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PRELIMINARY CULTURAL HERITAGE ASSESSMENT

OF

INDIGENOUS VALUES

LOTS 2 AND 3 DP 244652

URLIUP, BILAMBIL AND HOGANS ROADS BILAMBIL

NORTH COAST NEW SOUTH WALES

by
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for

JACKSON INTERNATIONAL PTY LTD

July, 2008

Report Reference JD379

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1.0 INTRODUCTION

This report presents the results of a preliminary assessment to identify whether there are Aboriginal cultural heritage values associated with Lots 2 and 3 DP 244652 (hereafter referred to as the Project Area), Urliup, Bilambil and Hogans Roads, Bilambil, northern New South Wales (**Figure 1**).

The preliminary assessment was undertaken by Susan Davies (Davies Heritage Consultants Pty Ltd).

1.1 The Scope of the Study

The proposed development application for the above property is to be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979*. The Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation issued by the Department of Environment and Climate Change identifies the important factors of consideration that need to be considered by proponents and consultants when assessing potential impacts on Aboriginal cultural heritage for development applications assessed under Part 3A. The Preliminary Assessment, which is primarily a desktop exercise, is the first step in this process. The main purpose of this step is to identify whether there are Aboriginal cultural heritage values associated with the Project Area. The Department of Environment and Climate Change note that the Preliminary Assessment should include:

1. A description of the location and nature of the proposed development;
2. A description of any social and cultural values including the spiritual, traditional, historical or contemporary associations and attachments which the place or area has for the present-day Aboriginal community; and
3. An assessment of which of the Aboriginal cultural heritage values that are known or likely to occur are likely to be directly or indirectly affected by the proposal.

Hence the scope of the study includes these three tasks.

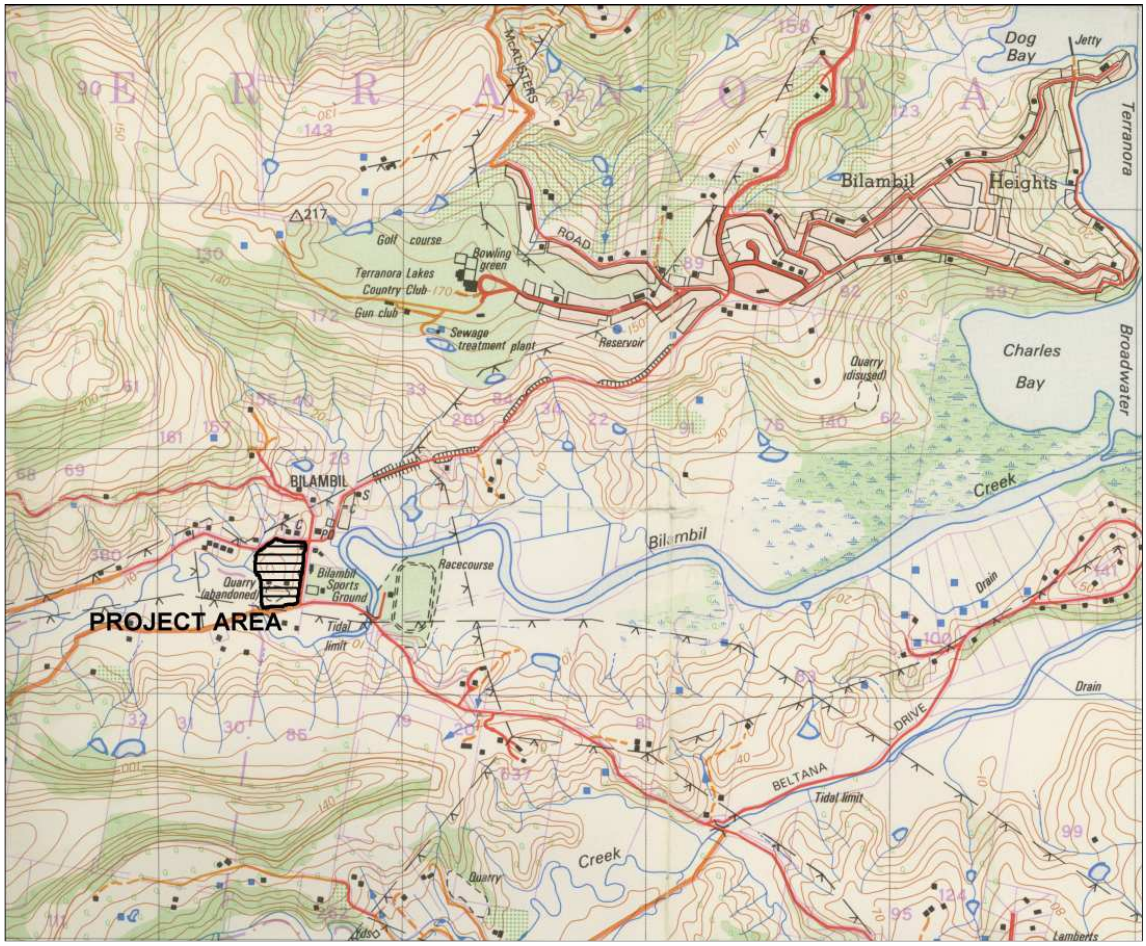

Figure 1. Location of the Project Area

2.0 LOCATION OF THE PROJECT AREA

The Project Area, which is approximately 4.5 hectares in size, is located in the Tweed Local Government Area approximately five kilometres south of the New South Wales/Queensland state border and around three and a half kilometres west of Terranora Broadwater. The southern boundary abuts Hogans Road; the eastern boundary abuts Bilambil Road; the northern boundary abuts Urliup Road and the southern half of the western boundary abuts Bilambil Creek (**Figure 2**).

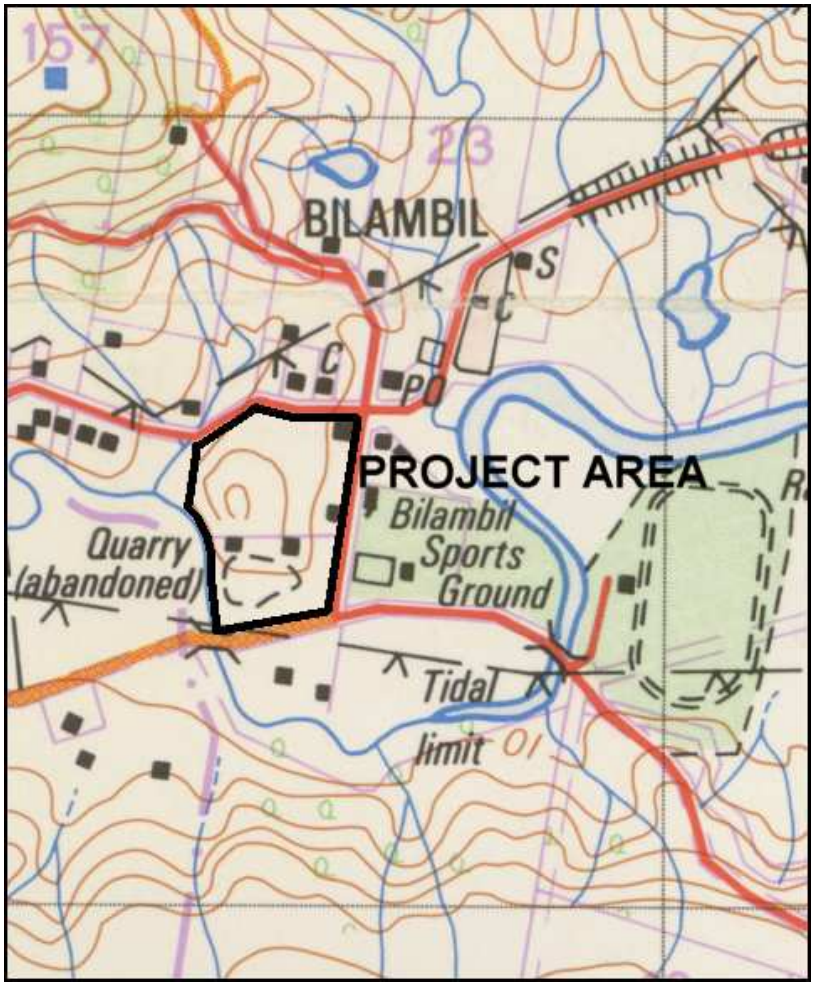

Figure 2. The Project Area

3.0 THE PROPOSED DEVELOPMENT

The developer proposes to establish 57 Residential Lots, one Commercial Lot, one area for Open Space, one SPS and one Detention Pond within the Project Area (see **Figure 3**).

In summary, the key elements of the proposed development include:

- A road connecting the development with Urliup Road to the north and Hogans Road to the south;
- Dedication of open space and park areas;
- Creation of 58 residential lots based on a local street network; and
- Provision of all normal urban infrastructure.

Figure 3. The Proposed Development)

4.0 INDIGENOUS CONSULTATION

Indigenous consultation commenced with the proponent seeking to identify stakeholder groups or people wishing to be consulted about the project. The Interim Community Consultation Requirements (Department of Environment and Climate Change) were followed. Hence, written notification was provided to:

- Tweed Byron Local Aboriginal Land Council (LALC);
- Registrar of Aboriginal Owners;
- Native Title Services;
- Tweed Shire Council; and
- Department of Environment and Climate Change.

In addition, the Department of Environment and Climate Change provided a list of Aboriginal community groups for the north coast / far north coast of New South Wales. A subset of groups for the Tweed area was selected from this list. Hence, written notification was also provided to:

- Tweed Shire Aboriginal Advisory Committee;
- Tweed Aboriginal Cooperative Society Ltd.;
- Nganduwal Descendents; and
- Gold Coast Native Title Group.

All the above notification letters were forwarded on the 2nd June, 2008. A public notice was inserted in the Northern Star on Friday 6th June, 2008.

The notification letters advised that the closing date for registration of interest was Monday 16th June, 2008 (i.e. 10 working days); the closing date for responses to the advertisement was Friday 20th June.

No responses were received by the closing dates.

5.0 INDIGENOUS CULTURAL CONTEXT

This Section provides a brief outline of the language groups (Sub-section 5.1), social interactions (Sub-section 5.2), settlement patterns (Sub-section 5.3), economy (Sub-section 5.4), material cultural (Sub-section 5.5) and population density (Sub-section 5.6) of the Indigenous people whose traditional land did and still does cover the present study area. Post-contact history is briefly outlined in Sub-section 5.8.

5.1 Language Groups

Generally, the area encompassing the catchments of the Clarence, Richmond and Tweed Rivers is referred to as the Bundjalung speaking area (Crowley 1978). Bundjalung is lexically quite diverse and contains many named local dialects.

The dialect spoken in the region of the Project Area was Ngandowal (Fox 2006:8).

The Project Area also appears to be within the bounds of the Tul-gi-gin people who were one of three groups within the Tweed Valley. The country of the Tul-gi-gin extended from Tallebudgera Creek in the north to the Tweed River in the south and inland from Springbrook plateau in the north to Tumbulgum and along the northern bank of the Rous River to the Border Range in the south (Fox 2006:8).

5.2 Social Interactions

As is the case in Australia generally, inter-group social gatherings were a feature of Aboriginal life in this region. Coleman (1982) has reviewed the ethnohistorical literature and concluded that movements of large groups of people within the coastal region were made in order to attend social gatherings, rather than to mainly take up residence in another location. Byrne (1981) suggested that arrangements were made for inland groups to enter the territory of coastal groups for seasonal fish runs and ceremonial activities. One example of the extent of social interactions is the attendance by Indigenous people from the Tweed-Richmond region at Bunya gatherings which were held in the Blackall Ranges about 100km north of Brisbane. Such social gatherings facilitated trade and/or exchange between groups; for instance groups from the Tweed-Richmond-Clarence Rivers are reported as returning from Bunya gatherings with Brigalow spears.

5.3 Settlement Patterns

Site location patterns postulated by archaeologists (see Byrne 1985; Godwin 1987) indicate that the major river corridors along the northeastern coast of New south Wales served as a focus of activity in the region. According to Tindale (1974:127) “there was a local abundance of food (in the river basins) and the broken intervening country was such as to discourage travel” and “only about one half of the available area was used by the people of these tribes. The rest represented little-used belts separating more favourable locations”.

In contrast, Coleman (1978, 1982) and Belshaw (1978) suggested that coastal populations in northeast New South Wales were semi-sedentary, living in villages or base camps and being dependent on estuarine and littoral resources throughout the year. The huts within these villages were substantial. In 1882 in the Ballina area, Rous reported seeing huts 30 feet long and six feet high.

It has been postulated that movements of large groups of people appeared to parallel the coast. There is, however, considerable debate about the extent of movement between northern New South Wales coastal and inland Aboriginal groups. McBryde (1976) argued that there was large-scale relocation of people on a seasonal basis, with summers spent on the coast fishing and collecting shellfish and winters spent hunting in the hinterland. McBryde (1976:53) also suggested that this seasonal movement of populations was generally along the main rivers. This suggestion is supported by ethnohistorical records from the Clarence region which document population movement to the coast in spring for fishing, and of winters spent inland hunting (Byrne 1981). Nevertheless, Byrne (1981) suggested that arrangements were made for inland groups to enter the territory of coastal groups for seasonal fish runs and ceremonial activities.

5.4 Economy

The Aboriginal groups in this region lived in an environment where “they were able to exploit, within a comparatively small area, a coastal and estuarine or riverine environment, bordered by sub-tropical rainforest, swamps and lightly timbered country. This environmental diversity resulted in a very favourable food supply, which was plentiful, varied and dependable” (Sullivan 1978:104). Marine and freshwater fish and shellfish, reptiles, mammals, birds and plant food provided a diverse diet. For example, plant species included the rhizomes of bracken (*Pteridium esculentum*) and the roots of the Gymea Lily (*Doryanthes excelsa*), Milkmaids (*Burchardia umbellata*) and Yams (*Dioscorea trasversa*).

The fruit of many species of plants were eaten including Fig (*Ficus* spp.), Native Guava (*Eupomatia laurina*), Pigeon Berry (*Monotoca elliptica*), Rough Tree Fern (*Cyathea australis*), Apple-berry (*Billardiera scandens*), Lance Leaf Geebung (*Persoonia lanceolata*), Lillipilli (*Acmena smithii*), wild grapes (*Vitus hyperglaucia*) and wild cherries (*Excarpua cupressiformus*). The nuts of the Moreton Bay Chestnut (*Castanospermum australe*), Bush Nuts (*Macadamia ternifolia*) and Buyna (*Araucaria bidwilli*) were also eaten.

Animal species exploited included possum, koala, bandicoot, pademelon, wallaby, kangaroo, flying fox, turkey, snake, lizard, echidna and turtle. Birds, fish and many varieties of shellfish were also part of the diet. Shellfish species gathered included cockle (*Anadara trapezia*), club whelk (*Pyrazus ebeninus*), rock oyster (*Crassostrea commercialia*), mud oyster (*Ostrea angasi*), hairy mussel (*Trichomya hirsute*) and pipi (*Plebidonax deltoides*).

5.5 Material Culture

Material culture for the northeastern region of New South Wales is generally similar (see McBryde 1978). This similarity is manifested in the characteristic unbarbed spears and wooden shields (McBryde 1978:178). Sullivan (1978:107) notes that "no barbed, pronged, or bone or shell tipped spears were used for fishing in this area though they were quite common elsewhere on the east coast". Other items included many artefacts made of wood or bark obtained from various trees. For example, shields were made from the wood of the Ironbark or Mangrove (*Avicennia officinalis*) trees and tea tree bark (*Melaleuca quinquenervia*) was used for the construction of huts. The bark from the Kurrajong (*Brachychiton populneus*) was used to make cord for the manufacture of fishing lines and nets. Ainsworth (1987:43) describes the types of nets used:

> "In catching fish they used what they called a "tow-row" – that is a finely meshed net attached to a stick of bamboo bent in the shape of a bow about eight feet across between the two ends. This gave a bag effect to the net and with a tow-row in each hand the blacks could surround the fish schools in narrow and shallow waters and catch them by the hundreds. The cordage of these nets, which were very strong and beautifully woven, was made from the inside fibre of the stinging tree and from the bark of the currajong. They used a similar net in hunting. This was made of the same fibre in long sections of four feet in width. These sections when joined together for the purposes of the chase would extend sometimes to a half-mile in length. Where game was plentiful in the forest or scrub the blacks would run the net after the manner of a fence in the shape of a semi-circle. Then the whole tribe with the doges would beat up the neighbourhood for a mile or two and drive all game – everything – towards the open end of the enveloping net"

Cordage was also used for tying up the ends of canoes. Canoes were generally made from a sheet of stringy bark which was gathered and bound at the ends and had thwarts jammed across the centre to hold the bark apart.

Maintenance tools included stone adzes and chisels, abrasive stones, bone awls and sharpened shell knives and scrapers. Boomerangs, clubs, spearthrowers and hafted axes were also manufactured. Ground-edge stone axes were generally manufactured from river pebbles. These pebbles were ground into shape on sandstone boulders which were generally situated in the bed of a watercourse as water is necessary for the grinding process. Vines were used to assist in climbing trees to capture possums or collect honey. The vine was used to support the climber and, if necessary, an axe was used to cut footholds.

5.6 Population Density

The northern New South Wales / southeast Queensland coastal zone was one of the most densely settled before the non-indigenous invasion of Aboriginal lands. The population density has been estimated at around 0.8 persons/km^2, which is comparable with other estimates of population density for coastal northern Australia (Hall 1982). This figure has been estimated, however, after non-indigenous incursion into the region; prior to direct contact the Aboriginal population was decimated by smallpox and other introduced diseases.

This estimate is supported by information provided by Fox (2006:8) who states that in 1823 John Oxley sighted about 200 Aboriginal men assembled on Fingal Head; in 1840

the Surveyor General recorded a very large encampment of over 300 Aboriginal people in the vicinity of the Cobaki Broadwater and the present day Coolangatta airport; in 1844 non-indigenous sawyers entering the Tweed were met by around 400 Aboriginals; and in 1845 the Tul-gi-gin people comprised around 200 men and women.

5.7 Implications for the Indigenous Archaeological Record

As Hall (1996:17) notes:

> Given such a range of tasks and activities at a number of levels, it is obvious that people would have left traces pertaining to most of them over much of the landscape; and when the temporal dimension is added, there would be very few localities that would not have been visited in the past. However, when one considers the kinds of material used and their preservational qualities, only a few physical traces would be expected to last the ravages of time...Thus, after hundreds of years, apart from localities which were most heavily used and which witnessed the accumulation of material in heaps (such as middens) only stone (in a form ranging from single artefacts to fish traps), some bone (including burials) and shell and fragments of charcoal (from cooking fires) remain distributed across the landscape.

In this article Hall (1996), however, did not address the possibility of sub-surface material. Also over time, items may be covered as a result of natural processes; this is especially applicable in sandy or aggrading environments. Hence, items may not only be distributed across the landscape but also below the present ground surface.

5.8 Post-Contact History

It was with the invasion of pastoralists, who came to take the land and stay, rather than the non-indigenous explorers or early timber getters, that contact became more extensive. Subsequent to this scale of contact are associated changes in the archaeological record. In this case, the most obvious effect is a change in Aboriginal demographic patterns and as a result site distribution and frequency. Associated with the non-indigenous settlement are a number of other changes such as the cessation of seasonal movement and the establishment of fringe camps. Contact places (e.g. massacre sites, fringe camps, missions, reserves, etc.) can in themselves be considered by members of the Aboriginal community as sites and places of cultural heritage significance. The aim of this Sub-section is to provide both a social and cultural context to these changes.

The typical pattern of initial friendly contact, followed by Aboriginal population decline through open conflict and diseases, was repeated time and time again as the frontier spread across the continent (ATSIC 1990). As settlement spread beyond the government-established areas, random shootings and premeditated massacres of groups of women, children and men were undertaken by squatters in an effort to clear their selections of Aborigines. Sometimes Aboriginal waterholes were poisoned, or Aboriginal people given flour, sugar or damper mixed with arsenic.

Native Mounted Police operated in northern New South Wales from around the late 1840s. Consisting of armed, mounted Aboriginal troopers under the command of white

officers, their mission was to reduce Aboriginal resistance to the intrusion and activities of the early non-indigenous settlers. This Force was used throughout the entire region to 'disperse' local Aborigines. 'Dispersal', a euphemistic term for murder, was an official Government policy for dealing with Aboriginal people (Cato 1982:4). Elder (1988:106) notes that "everyone on the frontier knew of the real brutality of the native police but the official records portrayed this band of licensed murderers as models of probity and conservatism". Elder (1988:106) quotes from a book on the native police:

> A young 'sub', new in the force...used the word 'killed' instead of the official 'dispersed' in speaking of the unfortunate natives left *horse de combat* on the field. The report was returned to him for correction with a severe reprimand for his careless working...The 'sub' being rather a wag corrected his report so that the faulty portion now read as follows. 'We successfully surrounded the said party of aborigines and dispersed fifteen, the remainder, some half dozen, succeeded in escaping....

Rowley (1981:86) also notes that the use of the Native Police for 'dispersal' amounted in practice to 'shoot-on-sight' against groups thought to threaten settlers and stock. Walker of the Native Police Force noted:

> The blacks...were in a manner outlawed in their own country, being hunted from the river and creek frontages and thus deprived of means of lawfully obtaining food. Driven to desperation, they carried out a constant war of retaliation with the whites and lived solely on cattle...It is the hostile bearing of the settlers that causes the blacks to keep in such large numbers, for they cannot continue the assemblies customary to them for more than a few days on account of the want of food...They supply this want from the herds of the settlers...

For example, at Shaws Bay, near Ballina, Haglund (1991) notes that a massacre occurred around 1853-54. Ainsworth (1987:45) states that between 200 and 300 Aboriginal people were camping on a "slope of the hill facing the valley reaching over towards Black Head". As a result of an attack by Native Mounted Police at least 30 and 40 people are believed to have been "killed outright and many who got away were badly wounded" (Ainsworth 1987:45).

As Aboriginal people were dispossessed of their land many became dependant fringe-dwellers around the new settlements. Some were employed as stockmen, domestic servants and shepherds. Within the study region, the Aborigines were of great assistance to the colonisers in mustering bullocks before fences were erected, finding cedar trees, cutting the undergrowth for them and also for clearing undergrowth and vines before a selection was cleared of its trees. They also assisted with hauling timber. Aborigines became skilful in breading in horses and as police trackers and were often on the staff at police stations. The women often took on jobs with households. However, wages were not always given for this work (England and Walker 1976: 17, 46).

Other Aborigines were forced into government reserves or church missions, where they had to rely on non-indigenous people for handouts of food and clothing. In the 1870s churches again became interested in the welfare of the Aborigines and set up more missions. In 1882 the Aborigines Protection Board of New South Wales was formed and the first reserves were established. For almost the next 100 years - until the 1960s - Aborigines were increasingly institutionalised and their rights restricted by legislation (ATSIC 1990).

In 1909 the *New South Wales Aborigines Protection Act* was passed (ATSIC 1990). The Board established by this Act owned all the improvements on reserves, had the

power to move Aboriginal people out of towns, appoint police as local guardians for reserves and to control all aspects of the lives of Aboriginal people living on reserves. Amendments to the Act in 1915 and 1918 allowed the Board to remove children from their parents for training, and to force "half-castes" to leave the reserves. These actions led to a considerable loss of traditional knowledge from being passed on between generations, and the break up of families. The practise of traditional lifestyles, including language and religion, were actively discouraged or prohibited. From the 1920s the official government policy changed from blanket 'protectionism' to forced assimilation for 'part-Aborigines' and in 1940 this assimilation policy was extended to all Aborigines. An implication of this policy was the eventual closure of all reserves. However, the Commonwealth policy of 'self-determination' for Aboriginal people was presented in 1972.

In 1983 the *Aboriginal Land Rights Act* was passed in New South Wales. This Act recognises that the State of New South Wales was traditionally owned and occupied by Aboriginal peoples and acknowledges the vital importance of land in Aboriginal culture. Under this Act, a system of Land Councils - at State, regional and local levels - were set up. Aboriginal culture in New South Wales is thus being revitalised. An important issue is the management and protection of Aboriginal sites and heritage items. Land Councils and other organisations (e.g. Aboriginal Corporations) provide advice to the National Parks and Wildlife Service, museums and consulting archaeologists on community wishes on these matters.

In the case of the northern coast of New South Wales, Byrne (1986) notes that many of the mission communities were able to maintain close links with their former lands. Many of the older initiated people kept alive the traditions associated with sacred places and the communities have maintained a unique attitude to the land which is possibly more spiritual than economic (also see Sub-section 8.2). The impact of non-indigenous settlement has been marked, but despite the assimilationist policies of past Governments, Indigenous people have not lost their Aboriginality. There is a demonstrable continuity of Aboriginal culture, and it has adapted rather than perished (see Godwin and Creamer 1984).

5.8.1 Implications for the Cultural and Archaeological Record

With the invasion of the area by non-indigenous people, the traditional lifeways of the local Aborigines were severely disrupted. Although some Aboriginal site types may have persisted into the post-invasion period (e.g. occupational camps), they generally ceased to be formed.

In the initial phase of this period non-traditional items were incorporated into subsistence activities. For example, steel axes replaced the traditional stone axe and glass and electricity insulators were sometimes flaked to obtain sharp cutting implements. Hence, the archaeological record may reflect the use of such non-traditional items.

6.0 INDIGENOUS ARCHAEOLOGICAL CONTEXT

The aim of this Section is to provide a general understanding regarding Indigenous archaeological site potential within the Project Area. The purpose of presenting this data is to provide background information so that sound predictions regarding the archaeological potential of the Project Area can be formulated. In Sub-section 6.1 an outline of the results of archaeological research for the broader study region is provided. Further Sub-sections review archaeological consultancies undertaken in the vicinity of the Project Area (Sub-section 6.2) and discuss previously recorded sites (Sub-section 6.3).

6.1 Northern New South Wales Archaeological Record

Although Aboriginal occupation of Australia is dated to around 60,000 years ago, the oldest dated site in the region (northern New South Wales/southern Queensland) dates to at least 22,000 years (Neal and Stock 1986). This site is located at Wallen Wallen Creek, North Stradbroke Island. There is also a relatively good archaeological record for the past 6,000 years.

Current theory holds that, as Pleistocene glacial ice melted and the seas rose, coastal people were forced to adjust to the changing landscape (Hall and Hiscock 1988). Seas reached their present levels sometime around 6,000 years ago. Through time regionally isolated settlement-subsistence systems and associated socio-political entities developed (McNiven 1991). Some groups fissioned and may have annexed territory from groups further west of the coast. By about 2,500 years ago, the region was populated by numerous named groups with diverging languages, similar to those recorded historically. These diverse groups were far from isolated entities and a great deal of social interaction (trade, marriage and other ceremonies) took place during the year. Thus, rather than taking the form of a patchwork quilt over the landscape, these different societies were more like a living interwoven mosaic due to extensive social ties through intermarriage and other socially-linking mechanisms.

Several locations within this region of Australia have been the subject of archaeological research, especially during the past decade (see Hall and Hiscock 1988). Archaeological excavations have revealed a long and interesting prehistory. For example, to the north of the Tweed River, excavation was carried out at Bushrangers Cave, an Aboriginal camping place located at the base of a high cliff in the McPherson Range at the headwaters of the Nerang River. Analysis of excavated material revealed that occupation of this campsite commenced sometime around 10,000 years ago (Hall 1986; Hall 1999). The remains of food animals found at this site do not change throughout this long span of occupation. These remains indicated not only that Aboriginal people using this site enjoyed a diet of wallaby, possum, turkey egg, fish and other animals but also that the local environment had remained quite similar for at least the last six millennia. It is noteworthy that Bushrangers Cave is located on the eastern side of a historically recorded Aboriginal pathway running from the coast to the mountains and river valleys to the west. It is thought that this pathway, which permitted travel and social interaction between the various clans of the region, has been in existence for thousands of years.

Appleton (1993) excavated an estuarine midden site at Sexton's Hill on the Tweed River. The midden was comprised predominantly of oyster although fish (mainly bream and snapper) and some macropod bone were also present. Thirty stone artefacts were recovered including bone points. The time span for the use of the site is probably from 4,700 BP (Before Present) to 4,200 BP (Appleton 1993).

Barz (1980) excavated National Parks and Wildlife Service (NSW) site number 04-6-0006 at Terranora (4kms south of Fingal). This shell midden, which overlies basalt bedrock, is one of two excavated middens on the Tweed and is the only undisturbed midden investigated in this area. The base of the midden has been dated to 605 years BP and analysis of the excavated material showed an apparent change from reliance on fish resources to a greater use of shellfish over time. However, the lack of comparable investigations precludes statements regarding the site's representativeness or importance (Dallas 1988). Burials associated with this site were removed and re-intered at the Tweed River Aborigine memorial (see Piper 1994a).

In the 1960s Dr. Laila Haglund undertook the salvage excavation of the well-known Aboriginal burial ground at Broadbeach (Haglund 1976). Some 150 individuals were buried at this site. None of the remains dated prior to c. 1,200 years ago. From her analysis, Haglund (1976:87) suggested that "burial rites were apparently prolonged and complicated, consisting of many separate features which could be combined in different ways on different occasions". Given a fairly universal rule that cemeteries are an intra- rather than inter-community phenomenon (Pardoe 1988), the evidence suggests that Aboriginal groups in the region became established as separate socio-political entities within the past 1,500 years or so.

One of the most interesting features of the Bushrangers Cave evidence is that the deposition rate (i.e. the amount of material left at the site per each 100 years) of Aboriginal cultural items increases significantly after about 2,500 years ago (Hall 1986; Hiscock and Hall 1988; Mowatt 1989). This finding is consistent with results from other sites outside this local area and is interpreted as evidence of not only a general increase in Aboriginal population during the last few thousand years but also an increase in the number of named Aboriginal groups. It is postulated that the increase in the number of groups is due to their splitting into separate units and spreading further west from the coast to occupy less densely populated country (for details of this model refer to Hall and Hiscock 1988). On linguistic grounds it is possible that a split occurred within a larger Bundjalung group with new dialects forming through time to produce those of the modern communities. From the linguistic work of Crowley (1978) and Sharpe (1978), it would appear that the Bundjalung languages have spread from south to north, and that the latest spread may have been well within the past 2,000 years. This sort of explanation is consistent with evidence gathered about numerous Aboriginal societies during the past 200 years. For example, based on linguistic and archaeological evidence, it has been argued that the Gnugi people of Moreton Island, had begun to diverge from a larger group on Stradbroke Island by at least 500 (and possibly 1,000) years ago (see Bowen 1989; Hall and Hiscock 1988). This gradual process of fission eventually produced the numerous Aboriginal groups as well as the diverse (although related) set of languages and dialects in the region that were recorded by early non-indigenous people into this part of Australia.

6.2 Cultural Heritage Assessments in the Region of the Study Area

Numerous archaeological surveys have been conducted in the study region (e.g. Barker 1990; Barz 1980, 1982; Barz and Piper 1980; Bonhomme 1988; Border 1991, 1992; Dallas 1988; Davies 1991a, 1991b, 1992a, 1992b, 1992c, 1993, 1994, 1998, 2004; Hall 1980, 1990a, 1990b, 1991a, 1991b; Higgins 1990; Koettig 1988; Lilley 1981, 1982; Navin 1990; Piper 1983, 1990, 1994a, 1994b, 1997, 2000, 2001). A large number of these surveys, however, did not locate archaeological sites (e.g. Dallas 1988; Davies 1992a, 1992b; Hall 1980, 1990b, 1991b; Koettig 1988; Lilley 1981, 1982; Piper 1983, 1990). As a result of his survey of a proposed housing development at Cudgera Creek, Hastings Point, Lilley (1982b) suggests that poor ground surface visibility and large-scale disturbance are the main factors for a lack of archaeological sites in these areas (also see Hall 1990a, Lilley 1981 and Koettig 1988).

In 1990 Hall was involved in the assessment of Aboriginal sites at the Coolangatta airport. Hall (1990a) located two site complexes and "occasional stone artefacts and shellfish remains in isolated spots in the more elevated parts". Due to visibility constraints in the swamp area bordering the Cobaki Broadwater, Hall (1990a) stated that "the evidence for Aboriginal occupation was restricted to the slightly higher ground surrounding the swamps". Within the two site complexes, shellfish remains were located at varying densities with evidence suggesting that subsurface remains were also present. Stone artefacts were also located over the area. Hall (1990a) noted the common presence of "bevelled pounders", large wedge-shaped artefacts that are found throughout the coastal zone between Cooloola and the Tweed River, that have been identified as tools used in the processing of the rhizome of the fern *Blechnum indicum* (Gillieson and Hall 1982; Higgins 1988).

In 1990 Hall completed a survey of the Cobaki Lakes Project. The Cobaki Lakes Project site was initially surveyed in 1981 by Lilley, but due to visibility constraints a second archaeological survey was undertaken by Hall (1990b). Despite the Cobaki Lakes Project site being situated just to the west of the site complexes located on the northern margin of Cobaki Broadwater, no archaeological remains were located. Hall (1990b) suggests that the negative results may be related to factors such as sand mining, ploughing and erosion. Poor ground surface visibility in the swamp areas also placed constraints on the survey.

Davies (1991a) surveyed the Telstra Optic Fibre Cable route between Anderson's Ridge and Banora Point and recorded shell middens in the dunes adjacent to Crabbes Creek Beach and a contact site on the banks of the Tweed River. The terrain adjacent to and behind the foredunes of Crabbes Creek Beach was also surveyed by Barz (1982) and Navin (1990).

Hall (1991a) and Davies (1992b) have undertaken surveys to the east of Chinderah. Both surveys were of low-lying coastal heath with a sand dune extending along the margin. This dune originated as a sand bar on a surface which dates some 220,000 BP. As a result of subsequent episodes of deposition and erosion some parts of this dune are Pleistocene (before 10,000 BP) while others are late Holocene (2,000 to 3,000 BP). Hall (1991a) located two low density sites on this dune and noted that the archaeological material at one of the sites was eroding from below the present surface suggesting that "more material may be present over a more extensive area". Hall (1991a) stated that "given the considerable antiquity of the sand ridge…it is quite

possible that similar materials exist undetected below its surface (especially along the top of the ridge)", and noted that the lack of high density scatters (and other archaeological remains) "may be more a function of poor ground surface visibility plus sand deposition over such remains than a reflection of absence". Although the dune has high archaeological potential, no Aboriginal archaeological material was located during Davies' (1992b) survey of the southern extent of the dune. Davies (1992b) suggested that factors contributing to the negative result included restrictions imposed by poor ground surface visibility, natural erosion and deposition as well as cultural factors such as sand removal and disturbance.

Hall (1991b) conducted an archaeological survey of the Chinderah Bypass road without locating archaeological material. An archaeological survey of a residential development area located on hilly terrain between Cudgera and Christies Creeks was undertaken by Collins (1993 - see Rich and Ahoy 1993). Four isolated finds and four low density stone artefact scatters (two of which were associated with shellfish fragments) were located. Of these only one stone artefact was located on low-lying terrain.

A quarry site was located near Cudgen Lake during an archaeological survey of the Cudgen Lake Nature Reserve Proposal. The site was found at the base of a small hill which extended down to the Lake (see Rich and Ahoy 1993).

During a survey conducted in 1980, Piper reported some 20 Indigenous archaeological sites in this general locality including 10 shell middens, four stone arrangements and six isolated occurrences of stone artefacts (Piper 1980 cited in Rich and Ahoy 1993). Piper (1976 cited in Rich and Ahoy 1993) has also located two sites on elevated terrain in the Tweed River floodplain. Both were low density artefact scatters located on elevated areas about two metres above the floodplain beyond the swamp and flood level (see Rich and Ahoy 1993).

Davies (1994) undertook an archaeological assessment of the Billinudgel to Chinderah bypass with representatives from the Tweed Byron Local Aboriginal Land Council (LALC). The present study area is located to the west of this bypass (now the Pacific Highway). Indigenous archaeological material was not located during this survey. Davies (1994) noted that the result may have been due to factors such as poor ground surface visibility and ground surface disturbance. As a result of this study, Davies (1998) identified three areas for further archaeological work. These areas included the crest of a spur line, the high bank of Cudgera Creek and the crest of a major ridge line. Archaeological test excavations were undertaken at these three locations without uncovering Indigenous cultural material.

Collins (1999 cited in Department Transport and Regional Services 2004) undertook an assessment of the route options for the Tugun Bypass. As a result of a field reconnaissance four low-density stone scatters and a single isolated artefact were recorded. All were in disturbed contexts. Although these sites were assessed as having a low level of archaeological (scientific) significance, the Indigenous group involved in the assessment considered that the sites had high social and/or cultural significance values and that the cultural landscape of which they were part was worthy of preservation (Collins 1999 cited in Department Transport and Regional Services 2004).

Davies (2004) and representatives from the Tweed Byron LALC undertook a cultural heritage assessment of a parcel of land a Cudgen to the south of the present study area. The terrain was low-lying and planted with sugar cane. No archaeological or cultural sites / places were identified.

Cultural heritage surveys and assessments (including sub-surface testing) of the Tugan Bypass from Stewart Road in Queensland to Kennedy Drive in New South Wales was undertaken over a period of time between 2000 and 2005 (Department Transport and Regional Services 2004). This Bypass is located through the Cobaki area and Murraba (see Sub-section 6.3). The location of previously recorded sites was confirmed, and six areas were recorded where stone artefacts were located (Department Transport and Regional Services 2004). It is understood construction activities associated with the Bypass have uncovered further stone artefacts (Ian Fox, pers. comm. 2008).

6.3 Recorded Indigenous Cultural Heritage Sites in the Vicinity of the Study Area

A search of the New South Wales Department of Environment and Climate Change Aboriginal Heritage Information Management System (AHIMS) has shown that no recorded sites appear to be located specifically within the Project Area.

However, from background research and information previously provided by Ian Fox (pers. comm. 2008) for another project, it is known that recorded sites are present in the vicinity of the Project Area. Numerous sites have been recorded by Ian Fox for his PhD thesis: A Cultural Landscape Defined and Analysis of the Bundjalung Mapping Project as an aid to Aboriginal Cultural Heritage Management. This thesis which was undertaken with the cooperation of Indigenous groups in the area has resulted in the recording of sites of cultural significance in the Bundjalung area, particularly within the Tweed and Byron Shire Council areas. A map previously provided by Mr Fox, highlights locations of cultural significance which contain Registered Sites and locations with a higher probability for containing sites of Cultural Significance. The Project Area is not within or immediately adjacent to any of these locations.

Recorded sites in the vicinity include:

- **Cobaki**

The Tul-gi-gin name for this area is “Murraba”; this name has also been given to the hill to the east of this area (Ian Fox, pers. comm. 2008). Murraba is an extremely significant area for Indigenous people.

The low ground / swamp to the east of the Cobaki area and behind Coolangatta (Aboriginal name: Goodlebar) which is now called Goodwin Park, was known as ‘Garwong’, meaning a place to be feared (Ian Fox, pers. comm. 2008).

Numerous sites are located in the Cobaki Broadwater / Cooloongatta Airport area including middens, open camp sites, burials and a ceremonial site (Ian Fox, pers. comm. 2008; DECC AHIMS Database). One of these sites is located on a low rise on the foreshore of Cobaki Broadwater within the boundaries of Gold Coast Airport. The site is listed on the Register of the National Estate. The site is a complex of stratified middens with stone artefacts and deposits to a depth of up to 75 cm. The National Estate midden complex has outstanding value to the local Aboriginal community as an educational resource and has intact cultural deposits that have considerable archaeological research potential. It is also the only estuarine midden complex that still retains much of its former environmental context (Department Transport and Regional Services 2004).

Another midden is recorded near Cobaki Broadwater immediately west of the Gold Coast airport boundary. The site is in poor condition and consists of a surface scatter of pipi, whelk and cockle shells, with a few small stone artefacts, extending for 120 to 150 m along a section of vehicle track (Department Transport and Regional Services 2004).

- **Ukerebagh Island**

This island is an important mythological (ritual) place. A shell mound with stone artefacts, a resource and food gathering area and potential archaeological deposits have also been recorded on this Island (DECC AHIMS Database).

- **South Tweed Heads / Terranora/ Banora Point**

Several sites are located in this area including a significant number of middens, as well as a bora/ceremonial ground and midden, natural mythological (ritual) site, open camp sites and burials (DECC AHIMS Database).

- **Razorback**

Razorback, the ridge fringing the Tweed area, has strong mythological significance; it is known as 'Joongurranahreean' (The Place where the Pelican Played) (Tweed Heads and District Historical Society Inc. 1958; Ian Fox pers. comm. 2008).

6.4 Summary of Archaeological Context

Based on the information provided within this Section of the report, it is considered that archaeological knowledge regarding possible site types and potential areas for site location can be proposed. Based substantially on the information contained within this Section with additional information from Section 9.2, a predictive model of site location for the study area can be proposed (see Sub-section 9.2.1).

7.0 DESCRIPTION OF THE STUDY AREA

This Section of the report outlines the environment and natural resources of the study area (Sub-section 7.1). These are discussed in terms of their possible implications for the archaeological and cultural record. Following this discussion, and based on information contained in all the preceding sections of this report, a predictive model for the study area will be proposed (Sub-section 9.2.1).

7.1 Environment and Resource Background

The following sections outline the topography, geology, vegetation, and fauna patterns within the study area. These aspects of the environment are indicators for archaeologically sensitive areas. For example, the archaeological implications for these related factors include:

- **Topography**

This factor relates specifically to access and available camping locations.

- **Geology and Soils**

An understanding of the geology of the region provides information related to the types of lithic materials available for exploitation by Aboriginal people. Soils are derived from the underlying geology or from fluvial or alluvial processes which have the potential to conceal or expose sites. In areas where a deep soil profile is present the potential for stratified archaeological sites is greater. Soils can also influence vegetation patterns.

- **Vegetation**

The type of vegetation communities present in the region relate directly to the types of plant species available for exploitation and indirectly to the faunal species supported by the available plant species.

- **Fauna**

The type of faunal species present relates to various factors including vegetation type and water availability. Additionally, terrain types (e.g. open coast, estuarine, valleys, ranges, etc) also affect the presence/absence of particular species.

All these factors affected the types of exploitation strategies employed by Aboriginal people and hence the formation of the archaeological record. Additionally, these factors also affect the survival and present detectability of sites (see Sub-section 9.1).

7.1.1 Topography

The Project Area is comprised of a low ridge line rising to a height of around 25m AHD (Australian Height Datum) surrounded to the east and south by lower lying terrain with elevations of around four to five metres AHD. Bilambil Creek is located along the southern portion of the western boundary.

- **Archaeological Implications**

The main element within the above mentioned topographic areas that may have been utilised by Aboriginal people may have been the banks of Bilambil Creek (see sub-section 9.2.1). Evidence of the use of this topographic feature would be in the form of one or more of the potentially occurring archaeological site types (see Sub-section 8.1). Although not always evident from the archaeological record, cultural factors may have affected the placement of camps within the study area.

7.1.2 Geology and Soils

The geology present within the area is comprised of Palaeozoic deposits of weathered metamorphic rocks of the Neranleigh-Fernvale Group (greywacke, slate phyllite quartzite, metasiltstone). Soil covering these deposits comprise red brown and yellow brown clay / silt soils which appear to be around one metre deep (Shaw Urquhart Pty Ltd 2008).

- **Archaeological Implications**

Although lithic raw materials within the bedrock (e.g. greywacke) are suitable for the manufacture of stone artefacts, such materials may not be exposed on the ground surface. As noted above soil profiles are generally deep and bedrock is at least one metre below the ground surface. Hence, it is unlikely that lithic raw material suitable for the manufacture of stone artefacts was available specifically within the study area.

7.1.3 Vegetation

The majority of native vegetation has been removed as a result of previous uses of the Project Area (see Sub-section 7.1.5). James Warren and Associates Pty Ltd (2008) report that the Project Area is highly disturbed with the majority of the land being infested with exotic weeds. Some patches of forested vegetation (Camphor laurel) occur along the property boundaries including the riparian zone adjacent to Bilambil Creek. Some elements of riparian rainforest are also present immediately adjacent to the creekline.

- **Archaeological Implications**

Vegetation types once present within the study area may have provided a variety of resources for exploitation (food and material culture items) (see Sub-sections 5.4 and 5.5). For example, the bark from some tree species were used for material culture items (e.g. containers, roof sheeting; see Sub-section 5.5). Honey and fauna (e.g. possum) were also removed from trees. The physical indications of these activities are likely to be visible as scarred trees (e.g. container scars, footholds, etc.). The implication of vegetation clearance that has occurred is that this site type would now not be present specifically within the area proposed for development. It should be stressed, however, that as a result of the significant modification to the vegetation pattern since non-indigenous settlement, it is difficult to draw inferences between current patterns and past Indigenous use.

7.1.4 Fauna

As mentioned above (Sub-section 7.1), the appearance and distribution of fauna within an area relates to factors such as vegetation communities, water availability and terrain types. It is considered that prior to non-indigenous settlement the study area would have contained a diverse range of faunal species. Non-indigenous settlement and associated economic activities have disrupted the area's original faunal communities.

- **Archaeological Implications**

Numerous faunal species were utilised by Aboriginal people and indicators of this activity may be present in the form of bone and shellfish remains. Shellfish remains may occur as both surface and sub-surface (or stratified) deposits, whereas generally bone remains are most likely to occur within stratified archaeological deposits or in a sub-surface context.

7.1.5 Prior Land Use

It is understood that at some time in the past the Project Area was cleared of vegetation and the area used for cattle grazing. Since this time, a quarry was established on the site with quarrying activities being undertaken on the western part of the low ridge and on the upper part of the eastern side of the ridge (see **Figure 4**). Shaw Urquhart Pty Ltd (2008).note that "the quarrying activities have resulted in the formation of a roughly south west to north east-trending quarry face, or cliff line, varying in height from around 5m at its south western end to 17m towards the north eastern end. The batter angles on the quarry faces vary from around 35^0 to sub-vertical". Shaw Urquhart Pty Ltd (2008) also note that possibly as a result of preferential quarry excavations "three raised mounds of rock are present in the central western area of the site around 30m from the quarry face".

Hence, as a result of these activities, it is considered that the ground surface and immediate sub-surface layers within the majority of the Project Area have been considerably disturbed.

7.1.6 Summary Implications

It is considered that, given the environment and resources (primarily flora and fauna) available, the terrain within the study area may have been exploited by Aboriginal people. The exploitation strategies would have left visible markers in the landscape (i.e. specific site types - see Sub-section 8.1). However, the detection and survival of such visible markers is often conditional upon natural (e.g. sheet wash, erosion, deposition) and cultural processes (e.g. non-indigenous land use). As a result of prior land use activities, it is unlikely that scarred trees would be present and it would be unlikely that any surface archaeological material would be *in situ*.

Figure 4. Land Use within the Project Area

8.0 THE POTENTIAL CULTURAL HERITAGE RECORD

Although Aboriginal people may have exploited all parts of the terrain present within the study area, their activities will only be reflected in the **archaeological** record if there are physical remains. However, many sites of significance to Aboriginal people do not contain such remains (cultural sites). In the following Sub-sections and based on information provided in the previous sections of this report, the most likely archaeological (Sub-section 8.1) and cultural (Sub-Section 8.2) site types that may be found within or immediately adjacent to the study area are discussed. The notion of Cultural Landscape is discussed in Sub-section 8.3.

8.1 Archaeological Site Types

There are potentially at least three archaeological site types that may be located within the study area:

- **Stone Artefact Scatters**

Stone Artefact Scatters are the remains of activity sites and contain evidence of Aboriginal activities such as the manufacture of stone artefacts. These sites may represent periods of variable duration and may reflect a variety of activities. Due to the resilient nature of stone material, Stone Artefact Scatters are also the most common archaeological site type.

Aboriginal people fractured fine-grained isotropic rocks to produce sharp cutting and scraping instruments. The raw material and form of stone tool artefacts can be quite varied, although fine-grained isotropic rocks, such as quartz, chert and silcrete, were preferred where sharp cutting and scraping edges were required. Crystalline volcanic rocks such as basalt, or pebbles of raw material such as argillite or greywacke, were flaked and then ground to form hatchet-heads for a variety of chopping and cutting tasks. The results of such activities as well as stone artefacts themselves, occur as scatters of modified stone (e.g. cores, flakes, flaked pieces, hammerstones, and anvils). Owing to site frequency and artefact density, Stone Artefact Scatters provide valuable information relating to past Aboriginal settlement and culture.

Stone Artefact Scatters often indicate the remains of occupational camp sites where other associated organic material has decayed, but they can also reflect the results of a specific activity (e.g. stone knapping site or food processing site). Sometimes Stone Artefact Scatters are recorded as Knapping Sites where only that specific activity is present. Knapping Sites and Stone Artefact Scatters, along with other site types such as hearths (fireplaces), shell middens, burials, shelters, etc., are often called Site Complexes.

Stone Artefact Scatters have been found in various locations, although the majority tend to be located on reasonably level ground. Higher density artefact scatters will generally be located closer to permanent water, whereas lower density and background scatters may be found some distance from permanent water.

Scatters of stone artefacts can be found in varying concentrations either in open terrain, or in rockshelter settings. The designation "site" is most commonly applied to high-

density concentrations of archaeological material, whilst the surrounding intermittent, low-density material is referred to as "background scatter". This "background scatter" often occurs in the form of isolated artefacts. Researchers often assume that all significant cultural information occurs within high-density concentrations of artefacts and areas of low artefact density or isolated items (background scatter) are of no value. A more accurate approach is to view the archaeological record as a more or less continuous artefact distribution of variable density across the landscape (see Dancey 1981; Dunnell and Dancey 1983:272; Dunnell 1992:34).

Stone artefact scatters and isolated artefacts have previously been recorded in the region of the study area (see Sub-sections 6.2 and 6.3).

- **Shell Middens**

In essence, Shell Middens are prehistoric food refuse heaps. They are deposits of shells of marine or freshwater molluscs that formed part of the Aboriginal diet. Midden sites can range considerably in size from large mounds to small, superficial scatters of shell. Middens may also contain the bones of terrestrial animals exploited for food as well as artefacts of stone, bone or shell (Bell 1986:28). These sites can occur close in inland lakes, swamps or rivers. Burials are sometimes located in middens (Bell 1986:30).

Shell middens have been recorded in the vicinity of the study area (see Sub-sections 6.2 and 6.3).

- **Contact and Post-Contact Period Sites**

Aboriginal settlement patterns and lifestyles changed significantly as non-indigenous people moved into local areas. Destruction of major portions of the natural landscape forced Aboriginal groups into a dependent relationship with the non-indigenous settlers. Locations where violent and non-violent contact occurred, fringe encampments which began to develop after contact and places of work (e.g. pastoral stations), are often remembered by Aboriginal people living today (Goulding 1993). Because of the close and personal historic contact Aborigines may have with these camps and locations, they regard them as significant and part of their history to be documented and, in some cases, preserved. While some of these sites still have visible remains, other sites often have no physical alterations to the landscape (e.g. massacre sites). Although there is often no documentation in relation to some of these sites, sometimes records do exist (e.g. station records, diaries, newspaper articles, etc.). Additionally, consultation with local and Indigenous informants assists in the identification of such sites.

8.2 Cultural Site Types

The following site types generally do not have physical indicators of their presence:

- **Mythological Sites and Places of Significance to Aboriginal People**

Mythological Sites usually involve no alteration to the natural landscape. As such they are archaeologically invisible and can only be identified with the aid of Aboriginal consultants. Such sites hold particular cultural significance to Aboriginal people.

Despite assumptions to the contrary, there exists a vital knowledge of 'sites of significance' amongst Aboriginal people. The Aboriginal Sites of Significance Survey conducted in New South Wales during the 1970s resulted in the recording of over 500 sites of Aboriginal significance. A large proportion of these were mythological or

ceremonial sites (Godwin and Creamer 1984). A case study by Godwin and Creamer (1984) at Yamba, at the mouth of the Clarence River, yielded numerous places of significance to Aboriginal people which were classified under a number of categories as follows:

Good Food Places

> These were places from which good supplies of fish, yams, birds' eggs, and so on, can be obtained.

Recent Camping Places

> These consisted of two kinds of places. First were those associated with the location of Aboriginal missions and reserves in the area over the past 100 years. Second were those associated with getting away from town, and these often served as base camps for food-gathering activities.

Dangerous Places

> These were identified as being where there had been a manifestation of a spirit, or where such manifestation might occur. Usually it involved a person being physically harassed by a spirit.

Mythological Sites

> These were identified by the presence of a feature central to a myth or that is explained by a myth. Mountains, rocks, swamps, and other natural places may be mythological places.

Ancestral Camping Places

> These were usually identified by spirit harassment.

Archaeologists generally cannot predict the presence of Cultural Sites. However, from background research and Aboriginal consultation the presence of such sites may be revealed.

8.3 Cultural Landscape

Although all the above mentioned site types are described in isolation of each other the pattern of distribution of such sites in the landscape should be viewed as providing information regarding the cultural landscape. That is, sites do not occur in isolation from other sites but are linked by various overlapping and interconnected relationships. Aboriginal people also managed the landscape in various ways (e.g. firing, deliberate plantings, fish traps, etc.) for resource utilisation. Thus, to Aboriginal people the landscape is part of the cultural heritage. As Ross (1996:9) notes:

> Generally speaking, Aboriginal people view landscapes differently from non-Aboriginal people. To most Aboriginal people a landscape is an entity in its own right. And it is more than the land alone, as the concept incorporates relationships between place and people, both in a spiritual sense and from the perspective of the resources which the landscape supplies. Although different components of the landscape may be recognised and named, the whole is more than the sum of its parts.

9.0 ARCHAEOLOGICAL PREDICTIVE MODELLING

This Section outlines the landscape archaeology approach employed in this study as well as archaeological site location predictions.

9.1 Landscape Archaeology Approach

One useful approach to generating predictive models for Aboriginal archaeological site location employs the notion of landscape archaeology (see Rossingnol and Wandsnider 1992). This approach follows the tenets of predictive modelling in hunter-gatherer archaeology whereby different environmental zones are seen to have provided distinctive sets of constraints on land-use patterns, particularly in terms of foraging behaviour and camp placement. Predictions are based on the known pattern of site distribution in similar land systems. The division into environmental zones relies on factors such as landforms, soils, vegetation, etc. These factors are assumed to have provided distinctive sets of constraints, which influenced prehistoric land use patterns in each zone. Hence, site types and their distribution should differ between zones. However, the detection of sites in each zone often depends on the following factors:

- **Ground surface Visibility**

This factor is determined by the nature and extent of the ground cover (e.g. vegetation).

- **Burial of Original Land Surfaces** (e.g. by aggrading flood alluvium or slope wash).

- **Exposure of Prior Land Surfaces** (e.g. surfaces eroded by water or wind erosion forming features such as gullies and sheet-eroded surfaces or washouts along vehicle tracks).

Exposure can also be enhanced by activities which disturb the ground surface (and at the same time disturb the site). Ploughing and logging are two examples of this form of disturbance. Research has demonstrated that ploughing / cultivation does not destroy artefacts but rather results in horizontal and / or vertical displacement, changes in the condition and preservation of artefact assemblages, changes in type frequencies and in the destruction or alteration of features and layers (see Boismier 1991:17). Horizontal displacement of artefact patterning is largely related to size, cultivation equipment type and slope. In general, studies have indicated that for all types of cultivation equipment, artefacts larger than 4 cm are moved the greatest horizontal distance, with artefacts smaller than 4 cm tending to be subjected to less horizontal displacement. Vertical displacement generally results in the segregation of artefacts by size. The results of vertical segregation is that artefacts greater than 4 cm tend to occur in higher proportions on the surface relative to the total plough zone artefact population. The most severe frequency changes occur among large artefact types, where the sorting action of plough implements causes them to be proportionally over-represented on the surface. Segregation effects on small artefacts result in them being either more evenly distributed throughout the plough zone or sorted to low levels within it. Both result in lower frequencies of small artefact types on the surface relative to the total plough zone population. Large artefact types have been shown by archaeological and experimental studies to be subjected to a greater amount of pattern disturbance and plough damage than smaller artefact types (Boismier 1991:18; also see Schofield 1991). That is, the

patterning of large artefact types are more suitable for recognising plough-induced patterning with small artefact types being better indicators of archaeological patterning.

The depth of the cultivation zone is also relevant. Stratified archaeological deposits in alluvial areas have the potential to extend undisturbed below the disturbed cultivation zone (around 30 - 40cm).

- **Site Obtrusiveness**

Some sites such as stone arrangements are easier to detect than (for example) sparse scatters of flaked stone artefacts, especially where the latter occur on well-vegetated surfaces.

- **Archaeological Visibility**

This factor relates to how observable archaeological material is on a given land surface. For example, stone artefacts will be easily observed on gravel free soils, where as on stony terrain these artefacts will be less easily detected.

9.2 Predictive Modelling

A predictive model is defined as “hypotheses or sets of hypotheses which simplify complex observations whilst offering a largely accurate predictive framework for structuring these observations” (Sebastian and Judge 1988:1). Before discussing the Predictive Site Location Model for this study, some caution is offered regarding this approach to site location. Location modelling is based on the results of archaeological surveys in similar and adjacent regions. Therefore, restricted survey strategies based on such prior distributions may only tend to confirm an already biased pattern. The accuracy of predictive models is reliant upon the standards of data from which they are derived. Given the constraints under which the major body of data are often collected (i.e. through limited field surveys), the level of understanding required to achieve the sort of heuristic, higher level framework, defined above is rarely achieved. Due to the fact that these surveys usually examine non-probabilistic samples and are restricted by variables such as topography and ground surface visibility, it is unavoidable that certain areas are not sampled. Therefore, although we may learn more about the nature of the record in certain areas of specific terrain, we learn little about the record that exists in areas that were under-represented in field surveys due to the constraints noted above. While techniques built into data collections such as testing of initial hypotheses and collection of independent data sets are avenues to address these problems, any study conducted with a low percentage sample coverage for a large area over a comparatively short time period will contain biases and inaccuracies which can become amplified when extrapolated. Thus, the identification of certain ‘archaeologically sensitive’ areas does not necessarily rule out the possibility that other areas also have archaeological potential. While recognising this in-built bias in the data base which provides the basis for predictive models of site location, they are employed for reasons of practicality.

9.2.1 Predictive Model for the Study Area

It is considered that the main site type that could be located within the study area would be stone artefact scatters, isolated stone artefacts and / or background scatter and / or shell middens / scatters. The area with the highest potential for such site types to be present would be relatively flat portions of the high bank of Bilambil Creek. This area would have been the preferred location for the placement of short term or intermittent camp sites.

As this area has been previously heavily impacted by prior land use activities, it is unlikely that, if any archaeological material is present, it would be *in situ*.

Based on these factors, it is considered that the study area has a generally low potential for the presence of archaeological material and particularly *in situ* archaeological material.

10.0 SOCIAL AND CULTURAL VALUES

Generally this report has addressed the archaeological potential but not the cultural significance of the study area to Aboriginal people. It is important to note that archaeological sites (e.g. stone artefact scatters, scarred trees, rock shelters, etc.) generally have cultural significance as such sites constitute evidence of prior occupation of the area by Aboriginal people and for this reason alone can be considered to have significance value. These values are irrespective of whether the site is *in situ*, disturbed or displaced. However, the likelihood of cultural sites being present has not been addressed. Besides topographical features there are other site types that are considered to have cultural significance. For example, some cultural site types relate to good food places or recent camping places (see Sub-section 8.2).

Background research has revealed that places of particular significance have not been recorded within the Project Area. Additionally, cultural sites were not recorded specifically within the Project Area during the Bundjalung Mapping Project (see Sub-section 6.3), nor was the area identified as having a higher probability for the presence of such sites. Hence, it could be assumed that cultural sites are not present. Generally, however, cultural significance values cannot be fully dismissed without consultation with the relevant Traditional Owners. As noted by Bowdler (1983:30), “identification of sacred sites and sites of significance to Aboriginal people is of necessity a matter for Aboriginal people. No-one else can decide whether the fact of significance or the degree of that significance to an Aboriginal community, except members of that community”.

The aim of this section of the report was to document information in relation to the social and cultural values including the spiritual, traditional, historical or contemporary associations and attachments which the study area may have for the Registered Stakeholder. However, as responses to the notification letters and advertisement were not received, there are no identified Registered Stakeholders for this Project.

Hence, although unequivocal assurance that sites with social and cultural values are not present within the Project Area cannot be provided, it is considered that the potential for such sites to be present is low.

11.0 SUMMARY AND CONCLUSION

Based on the above discussion, full assurance that cultural heritage will not be harmed by the proposed development cannot be provided. However, it is considered that based on prior land use activities, the lack of sites recorded on the AHIMS Database and the fact that the Project Area was not identified as a location of Cultural Significance or a location with a higher probability for containing sites of Cultural Significance by the Bundjalung Mapping Project, there is only a low to negligible potential for archaeological and / or cultural sites to be present. If archaeological sites were present they would not be *in situ*.

As noted in Sub-section 1.1, the Department of Environment and Climate Change note that the Preliminary Assessment should include three tasks. A summary of the results of these three tasks are outlined in **Table 1**:

Table 1. Summary of Tasks

1	A description of the location and nature of the proposed development;	This information is provided in Sections 2.0; 3.0 and 7.0.
2	A description of any social and cultural values including the spiritual, traditional, historical or contemporary associations and attachments which the place or area has for the present-day Aboriginal community	Based on the lack of recorded sites on the AHIMS Database and information contained within "A Cultural Landscape Defined and Analysis of the Bundjalung Mapping Project as an aid to Aboriginal Cultural Heritage Management" (Fox pers. comm.., 2008) there are no locations of cultural significance which contain Registered Sites and no locations with a higher probability for containing sites of Cultural Significance within the Project Area.
3	An assessment of which of the Aboriginal cultural heritage values that are known or likely to occur are likely to be directly or indirectly affected by the proposal	There do not appear to Aboriginal cultural heritage values that will be directly or indirectly affected by the proposal. Under the *National Parks and Wildlife Act, 1974* (as amended)(Section 90) it is an offence to destroy, deface, damage or desecrate, or cause or permit the destruction, defacement, damage or desecration of, an Aboriginal object or Aboriginal place. Hence, at any time during the Project it is suspected that an Aboriginal object has been uncovered, the developer must immediately contact the Department of Environment and Climate Change (Planning and Aboriginal Heritage – North East) on (02) 66515946

12.0 RECOMMENDATIONS

Based on information contained within this report, the following recommendations are provided:

(1) That no further cultural heritage assessments (e.g. site inspection; cultural heritage survey) of the Project Area are required;

(2) Workers employed on the project, particularly any jobs associated with initial vegetation clearance / topsoil stripping, should undergo a cultural heritage induction so that they are aware of the types of cultural heritage material that may be uncovered and the process to follow in the event that cultural heritage material is uncovered. The cultural heritage induction should be presented by a suitably qualified person;

(3) Should future activities associated with the development of Lots 2 and 3 DP 244652, Hogans, Urliup and Bilambil Roads, Bilambil, uncover anything which may be interpreted as Aboriginal in origin, work in the vicinity of the find should cease immediately and the developer should inform the Department of Environment and Climate Change (NSW), Coffs Harbour, as soon as possible, for discussion, negotiation and direction. The provisions of the *National Parks and Wildlife Act of 1974* (as amended) state that it is illegal to damage, deface or destroy a relic without written permission of the Director of the Service. Those failing to report a discovery and those responsible for the damage or destruction occasioned by unauthorised removal or alteration to a site or to archaeological material may be prosecuted under the *National Parks and Wildlife Act 1974*, as amended.

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a) Confirmation is required as to whether appropriate public notification / advertising has been undertaken as required by Part 3A guidelines.

Section 4. of the report clearly documents that appropriate public notification / advertising was undertaken. That is, He **written notification** was provided to:

- Tweed Byron Local Aboriginal Land Council (LALC);
- Registrar of Aboriginal Owners;
- Native Title Services;
- Tweed Shire Council; and
- Department of Environment and Climate Change.

In addition (and based on a list of Aboriginal community groups for the north coast / far north coast of New South Wales provided by the Department of Environment and Climate Change), **written notification** was also provided to:

- Tweed Shire Aboriginal Advisory Committee;
- Tweed Aboriginal Cooperative Society Ltd.;
- Nganduwal Descendents; and
- Gold Coast Native Title Group.

All the above notification letters were forwarded on the 2nd June, 2008.

A **public notice** was inserted in the Northern Star on Friday 6th June, 2008.

b) the report prepared by Davies Heritage consultants Pty Ltd acknowledges that it has not addressed "the cultural significance of the study area to Aboriginal people" (p.28) which is required by the Part 3A guidelines.

The above quote is lifted out of context from the first paragraph of Section 10 of the repot; this paragraph is an introduction to Section 10 with the intention of stating that **up to Section 10 the cultural significance had not been addressed – Section 10 attempted to address this issue.**

The second paragraph of Section 10 states:

> Background research has revealed that places of particular significance have not been recorded within the Project Area. Additionally, cultural sites were not recorded specifically within the Project Area during the Bundjalung Mapping Project (see Sub-section 6.3), nor was the area identified as having a higher probability for the presence of such sites. Hence, it could be assumed that cultural sites are not present. Generally, however, cultural significance values cannot be fully dismissed without consultation with the relevant Traditional Owners. As noted by Bowdler (1983:30), "identification of sacred sites and sites of significance to Aboriginal people is of necessity a matter for Aboriginal people. No-one else can decide whether the fact of significance or the degree of that significance to an Aboriginal community, except members of that community".
>
> The aim of this section of the report was to document information in relation to the social and cultural values including the spiritual, traditional,

historical or contemporary associations and attachments which the study area may have for the Registered Stakeholder. However, as responses to the notification letters and advertisement were not received, there are no identified Registered Stakeholders for this Project.

Hence, although unequivocal assurance that sites with social and cultural values are not present within the Project Area cannot be provided, **it is considered that the potential for such sites to be present is low**.

In Section 11 (Summary and Conclusion), the following statement is made:

…. it is considered that based on prior land use activities, the lack of sites recorded on the AHIMS Database and the fact that the Project Area was not identified as a location of Cultural Significance or a location with a higher probability for containing sites of Cultural Significance by the Bundjalung Mapping Project, there is only a low to negligible potential for archaeological and / or **cultural** sites to be present.

Table 1 Point 2 (Section 11): concludes:

Based on the lack of recorded sites on the AHIMS Database and information contained within "A Cultural Landscape Defined and Analysis of the Bundjalung Mapping Project as an aid to Aboriginal Cultural Heritage Management" (Fox pers. comm.., 2008) there are no locations of cultural significance which contain Registered Sites and no locations with a higher probability for containing sites of Cultural Significance within the Project Area.

Table 1 Point 3 (Section 11) concludes:

There do not appear to be Aboriginal cultural heritage values that will be directly or indirectly affected by the proposal.

Hence, the Davies Heritage Consultants Pty Ltd report does not acknowledge that it has not addressed the cultural significance of the study area to the Aboriginal people – the issue was addressed and this is reflected in Section 10 and 11 of the report.

c) Have any results been received following the consultation with the Local Aboriginal Land Council and / or other Aboriginal community groups since the consultant's report was prepared in July 2008?

Responses have not been received from the Local Aboriginal Land Council and / or other Aboriginal community groups since July 2008.