which had not been relocated during this investigation. Finally, discussion was focussed on the recommendations Ms Cameron would present to the Darkinjung LALC for deliberation.

A copy of the report and recommendation received from Darkinjung LALC in 2006 and correspondence received from Darkinjung LALC in 2008 is included as **Appendix i**.

## **2.2 Other Aboriginal Stakeholders**

Initially, it was considered that the consultation held with the Darkinjung LALC was sufficient for the purposes of the assessment, as modifications to the proposed Project Site layout would ensure that no identified Aboriginal site or artefact would be disturbed by the proposed activities. Please note the survey process for the Project was commenced in 2005 with this approach to consultation considered appropriate for other surveys and assessment completed around this time.

Subsequently, however, it has been deemed necessary to consult more widely with the Aboriginal community and consultation was completed in accordance with the Interim Community Consultation Requirements (ICCR's) of the Department of Environment and Climate Change. The consultation undertaken is summarised as follows.

- An advertisement (public notice) was placed in the local press on 19 August 2008, notifying of the proposed extension to the Calga Sand Quarry and the investigations already completed by Darkinjung LALC and ASR.
- The advertisement provided any Aboriginal stakeholder with 14 days (later extended to the 11 September 2008 – 23 days) to register an interest in the Project and archaeological investigation.
- Letters notifying of the above project and archaeological investigations were also sent to:
  - the Department of Environment and Climate Change;
  - the Office of the Registrar of Indigenous Corporations; and
  - Gosford City Council.

On the 27 August 2008, representatives of the Guringai Tribal Link Corporation (Ms Tracey Howie – Chairperson, and Mr Dave Pross) visited the Calga Sand Quarry and were provided (by Rocla personnel) with an inspection of several identified Aboriginal sites that have been identified on the Project Site. The current status of the proposed quarry extension and

archaeological investigations was discussed and the representatives of the Guringai Tribal Link Corporation were referred to ASR to register interest in the archaeological investigation. Within the nominated period for registering interest, ASR did not receive any replies to the advertisement.

In response to recent information provided to the archaeologist regarding a Native Title claim over the Project Site, correspondence requesting information on any current claim was sent to the Office of the Registrar (Aboriginal Land Rights Act, 1983 (NSW)) ("Native Title Registrar"). In correspondence sent on 8 July 2009, the Native Title Registrar indicated that in fact no native title claim has been registered (see **Appendix ii**). Furthermore, it is noted that under the Commonwealth *Native Title Act 1993*, the valid grant of a freehold estate (other than certain types of Aboriginal and Torres Strait Islander land) on or before 23 December 1996 is known as a 'previous exclusive possession act'. This means that native title has been extinguished over the area. Native title claimants are not allowed to include land and waters covered by previous exclusive possession acts in their applications and therefore this would normally exclude freehold areas (such as the land on which the Project Site is located). A native title application may be made over freehold land on the basis that freehold was invalidly granted, however, as noted on the National Native Title Tribunal website, the chances of this happening are very low<sup>1</sup>.

In any event, native title claims are considered outside the scope of an *Environmental Assessment*. That is, should a claim exist over land to which an application for project approval has been made, the application of the claim would be considered separately to the assessment of the project application.

### 3 THE ENVIRONMENTAL CONTEXT

#### 3.1 Introduction

Any discussion of the likely presence of Aboriginal cultural remains or of the basis why such remains might be discovered must be within the context of the environment and the resources that would have been available to any Aboriginal occupants of the area.

#### 3.2 Geology and Topography

The Project Site occurs within the Sydney-Bowen Basin, a major structural basin, which extends from Batemans Bay in the south, to Collinsville, Queensland in the north. The New South Wales portion of the basin is divided into northern and southern sections by a transverse structural high to the north of Narrabri. The southern section of the Sydney-Bowen Basin has been divided into two lower category structural basins, the Sydney Basin and the Gunnedah Basin (Menzies 1974). The survey area occurs in the Sydney Basin.

The principal rock units outcropping in the Sydney Basin are the Hawkesbury Sandstone and Wianamatta and Narrabeen Groups, comprising sandstone, shale and claystone (DMR 'Sydney' Metallogenic Map 1992).

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<sup>1</sup> Source: National Native Title Tribunal website - (<http://www.nntt.gov.au/Applications-And-Determinations/Registers/Pages/Register-Searches-for-Native-Title-Claims-Over-Freehold-Land.aspx>)

The Project Site occurs in the upper catchment of Cabbage Tree Creek on the western rim of a north/south trending plateau ridge, that separates Ausburns Creek to the east, and Cabbage Tree Creek to the west. The terrain slopes towards the west, from elevations of over 230m AHD adjacent to Peats Ridge Road, down to approximately 80m AHD in the creek bed where Creek C crosses the western boundary.

The soils in the survey area generally reflect the fine to medium grained weathered sandstone bedrock, some of which was covered with a very shallow layer of humic soils, derived from woodland detritus. Minor exposures on the upper slopes contained pebbles and blocky cobbles of what appeared to be glossy, orange-brown, 'lateritic-type' rock.

No stone suitable for knapping into stone tools was observed anywhere in the survey area, but there were extensive platforms of outcropping sandstone bedrock both to the north and south of the central creek approximately corresponding with the 190m AHD contour shown on **Figure 2**.

Several artefacts were recorded in a shelter with art and occupation deposits (see Section 7) comprising highly silicified metasedimentary rock, typically identified with conglomerates. No conglomerate rock sources were observed in the survey area, with the material for the artefacts likely to have been sourced from further down-creek.

### 3.3 Vegetation

As can be observed from the aerial photograph of the Project Site (**Figure 3**), at least 10% of the native vegetation has been cleared for an overhead transmission line, and a number of tracks cleared to provide access to test-drilling sites. Otherwise, the vegetation is generally unaltered, with bushfire prevention strategies in recent years resulting in unchecked growth, which has made the bush impenetrable in many places.

The natural vegetation of the area primarily consists of an open to semi-closed dry sclerophyll woodland, that includes smooth-barked apple (*Angophora costata*) – particularly on the higher, well drained areas, Sydney peppermint (*Eucalyptus piperita*), red bloodwood (*E. gummifera*), with lesser amounts of yellow bloodwood (*E. eximia*), and scribbly gum (*E. haemastoma*), with a banksia (*Banksia* spp.), wattle (*Acacia* spp.) and grevillea (*Grevillea* spp.) understorey, and with a bracken groundcover in the moister gullies and drainage depressions.

In addition to the typical dry sclerophyll assemblage, this area is locally renowned for its Gynea Lilies (*Doryanthes excelsa*) also known as Flame Lily, Giant Lily and Illawarra Lily (Fairley 1976: 283).

The survey area provided a rich and very diverse mixture of dry sclerophyll woodland containing most of the species listed above, as well as a number of unidentified vines and fruit-bearing shrubs more typical of wet sclerophyll woodland. Ms Cameron identified some of the plants as Rough-barked apple, Scribbly gum, Tea-tree, Old Man Banksia, Gynea Lily, Flannel flower, *Acacia* sp., Sour currant, Blue orchid, Geebung, Devil's twine, *Hakea* sp., Isopodan, Native fuchsia, Christmas bush, and Xanthorrhoea. A complete list of the flora of the Project Site is provided in an ecological assessment completed for the Project by Cumberland Ecology Pty Ltd (2008).

In terms of potential resources to Aboriginal people, the Project Site and its surrounds would have been abundant both in variety and quantity of foodstuffs and materials. Elsewhere, there

are reports of the stems of the Gynea Lily being harvested when only half a metre or so tall, and cooked with crushed ants for flavouring (Low 1988: 39, citing Backhouse 1843: 389). Nectar was collected from grevilleas and banksias (Low 1988: 26, citing Levitt 1981; Maiden 1889; Meagher 1974; Palmer 1884; Smith & Lalotas 1985, and Smyth 1878).

Wattle seeds were collected and ground to produce flour (Low 1988: 28, citing Maiden 1900; Meggitt 1957; O'Connell, Latz and Barnett 1983). The rhizomes (underground root-like stems) of the Bracken Fern were a source of starch, which was flavoured with crushed ants (Low 1988: 140). Nectar was collected from banksias, and the blossoms were soaked in water to make drinks, sometimes producing an alcoholic brew (Low 1988: 161). The banksia was also used for slow-burning fire-sticks (Cribb & Cribb 1982: 234).

In addition to the direct potential resources it contained, the flora was the habitat of red-necked and swamp wallabies, long-nosed bandicoot, sugar gliders, ringtail and brushtail possums, echidna, blue-tongued lizard, goanna, marsupial mice (Fairley 1976: 189-204), and a variety of snakes, all of which were hunted for their meat, skins, quills, and teeth.

### 3.4 Water Resources

The survey took place following rain and there was a steady flow within Creek A (see **Figures 3** and **4**). There was also a minor but steady flow in Creek B, although the dense vegetation in the upper parts of the creek obscured how far up the catchment the flow occurred.

It is probable that Creek A provided a reliable source of water for most of the year except for when there were severe droughts.

### 3.5 Stone Resources

As referred to in Section 3.1, no stone in the survey area was observed that would have been suitable for knapping into tools or implements. The presence of stone artefacts within the survey area would therefore suggest the presence of suitable resources within the more inaccessible areas of the survey area, in the creek bed below the 150m AHD contour (the creek was not investigated below that elevation)<sup>2</sup>, or beyond the survey area.

In the absence of an obvious suitable knapping material occurring naturally in the survey area any artefacts that might be present were probably sourced from elsewhere.

### 3.6 Previous Impacts

**Figure 3** shows the survey area has already been subject to several impacts. Most notably, a 90m wide area has been cleared for the transmission line easement through the survey area, with tracks of up to 5m in width cleared to allow access for sand exploration and water bore drilling activities. Also noticeable is a track which has been constructed linking the transmission line easement to a test drilling site in the vicinity of the confluence of Creek A and Creek B.

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<sup>2</sup> Stone artefacts manufactured from highly silicified metasedimentary rock, typically identified with conglomerates were identified within the survey area within a shelter.



## 4 THE ARCHAEOLOGICAL RECORD

### 4.1 Aboriginal Sites Register

The result of the search of the Aboriginal Sites Register (Aboriginal Heritage Information Management System – AHIMS) for all sites within the references Eastings 331000-338000, Northings 6299000-6306000 resulted in a listing of 180 sites, of which 103 occur within the map coverage of **Figure 2**. Details of the search are included as **Appendix iii**. Note that the AHIMS map references were recorded using maps drawn to the Australian Geodetic Datum 1966 (AGD66), but **Figure 2** is drawn to the Geocentric Datum of Australia 1994 (GDA94), and so the AHIMS references had to be converted to GDA94.

The 103 sites comprise the following.

|                                                                     |    |
|---------------------------------------------------------------------|----|
| Axe-grinding groove.....                                            | 17 |
| Rock engraving.....                                                 | 38 |
| Axe-grinding groove & Rock engraving.....                           | 20 |
| Axe-grinding groove & Rock engraving & Shelter with art.....        | 1  |
| Rock engraving & Shelter with art.....                              | 2  |
| Shelter with art.....                                               | 19 |
| Shelter with deposit .....                                          | 3  |
| Shelter with art & Shelter with deposit .....                       | 1  |
| Shelter with art & Shelter with deposit & Shelter with midden ..... | 1  |
| Stone arrangement.....                                              | 1  |

It is worth noting that all of the sites are directly associated with sandstone and that none of the sites are open artefact scatters.

Seven of the sites identified on the AHIMS register occur within the coordinates on, or immediately adjacent to, the Project Site. They were:

- |     |            |                                    |
|-----|------------|------------------------------------|
| (1) | #45-3-1423 | Rock engraving                     |
| (2) | #45-3-0119 | Rock engraving                     |
| (3) | #45-3-2196 | Axe grinding groove                |
| (4) | #45-3-0131 | Axe grinding groove/Rock engraving |
| (5) | #45-3-2195 | Rock engraving                     |
| (6) | #45-3-0132 | Axe grinding groove/Rock engraving |
| (7) | #45-3-1794 | Axe grinding groove                |

A further three sites occurred with coordinates placing them to the immediate east of Peats Ridge Road, near the Project Site.

- |      |            |                  |
|------|------------|------------------|
| (8)  | #45-3-0124 | Rock engraving   |
| (9)  | #45-3-1415 | Shelter with art |
| (10) | #45-3-1796 | Rock engraving   |

Unfortunately, many of the site references on the AHIMS Site Register are inaccurate. Since the first sites were recorded on the Sites Register, the computer programme for which the site register was written has been rewritten and/or upgraded at least three times, and each time the data was re-entered into the system there were errors.

Also during that time, there were considerable changes to the maps available to field workers, firstly from 1:63,360 (inch) scale (Imperial) military Topographic maps, to 1:250,000 military Topographic maps (printed in 1942), and then to 1:250,000 scale Topographic maps (printed at various times), and then to 1:100,000 and 1:25,000 scale Topographic maps (printed in 1983), and more recently to 1:25,000 scale maps (printed in 2001). Features that were apparent in the earlier maps and may have been used as reference points for provenancing sites were changed or destroyed – as for example the Pacific Highway and the old road that went through Calga. Both were realigned and the old roads removed from the maps.

Archaeologists have used various strategies to locate sites on maps, from compass and line-of-site, to sight referencing to topographic features, to using hand-held or vehicle-mounted Global Positioning Systems of varying degrees of accuracy. The current (2001) Topographic Map warns that “*Satellite (GPS) derived values may be in error by up to 20 metres*”, but during the late 1980s and 1990s the satellite signals were deliberately ‘warped’ by the American controllers, to avoid the use of the satellites by enemy forces, and GPS readings during that period were out by as much as 200m. While there were computer programmes that could correct the warped references, very few people went to the trouble to correct them.

When the converted references from the AHIMS printout were plotted onto the current (2001) Topographic Map, it soon became clear that Site 9 (#45-3-1415), a shelter with art, plotted to a level open area where there were no features in which a shelter could occur. Site 3 (#45-3-2196), an axe grinding groove was plotted in Creek B, but when the field investigation was undertaken an axe grinding groove site of similar description – and from the photographs attached to the Site Recording Form, of very similar appearance, was found in Creek A at approximately the same Easting. Clearly there were some anomalies and it became necessary to obtain copies of the original Site Recording Forms for each of the ten sites to obtain any additional information that might help to rectify the errors.

Upon receipt of copies of the original Site Recording Forms, it was realised that seven of the recordings had been made using an imperial scale map, “No.410 & 411 Zone 8. 1: 63,360 scale Topographic Map, ‘Gosford & Noraville’”. A copy of the map was borrowed from the Map Library, School of Human Sciences, University of New England, and each site was plotted according to its original reference. The locations were then ‘visually’ plotted onto the current project mapping by reference to contour lines and distances from permanent features. Of the ten sites on or in the vicinity of the Project Site, two were duplicated (Sites 2 [#45-3-0119] & 5 [#45-3-2195]), four occurred within or on the boundary of the Project Site (Sites 1 [#45-3-1423], 3 [#45-3-2196], 4 [#45-3-0131] and 6 [#45-3-0132]), and the remaining four occurred outside the Project Site. **Figure 5** presents the location of Sites 1 to 7 (located on or immediately adjacent to the Project Site).

Copies of the Site Recording Forms together with a 1: 63,360 scale map showing where the site would have been at the time the site was recorded, presuming that there was no error in the original map reference, are included as **Appendix iv**.



## 4.2 Other Archaeological Studies and Records

Several of the Site Recording Forms of the Aboriginal Sites Register refer to “Sim’s Report”, and a library search for Sim leads the researcher to early issues of the journal “Mankind”. In 1899, W.D. Campbell published an article on the Aboriginal carvings of Port Jackson and Broken Bay (Campbell 1899), but it was not until 1941 that Fred McCarthy wrote the first of a number of articles in “Mankind” about the rock engravings of Sydney (McCarthy 1941, 1944, 1946a, 1946b, 1947, 1949, 1954, 1956 and 1959, then joining with F. Hansen for similar articles in 1958 and 1960).

Other well-known archaeologists of the time were scholars such as M.J. Meggitt, A.P. Elkin, and R.M. Berndt, however, those three were studying the culture and lifeways of living Aboriginal people rather than the art of their predecessors.

The big attraction of the Sydney rock engravings to McCarthy was that they were very accessible, and could be marvelled for what they were as artistic creations and it wasn’t necessary for the observer to know anything of their meanings or cultural associations. The McCarthy articles would have been used as guide maps for the weekend enthusiasts, and still inspire people to search for new sites, for no other reason than the thrill of finding them, and perhaps being the first person to have seen them for hundreds of years.

In 1962, the first of several articles written by I.M. Sim appeared in “Mankind”, in which he continued the tradition of recording sites as McCarthy had done, and described rock engravings in the Royal National Park, the Woronora Dam Catchment, Darkes Forest and Waterfall (to the south and west of Sydney) he had recorded in 1960, some with his wife and others with J. Price (Sim 1962). More sites were to follow in the Royal National Park, Heathcote, and Burraneer Point, recorded by Sim, sometimes in the company of Messrs J. and K. Price (Sim 1963a).

A second article the same year listed sites at San Souci, Middle Harbour, Narrabeen, Manly Vale, Palm Beach and Berowra Waters and as far north as Mangrove Mountain on the Central Coast. Some he recorded alone, others with his wife, or with R.J. Martin (Sim 1963b). In 1965 Sim published more sites at Pittwater and around Broken Bay, Narrabeen and Lane Cove River (Sim 1965), but in 1966 he published the first of two articles on rock engravings in the Gosford District (1966 and 1969). It was from those recordings that Site Recording Forms were raised for the sites that now occur in the Site Register with a reference to the Sim’s Report. In the early days up to and including 1963, Sim would refer to a site simply by its nearness to a known place such as a jetty or a point, but once he had moved inland to where there were no distinctive features he began to use map coordinates, and so by the time he was looking for sites in the Gosford region he was giving sites a map reference.

The reason why the information above is significant is firstly to highlight the fact that Sim was following a tradition of ‘site collecting’, a person whose sole motivation was to find more sites. The second reason is to stress that his was not an academic pursuit or one motivated by a research question or hypothesis, and so site descriptions were simple and subjective.

Of the sites Sim recorded in the Gosford area, none of the published sites occur within the Project Site.



Warren Bluff, another enthusiastic site seeker (like Sim before him not a consultant archaeologist), recorded three of the ten sites identified on **Figure 5**. Bluff worked with a number of archaeologists over the last 20 years and acquired some of the skills necessary to record sites, and as a consequence his Site Recording Forms are reasonably reliable, if not always totally legible.

In fact, during the last 20 years, there have been a number of commissioned investigations in the general area undertaken as a necessary precursor to development. The Sites Register only tells us where sites have been recorded, but does not tell us where investigations have been undertaken but in which no sites were recorded.

In July 1995, Rex Silcox, archaeological consultant, surveyed a large proportion of a site approximately 1km east of Somersby (15km north of the Project Site) and recommended that a sub-surface investigation should be undertaken close to the eastern boundary. As a consequence in early 1996, Silcox conducted a test excavation programme in which 75 pits of 25cm x 25cm were dug to depths varying from 33cm to 55cm, along two parallel transects each 45m long and approximately 25m apart, crossed at right-angles by a third transect approximately 31m long. Silcox recovered 10 artefacts, seven of which came from three pits (from the very brief description of the artefacts in Silcox's report six were lacking in diagnostic features, leaving only four that could be positively identified as being artefacts) (Silcox 1996). The site does not appear on the AHIMS listing.

In December 1995, ASR undertook a survey of the site of proposed quarry extensions at nearby Somersby, but despite the presence of many other known sites in the general area none were found in the survey area (Appleton 1995).

In October 1996, ASR undertook a survey of the site of a proposed clay and shale quarry development at Peats Ridge to the east of Peats Ridge Road approximately 7km north of the Calga Quarry. Again, despite the presence of numerous known sites in the immediate vicinity, no sites were recorded in the survey area (Appleton 1996).

In 2004 ASR undertook an archaeological survey to accompany the successful development application to extend the Calga Sand Quarry to the north (Stage 3). This survey identified a shelter with art ("Calga Art1") under the rim of the plateau overlooking a tributary of Cabbage Tree Creek (Appleton 2004).

Clearly there are likely to be other sites in the area, but whether they will ever be recorded, depends firstly on whether they occur in areas still to be investigated, and secondly whether they will be visible at the time of the survey.

## **5 MODELS FOR SITE LOCATION**

### **5.1 Site Types and their Location**

In order to design an investigative strategy, it is firstly necessary to develop a predictive model for site locations. This is not to determine where the investigation should be conducted, but to establish a theoretical model for the distribution of archaeological material against which the effectiveness and subsequent analysis of the survey results can be tested, compared and reasoned. The basis upon which the predictive model is derived must, however, be one of consideration of which archaeological material might realistically be expected to not only be present, but also detectable.



The first objective of any archaeological investigation must be to observe and record a sufficient proportion of the archaeological record that is present to be able to propose that it is representative of the record as a whole. The investigative strategy is therefore directed and designed to detect that which is representative of the record in the particular survey area, and naturally, as different survey areas will comprise variations in environment, vegetation, topography, etc., so the investigative strategy must be designed to best suit the circumstances. The objective must be to detect material evidence, and so it is necessary to consider the extent to which artefactual material may be present, and the degree to which it is visible or might be discovered.

There are several factors, which are likely to affect, firstly, where Aboriginal people are most likely to have been, secondly, where they have left evidence of their activities, and thirdly, the degree to which that evidence is observable in the present record.

People visited places mainly to obtain resources, and in general places that were richest in resources were more likely to have been visited by people than those places with fewer resources. Important resources were permanent water, ephemeral water, food resources, stone raw material sources, shelter (from sun, wind, and rain), and perhaps suitable surfaces for rock art, and proximity to mythological natural features. Those resources may have been a factor in the suitability of a location for particular ceremonial activities but cultural boundaries also influenced the choice of ceremonial grounds. Alternatively, sites frequently occurred along preferred access routes and particularly where that route coincided with a watercourse. However, the attractions of such an environment frequently resulted in the archaeological record becoming discontinuous or significantly disturbed, as stock and vehicles impacted upon it in the post-European contact phase.

Frequency of visits and use of particular locations was also determined by the 'accessibility' or freedom from environmental constraints in the area. For example, whether there were alternative, preferred or easier ways to travel around or over natural barriers, be they geological, geographical, cultural, or imposed by fauna or flora, or whether they were only seasonally accessible, such as mounds on flood terraces, or the availability of water during periods of drought, or whether or not floods, fire or snow hindered access.

Few past Aboriginal activities are represented by surviving material evidence. This in part is because many activities did not leave material evidence (eg. tools were reused), but it is also because very little cultural material survived. An exception to this was shellfish, which was very durable.

The survival of material that is durable was also affected by recent European land use. Cultivation has destroyed many archaeological sites. However, cultivation can also help expose sites that might otherwise be covered. This brings us to the other important point about site distribution, which is that to a great extent site distribution recorded by archaeologists reflects the distribution of places where the ground surface is sufficiently eroded to expose artefactual material.

By far, the majority of recorded sites have been stone artefact scatters or isolated stone artefacts, and in the vast majority of sites they were found in one or more of the following contexts.

- (i) On or adjacent to deposits containing quartz, quartzite, jasper, silcrete, chert, chalcedony, metamorphosed greywacke, and other indurated or siliceous sedimentary rocks, or redeposited fine-grained volcanics.
- (ii) On river banks or adjacent to river banks where the watercourse contains river pebbles of quartz, quartzite, jasper, silcrete, chert, fine-grained volcanics, basalts, etc., and particularly at the junctions of watercourses.
- (iii) On ridges and spurs overlooking watercourses or on high vantage points affording uninterrupted views of swamps, water holes, saddles, passes, and any other likely access path into the observer's area.
- (iv) In the vicinity of outcrops of suitable raw material such as basalt, silcrete, chert, or other highly silicified sedimentary rock.

Other site types do occur and perhaps because of their lower and less predictable profile, are present in far greater numbers than we are aware of. People die but there are few recorded burials. One reason may be that in many instances the soils are too acid for the preservation of bone, but a far more likely reason is simply that burial frequently entailed subsurface internment, and a surface survey will only discover a burial where there has been erosion of significant disturbance to the surface deposits. As a consequence many burials have only been discovered when exposed by erosion of a sand body or river terrace.

Other site types such as carved trees, scarred trees, stone arrangements, Bora rings, etc., may once have been present, but are unlikely to have survived in easily accessible country from the attention of non-indigenous people. Thus, much of what might have existed is now lost or destroyed, and the archaeological record has become biased by the post-contact utilisation of resources, and by the selective exploitation and preservation of particular environments.

Other factors which affect the degree to which sites are recorded during an investigation include the time of year at which the fieldwork is performed (the seasonality of some vegetation growth) and the conditions under which the survey is performed (wet, dry, cold, windy, poor light, etc.).

A brief description of site types such as isolated artefacts, open scatters, camp sites, knapping floors, quarries, middens, mounds, hearths, carved trees, scarred trees, stone arrangements, Bora rings, burials, engravings, paintings, grinding grooves, occupation deposits (and PADs), and ceremonial and mythological sites is included as **Appendix v**.

## **5.2 A Predictive Model for the Survey Area**

Based on all of the above, the following model for site distribution was proposed for the survey area, in which there are no shelters or overhangs, no sources of stone suitable for knapping tools and implements, and in which there are no sandstone bedrock exposures.

- Isolated artefacts may be present and visible in erosion features.
- Low-density artefact scatters may be present and visible in erosion features, but it is unlikely that anydebitage will be visible.

- There is a potential for trees more than 150 years old to exhibit scarred surfaces<sup>3</sup>.
- There is a potential for any trees more than 150 years old to exhibit carved surfaces<sup>3</sup>.
- There is a potential for shelters to exist and therefore a potential for art sites.
- There is a potential for shelters to exist and therefore a potential for occupation deposits.
- There is a potential for engravings, and/or grinding grooves to occur wherever there is outcropping sandstone.
- There will be no stone quarries.
- There will be no shell middens.
- There will be no visible evidence of burials.
- There will be no surviving Bora rings.
- There will be no surviving stone arrangements.
- There are no known cultural associations with the area other than the knowledge that sites have previously been recorded in the area.

## 6 THE SURVEY

### 6.1 The Survey Strategy

#### December 2005 Survey

Prior to the survey, the Quarry Manager of the Calga Sand Quarry advised Appleton (ASR) that the vegetation throughout much of the Survey Area was presently very lush and dense, that access to many places would be very difficult, and would take much longer than might be anticipated from looking at the aerial photograph. In contrast, there were some areas, such as the ridge tops, the power line easement and the test drilling site access tracks, that provided accessible areas with good to moderate ground visibility. The strategy was therefore based on attempting to investigate any environment above the 150m AHD contour to which there was access. The reason why this particular contour was set as a parameter was firstly, because disturbance associated with the proposed southern extension would not occur at or below this elevation (due to the outcropping of harder and therefore non-extractable sandstone), and secondly, that the vegetation below that elevation was so dense as to make archaeological investigation totally ineffective.

In effect, the understorey and ground cover was so dense in many places above the 150m contour that it was only possible to perform a sample survey, while in others the

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<sup>3</sup> The Project Site has, like most of the Mangrove Mountain area, been ravaged by bush fires over many years. The vast majority of the vegetation is consequently regrowth and young trees (relative to the age of a tree that might have been scarred or carved over 150 years ago), and those trees that have resisted the fires are mostly Smooth-barked apple – trees unlikely to have been used for bark removal or carving. It is therefore extremely unlikely that any carved or scarred trees there might once have been have survived. It is also worth noting that the AHIMS Site Register does not list any scarred or carved trees in the general area – probably for the reason given.

vegetation was totally impenetrable. As a consequence, the survey strategy entailed walking tracks, following the edges of drop-offs, and targeting soil exposures and erosion features, drainage lines, and any tree that appeared to be old growth. Fortunately, there were a number of tracks through the area, which not only provided some access, but also a transect strip of exposed deposits through different environments and over different landforms.

Attempts were also made to walk the creek lines, however, while it was possible to walk Creek A from the transmission line easement down to below its confluence with Creek B, it was only possible to walk short sections of Creek B, which was densely overgrown. Access was also only possible for another 100m below the confluence of the two creeks before it became too dangerous to proceed any further, as the way was blocked by huge boulders covered in dense vegetation.

### **October 2006 Survey**

Having considered the results of the 2005 field survey and correlated the results with the site listing on the AHIMS Sites Register it became clear that there was one listed site in particular that had not been relocated, and yet according to the listed map references, occurred within the survey area. The site had originally been recorded by Sim in 1962 (Site #45-3-0119), and relocated and photographed by Bluff in 1993 (Site #45-3-2195). That site was described as an engraving of an “emu & woman”. Engravings of women are uncommon on the Central Coast and so the site was potentially of high cultural significance. As a consequence Appleton returned to the Project Site in mid-2006, and spent a day searching for the engraving, but without success.

Having explained to the Proponent the potential significance of the site and that it was crucial that it should be relocated, Appleton (ASR) returned to the site in October 2006, with Warren Bluff. However, despite being able to identify features in the landscape Bluff had significant difficulty relocating the site. After four hours searching Bluff observed an “abraded step” in the edge of a sandstone platform that he had recorded in 1993 in the vicinity of the engraved woman. Removal of the leaf detritus and roots that covered the platform revealed the engravings of the “emu & woman”.

On leaving the engraving site a stone arrangement was observed nearby (see Section 7.2).

## **6.2 Details of the Survey**

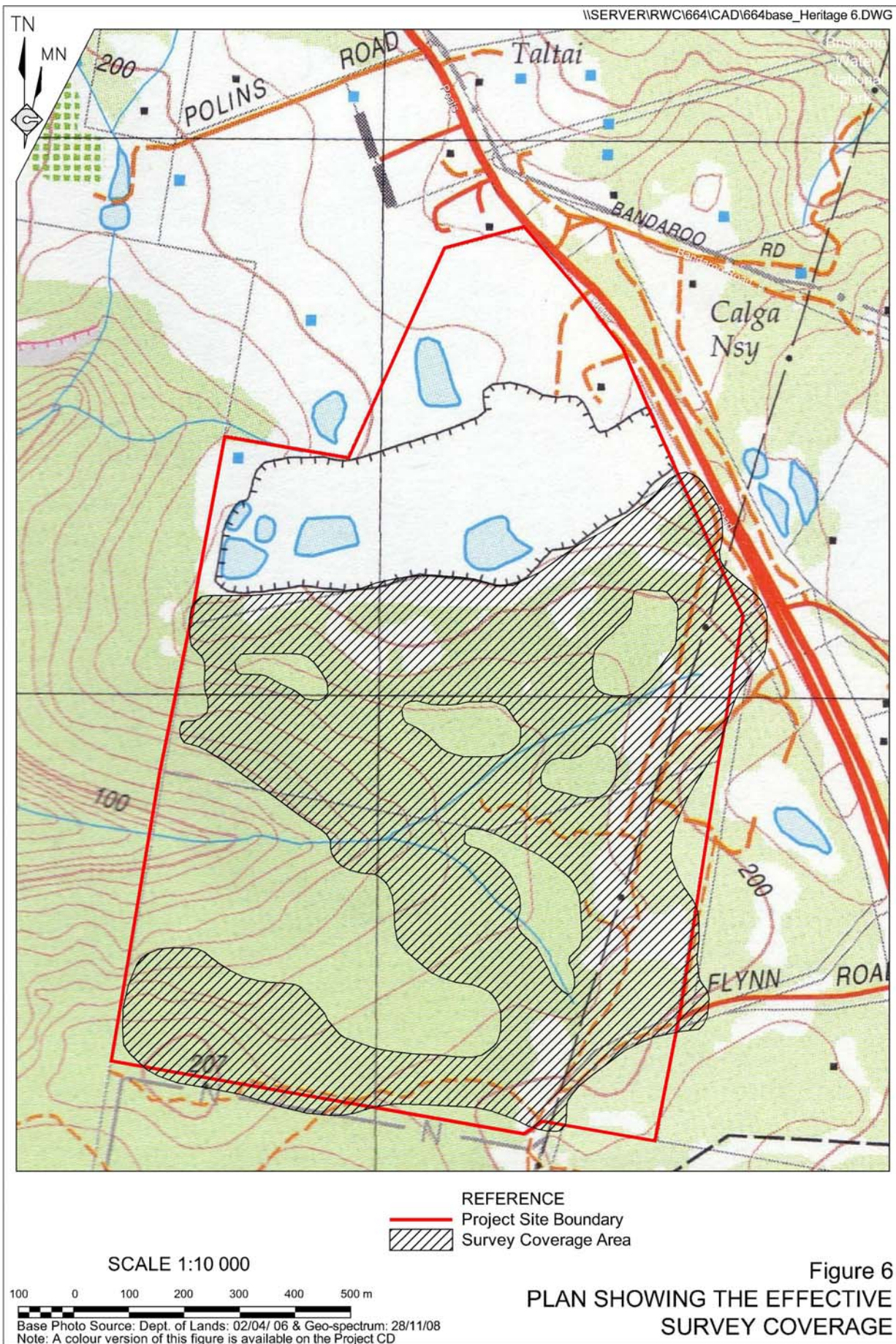
### **December 2005 Survey**

The survey was undertaken by ASR, assisted by Ms Jodi Cameron representing the Darkinjung LALC. The survey was made on foot, in dry conditions under a cloudy sky, in light ideal for observing any artefactual material present and observable. All of the areas shown shaded in pink in **Figure 6** were surveyed on foot.

### **October 2006 Survey**

The approximate location of the rock engraving was searched in detail by Appleton and Bluff for in excess of four hours. As noted in Section 6.1, eventually, a familiar “abraded step” was identified by Bluff leading to the eventual location of the rock engraving (Site #45-3-2195 [also Site #45-3-0119])







### 6.3 Site Recording

All relevant observations as to the topography, vegetation cover, and conditions, were recorded in a field-log, and photographs taken with an Olympus Camedia C-3030 Zoom Digital Camera, to record the character of the survey area, and to witness survey conditions.

### 6.4 Effectiveness of the Survey Technique

#### December 2005 Survey

There was a dense understorey and groundcover throughout most of the survey area, and even in cleared areas such as the transmission line easement, the groundcover was dense and the only visible ground surfaces were along the vehicle tracks and on bare rock surfaces. Other than the weather, which was perfect for observing any artefactual material, the survey was undertaken in far from ideal conditions. The vegetation was extremely dense wherever there was soil or weathering deposits, and many of the outcropping rock surfaces were concealed beneath an accumulation of leaf and twig detritus.

The survey technique was the most appropriate one to use in the circumstances, and the results are believed to be generally representative of the archaeological record in the survey area, in which it was predicted there would be very little artefactual material. The results, however, may not be representative of the extent to which there are grinding grooves in the creek lines, and rock engravings in the more elevated areas. Although the intention was to sample survey the entire area, the vegetation was an insurmountable obstacle to effective surveying in some environments.

#### October 2006 Survey

The objective of the survey undertaken by Appleton (ASR) and Bluff in October 2006 was to relocate the engraving of the “emu & woman”, and so the investigation was concentrated on large flat sandstone platforms. In the past, large platforms would remain exposed as bush fires would regularly destroy the leaf and branch litter that accumulated between fire events, however, in recent years bushfire management has reduced fire events with the consequence that most platforms have become covered by leaf litter and tree roots. As a result archaeological visibility was extremely poor, and if Bluff had not recognised the “abraded step” on the edge of the platform, the engravings would not have been relocated.

With regard to the finding of the stone arrangement, archaeological visibility was not a factor. The stone arrangement was recognised simply because there was a regular pattern to a group of rocks in a relatively rock-free area.

### 6.5 Effective Coverage

**Table 1** presents a summary of the effective survey coverage and is divided into units delineated by observed topographical features, environments, and/or land use, briefly described in terms of ‘horizontal’ or map area, soil, and archaeological visibility, and the percentage of the area actually surveyed.

**Table 1**  
**Effective Survey Coverage**

| Area | Description                                                                            | Survey area<br>(approximately 98ha) | Rock/soil                                                                                             | Vegetation                                                                                                                               | Average surface<br>visibility | Exposures                                                   | Approx area surveyed<br>on foot                           | Average arch.<br>visibility of exposures | Archaeology                                                              |
|------|----------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------|
| 1    | Northern ridge (plateau-like ridge top)                                                | 55,000m <sup>2</sup>                | Outcropping rock platforms of Hawkesbury Sandstone, Wianamatta & Narrabeen Groups                     | Isolated eucalypts, smooth-barked apple, scribbly gum with banksia, wattle and grevillea in crevices                                     | 85%                           | Rock surfaces                                               | 75%                                                       | 95%                                      | Rock engraving and stone arrangement (outside extraction area)           |
| 2    | Midslopes (boulder-strewn slopes mostly to the northern ridge)                         | 75,000 m <sup>2</sup>               | Outcropping benches and boulders of Hawkesbury Sandstone, Wianamatta & Narrabeen Groups               | Woodland of smooth-barked apple, Sydney peppermint, red bloodwood and scribbly gum, with dense banksia, wattle and grevillea understorey | 10%                           | Rock surfaces and cleared track                             | 60%                                                       | 60%                                      | Nil                                                                      |
| 3    | Creek catchment (central drainage basin and eastern catchment area above 150m contour) | 670,000sq m                         | Sloping outcrops and weathered sands derived from Hawkesbury Sandstone, Wianamatta & Narrabeen Groups | Woodland of smooth-barked apple, Sydney peppermint, red bloodwood and scribbly gum, with dense banksia, wattle and grevillea understorey | < 5%                          | Cleared tracks, powerline easement, slopewash and driplines | 50%                                                       | 75%                                      | Grinding grooves and rock engraving (outside extraction area)            |
| 4    | Southern ridge (plateau-like ridge top and cliff-line)                                 | 30,000sqm                           | Outcropping rock platforms and cliff-line of Hawkesbury Sandstone, Wianamatta & Narrabeen Groups      | Isolated eucalypts, smooth-barked apple, scribbly gum with banksia, wattle and grevillea in crevices                                     | 60%                           | Rock surfaces                                               | 70%                                                       | 95%                                      | Art site and occupation deposits in cliff-face (outside extraction area) |
| 5    | Creek line below drop-off (below 150m contour)                                         | 150,000sq m                         | Sheer-sided banks and ledges, & large boulders of Hawkesbury Sandstone, Wianamatta & Narrabeen Groups | Wet eucalypt woodland and gorge vegetation                                                                                               | ?                             | Boulder surfaces                                            | 0% (well outside extraction area and dangerous to survey) | ?                                        | ?                                                                        |

**Figure 6** shows the effective survey coverage based on the assumption that most artefactual material if exposed and visible can be observed for up to 5m to either side of the path of the observer. Clearly, this would vary significantly between a path walked through dense vegetation, and a path across a claypan, and is given as a guide only.

The photographic record that follows (**Plates 1 to 22**) provides a visual reference for the survey conditions and various aspects of past impacts to the survey area.

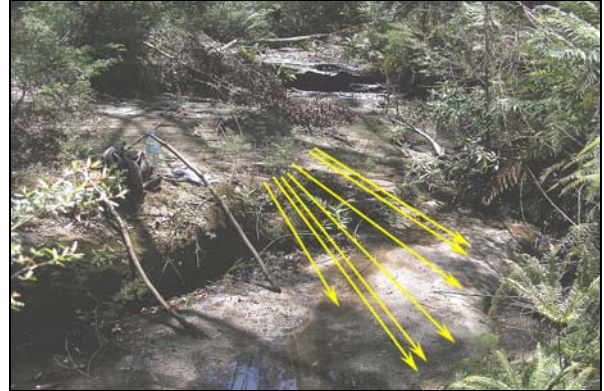
## 7 THE RESULTS

### 7.1 December 2005 Investigation

Two sites were recorded during the 2005 investigation, a shelter with art and occupation deposits, and a group of axe grinding grooves. The latter were later identified as being the site previously recorded as Site #45-3-2196.



**Plate 1** Looking eastwards up the mid section of Creek A



**Plate 2** Site #45-3-2196 viewed from downstream. The arrows point to axe grinding grooves



**Plate 3** Detail of some of the grooves at #45-3-2196 (scale 25 cm)



**Plate 4** Vegetation typical of the rim of the plateau at about the 150 m AHD contour



**Plate 5** Looking south-eastwards up the mid section of Creek B



**Plate 6** The western end of the northern ridge. The existing sand quarry is over to the right





**Plate 7** Looking eastwards along the edge of the drop-off to the northern ridge



**Plate 8** Looking westwards down the northern track with the northern ridge to the right



**Plate 9** Vegetation typical of the slopes below the northern ridge



**Plate 10** Looking westwards along the drop-off to the southern ridge



**Plate 11** Looking northwards from the southern ridge into the central depression



**Plate 12** Looking northwards across the central depression to the northern ridge





**Plate 13** The shelter viewed from the north-west. Jodi is looking for artefacts in the foreground



**Plate 14** Two of the six artefacts



**Plate 15** Hand stencilled in white clay (?). There are also faint traces of red ochre left of centre, and traces of unidentified charcoal forms in the centre and to left and right



**Plate 16** Unidentified charcoal drawing, with possible white stencil on the left



**Plate 17** Unidentified charcoal drawings (scale 25cm)



**Plate 18** Unidentified charcoal drawing





**Plate 19** Unidentified charcoal drawings



**Plate 20** Panel of charcoal drawings (scale 25cm)



**Plate 21** Detail of the two drawings in the left half of Plate 19. The figure on the right appears to be a macropod-like form



**Plate 22** Detail of the drawing from the right half of Plate 19. Identified as a macropod-like form

Details of the shelter with art and occupation deposits are as follows.

Site name: **“Popran Art1”**

Site type: Shelter with art and occupation deposits.

Location: GDA94: 333620 6300460.  
Gunderman 9131-3S 1:25,000 Topographic Map.

Topographical  
Location: At the foot of cliff-line in the upper catchment of Cabbage Tree Creek.

Environment: Dry sclerophyll woodland.

Nearest water: Tributary (ephemeral) of Cabbage Tree Creek.

Distance: Approximately 200m.

Other site(s)  
in the locality: Numerous axe grinding grooves and rock engravings. Shelter with art 1 000m to the north.

Shelter  
dimensions: Habitable length – Approx. 10m.  
Habitable depth – Approx. 5m.  
Dripline height – Approx. 2m.

Aspect: Due north (fully protected from the southerlies and south-westerlies).

Deposits: The floor of the shelter is composed of steeply inclined sandstone bedrock that ascends to within 20cm of the roof at the rear of the shelter. The bedrock dips below the ground surface short of the dripline. Six artefacts were observed in the deposits inside the dripline. The artefacts could be described at best as flaked pieces, however, they were clearly out of their natural context and had been brought to the site. The talus was covered in rocks and was not tested.

Archaeological  
features: There was one clear hand stencil, and a number of charcoal drawings, only two of which were recognisable forms, and they were of macropod-like figures. The motifs were applied in black (charcoal), red (ochre), and white (clay?).

## **7.2 October 2006 Investigation**

The site described on Sims' Site Recording Card as an engraving of an “emu & woman” was relocated during the 2006 investigation undertaken specifically to relocate the site.

Site name: **#45-3-0119 (#45-3-2195)**

Site type: Rock Engravings.

Location: GDA94: 334135 6301144 (corrected).  
Gunderman 9131-3S 1:25,000 Topographic Map.

Topographical

Location: Horizontal sandstone platform on upper to middle slopes of a spur ridge

Environment: Dry eucalypt woodland, banksia and tea-tree understorey.

Nearest water: Tributary (ephemeral) of Cabbage Tree Creek.

Distance: Approximately 220m.

Other site(s)

in the locality: Numerous axe grinding grooves and rock engravings. Shelter with art 800m to southwest.

Site

description: "Woman" - Pecked and abraded/engraved grooved outline, approximately 3cm wide and 1cm deep at its deepest. The anthropomorphic 'female' lies on her back with arms and legs spread apart (axis NE/SW). Her right leg terminates above the knee at the edge of the platform, and her left leg appears slightly bent outwards terminating below the knee at the platform edge. She is endowed with pendulous breasts that hang to either side of her torso, and her vulva is clearly visible. She appears to have an arm band around her left bicep, and another band around her right thigh. Her head appears to be a deliberately amorphous shape with possibly one eye (either her head is turned to the right, or only the right eye is still visible), but she has no nose, mouth, ears or hair. Approximate length from her finger tips to the platform edge (right leg) 240cm, and the approximate width between outer little-finger tips 145cm.

"Emu" – The "emu" comprises two pecked and abraded/engraved grooved lines up to 3cm wide and approximately 1cm deep at their deepest. The two lines arc above the "woman", the 'creatures' "feet" to her left. Both lines become indiscernible to her right. If this was an anthropomorphic figure its head would have been to her right. The upper line (the 'back') is only visible for 280 cm, but the lower line can be traced for nearly 6m. If there once was a head it is no longer visible.

"Hand" – Stylised abraded/engraved hand 50cm long by 37cm wide on the edge of an adjacent section of the same series of sandstone platforms.

Approximately 80m to the southwest and on the same axis of the "woman's" torso (almost directly in line with her open legs), and on the nearest cleared area, a circle of rocks was observed in an area where there were no other free-standing rocks or boulders.

Site name: **"Calga SA1"**

Site type: Stone arrangement.

Location: GDA94: 334078 6301082.

Gunderman 9131-3S 1:25,000 Topographic Map.

Topographical

Location: Level ground amid terraces of sandstone rock platforms on upper to middle slopes of a spur ridge.

Environment: Dry eucalypt woodland, banksia and tea-tree understorey.

Nearest water: Tributary (ephemeral) of Cabbage Tree Creek.

Distance: Approximately 220m.

Other site(s)

in the locality: Numerous axe grinding grooves and rock engravings. Shelter with art 800m to southwest.

Site description: The stone arrangement comprised a circle of eight variously sized sandstone boulders around a centre-stone. While the encircling stones were not at regular distances apart, each was diametrically opposite a stone on the opposite side of the circle. Although there was no absolute evidence that the stones were arranged by Aboriginal people the proximity of the stone arrangement to the engraving site, and the apparent alignment of the circle with the axis of the “woman’s” torso, pointed to a probable direct association of the two.

Note 1: The use of the words “woman”, and “emu” should more correctly be referred to as “woman-like” and “animal-like”, as they are probably anthropomorphic representations and not depictions of real people or animals. Similarly, the “hand” may not be a depiction of a human hand.

Note 2: Of 1,400 sites previously listed on the AHIMS Site Register for the Mangrove Mountain/Calga area there was only one stone arrangement. In an analysis of 7,804 engravings in the Sydney Basin Area (including the Gosford, Mangrove Mountain, Somersby and Calga areas) Jo McDonald (1992) found that only 79, or 1%, were of women. Of those only one was associated with a stone arrangement, and that was at Kuringai Chase.

The apparent association of the engraving of the “woman” and the stone arrangement at Calga are therefore very rare.

## **8 DISCUSSION**

### **8.1 Results of the Archaeological Investigations**

**Figure 7** presents the results of the two field surveys of the Project Site, including the (corrected) locations of sites identified by previous investigations and recorded on the AHIMS sites register.

The investigation of the Project Site was undertaken at a time following a number of years without a bushfire, during which the vegetation had grown unchecked to the point where much of it was impenetrable. In such circumstances, there was a greatly reduced possibility that ground surface archaeological evidence would be observed. Photographs taken at the time when some of the sites were recorded (in the early 1990s) show a more open and less obtrusive vegetation, in which rock platforms were highly visible. At the time of the current investigation many of the rock surfaces were covered in leaf and bark detritus, and/or encroaching groundcover.





In normal circumstances, one could have expected to relocate the site #45-3-2195 (also recorded as #45-3-0119), as it had clearly been visible on two previous occasions, but was not relocated during the 2005 investigation. The only description given in the earlier undated recording (probably c.1965) was that it was an engraving of an “emu and woman”, but when Bluff recorded it in 1993 he described the site (at a time when there was much less vegetation than at present) as “covered in leaf litter”.

He goes on to describe the engraving as,

*“2-3 indeterminate lines – edge of platform 1-1.5 m femal (sic) figure – lines on arms and legs; breasts & vulva – arms spread out – on south p? run-slopeing (sic)*

*- rock is 50 x 50 approx.*

*- photos taken*

*- 1 large anthropomorph - part*

*- 1 figure - macropod below it*

*- indeterminate lines*

*covered in leaf litter – hastening weathering process”.*

Subsequently, this site was relocated in October 2006 during an investigation targeted specifically to find the site. During the intervening years between the time that Bluff recorded the site in 1996 and the 2006 investigation, the leaf detritus had accumulated to a depth that supported tree roots, and the “weathering process” had reduced the “macropod” to two indeterminate, but apparently associated grooved lines.

Of the other sites recorded as occurring within the survey area, the only one that was found during the 2005 investigation was the site with axe grinding grooves (#45-3-2196).

Of some concern to ASR was the fact that Site #45-3-0132 was not relocated. The site was described on the undated Site Recording Form (c.1965) as “A group of grinding grooves & several engravings”. No other information was provided. The Site Recording Form for this site has simply been notated “Sim’s Report, Site 4/42”. The presence of grinding grooves suggests that the site was in the creek, but no exposed rock surfaces were found near Creek B during the current investigation. Given the description provided by the Site Recording Form for Site #45-3-0132, and the lack of available surfaces within Creek B where the coordinates suggest it is located, it is considered probable, it is likely that the site is the same as that recorded and relocated as #45-3-2196. It is also possible that vegetation obscured the rock engravings both when Bluff recorded the site and when the latest recording was made, or that they have since become so worn as to be very difficult to see. In any event, the Project would not result in any disturbance to Creek B and therefore, should the latter explanation be the case for the non-relocation of Site #45-3-0132, it would remain undisturbed in-situ.

No stone artefacts were observed other than in the shelter with art, but as Silcox (1996) found they are unlikely to be observed on the surface, particularly on slopes where they are likely to be covered by colluvial deposits from active erosion and weathering upslope of the location, or slope-wash.

From an archaeological viewpoint, the combination of an absence of naturally occurring stone suitable for knapping, and poor archaeological visibility created a situation in which it was extremely unlikely that any artefactual material would be observable in the survey area. There was no naturally occurring basalt in the area, and so the axe 'blanks' that were ground or sharpened in the axe-grinding grooves would have been brought in from elsewhere.

Given the absence of a knapping-stone source within the survey area and the looseness of the colluvial sand cover, it was not surprising that no stone artefacts were observed. Any stone tools or implements brought into the area would have been sourced elsewhere, and so any artefacts that might have been discarded during hunting and collecting were likely to be in very low densities, as the stone was not readily replaceable. If any artefacts were present on the Project Site, they would have been likely to consist of small trimming or maintenance flakes of less than 5mm long, or of discarded ground-edge axes, although Silcox (1996) recorded the four diagnostic types in the assemblage he recovered as being between 10mm and 30mm long. He also recorded that they were manufactured from indurated mudstone, quartz and silcrete (Silcox 1996, *Table 2*). None of these materials occur in the survey area and so they were probably sourced from an exposure of conglomerates further down-slope where a creek had exposed them.

The discovery of the art site (Popran Art1) was unexpected, as none had been previously reported in that location. The art was difficult to see at first, and could easily have been overlooked by an untrained or inexperienced observer and although some markings were so obscure as to be unrecognisable other than being applied charcoal, several images were clear and unmistakable as drawn forms and stencils.

In 1992, Jo McDonald published her findings of a study of recordings of images or motifs in 740 engraving sites and 625 shelter art sites in the Sydney Basin (McDonald 1992). She found that depictive art, i.e., non-stencilled art, accounted for 66.1% of the techniques employed. Of 14,424 motifs in shelter art sites, 41% were unidentifiable, 25% were of hand stencils, and 5.5% were of macropods. Black was the predominant colour being used in 46.2% of pigmented art, white accounted for 34.6%, red accounted for 16.5%, and yellow for 2.7% (*adjusted to total 100%*). Although the study is now over 13 years old, the sheer scale of her database made her findings a benchmark for any study of art in the Sydney Basin, and the Aboriginal art the Gosford region is frequently associated with the stylistic associations of the Sydney Basin (see also Attenbrow 2002).

While the motifs in "Popran Art1" are interesting they are not remarkable, slotting comfortably into the categories identified by McDonald, however, the presence of six pieces of highly silicified meta-sedimentary rock in the deposits within the drip-line of the shelter point to a potential for other artefactual material to occur within the site, and while the artefacts are not particularly remarkable, they do indicate a potential for the existence of buried archaeological material that might be of more scientific significance.

In summary, although the survey area occurred in an area in which there was a potential for sites to occur, the limitations to undertaking an effective survey imposed by the vegetation, meant that there was only a very low potential for the survey area to contain observable archaeological material.

Of ten sites, that from their AHIMS references appear to occur within the survey area, nine were relocated to different locations after further examination of the original Site Recording Forms. Of those nine, three occur to the east of Peats Ridge Road, and well outside the Project Site, another site, Site #45-3-1794, occurs much closer but still outside the Project Site; two are duplicated as sites #45-3-2195 and #45-3-0119; two others appear to be duplicated, Site #45-3-0132 and Site #45-3-2196; two occur on the southern boundary of the Project Site, namely Sites #45-3-1423 and #45-3-0131. A new site, the shelter with art (Popran Art1), occurs in the south-western corner of the Project Site. A stone arrangement (Calga SA1) was also identified near Site #45-3-2195.

## **8.2 Further Investigation**

As described above, groundcover and impenetrable bush was a severe constraint to a fully effective archaeological investigation and there remains the possibility that there are other engravings and axe-grinding grooves concealed beneath detritus which are yet to be recorded.

Darkinjung LALC recommended that “some form of burn off be implemented so as to assist with the investigation of sites not found” (**Appendix i**, p.4). ASR fully concurs with the Land Council’s recommendation and to ensure that sites both inside and immediately outside the footprint are recorded, the proposed burn-off area should comprise the proposed quarry extension footprint including a buffer zone 20m around the footprint, and include the proposed access road corridor.

Only rubber-tyred vehicles should be used in the burn-off area, either before, during or after the burn-off, and there should be no mechanical disturbance to surface deposits within the burn-off area either to gain access to the area, or create fire-breaks to control the fire, or to remove burnt vegetation after the fire, until such time as a post-fire archaeological investigation of the burn-off area has been completed.

DECCW has indicated that it would support such a strategy if the Minister for Planning issues approval for the project.

## **8.3 Impact Mitigation for Existing Sites**

Following the relocation of the engraving site (Site #45-3-2195 [also identified as Site #45-3-0119]) and the finding of the stone arrangement (Calga SA1) Appleton (ASR) advised the Proponent that because of the high cultural and scientific significance of the sites (see Section 8), that the sites should be protected by a buffer zone, with the zone to be 120m long by 45m wide. In addition the Proponent was advised that the recommendations resulting from the investigation would include the requirement that there should be no impact to either the grinding grooves in the creek line (Site #45-3-2196) or to the “Popran Art1” site. Based on these the Project would not directly or indirectly (through peripheral quarrying activity) impact in any way on any of the four sites (Site #45-3-2195, Site #45-3-2196, Calga SA1 or Popran Art1) (see **Figure 4** and **Figure 7**).



Also, Appleton (ASR) recommends that the three culturally sensitive locations, the engraving site and stone arrangement (Site #45-3-2195 [also identified as Site #45-3-0119]) and Calga SA1), the grinding groove site in the creek-line (Site #45-3-2196), and the art site (Popran Art1), should be fenced off with permanent fences at a distance of no less than 20m from the outer edge of each site (the archaeologist and the Darkinjung LALC Sites Officer should be present during the construction of the fence-lines to advise on their appropriate placement). The fences should be removed when the Project Site is rehabilitated upon completion of quarrying operations, as fence lines have the potential to impact on the effectiveness of long-term weed and effective fire control, and may contribute to slope erosion and the redirection of the natural flow of surface water run-off if left in place permanently.

As a further measure to protect the sites, all quarry personnel (and newly arriving personnel) should be briefed on the site locations, the measures they should take to avoid impacting upon them, and the penalties that they might be subject to if they disturb or alter the sites in anyway, under the *National Parks and Wildlife Act 1974* (as amended).

With regard to the potential for airborne dust to impact upon Popran Art 1, firstly, it should be noted that the site faces north and is shielded from the proposed extraction areas by dense bushland. Also, the site is located approximately 550m from the extraction area for Stage 4, and 200m from the extraction area for Stage 5. Secondly, the prevailing winds are from the southwest, and Popran Art 1 is to the southwest of the proposed quarry extensions in Stage 4 and west of the extensions for Stage 5, ie. upwind of the proposed southern extension, and therefore is unlikely to be affected by dust carried by prevailing winds. In these circumstances it is considered that there will be no impact to the site from airborne dust.

## **9 SIGNIFICANCE ASSESSMENT**

### **9.1 Introduction**

The NPWS policy to safeguard all sites, Aboriginal places, and archaeological material of significance wherever possible requires that some means of assessing the significance of the sites is necessary. This is not only for the purpose of determining whether sand extraction can proceed as proposed, but also to provide Cultural Resource Managers with the information for future management of the area.

### **9.2 Cultural Significance**

The Aboriginal or cultural significance of Aboriginal relics and sites can only be assessed by the Aboriginal community, and in particular, the Elders. It is the responsibility of the archaeologist to ensure that the Elders, or elected representatives of the Aboriginal community are advised of the survey results, and are consulted as to their knowledge and opinion of the significance of the area, and to transcribe and present those expressions in report form.

In this instance, Jodi Cameron, who had assisted in the survey, reported the results of the investigation and her recommendations to the land council by way of a written report. With the approval of the Chairperson, Ms Cameron has provided ASR with a copy of the report, which has been included as **Appendix i**.

With regard to the engraving and stone arrangement, there was no prior Aboriginal knowledge of the existence of either site, and so in terms of assessing the cultural significance of the sites there was no prior knowledge of any cultural association with the sites. Unfortunately there are no surviving Aboriginal people with a personal association or informed knowledge of the sites in the region and so cultural significance only becomes attached to a place when such a place is found to contain features or artefacts that can be associated with Aboriginal activities in the past. Clearly, however, in terms of the information accumulating from archaeological investigations and the role that such information plays in underpinning Aboriginal association with place, country and the past, and cultural identity the sites are of high cultural significance.

### **9.3 Research Potential**

The discovery of the shelter with art and intact occupation deposits (Popran Art1) has produced a site of moderate to high research potential. While the art is culturally significant, it adds little new information to the vast record of art in the Sydney and Central Coast region.

But the occupation deposits have the potential to contain datable material, and evidence of particular site activities, and information useful in providing a greater understanding of intra-site spatial activity, knapping techniques, subsistence strategies, diets, as well as be a potential repository of cultural material.

The axe-grinding grooves site (Site # 45-3-2196) is typical of many found in the area, and has no potential to provide any new information and is therefore of very low research potential.

The “woman & emu” engraving site (Site #45-3-2195 [also identified as Site #45-3-0119]) and the associated stone arrangement (Calga SA1) are of high research significance in terms of their rarity in the archaeological record of the Sydney Basin, however, there is very little potential for the sites to provide additional information to that already provided in this report. Thus, the sites are of high scientific (knowledge) importance, but are low in potential research opportunity.

## **10 RECOMMENDATIONS**

As a consequence of this investigation, the survey area is believed to contain five sites of Indigenous cultural significance, comprising of three previously recorded sites and two new sites, a shelter with art and occupation deposits (Site Popran Art1) and a stone arrangement (Calga SA1). Of the five sites, none of the sites would occur within the footprint of the proposed southern extension of the Calga Sand Quarry.

### **10.1 Further Investigation**

As described earlier in this report ground cover and impenetrable bush was a severe constraint to a fully effective archaeological investigation and there remains the possibility that there are other engravings and axe-grinding grooves concealed beneath detritus yet to be recorded.

Darkinjung LALC recommended that “some form of burn off be implemented so as to assist with the investigation of sites not found” (**Appendix i**, p.4). ASR fully concurs with the Land Council’s recommendation and to ensure that sites both inside and immediately outside the footprint are recorded, the proposed burn-off area should comprise the proposed quarry extension footprint including a buffer zone 20m around the footprint, and include the proposed access road corridor.

Only rubber-tyred vehicles should be used in the burn-off area, either before, during or after the burn-off, and there should be no mechanical disturbance to surface deposits within the burn-off area either to gain access to the area, or to create fire-breaks to control the fire, or to remove burnt vegetation after the fire, until such time as a post-fire archaeological investigation of the burn-off area has been completed.

## 10.2 Impact Mitigation

In relation to the sites identified on the Project Site to date, the Darkinjung LALC has made the following recommendations.

- There should be a buffer zone at least 20m wide around any sites that exist within the (*vicinity* of) the impact zone.
- There should be sedimentation controls emplaced to limit sedimentation of the creeks that would otherwise adversely affect any Aboriginal sites in the creeks.
- Those whose job it is to remove any vegetation within the Project Site should be informed of the site types that might be present, and what to do if any such sites are observed.
- The Darkinjung LALC should be informed if and when any sites are found.

ASR agrees with the recommendations of the Darkinjung LALC and adds the following recommendations

- The three culturally sensitive locations, the engraving site and stone arrangement (Site #45-3-2195 [also identified as Site #45-3-0119] and Calga SA1), the grinding groove site in the creek-line (Site #45-3-2196), and the art site (Popran Art1), should be fenced off with permanent fences at a distance of no less than 20m from the outer edge of each site (the archaeologist should be present in locating the appropriate fence-lines). The fences should be removed when the Project Site is rehabilitated upon completion of quarrying operations.
- As a further measure to protect the sites, all Project personnel should be briefed on the site locations, the measures they should take to avoid impacting upon them, and the penalties that they might be subject to if they disturb or alter the sites in any way, under the National Parks and Wildlife Act 1974 (as amended).
- Amended Site Recording Forms for each of the ten sites investigated should be lodged with the Sites Registrar.
- The Quarry Manager should give Darkinjung LALC prior notice of any future clearing or earthmoving activities within the Project Site.

In addition, the Proponent is advised that they are legally obliged to comply with the following provisions of the National Parks and Wildlife Act 1974 (as amended), which state that:

*"The owners, and their employees, earthmoving contractors, subcontractors, machine operators and their representatives, whether working in the survey area or elsewhere, should be instructed that in the event of any bone or stone artefacts, or discrete distributions of shell, or any objects of cultural association, being unearthed during earthmoving, work should cease immediately in the area of the find."*

In the event that any bone cannot be clearly identified by a qualified archaeologist as being of animal remains the Gosford police station is to be informed of its discovery, and officials and/or their representatives of the Darkinjung Local Aboriginal Land Council, and the Department of Environment and Conservation, Dubbo, advised that the bone is subject to police investigation.

Work should not recommence in the area of the find, until both the police (if bone has been found) and those officials or representatives have given their permission to do so. Those failing to report a discovery and those responsible for the damage or destruction occasioned by unauthorised removal or alteration to a site or to archaeological material may be prosecuted under the National Parks and Wildlife Act 1974, as amended."

Following a review of the proposed protection and control measures, the DECC requested that further consideration be given to the proactive management and restoration of the Site #45-3-2195 / Calga SA1 complex. The additional protection measures of the Site #45-3-2195 / Calga SA1 complex suggested by the DECC have been further considered as follows.

1. "Restoration" of an open-site engraving is impractical, as the act of restoring the engraving would in fact be considered to be damaging the site.
2. The only way of further protecting the site (or at least reducing the pace at which natural degradation occurs), therefore, would be through the erection of a cover over the site. However, this in itself could result in an accelerated degradation of the site as:
  - firstly, the structure would require supports fixed to the rock which could hasten the deterioration of the foundation rock; or
  - the drilling required to fix the supports may introduce intrusive weaknesses into the rock resulting in accelerated decomposition; or
  - the sheltering of the rock formation would result in the foundation rock drying out, the surface of which, without constant dampness, would quickly decompose.
3. Given the discussion above, the only way to ensure the engraving does not deteriorate further is to construct a building over the site in which there is 24 hour temperature and humidity control. This is impractical, even if feasible, and well beyond the means of the quarry owner, Council, Darkinjung LALC, or any land claimants.



4. Erecting a barrier to prevent leaf litter from building up across the site would also produce a concentration of leaf litter thereby creating a fire hazard. There is precedent for such a build up of leaf litter resulting in the destruction of a site. The archaeologist nominates an art site in the ACT where a fence erected around the site by NPWS collected leaf litter which led to a blaze that all but destroyed the art. In this instance the concentration of heat caused by the build-up of detritus could also cause significant cracking and degradation of the rock surface.

The proposed protection of the Site #45-3-2195 / Calga SA1 complex is considered the most practical method of conserving the site. The “convoluted narrow tongue of preserved land” would enable access to the site to be retained whilst also restricting access by the general public and therefore reducing the potential for deliberate or inadvertent damage to the site.

There is also precedent for the protection of a site in such a way. The archaeologist nominates the site of an engraving of a whale which is currently located on an island of retained material in the middle of the F3 Freeway not far from Calga. In contrast to the proposed protection of the Site #45-3-2195 / Calga SA1 complex, there is no access to this site, suggesting the proposed management is of an equal or better standard.

## **11 GENERAL GLOSSARY**

The definitions that follow are for terms used in this and other reports written by the author, and do not necessarily apply to their use in different contexts.

**ADZE :** A modified flake with at least one steeply-retouched working edge. While all adzes are generally considered to be wood-working tools it is probable that some also served as cores and others as scrapers. Adzes with a uniform butt were frequently hafted to make a chisel-like tool, but the intended use of the adze determined the size of the adze and whether it was hafted (Flenniken and White, 1985).

**AHD:** Australian Height Datum

**ARCHAEOLOGICAL DEPOSIT :**  
Sediments which contain evidence of past Aboriginal use of the place, such as artefacts, hearths, burials etc.

**ARTEFACT :** Any object that has attributes as a consequence of human activity (Dunnell, 1971). In this report 'artefacts' has been used generally to describe pieces of stone that have been modified to produce flakes, flaked pieces, cores, hammerstones, or axes.

**BACKED BLADE :**  
A stone tool manufactured from a flake on which one margin has been modified by the removal of small flakes to blunt the edge or margin opposite the cutting edge.

**BORA GROUND :**  
A ceremonial site comprising of one or two connected circles composed of compacted or mounded earth, or defined by an arrangement of stones, of 2 to 30m diameter, generally used in male initiation rites.

**CAMPSITE :** A place at which the density of artefacts and the variety of material indicates that people 'frequently' used the place as a stopping or resting place. Such places are also likely to contain or be close to water resources, food resources, or stone material resources. In this report a campsite is used to describe artefact scatters that are associated with hearths or fireplaces, as distinct from scatters that are not associated with hearths or fireplaces, which are described as Open Scatters.

**CHALCEDONY :**  
A form of silica (partially translucent), which occurs as linings in cavities in rocks. When banded it is known as AGATE (Department of Mines, 1973). Chalcedony is uniformly coloured and agate has curved bands or zones of varying colour (Cook & Kirk, 1991).

**CHERT :** Another name for sedimentary chalcedony. It occurs most frequently in limestones, or in marine sedimentary rock, or as pebbles in sedimentary rock. In its depositional context it is often concentrated in bedding planes. Chert found in deep-water limestones is formed from radiolaria and diatoms (siliceous planktonic micro-organisms) (Cook & Kirk, 1991).  
Chert is a form of amorphous or extremely fine-grained silica, partially hydrous, found in concretions and beds. It is classified as a chemical sedimentary rock although it may be precipitated both organically and inorganically (Department of Mineral Resources, n.d.).

**CONGLOMERATE :**  
Naturally cemented gravel. Conglomerate is a coarse-grained clastic sedimentary rock composed of generally rounded fragments of other rock types larger than 2 mm in diameter, set in a fine-grained matrix of sand, silt, or any of the common natural cementing materials (Department of Mineral Resources, n.d.).

**CORE :** A piece of stone from which flakes have been removed, that cannot otherwise be described as a retouched or modified artefact.

**CORTEX :** The naturally altered surface of stone – eg. the water-worn surface of river pebbles.

**DEBITAGE :** The small waste material observed in knapping floors. Generally, waste material is described as all those fragments having a maximum dimension of less than 10mm

**FLAKE :** A fragment of stone exhibiting features indicating that it has been deliberately removed from a core piece. These features are evident as:

- (i) Platform: Plane or point at which a blow was delivered to remove the flake.
- (ii) Bulb of Percussion: Convex surface that occurs on the face or ventral surface of a flake, radiating from the point of impact, produced as a consequence of the force pattern.

Other terms:

- (i) Dorsal: The back or outer face of a flake as it would have been prior to removal from a core. Frequently either ridged or exhibiting negative flake scars when removed in secondary flaking, with a natural weathered cortex when removed in primary flaking.
- (ii) Ventral: The 'chest' or inner face of a flake as it would have been prior to removal from the core. The surface upon which the Bulb of Percussion occurs.
- (iii) Platform Preparation: The removal of flakes from a surface to produce a level platform. May be evidenced by retouch scars to the platform.
- (iv) Retouch: The removal of small flakes from an edge or margin of an artefact to modify its shape or sharpen its edge.
- (v) Proximal: The end of a flake closest to the striking platform.
- (vi) Distal: The end of a flake furthest from the striking platform.
- (vii) Margin: The edge of an artefact.
- (viii) Eriallure: A small circular to elliptical negative flake scar occurring on the surface of the bulb of percussion on flakes of very fine-grained or highly silicified material. It occurs 'naturally' as a consequence of internal forces generated at the time of flake removal.
- (ix) Split Cone: Occurs when the flake splits down its axis frequently removing part of the striking platform. Generally believed to be produced by faulty knapping technique, but is also probably a consequence of flawed material.
- (x) Transverse Snap: Occurs when a flake snaps across its axis. Generally believed to be caused by post-depositional impacts such as human or stock treadage, or vehicular traffic.

**FLAKED PIECE :**

A fragment of stone exhibiting flake scars indicating that it is an artefact, but not displaying diagnostic features, such as a Bulb of Percussion, Striking Platform, or an Eriallure.

**GREYWACKE :**

A type of sandstone, grey or greenish-grey in colour, tough and well indurated and typically poorly sorted (Clark & Cook, 1986).

A generally poorly sorted, dark sandstone containing feldspar and sand-sized rock fragments of metamorphic or volcanic rocks (Department of Mineral Resources, n.d.).

Usually a dark and coarse-grained rock compared to mudstones and siltstones that are much finer-grained and better sorted.

**HOLOCENE PERIOD :**

The period from 10,000 years ago to the present.

**IGNEOUS ROCK :**

Rock formed by the cooling and solidification of magma on or below the earth's surface (Geography Dictionary, 1985).

**In situ :** In its original place – as deposited.

**ISOLATED ARTEFACT :**

A solitary stone artefact, at least 50m from its nearest neighbour. This is based on NPWS policy that two artefacts within 50m of each other constitute a site.

**KNAPPING FLOOR:**

A discrete scatter of artefacts in which at least two artefacts are recognisably of the same material, and derive from the same piece of stone. Also described as a stone tool manufacturing site or floor.

**LOCATION :** The place at which an artefact is found, or a place identified as having either archaeological or Aboriginal significance.

**MEASUREMENT :**

- I) Flake:
  - i) Length: Measured along the percussion axis at right angles to the platform.
  - ii) Width: The greatest width measured at right angles to the percussion axis.
  - iii) Thickness: The greatest thickness measured at right angles to the percussion axis.
- II) Flaked piece:
  - i) Length: The longest dimension
  - ii) Width: The greatest width measured perpendicular to the length.
  - iii) Thickness: The greatest thickness measured perpendicular to the length.
- III) Core:
  - i) Length: The longest dimension.
  - ii) Width: The greatest width measured perpendicular to the length.
  - iii) Thickness: The greatest thickness measured perpendicular to the length.

**MIDDEN :** A refuse heap or stratum of food remains, such as mollusc shells, and other occupational debris (Dortch, 1984 – see also Meehan, 1982).

**MUDSTONE :** A fine-grained detrital rock, usually quite massive and well consolidated. May be black through grey to off-white, browns, reds and dark blues/greens. Frequently found in association with sandstones (Cook & Kirk, 1991).

Identification is often aided by colour variations in layering. A source for stone material tool manufacturing material found as river pebbles in creek beds, and artefacts often display a water-worn cortex.

**NEGATIVE FLAKE SCAR :**

A concave surface resulting from the removal of a flake, occurring on the surface of the rock from which a flake has been removed.

**PLEISTOCENE PERIOD :**

The period from about 10,000 years ago to 2 million years ago.

**POTENTIAL ARCHAEOLOGICAL DEPOSIT (PAD) :**

Synonymous with Potentially Archaeologically Sensitive : Having the potential to contain archaeological material although none is visible.

**QUARTZITE :**

Quartzites are formed by the regional or contact metamorphism of quartz arenites, siltstones, and flints (cherts). They are composed essentially of quartz, and usually have a fine-grained granoblastic (grains are roughly the same size) texture. Generally massive, but may sometimes show sedimentary structures (Cook & Kirk, 1991).

**ROTATION :**

The removal of flakes from a core by blows directed at different angles, to different platforms. May be evident on the dorsal surface of a flake as negative flake scars, which do not follow the same direction as the percussion axis of the flake. This may be confused with scars produced during core preparation.

**SCAT :** The solid waste material produced by an animal – dung, droppings, manure (Triggs, 1985).

**SCATTER :** Two or more artefacts occurring within 50 metres. Scatter may also be used in the context of 'background scatter', meaning the general distribution of artefacts across the landscape that cannot be recognised as discrete concentrations.



- SILCRETE :** A near surface or surface siliceous induration (Desen & Peterson, 1992).  
A conglomerate consisting of surficial sand and gravel cemented into a hard mass by silica.  
A siliceous duricrust (Bates & Jackson, 1980).  
Crusts may form as a result of low, infrequent rainfall, on reasonably flat surfaces. These are known as duricrusts – those cemented by silica are known as silcretes (Clark & Cook, 1986), sometimes referred to locally as 'billy' (Gentili, 1968), or 'grey billy'.  
Silcrete on the northern tablelands of NSW forms at the surface contact between sediments of the Sandon Beds and the Armidale Beds with overlying basalt, where groundwater (more rich in silica than surficial water) interacts with surficial water and precipitates new quartz as the matrix to the sediments (N.D.J. Cook, Dept. of Geophysics, UNE, pers. Comm.).  
In softer formations of quartz sands, groundwater has apparently been responsible for the formation of concretionary layers of silcrete. Under altered climatic conditions, the less competent beds erode away leaving concretions. Since they are often the size of old-fashioned woolsacks and are greyish and white, they are popularly known as gray billy (slang for billy goat) (Fairbridge, 1968).
- SITE :** A discrete area or concentration of artefactual material, place of past Aboriginal activity, or place of significance to Aboriginal people.

## **12 SOIL SCIENCE TERMS**

(taken from Banks, 1995, and others as referenced).

**BEDROCK :** Outcrop of *in situ* rock material below the soil profile.

**BENCH :** A strip of relatively level earth or rock breaking the continuity of a slope.

**BLOWOUT :** A closed depression formed in the land surface by wind eroding sands and depositing them on adjacent land.

**CHERT:** A very fine-grained amorphous silicate sedimentary rock, commonly a layer of chemical precipitate or micro-organism skeletal remains (Milford 1999).

**CLAY:** Soil material composed of very fine particles less than 0.002 mm size. When used to describe a soil texture group, such a material contains more than 35% clay (Milford 1999).

**CLAYPAN :** A depression caused by the aeolian deflation of sediments, or by the presence of a prior lake.

**CONGLOMERATE :** A poorly-sorted detrital sedimentary rock composed of rounded gravels, stones or cobbles in a matrix of much finer material (Milford 1999).

**DUNE :** A ridge built up by wind action composed of sands, silts, or sand-sized aggregates of clay.

**FLOODPLAIN :** A large flat area, adjacent to a watercourse, characterised by frequent active erosion and aggradation by channelled and overbank stream flow.

**GIBBER :** A level surface covered by a thick deposit of gravel or broken siliceous pebbles, occurring in the more arid parts of the continent, thought to have been formed from the break-up of a siliceous (silcrete) surface crust, and termed gibber plains (Whittow, 1984) – see also silcrete.

**GILGAI :** Surface microrelief associated with soils containing shrink-swell clays. Gilgai consists of mounds and depressions, or irregularly distributed small mounds and subcircular depressions varying in size and spacing. Vertical interval usually <0.3m; horizontal interval usually 3-10m, and surface almost level. Sometimes called 'crab-hole' soils.

**GREYWACKE:** A tough, well-indurated type of sandstone distinguished by detrital quartz crystals and rock fragments set in a finer-grained matrix (Milford 1999).

**GULLY :** An open incised channel in the landscape generally greater than 30cm deep and characterised by moderately to very gently inclined floors and steep walls (Milford 1999).

**HUMMOCK :** A small raised feature above the general ground surface.

### **LANDFORM ELEMENTS :**

Crest : Landform element standing above all points in the adjacent terrain.

Flat : Neither a crest or a depression <3% slope.

Upper slope : Adjacent to and below a crest or flat but not a depression.

Midslope : Not adjacent to a crest, a flat or a depression.

Lower slope : Adjacent to and above a flat or a depression but not a crest.

**LITHOSOLS :** Shallow soils showing minimal profile development and dominated by the presence of weathering rock and rock fragments.

**METAMORPHIC:** Rocks whose composition, texture and/or structure have been altered through tectonic pressure and/or heat (Milford 1999).

**METASEDIMENTARY:** Partially-metamorphosed sedimentary rock (Milford 1999).

**MUDSTONE:** A fine-grained dark-coloured sedimentary rock, formed from lithified mud; similar to shale but more massive (Milford 1999).

- pH** : A measure of the acidity or alkalinity of a soil. A pH of 7.0 denotes neutrality, higher values indicate alkalinity, and lower values indicate acidity. The pH scale is logarithmic, i.e., a pH of 4.0 is ten times as acid as a pH of 5.0, and one hundred times as acid as a pH of 6.0. (DLWC 1999).
- RILL** : A small channel cut by concentrated runoff through which water flows during and immediately after rain.  
A small ephemeral channel, generally no more than 30 cm deep, created by concentrated runoff (Milford 1999).
- RUNOFF** : That portion of precipitation not immediately absorbed into or detained upon the soil and which thus becomes surface flow.
- SCARP/CLIFF** : A steep slope terminating a plateau or any level upland surface.
- SCRUB** : vegetation structure consisting of shrubs 2-8m tall.
- SHEET EROSION** : The removal of the upper layers of soil by raindrop splash and/or runoff.
- SOIL PROFILE** :
- "A HORIZON": The top layer of mineral soil. This may consist of two parts:
    - A<sub>1</sub> HORIZON: Surface soil and generally referred to as the topsoil.
    - A<sub>2</sub> HORIZON: similar in texture, but paler in colour, poorer in structure, and less fertile.
  - "B HORIZON": The layer below the A Horizon. This consists of 2 parts:
    - B<sub>1</sub> HORIZON: A transitional horizon dominated by properties characteristic of the underlying B<sub>2</sub> horizon.
    - B<sub>2</sub> HORIZON: typically contains concentrations of silicate clay and/or iron, and/or aluminium and/or translocated organic material.
  - "C HORIZON": The parent rock. Recognised by its lack of pedological development, and by the presence of remnants of geologic organization.
  - "R HORIZON": Hard rock that is continuous (Charman & Murphy, 1993; 350-1).
- SPUR** : A ridge which projects downwards from the crest of a mountain as a water-parting (Whittow, 1984).
- SUBSOIL** : Sub-surface material comprising the B and C Horizons of soil with distinct profiles; often having brighter colours and higher clay contrasts.
- SURFACE CONDITION** :
- Gravelly : Over 60% of the surface consists of gravel (2-69mm).
  - Hardsetting : Soil is compact and hard.
  - Loose : Soil that is not cohesive.
  - Friable : Easily crumbled or cultivated.
  - Self-mulching : A loose surface mulch of very small peds forms when the soil dries out.
- SWALE** : A linear level-floored open depression excavated by wind or formed by the build-up of two adjacent ridges.
- SWAMP** : Watertable at or above the ground surface for most of the year.
- TOPSOIL**: The surficial layers of the soil profile, typically the A Horizon, which is usually darker, more fertile, better structured and contains more organic matter than underlying soil materials (Milford 1999).
- TERRACE** : A flat or gently inclined surface bounded by a steeper ascending slope on its inner margin and a steeper descending slope on its outer margin (Whittow, 1984).
- TOPSOIL** : A part of the soil profile, typically the A<sub>1</sub> horizon, containing material that is usually darker, more fertile and better structured than the underlying layers.
- UNDERSTOREY** : A layer of vegetation below the main canopy layer.
- WEATHERING**: The physical and chemical disintegration, alteration and decomposition of rocks and minerals at or near the earth's surface by atmospheric and biologic agents (Milford 1999).

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# **APPENDICES**

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- |                     |                                                                                                                                            |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Appendix i</b>   | <b>Report From Darkinjung Local Aboriginal Land Council (2004) and Correspondence from Darkinjung Local Aboriginal Land Council (2007)</b> |
| <b>Appendix ii</b>  | <b>Results of the Search of the AHIMS Site Register</b>                                                                                    |
| <b>Appendix iii</b> | <b>Original Site Recording Forms</b>                                                                                                       |
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# **Appendix i**

Report from Darkinjung Local Aboriginal Land  
Council (2006) and Correspondence from  
Darkinjung Local Aboriginal Land Council (2008)

(No. of pages excluding this page = 5)



## Report from Darkinjung Local Aboriginal land Council (2006)



### ABORIGINAL HERITAGE SITE SURVEY

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#### Aboriginal Heritage Survey For Rocla Quarry - Calga

##### Introduction

The Darkinjung Local Aboriginal Land Council was contacted by John Appleton Archaeological Surveys and Reports PTY LTD to accompany him on an Aboriginal heritage impact assessment of land located directly adjacent to the current quarry site. Mr Appleton was commissioned by Rocla Quarry products to carry out the survey.

This survey is in accordance with the Environmental Planning Act (EPA) 1979, NPWS Act sec 6, and the Gosford City Council's requirements on land prior to development taking place.

##### Aim

The aim of the survey is to determine if any sites of significance are located within the boundaries of the property to be assessed.

Sites of significance include:

- Cave and/or shelter (which may also contain art work and or artefact deposits)

- Middens
- Scar and Marked Trees
- Artefact scatter
- Open campsites
- Burial sites
- Rock engravings
- Grinding grooves

##### Site Location

Lots 1 and 2 are located at the end of Flynnes Rd at Calga. The area is best accessed from the F3 Sydney to Newcastle Freeway. By exiting at the Peats Ridge interchange you are on the Peats Ridge Rd, the property entrance is located at the end of Darkinjung Rd. Vehicle access is restricted into Flynn's Rd.

### Methodology

The survey on Lot1 And 2 DP 805358, Calga, was carried out on the **8<sup>th</sup> and 9<sup>th</sup> December 2005** by John Appleton Archaeological Surveys and Reports PTY LTD and Jodi Cameron Sites officer for the DLALC.

The survey was carried out on foot by way of visual inspection. Areas targeted were old growth trees, rock ledges and shelves, any open flat exposed rock surfaces and creek lines.

### Aboriginal Occupation

The survey area and surrounds has many recorded Aboriginal sites, these sites include rock engravings, shelter cave deposits and art. These are evidence of the areas occupation by Aboriginal people over the last 40,000 years. The area known as Calga would have been an ideal area for past traditional Aboriginal people with good areas for shelter, hunting, and water and food collection available. The rocky escarpments and ledges provided an area for engravings and ochre and charcoal art associated with ceremony and learning.

Little is recorded of the people who lived in this area however they are known to have lived and hunted on the plateau area and surrounding valleys.

### Site Findings

A number of sites that have been registered with NPWS in the survey area were unable to be found. This could be for a number of reasons including human error, as one site was obviously plotted wrong. An engraving and cave site were unable to be located.

The sites that were found may or may not be those currently on the AHIMS register. It was surprising that no other sites were found as the area has a high potential for site findings, the AHIMS register and the adjoining property that has a number of sites such as engravings also indicate this.

Two Aboriginal sites were located in the survey area.

1. Grinding Grooves were located in the creek known as **A** on the Northern side of the survey area. Seven grooves were found however there could have been more under the sand and vegetation deposits in that section of the creek. Also less than 2meters from this site is where the road crosses the creek. There may have been grooves in that platform however the making of the crossing and the deposits of sand have left it highly impacted upon.

2. A cave with art and scattered artefacts was located on the southern side of the survey area. The cave/shelter is 10mtrs long, 5mtrs deep and 2mtrs high. The floor slopes up to the roof at the back of the cave. The cave is in poor condition with water and mineral seepage on the roof and walls. Four areas of charcoal drawings were located and 1 white ochre hand stencil. The drawings were mostly indistinguishable apart from a charcoal Kangaroo in amongst other drawings. Four pieces of artefact scatter were located within the drip line area of the cave.
3. A hand shape indentation on some rock in a small over hang was located in the northern side of the survey area. The overhang is situated on a lower level of rocky out crop under the present quarry. It may or may not be of Aboriginal origin.

### Discussion

The survey area is thickly vegetated with rocky out crops on the ridge tops, two first order creeks that form in a depression area then meet and join further down to a second order stream. Habitats of heath lands and what looked like a hanging swamp habitat were also located in between these first order creeks and on the northern and southern sides of the survey areas just below the ridgeline areas.

Some of the thick growth or forests of Banksias and Hakea may have started on open rock ledges that have been covered with leaf litter and sand build-up. Most of the survey and surrounding area is thick with vegetation; there is at times no surface visibility at all due to thick leaf litter. Some areas were impenetrable and unable to be accessed because of the thickness of the bush growth in that area.

Areas that did have ground visibility were mainly those areas where tracks had been made. A tract of land that the electrical easement lines run through has been cleared and maintained and now has regrowth of bracken fern. This area also is the cause of sand sedimentation within the creek lines.

A number of sites that have been registered with NPWS in the survey lots were unable to be found. This could be for a number of reasons, thick bush regrowth and human error. The sites that were found may or may not be those currently on the register. It was surprising that no other sites were found the area has a high potential and there is certainly a lot of sites located on the property next to this one.

Another area of concern was the amount of fire fuel located within these lots it seems evident that a fire has not been through this area for quite some time perhaps 5yrs or so. Although it is favourable to locate sites before a fire to

minimize their damage it would actually be beneficial in this instance to have a burn off to actually locate sites.

**Recommendations**

The recommendations for the Rocla Quarries, Lots 1 and 2 in regards to Aboriginal Heritage are as follows:

- That further investigation be carried out to relocate the already registered sites to make sure that they do exist with in the proposed new quarry area, and no new sites exist which were unable to be located on the 8<sup>th</sup> and 9<sup>th</sup> of December.
- That some form of burn off be implemented so as to assist with the investigation of sites not found.
- That should licence be granted to extend the quarry that the quarry take action to erect sedimentation controls that would effect the two creeks within the proposed new quarry area. This would limit any sediment run off that would cover or adversely affect any Aboriginal sites within the creeks and there banks.
- That sites that exist with in the new quarry area have a 20mtr buffer area around them. That appropriate sedimentation control is erected around them.
- That the people who are removing vegetation to start the quarry be educated about what an Aboriginal site and artefacts looks like.
- That the Darkinjung Local Aboriginal Land Council be informed should any site or artefact previously undetected be uncovered when quarrying begins

This report has been written and prepared by Jodi Cameron Sites officer for Darkinjung local Aboriginal land council. Should you have any queries in regard to this report please contact me at the land council.

Regards

Jodi Cameron  
Cultural Heritage Environment Officer  
Darkinjung Local Aboriginal Land Council

Correspondence from Darkinjung Local Aboriginal Land Council (2008)



**DARKINJUNG LOCAL  
ABORIGINAL LAND COUNCIL**

168 PACIFIC HIGHWAY,  
WATANOBBI NSW 2259  
POSTAL ADDRESS:  
P.O. BOX 401, WYONG NSW 2259

A.B.N. 99 583 297 167  
TELEPHONE: (02) 4351 2930  
FAX: (02) 4351 2946  
EMAIL: darkinjung@dlalc.org.au

November 18, 2008  
Archeological Surveys & Reports Pty Ltd  
16 Curtis Street  
Armidale NSW 2350

Attention: Mr. John Appleton

**ARCHEOLOGICAL INVESTIGATION CALGA SAND QUARRY**

Dear John,

In reference to the above on behalf of DLALC I ask you to consider the following recommendations for the project:

- To have recommendations adhered to in Ms. Jodie Cameron's 2005 report following Aboriginal Heritage;
- To have a DLALC representative present during all works conducted for the duration of project; and
- This would in turn help monitor and maintain protection due to the high possibility of uncovering or findings of Aboriginal objects in the area proposed, due to recent events that have occurred in similar areas on the Central Coast we need to ensure monitoring is conducted.

Please consider our recommendations and advise accordingly. I am available to discuss this matter further if required.

Thanking you in advance for your considerations and professionalism in relation to the above.

Mr. Sean Gordon

  
Chief Executive Officer  
D.L.A.L.C



# Appendix ii

## Results of the Native Title Search

(No. of pages excluding this page = 1)



11-13 Mansfield Street  
Glebe NSW 2037  
PO Box 112, Glebe NSW 2037  
P. 02 9562 6327 F. 02 9562 6350

Mr John Appleton  
16 Curtis Street  
Armidale, NSW 2350

8 July 2009

Dear Mr Appleton

**Request - Search for Aboriginal Land Claim**

I refer to your letter dated 1 July 2009 to search the Register of Aboriginal Land Claims database in relation to land you described as:

**Lot(s): 2 DP 229889 and part Lot 121, DP 75522**  
**Parish: Cowan**

I have searched the Register of Aboriginal Land Claims database and the subject land described by you does not appear on the Register as being affected by an Aboriginal Land Claim in pursuant to sections 36 or 37 of the *Aboriginal Land Rights Act 1983*.

Yours sincerely

Courtney Field  
**Administrative Officer, ALRA**

*Please Note: Search Requests should not be made over privately owned land. Crown Land is the only land in NSW that is likely to be affected by an Aboriginal Land Claim under the Aboriginal Land Rights Act. It is not necessary to make a search over privately owned – even if an Aboriginal Land Claim has been made over privately owned land it would be refused as soon as this is known.*

**Office of the Registrar, ALRA**

# Appendix iii

## Results of the Search of the AHIMS Site Register (the list was 30 pages long. A copy is available upon request)

(No. of pages excluding this page = 2)

Your Ref:  
Our Ref: AHIMS #9173

Archaeological Surveys and Reports  
16 Curtis Street  
Armidale NSW 2350

Tuesday, 10 February 2004

Attention: John Appleton

Dear Sir or Madam:

**Re: AHIMS Search for the following area at Sydney  
Zone 56 Eastings: 331000-338000 Northings: 6299000-6306000**

I am writing in response to your recent inquiry in respect to Aboriginal objects and Aboriginal places registered with the NSW National Parks and Wildlife Service (NPWS) at the above location.

A search of the NPWS Aboriginal Heritage Information Management System (AHIMS) has shown that 180 Aboriginal objects and Aboriginal places are recorded in or near the above location. Please refer to the attached report for details.

The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.

The following qualifications apply to an AHIMS search:

- AHIMS only includes information on Aboriginal objects and Aboriginal places that have been provided to NPWS;
- Large areas of New South Wales have not been the subject of systematic survey or recording of Aboriginal history. These areas may contain Aboriginal objects and other heritage values which are not recorded on AHIMS;
- Recordings are provided from a variety of sources and may be variable in their accuracy. When an AHIMS search identifies Aboriginal objects in or near the area it is recommended that the exact location of the Aboriginal object be determined by re-location on the ground; and
- The criteria used to search AHIMS are derived from the information provided by the client and NPWS assumes that this information is accurate.

All Aboriginal places and Aboriginal objects are protected under the *National Parks and Wildlife Act 1974* (NPW Act) and it is an offence to destroy, damage or deface them without the prior consent of the NPWS Director-General. An Aboriginal object is considered to be known if:

- It is registered on AHIMS;
- It is known to the Aboriginal community; or
- It is located during an investigation of the area conducted for a development application.

If you considering undertaking a development activity in the area subject to the AHIMS search, NPWS would recommend that an Aboriginal Heritage Assessment be



NSW  
NATIONAL  
PARKS AND  
WILDLIFE  
SERVICE

ABN 30 841 387 271

Head Office  
43 Bridge Street  
PO Box 1967  
Hurstville NSW  
1560 Australia  
Tel: (02) 9585 6444  
Fax: (02) 9585 6555  
[www.npws.nsw.gov.au](http://www.npws.nsw.gov.au)

undertaken. You should consult with the relevant consent authority to determine the necessary assessment to accompany your development application.

Yours Sincerely



Kellyanne Sheargold  
Aboriginal Information Officer  
Information Systems Unit  
Cultural Heritage Division  
Phone: (02) 9585 6345  
Fax: (02) 9585 6094

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# Appendix iv

## Original Site Recording Forms

(No. of pages excluding this page = 19)

ABORIGINAL HERITAGE EXISTING ENVIRONMENT 69  
AND CONSTRAINTS ASSESSMENT

ROCLA MATERIALS PTY LTD  
Proposed Southern Extension – Calga Sand Quarry  
Draft Report No.664/01 – 12/05/2006



Site plotted onto 1:63,360 scale Topographic map, No.410 & 411 Zone 8, 1942  
"Gosford & Norahville"

ARCHAEOLOGICAL SURVEYS & REPORTS PTY LTD  
Project 393/06

REGISTER CASE 2

1. Map Name *Sydney* ..... *Gosford/Narrabri* ..... 5. Site No. *45-3-124*...  
2. Scale *1:250,000* ..... *1:63,360* ..... 6. Site type .....  
3. Grid ref *4228 87 01* ..... *231 702* ..... Engravings  
4. Site name(s) *Calga* ..... 7. Classification *Q*.....  
8. Air photo ref .....  
9. Cadastral .....  
10. Land Status ..... 11. ....  
12. Directions for site relocation

13. Owner ..... 14. Tenant/Manager .....  
Address ..... Address .....  
.....  
Attitude ..... Attitude .....

15. Site Description *Along side the former Pacific Highway. 6 footprints  
+ a lizard. According to local information, the rest of the group,  
including a line of foot prints, was destroyed during road construction*

16. Reasons for investigation .....  
17. Condition .....  
.....  
18. Interpretation .....

ABORIGINAL HERITAGE EXISTING ENVIRONMENT 71  
AND CONSTRAINTS ASSESSMENT

ROCLA MATERIALS PTY LTD  
Proposed Southern Extension – Calga Sand Quarry  
Draft Report No.664/01 – 12/05/2006



Site plotted onto 1:63,360 scale Topographic map, No.410 & 411 Zone 8, 1942  
"Gosford & Norahville"

ARCHAEOLOGICAL SURVEYS & REPORTS PTY LTD  
Project 393/06

REGISTER COPY

1. Map Name *Sydney* ..... *Gosford/Norahville* ..... 5. Site No. *45-3-131* .....  
2. Scale *1:250,000* ..... *1:63,360* ..... 6. Site type .....  
3. Grid ref *C. 42188698* ..... *C. 213697* ..... *Engraving/Grinding grooves* .....  
4. Site name(s) *Calga* ..... 7. Classification *0* .....  
8. Air photo ref .....  
9. Cadastral .....  
10. Land Status ..... 11. ....  
12. Directions for site relocation

13. Owner ..... 14. Tenant/Manager .....  
Address ..... Address .....  
.....  
Attitude ..... Attitude .....

15. Site Description *3 scattered series. Grinding grooves, psthole, footprints, emu + kangaroo tracks.*

16. Reasons for investigation .....  
17. Condition .....



ABORIGINAL HERITAGE EXISTING ENVIRONMENT 73  
AND CONSTRAINTS ASSESSMENT

**ROCLA MATERIALS PTY LTD**  
*Proposed Southern Extension – Calga Sand Quarry*  
*Draft Report No.664/01 – 12/05/2006*



Site plotted onto 1:63,360 scale Topographic map, No.410 & 411 Zone 8, 1942  
"Gosford & Norahville"

ARCHAEOLOGICAL SURVEYS & REPORTS PTY LTD  
Project 393/06



1. Map Name *Sydney* ..... *Gooford/Norahville* Site No. *45-3-132*..  
2. Scale ..... *1:250,000* ..... *1:63,360* 6. Site type .....  
3. Grid ref *(42208700)* ..... *(221699)* ..... *Engraving/Grinding groove*  
4. Site name(s) *Calga* ..... 7. Classification ..... *○*..  
8. Air photo ref .....  
9. Cadastral .....  
10. Land Status ..... 11. ....  
12. Directions for site relocation

13. Owner ..... 14. Tenant/Manager .....  
Address ..... Address .....  
.....  
Attitude ..... Attitude .....

15. Site Description *In a creek bed. A group of grinding grooves & several engravings.*

16. Reasons for investigation .....  
17. Condition .....  
18. Interpretation .....  
19. Visitation .....  
20. Recommendations .....

ABORIGINAL HERITAGE EXISTING ENVIRONMENT 75  
AND CONSTRAINTS ASSESSMENT

ROCLA MATERIALS PTY LTD  
Proposed Southern Extension – Calga Sand Quarry  
Draft Report No.664/01 – 12/05/2006



Site plotted onto 1:63,360 scale Topographic map, No.410 & 411 Zone 8, 1942  
"Gosford & Norahville"

ARCHAEOLOGICAL SURVEYS & REPORTS PTY LTD  
Project 393/06

1. Map Name *Gunderman G/N Sydney* 5. Site No. *45-3-1415*  
2. Scale *1:25,000* *1:63* *1:250,000* 6. Site type *old*  
3. Grid ref *3528.0023* *2340.7000* *6422.870* (2) *AN*  
4. Site name(s) *CALGA* 7. Classification  
8. Air photo ref  
9. Cadastral  
10. Land Status 11.  
12. Directions for site relocation

*about 6m N. of Lough's s/n 217 (G/N 1:63,360  
2335.7000)*

13. Owner 14. Tenant/Manager  
Address Address  
Attitude Attitude

15. Site Description

*Lough's s/n 218*  
*Report in Catalogue*  
*dimensions: 3m x 12m x 12m high*

16. Reasons for investigation *DMR Survey Freeway No 3 9/79 Sites*  
17. Condition *more than 500 from Centre Line*  
18. Interpretation  
19. Visitation

ABORIGINAL HERITAGE EXISTING ENVIRONMENT 77  
AND CONSTRAINTS ASSESSMENT

**ROCLA MATERIALS PTY LTD**  
*Proposed Southern Extension – Calga Sand Quarry*  
*Draft Report No.664/01 – 12/05/2006*



Site plotted onto 1:63,360 scale Topographic map, No.410 & 411 Zone 8, 1942  
 "Gosford & Norahville"

ARCHAEOLOGICAL SURVEYS & REPORTS PTY LTD  
Project 393/06

1. Map Name *Junderman*... *g/n*... *Sydney*... 5. Site No. *45-3-1423*...  
2. Scale *1:25,000*... *1:63*... *1:250,000*... 6. Site type...  
3. Grid ref *34030006*... *21296879*... *C-4215-8690*... *Engraving*...  
4. Site name(s) *CALGA*... 7. Classification...  
8. Air photo ref...  
9. Cadastral...  
10. Land Status... 11. ...

12. Directions for site relocation

*135m W of G.C. track.*

13. Owner... 14. Tenant/Manager...  
Address... Address...  
Attitude... Attitude...

15. Site Description

*Loughs w/n 226*

*Report in Catalogue*

*Shield 1m, level 1m;*

*hangars 1.5m, shield 1m.*

*90m S. are pot holes, a ss + at least 3 rock engravings.*

*Requires a night inspection*

16. Reasons for investigation *QMR survey Freeway No3 7/79 sites*...  
17. Condition *More than 500' from centre line*...  
18. Interpretation...  
19. Visitation...  
20. Recommendations...



ABORIGINAL HERITAGE EXISTING ENVIRONMENT 79  
AND CONSTRAINTS ASSESSMENT

ROCLA MATERIALS PTY LTD  
Proposed Southern Extension – Calga Sand Quarry  
Draft Report No.664/01 – 12/05/2006



Site plotted onto 1:63,360 scale Topographic map, No.410 & 411 Zone 8, 1942  
"Gosford & Norahville"

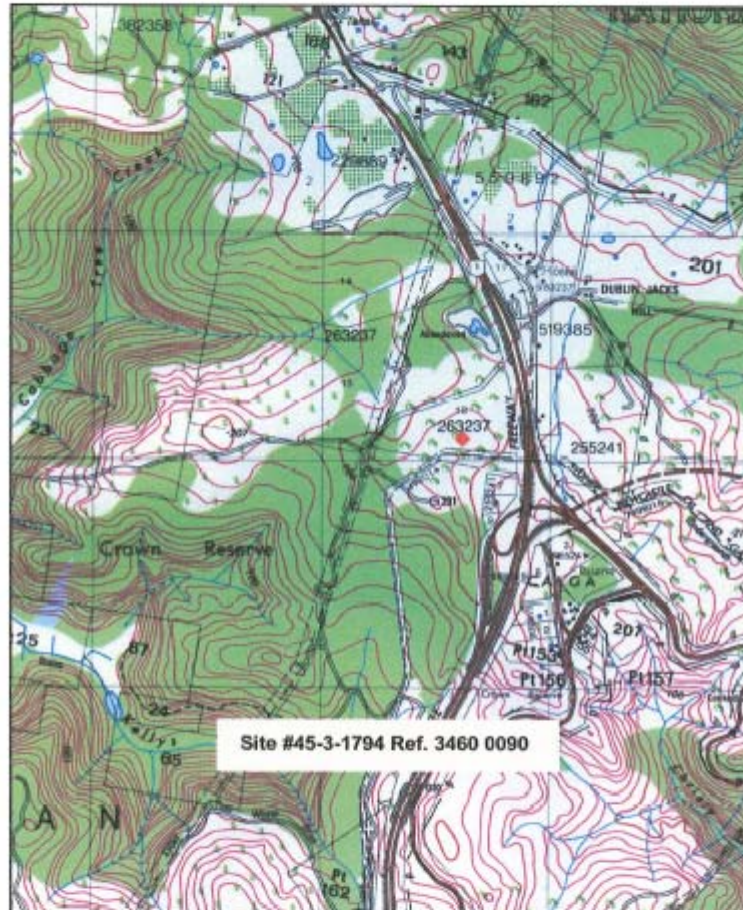
ARCHAEOLOGICAL SURVEYS & REPORTS PTY LTD  
Project 393/06



|  <b>National Parks and Wildlife Service</b><br><small>BOX N189, GROSVENOR STREET POST OFFICE, SYDNEY, NSW 2000. TEL (02) 237 6500</small><br><b>Standard Site Recording Form</b> |                                  |                                                                |                                                     |                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| MAP NAME<br><i>Supersy</i>                                                                                                                                                                                                                                        | EDITION                          | SCALE<br><i>1:250K</i>                                         | REFERENCE<br><i>3346/3009</i>                       | HEAD OFFICE USE ONLY:<br>NWPS site no: <i>45-3-1794</i><br>Site types: File nos:<br><b>ENGRAVINGS</b> Date<br>Filed by: <i>AD</i> <i>8/2/89.</i> |
| Site name: <i>...</i>                                                                                                                                                                                                                                             |                                  | Locality/property name:                                        |                                                     | Owner/Manager:                                                                                                                                   |
| Local post office: <i>...</i>                                                                                                                                                                                                                                     |                                  |                                                                |                                                     | Address:                                                                                                                                         |
| NPWS District: <i>...</i>                                                                                                                                                                                                                                         |                                  | Region: <i>...</i>                                             |                                                     |                                                                                                                                                  |
| Reason for investigation (give R.O. instruction no. where applicable):<br><i>...</i>                                                                                                                                                                              |                                  |                                                                |                                                     |                                                                                                                                                  |
| Portion no: <i>...</i>                                                                                                                                                                                                                                            | Other land category:             |                                                                | Plan/sketch/section of site attached? <i>Yes/No</i> |                                                                                                                                                  |
| Parish: <i>...</i>                                                                                                                                                                                                                                                | County: <i>...</i>               |                                                                | How many?                                           |                                                                                                                                                  |
| Air photo refs. (for stereo pair)                                                                                                                                                                                                                                 |                                  |                                                                | Photos taken? <i>Yes/No</i>                         |                                                                                                                                                  |
|                                                                                                                                                                                                                                                                   |                                  |                                                                | How many attached?                                  |                                                                                                                                                  |
| How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff, etc. Draw diagram on separate sheet.)<br><i>...</i>                                                                                           |                                  |                                                                |                                                     |                                                                                                                                                  |
| Other sites in locality? <i>Yes/No</i>                                                                                                                                                                                                                            |                                  | Site Types include: <i>...</i>                                 |                                                     |                                                                                                                                                  |
| Are sites in NPWS Register? <i>Yes/No</i>                                                                                                                                                                                                                         |                                  | Unregistered sites — plans for future recording? <i>Yes/No</i> |                                                     |                                                                                                                                                  |
| Have artefacts been removed from site? <i>Yes/No/don't know, When?</i>                                                                                                                                                                                            |                                  |                                                                |                                                     |                                                                                                                                                  |
| By whom?                                                                                                                                                                                                                                                          |                                  | Deposited where?                                               |                                                     |                                                                                                                                                  |
| Is site important to local Aborigines? <i>Yes/No/don't know.</i>                                                                                                                                                                                                  |                                  |                                                                |                                                     |                                                                                                                                                  |
| Give contact(s) name(s) + address(es)                                                                                                                                                                                                                             |                                  |                                                                |                                                     |                                                                                                                                                  |
| Contacted for this recording? <i>Yes/No.</i>                                                                                                                                                                                                                      |                                  |                                                                |                                                     |                                                                                                                                                  |
| (Attach additional information separately) If not, why not?                                                                                                                                                                                                       |                                  |                                                                |                                                     |                                                                                                                                                  |
| Verbal/written reference sources (including full title of accompanying report).                                                                                                                                                                                   |                                  |                                                                |                                                     |                                                                                                                                                  |
| <i>...</i>                                                                                                                                                                                                                                                        |                                  |                                                                |                                                     |                                                                                                                                                  |
| Checklist:<br>surface visibility,<br>damage/disturbance/<br>threat to site                                                                                                                                                                                        | Condition of site:<br><i>...</i> |                                                                |                                                     |                                                                                                                                                  |
| Recommendations for management & protection (attach separate sheet if necessary):<br><i>...</i>                                                                                                                                                                   |                                  |                                                                |                                                     |                                                                                                                                                  |
| Site recorded by: <i>...</i> Date: <i>...</i>                                                                                                                                                                                                                     |                                  |                                                                |                                                     |                                                                                                                                                  |
| Address/institution: <i>...</i>                                                                                                                                                                                                                                   |                                  |                                                                |                                                     |                                                                                                                                                  |

ABORIGINAL HERITAGE EXISTING ENVIRONMENT 81  
AND CONSTRAINTS ASSESSMENT

ROCLA MATERIALS PTY LTD  
Proposed Southern Extension – Calga Sand Quarry  
Draft Report No.664/01 – 12/05/2006



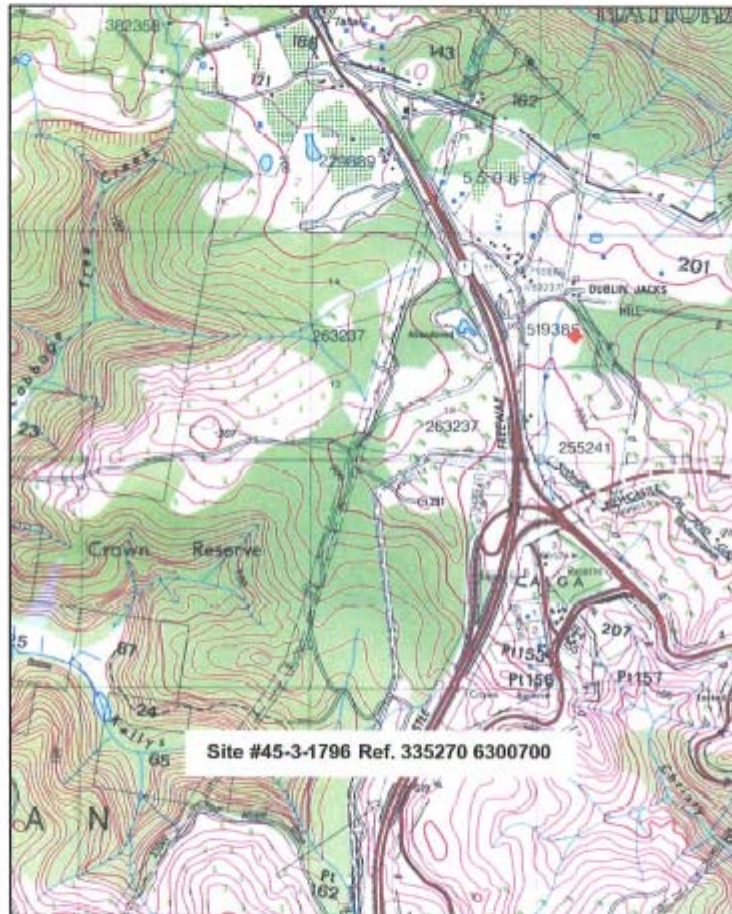
Site plotted onto 1:25,000 scale Topographic map, 9131-3-S "Gunderman "

ARCHAEOLOGICAL SURVEYS & REPORTS PTY LTD  
Project 393/06

|  <b>National Parks and Wildlife Service</b><br><small>BOX N189, GROSVENOR STREET POST OFFICE, SYDNEY, NSW 2000. TEL (02) 237 6500</small><br><b>Standard Site Recording Form</b>                                 |                                      |                                                                  |                                                       |                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------|
| MAP NAME<br><b>SYDNEY</b>                                                                                                                                                                                                                                                                         | EDITION                              | SCALE<br><b>1:250K</b>                                           | REFERENCE<br><b>3352/3007</b>                         | HEAD OFFICE USE ONLY:<br>NWPS site no: <b>45-3-1796</b>        |
| <b>Gundeman</b>                                                                                                                                                                                                                                                                                   | <b>1st</b>                           | <b>1:25000</b>                                                   | <b>3527E 0070N</b>                                    | Site types: <b>ENGRAVINGS</b> File nos:<br>Date: <b>8/2/89</b> |
| Site name: <b>Robinsons</b>                                                                                                                                                                                                                                                                       |                                      | Locality/property name:                                          |                                                       | Owner/Manager: <b>Mr. M. Robinson</b>                          |
| Local post office: <b>Calga</b>                                                                                                                                                                                                                                                                   |                                      | Address: <b>Tones Rd Calga</b>                                   |                                                       | Ph: <b>043 751116</b>                                          |
| NPWS District: <b>Gosford</b>                                                                                                                                                                                                                                                                     |                                      | Region: <b>Central</b>                                           |                                                       |                                                                |
| Reason for investigation (give R.O. instruction no. where applicable):<br><b>Private</b>                                                                                                                                                                                                          |                                      |                                                                  |                                                       |                                                                |
| Portion no: <b>201</b>                                                                                                                                                                                                                                                                            | Other land category:                 |                                                                  | Plan/sketch/section of site attached? <b>Yes</b> /No. |                                                                |
| Parish: <b>Calga</b>                                                                                                                                                                                                                                                                              | County: <b>Northumberland</b>        |                                                                  | How many?                                             |                                                                |
| Air photo refs. (for stereo pair)                                                                                                                                                                                                                                                                 |                                      |                                                                  | Photos taken? <b>Yes</b> /No                          |                                                                |
|                                                                                                                                                                                                                                                                                                   |                                      |                                                                  | How many attached? <b>2</b>                           |                                                                |
| How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along creek, from grid reference (Draw diagram on separate sheet.)) <b>3565E 0094N Calga Lake Tones Rd to Robinsons farm approx 500m on left side approx 100m behind house large shed.</b> |                                      |                                                                  |                                                       |                                                                |
| Other sites in locality? <b>Yes</b> /No.                                                                                                                                                                                                                                                          |                                      | Site Types include: <b>Cut Shelter Engraving, Grinding</b>       |                                                       |                                                                |
| Are sites in NPWS Register? <b>Yes</b> /No.                                                                                                                                                                                                                                                       |                                      | Unregistered sites — plans for future recording? <b>Yes</b> /No. |                                                       |                                                                |
| Have artefacts been removed from site? <b>Yes</b> /No/don't know. <b>When?</b>                                                                                                                                                                                                                    |                                      |                                                                  |                                                       |                                                                |
| By whom?                                                                                                                                                                                                                                                                                          |                                      | Deposited where?                                                 |                                                       |                                                                |
| Is site important to local Aborigines? <b>Yes</b> /No/don't know.                                                                                                                                                                                                                                 |                                      |                                                                  |                                                       |                                                                |
| Give contact(s) name(s) + address(es)                                                                                                                                                                                                                                                             |                                      |                                                                  |                                                       |                                                                |
| Contacted for this recording? <b>Yes</b> /No.                                                                                                                                                                                                                                                     |                                      |                                                                  |                                                       |                                                                |
| (Attach additional information separately) If not, why not? <b>NOT KNOWN</b>                                                                                                                                                                                                                      |                                      |                                                                  |                                                       |                                                                |
| Verbal/written reference sources (including full title of accompanying report).                                                                                                                                                                                                                   |                                      |                                                                  |                                                       |                                                                |
| Checklist:<br>surface visibility,<br>damage/disturbance/<br>threat to site                                                                                                                                                                                                                        | Condition of site: <b>Weathering</b> |                                                                  |                                                       |                                                                |
| Recommendations for management & protection (attach separate sheet if necessary)                                                                                                                                                                                                                  |                                      |                                                                  |                                                       |                                                                |
| Site recorded by: <b>H. T. Bluff</b>                                                                                                                                                                                                                                                              |                                      | Date: <b>11/88</b>                                               |                                                       |                                                                |
| Address/institution: <b>Mortdale</b>                                                                                                                                                                                                                                                              |                                      |                                                                  |                                                       |                                                                |

ABORIGINAL HERITAGE EXISTING ENVIRONMENT 83  
AND CONSTRAINTS ASSESSMENT

ROCLA MATERIALS PTY LTD  
Proposed Southern Extension – Calga Sand Quarry  
Draft Report No.664/01 – 12/05/2006



Site plotted onto 1:25,000 scale Topographic map, 9131-3-S "Gunderman "

ARCHAEOLOGICAL SURVEYS & REPORTS PTY LTD  
Project 393/06

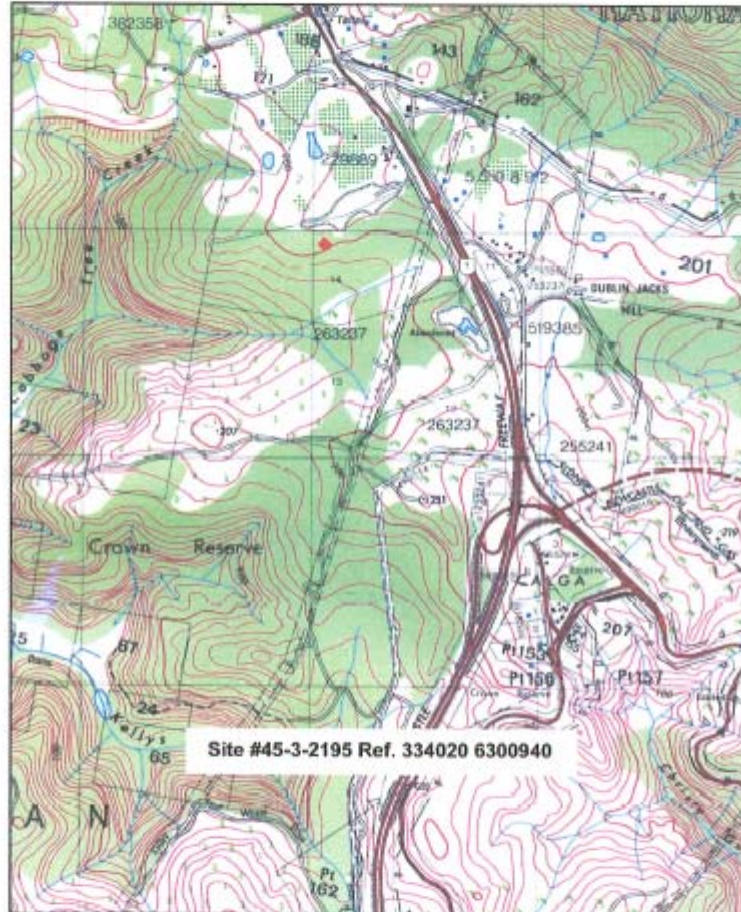
[X] New recording [ ] Additional Info

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
|  <b>National Parks and Wildlife Service</b><br>Box 1967, Hurstville NSW 2220. Tel: (02) 585 6444<br>Standard Site Recording Form Revised 5/88                                                                                                                                                                                                                                                                                                                            |                                                                                               |
| 1:250,000 map sheet: <u>Sydney</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                               |
| AMG Grid reference: <u>334020</u> mE <u>6300140</u> mN<br>Full reference - please include leading digits: <u>334020</u> <u>6300140</u><br>Scale of map used for grid reference: [X] 25K, 50K (preferred) [ ] 100K [ ] 250K<br>Please use largest scale available: <u>25K</u><br>1:25K, 50K, 100K map name: <u>Goodman</u>                                                                                                                                                                                                                                 |                                                                                               |
| NPWS Code: _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                               |
| HEAD OFFICE USE ONLY:<br>NPWS Site no: <u>45-3-2195</u><br>Site types: <u>Improving</u><br>Accessioned by: <u>[Signature]</u> Date: <u>28 Oct 93</u><br>Data entered by: _____ Date: _____<br>Owner/Manager: _____<br>Address: _____                                                                                                                                                                                                                                                                                                                      |                                                                                               |
| Site name: <u>Calga</u> Locality/property name: _____<br>NPWS District: <u>Newcastle</u> Region: <u>Central</u><br>Reason for investigation: <u>fauna</u>                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                               |
| Portion no: <u>108</u><br>Parish: <u>Cowan, Gosford Shire, County Northumberland</u><br>Photos taken? <u>yes</u><br>How many attached? <u>5</u>                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                               |
| How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff. (Draw diagram on separate sheet.)<br><u>Take main road off Sates New white Freeway (1) going North. Park 150m past Jones Road on R.H.S. - side to west of road near elum tower. High cutting &amp; quarry area. Walk down side (vegetated) of quarry tower - just over 100m.</u>                                                                                                                                                      |                                                                                               |
| Other sites in locality? _____ Site Types include: _____<br>Are sites in NPWS Register? _____<br>Have artefacts been removed from site? _____ When? _____<br>By whom? _____ Deposited where? _____<br>Is site important to local Aborigines? _____<br>Give contact(s) name(s) + address(es) _____<br>Contacted for this recording? _____<br>(Attach additional information separately) If not, why not? <u>NOT KNOWN</u><br>Verbal/written reference sources (including full title of accompanying report): _____<br>NPWS Report Catalogue # <u>4/133</u> |                                                                                               |
| Checklist:<br>surface visibility,<br>damage/disturbance/<br>threat to site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Condition of site: <u>covered in leaf litter - away from quarry</u><br><u>in south facing</u> |
| Recommendations for management & protection (attach separate sheet if necessary):<br><u>- Inform Quarry staff?</u><br><u>- night recorded</u>                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                               |
| Site recorded by: <u>W.T. Bluff</u> Date: <u>24-9-93</u><br>Address/institution: <u>A. Jones</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                               |



ABORIGINAL HERITAGE EXISTING ENVIRONMENT 85  
AND CONSTRAINTS ASSESSMENT

ROCLA MATERIALS PTY LTD  
Proposed Southern Extension – Calga Sand Quarry  
Draft Report No.664/01 – 12/05/2006



Site plotted onto 1:25,000 scale Topographic map, 9131-3-S "Gunderman "

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Project 393/06

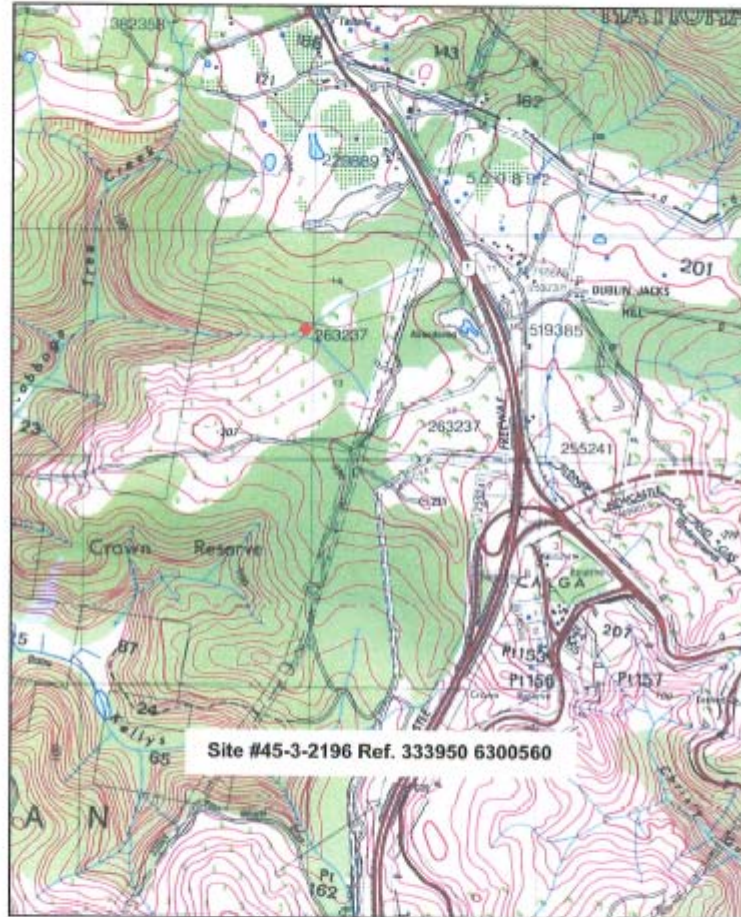


[ ] New recording [ ] Additional Info

|                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>National Parks and Wildlife Service</b><br>Box 1967, Hurstville NSW 2220. Tel: (02) 585 6444<br>Standard Site Recording Form Revised 5/88                                                                                                            |                                                                                                                                                                                                                                    |
| 1:250,000 map sheet: <u>SYDNEY</u> NPWS Code: <u>45</u>                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                    |
| AMG Grid reference<br>Full reference - please include leading digits<br>25K: <u>33950</u> mE 25K: <u>6200560</u> mN                                                                                                                                                                                                                       | <b>HEAD OFFICE USE ONLY:</b><br>NPWS Site no: <u>45-3-2196</u><br>Site types: <u>A.C.G.</u><br>Accessioned by: <u>B/E</u> Date: <u>28 Oct 93</u><br>Data entered by: <u>ML</u> Date: <u>28/10/93</u><br>Owner/Manager:<br>Address: |
| Scale of map used for grid reference <input checked="" type="checkbox"/> 25K, 50K (preferred) <input type="checkbox"/> 100K <input type="checkbox"/> 250K<br>Please use largest scale available<br>1:25K, 50K, 100K map name: <u>Gondwana</u>                                                                                             |                                                                                                                                                                                                                                    |
| Site name: <u>Calga</u> Locality/property name:<br>NPWS District: <u>North Sydney</u> Region: <u>Central</u>                                                                                                                                                                                                                              |                                                                                                                                                                                                                                    |
| Reason for investigation: <u>Private</u>                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                    |
| Portion no: <u>124</u><br>Parish: <u>Carson</u> <u>Nathaniel</u>                                                                                                                                                                                                                                                                          | Photos taken? <u>yes</u><br>How many attached? <u>3</u>                                                                                                                                                                            |
| How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff, etc.)<br><u>Follow road to old quarry way off road from western side of road. Follow road to old quarry way off road from western side of road. Follow road to old quarry way off road from western side of road.</u> |                                                                                                                                                                                                                                    |
| Other sites in locality? <input type="checkbox"/> Site Types include:<br>Are sites in NPWS Register? <input type="checkbox"/><br>Have artefacts been removed from site? <input type="checkbox"/> When?<br>By whom? <input type="checkbox"/> Deposited where?                                                                              |                                                                                                                                                                                                                                    |
| Is site important to local Aborigines?<br>Give contact(s) name(s) + address(es)<br>Contacted for this recording? <input type="checkbox"/><br>(Attach additional information separately) If not, why not? <u>NOT KNOWN</u>                                                                                                                 |                                                                                                                                                                                                                                    |
| Verbal/written reference sources (including full title of accompanying report)<br>NPWS Report Catalogue # <u>9/1222</u>                                                                                                                                                                                                                   |                                                                                                                                                                                                                                    |
| Checklist:<br>surface visibility,<br>damage/disturbance/<br>threat to site                                                                                                                                                                                                                                                                | Condition of site:<br><u>Weathering</u>                                                                                                                                                                                            |
| Recommendations for management & protection (attach separate sheet if necessary):                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                    |
| Site recorded by: <u>W.T. Bluff</u> Date: <u>16/10/93</u><br>Address/institution: <u>Montdole</u>                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                    |

ABORIGINAL HERITAGE EXISTING ENVIRONMENT 87  
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# Appendix v

## Site Types

(No. of pages excluding this page = 2)

### Site types associated with Indigenous activities and culture

The definitions that follow are for terms used in this report, and do not necessarily apply to their use in different contexts.

Art sites are defined as places where any medium has been applied to a rock surface either as symbols, characters, drawings, paintings, or any other rendition, recognisable as not being a natural discolouration or feature. They also include markings to a rock surface, either by engraving, abrading, or pecking, and which cannot be identified as being a natural feature.

Bora rings are circles of 2-30 metres diameter of compressed earth (from repeated treading or dancing), or stone arrangements, at which men performed initiation ceremonies, and are the most frequently recorded ceremonial sites. Sometimes they occur as two rings joined by a central track in a barbel configuration. They usually occur on level or low-lying country, which is usually the first topographical unit to be cultivated, or utilised for highways and roads, but they may also occur as circular stone arrangements on elevated rock platforms and hilltops. If they are or were present then they are usually either already known and have been recorded, or they have long since been destroyed.

Carved trees are readily recognised by even the untrained observer. The carving is incised either into the outer bark, or more commonly, into the living wood after removal of a section of the bark. The designs frequently consist of 'diamond cross-cuts', but may also consist of stylised animal motifs. Previously unrecorded carved trees are still discovered in relatively remote or inaccessible areas. Carved trees frequently occur near burial sites and/or Bora rings, but in some regions they may have been tribal boundary markers.

Fish traps may occur either in rivers or on seashores. They are recognisable as unnaturally formed stone arrangements that were constructed to trap fish (or eels or turtles) carried into the enclosure in deep water, and which are left stranded within the enclosure as the water level drops. The fish were then caught by nets, hand, or by spear.

Grinding grooves are usually observed on the surfaces of large sedimentary boulders or exposed shelves and outcrops of sedimentary rock along creek banks and beds, or near water. They have been produced by Aborigines using the rock surface to shape and sharpen the edges of stone to produce ground-edged axes, or to sharpen wooden spears (the latter tend to be narrow and deep). Water was used to lubricate the surface of the rock. The grooves frequently occur as linear abraded depressions in the rock, and may each be between 10 and 50 centimetres long, up to 15 centimetres wide, and 2 to 5 centimetres deep. Some sedimentary rock surfaces may exhibit shallow ground depressions of roughly round or elliptical shape, and these are more likely to be associated with seed grinding, root crushing, or other food preparation.

Middens may be identified variously as beach, lagoon, lacustrine, or estuarine, and are most likely to be observed at or above the water line where erosion, topsoil removal, or mining has exposed the shell. The size of the midden can vary enormously, with the smallest comprising a 'one off', "dinner-time camp" (Meehan. 1982), with as few as two or three shells, or a shallow lens of only a few centimetres. The largest middens may extend for many kilometres and may comprise of a number of lenses and layers of shell and ash up to several metres deep. These large middens may be evidence of continuous exploitation of the resource over many thousands of years. Middens of fresh water mussel shell may be found in eroding creek banks or in eroding terraces, particularly near both existing and defunct water holes.

Isolated shell or fragments may occur on any surface and in any situation. A single shell may have been discarded by a bird, but the presence of use-wear would indicate Aboriginal use of the shell as a tool, which was discarded after use. Such occurrence is likely to be where there is no immediate source of stone material suitable for tool manufacture.

Natural Mythological sites are places of significance to Aborigines, either because they are described in mythological stories or songlines, or because they were used in religious ceremonies. They may occur anywhere and while some are more predictable than others – as for example, permanent water holes, waterfalls, rock promontories, etc., others may have no particularly remarkable features. Seldom is there any recognisable artefactual evidence or anything to distinguish it from similar features in the vicinity. These sites must of necessity be identified by Aboriginal people with an association with the place.

Open sites, campsites, knapping floors, scatters, and isolated artefacts, are most likely to occur on eroded and exposed creek banks, particularly where slope wash or stock trails has removed the humic layer, or on eroded ridges and spurs, particularly near the junctions in watercourses. Open sites are most likely to be present in greatest numbers near a source of either raw stone material, or potential food resources, or in a natural corridor between two differentially preferred environmental zones, or at the contact between two environmental zones containing different resources.

Artefacts in open scatters are likely to be manufactured from the dominant raw material available; i.e. Greywacke on greywacke-sourced soils, quartz on granite-sourced soils, silcrete and chert on relict sedimentary soils.

Artefact assemblages in open scatters are likely to consist predominantly of discard material, i.e., cores, flakes, flaked pieces, and debitage.

Artefacts exhibiting retouch scars and backing are most likely to occur in sites where secondary activity took place peripheral to the central camp site, although this is a generality and can only be observed where there is sufficient surface visibility to identify peripheral sites. Fragments of flakes with retouch or backing may occur on knapping floors indicating breakage occurring during manufacture, or maintenance areas in which damaged tools have been replaced and discarded.

Isolated artefacts are likely to be most frequently observed where the groundcover obscures all but the larger artefacts, such as cores, and large flakes, or where there is little contrast between the texture of artefactual material and the surface upon which it lies. Artefacts of materials contrasting with the matrix may be visible regardless of size; eg. quartz artefacts may be far more visible than much larger basalt artefacts against a background of dark humic terrace soils.

PADs or Potential Archaeological Deposits are deposits, usually in shelters (but they may also be identified where there are intact deposits in open areas), which although not containing any visible archaeological material, are considered likely to contain archaeological material below the surface. These 'sites' are not recorded as sites on the Aboriginal Site Register, but are identified as places that require subsurface testing to establish whether a site exists or not.

Rock shelters with art or occupation deposits, are most likely to occur where the character of the parent rock is sufficiently massive or consolidated for it to retain a structure that weathers differentially to form shelters and overhangs.

Scarred trees are perhaps the most difficult site type to determine as having been caused by deliberate removal of the bark by humans and not as a consequence of natural events; such as abrasion from falling trees or branches, natural branch attrition, fire damage, or contact from vehicles or stock. They may occur in places wherever there are tree species that produce bark suitable for tool and implement manufacture. While some scars are clearly the consequence of deliberate bark removal by Aborigines (either evidenced by stone axe marks, or identified by Knowledge Holders), some scars were made by settlers, and stockmen, and surveyors who frequently blazed trails and property boundaries by scarring the trees, and by timber men who removed a strip of bark to test the suitability of a tree for logging.

Other site types such as hearths, burials, etc., are less easily predicted, although burials are frequently associated with carved trees, and Bora rings, and hearths with campsites, shelters, and shell middens.

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