Hillview Heights Estate

# Aboriginal and Archaeological Survey and Assessment of Lot 66 DP 551005, Moonee Beach, NSW

December 2006

Umwelt
Environmental Consultants

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# 1.0 INTRODUCTION

This report documents the Aboriginal cultural heritage and archaeological investigation of Lot 66 in DP 551005, Moonee Beach, Parish of Moonee, in the Coffs Harbour Local Government Area (refer to **Figure 1.1**). This report will be submitted to the Department of Planning and Coffs Harbour City Council as part of a Master Plan application to gain consent to proceed with a Development Application for a proposed subdivision for the part of the property adjoining the Pacific Highway.

This report has been prepared to comply with the requirements for archaeological assessment for state significant development pursuant to Part 3A of the *Environmental Planning and Assessment Act* 1979 (refer to **Section 1.3**). The information presented in the report follows the *NPWS Standards and Guidelines for Archaeological Report Writing 1997*. Aboriginal consultation has been undertaken in accordance with the above guidelines and in compliance with the *Department of Environment and Conservation's (DEC's) Interim Community Consultation Requirements for Applicants* (2004).

## 1.1 LOCATION AND SIZE OF THE PROJECT AREA

The project area is located on the Mid North Coast of New South Wales, approximately 10 kilometres north of Coffs Harbour and adjoins the small town of Moonee Beach. It is situated on the eastern (seaward) side of the Pacific Highway immediately south of Moonee Beach. It is bordered to the east by Crown Reserved land associated with Sapphire Beach. The project area is approximately 114 hectares (1.4 $km^2$) in area.

## 1.2 PROPOSED DEVELOPMENT

The project area is subject to two zone classifications; a 2(e) Residential Tourist Zone and a 7A Environmental Protection Habitat and Catchment Zone. Only the sections of the project area within the 2(e) classification can be developed. Those areas designated within the 7A zoning may be used for "…agriculture (which does not include the clearing of bushland or the construction of buildings), environmental protection works, home industries and home occupations" (Coffs Harbour LEP 2000: 23).

This report will be submitted to Coffs Harbour City Council with a development application outlining a proposal for a residential subdivision in two distinct sections of the project area: one on the north-western side of the project area, and the other on the southern border (refer to **Figure 1.2**). Sugar Mill Creek provides a natural divide between the two areas (refer to **Figure 1.1**). A small portion of the project area, south-east of the subject land and within an area previously sand mined, is also zoned for development, and will be the subject of future negotiations and development design.

The construction of the proposed development will require the clearing of vegetation in the immediate development areas, the creation of access roads or laying of bitumen over existing tracks, ground disturbance works including the placement of bridges (or pipes) where creeks are crossed, and the emplacement of infrastructure associated with sewerage, water and electricity.

It is envisaged that a walkway will be constructed from each of the two residential areas to Green Bluff (refer to **Figure 1.1**). The placement of the proposed path is flexible, therefore it will be designed according to the requirements of the archaeological, ecological and hydrological assessments.


Source: 1:25 000 Topographic Map (LPI NSW)

0 500 1000 1500m

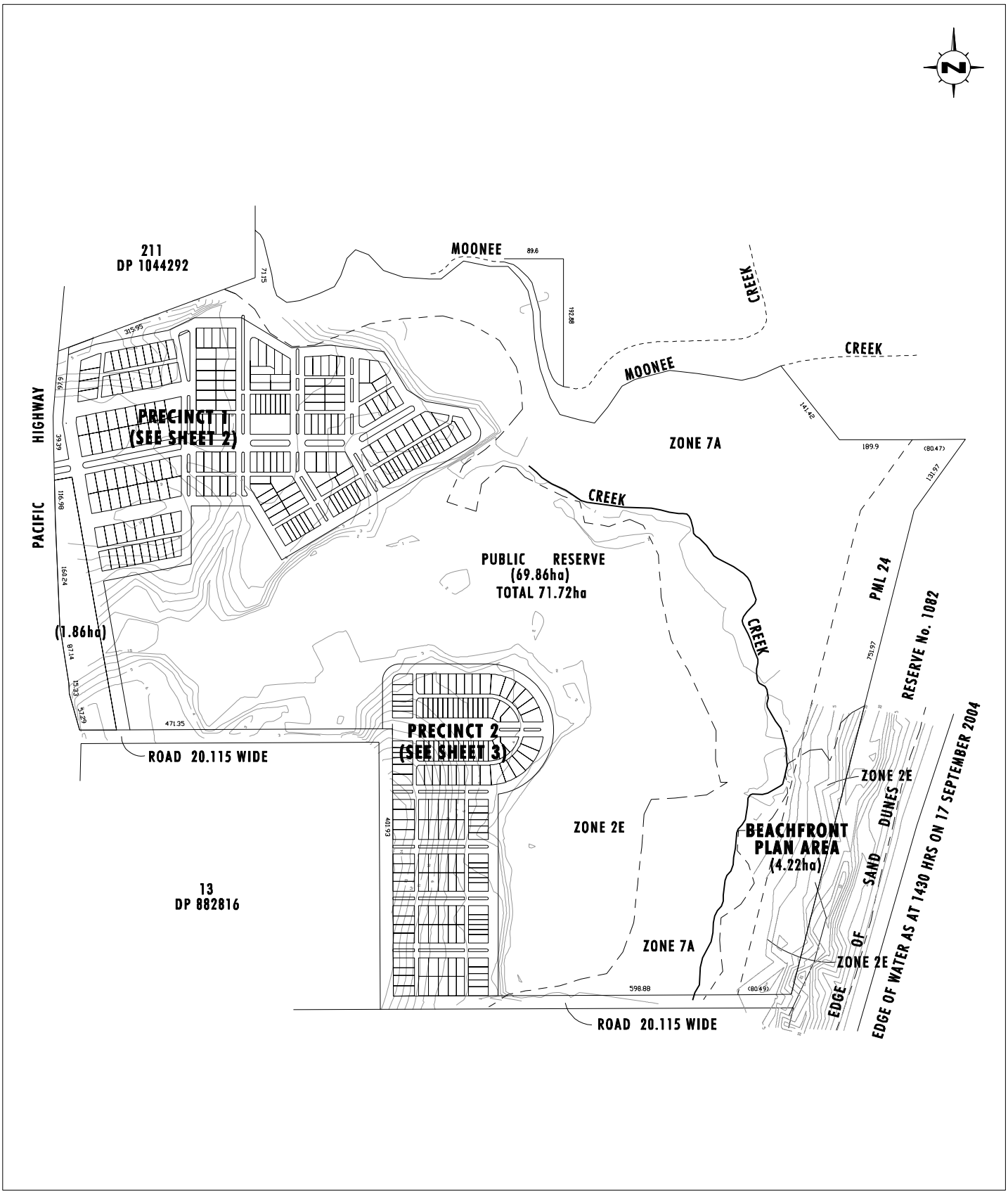
1:30 000

**Legend**

Project Area

FIGURE 1.1

**Project Locality**




Source: Blairlanskey Surveys

0 100 200 400m
1:8 000

**Legend**

— — Zoning Boundary

FIGURE 1.2

**Proposed Development**

## 1.3 RELEVANT LEGISLATION

As this development is classified as being of 'State Significance' it will be assessed under Part 3A of the *Environmental Planning and Assessment Act* 1979 and the provisions of the *National Parks and Wildlife Act* 1974 (NPW Act) will not apply. This means that Section 87 permits and Section 90 consents under the NPW Act will not be required for any works that may impact Aboriginal heritage sites/objects undertaken as part of this project, if approved. This does not mean that the level of assessment work required or the way issues are managed changes, it mainly relates to reducing the number of separate approvals and time required to start a project once approved.

Prior to granting approval for a project the Department of Planning will consider cultural heritage issues and consult with DEC regarding the project to ensure that cultural heritage issues are appropriately considered when a decision is made about whether or not to approve a project. They will also consider what management requirements need to be implemented.

As there will be no requirement to apply for a Section 87 permit or 90 consent for a Part 3A approved project, the proponent will be required to manage cultural heritage issues in accordance with the management recommendations presented in this Aboriginal archaeological assessment and with any conditions of approval imposed by the Department of Planning. This may include salvage of artefacts, subsurface works, conservation outcomes or any other management strategies. The management of cultural heritage resources within the current project area is discussed in **Section 8** with the methodology for further archaeological works to be carried out detailed in **Appendix 1**.

## 1.4 STRUCTURE OF THE REPORT

**Section 2** of the report discusses Aboriginal consultation and involvement in the project.

**Section 3** details the environmental context of the project area.

**Section 4** summarises the previous archaeological research undertaken within five kilometres of the project area. This information is used to produce a predictive model for site location within the project area.

**Section 5** presents the predictive model for site location.

**Section 6** summarises the survey methodology and presents the results of the survey.

**Section 7** documents the Aboriginal and archaeological significance/sensitivity of the project area.

**Section 8** provides management options for sites and potential archaeological deposits (PADs) located within the project area that will be impacted by proposed development in the area.

**Section 9** provides recommendations for sites/PADs within the project area.

**Section 10** lists the documents cited in the text.

# 2.0 ABORIGINAL CONSULTATION AND INVOLVEMENT

The NPWS Aboriginal Cultural Heritage Guidelines (1997) outline three principles behind the collaborative approach to Aboriginal heritage survey and site management required by the Service. These principles include the following:

- Aboriginal culture is a living culture;
- Aboriginal communities are the rightful owners of Aboriginal cultural heritage information; and
- NPWS decision making on Aboriginal cultural heritage issues is transparent.

Umwelt supports the principles underlying the NPWS approach and aims to involve the relevant Aboriginal community/communities in all its heritage assessments.

In January 2005, DEC released its *Interim Community Consultation Requirements for Applicants* (2004). This document replaced all previous guidelines relating to Part 6 of the NPW Act 1974. Part B of the of the *Interim Community Consultation Requirements for Applicants* requires the proponent, or consultant on behalf of the proponent, to contact the Local Aboriginal Land Council, Registrar of Aboriginal Owners, Native Title Services, local council(s) and the DEC, to request information regarding their knowledge of relevant Aboriginal stakeholders that would require consultation in relation to a proposed development. In compliance with the requirements notification letters for the current project were sent to the appropriate bodies on 22 July 2005.

Also in compliance with the requirements, an advertisement was placed in the local print media (26 July 2005) requesting Aboriginal stakeholder groups or individuals register their interest in the project area. A copy of the advertisement has been included in **Appendix 2**.

As a result of the notification processes outlined above, the following groups registered an interest in the project area:

- Coffs Harbour and District Local Aboriginal Land Council (CHDLALC – contact person Chris Spencer, Sites Officer); and
- Gumbalar Julipi Elders Group (GJE - contact person Uncle Kenny Nayda).

After the registered Aboriginal stakeholders were identified, they were provided with details of the proposed development location. The CHDLALC and GJE were asked if they were aware of any Aboriginal sites, places or stories relating to the general area or within the project area itself. The survey methodology for the project, outlined in **Section 6,** was also discussed with, and endorsed by, the CHDLALC and GJE.

The survey of the project area was undertaken on 15 and 16 March 2005 with representatives of CHDLALC and the GJE. A second inspection of the site was undertaken on 22 and 23 June 2006 at the request of the CHDLALC. The second inspection was related to revisiting areas that had been identified by the Aboriginal stakeholders as having Aboriginal cultural heritage sensitivity since the March 2005 survey (refer to **Section 5** for further details).

Further discussion was undertaken with Chris Spencer of the CHDLALC on Friday 24 November, and Tuesday 19 December 2006 regarding the draft report and specifically the recommendations. The outcomes of this consultation are addressed within the Management Recommendations (refer to **Section 9**) of this report. Correspondence from

CHDLALC regarding the proposed development and this archaeological assessment are summarised in **Sections 7** and **9** and included in full in **Appendix 3**.

## 2.1 NATIVE TITLE SEARCH

A search of the National Native Title Tribunal (NNTT) Register provides information on the status of Native Title claims in the area of interest. That is, if the project area is subject to a Native Title application and/or determination and/or Indigenous Land Use Agreement under the *Native Title Act* 1993. It also provides information on the current status of Native Title applications.

Umwelt lodged a NNTT search for the project area on 3 February 2005. A copy of the NNTT search is provided in **Appendix 4**. The returned search of the four NNTT registers found no claimants in the Coffs Harbour Local Government Area associated with any of the following databases:

- National Native Title Register;
- Register of Native Title Claims;
- Unregistered Claimant applications; and
- Register of Indigenous Land Use Agreements

The NNTT advises that a negative result from a search of their register does not mean a Native Title claim does not exist, but rather it could indicate that at the time of the search:

- claims or determinations of Native Title may not have been received by the Federal Court; or
- the NNTT had not received notification by the Federal Court (or State or Territory body) of an application.

The Aboriginal stakeholder groups were not aware of any Native Title claims within the Coffs Harbour Local Government Area.

# 3.0 ENVIRONMENTAL CONTEXT

The purpose of this section of the assessment is to provide background information related to the environmental context of the project area. The information from the environmental context will be used in the formulation of a predictive model for Aboriginal archaeological site location and preservation (refer to **Section 5**). Dean-Jones and Mitchell (1993: 52) state that there are three sets of questions that should be addressed when formulating a predictive model for Aboriginal site location. These are:

i) What environmental factors influenced Aboriginal site selection at the time of occupation?

ii) What environmental factors influence the chance of site preservation over time?

iii) What environmental conditions have produced site exposure and visibility today?

Environmental information is used to gain an understanding of what resources may have been available locally that could have attracted Aboriginal hunter-gatherers to the area; as this information will suggest where Aboriginal people may have camped and thus where archaeological material may be present. The section also discusses the geomorphology of the project area and the nature of previous and current land use. This information is important as it suggests where Aboriginal sites may have been buried and preserved and where they may have been destroyed.

The project area falls within a highly diverse area referred to as the North Coast Bioregion, which extends from just north of Newcastle through to the Queensland border.

## 3.1 PRESENT AND PAST LAND USE

The beach sands of the north coast of NSW have been intermittently mined since the 1870s (Raggat 1926). The Moonee Beach area has a long history of mining. Records held by the NSW Department of Primary Industries - Mineral Resources, indicate that sand mining has been operating in the local area since at least 1958 (refer to **Appendix 5).** Mid Sapphire Beach has been the subject of mineral exploration and sand mining since the mid 20th century (Cudgen R Z 1967, Dallas and Tuck 2003). In 1967, mineral resources (including 4,714 tons of Rutile and 5, 615 tons of Zircon), were recorded within the current project area (Cudgen R Z Limited 1967:21, refer to **Appendix 5**). While records are scant as to the methods of sand extraction, it is known that Cudgen R Z Limited conducted mining operations at Mid Sapphire Beach between 1967 and 1977 (Dallas and Tuck 2003). **Figure 3.1** shows the extent of the area sand mined and indicates that the eastern boundary of the project area has been subject to sand mining.

Gold prospecting occurred in the Sapphire Beach area during the 1890s. Inspired by the find of a small gold reef at Woolgoolga (north of the project area), the Taylors, a local family, began prospecting in the wider region. In 1895 prospecting occurred at Herman Rieck's farm at Sapphire Beach approximately one kilometre south of the project area, however, no gold was found (Dallas and Tuck 2003: 34, refer ton **Figure 3.2**). In addition to the recorded gold prospecting at Rieck's Farm a number of small deflated mullock heaps were observed in Lot 54 DP 624320 immediately south of the project area. These mullock heaps were interpreted as being the result of onsite gold prospecting within the allotment (Dallas and Tuck 2004: 34).

In addition to disturbance from sand mining activity (and probably prospecting) the project area has been subject to logging and clearing of the natural vegetation, with the majority of the project area being cleared at some stage.

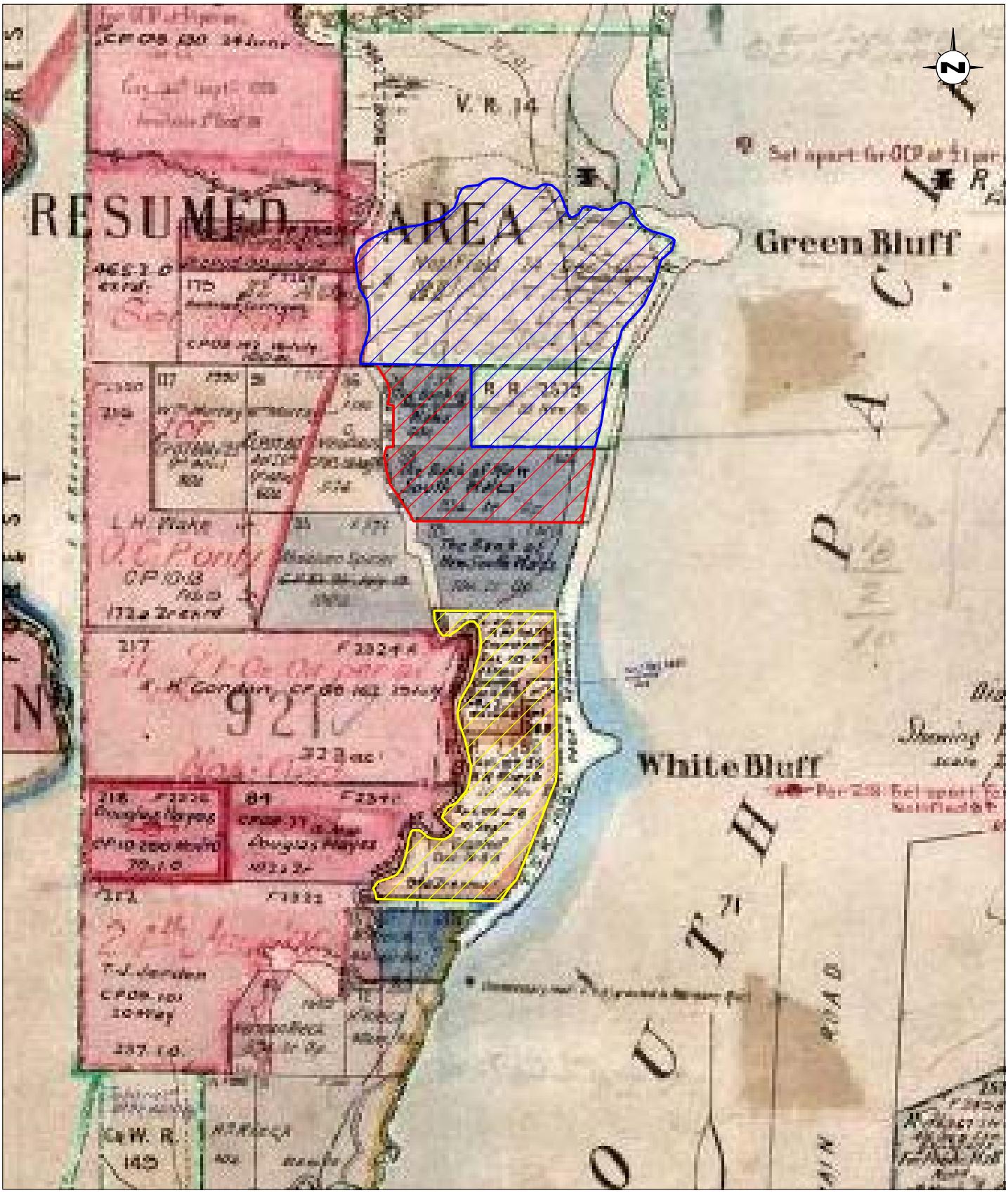

Source: Patterson Britton & Partners 2005

**Legend**

- Project Area
- Sand Mining Activity

FIGURE 3.1

**Location of Sand Mining at Sapphire Beach**




Source: LPI 1897 Parish Map

**Legend**

- Rieck's farm
- Umwelt Study Area
- Dallas and Tuckers Study Area

FIGURE 3.2

**1897 Parish Map**

On the western margin of the project area, parallel to the Pacific Highway, a section has been cleared with the placement of a transmission line and access track which is regularly graded. Many of the vehicle tracks within the project area also undergo regular grading.

### 3.1.1 Implications for Aboriginal Site Preservation

The evidence related to prior and current land use indicates that the strip of dune sands to the east has been sand mined and thus will have no archaeological integrity. Likewise, any areas subject to prospecting or vegetation clearance and subsequent loss of topsoil are likely to have had their archaeological integrity disturbed or destroyed. If areas of potential archaeological deposit with integrity exist within the project area they are, therefore, likely to be small in area and related to areas not previously subject to land clearance and/or ground surface disturbance.

## 3.2 CLIMATE

The general Coffs Harbour area has a subtropical climate, with warm wet summers, and cool to mild dry winters (BOM 2005). The Bureau of Meteorology (2005) state the climatic variations in the region are linked to '…the steady trade winds to the north and the anticyclone belt to the south which oscillates northwards and southwards over the region annually.'

These seasonal winds create warm humid periods from April to July. July to September is relatively dry with light winds, leading to higher humidity and rainfall from November to March. The average minimum/maximum temperatures range from 7 $^0$C to 19 $^0$C in winter and 19 $^0$C to 27 $^0$C in summer.

### 3.2.1 Optimal Seasons of Use for Aboriginal People

Based only on the climatic data, Aboriginal people could have occupied this area all year round. There is sufficient rainfall throughout the year to have supplied sufficient fresh water for coastal occupation. There may have been times, however, when on-shore winds made camping on the beach unpleasant.

## 3.3 GEOLOGY, GEOMORPHOLOGY AND SOILS

The coastal plains in the general area are formed by low lying Quaternary sediments consisting of sands, silts and gravels which have accumulated within alluvial, palludal (marsh), and estuarine conditions (Dallas and Tuck 2003.). Behind the coastal plains the foothills lie within the Palaeozoic Coramba Beds containing greywacke, siliceous claystone, quartzite and chert. Chert (including jasper) and greywacke are often used in the production of flaked stone tools. In the Moonee Beach/Coffs Harbour area chert tends to be in pebble form and is found along the coastline and in streams. Greywacke outcrops occur on the slopes of Roberts Hill (in the centre of Coffs Harbour).

The soil landscape map for the area indicates that the soil in the elevated areas of the project area is highly fertile initially, but is easily deteriorated with use, resulting in infertile soil that is easily eroded once cleared.

### 3.3.1 Implications for Aboriginal Resource Exploitation/Site Preservation

The coastal plain environment would have been a rich resource area; however, the back dune swamplands are not likely to have been a preferred camping area due to their waterlogged

nature and the presence of insects such as mosquitoes. Therefore, areas in proximity to these resource rich swamps, on elevated topography and away from insects would have been preferred camping locations.

The foothills are more likely to have provided dry, elevated areas suitable for camp sites. The geological bedrock of the foothills provides materials that would be suitable for Aboriginal people to manufacture stone tools. Thus, if rock outcrops in the project area it may have acted to attract Aboriginal people to the area. Furthermore, based on the local geology it can be predicted that any stone artefactual material located within the project area (if any) will be manufactured from greywacke or chert.

The erodibility of the soil suggests that the archaeological integrity of sites (if any are present) in areas previously cleared will have been disturbed/destroyed.

## 3.4 TOPOGRAPHY AND HYDROLOGY

The general topography surrounding the project area is best described as lowland areas, with low undulating residual hills, gentle gradients leading down to coastal back swamps and dunes. Within the project area the topography rises to a maximum of 10 m AHD. This relatively high ground occurs in the central south of the project area. While local relief within the project area is low there are a variety of landforms present.

The area of higher elevation in the central south of the project area is a flat broad ridge of low relief which runs from the adjoining parcel of land into the central south-western boundary of the project area and continues to the north-north-east. From the north-eastern corner of the ridgeline a spur, again relatively broad and of low relief, continues in a north-north-eastern direction to the junction of Sugar Mill Creek and a back swamp. There is an area of flat elevated topography on the creek bank above the swamp at this location which is approximately 75 metres in diameter.

The project area is bordered on the eastern side by a dune system (Sapphire Beach) associated with the Tasman Sea. Sugar Mill Creek and associated tributaries cross the project area on a north-east–south-west axis. Sugar Mill Creek connects to Moonee Creek, north of the project area and forms an estuary on the northern side of Green Bluff. The lower reaches of Sugar Mill Creek and its associated tributaries would be brackish; therefore, these lower reaches would not have provided a water source to Aboriginal people using this area in the past. However, this part of the tributary/estuarine system would have provided abundant resources, including fish, shell fish and water birds (and their eggs), which would have been exploited by Aboriginal people using the area. The reaches of the creek above the tidal zone would have supplied semi-permanent to permanent fresh water.

The dune system on the eastern side of the project area is flanked by back swamps. The low-lying floodplains and back swamps in the lowland areas around Coffs Harbour retain surface water as a result of the high water table creating boggy conditions in low lying areas. These back swamps would have provided permanent to semi permanent fresh water.

### 3.4.1 Implications for Aboriginal Resource Exploitation/Site Preservation

The topographic information indicates that the low-lying areas within the project area are less likely to have been used a camp sites due to water logging and insects. Dry elevated areas of low gradient on the bedrock ridge/spurs are more likely to have been preferred camping locations. Areas of high elevation in close proximity to resource rich areas such as creeks and swamps would have been favoured camping loci.

The availability of fresh water for drinking purposes should not have been a problem for Aboriginal people inhabiting the area due to the high rainfall and the presence of Sugar Mill Creek, swamps and topography prone to water retention.

## 3.5 VEGETATION

Within the North Coast Bioregion, the vegetation along the coast tends to include coastal tea tree (*Leptospermum laevigatum*) and coastal wattle (*Acacia longifolia*) near the beach, with some areas of beach she-oak (*Casuarina equisetifolia*), snappy gum (*Eucalyptus racemosa*), blackbutt (*Eucalyptus pilularis*), dwarf red bloodwood (*Eucalyptus gummifera*) and bastard mahogany (*Eucalyptus umbra*). Banksia (*Banksia* sp.) and bangalow palms (*Archontophoenix cunnighamii*) are found in the dunes and heath and paperbark (*Melaleuca* sp.) swamps occur behind the dunes. Rare patches of rainforest species can be found where sufficient nutrients have accumulated to support their growth.

The estuaries are dominated by mangrove communities composed of *Avicennia marina*, *Aegiceras coniculatum*, *Exoecaria agallocha* and saltmarsh species. Freshwater margins are occupied by swamp oak (*Casuarina glauca*) and paperbark (*Melaleuca quinquenervia*) and flooded gum (*Eucalyptus grandis*).

### 3.5.1 Implications for Aboriginal Resource Exploitation

The area has been subject to logging, clearing and (in parts) sand mining in the past, therefore the vegetation currently present in the project area is not representative of the vegetation or floral resources that would have been available to the Aboriginal people that occupied the area prior to European settlement.

Ethno-historical records indicate that the timbers in the general area were a highly functional resource for the Aboriginal people, who used the bark for canoes and shields, timber for spears and clubs and bark fibre for nets and bags. In addition, the Aboriginal people climbed the trees by creating toe holes in the bark to access food resources (honey, birds, and possums) located amongst the foliage.

Mangroves have seed pods that were eaten by Aboriginal people after lengthy preparation to remove tannins. Banksias provided nectar, bangalow palms had edible leaf bases and their leaves were used to make water containers and tea tree provided soft bark for use as nappies and bandages. Tea tree was also used as a medicinal plant (Low 1989).

Overall, the project area and its local environs would have contained adequate food plants to sustain small to moderate sized groups of Aboriginal people for short periods of time (e.g. for a week rather than a month) as an adjunct to the marine resources that would have been their primary target and main protein source. The plants on the other hand would have supplied the necessary carbohydrates, vitamins and minerals they required for a balanced diet.

## 3.6 FAUNA

The project area is situated in proximity to a variety of resource zones; to the north is an estuarine area which would have supported shellfish, fish, eels, mangrove worms etc.; the coastal resources to the east which would have provided shellfish, turtles, fish, sea birds, eggs etc.; and to the west the woodland which would have provided possums, kangaroos, wallabies, reptiles, flying-foxes and an array of bird species and their eggs.

Evidence of some of the fauna exploited by the Aboriginal people in this area is taken from studies of the remains of middens on Moonee Beach, which revealed a wide range of shellfish and faunal bones (dingoes, wallabies and shearwaters) (Rogers 1977).

### 3.6.1 Implications for Aboriginal Resource Exploitation/Site Location

The project area is situated in the midst of what is a rich coastal and estuarine resource area. The easily acquired coastal and estuarine resources would have been a focus for Aboriginal exploitation. Where people camped on a daily basis, however, would have depended to a large degree on the availability of fresh water and on the prevailing winds.

For the current project area it can be predicted that sites may be present that contain evidence of the exploitation of estuarine and beach shellfish species and also possibly of hinterland faunal species. It is unlikely, however, that such sites would have survived sand mining in the east of the project area, but they may have survived on the elevated ridge/spur behind the dunes and in the vicinity of Sugar Mill Creek. The integrity of these sites (if they exist) will be dependent on levels of ground disturbance from prior development.

## 3.7 SUMMARY OF ENVIRONMENTAL CONDITIONS

Based on the environmental data, occupation of the general area was probably year round. Suitable occupation sites are likely to be confined to elevated, (what were) vegetated areas protected from the seasonal winds, such as behind the dune system. Low-lying areas may have been used for camping during drier winter periods, but are less likely to have been associated with camp sites during wetter periods when these areas are susceptible to water logging and would have attracted insects such as mosquitoes. Campsites would more likely to be located on the elevated foothill margins. Within the project area, suitable occupation areas are located in areas of higher elevation (ridge/spur) but within proximity to resource rich areas such as creeks and swamps.

If camp sites exist within the project area they are likely to contain stone artefacts manufactured from chert and greywacke, estuarine and beach shellfish and possibly bone from hinterland and marine species. Past and current European land-use suggests that it is unlikely that Aboriginal sites will be located that retain archaeological integrity. Previous land use within the project area is expected to have disturbed any surface or subsurface artefacts which may be present. Conversely the land use history of the project area may provide a degree of ground surface visibility which may allow for the detection of sites within the project area.

# 4.0 ABORIGINAL CULTURAL HERITAGE AND ARCHAEOLOGICAL CONTEXT

This section of the report provides information in relation to the known Aboriginal cultural heritage values and archaeological context of the general area. This information is combined with that provided in **Section 3** to prepare a predictive model for site location within the project area (refer to **Section 5**).

The cultural information available for this region forms part of a continued oral history maintained by the Gumbaynggir people and supplemented by archaeological assessments. Archaeological assessments have been conducted along the north coast of NSW in line with the development of the area, particularly in the Northern Rivers district. There have not, however, been a large number of systematic surveys in the Coffs Harbour region.

## 4.1 ETHNOGRAPHIC EVIDENCE FOR ABORIGINAL PATTERNS OF OCCUPATION

Records indicate that at the time of European settlement, Coffs Harbour was '….occupied by the Gumbaynggir (Kumbainggiri)' (Crowley, 1978). Their area extended from Nambucca (in the south), to the Clarence River (in the North) and to the foothills of the New England Tablelands (to the west). There were up to four dialects within the Gumbaynggir language. Linguistic similarities between these dialects allowed for the exchange of information between the groups. The discreet language differences between the Gumbaynggir people support the theory of shared interactions (ceremonies) and resources (food), but daily life was essentially carried out as independent groups.

McDougall (1900:116) stated '….each tribe kept to its own belt of country, and separated into small camps, and only collected together on special occasions.' McFarlane (1934) wrote that camps away from the dunes were moved regularly as instigated by the availability of food in that locus. The Coffs Harbour Historical Association (in Collins 1994) reported that the Moonee-Coffs area was occupied by small groups (20-50) who used the coastal sections during the autumn and winter periods when the coastal food resources were at their highest, or for special ceremonies.

Groups of such sizes would require substantial resources; therefore their base camps are unlikely to have been used for extended periods, even in periods of high resource availability. MacFarlane (1934) reported base camps tended to be located in protected locations, such as densely vegetated areas. Godwin (1990:97) suggested that a number of individual families may work together to procure sufficient food by divvying up the roles and formulating an effective, flexible 'band'.

Hodgkinson, a surveyor in the mid north coast region during the 1840s, noted that there was a total of between 1200-1500 Gumbaynggir people at this time. The low numbers of Aboriginal people estimated at that time would reflect the decimation of the population by European communicable diseases (such as measles and small pox) in the early 1800s. As European settlement patterns intensified in the Coffs Harbour region, so did the periods of conflict, further reducing the size and strength of the Aboriginal population.

Mrs Bundock (1896), a historian in the late 1800s, made an observation of a young Aboriginal girl who preferred the use of a tin can rather than creating a traditional water carrier, but her mother still utilised traditional methods. She also observed young Aboriginal men favouring European tools to traditional ones, which appears to indicate that the late 1800's was a period when traditional technology was in decline.

## 4.2 ABORIGINAL CULTURAL CONNECTION TO THE LOCAL AREA

Despite the impact on the Aboriginal population by the settlement of Europeans, a level of cultural knowledge and traditional practice has been maintained to the present day. This knowledge includes stories (oral history), knowledge of men's and women's sites and the importance of an ongoing connection to country. The following information was provided by the Aboriginal stakeholder groups involved in the project.

Moonee Creek, which is situated just north of the current project area forms a geographic boundary between the traditional land of the Gumbalar Julipi Elders and the Garby Elders to the north of the creek. Both ethno-historic records and the present Elders relay stories of periods when people would travel north and south through this general area. The proximity of the current project area to a social boundary and the available resources could indicate it was used as a temporary camp area for groups travelling across the boundary to ceremonies, such as corroborees.

There were two Kippera rings (male initiation sites sometimes known as Bora rings) situated on the southern side of the present Coffs Harbour area. According to local Elders, the Garby and Gumbala Julipi people could pass this boundary without requiring permission from the other. This suggests that the current project area and its environs was not significant as a ceremonial area, but more so as a resource area for people passing through on their way to ceremony.

Located between Moonee Beach (north of the current project area in Garby Elders area) and south of Coffs Harbour, there are many mythological increase sites on peninsulas along the coastline. In the mythology, 'increase sites' are areas where animal species would go to breed and increase their population to ensure food was plentiful the following season. All peninsulas in this region are considered to be men's sites where women are not permitted access. Each peninsula represented a different animal species.

The local Elders' maintain knowledge of mythological sites, dreaming routes, ceremonial sites and have knowledge of campsites from archaeological work throughout the Coffs Harbour region, and they have indicated that the general area is sensitive in terms of its Aboriginal cultural heritage.

## 4.3 PREVIOUS ARCHAEOLOGICAL RESEARCH

In line with the DEC (1997) Guidelines for Archaeological Report preparation, **Section 4.3.1** provides a definition of the various site types discussed within this section of the report.

### 4.3.1 Site Types

*Artefact Scatter/Open Camp Site* - an artefact scatter, or open campsite, refers to areas in the open landscape (i.e. not a rockshelter or cave), that contains two or more stone artefacts located within approximately 100 metres of each other. This is the most common site type located in the Australian archaeological record.

*Isolated Find/Isolated Artefact* - One stone artefact found in an area where no other artefacts are located is referred to as either an 'isolated find' or 'isolated artefact'. This is also a common site type, however, early (up to 1990s) archaeological surveys tended not to record this site type, and they are, therefore, not represented accurately in the archaeological record.

*Scarred and Carved Trees* - Aboriginal people often removed bark from tree trunks for toe holds (to aid in climbing to extract honey or possums from tree hollows), bowls, shields, spearthrowers, canoes and/or for roofing material for shelters. Bark removal leaves scars on

the tree trunk which indicates the Aboriginal use of an area. Other trees were carved with designs which are used to mark ceremonial grounds and burials (Etheridge 1918; McBryde 1974).

*Middens* - Middens are accumulations of shells discarded after human (Aboriginal) consumption, but also contain other discarded remnants such as animal bones, stone tools or charcoal (from a hearth). Midden sites are commonly located along the coast and estuaries and less often located in inland areas in association with waterways and lakes. On occasions, but much less frequently, middens may contain human burials.

*Stone Quarries* - Stone quarries are places where raw material was sourced to manufacture tools. Quarries may be cobble beds in rivers or on beaches, or they may be rock outcrops. When outcrops are exploited the quarrying technique may be the flaking of rock from the outcrop itself, or scree from below the outcrop may be used instead. In some areas the stone may be dug from beneath the earth as Aboriginal stone knappers often preferred rock which had not been dried out by exposure to the elements (Tindale 1965; Jones and White 1988).

*Ceremonial Grounds* - in this region the main type of ceremonial ground recorded is the Kippera. Kippera grounds generally consisted of two earthen rings or two rings outlined with stones. The Kippera ground was used during male initiation ceremonies (Fife 1995).

*Mythological Sites* – Mythological sites are areas linked to stories passed down through generations, often referred to as The Dreamtime, that are either sacred or non sacred in nature (Robinson 1912). Non-sacred stories were narratives for entertaining the uninitiated, but may remind the community of acceptable behaviour. The sacred stories were only for the initiated and were used to guide daily life, and related to religion, marriages, boundaries not to be crossed, animals that could and couldn't be hunted and iterating the Traditional Lore.

## 4.4 DEC AHIMS SITE REGISTER

A search of the NPWS Aboriginal Heritage Information Management Site (AHIMS) register was conducted on the 27 January 2005. The DEC AHIMS register is a database of all the sites registered with DEC across New South Wales. The search revealed 28 Aboriginal sites within a five kilometre radius of the project area. The full results of the AHIMS search are summarised in **Section 4.4.1** and are provided in full in **Appendix 6**.

### 4.4.1 Sites Recorded within a 5 kilometre radius of the Project Area

Site types recorded for this area include; artefact scatters, isolated finds, scarred trees and middens (with artefacts) and potential archaeological deposits (PADs) (refer to **Table 4.1**). Within the DEC AHIMS results not all the data fields were completed for all sites (i.e. whether a site recorded as AFT contained one or more artefacts – refer to **Appendix 6**), therefore, a classification of unknown number of artefacts (UNOA) has been used here for those sites. **Figure 4.1** shows the location of the sites previously recorded within a five kilometre radius of the project area.

**Table 4.1 - Aboriginal Sites within Five Kilometre Radius of the Project Area**

| Artefact Scatter | Isolated Find | Unidentified No. of Artefacts | Midden/ Midden with Artefacts | Scarred Tree | PAD | Total |
|---|---|---|---|---|---|---|
| 13 | 4 | 6 | 2 | 2 | 1 | 28 |


Source: 1:25 000 Topographic Map (LPI NSW)

0 0.5 1.0 1.5km

1:35 000

## Legend

- Project Area
- Open Camp Site
- PAD
- Midden
- Midden and Associated Artefact
- Isolated Find
- Unknown Number of Artefacts in Site
- Scarred Tree

FIGURE 4.1

**Archaeological Sites located within a 5km Radius of the Project Area**

File Name (A4): R01_V1/2044_003.dgn

From the results of the site search and the location of the sites (as indicated on **Figure 4.1**) it is possible to observe that:

- the most frequently recorded site types are artefact scatters (13) followed by sites containing an unknown number of artefacts (six);
- there are 10 sites in the vicinity of the current project area, with two sites (one artefact scatter and one isolated find) on the southern boundary of the project area, and two artefact scatter sites and a midden on the northern side of the northern-most tributary of Sugar Mill Creek;
- midden sites in the area rare and are associated with creeks and estuaries;
- scarred trees are relatively rare;
- PADs are rare; and
- there are no AHIMS registered sites located in the current project area.

The site cards logged for sites 22-1-0051 and 22-1-0083 were obtained in order to further examine the location and nature of midden deposits previously recorded in proximity to the project area. Upon reviewing these site cards it was discovered that the location of the midden deposit to the north of the project area (22-1-0051) does not plot (from its AMG coordinates) in the position on which it was mapped on the site card. Rather than to the north of Sugar Mill Creek it was mapped on the southern side of the creek, approximately 20 metres east of the footbridge which crosses from the Moonee Beach Caravan Park on the northern side of the Moonee Creek inlet (refer to **Figure 4.2**). The description of the midden location given for site card 22-1-0051 specifically states that it is located on the southern bank, starting approximately 20 metres from the foot bridge and extending for approximately 120 metres.

Site 22-1-0083 is also referred to as a midden site; however, the grid coordinate on the site card refers to the location of an artefact scatter and not a midden. The midden material referred to on the 22-1-0083 site card is a mention of the 22-1-0051 midden location. Thus there is only one midden to the north of the project area and it is located as indicated on **Figure 4.2**, on the southern side of the tributary.

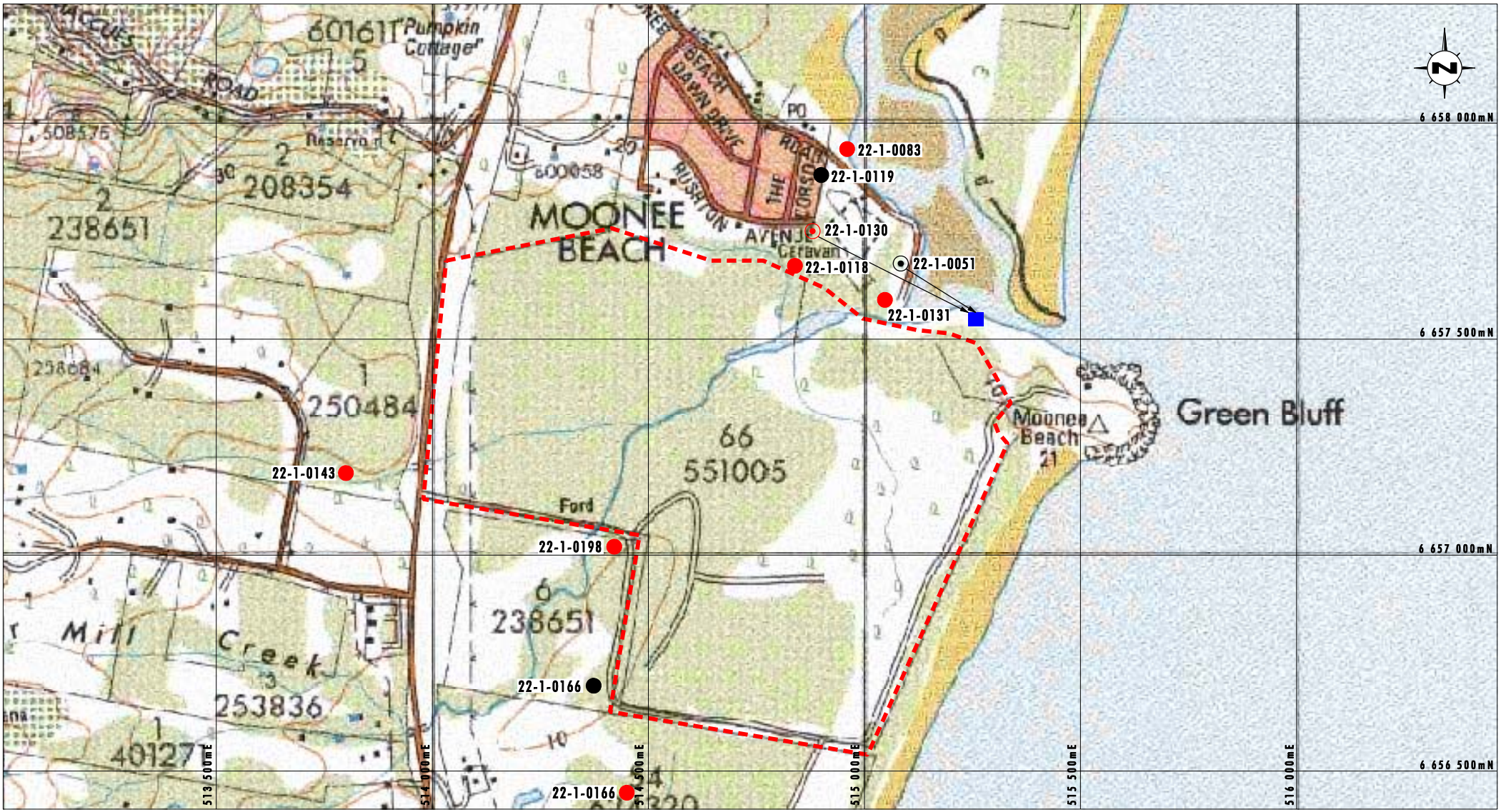
In relation to the sites to the south of the project area, subsurface investigation has been conducted within the adjacent Lot 6 DP 238651 (refer to **Sections 4.5.10** and **4.5.12**) to investigate four of the sites listed to in **Table 4.1** (refer to **Figure 4.2**). Subsurface artefacts were located in these areas; however, as the artefact analysis and report are currently in process the archaeological significance of these sites is currently unknown.

## 4.5 PRIOR ARCHAEOLOGICAL ASSESSMENT WITHIN THE COFFS HARBOUR REGION

This section presents a summary of the archaeological assessments that have been conducted in proximity to the current project area.

### 4.5.1 North 1964 Moonee Beach

In 1964, North located what was described as an axe factory with a midden (NPWS #22-1-0019) on the southern side of the Look At Me Now Headland (at the northern end of




Source: 1:25 000 Topographic Map (LPI NSW)

0 200 400 600m
1:12 500

## Legend

- Project Area
- Midden and Associated Artefact
- Open Camp Site
- Isolated Find
- Unknown Number of Artefacts in Site
- Location of midden previously recorded on AHIMS site cards 22-1-0130 & 22-1-0051

FIGURE 4.2

**Archaeological Sites at Moonee Beach Area**

File Name (A4): R01_V1/2044_002.dgn

Moonee Beach). As well as containing stone artefacts, the midden contained remnants of mud whelk, pipi and turban shells, with bones from wallaby, dingo and shearwater and pieces of ochre. Over 1,000 stone artefacts were recorded at the site, and all were produced from beach pebbles (greywacke, mudstone, siltstone and some sandstone) available within close proximity to the site. This site has been destroyed by sand mining.

### 4.5.2 McBryde 1967, 1972, 1974 Clarence Valley and Coffs Harbour

McBryde (1974) conducted the first regional study in the Clarence Valley area, which included an examination of middens, quarry sites and rockshelters along the Clarence and associated tributaries. Radiocarbon dating of one rockshelter (Seelands) provided a maximum date of occupation of 6,400 $\pm$ 300 BP, which remains the oldest occupation date along the northern coast of NSW. The Seelands rockshelter is approximately 70 kilometres from the current project area. The rockshelter contained a large number of stone artefacts, which demonstrated a change in tool technology, from large unifacially flaked pebble cores to smaller artefacts, such as backed blades.

Of greater relevance to the current project area was McBryde's (1967, 1972) archaeological work conducted close to the Look At Me Now Headland (approximately four kilometres north of the current project area on the northern end of Moonee Beach). The site investigated was originally recorded by North as an axe factory (**Section 4.5.1**), and was described by McBryde as an exposed midden with stone artefacts in the dune system on Moonee Beach. This site which was partially salvaged before the area was subject to sand mining activities.

### 4.5.3 Piper 1986, Moonee Beach

Piper conducted two archaeological surveys: a 500 $m^2$ area on the western side of the Pacific Highway at Moonee Beach, and a 0.24 $km^2$ area of a model airfield southwest of the Look At Me Now Headland. Neither area revealed sites, with the airfield determined to have been swampland before being drained with man-made channels.

### 4.5.4 Byrne 1987, Moonee Beach

Byrne surveyed an area approximately two kilometres west of Moonee Beach, on the western side of the Pacific Highway. The area had generally low visibility (<5%) with the exception of a small knoll beside the highway where erosion did not expose any artefacts. Byrne did, however, locate 50 artefacts that had been exposed along a ridgeline as a result of cultivation. The flakes were made from quartz and chert and there was one unifacially flaked pebble.

As a result of his survey, Byrne proposed a model for site patterning for the hinterland with sites restricted to areas of higher elevation such as spurs and knolls.

### 4.5.5 Navin and Officer 1990, Coffs Harbour to Koolkhan

Navin and Officer conducted a survey for a proposed 330 kV electricity feeder extending over 82 kilometres between Coffs Harbour and Koolkhan (Grafton). The local area surveyed was in the hinterland to the north west of the current project area, and while not directly relevant provides information in relation to patterns of occupation. The length of the survey area provided the opportunity to include a wide variety of landforms in the assessment.

The survey revealed 56 sites and five PADs. The sites consisted of 39 artefact scatters, six isolated finds, four scarred trees, four rockshelters (three with art) and three quarry sites. Most of the sites were disturbed and were given low to moderate significance. Of note was

the low number of sites located in landforms adjoining the riparian corridors (along creeklines), but higher numbers of sites on the ridgelines, slopes and spurs.

The emplacement of the transmission line meant that a number of the sites recorded were destroyed under a Section 90 Consent, but wherever possible, pole placement was designed to minimise impact on sites.

### 4.5.6 Navin 1991, Moonee Beach

Navin (1991) surveyed a 90 hectare area north of Moonee Creek, 2.5 kilometres north of the township of Moonee Beach and the current project area. A section of Navin's survey area overlapped Piper's (1986) (refer to **Section 4.5.3**) survey area.

The area was surveyed as part of a development application to create a golf course to be associated with other tourist facilities. Tony Perkins of the CHDLALC reported at the time that he was not aware of any significant sites in the study area, but acknowledged the importance of the Look At Me Now Headland.

Navin describes the general project area as:

> medium height open forest dominated by Eucalyptus and Paperbarks, with an understorey of grasses and shrubs. Much of this forest is regrowth….Small areas of mangrove swamp occur along the margins of Moonee Creek and its larger tributaries. The central part of the study area has been completely cleared of original vegetation and now comprises manicured grasslands.

Navin also described the degree of land disturbance across the project area from clearing of vegetation for use by an Aero Club, land disturbance associated with the emplacement of sewerage pipes, Telecom cabling, sand quarrying and recreational trails.

As a result of the survey, Navin located one scarred Swamp Mahogany tree (Moonee Creek 1). Tony Perkins and Navin classified the scarred tree as significant, as this site type is rare within the archaeological record for this area as a result of European logging activities.

### 4.5.7 Collins 1994, Moonee

Collins conducted a survey of a 156 hectare area at Moonee on the western side of the Pacific Highway. The archaeological assessment was to be submitted with a Development Application for a proposed rural subdivision of one hectare lots with associated infrastructure (roads, emplacement of transmission lines, sewerage and water pipes).

Collins described her project area as:

> ..flat to gently undulating, lying generally at a level between 5 and 9 metres RL. Soils here consist of deep sandy clays with grey silty topsoil….the more elevated parts of the lowland support tall Eucalypt forest, although much of the area below the 8m contour line has been drained and now supports pasture grasses, remnant patches of Melaleuca/reed forest suggest that soils here may once have been waterlogged on a regular if not permanent basis.

Collins located four sites within the development area: Site 1 had 35 stone artefacts on an access track which followed a ridgeline; Site 2 contained 15 stone artefacts, also exposed on a track on a ridgeline; Site 3 had three stone artefacts adjacent to Skinner Creek; and Site 4 was an isolated find on a spur.

Sites 1 and 2 were given moderate to high significance classifications for their scientific and cultural value to the Aboriginal community. Site 3 was given a low to moderate significance and Site 4 was awarded low significance.

### 4.5.8 Connell Wagner 2003, Moonee Beach

In May 2003, Collins, on behalf of Connell Wagner, conducted an Aboriginal and archaeological constraints analysis for two proposed inner bypass routes to Coffs Harbour for the Roads and Traffic Authority (RTA). The bypass options commenced on the southern side of Coffs Harbour near the industrial complex and finished north of the city. Both options are situated to the west of the town. From the assessment, it was noted that no previously recorded sites in the area were at risk of impact, and discussions with CHDLALC and GJE indicated that the areas likely to be impacted by the proposed highway footprint would not to pass through any culturally sensitive areas.

### 4.5.9 Dallas and Tuck (in prep.), Moonee Beach

An archaeological survey was conducted on Lot 210 DP 1044292, immediately north of the current project area, on behalf of Oldarb Pty Ltd as part of a development application to Coffs Harbour City Council. The survey area, referred to as Pettina Park, is approximately 3.15 hectares, has a pet kennel, residences, yards, stables and grazing lands.

The survey area was divided into two areas; the saddle and the side slopes. On the saddle an artefact scatter (MB1) was located consisting of six artefacts (4 greywacke and 2 pebbles), and the side slopes were highly disturbed with no sites located. The site was classified as having low archaeological value with a recommendation for a Section 90 Consent.

### 4.5.10 Dallas and Tuck 2003, Mid Sapphire Beach

After conducting a field survey in July 2003, Dallas and Tuck completed an archaeological assessment of 80 hectares adjoining Mid Sapphire Beach, located immediately south of the current Umwelt project area. Dallas and Tuck's investigation was conducted as part of the Moonee Development Control Plan which seeks to appropriately manage the future release of land for development in a sustainable manner (Dallas and Tuck 2003: 9).

A total of two Aboriginal open sites (artefact scatters) and two isolated finds were recorded during the survey. Of these sites, both of the artefact scatters (MSB1 and MSB2) and one of the isolated finds (ISF 2) were associated with areas identified as containing potential archaeological deposit (PAD).

All of the sites identified were comprised of stone artefacts with a maximum of 15 and a minimum of a single artefact being recorded at each site. The most common raw materials of which the stone artefacts were fashioned were greywacke and river cobbles/pebbles with milky quartz and blue-grey volcanic materials also present. The artefact types recorded by Dallas and Tuck are described as being of the 'pebble core tool' tradition (Dallas and Tuck 2003: 65).

It was recommended that further subsurface investigations be undertaken at the two artefact scatter sites (MSB1 and MSB2) as well as the isolated find which was determined to be associated with PAD (ISF 2). It was further recommended that a Section 90 (surface collection only) be sought for ISF 1.

### 4.5.11 ERM in prep. 2006, Moonee Beach

ERM conducted a survey and assessment of Lots 1 and 2 of DP 725785, approximately one kilometre north of the town of Moonee Beach (approximately 1.5 kilometres north of the

current Umwelt project area). ERM's investigation was undertaken as part of a proposed 97 hectare residential subdivision.

Seven sites were recorded by ERM 2006 (one scarred tree, four artefact scatters and two isolated finds) and all were concluded to have been previously recorded by Collins 1994 (refer to **Section 4.5.7**). The most common artefact raw material recorded by ERM was mudstone, followed by coarse grained igneous stone. Siltstone and quartzite were also present in the assemblage. The most common artefact types recorded were flakes and broken flakes with some retouched artefacts present (ERM in prep Appendix B). In addition to the surface evidence four areas of PAD and one area of cultural sensitivity were identified on the northern and north-eastern margins of ERM's project area.

It was recommended that where possible all impacts to sites, PADs and the area of cultural sensitivity recorded during the survey be avoided especially where remnant vegetation remained. It was further recommended that all sites outside the impact footprint should be protected during construction and the two sites with surface evidence inside the impact area undergo surface collection by an archaeologist and the Aboriginal stakeholders prior to construction.

### 4.5.12 Davies in prep., Mid Sapphire Beach

In mid 2006 Sue Davies conducted excavations at in the three sites and areas of PAD identified by Dallas and Tuck 2003 (refer to **Section 4.5.10**), as well as one additional PAD she recorded (refer to **Figure 4.3**). The results of these excavations are currently being compiled. Davies has commented that preliminary observations from the excavation of ISF2 (AHIMS 22-1-0166) and its associated PAD indicate that the site continues into the current Umwelt project area and would appear that the site has more integrity within the current Umwelt project area than within the area excavated (Davies pers. comm. 2006).

### 4.5.13 Implications for Site Location/Site Preservation

Previous archaeological investigations within the local area have identified a wide variety of sites in a variety of landform elements (Byrne 1987; Navin and Officer 1990; and Navin 1991). The majority of sites located in the area have been located in association with the dune systems and estuaries (artefact scatters and a midden) or along ridges and spurs (artefact scatters and isolated finds).

Previous archaeological research in the broader Coffs Harbour region suggests that larger and more complex Aboriginal sites are most likely to be located on elevated ground adjacent to relatively permanent water and near resource rich areas such as wetlands and swamps, on elevated (dry) ground along creeks (Dallas and Tuck 2003) and beach and estuarine environments.

Information supplied by the Aboriginal community .reveals a number of mythological and ceremonial sites, and supports the use of this general area as a corridor of movement between tribal areas on the way to meeting places.


Source: Patterson Britton & Partners 2005

0 0.25 0.5 1km
1:23 000

**Legend**

- Project Area
- Areas Excavated by Davies 2006

FIGURE 4.3

**Location of Recent Excavations Undertaken by Davies**

# 5.0 THE PREDICTIVE MODEL

The information from the previous archaeological research and the AHIMS database show that the general area has sites located behind the dune systems or on ridges and spurs. The current project area has small samples of all of these landforms. Previous archaeological research in the Coffs Harbour region also suggests that Aboriginal sites are located adjacent to relatively permanent water and resource rich areas such as wetlands and swamps, on elevated (dry) ground. Based on the information taken from previously recorded Aboriginal sites and the landscape of the area, the following is a predictive model for distribution of site types and site contents for the project area.

## 5.1.1 Artefact Scatters

Artefact scatters are the most common type of site located in Australian archaeology and have the highest incidence in the area surrounding the project area. Artefact scatters are thus the mostly likely sites to occur in the project area. The two artefact scatters near the southern boundary of the project area are located on an elevated knoll and other artefact scatters in the general area are found on ridges and spurs. Occasionally these artefact scatters are associated with midden material.

If artefact scatters do occur within the project area they are predicted to:

- be low to moderate density scatters restricted to areas of higher elevation such as ridges, spurs, knolls and upper and mid slopes which are free draining and dry;
- contain flakes, broken flakes and occasional retouched flakes manufactured from pebbles of chert, quartz, greywacke, mudstone, siltstone and volcanic material. The pebbles will most likely be sourced from the beach; and
- be located in disturbed contexts.

## 5.1.2 Middens

Midden sites in the general vicinity of the project area have been recorded as containing shell material and sometimes also incorporate stone artefacts, bone and more rarely hearths and burials.

If middens are located within the project area, they will be either on the far north-eastern boundary of the project area or where Sugar Mill Creek meets the estuary of Moonee Creek. It is possible a midden would contain shell fragments (mud whelk, pipi and turban shells), as well as stone artefacts, with small numbers of animal bones (wallaby, dingo and shearwater) and there is a small possibility that middens may contain pieces of ochre.

## 5.1.3 Isolated Finds

Isolated finds, as for artefact scatters are a common site type, and are considered likely to occur within the project area.

Any isolated find within the project area is predicted to be:

- located in areas of higher elevation such as ridges, spurs, knolls and upper and mid slopes which are free draining and dry;

- contain either a flake, broken flake or occasional retouched flake manufactured from a pebble of chert, quartz, greywacke, mudstone, siltstone or volcanic material. The pebble will most likely be sourced from the beach; and

- be located in disturbed contexts.

### 5.1.4 Potential Archaeological Deposits (PADs)

Based on the results of Davies excavations to the south of the project area artefacts are likely to occur within the project area in a subsurface context (Davies pers. comm. 2006). Any PADs which do occur will have limited (if any) archaeological integrity due to previous land use history of the project area.

Any subsurface archaeological material present within the project area is predicted to:

- be located in areas of higher elevation such as ridges, spurs, knolls and upper and mid slopes which are free draining and dry;

- contain flakes, broken flakes and occasional retouched flakes manufactured from pebbles of chert, quartz, greywacke, mudstone, siltstone and volcanic material. The pebbles will most likely be sourced from the beach; and

- be located in disturbed contexts.

PADs may be located within or independently of artefact scatter and isolated find sites.

### 5.1.5 Scarred Trees

Scarred or carved trees created by Aboriginal people may be found wherever mature trees survive. Carved trees are not found as frequently as scarred trees.

Based on the information from the environmental context, the DEC AHIMS database and previous land use (logging), it is thought highly unlikely that trees of sufficient age would have survived logging for scarred trees to remain in the project area.

### 5.1.6 Burials

Traditional burial sites are important to modern Aboriginal communities. In ancestral times the deceased was sometimes buried in soft earth or sand, and sometimes they were cremated. Alternatively the body was wrapped in bark and placed in rock overhangs or rockshelters, or in hollow trees, but specific burial descriptions are absent for this area.

Based on the information from previous archaeological work and the DEC AHIMS database, and the degree of prior ground disturbance (which should have revealed burials if they were present) it is thought highly unlikely that a burial would be located in the project area.

## 5.2 SUMMARY OF THE PREDICTIVE MODEL

The following is a predictive model for site location, site type, site contents and site preservation within the project area. The predictive model is based on a combination of the environmental (refer to **Section 3**) and Aboriginal cultural and archaeological contexts (refer to **Sections 4.1** to **4.5**) of the project area.

1) Artefact scatters and isolated finds are the most likely site types to be located in the project area, and are likely to be located in the same landform as the two sites situated

on the southern boundary of the project area (i.e. elevated ridges/slopes) and in proximity to resource rich areas such as swamps and creeks.

2) If stone artefacts are located within the project area they are most likely to be flakes, broken flakes and occasional retouched flakes manufactured from pebbles of chert, quartz, greywacke, mudstone, siltstone and volcanic material. The pebbles will most likely be sourced from the beach.

3) Artefacts may occur in a subsurface context within the project area in landforms such as ridges and mid/upper slopes which are predicted to be the likely locations of camp sites. PADs may be associated with surface sites such as artefact scatters and isolated finds, but may also be located where no surface archaeological materials are located. Any subsurface materials which have survived within the project area will have little if any archaeological (i.e. spatial or spatial) integrity due to the past ground surface disturbance.

4) Middens may occur near or along the Moonee/Sugar Mill Creek estuarine confluence on the northern boundary of the project area. These middens could include estuarine shellfish species, mammal and bird bone. They may also include stone artefacts.

5) Middens are not likely to have survived in the east of the project area associated with the dunes as a large proportion of this area has been sand mined.

6) Burials, scarred or carved trees are unlikely to occur in the project area due to past land use history.

# 6.0 SURVEY METHODOLOGY AND RESULTS

## 6.1 METHODOLOGY

The survey was conducted over 15 and 16 March 2005 with Ken Nayda of GJE and Chris Spencer of the CHDLALC. The methodology was further discussed when all arrived at the project area, and it was determined that the survey would cover areas proposed for disturbance by the development, the existing tracks, any areas of exposure and where possible (due to vegetation) the banks of Sugar Mill Creek.

The survey on 15 March commenced in the north-eastern corner of the project area, where the location of a midden site was known by the Aboriginal group representatives. This midden was site (22-1-0051 also previously noted on site card 22-1-0083) is located on the southern side of the Sugar Mill Creek estuary. From this location, the survey continued along an existing track down to the south eastern boundary of the property before following the southern boundary in a westerly direction (refer to **Figure 6.1**). The survey continued on tracks and clearings on the south eastern side of Sugar Mill Creek. Over 4.7 kilometres of tracks and clearings were covered in this section of the survey with the participants covering an approximate width of 30 metres providing an area of 141,000 $m^2$ covered in the first day. This section of the survey incorporated vegetated dune systems, drainages (mangroves) and forests (*Melaleuca* and *Casuarina*) on a ridge and simple slopes.

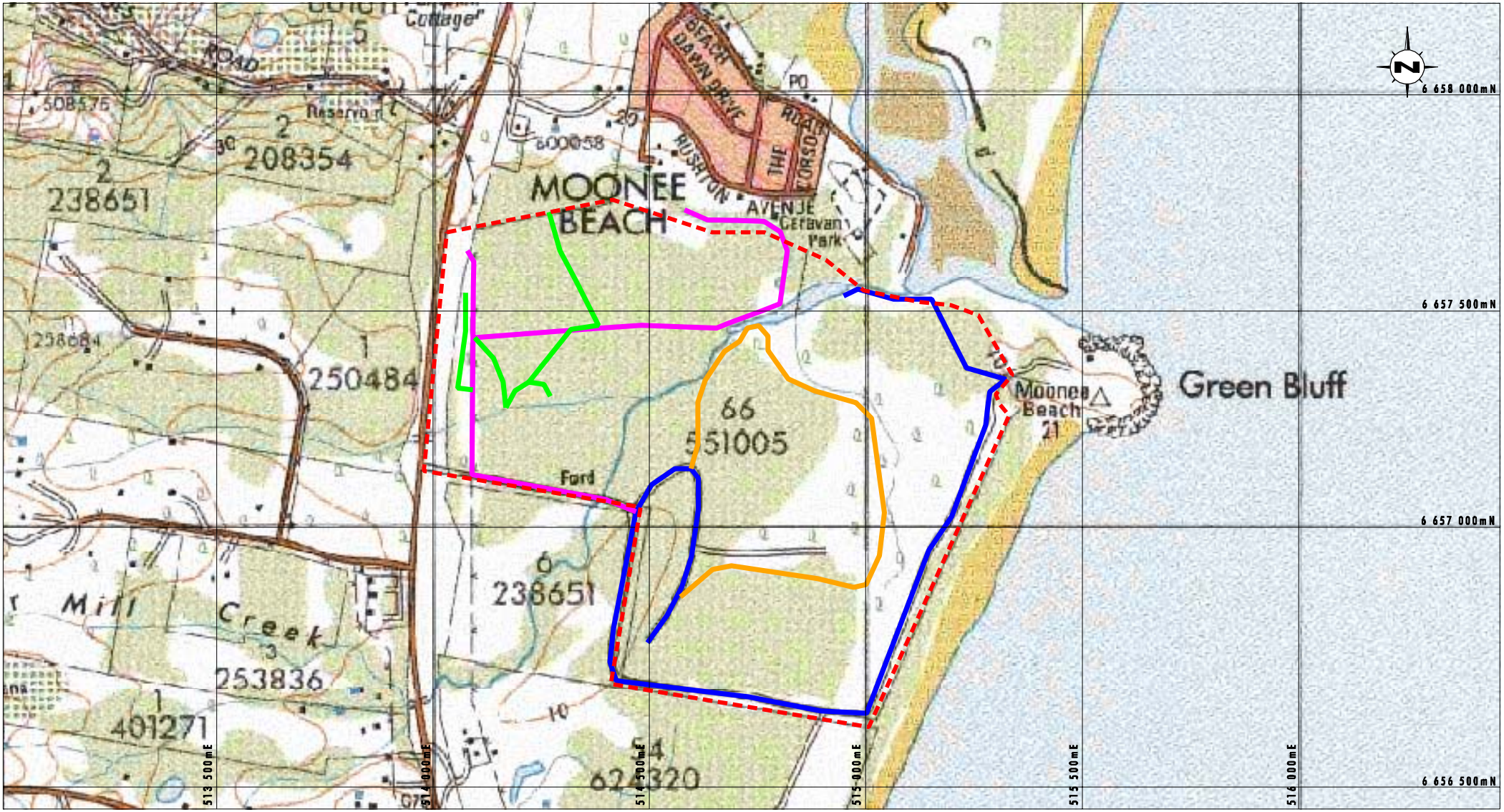
The survey on the 16 March commenced on a track on the southern boundary, and on the western side of Sugar Mill Creek, before progressing along the existing power easement. All tracks leading from the easement were followed. Wherever possible creek lines were accessed, often vegetation was too thick to allow access. Over 3.5 kilometres was covered along the northern side of Sugar Mill Creek with the participants covering an approximate width of 30 metres (an area of 105,000 $m^2$). This section of the survey incorporated drainages (mangroves) and forests (*Melaleuca*, *Eucalypt* and *Casuarina*) on simple slopes (refer to **Figure 6.1**).

All trees along the survey that had a diameter greater than 30 cm were investigated for scars or carvings. The vegetation was very thick in most areas which made it difficult to survey areas away from vehicles or pedestrians tracks. Visibility off the tracks was nil.

## 6.2 EFFECTIVE COVER

**Table 6.1** presents the effective coverage for the four transects conducted over the project area. **Table 6.2** presents the effective coverage for landform units. The landform units have been divided into drainage areas, lower slopes, mid slopes, upper slopes and crests/ridges. The percentage of visibility for the total area of each transect was calculated as stipulated in the NPWS Aboriginal Cultural Heritage Standards and Guidelines (1997).

A total area of 237,900 $m^2$ was surveyed of which 86,050 $m^2$ was along drainage lines, 90,800 $m^2$ on lower slopes, 43,050 $m^2$ on mid slopes, 12,000 $m^2$ on upper slopes, 6,000 $m^2$ on the crests/ridges and 8,100 $m^2$ on modified areas. There was a higher percentage of exposure on the mid slopes, upper slopes and crests/ridges as a large amount of the soil had been lost from erosion following logging or wash on graded tracks, which exposed the B horizon along tracks and some drainage lines. The largest area inspected was Transect 1 followed by Transect 3, Transect 2 and Transect 4 was the shortest transect. Overall, the effective coverage was less than 5% of the project area.




Source: 1:25 000 Topographic Map (LPI NSW)

**Legend**

- Project Area
- Transect 1
- Transect 2
- Transect 3
- Transect 4

FIGURE 6.1

**Transects Covered During the Survey of the Project Area**

File Name (A4): R01_V1/2044_004.dgn

## Table 6.1 - Effective Coverage of Transects in the Project Area

| Transect No. | Area of Land form Unit Inspected in each transect | Survey Unit (length * transect width) =m2 | | | Total Area Surveyed | Area of exposure | % visibility for each area of exposure | Total area of exposure for each transect | Total % exposure for transect | Area for detection on the exposure (exposed area x % vis.) | Effective coverage for total area of ea. transect | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | Drainage | 400 | 30 | 12000 | | 1600 | 70% | 12800 | | 1120 | 0.01 | |
| | Lower Slope | 1600 | 30 | 48000 | | 6400 | 70% | | | 4480 | 4.67 | |
| | Mid Slope | 700 | 30 | 21000 | | 2800 | 70% | | | 1960 | 2.04 | |
| | Upper Slope | 300 | 30 | 9000 | | 1200 | 70% | | | 840 | 0.88 | |
| | Ridge/Crest | 200 | 30 | 6000 | | 800 | 70% | | | 560 | 0.58 | |
| | | | | | 96000 | | | 12800 | 13 | 8960 | 0.08 | 0.01% |
| T2 | Drainage | 1000 | 30 | 30000 | | 2000 | 40% | | | 800 | 1.67 | |
| | Lower Slope | 600 | 30 | 18000 | | 1800 | 60% | | | 1080 | 2.25 | |
| | Mid Slope | | | | | | | | | 0 | 0.00 | |
| | Upper Slope | | | | | | | | | 0 | 0.00 | |
| | Ridge/Crest | | | | | | | | | 0 | 0.00 | |
| | | | | | 48000 | | | 3800 | 8 | 1880 | 3.92 | 0.82% |
| T3 | Drainage | 675 | 30 | 20250 | | 70 | 5% | | | 3.5 | 0.01 | |
| | Lower Slope | 700 | 30 | 21000 | | 2100 | 40% | | | 840 | 1.29 | |
| | Mid Slope | 700 | 30 | 21000 | | 2100 | 40% | | | 840 | 1.29 | |
| | Upper Slope | 100 | 30 | 3000 | | 400 | 70% | | | 280 | 0.43 | |
| | Ridge/Crest | | | | | | | | | 0 | 0.00 | |
| | | | | | 65250 | | | 4670 | 7 | 1963.5 | 3.01 | 0.46% |
| T4 | Drainage | 100 | 30 | 23800 | | 300 | 5% | | | 15 | 0.05 | |
| | Lower Slope | 400 | 30 | 3800 | | 1000 | 20% | | | 200 | 0.70 | |
| | Mid Slope | 600 | 30 | 1050 | | 1500 | 40% | | | 600 | 2.09 | |
| | Upper Slope | | | | | | | | | 0 | 0.00 | |
| | Ridge/Crest | | | | | | | | | 0 | 0.00 | |
| | | | | | 28650 | | | 2800 | 10 | 815 | 2.84 | 0.99% |

## Table 6.2 - Effective Coverage for Each Landform Unit

| Transect No. | Area of Land form Unit Inspected in each transect | Survey Unit (length * transect width) =m2 | | Area of exposure | % visibility for each area of exposure | Total area of exposure for each transect | Total % exposure for transect | Area for detection on the exposure (exposed area x % vis.) | Effective coverage for total area of ea. transect | |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL | Drainage | 86050 | | 3970 | 30% | | | 1191 | 0.50 | |
| TOTAL | Lower Slope | 90800 | | 11300 | 48% | | | 5368 | 2.26 | |
| TOTAL | Mid Slope | 43050 | | 6400 | 50% | | | 3200 | 1.35 | |
| TOTAL | Upper Slope | 12000 | | 1600 | 70% | | | 1120 | 0.47 | |
| TOTAL | Ridge/Crest | 6000 | | 800 | 70% | | | 560 | 0.24 | |
| TOTAL | Modified | 8100 | | NA | NA | | | NA | NA | |
| | | | 237900 | 24070 | | | | 11439 | 4.81 | 0.20% |

## 6.3 RESULTS OF THE FIELD SURVEY

### 6.3.1 Condition of the Project Area

The project area was surveyed on foot and incorporated four major transects (refer to **Figure 6.1**). The project area had been subject to disturbance including the clearing of cedar trees during periods of logging. This has resulted in the majority of the area being covered in regrowth vegetation (refer to **Plate 1**). The regrowth vegetation was predominantly Casuarina on the eastern border (refer to **Plate 2**), Melaleuca forests in waterlogged areas (refer to **Plate 3**) and predominantly ironbark on the remainder of the property (refer to **Plate 4**). Approximately 20 trees where identified that had a diameter greater than 30 cm that may have been suitable for scarred/carved trees. Some of these had fallen due to natural or human processes. There was recent evidence that the area had been used as a source of wood (presumably firewood), particularly on the western margins of the property. No scarred or carved trees were located.

On the western side of the project area, a power easement, a cleared area approximately 50 metres by 700 metres ran parallel to the Pacific Highway (refer to **Plate 5**). Also within the easement was a pump for reclaimed water, which had impacted an area of approximately one square metre (refer to **Plate 6**). Beside the easement a Telstra cable had been laid parallel to and between the easement and the Pacific Highway. Foreign fill material had been introduced to the project area to cover the tracks in the easement, particularly where they crossed tributaries of Sugar Mill Creek. This was also true of other areas outside of the easement that are prone to water logging.

The survey predominantly followed tracks, as these provided the greatest areas of ground surface visibility. Ground surface visibility and access was restricted within densely vegetated areas. The majority of the vehicle tracks had at previously been graded. This has resulted in the total loss of the A soil horizon along most tracks and exposure of the B horizon (refer to **Plate 7**). Where the grader had cut the tracks, it provided the opportunity to examine the soil profile on both margins of the tracks (refer to **Plate 8**). The soil depth was shallow across most landforms within the project area, except the dune system and the areas prone to water logging.

Away from the tracks, the soil tended to be very hummocky as a result of the tree logging. The species and density of the undergrowth vegetation varied according to the landform element: on the dune system the vegetation was predominantly Bitou bush (*Chrysanthemoides rotunda)*; grasses predominated beside the mangroves and in the Melaleuca forest (refer to **Plate 9**); and bracken fern dominated areas with ironbarks and Angophora species (refer to **Plate 10**). The Melaleuca forest in the northern portion of the project area had been subject to recent bushfires which had cleared the dense understorey, but visibility remained low in these areas (refer to **Plate 11)**.

The majority of the tracks had been used recently to access either sections of Sugar Mill Creek or Green Bluff. During the survey, at least three vehicles passed through the project area to Green Bluff. Tracks that passed through the middle of the project area had been used to dump domestic waste and wrecked cars (refer to **Plate 12**). Due to the degree of prior disturbance the project area is not thought to retain any archaeological (spatial or archaeological and/or stratigraphic) integrity.

### 6.3.2 Sites Located During the Survey

During the survey, one new site was identified and two other sites – assessed as being extensions of previously recorded sites (NPWS # 22-1-0051 and NPWS #22-1-0198) were recorded (refer to **Figure 4.1**). The associated site cards are included in **Appendix 7** for

PLATE 1
**Most of the vegetation in the project area was regrowth vegetation**

PLATE 2
**Edge of casuarina forest**

PLATE 3
**Edge of a Melaleuca Forest**

PLATE 4
**Ironbark forest**

PLATE 5
**Power easement**

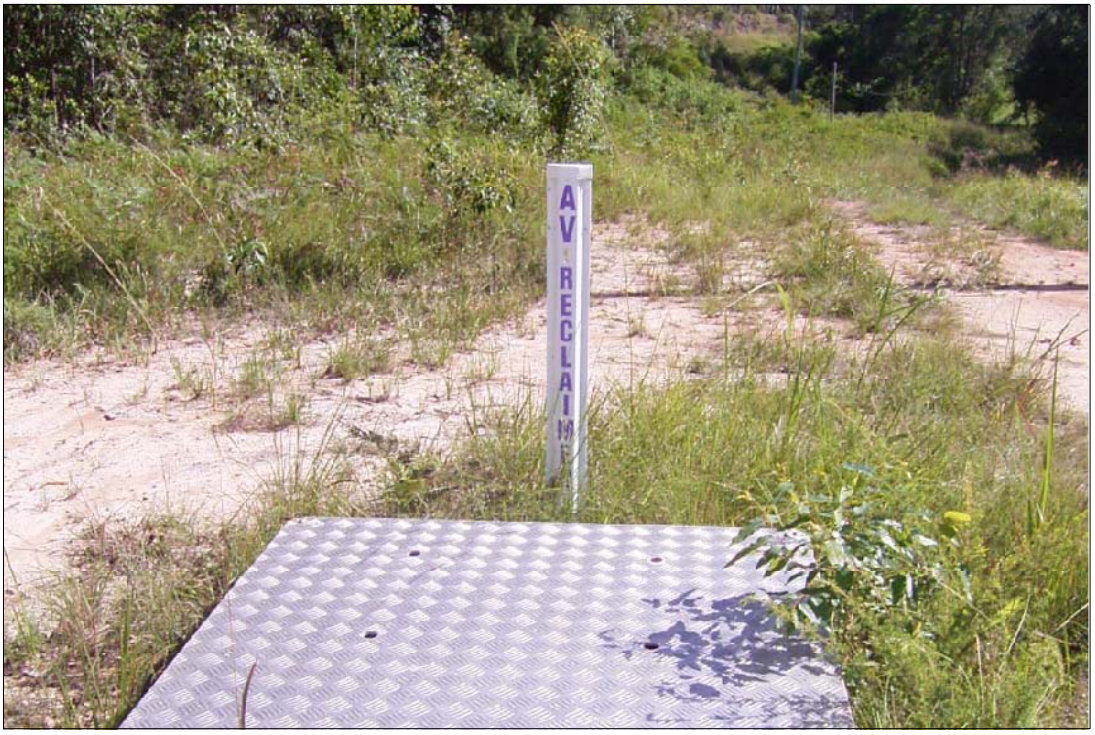



PLATE 6
**Water Pump in easement**

PLATE 7
**Exposed B horizon along tracks**

PLATE 8
**Soil profiles visible from grader cuttings along the tracks**

PLATE 9
**Melaleuca forest**

PLATE 10
**Bracken fern predominates in the understorey**

PLATE 11
**Visibility after bushfire amongst the Melaleuca**

PLATE 12
**One of many areas where vehicles or rubbish had been dumped in the project area**

reference. **Figure 6.2** shows the distribution of the sites identified within the project area and photographs of the sites are included with the site cards (**Appendix 7**).

**AHIMS #22-1-0051**

The visible extent of this previously recorded midden is located wholly outside the project area on the southern side of Sugar Mill Creek just 20 metres back from the confluence of Moonee and Sugar Mill Creek (refer to **Section 4.4.1** above and **Figure 4.2**). Additional site information was recorded for this site during the survey that relates to a scatter of artefacts which extends for approximately 70 metres along an informal pedestrian track which is regularly used to access Green Bluff. The extent of the artefacts recorded was limited to exposure within the pedestrian track as the remainder of the area was densely vegetated with lantana (refer to photographs on the site card located in **Appendix 7**). Shell fragments were also observed along the exposure within the pedestrian track and these were assessed as being natural in origin. The artefact scatter recorded is located adjacent to the 7A (conservation) zoned area, but wholly outside the project impact area.

No additional information was recorded with regard to the midden deposit as it has previously been described in site cards 22-1-0051 and 22-1-0083 (again refer to **Figure 4.2**). It should be noted however that the extent of the shell deposit is unknown due to a dense cover of lantana and it may extend south and inside the northern boundary of the project area in the 7A (conservation) zoned area which will not be subject to development impact (refer **to Figure 1.2**).

**Sugar Mill Creek 2**

A small artefact scatter (Sugar Mill Creek 2 – SMC2), consisting of two stone artefacts, one on either side of a vehicle track was recorded on the southern boundary of the project area (refer to site card in **Appendix 6** for further details). The track had been graded to a depth of up to two metres, leaving cuttings either side. The soil removed from the track had been deposited out of the project area, probably when the area cleared by the loggers. The landform was a midslope, which runs to the south (on the adjoining property) towards a Melaleuca forest. The level of disturbance at this site was classified as high due to previous land use.

**AHIMS #22-1-0198**

An artefact scatter was located on the north-eastern section edge of a low broad ridge. This site consisted of six artefacts distributed over a 100 metre stretch of an existing (sloping) access track. The artefact raw material was local pebble. Visibility off the track was nil therefore the site extent was determined by exposure. The artefact scatter is thought to be an extension of site 22-1-0198 previously recorded immediately to the south-west of the vehicle track on which the artefacts were recorded during the current field survey (refer to **Figures 6.1** and **6.2**). The previous site recording is scant in terms of detail but does record the presence of stone artefacts and plants or animals known to have been used by Aboriginal people.

## 6.4 ADDITIONAL SITE INSPECTION

At the request of CHDLALC a second field inspection was conducted in June 2006. The purpose of the additional field inspection was to further discuss with the Aboriginal stakeholders places of cultural heritage value within the project area. During this additional field inspection two areas of PAD were identified by the CHDLALC representatives.


Source: 1:25 000 Topographic Map (LPI NSW)

0 200 400 600m
1:12 500

**Legend**

- Project Area
- Artefact Scatter
- PAD
- Isolated Find

FIGURE 6.2

**Sites located within the Project Area**

The first of these PADs is located adjacent to the artefacts recorded as an extension of site 22-1-0198 (refer to **Figure 6.2**). The PAD is located on a ridge which extends from the southwest. The ridge crest is bordered by the vehicle track on which six artefacts were recorded (22-1-0098) at its northern and eastern margins. Thus site 22-1-0198 is a site incorporating a presently undefined area likely to have subsurface artefacts. The PAD will therefore be referred to as 22-1-0098 PAD. A narrow spur extends from the northern tip of the ridge on which 22-1-0198 and its associated PAD are located. The spur continues north-north-east towards swampy ground located at the central northern boundary of the project area, and just north of the second PAD identified (refer to **Figure 6.2**). The second PAD, (PAD 2) is located on elevated topography above Sugar Mill Creek. The PAD area is about 70 metres in diameter (refer to **Figure 6.2**).

Due to the previous land use history of the project area, particularly logging, it is expected that the PAD areas will retain little, if any, archaeological integrity (stratigraphic or spatial integrity). While little archaeological integrity is expected, subsurface testing at the two PAD locations has been requested by CHDLALC as the area is classified as being of high Aboriginal cultural heritage significance. From an archaeological perspective excavations will provide little additional information than that already gathered by Davies, except to further refine the predictive model. Should any artefacts be recovered during the excavations these can be compared with the assemblage salvaged by Davies to the immediate south of the project area (refer to **Figure 4.3**).

# 7.0 SIGNIFICANCE

This section of the report will provide discussions related to the Aboriginal and archaeological significance of the sites and PADs located within the project area. Archaeological significance is a scientific value which can be determined by archaeologists based on the data pertaining to the area; however, cultural heritage significance can only be determined by members of the Aboriginal community.

The management recommendations formulated for sites/PADs are based on their Aboriginal cultural heritage and archaeological significance.

## 7.1 ABORIGINAL SIGNIFICANCE AND SENSITIVITY

The CHDLALC and GJE assessed the project area as having a high level of cultural significance. This conclusion is drawn from the Aboriginal oral history known for the area, the resources available locally, the results of the inspection and the results of the excavations undertaken by Davies in the allotment directly to the south. The two areas of PAD identified were assessed by the Aboriginal stakeholders as being areas of high potential for subsurface artefactual material and both were identified as being of high cultural importance.

## 7.2 ARCHAEOLOGICAL SIGNIFICANCE

The significance of an archaeological site is denoted by its potential to contribute information that will enhance knowledge of past cultural practices. Significance is assessed according to principles outlined originally in Australia in the Burra Charter, which was adapted from International Council for Monuments and Sites (ICOMOS), Venice Charter. The current Burra Charter (1999) provides guidance for the conservation and management of places of cultural significance (cultural heritage places), and assessing cultural significance to aid the determination of appropriate management procedures.

The Burra Charter defines cultural significance as ‘aesthetic, historic, scientific or social value for past, present or future generations’ (Australia ICOMOS 1999). The NSW NPWS (1997) provides a discussion on the assessment of cultural significance for Aboriginal sites. NPWS recommends archaeologists focus on the scientific significance as the aesthetic, historic and educational value of sites is better determined by others, if relevant at all.

The scientific significance of any Aboriginal sites or PAD is assessed according to its ability to contribute to the scientific or archaeological understanding of Aboriginal culture. Rarity, representativeness, intactness and integrity, connectedness, potential to provide new information about Aboriginal culture in an area and potential to contribute to a chronology of the local Aboriginal culture are the criteria used to assess the scientific significance.

**Rarity**

The significance of a site that is unique or rare is greater than if it is an example of a common site type. Stone artefact scatters are the most common form of archaeological evidence of traditional Aboriginal occupation in the general area. On this basis:

- 22-1-0051 is a midden with stone artefacts. Whilst this may have been a common site type in the general area in the past, many of the registered midden sites in the area have been destroyed from sand mining or other development. For this reason, this site type is now considered to be rare in the locality. The midden material previously recorded as eroding form the bank of Sugar Mill Creek/Moonee inlet was not re-assessed for this report as it is located outside the project area. The significance assessment presented

here is for the section of the site located within the project area which contains only stone artefacts locates in a disturbed context along a pedestrian track. Artefact scatters are the most common site type in the local and regional area and are therefore generally afforded a low significance for rarity. As the artefact scatter may have an association with a midden site it has, however, been assessed as having low to moderate archaeological significance for rarity.

- Sugar Mill Creek 2 (SMC2) is an artefact scatter and thus the most common site type recorded in the area. The site contents are also those most commonly located in the area, therefore the site is considered to have low archaeological significance for rarity.

- Site 22-1-0198 is a low density artefact scatter and thus the most common site type for the area. The site contents are also those most commonly located in the area. It can also be predicted that the associated area of identified PAD will contain a low density artefact scatter with similar artefact types (if any). Overall the site (including any potential subsurface artefacts) is considered to have low archaeological significance for rarity.

- PAD 2 is assessed as an area where artefacts in a subsurface context are likely, but as in site 22-1-0198 it can also be predicted that the PAD will contain a low density artefact scatter with similar artefact types (if any) to those known for the area. Overall the PAD is considered to have low archaeological significance for rarity.

**Representativeness**

It is necessary to investigate a representative sample of Aboriginal archaeological sites within a region so as to increase our knowledge of the area, but it is also necessary to leave a representative sample of sites intact for future generations. The objective is to conserve every type of site in the range of landscapes in which they occur, so as to provide a resource of evidence for future research questions.

All sites can be described as representative of a particular site type; however, certain aspects of sites increase their representativeness value. Some sites contain elements that are uncommon to the area in which they are located. Examples for this area would be art or axe grinding grooves which would have high representativeness value as they are not known in the area. Due to sand mining in this area, midden sites which would once have been common are becoming rare and thus those that remain have relatively high representativeness value. Other sites may be composed of common elements, but may be preserved in such a way, or may be arranged with such complexity that they will have great value in representing the site type, in an unusually informative way. Sites in undisturbed areas would be assessed as having high significance for representativeness on this basis:

- The artefact scatter recorded at site 22-1-0051 is similar to other artefact scatters in the locality and region and is in a disturbed context like most of the other sites. Thus it is assessed as having low archaeological significance for representativeness.

- SMC2 is an artefact scatter on a ridge crest, which according to results from previous archaeological research and the AHIMS database is common for this area. Based on this, SMC2 is considered to have low archaeological significance for representativeness.

- Site 22-1-0198 is an artefact scatter on a ridge crest, which according to results from previous archaeological research and the AHIMS database is common for this area. This site is also considered to have PAD. PADs were identified in similar landforms in the adjacent allotment to the south and can be predicted in similar landform elements along the coast. As many of these areas have already been impacted by development site 22-1-0198 and its associated PAD are assessed as having moderate archaeological significance for representativeness.

- PAD 2 is an area of elevated, level topography located above Sugar Mill Creek and a swamp. PADs were identified in similar landforms in the adjacent allotment to the south and can be predicted in similar landform elements along the coast. As many of these areas have already been impacted by development PAD 2 is assessed as having moderate archaeological significance for representativeness.

**Integrity**

The integrity or intactness of a site is important when assessing its significance and requirements for further investigation or conservation. A site that has been subject to minimal disturbance following its creation contains considerably more information about environmental change and cultural sequences than a similar site that has been degraded by erosion which has removed the soil matrix in which the site exists. If a site was located within a development area that was assessed as having a high degree of archaeological integrity it would have high significance and conservation may be warranted. On this basis:

- The artefact scatter recorded at 22-1-0051 is highly disturbed (pedestrian pathway through site) and therefore not expected to retained ant archaeological integrity. Therefore the artefact scatter is considered to have a low level of archaeological significance for integrity.

- SMC2 has been heavily disturbed by the grading of the vehicle track, vehicular access and logging activities; all of which have led to topsoil disturbance and loss. The site therefore is assessed as having no potential for stratigraphic or spatial integrity and thus has low archaeological significance for integrity.

- As for SMC2, site 22-1-0198 has also been heavily disturbed by the grading of the vehicle track, vehicular access and logging activities; all of which have led to topsoil disturbance and loss. While subsurface artefacts are expected at this site they too will have been subject to a high level of disturbance due to the previous land use history of the site. The site and associated PAD are therefore assessed as retaining little if any potential for stratigraphic or spatial integrity and thus are assessed as having low archaeological significance for integrity.

- PAD 2 has also been heavily disturbed by logging and loss of topsoil. PAD 2, therefore, is assessed as having little if any potential for stratigraphic or spatial integrity and thus is assessed as having low archaeological significance for integrity.

**Connectedness**

This value measures how a site is related to adjacent or nearby sites. A complex or suite of associated sites across a landscape contains more information about traditional Aboriginal society than an isolated site. The nature of the connection between sites may be related to their association within particular landform elements, or may be related to the nature of the contents of the sites.

As the chronology of sites is difficult to ascertain without subsurface investigation (to locate material suitable for dating), chronological connectedness is difficult to ascertain at the survey stage of an assessment. Connectedness across a landscape (e.g. sites located along a single watercourse) is easier to define; however, this form of connectedness cannot be supported without chronological control as the sites may be thousands of years apart in their age. Connectedness may be implied for sites that share a rare attribute such as the use of a rare raw material or form part of a sequence of activities (e.g. an axe quarry site, a site nearby where stone from the quarry was reduced to form an axe blank, an axe grinding groove site where the axe blank was sharpened). As it is not possible to recognise any of

these features in the sites located within the project area they are all assessed as having low archaeological significance for connectedness.

**Complexity**

The complexity of a site is an indication of its ability to contribute information on the local Aboriginal culture. The complexity of a site may be indicated by the number, variety and/or density of artefacts it contains, or by the range of features that occur within it (e.g. hearths, burials, heat treatment pits). As none of the sites have complex assemblages or are predicted to have complex subsurface assemblages all of the sites are assessed as having low archaeological significance for complexity.

**Ability to Contribute to Understanding of Cultural Sequences**

For a site to contribute to our understanding of cultural sequences, it must contain distinguishable features or aspects that can be shown to have been created at different times. Their relative relation with a past cultural period may be indicated within stratified cultural deposits that have remained reasonably free of disturbance. Within a relatively intact cultural deposit, the association of datable features such as charcoal preserved within a hearth, or some specific types of artefacts can provide an indication of cultural sequencing. As none of the sites retain stratigraphic integrity they are assessed as having low archaeological significance for contributing to our understanding of cultural sequences.

### 7.2.1 Potential Archaeological Deposit (PAD)

Technically potential archaeological deposits (PADs) are places where the subsurface profile is assessed as having a high probability of containing cultural heritage materials in a relatively undisturbed context. Factors that need to be considered when assessing PADs include:

a) the depth of the 'A' horizon profile;

b) any potential disturbances to the subsurface environment (e.g. clearing, tilling);

c) the probability of cultural materials being present as assessed through the environmental setting and/or a surface artefact assemblage; and

d) any geomorphic agencies likely to have affected the area (e.g. creek channel migration, colluvial or alluvial depositional processes and Aeolian processes).

Whilst two areas were identified by CHDLALC within the project area as PADs (22-1-0198 and PAD 2) neither are assessed as having any stratigraphic or spatial integrity due to prior land disturbance. Similarly the remaining sites, SMC2 and the artefact scatter within 22-1-051) are assessed as lacking stratigraphic or spatial integrity. Thus all of the sites are assessed as having low archaeological significance for PAD.

## 7.3 SUMMARY OF SIGNIFICANCE

The Aboriginal significance of the project area has been assessed by Coffs Harbour and District LALC and Gumbala Julipi Elders as high (refer to **Section 6.1**).

The results of each assessment criterion in **Section 6** were entered into a Likert five point scale for each site to determine their overall archaeological/scientific value. The total scores are summarised below in **Table 7.1**.

**Table 7.1 - Archaeological Significance Ranking for the Sites in the Project Area**

| | Site 22-1-0051 | Sugar Mill Creek 2 (SMC2) | Site 22-1-0198 and associated PAD | PAD 2 |
|---|---|---|---|---|
| Rarity | Low to Moderate | Low | Low | Low |
| Representativeness | Low | Low | Low to Moderate | Low to Moderate |
| Integrity | Low | Low | Low | Low |
| Connectedness | Low | Low | Low | Low |
| Complexity | Low | Low | Low | Low |
| Contribution | Low | Low | Low | Low |
| PAD | Low | Low | Low | Low |
| **Score** | **9** | **7** | **9** | **9** |
| **Overall Significance Ranking** | **Low** | **Low** | **Low** | **Low** |

The archaeological significance of the sites/PADs within the project area has been determined based on criteria outlined above to be:

- 22-1-0051 (low);
- SMC2 (low);
- 22-1-0198 PAD (low); and
- PAD 2 (low).

It should be noted that while additional information was recorded for site 22-1-0051, and it was assessed for archaeological and cultural heritage significance by both Umwelt and the Aboriginal stakeholders, the known extent of the site is wholly outside the proposed development impact area (refer to **Figures 4.2** and **6.2**).

The cultural significance of the sites and PADs identified in the project area is assessed as being high by the Aboriginal stakeholders. As stated in **Section 7.1** of this report, the CHDLALC and GJE commented (during field surveys conducted for this project) that the project area, Green Bluff and the general region were of high cultural importance.

# 8.0 MANAGEMENT OPTIONS

Management options for the sites within the project area need to be considered in relation to the proposed development before any works can proceed. Management options for the project area and specifically for the three sites and the PAD are addressed in **Section 8.1** with recommendations presented in **Section 9**.

## 8.1 MANAGEMENT OPTIONS AND EVALUATION

There are a number of standard management options that require consideration in relation to any development project. These include:

1. **Conservation** - When sites within a project area are assessed as of high Aboriginal cultural heritage and archaeological significance, it is an option to set aside a section of the project area to be conserved. This generally incorporates a number of Aboriginal sites/PADs/areas of high significance. An alternative is to conserve a similar area in terms of topographic and heritage values outside the project area to offset for cultural heritage loss during development.

2. **Destruction without salvage** – When sites have been classified as of low Aboriginal cultural heritage and archaeological significance, or when previously recorded evidence of a site cannot be located during inspection, the area of the site may sometimes be destroyed by development without any required salvage work.

3. **Destruction with salvage (surface collection only)** - When sites have low archaeological significance and moderate to high Aboriginal cultural heritage significance, the artefacts on the surface may be collected prior to development.

4. **Subsurface investigation** - If an area has been identified as having PAD, subsurface investigations are generally conducted in advance of the proposed development to gauge the extent and significance of the cultural heritage material.

5. **Destruction with salvage (subsurface excavation) -** If a site has associated PAD and is of high Aboriginal cultural heritage and archaeological significance it is appropriate to salvage as much of that site as is necessary to retrieve a representative sample of the subsurface material. The area of the subsurface investigation may be determined by subsurface testing or may be determined through surface observation.

## 8.2 DISCUSSION AND SUMMARY OF MANAGEMENT OPTIONS

The proposed development seeks to only impact approximately 30% of the project area with 70% of the project area conserved and protected under the Coffs Harbour City Council Section 7A Environmental Protection Habitat and Catchment Zone. It should be noted that while the ethos of the 7A zoning is conservation, development either requiring or not requiring development consent is permissible within the zoning (refer to **Section 1.2**). Based on the management options available to the proponent, appropriate management for the three sites and PAD located within and in close proximity to the project area are:

**Management Option 1 - Conservation**

The visible extent of site 22-1-0051 is located entirely outside the proposed development footprint and is wholly outside the project area. The extent of the buried shell deposit is unknown and may continue south and inside the northern boundary of the project area. Management Option 1 is considered the best option for the land inside the northern boundary

of the project area immediately south of the visible extent of 22-1-0051 which is 7A (conservation) zoned land.

The CHDLALC and GJE have requested that a retaining wall of similar construction to that located along the estuary (**Plate 13**) be constructed in front of the eroding bank at the site (outside of the development area) to prevent further loss of artefactual material. The Aboriginal stakeholders have also requested that remediation works are undertaken to protect the exposed artefacts.

As part of the conservation management option the proponent could consider making a contribution to the rehabilitation and conservation of site 22-1-0051. Although the site is entirely outside the project area meaning there is no requirement for the proponent to contribute to the rehabilitation/conservation of 22-1-0051, any contribution made would assist with offsetting the loss of cultural heritage values from within the development.impact area.

**Management Option 2 - Destruction without Salvage**

This option is not thought appropriate for any of the sites/PADS due to their high Aboriginal cultural heritage value.

**Management Option 3 - Destruction with Salvage (surface collection only)**

Management Option 3 would address the cultural heritage significance of SMC2 by permitting the relevant Aboriginal representatives to conduct salvage (surface collection only) of the artefacts.

Surface collection is also appropriate for the surface assemblage of site 22-1-0198.

Further surface salvage of the Precinct 2 area after the initial clearance of vegetation has been requested by CHDLALC and GJE to allow any artefactual materials uncovered (if any) to be collected prior to the commencement of the development.

**Management Option 4 - Subsurface Investigation**

Subsurface investigations have been requested by CHDLALC and GJE at the 22-1-0198 PAD and PAD 2 sites. Due to high levels of prior disturbance these areas are not expected to retain any archaeological integrity and any subsurface investigation undertaken would form part of an Aboriginal cultural heritage salvage. Salvage of this nature is deemed appropriate due to the high Aboriginal cultural heritage significance afforded the areas of PAD by CHDLALC and GJE.

**Management Option 5 - Destruction with Salvage (subsurface excavation)**

Based on the results of the subsurface investigation of 22-1-0198 PAD and PAD 2 further subsurface salvage may be required if significant numbers of artefacts or if features (hearths, knapping floors) are identified (refer to **Appendix 1** for further details).

PLATE 13
**Reinforced retaining wall on Moonee Estuary**

# 9.0 RECOMMENDATIONS

The management recommendations outlined below have been prepared with regard to:

- respect and consideration of the views of the local Aboriginal stakeholder groups;
- providing clear guidance regarding appropriate management and protection of Aboriginal cultural heritage and archaeological values; and
- in view of the results of the archaeological survey and assessment of the project area.

For the proposed development of the project area it is recommended:

1. The proponent will permit the relevant Aboriginal stakeholders with the assistance of a suitably qualified person (refer to **Appendix 1**) conduct surface collection of the SMC2 and 22-1-0198 sites as per the methodology set out in **Appendix 1.** The surface collection will be undertaken in advance of any ground disturbing works associated with the proposed development. In addition, it is recommended that the proponent allow a representative from the relevant Aboriginal stakeholder groups to visit the SMC2 and 22-1-0198 site areas after ground disturbance works are completed so that they may collect any artefacts uncovered by vegetation clearance.

2. Subsurface investigation/salvage will be conducted in the 22-1-098 PAD and PAD 2 areas (refer to **Figure 6.2**). The subsurface investigations/salvage should be undertaken in accordance with the salvage methodology detailed in **Appendix 1**.

3. The CHDLALC should retain the care of any artefacts collected/salvaged from the project area (refer to **Appendix 1**).

4. Any trails/walking tracks designated for the residents to access Sapphire Beach or Green Bluff should be clearly demarcated to limit the areas impacted by pedestrian traffic. Should ground disturbing works be required for the construction of these pathways outside of the impact areas shown for Precincts 1 and 2 in **Figure 1.2**, further consultation with the Aboriginal stakeholders will be undertaken by the proponent.

5. The proponent engage in consultation with representatives from the relevant Aboriginal stakeholder groups, the Coffs Harbour City Council and any other relevant statutory agencies regarding a possible contribution to the construction of a retaining wall (similar to that shown in **Plate 13**) to protect the north-western bank in the area of the 22-1-0051 site to prevent the further loss of cultural heritage material.

6. The proponent engage in consultation with representatives from the relevant Aboriginal stakeholder groups, the Coffs Harbour City Council and any other relevant statutory agencies regarding a possible contribution towards remediation or upgrading of the existing pedestrian track in order to protect/conserve site 22-1-0051.

7. Should the removal of lantana or any other vegetation be necessary within 7A zoned land adjacent to site 22-1-0051 this should be undertaken in consultation with the Aboriginal stakeholders and should be undertaken in a manner that minimises ground disturbance.

8. Any development carried out in the 2 E zoned 'Beachfront Area' as shown in **Figure 1.2** will not require any further cultural heritage works as it is entirely inside the area previously affected by sand mining.

9. In the event that any skeletal material is uncovered by the proposed development, works will cease immediately and NSW Police Department, the DEC and the relevant Aboriginal stakeholder groups will be contacted and appropriate management options identified.

## 9.1 COMMENTS ON THE MANAGEMENT RECOMMENDATIONS BY THE ABORIGINAL STAKEHOLDERS

After reviewing a draft of this assessment the CHDLALC and the GJE endorsed the management recommendations outlined in **Section 9**. During the consultation program the Aboriginal stakeholders specified that they:

- Support the methodology for the surface collection as outlined in **Appendix 1** (refer to **Appendix 3**).

- Support the subsurface salvage methodology as outlined in **Appendix 1** (refer to **Appendix 3**).

- The Aboriginal stakeholders also stressed the importance of constructing a retaining wall to stop further loss of cultural material from site 22-1-0051. Irrespective of any future impacts from increased pedestrian traffic or future upgrading of infrastructure relating to the current pedestrian track the Aboriginal stakeholders would like the construction of the retaining wall to proceed as swiftly as possible (refer to **Appendix 3**).To this end the Aboriginal stakeholders have requested that the proponent the make a contribution to conservation measures for site 22-1-0051 in consultation with the CHDLALG, GJE, Coffs Harbour City Council and any other relevant statutory authority..

### 9.1.1 Artefact Care and Control

Determining the care and control of the artefacts retrieved during surface collection and salvage programs forms part of the consultation process with the Aboriginal stakeholders. The CHDLALC and the GJE indicated during the consultation program conducted as part of this assessment that they would like to opportunity to return any artefacts that will not be of value as a teaching resource to a designated locale within the project area. The CHDLALC have requested that the area designated for the return of artefacts within the proposed development is as close as practical to the original location from which the artefacts were salvaged (refer to **Appendix 3**). Any artefacts retained by the CHDLALC would be appropriately catalogued and housed at the Land Council office within an existing display cabinet.

The CHDLALC and the GJE will seek a formal Care Agreement with the DEC for any artefacts recovered from the project area.

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# APPENDIX 1

# Salvage Methodology

# Appendix 1 - Subsurface Testing and Manual Excavation

Due to the high Aboriginal cultural heritage significance afforded to site 22-1-0198 and its associated PAD and PAD 2 it has been assessed as appropriate to undertake subsurface testing of these two areas prior to impact by development. Further manual excavation may also be required based on the outcomes of the subsurface testing program.

It is proposed that the subsurface testing/excavations be undertaken by representatives of CHDLALC and GJE under the supervision of a suitably qualified person. This will generally be an archaeologist unless either the CHDLALC or GJE has a member with sufficient expertise to direct the subsurface testing/excavations and to undertake the stone artefact analysis and prepare the requisite report.

## 1. Methodology for Subsurface Testing within Precincts 1 and 2

It is proposed to undertake subsurface testing in two locations within the proposed development area. Methodology for these test excavations is as follows:

- the precise location for the subsurface testing will be chosen in consultation with the CHDLALC and GJE, but will take place wholly inside the areas to be impacted by the proposed development (Precincts 1 and 2) and within the 22-1-0198 PAD and PAD 2 described in **Section 6.2.1** of the report;
- the test pits will be undertaken within an area 10 metres by 2 metres in Precinct 1 and 5 metres by 3 metres in Precinct 2;
- each test pit will be 25 cm by 25 cm;
- the test pits will be removed as 5 cm arbitrary spits or by stratigraphy should a feature (such as a hearth) be uncovered;
- the 25 cm squares will be removed in a manner that systematically tests the excavation areas;
- a maximum of 56 of the 25 cm squares will be excavated systematically across the PAD 2 excavation. While of 42 of the 25 cm squares will be excavated systematically across the PAD 2 excavation;
- test pitting will halt when:
  - 25 or more of the 25 cm squares have been excavated at the 22-1-0198 PAD location 30 or more of the 25 cm squares have been excavated at the PAD 2 location and all present agree that the area does not warrant further excavation;

or if artefacts are located within the initial 25 or 30 test pits in either location:

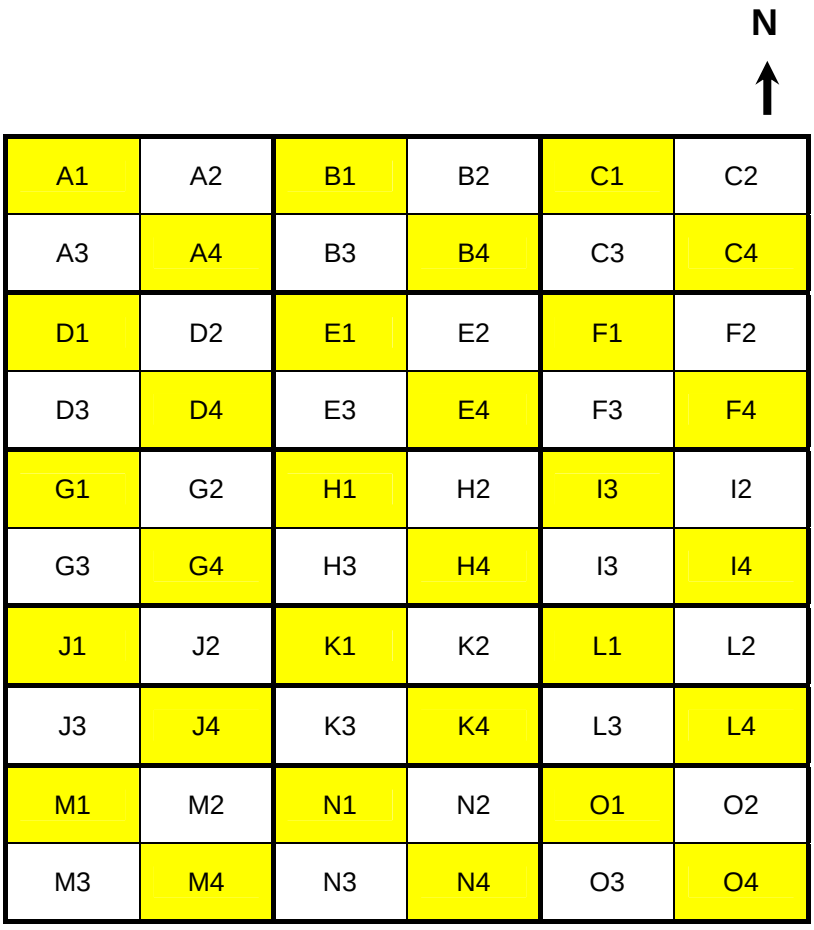
  - 42 of the 25 cm squares will be excavated within the 22-1-0198 excavation and 56 of the 25 cm squares will be excavated within the PAD 2 excavation to ascertain the areas of greatest artefact concentration;

- the test pits will be manually excavated using spades and trowels; and
- the test pits will continue until the B soil horizon (clay) is reached or until all present are satisfied that they can halt.

## 2. Subsurface Testing – Precinct 2

**Figure A1** illustrates the layout of the 3 metre by 5 metre excavation to be conducted within the PAD in Precinct 2. The excavation will take place wholly within the area proposed for impact by the development (as shown in **Figure A1.1**). Each of the labelled squares represents a 25 cm by 25 cm test pit. A minimum of 25 of the yellow shaded squares illustrated in **Figure A1** will be excavated. The excavated squares will be evenly spaced throughout the excavation area to provide a representative sample of the subsurface assemblage (if any). Based on the results of the initial 25 test pits the option of excavating all of the shaded squares will be discussed with the CHDLALC and GJE representatives present. Further excavation will only be warranted based on the presence of features or significant densities of artefacts. As stated above the exact location of the trench will be decided in consultation with the Aboriginal stakeholders present; however the trench will be aligned north-south on its five metre axis.

**Figure A1. Diagram of the Test Excavations to be undertaken at 22-1-0198 PAD**




Further excavation will be undertaken to remove the whole excavation area or part of the excavation area based on the results of the subsurface testing.

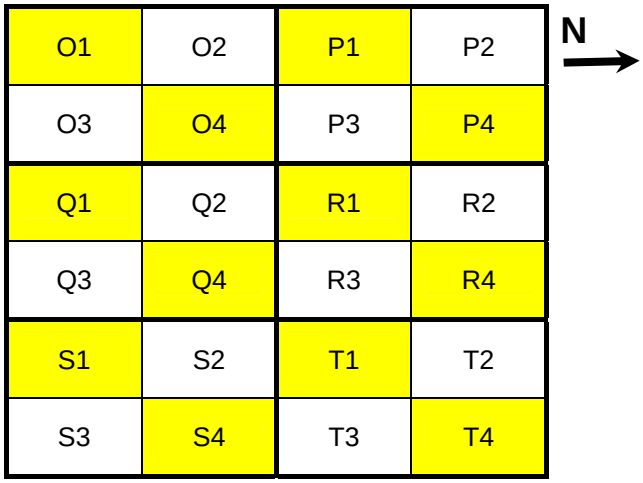
# 3. Subsurface Testing PAD 2

**Figure A2** illustrates the layout of the 2 metre by 10 metre excavation to be conducted within the PAD in Precinct 1. The excavation will take place wholly within the area proposed for impact by the development (as shown in **Figure 1.2** of the main text). Each of the labelled squares represents a 25 cm by 25 cm test pit. A minimum of 25 of the yellow shaded squares illustrated in **Figure A2** will be excavated. The excavated squares will be evenly spaced throughout the excavation area to provide a representative sample of the subsurface assemblage (if any). Based on the results of the initial 25 test pits the option of excavating all of the shaded squares will be discussed with the CHDLALC and GJE representatives present. Further excavation will only be warranted based on the presence of features or significant densities of artefacts. As stated above the exact location of the trench will be decided in consultation with the Aboriginal stakeholders present; however the trench will be aligned east-west on its ten metre axis.

**Figure A2. Diagram of the Test Excavations to be undertaken at PAD 2**

| | | | | |
|---|---|---|---|---|
| A1 | B1 | A2 | B2 | N → |
| C1 | D1 | C2 | D2 | |
| C1 | C2 | D1 | D2 | |
| C3 | C4 | D3 | D4 | |
| E1 | E2 | F1 | F2 | |
| E3 | E4 | F3 | F4 | |
| G1 | G2 | H1 | H2 | |
| G3 | G4 | H3 | H4 | |
| I1 | I2 | J1 | J2 | |
| I3 | I4 | J3 | J4 | |
| K1 | K2 | L1 | L2 | |
| K3 | K4 | L3 | L4 | |
| M1 | M2 | N1 | N2 | |
| M3 | M4 | N3 | N4 | |

**Figure A2. Diagram of the Test Excavations to be undertaken at PAD 2 (cont)**




Further excavation will be undertaken to remove the whole excavation area or part of the excavation area based on the results of the subsurface testing.

## 4. Methodology for Manual Excavations (if required)

Following the subsurface testing a decision will be made (in consultation with CHDLALC and GJE) in relation to which (if any) areas tested require further manual excavation. The rationale for the manual excavations is to salvage any areas with the potential to provide sufficient artefactual material for detailed analysis with the aim of obtaining further information related to Aboriginal use of the landscape within the project area. Comparative analysis with the assemblage from the previously excavated areas within the adjacent land to the south (Davies in prep.) will assist with interpretation.

It is proposed that at the end of the test pitting program, a week will be set aside to provide CGDLALC and GJE with the results of the test pits and to request their comment on draft proposals for further excavation (if warranted).

The area of the initial test excavations will be wholly removed within those sections of the trench where artefacts were present. Further excavation outside the trench will be undertaken if features or dense artefact concentrations are encountered that are likely to extend beyond the trench area. The decision as to how and where to increase the area of the excavation will be undertaken in consultation with representatives of the CHDLALC and the GJE. The additional area will incorporate the extent of any feature(s) identified or until artefact numbers decrease significantly. The following methodology is proposed for the manual excavations:

- the excavations will be undertaken as 1 metre squares excavated as 50 cm quadrats and arbitrary 5 cm spits. Stratigraphic excavation will be employed if features are located;
- at least one soil sample will be collected from each spit of each 1 metre square for Munsell and pH analysis. Further samples will be collected if features are observed. For consistency the Munsell and pH readings will be undertaken by one person under the same light conditions after the completion of the excavations;
- XYZ coordinates will be recorded within the manual excavations for features and for artefacts associated with features (e.g. artefacts associated with a possible hearth etc.); and

- sediments will be collected using the techniques recommended by dating laboratories from any features such as hearths (if identified) for radiocarbon or optically stimulated luminescence or thermoluminescence dating where applicable.

# 5. Methodology for the Surface Collection of Artefacts within Precinct 2

Prior to any vegetation clearance and/or ground surface disturbance within the project area, the two artefacts within the Sugar Mill Creek 2 site will be collected. It is then intended to collect any other artefacts that may be exposed by vegetation clearance within the Precinct 2 before construction or any further ground disturbance occurs. Surface collection will take place only after all the vegetation clearance has occurred and will not proceed while large plant or earthmoving equipment is actively working within Precinct 2.

The collection methodology will include flagging of artefacts so that their distribution can be photographed. Detailed survey plans are not thought warranted for the area as any artefacts remaining within Precinct 2 will be located within contexts which are highly disturbed due to past land use and/or by vegetation clearance for the project. In conjunction with the photographic record a 3D GPS recording will be made of the location and distribution of any and all artefacts so that this information can be recorded and provided to the Department of Environment and Conservation (DEC) and used for the comparative spatial analysis with any and all artefacts recovered from the subsurface testing/excavation program to be undertaken within Precincts 1 and 2.

The artefacts collected will be placed into plastic bags and labelled with the site name from which they were collected, the date, and those present during the collection. Photos taken at each site will be printed and stored with the artefacts (refer to Artefact Care and Control section below). All artefacts collected will be analysed along with any artefacts recovered from the two excavations.

# 6. Artefact Analysis

Following the salvage works the artefacts recovered will be analysed by a suitably qualified and experienced lithic analyst. The analyst should preferably have experience with artefact assemblages from the north coast of NSW and must have the expertise to recognise raw materials and knapping techniques/reduction sequences. The analyst should also be experienced in statistical analysis of artefact data; though it is not expected that the project area salvage will produce large enough assemblages to be statistically meaningful.

All artefacts will be analysed using at least x10 magnification. Edges and artefacts suspected of having use-wear or residues will be inspected using at least x30 magnification. If suitable artefacts are located within the assemblage these will be subject to residue and use-wear analysis (maximum of five).

When completed the report should be obtained from Sue Davies for the salvage excavations undertaken in Lot 2 DP 238651 and Lot 54 DP 624320, Moonee Beach (immediately south of the current project area – refer to **Figure 4.3** in the main text report) (Davies in prep.). The results of the artefact analysis generated by the assemblage salvaged from the current project area should be compared to the artefact analysis generated by Davies in order that intra assemblage analysis can be undertaken.

## 6.1 Discussion of Attributes to be recorded for Analysis

The attributes to be recorded for the artefacts recovered from the development impact area are outlined below. A discussion follows each attribute, detailing the proposed method of recording, potential problems with the method proposed, and the possible behavioural implications of each attribute.

Not all attributes can be measured on all artefacts (e.g. termination type cannot be measured on proximal flake pieces). Therefore, after a discussion of the most basic common attributes, subsequent attributes are divided into sections, with subsections for categories.

## 6.2 Common Attributes

### Artefact Type

Description: Artefact class is a technological category reflecting the mechanical processes which resulted in the physical form of the artefact at the time of recovery. Classes used will include flakes, broken flakes, retouched flakes, flaked pieces, cores, flake-cores, hammerstones, grindstones, ground-edge axes, heat-shattered fragments, and non-diagnostic fragments.

Problems: Classing artefacts does not usually entail significant problems, other than occasional ambiguities between flaked pieces and broken flakes, and between (retouched) flakes and flake-cores (see **Retouch** for a further explanation).

Uses: This category will be used to assess differences in provisioning strategies (e.g. core provisioning vs flake provisioning), and differences in site function/use (e.g. presence/absence of grindstones).

### Raw Material

Description: A largely self-explanatory attribute, raw materials expected to be present include greywacke, river cobbles/pebbles, milky quartz, chert and blue-grey volcanic materials.

Problems: This category is usually without problems, though it is acknowledged that some disagreement exists as to the appropriate nomenclature of some raw material types. As the category is nominal and not technical or geological the only criteria guiding the choice of term here are that the meaning of the term be understandable to others and that it be applied consistently.

Uses: Raw material is an important attribute, which may broadly indicate the place of origin of an artefact. The dominance of one raw material or another may also be used to group or differentiate sites. Raw material is also frequently used in concert with attributes in the creation of analytic units for more in-depth inter and intra site comparisons.

### Artefact Weight

Description: Artefact weight will be measured for all artefacts to one tenth of a gram.

Problems: This attribute does not entail any difficulties.

Uses: One of the most useful artefact attributes, weight is the most effective approximation of volume for a given raw material. As such it most accurately reflects the amount of stone being brought to a site. Average weight within a given artefact class is also a good indication of the amount of 'stress' that has been placed on the provisioned material. Large pieces of stone still retaining usable potential are unlikely to be discarded when people are conserving their technological resources (for example, as they move increasingly away from places where replacement material is available). Alternatively, when people are close to the raw material source, or when they are provisioning larger amounts of

material to a site, the pressure on the 'exhaustion threshold' is relieved and there should be a resultant rise in the average weight of discarded artefacts.

### Dimensions

### Percussive Dimensions

Description: Percussive dimensions measure the length of the flake in the direction of force application from the point that force was applied. In this regard it relates to the length of core face that was removed during the manufacture of the artefact. Width is oriented across the face of the flake from the mid-point of length, and thickness from the mid-point of length and width of the ventral to the corresponding point on the ventral.

Problems: While not as arbitrary as maximum dimensions, there is some uncertainty as to what these attributes are actually measuring in terms of the flake manufacturing process.

Use: Variations in average flake dimensions, and in the distribution of flake sizes in histograms, are expected to correlate with differences in the provisioning and reduction strategies at different places. For example, the reduction of cores at a site will produce a large number of moderate to small flakes and some larger flakes. As a result the histogram of flake length will show a relatively consistent increase in number of flakes from large to small. Contrastingly, when most flakes are the result of retouching or maintenance tasks on other flakes, the majority of the flakes remaining should be very small, with comparably few large to moderate flakes. However, it may be the case that a few moderate to large flakes will be discarded at the site as they are exhausted through excessive/heavy retouch or simply thrown away prior to a reprovisioning event. In such a case, a histogram of artefact size should show a bimodality in regard to length (a small peak in the moderate range and a large peak in the small range), and an even more pronounced bimodality in regard to thickness (most retouching flakes being very thin).

### Maximum Dimensions

Description: Maximum length, width and thickness will be measured on all artefacts. 'Length' will arbitrarily be measured along the longest plain, with width the longest of the plains at 90° to length, and thickness measured at 90° to both.

Problems: There are no problems associated with taking this measurement, although it needs to be noted that the definitions of length, width and thickness are entirely arbitrary and do not reflect any aspect of artefact manufacture.

Uses: This measure is most useful as a broad measure of size, and may have a role in assessing fragmentation rates (particularly in the case of heat-shattered fragments) and calculating Minimum Numbers of Artefacts (MNA).

### Cortex – Amount and Type

Description: Cortex refers to the 'skin' of a rock – the surface that has been weathered to a different texture and colour by exposure to the elements over a long period. The amount of cortex as a percentage of surface area will be measured on all artefacts (in relation to flakes, cortex can, by definition only occur on the dorsal and platform surfaces). The nature of cortex – its shape and texture – will vary depending on where the raw material was sourced. Cortex will be recorded in all instances where cortex is present.

Problems: This is a relatively unambiguous descriptive category.

Use: When a natural cobble is first selected it will usually be covered in cortex. Therefore the first artefacts produced from it will have a complete coverage of cortex on the dorsal side (primary

reduction). As the cobble is increasingly reduced the amount of cortex on each artefact will rapidly decrease (secondary reduction) until it ceases to be present on artefacts (tertiary reduction). As a result of this trend, it should be possible to determine how early in the reduction sequence the artefact was produced. If large numbers of artefacts or a high proportion of the artefacts of a raw material retain cortex it may indicate that the site is located in close proximity to the source. Differences between the proportions of artefacts retaining cortex between different raw material sites indicates relative differences in distance to source. This does not necessarily mean distance in terms of measurable distance across the landscape; it may also reflect length of time since leaving the source. For example, the last campsite when a group is returning to the source of the raw material may be very close to the source in terms of distance, but distant in terms of time elapsed since the group left the source. If artefacts with cortex are occurring in sites a long distance from the place of origin of the natural cobble, them it is likely that cobbles were being transferred to the site when still only slightly reduced. This would imply an attempt to maximise the amount of stone being provisioned with the weight of transported material being a relatively minor concern.

Cortex type may help to clarify the source of the raw material (e.g. from river gravels [rounded, cortex many microscopic conchoidal fractures], surface scree [cortex weathered, porous, often oxidised, can be angular or rounded] or from outcrops [dependent on raw material type, more likely to have flat angular surfaces or recorticated flake scars]).

## 6.3 Attributes to be recorded on Flakes

In most circumstances flakes, whether broken or whole, will account for the majority of artefacts in an assemblage. Flakes are frequently produced in large numbers during reduction events, though most are never subject to use. Flakes are generally inferred to be the most utilitarian of the basic artefact categories, usually possessing a sharp edge along the entire circumference when whole and amenable to reworking patterns which may yield formal 'implements' or 'tools', such as backed artefacts and scrapers.

### Knapping Type

Description: Three main knapping methods are used in the production of flakes, resulting in flakes with distinctive characteristics. The first is freehand percussion, where the objective piece is held in the hand and struck with a hard hammer (eg. a hammerstone), resulting in 'classic' flakes with a single bulb, and a ringcrack/PFA. The second is bipolar, where the objective piece is rested against an anvil and struck. This results in flakes that have straight sheer faces and crushing at both ends. The third is pressure flaking, where an indenter is placed against the edge from which the flake is to be removed and force is applied. The resulting flakes have a characteristically diffuse bulb, with no errailure scar and no PFA.

Problems: Ambiguities do exist in this classification, and the identification of pressure flakes in particular may be difficult, however difficulties are expected to be relatively infrequent.

Use: Freehand percussion, bipolar and pressure flaking are all different approaches to reduction, with different advantages and disadvantages. Pressure flaking is the most controlled method, in terms of how much force is applied and to where. However pressure flaking does not produce large flakes and is usually associated with fine retouching work. Bipolar reduction is usually viewed as a system employed to increase core use-life. As cores become small their inertia thresholds drop making it difficult to reduce flakes via the freehand method. Resting the core and applying bipolar technique allows flakes to be reduced from a core too small to hold or from small round pebbles with no platform angle to initiate reduction. Pressure flaking when undertaken using an anvil often results in a form of bipolar reduction. Patterns in the distribution of flakes resulting from backing may be used to locate areas of backed artefact manufacture. Patterns in the distribution of flakes produced by bipolar knapping maybe used to indicate where there was pressure to maximize core potential.

### Artefact Type

Description: Artefact type is a formal (e.g. less strictly technological), nominal category, similar to artefact class. Artefact types expected to be located include bondi points, microliths, scrapers, and adzes.

Problems: Ambiguity is an inherent feature of artefact typology, with the lines between different types frequently imprecise. Working definitions for each class used will be specified in the text of the analysis.

Use: Despite the problem discussed above, typology proceeds on the basis that at different places and at different times people manufactured artefacts with specific shapes and characteristics. As a result, the general period during which an artefact was made can be inferred if it is of a specific form. It is also not uncommon to infer that a given artefact form implies a given artefact function, and that from the shape of the artefact the activities taking place at the site can be specified, though these suggestions so far lack archaeological support. The problems with both of these uses are well documented, and any such inferences drawn here will be sparing. There is, however, some potential benefit in approaches based on subsistence patterns and the organization of technology. On this basis, it may be possible to make some assertions from artefact typology as to the way subsistence may have been organized at different places through the landscape.

### Artefact Breakage

Description: At a basic level, flakes break in six different ways. Three are transverse (at 90° to the direction of percussion) – proximal, medial, distal; two are longitudinal (along the plane of percussion) – left, right (oriented from the ventral view); and one ambiguous – marginal (where dorsal and ventral can be clearly distinguished, but the margin from which the piece has detached is uncertain). All such breaks will be recorded.

Problems: It is occasionally difficult to be certain of the breakage on an artefact. In most cases, however, the kind of breakage can be ascertained.

Use: It is important to differentiate broken from complete flakes for the purposes of analysis, as the two are not comparable in regard to a number of measures. The amount of artefact breakage in an assemblage also indicates the degree of fragmentation to which the assemblage has been subject. In highly fragmented assemblages, the actual number of artefacts represented may be significantly exaggerated. Quantifying breakage allows a more accurate approximation of artefact numbers to be made.

### Heat Affect

Description: Heat will affect artefacts in different ways, depending on the way it has occurred. Most heat affected flakes on fine-grained material will reveal a greasy surface lustre on newly flaked surfaces and some discoloration. However as heat becomes excessive signs such as potlidding (the 'popping' of small plate-like pieces off the flake) or crazing (multiple fracture lines in multiple directions across the face of the flake) will occur. The presence of any of these features will be recorded.

Problems: This is a relatively unambiguous descriptive attribute for fine-grained materials – its application to coarse-grained materials (such as those generally expected in the project area) is perhaps less certain.

Use: Trends in the spatial distribution of heat-affected artefacts may be used to indicate either heat-treatment (the controlled application of heat to improve flaking qualities) or post-depositional burning (uncontrolled heating through bush-fires or stump burning) depending on the signs of heating and associated archaeological features (e.g. hearths).

### Platform Size – Width and Thickness

Description: The platform is the surface into which force is applied in the formation of a flake. Platform width is measured across the platform in the same direction as flake width, while platform thickness follows flake thickness

Problems: Some ambiguity exists on 'where to stop measuring' platform width and thickness, particularly on primary cortical flakes on rounded cobbles (the first flakes removed from a natural cobble), and platform surfaces comprised of multiple flake scars. Despite this the measure appears to work quite well for the majority of flakes.

Use: Platform size is expected to decrease under two circumstances. The first is when flakes are produced from small cores. The second is somewhat more speculative and based on the premise of a correlation between very small (focalized) platforms and the production of parallel-sided flakes (blades) associated with backed artefact manufacture.

Differences in platform size averages within and between sites will be examined to test these correlations and to infer what these mean in terms of human behaviour patterns e.g. curation of stone, expedient use of stone.

### Platform Surface

Description: Platform surface will be recorded as one of the following: cortical, single flake scar, multiple flake scars, or facetted.

Problems: This is a largely unambiguous descriptive attribute.

Use: The surface of a platform provides information about the history of the core prior to the detachment of the flake, and also about methods employed to control the flaking process. Patterns in the spatial distribution of these attributes may be used to infer differences in reduction strategies.

### Overhang Removal

Description: Frequently prior to the detachment of a flake from a core, the thin overhanging 'lip' of the core was removed in order to stop 'crushing' or force dissipation at the point of force application. This process is known as overhang removal.

Problems: This is a largely unambiguous descriptive attribute.

Use: Overhang removal is often seen as a form of raw material conservation. If a knapper desires to remove thin flakes from the face of the core by striking close to its edge, overhang removal may avoid the platform crushing and the resultant flake ending in a step termination which must be removed from the face of the core before flake production can continue. Thus, raw materials within assemblages, that have high relative proportions of overhang removal, or total assemblages that have high relative proportions of overhang removal, will be used to indicate raw material conservation, which can then be interpreted in relation to human resource use patterns/preferences.

### Dorsal Scar Count

Description: The dorsal face of a flake provides a partial record of previous flaking episodes to have occurred down the core face at or near the same point. The number of flake scars on the dorsal surface of a flake which can be oriented relative to their direction of percussion and which are clearly discernable will be recorded.

Problems: There is some ambiguity in this measure, hence the use of the term 'clearly discernable' above. Furthermore, by the nature of the flaking process, each subsequent scar will remove traces of the previous scars, resulting in an incomplete record. For these reasons, this measure needs to be treated with some caution.

Use: Dorsal scar count is a rough indication of how much flaking has occurred prior to the detachment of the flake in question. It also provides a maximum against which to form ratios of 'aberrant to non-aberrantly terminating scars', 'parallel to non-parallel scars' and 'number of scars per rotation' (see next three attributes), all of which may assist in clarifying the reduction process and assist in understanding differences in the Aboriginal use of raw materials and sites.

### Number of Aberrantly Terminating Dorsal Scars

Description: Aberrant terminations are further discussed below under **Terminations**. For the purposes of this description it is sufficient to say that flake scars terminating as steps and hinges will be recorded as aberrant in this assessment.

Problems: The problem(s) with this count are the same as those for the previous.

Use: As cores become smaller and more heavily reduced, the inertia threshold will fall and platform angle will increase, resulting in an increase in the number of aberrant terminations as a percentage of the number of flakes removed. Flakes which have a high number of aberrantly terminating flake scars as a percentage of the total are expected to have been produced towards the exhaustion threshold of the core. This measure will be used to indicate pressure on raw material availability and provisioning strategies.

### Number of Parallel Flake Scars

Description: A basic count of the number of parallel flake scars.

Problems: As previous.

Use: Examining the ratio of parallel to non-parallel scars on the dorsal surface of flakes may help to clarify the prevalence of 'blade' production in the reduction systems at different places. It may also be possible from examining this ratio in relation to flake size to test whether blade production occurred at a specific stage in the reduction sequence, or whether it was present throughout the complete reduction sequence.

### Presence of Parallel Arrises

Description: Arrises or dorsal ridges are a way of controlling artefact morphology. Flakes struck down an existing ridge will tend to follow the direction that the ridge takes. This attribute will involve noting the presence or absence of dorsal ridges that run parallel to the length of the flake.

Problems: Unlike the previous measures, this attribute is largely unambiguous.

Use: Like faceting, the presence of parallel arrises is associated with more controlled flaking methods such as blade production. The relationship between flake size and the presence of parallel arrises may provide similar information to the previous attribute (while at a lower resolution, being presence/absence based, this attribute is less ambiguous than number of parallel scars), as well as helping clarify the spatial distribution of different reduction strategies.

### Dorsal Scar Rotation Count

Description: As a core is reduced it may be turned or rotated to provide new platforms or overcome problems with increasing platform angles. As a result, flakes may be detached which cut across old

flake scars. The result should be apparent as dorsal scars in different direction to the direction of percussion of the flake being recorded.

Problems: The problem with this measure is the same as that for dorsal scar counts in general.

Use: Core rotation is increasingly likely towards the exhaustion threshold of cores, when platform angles increasingly approach or exceed 90° (it becomes very difficult to remove flakes from platforms with angles exceeding 90°). If it is possible to show a correlation between flake size and number of dorsal scar rotations then it will become possible infer from differences in the spatial distribution of this data that core exhaustion was more frequently approached in some areas than in others. If it is not possible to show this correlation, then it may be taken to suggest that core rotation was part of the reduction strategy throughout the reduction continuum.

### Termination

Description: Termination refers to the way in which force leaves a core during the detachment of a flake. Every complete flake has a termination. There are patterns in the form which terminations will take, with the four major categories (those to be used here) being: feather, hinge, step, and outrepasse (or plunging).

Problems: This is a largely unambiguous descriptive attribute. The only point at which uncertainty does enter is in differentiating some transversely snapped flakes from step terminated flakes. In the majority of cases, however, this problem does not arise.

Use: Different terminations have different implications both for flake and core morphology. A flake with a feather termination (in which force exits the core at a low or gradual angle) will have a continuous sharp edge around the periphery beneath the platform. This has advantages in terms of the amount of the flake edge which can be used for cutting, and also makes the flake far more amenable to subsequent retouching or resharpening activities. Detaching flakes with feather terminations also has minimal impact on the effective platform angle of the core, and so platform angle thresholds are reached relatively slowly while feather terminating flakes continue to be produced.

Hinge and step terminating flakes have none of these advantages. They result in edges which are amenable neither to cutting nor to retouching. Furthermore, hinge and step terminations lead to rapidly increasing effective platform angles, leading to a requirement for core rejuvenation and core exhaustion. For these reasons, such terminations are considered undesirable or *aberrant*. The number of aberrant flake terminations is expected to increase towards the end of a core's uselife, as reduction in core size and increase in core platform angle make it increasingly difficult to detach feather terminating flakes. In areas where aberrantly terminating flakes are relatively common it may be inferred that core potential was more thoroughly exploited. From this it may in turn be inferred that the pressure to realize core potential (e.g. a strategy of heavy raw material conservation) was greater. Increased mobility/emphasis on portability is one possible explanation of such a pattern.

Outrepasse flakes have the opposite effect on core morphology to step and hinge flakes, in that they remove the entire core face and part of the core bottom. As a result, such flakes may be used to rejuvenate cores in which core angles have become high but which still retain useable potential (e.g. are still quite large). The presence of outrepasse flakes may be taken to indicate core rejuvenation and the requirement to increase core use-life.

### Retouch

Description: Retouch is the term given to alterations made to a flake by the striking of subsequent flakes from its surface. Retouching may be done either to alter artefact form or to rejuvenate (resharpen) dulled edges, and possibly both. Degree/amount of will be recorded as presence/absence.

Problems: This is a largely unambiguous descriptive attribute. The only area in which difficulty may arise is in instances where edge damage cannot be differentiated from retouch. This occurs infrequently, as edge damage is usually a modern alteration to artefact form which can be noted through differences in surface colour between the flake scar and the rest of the artefact surface.

Use: The two main uses of retouch need to be separated for the purposes of this discussion. Retouch to achieve form (for example, artefact backing) is distinct from retouch for the purposes of edge rejuvenation. 'Formally retouched' artefacts are anticipated to occur at places of manufacture and places of discard. Importantly, such artefacts will be manufactured prior to use as part of a gearing up or preparation for activities such as hunting. The presence of concentrations of such artefacts, including incomplete specimens may indicate the base-camp locations from which mobile subsistence activities were conducted. Such artefacts are also expected to be present among very small assemblages at distances from occupational foci, as the result of discard, loss, or breakage.

Edge rejuvenation retouch is expected to increase as the availability of replacement materials decreases. Such artefacts are expected to represent 'personal gear', an implement carried with a person and maintained for repeated use. Unlike formally retouched pieces, artefacts with edge rejuvenation will not be produced *in preparation for* activities. The sharpest and most useful edge is a fresh edge. Rather, rejuvenation will occur as need arises. The presence of such artefacts at occupational foci is likely to represent discard following use and prior to reprovisioning/retooling. The percentage of artefacts exhibiting retouch is expected to increase in systems where large amounts of replacement raw material are not available.

It needs to be noted that a third type of retouch also occurs, aimed at neither formalisation of shape or edge rejuvenation. This is when a flake (usually a large to very large flake) has been used for the subsequent production of utilitarian flakes (e.g. when it has been used as a core). This strategy is quite prevalent in the Hunter Valley. Differentiating such artefacts from other retouched artefacts is empirically difficult, however, is intuitively quite easy. Any such intuitive judgements can, however, be tested during the analysis phase, as such flakes are expected to be quite distinct from other retouched artefacts in size and weight.

### Retouch Type

Description: Retouch type is a technological attribute relating the way in which retouch was carried out. Categories to be used are steep, acute, unifacial, bifacial, tranchet and/or used as core.

Problems: This is a largely unambiguous descriptive attribute.

Use: Whether retouch results in a steep or acute edge is important in relation to the possible functions of those edges. Acute retouch results in sharp edges suitable for cutting whilst steep retouch can be used to totally remove a sharp edge (to blunt as in backed artefacts) or to produce thick strong edges suitable for adzing or scraping. Thus, artefact function can be suggested by recording this attribute (residue and use-wear analysis is also planned to substantiate these interpretations). The recording of the technique used for retouch addresses questions related to techniques of implement manufacture and thus another form of human behaviour that can be analysed within and between assemblages.

### Retouch Location

Description: Each flake will be divided into eight segments: proximal end, proximal left, proximal right, marginal left, marginal right, distal left, distal right, and distal end; with the presence or absence of retouch in each to be recorded.

Problems: Apportioning sections relies on a visual division of the flake, which may be slightly inaccurate. This is not expected to be a significant effect.

Use: An examination of retouch location may reveal trends in distance decay (eg. increasing number of margins retouched over distance, or may simply reveal non-random patterns in the way retouching was carried out. If the former, then the trend may be used to suggest trajectories along which flakes were being carried as personal gear. In the case of the latter, the information would provide an insight into the manufacturing/reduction systems being employed.

## 6.4 Attributes to be recorded on Cores

The following attributes are to be recorded on cores. Most information taken from cores concerns the way in which they were reduced – what pressures, controls and systems were applied.

### Percentage of Surface Flaked

Description: This attribute involves an estimate of the percentage of the outer surface of the core which has had flake scars removed from it.

Problems: This is a visual estimate and liable to prove reasonably inaccurate and coarse. Nevertheless, it remains useful.

Use: This measure can be useful in assessing degree of core reduction. In particular, it can be useful in locating areas of heavy core reduction, particularly when used in concert with the following two measures.

### Number of Flake Scars

Description: This measure mirrors **dorsal scar count** from the previous section. All scars over the length of 10 mm will be measured (there are usually large numbers of flake scars between 10-3 mm, which relate more to platform preparation than flake production.

Problems: Most of the problems with this measure arise from fact that subsequent scars remove traces of former scars, leaving an incomplete record of the past. As a result, this measure will always underestimate the number of flakes removed from the core.

Use: Dorsal scar count provides an estimate of the amount of reduction to which a core has been subject. Used in concert with measures such as **number of rotations** and **percentage of surface flaked**, it may be help to locate differences in the degree of core reduction at different locations.

### Number of Rotations

Description: This measure mirrors **dorsal scar rotation count** as discussed above.

Problems: This measure has the same problems as **number of flake scars**.

Use: Different reduction systems use core rotation in different ways. In some systems, cores are rotated only once, after the striking of the initial flake to form a platform. All subsequent scars are removed in one direction from that platform. Other systems will involve repeated rotations between two platforms, or may involve continuous core rotation and numerous platforms. It may be the case that through the use-life of a core a number of different strategies will be used.

Assessing core rotation may help to clarify reduction systems, and the stage in the reduction system at which the individual core was discarded. This can be used to indicate differences in use of raw materials both within assemblages and between assemblages.

### Number of Aberrantly Terminating Scars

Description: Flake scars terminating as steps and hinges will be recorded as aberrant in this assessment.

Problems: There should be no problems with this simple count.

Use: As cores become smaller and more heavily reduced, the inertia threshold will fall and platform angle will increase, resulting in an increase in the number of aberrant terminations as a percentage of the number of flakes removed. Flakes which have a high number of aberrantly terminating flake scars as a percentage of the total are expected to have been produced towards the exhaustion threshold of the core. This measure will be used to indicate pressure on raw material availability and provisioning strategies.

### Number of Parallel Flake Scars

Description: A basic count of the number of parallel flake scars.

Problems: There should be no problems with this simple count.

Use: Examining the ratio of parallel to non-parallel scars on cores may help to clarify the prevalence of 'blade' production in the reduction systems at different places. It may also be possible from examining this ratio in relation to flake size to test whether blade production occurred at a specific stage in the reduction sequence, or whether it was present throughout the complete reduction sequence.

## 6.5 Comments

Description: a column will be supplied in the data base for recording comments. This may include comments on attributes such as artefact colour, granularity, presence and nature of inclusions, or other comments that do not fit snugly inside one of the attribute classes.

Problems: No problems are expected.

Use: Descriptions of artefacts can sometimes be useful for assisting in locating conjoins.

## 7. Care and Control of Artefactual Material

Based on previous work in the area it is proposed that the artefacts be housed at the CHDLALC offices in a display cabinet and be used for teaching and training purposes.

# 8. Reporting

Once the salvage work and artefact analysis is completed the DEC, the CHDLALC and the GJE are to be furnished with a report. This report will comply with *NPWS Standards and Guidelines for Archaeological Report Writing 1997*. Any further consultation with the Aboriginal stakeholders will proceeded in accordance with the Department of Environment and Conservation's *Interim Community Consultation Requirements for Applicants 2004.*

# APPENDIX 2

# Advertisement for Stakeholders in Project Area

# Hillview Heights Estate

## Aboriginal Archaeological and Cultural Heritage Study

## Notification and Registration of interest in Consultation

Hillview Heights Estate (HHE) has been commissioned to conduct an assessment of a property in Moonee Beach, within the Coffs Harbour Local Government Area. HHE seeks the registration of interested Aboriginal groups or individuals to participate in a consultation program as part of Aboriginal cultural heritage and archaeology assessment and management studies.

The Aboriginal community is invited to register interest through Sarah Paddington, Senior Archaeologist, Umwelt. **Registration must be received by 5pm, on Tuesday, 9 August 2005**, by tel: 02 4950 5322, fax 02 4950 5737, email: spaddington@umwelt.com.au or post: PO Box 838, Toronto NSW 2283.

# APPENDIX 3

# Written Responses from the Aboriginal Community

# Coffs Harbour & District Local Aboriginal Land Council

Cnr Pacific Highway & Arthur Street, Coffs Harbour 2450
PO Box 6150, Coffs Harbour Plaza NSW 2450
Phone: (02) 6652 8740 Fax: (02) 6652 5923


27th November 2006

Attention: Jillian Ford

Umwelt (Australia) Pty Ltd
PO Box 838
Toronto NSW 2283

4 DEC 2006

Re: Draft Report of Aboriginal and Archaeological Survey and Assessment
Lot 66 DP 551005, Moonee Beach.

Dear Jillian,

Thank you for providing a draft copy of your report for comment from the Coffs Harbour and District Local Aboriginal Land Council and the Gumbula Julipi Elders.

Further to our conversation of 24th November 2006, I have received your advice notifying of the amendments that I advised during our discussion.

After reviewing the amendments in the report recommendations it has been established that this report contains the views expressed by the Coffs Harbour and District Local Aboriginal Land Council and the Gumbula Julipi Elders during our field visit.

The methodology that has been outlined for the PAD contained within site 22-1-098 and PAD 2 is satisfactory for the subsurface investigation. Please note that this subsurface investigation will need to take place before any future ground disturbance activities.

Coffs Harbour and District Local Aboriginal Land Council and the Gumbula Julipi Elders holds no constraints for this development proceeding. Provided, all recommendations are strictly adhered to and that the opportunity for further advice from both Land Council and the Elders be recognised for the duration of this development, as this area of the coastline is extremely significant to both the local Aboriginal community and the community of the Gumbaingirr Nation.

If you have any questions in relation to this matter, please do not hesitate to call the undersigned on the number above.

Yours truly,

Chris Spencer
Coordinator


e-mail: coffs.harbour.lalc@bigpond.com

# APPENDIX 4

# National Native Title Tribunal Result

NATIONAL NATIVE TITLE TRIBUNAL

Level 25
25 Bligh Street
SYDNEY NSW 2000
AUSTRALIA

GPO Box 9973, SYDNEY NSW 2001
Telephone: (02) 9235 6300
Facsimile: (02) 9233 5613
Website: www.nntt.gov.au

Our Ref: 237/05DD
Your Ref: Coffs Harbour

Sarah Paddington
Umwelt (Australia) Pty Ltd
2/20 The Boulevard
Toronto NSW

Dear Sarah

**Native title search results of Coffs Harbour LGA**

Thank you for your fax of 3 February 2005

My search on found:

| Register Type | NNTT Reference Numbers (if any found) |
|---|---|
| National Native Title Register | 0 |
| Register of Native Title Claims | 0 |
| Unregistered Claimant applications | 0 |
| Register of Indigenous Land Use Agreements | 0 |

Please note, recent applications lodged or amended in the Federal Court may not have been sent to us.

We will send you an invoice for $21.45

If you need more information please call me on (02) 9235 6300.

Yours sincerely

*Dianne Drake*