

**DRAFT**  
**Proposed Test Bore Sites Related to a Proposed Dunal Exfiltration Scheme at**  
**Merimbula, NSW**  
**Aboriginal Archaeological Assessment**

A Report to  
nghenvironmental  
PO Box 470  
Bega NSW 2550

June 2009



*Julie Diben*  
*New South Wales Archaeology Pty Limited*  
*PO Box 2135 Central Tilba NSW 2546 Ph/fax 02 44737947 mob. 0427074901*  
[julie@nswarchaeology.com.au](mailto:julie@nswarchaeology.com.au)

# TABLE OF CONTENTS

<b>1. SUMMARY</b> .....	<b>1</b>
1.1 INTRODUCTION .....	1
1.2 PROPOSED IMPACTS .....	1
1.3 THE ARCHAEOLOGICAL STUDY .....	1
1.4 PREVIOUSLY RECORDED SITES .....	1
1.5 RESULTS .....	1
1.6 STATUTORY CONTEXT .....	2
1.7 CONCLUSIONS.....	2
1.8 RECOMMENDATIONS.....	2
<b>2. INTRODUCTION</b> .....	<b>4</b>
<b>3. PARTNERSHIP WITH THE ABORIGINAL COMMUNITY</b> .....	<b>4</b>
<b>4. PROPOSED IMPACTS</b> .....	<b>5</b>
4.1 PROPOSED IMPACTS .....	5
4.2 PRIOR IMPACTS .....	6
<b>5. STUDY METHODOLOGY</b> .....	<b>10</b>
5.1 LITERATURE REVIEW.....	10
5.2 FIELD SURVEY AND METHODOLOGY .....	10
<b>6. LANDSCAPE CONTEXT</b> .....	<b>12</b>
6.1 TOPOGRAPHY, GEOLOGY AND GEOMORPHOLOGY .....	12
<b>7. ARCHAEOLOGICAL CONTEXT</b> .....	<b>14</b>
7.1 SOCIAL GEOGRAPHY AND OCCUPATION MODELS .....	14
7.2 PREVIOUSLY RECORDED SITES .....	15
7.3 ARCHAEOLOGY - THE LOCAL REGION .....	15
7.4 ARCHAEOLOGY - THE MERIMBULA AREA .....	16
7.5 ARCHAEOLOGICAL POTENTIAL OF THE STUDY AREA .....	19
<b>8. SURVEY RESULTS</b> .....	<b>22</b>
8.1 RESULTS .....	22
<b>9. STATUTORY INFORMATION</b> .....	<b>27</b>
<b>10. MITIGATION AND MANAGEMENT STRATEGIES</b> .....	<b>28</b>
10.1 MANAGEMENT AND MITIGATION STRATEGIES .....	28
<b>11. CONCLUSIONS AND RECOMMENDATIONS</b> .....	<b>30</b>
<b>12. REFERENCES</b> .....	<b>31</b>
<b>APPENDIX 1. CORRESPONDENCE FROM EDEN LALC</b>	

## **1. SUMMARY**

### 1.1 Introduction

New South Wales Archaeology Pty Ltd was commissioned in May 2009 by ngenvironmental, on behalf of Bega Valley Shire Council, to undertake an Aboriginal archaeological assessment of test bores sites associated with the proposed dune exfiltration project at Merimbula on the Far South Coast of NSW.

The study area is situated opposite the Merimbula Airport in the dunes that form the Merimbula Bay Barrier. This area is currently part of reserve/vacant land to the north of Boyd National Park.

### 1.2 Proposed impacts

The proposal entails the drilling of bores, test pumping and water sampling at two different locations (Northern and Central Areas) in the dune complex.

Proposed impacts include the following:

- Access to drilling locations along existing tracks by vehicles comparable in size to a standard 4WD ute;
- Temporary flattening of minor shrubs at the drill locations; and
- Drilling of bores at a maximum diameter of 300mm to a maximum depth of 20m.

The proposed impact areas are small and discrete in nature, however the potential exists to disturb or destroy Aboriginal objects that might be present in or immediately adjacent the drilling locations.

### 1.3 The Archaeological Study

An archaeological investigation of the proposed impact areas has been conducted by Julie Dibden, NSW Archaeology Pty Ltd and Lawrence Bamblett and Terry Scott, Eden Local Aboriginal Land Council.

Field work was undertaken June 2009. The proposed impact areas were subject to a comprehensive visual inspection and assessment of archaeological sensitivity.

The New South Wales National Parks and Wildlife Service (now incorporated in the Department of Environment and Climate Change) has prepared a draft document that provides a series of guidelines regarding the assessment and management of Aboriginal cultural heritage in New South Wales. This report has been prepared in accordance with these draft guidelines (NSW NPWS 1997).

### 1.4 Previously Recorded Sites

A search of the New South Wales Department of Environment and Climate Change (NSW DECC) Aboriginal Heritage Information Management System (AHIMS) has indicated that there are no previously recorded Aboriginal objects located within the proposed impact areas (AHIMS search #25785). Five previously recorded sites are located in adjacent areas of the dune system of the Merimbula Bay Barrier; these sites will not be impacted as a result of the proposal.

### 1.5 Results

No Aboriginal objects were recorded in the proposed impact areas during the field inspection. Based on a review of previous investigations conducted within the landform and in close proximity to the proposed impact areas the following predictions are made in respect of the potential for subsurface archaeological materials to be present:

- The potential for Aboriginal objects in the form of stone artefacts to be present in a test bore locations is considered to be low. If present at all, stone artefacts will be distributed in very low density only;
- The potential for Aboriginal objects in the form of shell midden to be present in the test bore locations is considered to be low.
- The potential for Aboriginal skeletal material and burial contexts to be present in the Merimbula Bay Barrier landform is high. Aboriginal skeletal material has been found previously within the landform

and this is consistent with burial site locational patterning elsewhere along the south coast. However the exact location of burials cannot be predicted in respect of the proposed test bore sites.

## 1.6 Statutory Context

Sections 84 and 90 of the *National Parks and Wildlife Act 1974* (as amended) provide statutory protection for any physical/material evidence of Aboriginal occupation of NSW and places of cultural significance to the Aboriginal community.

The implementation of the Aboriginal heritage provisions of the Act is the responsibility of the NSW Department of Environment and Climate Change (DECC). It is an offence to *knowingly* disturb an Aboriginal object, irrespective of its nature or significance, without the prior written consent of the Director-General of the NSW Department of Environment and Climate Change.

The Act defines an Aboriginal 'object' as

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

Given that no Aboriginal objects have been recorded and that the potential for subsurface archaeological material in the form of stone artefacts and shell to be present in the study area is assessed to be low, there are no statutory constraints identified to be relevant to the proposed test bores.

## 1.7 Conclusions

There are no archaeological constraints identified to attach to the proposed test bores. However given the potential for Aboriginal skeletal material and burial contexts to be present within the dune system (and possibly within the test bore locations) appropriate management and mitigation strategies are required to be implemented in regard to the proposal. An appropriate management and mitigation strategy would ensure that if present, human skeletal material is identified without causing significant damage to the either the material (skeleton) or burial context (burial pit).

## 1.8 Recommendations

Two possible management and mitigation strategies relating to the potential for burials to be present in the test bore sites are outlined below for consideration of all stakeholders (it is noted that a program of GPR [ground penetrating radar] is not included here based on a consideration of its potential limitations in identifying burials in disturbed contexts):

### 1. *Subsurface test excavation*

A program of subsurface test excavation would entail obtaining an AHIP (Aboriginal Heritage Impact Permit) under the National Parks and Wildlife Act 1974 and subsequently conducting subsurface test excavation in order to determine whether or not Aboriginal skeletal material is present within the Test Bore locations.

### 2. *Monitoring*

A program of monitoring would entail making observations of the spoil from the top 2 metres of each of the test bores to determine whether or not Aboriginal skeletal material is present.

Both options are discussed further in Section 10.

## *Acknowledgments*

Gratitude is extended to the following people for their assistance in this project:  
Lawrence Bamblett and Terry Scott, Eden Local Aboriginal Land Council  
Ken McLeod, Bega Valley Shire Council  
Ian Grey, Ian Grey Groundwater Consulting Pty Ltd



Figure 1. Location of the study areas (Bega 1:100,000 1<sup>st</sup> ed. topographic map).

## 2. INTRODUCTION

NSW Archaeology Pty Ltd has been engaged by ngenvironmental to undertake an Aboriginal archaeological assessment of two areas within the dunes behind Merimbula Beach where test bores are proposed. The proposal areas are situated to the east of Merimbula Lake, in an area of reserve/vacant to the north of Boyd National Park; they are situated on the dune system of the Merimbula Bay Barrier (Figure 1).

In accordance with the NSW NPWS guidelines for archaeological reporting this report aims to document:

- the proposed impacts;
- the involvement in the project of the Aboriginal community;
- the environmental setting of the study area in order to establish background parameters;
- a review of archaeological and relevant literature, heritage listings on the DECC Aboriginal Heritage Information Management System and other relevant registers;
- a synthesis of local and regional archaeology;
- a predictive model of site location for the study area;
- the field survey strategy and results;
- recommendations based on the results of the investigation.

Julie Dibden, NSW Archaeology Pty Ltd and Lawrence Bamblett and Terry Scott, Eden Local Aboriginal Land Council, have conducted the field assessment. This report has been written by Julie Dibden.

## 3. PARTNERSHIP WITH THE ABORIGINAL COMMUNITY

The study area falls within the boundaries of the Eden Local Aboriginal Land Council (ELALC) as defined under the *Aboriginal Land Rights Act 1983* (NSW). Lawrence Bamblett and Terry Scott, representing ELALC, assisted in the field survey and the formulation of management and mitigation strategies.

A draft copy of this report will be provided to ELALC for review and comment.

#### **4. PROPOSED IMPACTS**

The information contained in this section of the report is provided in accordance with the NSW NPWS (1997) guidelines for archaeological survey reporting. A full description of the proposal and its potential impact on the landscape and heritage resource is described below. This information includes a summary of the impact history of the study area.

##### **4.1 Proposed impacts**

The proposed works entails the drilling of bores, test pumping and water sampling at two locations (Northern and Central Areas) in the dune complex of the Merimbula Bay Barrier. Plans of the approximate locations of the proposed bores (1 test production bore and 6 monitoring bores) and are provided in Figures 2, and 3. An existing monitoring bore (PPK1) is present in the Central Area (Plate 1).



Plate 1. An existing monitoring bore site in the Central Area; note minimal surface disturbance.

The test production bore will be drilled using a mud rotary technique, while the 12 monitoring bores will be drilled using a hollow flight auger technique. The test production bore will be installed with a screen and casing of 100mm diameter; the monitoring bores will have a screen and casing of 50mm. The maximum width of boring will be 300mm. The bores will be drilled through the entire thickness of the aquifer/upper sand unit, or to a maximum depth of 20 metres. All bores will be completed with gravel packs, bentonite seals and lockable surface monuments cemented in place. It is noted that spoil from the bores is minimal and will be either spread on the ground directly at the site or removed entirely if required.

The drilling rig itself is mounted on a small track-mounted vehicle (Geoprobe). It is a low impact and highly manoeuvrable rig and hence is well suited to working in sensitive and difficult locations. A working area of up to 3m x 5m will be needed at each bore location, although it is noted that this area can be reduced if need be in sensitive locations. All of the proposed drilling locations are located immediately adjacent existing tracks, which will be utilised for part of the working area.

Due to the nature of the rig to be employed it is considered unlikely that any clearing of vegetation will be required other than temporary flattening of minor scrub.

Specific impacts associated with the drilling of the bores and the subsequent testing include:

- Access to drilling locations along existing tracks by vehicles comparable in size to a standard 4WD ute;
- Temporary flattening of minor shrubs at the drill locations; and
- Drilling of 50mm and 100mm bores to a depth of up to 20m.

Essentially the proposed impacts are very small and discrete in nature. Nevertheless, these impacts have the potential to disturb or destroy Aboriginal objects that might be present in or immediately adjacent the drilling locations.

#### 4.2 Prior impacts

The proposal area has been subject to a range of previous impacts that are likely to have caused some disturbance to any Aboriginal objects that may be present.

A series of vehicular and pedestrian tracks extend throughout the dune complex and some of these will be utilised for site access during the test bore construction activity. In some instances these tracks are incised through the sand to a depth of c. 0.6 m causing localized impact (Plate 2). Evidence of previous and now abandoned tracks is also present in the immediate vicinity of many of the sites in question.



Plate 2. Track incision in dune at c. 5 m south of the Central Area Test Bore 1

A transmission line extends the length and western side of the landform (Plate 3). The line is located within a c. 50 m wide cleared easement which contains numerous vehicle tracks; disturbance in the area is high. At the Northern Area two test bores are proposed to be located at the margins of this clearing.





Plate 3. Transmission line easement looking south towards the Northern Area Site 1 (to left).

The Northern area appears to have been significantly impacted previously; the ridge and swale system is ill defined in this area (it is generally flat) which suggests that it has been subject to previous mechanical clearance and modification. Given its proximity and relationship to the southern edge of the existing urban area of Merimbula it is probable that the area was subject to clearance at the time of that original subdivision. By contrast the ridge and swale system at the Central Area is well defined and appears largely undisturbed.



Figure 2. Plans of the approximate location of proposed test bore sites - Northern Area (supplied by client)



Figure 3. Plans of the existing and approximate location of proposed test bore sites - Central Area (supplied by client)

## **5. STUDY METHODOLOGY**

This archaeological assessment has included the following components:

- A NSW DECC Aboriginal Heritage Information Management System site search to determine whether or not previously recorded Aboriginal objects are present at the proposal area and to list the type and range of sites known to be present within the local area.
- A review of local and regional archaeological reports and other relevant documents in order to provide a contextual framework to the study and heritage management context.
- A review of Aboriginal history of the proposed impact area.
- A review of geomorphology, landscape and landforms present.
- A review of resources the area would have provided to Aboriginal people.
- A comprehensive field survey of the proposal areas aimed at recording Aboriginal objects, areas of archaeological sensitivity and other areas of cultural value.
- Documentation of survey results.
- An analysis of survey results.
- The formulation of a set of management recommendations ensuing from the above.

### **5.1 Literature Review**

Background research has been conducted to determine if known Aboriginal sites are located in the vicinity of the proposal area and to facilitate site prediction on the basis of known regional and local site patterns in order to place the study area within an archaeological research and heritage management context.

The following information sources were accessed for this study:

- NSW DECC Aboriginal Heritage Information Management System
- Previous archaeological studies conducted within the proposal area
- Relevant archaeological reports held in the NSW DECC Cultural Heritage Unit
- Pambula 1:25,000 topographic map

### **5.2 Field Survey and Methodology**

A comprehensive field survey was carried out in June 2009. The field survey was undertaken in consultation with a representative of Bega Valley Shire Council and Ian Grey (Ian Grey Groundwater Consultancy) in order to be clear in regard to the location of proposed impacts and the manner in which the work would be undertaken. Additionally this consultation provided the opportunity for the proponent to become aware of the archaeological issues and relevant options for the management and mitigation of impacts.

The field survey was aimed at locating archaeological material situated on or in land surfaces. An assessment was also made of prior land disturbance, survey coverage variables (ground exposure and archaeological visibility) and the potential archaeological sensitivity of the land. All trees assessed to be of sufficient age as to bear evidence of Aboriginal scarring were examined.



Figure 4. The location of the study areas within an environmental context (Pambula 8824-2S 2<sup>nd</sup> ed. 1:25,000 GDA topographic map).

## 6. LANDSCAPE CONTEXT

A consideration of the landscape is necessary in archaeological work in order to characterise and predict the nature of Aboriginal occupation across the land (NPWS 1997). In Aboriginal society landscape could be both the embodiment of Ancestral Beings and the basis of a social geography and economic and technological endeavour. The various features and elements of the landscape are/were physical places that are known and understood within the context of social and cultural practice.

Given that the natural resources that Aboriginal people harvested and utilised were not evenly distributed across landscapes Aboriginal occupation and the archaeological manifestations of that occupation will not be uniform across space. Therefore, the examination of the environmental context of a study area is valuable for predicting the type and nature of archaeological sites that might be expected to occur. Factors which typically inform the archaeological potential of a place include the presence or absence of water, animal and plant foods, stone and other resources and as well, the nature of the terrain.

Additionally, geomorphological and humanly activated processes need to be defined as these will influence the degree to which archaeological sites may be visible and/or conserved. For example land that is heavily grassed will prevent the detection of archaeological material while land which has suffered disturbance may no longer retain artefacts or stratified deposits. A consideration of such factors is necessary in formulating site significance and mitigation and management recommendations.

The following sections provide information in regard to the landscape context of the study area.

### 6.1 Topography, geology and geomorphology.

The study area is located immediately to the south of the main township of Merimbula on the Far South Coast of New South Wales. The proposed test bore locations are situated on the Merimbula Bay Barrier between the lake and Merimbula Beach (Figure 4).

The underlying geology of the area is comprised of Quaternary coastal sand marine deposits (Bega- Mallacoota 1:250 000 Geological Series Sheet SJ/55-4 2<sup>nd</sup> Ed. 1995).

During the Pleistocene the area now occupied by the Merimbula township and its immediate environs were situated at some distance from the sea. For most of the period after 100,000 years before present (BP) sea levels were lower than current levels; between 25,000 BP and 15,000 BP sea levels were 110 m -130 m below current levels. During this time the valley which is now occupied by Merimbula Lake would have been an inland drainage depression.

With the rising of the sea levels during the early to mid Holocene at around 6000 BP inland drainage depressions were inundated by sea water. In the ensuing period a process of embayment and various processes of tidal and fluvial deposition created the landforms of Merimbula Lake.

Merimbula Beach is a large westward-facing arcuate beach barrier complex which extends over 6 km from Mitchies Beach, in the lee of Merimbula Point southwards to the Pambula Beach headland. The curvature, configuration and position of Merimbula Beach are determined by wave refraction and bathymetry generated by onshore wave trains from the Tasman Sea, between Merimbula Point and Mitchies Point. Dominant swells off Merimbula are from the southeast (Young and Bryant 1992). While 95% of wave energy reaches the surf zone across the narrow shelf, mean wave heights are only 1.2 m (Young and Bryant 1992: 201).

The Merimbula beach barrier complex is of Holocene age and is described as a beach barrier of stationary type (Thom 1978). The Merimbula beach barrier is relatively narrow (<300 m), has a wide back barrier flat, and, in comparison with extensive beach-ridge plains, is relatively high averaging 8-10 m above mean sea level (MSL).

Stratigraphically the barrier comprises a thin wedge of near-shore shelly sand overlain by leached well sorted quartzose sands (Thom 1978; Polach *et. al* 1979). The majority of the sand storage in the Merimbula barrier has accumulated in the mid to late Holocene; shelly sands (shell hash) underlying the barrier at 7 m below MSL on the seaward side have been dated to 5530+/- 85 yrs BP (ANU-1404) (Polach *et. al* 1979: 335). There was clearly a time lag between mean sea level approaching present (eg. at c. 6500 years BP), and morphological development of the barrier as a landform in its present form.

A two stage development model has been proposed for stationary beach barriers. First, the onset of the transgressive beach barrier facies by vertical accretion between 8000 and 7000 BP and washover creating a relatively deep back barrier sand infill facies, and secondly, after sea level reached its present position at about 6000 BP, the growth of foredunes and cessation of major back barrier washover (Polach *et. al* 1979:335). The barrier would have occupied its present position from 5000 BP.

The dune landform consists of a series of crests and swales oriented parallel to the beach. The vegetation varies across between the Northern and Central Areas. The Northern Area is comprised of Bangalay trees with a banksia understory; ground covers include bracken and lomandra. The Northern Area has been subject to recent fire impacts. The Central area is comprised of banksias with bracken, lomandra and sedge ground cover.

## 7. ARCHAEOLOGICAL CONTEXT

### 7.1 Social geography and occupation models

On the basis of archaeological research it is known that Aboriginal people have occupied Australia for at least 40,000 years and possibly as long as 60,000 years (Mulvaney and Kamminga 1999: 2). By 35,000 years before present (BP) all major environmental zones in Australia, including preglacial environments of Tasmania, were occupied (Mulvaney and Kamminga 1999:114).

At the time of early occupation Australia experienced moderate temperatures. However, between 25,000 and 12,000 years BP (the Last Glacial Maximum) dry and either intensely hot or cold temperatures prevailed over the continent (Mulvaney and Kamminga 1999: 114). At this time the mean monthly temperatures on land were 6-10°C lower; in southern Australia coldness, drought and winds acted to change the vegetation structure from forests to grass and shrublands (Mulvaney and Kamminga 1999: 115-116).

During the Last Glacial Maximum at about 24-22,000 years ago, sea levels fell to about 130 m below present levels and accordingly, the continent was correspondingly larger. With the cessation of glacial conditions, temperatures rose with a concomitant rise in sea levels. By ca. 6000 BP sea levels had more or less stabilised to their current position. With the changes in climate during the Holocene Aboriginal occupants had to deal not only with reduced landmass, but changing hydrological systems and vegetation; forests again inhabited the grass and shrublands of the Late Glacial Maximum. As Mulvaney and Kamminga (1999: 120) have remarked:

*When humans arrived on Sahul's shores and dispersed across the continent, they faced a continual series of environmental challenges that persisted throughout the Pleistocene. The adaptability and endurance in colonising Sahul is one of humankind's' inspiring epics.*

Occupation of the south coast dates from at least 20,000 years ago as evidenced by dated sites at Burrill Lake (Lampert 1971) and two sites near Buchan in Victoria; Cloggs Cave (Flood 1980) and New Guinea 2 (Ossa *et al* 1995). The Bulee Brook 2 site excavated by Boot (1994) in the hinterland ranges provides evidence that occupation of this zone had occurred by at least 18,000 years ago. The majority of dated sites on the Far South Coast are of mid to late Holocene in age.

The study area lies within the area defined by Tindale (1974) as that belonging to the Thaua people. The Thaua people are described as occupying land south from Wallagoot Lake to Green Cape (south of Eden) and inland to the escarpment of the Great Divide. Tindale (1974) notes that there were two groups of Thaua, the Katungal, or 'sea coast people' and the Baianbal or Paienbara, the inland 'tomahawk people'. Both 'tribes' belonged to the Yuin 'cultural area' whose groups shared cultural characteristics such as a common initiation ceremony and closely related languages. Eades (1976) describes the Dyirringan language as being spoken in the area between Wallaga Lake and Twofold Bay with the Thawa language spoken south of Twofold Bay.

Observations from the Bega/Eden region indicate that Aboriginal people relied heavily on coastal resources such as fish and shellfish and that camps were located on coastal dunes or in forests within close proximity to the coast (Sullivan 1982). Ethnohistorical records note that fishing methods utilised on Black Ada Lagoon near Tathra, involved a combined effort of people driving fish to one end of the lagoon where they could be easily speared (Smith 1970:5).

A number of historical sources refer to Aboriginal people exploiting beached sea mammals. Frazer (1892) noted that at Twofold Bay and along the South East Coast:

*"...a stranded whale is a god-send to the tribe. When the news spreads, they come down in multitudes to enjoy the feast and for many days they may be seen ....hurrying in and out of the body of the monster."*

Robinson noted that a dead porpoise near Twofold Bay was similarly eaten (cited in Sullivan 1982).

The study area is situated between three major resource zones, the estuary, coast (littoral zone) and its forested hinterland. Accordingly both marine and terrestrial species of mammals, birds, fish and reptiles were available for economic exploitation.



The European settlement of the far south coast caused significant changes to Aboriginal life. After the initial invasion and population decline Aboriginal people began to find employment within the new settler economy. In the early days of settlement they had continued access to many lands and maintained many cultural and social traditions (Chittick & Fox 1997:191). By 1882 Aborigines lived mostly in camps around the small town of Bega, until 1891 when the Aboriginal Protection Board established the Wallaga Lake Reserve, which became a virtual prison (Byrne 1984). In the 1940s and 1950s the Aboriginal people worked as seasonal labourers in the bean and pea fields and after World War 2 in the timber industry.

The following discussion in Sections 7.2 and 7.3 will present a review of previous archaeological work in the region for the purposes of producing a predictive model of site type and location for the study area.

## 7.2 Previously Recorded Sites

A search of the NSW DECC Aboriginal Heritage Management Information System was conducted on the 6<sup>th</sup> May 2009 (AHIMS search #25785). The search was undertaken for an area encompassed by Eastings: 757000-760000 and Northings: 5908000-5912000.

Five Aboriginal object locations are recorded on AHIMS as being present within the site search area including a burial site (#62-6-0173), two scarred trees (#62-6-0193 and #62-6-0475), an artefact scatter (#62-6-0133) and a midden (#62-6-0192). None of these sites are situated within the proposed impact areas, however they are all situated on the Merimbula Bay Barrier; two of the sites (#62-6-0192 and #62-6-0193) are located c. 200 - 300m to the south of the Northern Area. The remaining sites were recorded in and adjacent an abandoned sand quarry c. 1 km south of the Central Area. These sites are all described further below.

The AHIMS register only includes sites that have been reported to NSW NPWS. Generally, sites are only recorded during targeted surveys undertaken in either development or research contexts. Accordingly, this search cannot be considered to be an actual or exhaustive inventory of Aboriginal sites situated within the local area or indeed within the study area itself.

## 7.3 Archaeology - The Local Region

A large number of studies have been undertaken within both an academic and consultancy context on the Far South Coast of NSW.

Sullivan (1981; 1982) examined the middens of the south coast as the topic of her doctoral research. Sullivan recorded a number of middens at Pambula which were found to contain primarily estuarine species such as cockle, mud oyster, rock oyster, whelk and mussel with occasional rock platform species including abalone, warrener (*Cabestana splengleri*), nerite and *Austrochlolea*.

Test excavation was carried out by Sullivan (1982) in a mounded midden on the shores of Pambula Lake. The age of the base of the midden was determined by radiometric analysis to be about 3,000 years BP. The deposit was broadly divided into an upper, middle and lower midden. The upper midden was found to be composed mainly of edible mussel with a low proportion of hairy mussel which had accumulated between 1,200 years BP and the time of European contact. The middle midden contained mainly hairy mussel and mud oyster and had accumulated between 3,000 and 2,300 years BP. The lower midden was made up primarily of mud oyster and its accumulation was found to have commenced at 3,000 years BP (Sullivan 1982).

The excavated midden was found to contain fragmented bones of fish, bird, and land and sea mammals. The bones of small marsupials including wallaby, potoroo, possum and other medium sized animals were interpreted as indicating consistent exploitation throughout time while larger animals including sea mammals and kangaroos occurred sporadically indicating irregular exploitation. The bones from 12 different species of fish were found. Their differential distribution through the deposit allowed Sullivan to infer a diversification of fishing methods through time (Sullivan 1982).

Both bone and stone artefacts were recovered. Flaked stone artefacts were made from silcrete, quartz and acid volcanic. Silcrete and backed artefacts are present in the earliest (lower) part of the deposit only and quartz (with low incidences of bipolar features) dominated the stone assemblage from 1,900 years BP. This pattern, argued Sullivan (1982), corresponds to the previously defined Bondaian and Post Bondaian periods.

To the south of Merimbula the Greenglade rock shelter at Wonboyn Beach south of Eden was excavated by Colley (1997). Occupation of the site was established by radio carbon dating to have extended from 600 years BP (before present) until the 19<sup>th</sup> century. The site was found to contain shell midden and glass artefacts.

Colley (1997) also excavated an open midden at Baycliff. A date of 330±110 BP was obtained from charcoal retrieved from 55 cm below the surface.

#### 7.4 Archaeology - The Merimbula Area

Hughes (1982a) investigated an area on the northern shores of Merimbula Lake. The property consisted of low sandy flats, cliffs and slopes above the lake. Six midden sites situated on the cliff line at the junction of the hill slopes and rock platforms and estuarine sand flats were recorded by Hughes (1982a). The relatively intact, large middens consisted almost entirely of estuarine species: rock oyster, mud oyster, cockle, mud whelk and mussel, the later being present in the upper parts of the middens only. Stone artefacts, charcoal, fish bones and scales were also noted in some middens (Hughes 1982a).

Hughes (1983) conducted a further study of the Merimbula Lake foreshore and slopes above the lake. An additional nine sites, eight discrete middens/midden complexes and a stone artefact scatter were located. Hughes (1983) indicated that midden material is virtually continuous along parts of the cliff line and estuarine sand flats fronting the lake. As a result of the analysis of this work Hughes (1983) argued that the archaeology in the Merimbula Lake area was found to differ to that in the Bega River estuary located to the north. While sites in the north are of a high density they tend to be predominantly surface scatters of stone artefacts with very few shell middens. Hughes (1983) argued that the relative lack of shell midden at the Bega River appears to reflect the low shell fish productivity of the estuary river mouth as compared to both the Merimbula and Pambula Lakes.

Hughes (1982b) also surveyed 24 hectares of hilly terrain one kilometre north-west of Merimbula. One small artefact scatter was located on a broad ridge crest. The scatter consisted of six quartz flakes and unmodified pieces and one acid volcanic flake.

Byrne and Brayshaw (1983) undertook a survey of two blocks of dune land for a proposed expansion to sand mining at Merimbula. The two areas subject to survey measured approximately three hectares each and are situated to the east of Merimbula Lake at the southern end of the Bay Barrier, and c. one kilometre south of the Central Area subject to the current investigation. One artefact and two large whelk shells were recorded. The existing quarry faces were inspected and no archaeological material was observed indicating a lack of subsurface material in that area.

Aiken (1986) conducted a survey in response to a proposed housing development of a two square kilometre parcel of land north of Merimbula. During that study the majority of each of the different environmental zones in the area was surveyed including lagoon margins, beach, ridgelines, slopes and creeks. Given the forested nature of the area visibility conditions were low with the exception of small areas of exposure. One Aboriginal site was recorded on the east side of Pages Creek on the footslope situated above Back Lagoon. The site consisted of 14 stone artefacts distributed over an 8m x 30m area. The lack of further archaeological recordings was assessed by Aiken (1986) to be a factor of low visibility variables rather than a true reflection of the archaeological status of the study area. Aiken (1986) divided the property into a number of different environmental locations and made a prediction of their potential archaeological sensitivity. These are listed as follows:

- Medium to High Archaeological Sensitivity.  
This area encompassed the gently sloping and flat areas above Back Lagoon, the higher areas above the junction of the creek and lagoon and the foredunes of Short Point Beach. The Aboriginal site recorded by Aiken is located within this zone.
- Medium Archaeological Sensitivity.  
This area encompassed the flat ground on the knoll of the main ridge located to the east of Pages Creek. The similar ridge landform situated on the west side of the creek was exempted from this zone due to the lack of archaeological recordings on the area during the Aiken survey.
- Low Archaeological Sensitivity.  
This area included the remainder of the property.

Based on the field survey result and the prediction of the archaeological status of the property Aiken (1986) recommended that there were no development constraints in regard to the area of the property which she assessed to be of low archaeological sensitivity. She recommended a program of subsurface investigation to be undertaken in the area of the recorded Aboriginal site and the remainder of the area assessed to be of moderate to high archaeological sensitivity.

Lance (1987) subsequently conducted a limited program of subsurface investigations on the property in accordance with Aiken's (1986) recommendations. Auger and shovel pits were excavated in a number of locations. The results of Lance's (1987) works are summarized below:

- The beach barrier sand dunes and flats between Short Point Beach and Back Lagoon

The test pits conducted in this area revealed a sequence of beach sands with a humic rich soil formation overlain by a shallow band of bleached sand. A friable light grey sand derived from swamp deposits were encountered below the humic rich horizon.

The archaeological material recovered consisted of a dispersed scatter of marine shell which Lance (1987) thought probably originated from a larger shell midden.

- The foreshore of Back Lagoon and the smaller lagoon to the north

In the Back Lagoon area shallow sandy soils were found to overlie sandstone bedrock. Two artefacts were found on the surface however, test excavation revealed no further archaeological material. One surface artefact scatter was found in this area. This artefact occurrence appears to be located in a different location to the previous site found by Aiken (1986) and it is situated to the east and outside the current study area. The artefacts were located on a track on the lower slopes of gently sloping ground 60m from the north east shore of Back Lagoon. Twelve artefacts were recorded over a length of track measuring 25m long. Test excavation in the vicinity of the site revealed a shallow sandy soil overlying decomposing sandstone bedrock. Several fragments of marine shell were found suggesting that the exposed portion of the site would originally have contained shell midden which has been dispersed by vehicle and water movement. No artefacts were found in a subsurface context in association with the surface finds.

In the area of the smaller lagoon no cultural material was found.

- The major ridge.

Augering revealed shallow sandy deposits overlying bedrock. No artefacts or shell were recorded in subsurface contexts. Lance concluded that the low artefact density recorded by Aiken (1986) during the surface survey was an accurate reflection of artefact numbers in the deposit.

Lance (1987) concluded that low levels of archaeological material are present and that this represents low levels of prehistoric usage of the area. Lance (1987) argued that while additional material could be present in the area this is likely to be distributed at low density. Lance (1987) presented several reasons which might explain this situation; - that shallow lagoons did not provide a wide range of edible fauna and that therefore the area was less attractive than the nearby Merimbula Lake, that the sloping ground was an unattractive camping location and that geomorphological processes may have removed material from the area.

Williams (1998) conducted an archaeological investigation of a part (Lot 229) of the same property. The area in question is situated on a spur that backs on to Back Lagoon west of Pages Creek. The study was conducted in respect of a proposal to develop the land as a health retreat. The study area included the main spur crest, upper, mid and lower side slopes, creek bottom and the lake foreshore. Visibility encountered was assessed to be generally very poor, however Williams (1998) argued that the survey results are indicative of the survey potential of the area. One small Aboriginal site was recorded. The site is described as consisting of three stone artefacts located on a spur crest over an area of 15m. All artefacts were flakes made of purple rhyolite. This site has subsequently been disturbed by recent earth works (cf Dibden 2004).

An assessment of a proposed Merimbula effluent disposal works at an abandoned sand quarry on the Merimbula Bay Barrier was undertaken by ANUTECH (Egloff 1988). This site is situated one kilometre south of the Central Area. In the course of that survey a few isolated fragments of anadara and whelk fragments were identified; none were found on the margin of the sand quarry. Several stone artefacts were recorded in the upper margins of the quarry. Three clusters of highly fragmented human bone remains were recorded at the base of the quarry and it was inferred that they had originated from the wall of the quarry (#62-6-0173).

Boot (1993a, 1993b) completed a desktop survey for a proposed development on a ten hectare area of land on the mid-point of the Merimbula Bay Barrier opposite the Merimbula Airport. This location corresponds to the

southern end of the Northern Area in which test bores are currently proposed. It was concluded by Boot (1993a) that the area was of high archaeological sensitivity.

Kuskie (1995) undertook a survey of that area in December 1994 and identified a scarred tree site (#62-6-193) and a small area of shell midden (#62-6-0192); both these sites are situated to the south (c. 200-300m) of the Northern Area in which test bores are proposed. Kuskie noted that very poor visibility was encountered during the initial survey and a program of subsurface testing was initiated in order to clarify the archaeological sensitivity of the area. Twenty-three mechanically excavated test pits (measuring 1.3m x 0.7m) and sixteen shovel probes (measuring 0.5m x 0.5m) were dug along four transects. No archaeological material was recovered from any of the test pits. Despite this result the area was assessed to be of potential to contain Aboriginal burials.

Barber (1998) surveyed a small house lot on the foreshore of Merimbula Lake. Shell material was found across the disturbed topsoil of the property. Oakley (2000) also surveyed a small Lot on Main Street, Merimbula situated on the isthmus separating Back Lagoon from Merimbula Lake. Shell material was identified but Oakley (2000) argued that the material may not have been of Aboriginal origin.

Kuskie and Gutierrez (2000) conducted a survey of the ten hectare Merimbula Cove property located on the northern shores of Merimbula Lake. Six Aboriginal sites were located including middens, one artefact scatter and one isolated stone artefact. The middens contained estuarine shellfish species of predominantly cockle with some mud oyster and whelk. Stone artefacts were made on locally available rhyolite and quartz and were interpreted to be representative of non-specific flaking activities and microblade production. Kuskie and Gutierrez (2000) found that sites were tethered to level to moderate sloping simple slopes and spur crests within 100m or so of the lake margin.

Kuskie and Webster (2001) conducted test excavation at a midden site situated on a ridge crest overlooking Merimbula Creek. The investigation revealed the presence of three low density scatters of shell across site. No stone artefacts were recorded.

Kuskie (2002) surveyed 6 hectares of the proposed Lakewood residential development on the northern shore of Merimbula Lake. No Aboriginal sites were recorded and this result was explained to be a factor of the steepness of the hill slopes and accordingly the low archaeological potential of the area.

Wheeler and Douglas (2003) conducted a survey at the site of the Merimbula Public School situated on an isthmus between Merimbula Lake and Back Lagoon. While some areas of the site were found to be grossly modified, it was assessed that the majority of the site is undisturbed. Stone artefacts and midden material were recorded in surface exposures. Subsequent subsurface excavation was carried out on the site by Wheeler et al. (2003). In addition monitoring of selected locations was undertaken by representatives of the Bega Traditional Aboriginal Elders Council.

The subsurface work conducted at the school site revealed the presence of stone artefacts, shell midden and ochre within relatively intact soil profiles. Stone artefacts were found to be present in comparatively high densities representing tool maintenance and knapping activities. Raw materials utilised for stone working included silcrete, rhyolite and quartz. Backed artefacts dominated the 'finished implement' type and the analysis of material showed that blades were manufactured on site. The materials excavated led Wheeler et al (2003) to conclude that the site is large, complex and repeatedly occupied.

Dibden (2004) conducted a survey of the proposed Mirador subdivision area situated north of Back Lagoon in the area previously surveyed by Aiken (1986), Lance (1987) and Williams (1998). The artefact scatter previously identified by Aiken and Lance was relocated and found to be an extensive, but low density scatter on a spur landform. The site previously found by Williams (1998) was relocated and found to have been recently disturbed by earth works.

Oakley (2004) conducted an assessment of the Carrington Development at Merimbula. Oakley's assessment was conducted following the commencement of development at the site. Eden LALC representatives had monitored earth works and recorded a midden at the site. The midden was found to be relatively undisturbed and comprised of estuarine species. Stone artefacts were also recorded. Aboriginal skeletal remains were subsequently recorded at the site by Bobby Maher (Maher pers. comm. 2007).

Kuskie (2004) reports the salvage of a shell midden and artefact scatter site (MC7/A) identified by representatives of Bega Traditional Aboriginal Elders Council during a monitoring program of the Merimbula

Cove Residential Development site. The MC7/A site was found on a ridge crest; in addition a further small shell midden (MC6/A) and an isolated artefact (MC6/B) was found on a simple slope.

Site MC6/A was found to contain *in situ* shell midden to a depth of 12 cm. In addition two stone artefacts and several pieces of bone and charcoal were retrieved. The midden, dominated by cockle (*Anadara trapezia*), was of a circular shape measuring 1.5 m in diameter. Mud oyster, mud whelk and edible mussel were also present but in lower frequencies. A single cockle shell was radiocarbon dated to 1192±30 years BP, equating to a calibrated age of 910-620 cal BP [Radiocarbon Date Number Wk14112] (Kuskie 2004).

Surface collection of stone artefacts and minor excavation by trowel of one midden locus was conducted at Site MC7/A. Of the forty seven stone artefacts recorded, banded rhyolite was found to dominate the assemblage, however silcrete was also present in moderate frequency. Flaking debitage dominated the artefact types, however the presence of one microblade and two microblade cores indicated on-site microblade technology. A single geometric microlith was retrieved from the *in situ* midden. Shell from that deposit was radiocarbon dated to 807± 30years BP (equating to an age calibration of 540-290 cal BP) [Radiocarbon Date Number Wk14110]. As Kuskie (2004) notes, this is a rarely documented finding in the south east, and strongly suggests the continuation of microblade technology into the recent past (however, *cf* Boot 2002).

ERM Australia (2005) undertook a survey of approximately four kilometres of proposed pipeline between the Merimbula sewage treatment plant and Oaklands farm; an area proposed for a storage pond at Oaklands was also surveyed. No Aboriginal objects were identified during that survey. The proposal areas were assessed to generally be of low archaeological sensitivity.

Dibden (2005) conducted a survey at Millingandi in response to a caravan park redevelopment. The area was located adjacent to Merimbula Lake and included an elevated flat landform (Tertiary) and bedrock slopes. A number of stone artefacts were recorded in sparse exposures. A program of subsurface test excavation was undertaken revealing a high density and consistent distribution of stone artefacts across the entire area (Dibden 2006a).

Dibden (2006b) conducted a salvage excavation at a building site in Beach Street, Merimbula. The excavation revealed the presence of a midden, in varying degrees of disturbance which possessed shell and high stone artefact numbers.

#### 7.5 Archaeological Potential of the Study Area

The literature review presented above indicates that in coastal environments on the far south coast middens and stone artefact scatters are commonly recorded sites. Human burials and scarred trees are also recorded, albeit in low numbers. Sand bodies within the local area have the potential to contain intact archaeological deposits and burials.

Based on a consideration of the above models and the review of prior research conducted in the Merimbula area the following site predictions are made:

##### **Stone Artefacts**

Stone artefacts are located either on the surface and/or in subsurface contexts. The raw materials used for artefact manufacture in the Merimbula area include volcanics, quartz and silcrete.

Within the local area stone artefacts will be widely distributed across the landscape in a virtual continuum, but with significant variations in density in relation to different environmental factors. Artefact density and site complexity will be greater on elevated flat land near a source of reliable water (c. 100 metres of the highest order streams).

The detection of artefact scatters depends on ground surface factors and whether or not the potential archaeological bearing soil profile is visible. Prior ground disturbance, vegetation cover and sediment/gravel deposition can act to obscure artefact scatter presence.

Stone artefacts have previously been recorded within the context of the dunes of the Merimbula Bay Barrier. Based on the results of previous surveys in the local area and the environmental context of the proposal site it is predicted that archaeological evidence in the form of stone artefacts may be present in the proposal areas. However based on previous research (Byrne and Brayshaw [1983], Egloff [1988] and Kuskie [1995]) it is clear that stone artefacts are present to very low to negligible density only.

### **Grinding Grooves**

Grinding grooves are found in rock surfaces and result from the manufacture and maintenance of ground edge tools. Given the absence of sandstone exposures in the study area grinding groove sites are unlikely to be present.

### **Middens**

Middens consist of deposits of shell and sometimes contain stone artefacts, bone and human burials. Middens are a commonly recorded site type in the Merimbula area.

Middens situated in the area will vary in their species composition which is generally a factor of environmental location. Rock platform species are typically dominant in sites situated on headland contexts, while estuarine species are dominant in sites found around Merimbula Lake.

There is potential for middens to be recorded within the proposal areas. However based on previous research (Byrne and Brayshaw [1983], Egloff [1988] and Kuskie [1995]) it is clear that substantial middens are not prevalent in the landform subject to this assessment. Both the Byrne and Brayshaw (1983) and the Egloff (1988) survey included examination of the sections of the existing sand quarry south of the study area at which time no evidence of midden was found within the sections. The Kuskie (1995) research entailed excavation across a large area of the dunes located between the Central and Northern Areas and no shell was recovered.

### **Burials**

Several Aboriginal burial sites are known within the wider region. Burials are generally only visible in areas where the deposit has been disturbed either by natural erosion or human activity, as was the case at the abandoned sand quarry (Egloff 1988). As noted previously Egloff (1988) found skeletal material within the south-eastern part of the existing sand quarry. Egloff (1988) noted that the material appeared to have eroded out of the wall of the quarry. Given the advanced state of decay of the bone and the lack of archaeological context no details in regard to mode of interment or depth of burial was observable.

Unfortunately the majority of skeletal material found along the south coast is similarly disturbed and without archaeological context. Relatively intact burials are rare; two are described below.

Bowdler (1982) investigated a burial which was eroding out of a dune at Wonboyn Beach. The skeleton was thought to be a mature male and had been buried in a prepared pit. The skeleton was arranged in an extended position on its back. The burial was found at a depth of c. 54 cm below the surface.

Dibden (in prep) investigated a burial consisting of a young female and neonate within a prepared pit at Murrumarrang. The female was found to be resting on her side in a highly flexed position. The burial was found at c. 37 cm below the surface however given uncertainty in regard to prior disturbance it is unclear as to what the original depth of the burial might have been.

In summary burials can be expected to be present in deep sandy soil profiles within the Merimbula area. Accordingly there is the potential for burials to be present in the proposal areas.

### **Rock Shelters**

Rock shelter sites consist of any form of rock overhang which contains artefacts and/or art. Common archaeological features of rock shelter sites are: surface artefacts, occupation deposit such as stone artefacts, shell, bone and charcoal, rock drawings, paintings and stencils, engraved imagery, potential archaeological deposit and grinding grooves.

Given the absence of large vertical stone exposures in the study area this site type is unlikely to be recorded.

### **Scarred and Carved Trees**

Scarred and carved trees result from the removal of bark from trees by Aboriginal people for either domestic or ceremonial purposes. These site types can occur anywhere that trees of sufficient age are present, however, in an Aboriginal land use context would most likely have been situated on flat or low gradient landform units in areas suitable for either habitation and/or ceremonial purposes.

Bark removal by European people through the entire historic period and by natural processes such as fire blistering and branch fall, make the identification of scarring from a causal point of view very difficult. Accordingly, given the propensity for trees to bear scarring from natural causes their positive identification is impossible unless culturally specific variables such as stone hatchet cut marks or incised designs are evident and rigorous criteria in regard to tree species/age/size and its specific characteristics in regard to regrowth is adopted.

Nevertheless, the likelihood of trees bearing cultural scarring remaining extant and in situ in the study area is low given events such as land clearance and bushfires. Generally scarred trees will only survive if they have been carefully protected such as the trees associated with Yuranigh's grave at Molong where successive generations of European landholders have actively cared for them.

While there are two previously recorded scarred tree sites within the Merimbula dunes, the potential for additional sites to occur is relatively low.

### **Stone Quarry and Procurement Sites**

A lithic quarry is the location of an exploited stone source (Hiscock & Mitchell 1993:32). Sites will only be located where exposures of a stone type suitable for use in artefact manufacture occurs. These sites will commonly have evidence of exploitation including extraction and preliminary flaking preparation. The presence of these site types is dependent on the surface exposure of suitable stone. Quarries are a rare site type in this region. Given the absence of suitable stone in local outcrops in the proposal area this site type is unlikely to be recorded during the study.

## 8. SURVEY RESULTS

### 8.1 Results

Each of the test bore sites were subject to a surface survey and assessment of prior disturbance and archaeological sensitivity.

No Aboriginal objects were identified at any of the sites investigated. The test bore locations are described below:

#### *The Central Area*

The Central Area was assessed to be a relatively undisturbed section of the Merimbula Bay Barrier landform and was comprised of well defined crests and swales. Three bores are proposed for this locale; a test production/injection bore and 2 monitoring bores. Their location is each described below:

Site 1 (located c. 10 metres north of an existing bore)                      grid ref: 758801e 5911144n (hand GPS- GDA)

This site is the location of the proposed production/injection bore and is located on the crest of a narrow sand ridge (Plate 4). A deeply incised (c. 0.5m deep) beach access track passes in an east/westerly alignment immediately to the south of this site. This track provides an ability to observe the top 50 cm of the soil profile in this area which is a light brown, clean sand with little organic matter. The bore site is situated c. 5 metres north of the existing track in a small area devoid of shrubs. Ground cover is comprehensive at this site and ground exposure was negligible. However good ground exposure and archaeological visibility was present in the adjacent track.



Plate 4. Central Area: Site 1 looking north; note track.

Site 2 (located c. 20 metres east of Site 1)                      grid ref: 758820e 5911125n (hand GPS- GDA)

This site is the location of a proposed monitoring bore and is located in a swale (Plate 5). A beach access track passes in an east/westerly alignment immediately to the south of this site. The bore site is situated c. 5 metres north of the existing track in a small area devoid of shrubs. Ground cover is comprehensive at this site and ground exposure was negligible. However good ground exposure and archaeological visibility was present in the adjacent track.





Plate 5. Central Area: Site 2 looking southeast.

Site 3 (located c. 20 metres northwest of Site 1)

grid ref: 758788e 5911172n (hand GPS- GDA)

This site is the location of a proposed monitoring bore and is located on a broad crest of a sand ridge (Plate 6). A beach access track passes in an east/westerly alignment immediately to the south of this site. The bore site is situated c. 5 metres north of the existing track in a small area devoid of shrubs. Ground cover is comprehensive at this site and ground exposure was negligible. However good ground exposure and archaeological visibility was present in the adjacent track.



Plate 6. Central Area: Site 3 looking east.

*The Northern Area*

Site 1 (located at the eastern margin of transmission line)      grid ref: 759181e 5912134n (hand GPS- GDA)

This site is the location of a proposed monitoring bore and is located at the margin of the clearing and network of tracks associated the transmission line (Plate 7). This area has been subject to recent fire activity and accordingly ground exposure is relatively high (c. 50%) with archaeological visibility estimated to be c. 30%. High ground exposure and archaeological visibility was present in the adjacent track network west of the site. The site has been subject to relatively high levels of previous disturbance.



Plate 7. Northern Area: Site 1 looking east.

Site 2 (located c. 70 m east of Site 1)      grid ref: 759253e 5912067n (hand GPS- GDA)

This site is the location of a proposed monitoring bore and is located immediately adjacent to a beach access track (Plate 8). This area has been subject to recent fire activity and accordingly ground exposure is relatively high (c. 50%) with archaeological visibility estimated to be c. 30%. The site has been subject to relatively high levels of previous disturbance.



Plate 8. Northern Area: Site 2 looking south.

Site 3 (located c. 50 m east of Site 2 closest to beach)

grid ref: 759300e 5912058n (hand GPS- GDA)

This site is the location of a proposed monitoring bore and is located immediately adjacent to an old beach access track (Plate 9). This area has been subject to recent fire activity and accordingly ground exposure is relatively high (c. 50%) with archaeological visibility estimated to be c. 30%. The site has been subject to relatively high levels of previous disturbance.



Plate 9. Northern Area: Site 3 looking east.

Site 4 (located c. 250 m north of sites 1-3)

grid ref: 759368e 5912291n (hand GPS- GDA)

This site is the location of a proposed monitoring bore and is located immediately adjacent to the clearing and network of tracks associated the transmission line (Plate 10). This area has been subject to recent fire activity and accordingly ground exposure is relatively high (c. 70%) with archaeological visibility estimated to be c. 30%. The site has been subject to relatively high levels of previous disturbance.



Plate 10. Northern Area: Site 4 (where figures are standing) looking east; note track to west of site which traverses the transmission line easement.

#### *Summary of Results*

No Aboriginal objects were recorded in the proposed impact areas during the field inspection. Based on a review of previous investigations conducted within the landform and in close proximity to the proposed impact areas the following predictions are made in respect of the potential for subsurface archaeological materials to be present:

- The potential for Aboriginal objects in the form of stone artefacts to be present in a test bore locations is considered to be low. If present at all, stone artefacts will be distributed in very low density only;
- The potential for Aboriginal objects in the form of shell midden to be present in the test bore locations is considered to be low;
- The potential for Aboriginal skeletal material and burial contexts to be present in the Merimbula Bay Barrier landform is high. Aboriginal skeletal material has been found previously within the landform and this is consistent with burial site locational patterning elsewhere along the south coast. Nevertheless the exact location of burials cannot be predicted in respect of the proposed test bore sites.

## **9. STATUTORY INFORMATION**

*The National Parks and Wildlife Act 1974 (as amended)*

Two pieces of legislation provide the primary basis for Aboriginal heritage management in NSW, the National Parks and Wildlife Act 1974 (NPW Act) and the Environmental Planning and Assessment Act 1979 (EP&A Act) (NPWS 1997).

The Environmental Planning and Assessment Act 1979 (EP&A Act), its regulations, schedules and guidelines provides the context for the requirement for environmental assessments to be undertaken during land use planning (NPWS 1997).

The NPW Act provides statutory protection for all Aboriginal objects and Aboriginal Places in NSW.

An 'Aboriginal object' is defined as

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

Under s90 of the NPW Act a person must not knowingly destroy, damage or deface or knowingly cause or permit the destruction, damage or defacement of an Aboriginal object or Aboriginal Place without first obtaining the consent of the Director-General of the NSW DECC. Consents which enable a person to impact an Aboriginal object are issued by the DECC upon review of an Aboriginal Heritage Impact Permit.

Under s87 of the NPW Act a person must not excavate or disturb land for the purposes of discovering an Aboriginal object without first obtaining the consent of the Director-General of the NSW DECC. Permits which enable a person to excavate land for the purposes of determining whether or not an Aboriginal object is present are issued by the DECC upon review of an Aboriginal Heritage Impact Permit.

## 10. MITIGATION AND MANAGEMENT STRATEGIES

The aim of this study has been to identify Aboriginal objects and to assess the archaeological sensitivity of the proposal area and thereafter to give consideration to management within the context of the proposed impacts.

No Aboriginal objects were recorded in the proposed impact areas during the field inspection. Based on a review of previous investigations conducted within the landform and in close proximity to the proposed impact areas the following predictions are made in respect of the potential for subsurface archaeological materials to be present:

- The potential for Aboriginal objects in the form of stone artefacts to be present in a test bore locations is considered to be low. If present at all, stone artefacts will be distributed in very low density only;
- The potential for Aboriginal objects in the form of shell midden to be present in the test bore locations is considered to be low;
- The potential for Aboriginal skeletal material and burial contexts to be present in the Merimbula Bay Barrier landform is high. Aboriginal skeletal material has been found previously within the landform and this is consistent with burial site locational patterning elsewhere along the south coast. However the exact location of burials cannot be predicted in respect of the proposed test bore sites.

In summary there are no archaeological constraints identified to attach to the proposed test bores. However given the potential for Aboriginal skeletal material and burial contexts to be present within the dune system (and possibly within the test bore locations) appropriate management and mitigation strategies are required to be implemented in regard to the proposal. An appropriate management and mitigation strategy would ensure that if present, human skeletal material is identified without causing significant damage to either the bone material (skeleton) or burial context (burial pit).

A number of factors have been taken into consideration in relation to identifying suitable options for the management and mitigation of impacts relating to the potential for burials to be present including:

- The small and discrete nature of proposed impacts;
- The fact that Kuskie (1995) conducted extensive subsurface test excavation in the area situated between the Northern and Central Areas without encountering any human skeletal material;
- The need for an effective methodology which will ensure that if skeletal material is found significant damage is not sustained to either the bone and/or burial context.

Two possible management and mitigation strategies relating to the potential for burials to be present in the test bore sites are outlined below for consideration of all stakeholders (it is noted that a program of GPR [ground penetrating radar] is not included here based on a consideration of its potential limitations in identifying burials in disturbed contexts):

### 1. *Subsurface test excavation*

A program of subsurface test excavation would entail obtaining an AHIP (Aboriginal Heritage Impact Permit) under the National Parks and Wildlife Act 1974 and subsequently conducting subsurface test excavation in order to determine whether or not Aboriginal skeletal material is present within the Test Bore locations.

### 2. *Monitoring*

A program of monitoring would entail making observations of the spoil from the top 2 metres of each of the test bores to determine whether or not Aboriginal skeletal material is present.

Both options are discussed further below.

## 10.1 Management and Mitigation Strategies

### Subsurface Test Excavation

Subsurface test excavation is a further stage of archaeological investigation which would be conducted for the purposes of identifying the presence of burials.

In the case at hand further investigation in the form of subsurface excavation is identified as an option for consideration by the proponent in respect of the need to implement an effective strategy for the identification of human skeletal remains.

A number of factors relating to such an approach do however need consideration; these are listed in point form below:

1. Given the lack of an adequate sample of data relating to the range of depths at which burials were interred on the south coast in sand bodies it is uncertain as to what a sufficient depth an excavation square would reach. Accordingly an excavation depth of up to at least 1.2 m might be anticipated.
2. In order to conduct subsurface excavation of sufficient depth as to investigate adequately for the presence of burials a test square measuring 1 metre in diameter would need to be excavated.
3. An excavation square would need to be conducted in each of the test bore locations. If burials were encountered additional test bore sites would need to be identified and additional test squares would need to be excavated.
4. If burials are encountered during a program of subsurface excavation the likelihood of causing significant damage to either skeletal material or the burial context is considered to be generally low.
5. Following test excavation and in the event of nil Aboriginal objects being encountered the test bore sites would require no further archaeological assessment and the test bores could be completed without further actions being necessary.
6. If Aboriginal objects are encountered during test excavation an additional AHIP would need to be sought by the proponent in order to allow impacts relating to the proposed test bore works.

### Monitoring

Monitoring during impact for the purposes of identifying cultural material that may be uncovered during earth disturbance can be implemented as a management strategy. Monitoring is a reactive rather than pro-active management strategy, and as such, is not an ideal management tool in cultural heritage management. Monitoring as a management strategy should only be adopted, if at all, when all other management options have been considered. Monitoring for stone artefacts (for example) is not a widely accepted method of management because sites of significance can be destroyed as monitoring is taking place and because it can result in lengthy and costly delays to development works if significant cultural material is uncovered. In the case at hand stone artefacts (and midden) are predicted to be present in very low to negligible density only and accordingly is largely irrelevant to the current management concerns.

However an exceptional case in relation to the efficacy of monitoring obtains when burials are predicted to possibly be present in an impact area. In the case at hand monitoring test bore works is identified as an option for consideration by the proponent in respect of the need to implement an effective strategy for the identification of human skeletal remains.

A number of factors relating to such an approach need consideration and these are listed in point form below:

1. Monitoring of approximately the top 2 metres of the test bore spoil is possible with a monitoring strategy;
2. Given that there is some potential to cause damage to either the skeletal material and/or the burial context, if encountered, during monitoring of test bore drilling works, this risk needs to be minimised. An appropriate risk minimisation strategy has been identified to entail the following:
  - The use of a hand auger for the top 2 metres of spoil to minimise impacts to skeletal material if found;
  - The removal of spoil in 10 cm increments.
3. A protocol relating to burials would need to be established prior to works commencing which would outline the appropriate scenario for:
  - Cessation of work at the test bore site in question;
  - Notification to relevant authorities; and
  - Continuation of works program. It is noted that the proponent would need to be able to continue with works in alternative locations while the relevant protocol was implemented for any burials uncovered.

## 11. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are made on the basis of:

- Legal requirements as set out under the National Parks and Wildlife Act 1974 (as amended) which states that it is illegal to knowingly destroy, damage or deface or knowingly cause or permit the destruction, damage or defacement of an Aboriginal object or Aboriginal Place in NSW without first obtaining consent of the Director-General of the NSW Department of Environment and Conservation (see Section 9 Statutory Information).
- The potential for Aboriginal human burials to be present in a subsurface context.
- Consideration of the type and nature of the proposed impacts.
- Consultation with the Eden Local Aboriginal Land Council.

There are no archaeological constraints identified to attach to the proposed test bores. However given the potential for Aboriginal skeletal material and burial contexts to be present within the dune system (and possibly within the test bore locations) appropriate management and mitigation strategies are required to be implemented in regard to the proposal. An appropriate management and mitigation strategy would ensure that if present, human skeletal material is identified without causing significant damage to the either the material (skeleton) or burial context (burial pit).

Two possible management and mitigation strategies relating to the potential for burials to be present in the test bore sites are outlined below for consideration of all stakeholders (it is noted that a program of GPR [ground penetrating radar] is not included here based on a consideration of its potential limitations in identifying burials in disturbed contexts). Both options are discussed in detail Section 10.

1. *Subsurface test excavation*

A program of subsurface test excavation would entail obtaining an AHIP (Aboriginal Heritage Impact Permit) under the National Parks and Wildlife Act 1974 and subsequently conducting subsurface test excavation in order to determine whether or not Aboriginal skeletal material is present within the Test Bore locations.

2. *Monitoring*

A program of monitoring would entail making observations of the spoil from the top 2 metres of each of the test bores to determine whether or not Aboriginal skeletal material is present.



## 12. REFERENCES

- Aiken, G. 1986 *An Archaeological Reconnaissance of the Upper Berrambool Housing Development Area, Merimbula, New South Wales*. A report to Willing & Partners Pty Ltd, Canberra, ACT.
- Attenbrow, V. 1976 *Aboriginal Subsistence Economy on the Far South Coast of New South Wales, Australia*. Unpublished BA (Hons) thesis, University of Sydney, Sydney.
- Baker, R & R. Haworth 2000a Smooth or oscillating late Holocene sea level curves? Evidence from cross-regional statistical regressions of fixed biological indicators. *Marine Geology* 163. pp 353-65.
- Baker, R & R. Haworth 2000b Smooth or oscillating late Holocene sea level curves? Evidence from the palaeozoology of fixed biological indicators in east Australia and beyond. *Marine Geology* 163. pp 367-86.
- Barber, M. 1998 An archaeological investigation of Lot 15A, 22 Beach Street Merimbula. Report to the D'Arcy Family.
- Boot, P. 1993a *Conceptual Plan for Land opposite Merimbula Airport: Follow-up Report on the results of Discussions with Eden Local Aboriginal Land Council*. A report to Collie Margules Australia Pty ltd.
- Boot, P. 1993b *Conceptual Plan for Land opposite Merimbula Airport: Preliminary Assessment of Archaeological and Heritage Values*. A report to Collie Margules Australia Pty ltd.
- Boot, P. 1994 Recent Research into the Prehistory of the Hinterland of the South Coast of New South Wales. In, Sullivan, M, Brockwell, S. and Webb, A. (eds) *Archaeology in the North: Proceedings of the 1993 Australian Archaeological Association Conference*. NARU: Darwin.
- Byrne, D. 1983 *The Five Forests: An Archaeological and Anthropological Investigation*. Unpublished report to NSW National Parks and Wildlife Service.
- Byrne, D. 1984 *Aboriginal Sites in Wandella-Dampier State Forests: An Archaeological Survey Ahead of Scheduled Forestry Operations*. Unpublished report to Forestry Commission of NSW.
- Byrne, D. and Brayshaw, H. 1983 *An archaeological survey of a proposed sand mining development at Merimbula, NSW*. A report to the Land Resources and Environment Branch of the New South Wales Crown Land Office.
- Chittick, L. and Fox, T. 1997 *Travelling With Percy: A South Coast Journey*. Aboriginal Studies Press: Canberra.
- Colley, S. 1997 A Pre and Post Contact Aboriginal Shell Midden at Disaster Bay, NSW South Coast. *Australian Archaeology*. 45: 1-19.
- Dibden, J. 2004 *Mirador Proposed residential subdivision*. Report to ngenvironmental.
- Dibden, J 2005 *Proposed Re-Development at Kalorama Caravan Park, Millingandi, near Merimbula, NSW. Report to Driftwood Village*.
- Dibden, J 2006a *Proposed Re-Development at Kalorama Caravan Park, Millingandi, near Merimbula, NSW. Subsurface Test Excavation. Preliminary Research Permit #2402*. Report to Driftwood Village.
- Dibden, J. 2006b in prep. Salvage excavation at Beach Street Merimbula.
- Eades, D.K. 1976 The Dharawal and Dhurga languages of the New South Wales South Coast. In *Australian Aboriginal Studies Research and Regional Studies No. 8*. AIAS: Canberra.
- Egloff, B. 1988 Merimbula Effluent Disposal Works Archeological Investigations. Report to DPWS>
- ERM Australia 2005 *Merimbula Aboriginal Archaeological Assessment*. A report for the Bega Valley Sewerage Program.

- Flood, J. 1980 *The Moth Hunters: Aboriginal Prehistory of the Australian Alps*. AIAS: Canberra.
- Geering, K. 1983a *An Archaeological Assessment of Proposed Development Areas Within Bournda State Recreation Area, South Coast, N.S.W.* Unpublished report to Trustees, Bournda State Recreation Area.
- Hiscock, P. & Mitchell, S. 1993 *Stone Artefact Quarries and Reduction Sites in Australia: Towards a Type Profile*. AGPS: Canberra.
- Hughes, P. J. 1982a *A preliminary Assessment of Merimbula Archaeological Sites in the Merimbula Heights Estate Area, Merimbula, NSW*. Unpublished report to Sinclair Knight & Partners Pty Ltd.
- Hughes, P. J. 1982b *An Archaeological Survey of the Proposed Merimbula Waterslide Development, Merimbula, NSW*. Unpublished report to Margules and Associates, Kingston, ACT
- Hughes, P. J. 1983 *An Archaeological Survey of Stage 2 of the Proposed Development of the Merimbula Heights estate Area, Merimbula, NSW*. Unpublished report to Sinclair Knight & partners Pty Ltd.
- Kuskie, P. 1995 *An archaeological assessment of land adjacent to Merimbula Airport, Far South Coast, New South Wales*. A report to Bega Valley Shire Council.
- Kuskie, P. 2002 *An archaeological assessment of the proposed Lakewood Estate residential development at Merimbula, Far South Coast of New South Wales*. A report to Young Consulting Engineers Pty Ltd.
- Kuskie, P. 2004 *Salvage of Aboriginal Heritage Evidence Within Stage 4 of the Proposed Merimbula Cove Residential Development, Lakewood Drive, Merimbula, Far South Coast of New South Wales*. A report to Ridge Consolidated Pty Ltd.
- Kuskie, P. & V. Gutierrez 2000 *An archaeological assessment of the proposed Merimbula Cove residential development, Far South Coast of New South Wales*. A report to Caddey Searl and Jarman.
- Kuskie, P. & V. Webster 2001 *Archaeological Test Excavations at Aboriginal Site #62-6-189, Along the Prices Highway Deviation near Merimbula, Far South Coast of New South Wales*. A report to Roads and traffic Authority of New South Wales and Bega Traditional Aboriginal Elders Council.
- Lance, A. 1987 *Further Archaeological Investigations of the Upper Berrambool Housing Development Area*. A report to Willing & Partners Pty Ltd Canberra.
- NSW National Parks and Wildlife Service 1997 (Draft) *Guidelines for Archaeological Survey Reporting*.
- Oakley, B. 2000 *Indigenous Heritage Assessment 16 Main Street Merimbula NSW*. Report to Judy Hori.
- Oakley, B. 2004 *Indigenous Heritage Assessment Merimbula Lake Midden & Carrington Development Site Fishpen Merimbula NSW*. Report to Carrington Merimbula Pty Ltd.
- Ossa, P., Marshall, B. & Webb, C. 1995 New Guinea 2 cave: A Pleistocene site on the Snowy River, Victoria. *Archaeology in Oceania* 30(1):22-35.
- Peterson, N. 1976 *Tribes and Boundaries in Australia*. AIAS: Canberra.
- Poiner, G. 1976 The process of the year among Aborigines of the central and south coast of New South Wales. *Archaeology and Physical Anthropology in Oceania* 11: 186-206.
- Polach, H.A., Thom, B.G. and Bowman, G.M. 1979 ANU radiocarbon date List VII. *Radiocarbon* 21 (3): 329-338.
- Roy, P. 1984 New South Wales estuaries: their origin and evolution. In Thom, B. (ed) *Coastal Geomorphology in Australia*. Academic Press: Sydney.
- Smith, B. 1970 *A Brief History of Bega*. Bega Historical Society: Bega.
- Sullivan, M.E. 1982 *Aboriginal Shell Middens in the Coastal Landscape of New South Wales*. Unpublished PhD Thesis, Australian National University, Canberra.

- Thom, B.G. 1978 Coastal sand deposition in southeast Australia in the Holocene. Pp. 197-214 In: Davies, J.L. and Williams, M.A.J. (eds). *Landform Evolution in Australasia*. ANU Press: Canberra.
- Thompson, K. 1985 *A History of the Aboriginal People of East Gippsland*. Unpublished report to Land Conservation Council, Victoria.
- Tindale, N.B. 1974 *Aboriginal Tribes of Australia*. ANU: Canberra.
- Vallance, D. 1983 *Fishing, Weather and Site Location: An Esoteric Essay*. Unpublished Litt. B. thesis, Australian National University, Canberra.
- Wheeler, J. & P. Douglas 2003 *Merimbula Public School NSW Archaeological Assessment and Development Impact Mitigation Plan*. Report to NSW DPWS and DET.
- Wheeler, J., R. Wright, P. Douglas, G. Wilson, D. Tuck and D. Steele 2003 *Aboriginal Archeological test Excavation Report & Development Impact Mitigation Plan for Proposed Re-development of the Merimbula Public School Merimbula, NSW*. Report to the NSW Department of Education and Commerce.
- Williams, D. 1998 *An Archaeological Survey of a Proposed Health Retreat near Merimbula, Far South Coast NSW*. Report to Kos Health Retreats Pty Ltd.
- Young, R.W. and Bryant, E.A. 1992 Catastrophic wave erosion on the southeastern coast of Australia: impact of the Lanai tsunami ca. 105ka? *Geology* 20: 199-202.

Appendix  
Correspondence from Eden LALC