

Annex B

Revised Sediment Pond Calculations

SWMP Commentary, Detailed Calculations

Note: These "Detailed Calculation" spreadsheets relate only to high erosion hazard lands as identified in figure 4.6 or where the designer chooses to use the RUSLE to size sediment basins. The "Standard Calculation" spreadsheets should be used on low erosion hazard lands as identified by figure 4.6 and where the designer chooses not to run the RUSLE in calculations.

1. Site Data Sheet

Site Name: Champions Quarry

Site Location: Tucki Tucki

Precinct: Modelling is indicative only and based on nominal subcatchments:

Description of Site: quarrying (Q1 & Q2)

Site area	Sub-catchments						Remarks
	Q1	Q2					
Total catchment area (ha)	3	1					
Disturbed catchment area (ha)	3	1					

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	F	F					From Appendix C
% sand (fraction 0.02 to 2.00 mm)							Soil texture should be assessed through mechanical dispersion only. Dispersing agents (e.g. Calgon) should not be used
% silt (fraction 0.002 to 0.02 mm)							
% clay (fraction finer than 0.002 mm)							
Dispersion percentage							E.g. enter 10 for dispersion of 10%
% of whole soil dispersible							See Section 6.3.3(e). Auto-calculated
Soil Texture Group	F	F					Automatic calculation from above

Rainfall data

Design rainfall depth (days)	5	5					See Sections 6.3.4 (d) and (e)
Design rainfall depth (percentile)	80	80					See Sections 6.3.4 (f) and (g)
x-day, y-percentile rainfall event	35.3	35.3					See Section 6.3.4 (h)
Rainfall R-factor (if known)	4360	4360					See Appendix B
IFD: 2-year, 6-hour storm (if known)	14.1	14.1					See IFD chart for the site

RUSLE Factors

Rainfall erosivity (<i>R</i> -factor)	4360	4360					Auto-filled from above RUSLE LS factor calculated for a high rill/interrill ratio.
Soil erodibility (<i>K</i> -factor)	0.06	0.06					
Slope length (m)	80	50					
Slope gradient (%)	5	5					
Length/gradient (<i>LS</i> -factor)	1.19	0.91					
Erosion control practice (<i>P</i> -factor)	1.3	1.3					
Ground cover (<i>C</i> -factor)	1	1					

Calculations

Soil loss (t/ha/yr)	404	308					
Soil Loss Class	4	3					See Section 4.4.2(b)
Soil loss (m ³ /ha/yr)	311	237					
Sediment basin storage volume, m ³	158	40					See Sections 6.3.4(i) and 6.3.5 (e)

SWMP Commentary, Detailed Calculations

2. Storm Flow Calculations

Peak flow is given by the Rational Formula:

$$Q_y = 0.00278 \times C_{10} \times F_y \times I_{y,tc} \times A$$

- where:
- Q_y is peak flow rate (m^3/sec) of average recurrence interval (ARI) of "Y" years
 - C_{10} is the runoff coefficient (dimensionless) for ARI of 10 years. Rural runoff coefficients are given in Volume 2, figure 5 of Pilgrim (1998), while urban runoff coefficients are given in Volume 1, Book VIII, figure 1.13 of Pilgrim (1998) and construction runoff coefficients are given in Appendix F
 - F_y is a frequency factor for "Y" years. Rural values are given in Volume 1, Book IV, Table 1.1 of Pilgrim (1998) while urban coefficients are given in Volume 1, Book VIII, Table 1.6 of Pilgrim (1998)
 - A is the catchment area in hectares (ha)
 - $I_{y,tc}$ is the average rainfall intensity (mm/hr) for an ARI of "Y" years and a design duration of "tc" (minutes or hours)

Time of concentration (t_c) = $0.76 \times (A/100)^{0.38}$ hrs (Volume 1, Book IV of Pilgrim, 1998)

Note: For urban catchments the time of concentration should be determined by more precise calculations or reduced by a factor of 50 per cent. Place an x in the appropriate column below to automatically halve the time of concentration for that sub-catchment.

Peak flow calculations, 1

Site	A (ha)	Place an x here to halve t_c	t_c (mins)	Rainfall intensity, I , mm/hr						C_{10}
				$1_{yr,tc}$	$5_{yr,tc}$	$10_{yr,tc}$	$20_{yr,tc}$	$50_{yr,tc}$	$100_{yr,tc}$	
Q1	3		12	81	126	139	157	181	199	0.9
Q2	1		8	95	148	164	186	213	235	0.9

Peak flow calculations, 2

ARI (yrs)	Frequency factor (F_y)	Peak flows						Comments
		Q1 (m^3/s)	Q2 (m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	
1 yr,tc	0.67	0.407	0.159					
5 yr,tc	0.92	0.870	0.341					
10 yr,tc	1	1.043	0.410					
20 yr,tc	1.07	1.261	0.498					
50 yr,tc	1.23	1.671	0.655					
100 yr,tc	1.39	2.076	0.817					

4. Volume of Sediment Basins, Type D and Type F Soils

Basin volume = settling zone volume + sediment storage zone volume

Settling Zone Volume

The settling zone volume for Type F and Type D soils is calculated to provide capacity to contain all runoff expected from up to the y-percentile rainfall event. The volume of the basin's settling zone (V) can be determined as a function of the basin's surface area and depth to allow for particles to settle and can be determined by the following equation:

$$V = 10 \times C_v \times A \times R_{x\text{-day, } y\text{-}\%ile} \text{ (m}^3\text{)}$$

where:

10 = a unit conversion factor

C_v = the volumetric runoff coefficient defined as that portion of rainfall that runs off as stormwater over the x-day period

$R_{x\text{-day, } y\text{-}\%ile}$ = is the x-day total rainfall depth (mm) that is not exceeded in y percent of rainfall events. (See Sections 6.3.4(d), (e), (f), (g) and (h)).

A = total catchment area (ha)

Sediment Storage Zone Volume

In the detailed calculation on Soil Loss Classes 1 to 4 lands, the sediment storage zone can be taken as 50 percent of the settling zone capacity. Alternately designers can design the zone to store the 2-month soil loss as calculated by the RUSLE (Section 6.3.4(i)(ii)). However, on Soil Loss Classes 5, 6 and 7 lands, the zone must contain the 2-month soil loss as calculated by the RUSLE (Section 6.3.4(i)(iii)).

Place an "X" in the box below to show the sediment storage zone design parameters used here

	50% of settling zone capacity,
X	2 months soil loss calculated by RUSLE

Total Basin Volume

Site	C_v	$R_{x\text{-day, } y\text{-}\%ile}$	Total catchment area (ha)	Settling zone volume (m ³)	Sediment storage volume (m ³)	Total basin volume (m ³)
Q1	0.90	35.3	3	953.1	158	1111.1
Q2	0.90	35.3	1	317.7	40	357.7

Note that designers should achieve a minimum 3:1 length:width ratio in Type D or F basins

Annex C

Anthropological Report

Anthropological Assessment
of proposed extension of the
Champions Quarry
1586 Wyrallah Road
Tuckurimba NSW

CONTENTS

- 1. PURPOSE**
- 2. PROPERTY DESCRIPTION**
- 3. INTRODUCTION**

PART A

- 4. DESCRIPTION OF THE TRADITIONAL SOCIETY**

PART B

- 5. THE BANDJALANG BORA CEREMONY: GENERAL CONSIDERATIONS**
- 6. THE TUCKI TUCKI BORA RING AND SURROUNDING LANDSCAPE**
- 7. CONCLUSION TO PART B**

PART C

- 8. BANDJALANG BURIALS: GENERAL CONSIDERATIONS**
- 9. THE POSSIBILITY OF BURIALS HAVING OCCURRED ON THE
CHAMPIONS QUARRY PROPOSED EXPANSION SITE:**
- 10. CONCLUSION TO PART C**

PART D

- 11. TRADITIONAL ECONOMY AND THE PROJECT SITE**

PART E

- 12. COMMUNITY CONSULTATION**
- 13. COMMUNITY VIEWS**
- 14. BIBLIOGRAPHY**
- 15. ATTACHMENTS**
 - (a) CURRICULUM VITAE**
 - (b) DEPARTMENT OF ENVIRONMENT AND CLIMATE CHANGE,
N.S.W.: OPERATIONAL POLICY: PROTECTING ABORIGINAL
CULTURAL HERITAGE**

1.

Purpose

Tony Jefferies B.A. (Hons) was engaged by Champions Quarry to address the concerns raised by Ngulingah Land Council, in particular Mr. Murray John Roberts, regarding the proposed extension to Champions Quarry, Wyrallah Road, Tuckurimba. The concerns are detailed in the Introduction following.

I have read the guidelines provided in the Department of Environment and Climate Change New South Wales *Operational Policy: Protecting Aboriginal Cultural Heritage* and prepared this report in accordance with those guidelines.

Property Description

The Subject Lands are located on:

Lot 5 DP857530:41:77ha (94 Hazlemount Lane, Tuckurimba NSW 2480)

Lot 1 DP729118:1.75ha (1586 A Wyrallah Road, Tuckurimba, NSW 2480)

Lot 4 DP588125:38.71 ha (A Wyrallah Road, Tuckurimba NSW 2480)

Lot 183 DP 1013042:46.85ha (1692 Wyrallah Road, Tuckurimba NSW 2480)

Lot 1 DP 127550:34.30ha (1694 Wyrallah Road, Tuckurimba NSW 2480)

Lot 101 DP755746,(1782F Wyrallah Road, Tuckurimba NSW 2480)

Introduction

This anthropological assessment of the Aboriginal significance of the proposed extension to Champions Quarry is based on the following assumptions:

That there are no sites of significance, by which is meant djurbi:l or sacred sites, burial caves, bora rings, or other places of exceptional importance to Aboriginal people on the proposed expansion area. This conclusion is based on the findings of two archaeological and cultural heritage surveys of the property (Appendix G Aboriginal Cultural Heritage

Assessment, Everick Heritage Consultants 2008; Appendix H Cultural Heritage Assessment ERM 2009). Heritage consultant Marcus Fergusson and Tony Jefferies walked over the land on 12-05-2010 and were able to find no evidence of camp sites or other places of traditional significance. These findings also accord with an inspection earlier this year of the site from an adjacent public access conducted by Ashley Moran, Aboriginal Heritage Conservation Officer for the Northern Rivers (N.S.W. National Parks and Wildlife Service) (*pers. comm.* 14-05-2010).

The Anthropological Report assesses the site of the proposed quarry expansion within the broader traditional Aboriginal landscape. This assumption is based on the belief that Tucki Tucki bora ring, which is located approximately 3 ½ kilometres north north west of the proposed quarry extension, was the place of greatest social significance in the immediate area and that traditional land use, while not entirely determined by the bora ring, can be best understood in terms of the bora ring's location and the influence it would have exerted. This point of view is in agreement with that expressed by Traditional Owner and Wijabal Elder Mr Murray John Roberts who regarded the general area of which the proposed quarry extension is a part, as significant on the basis of its use '[...] by large groups participating in both ceremonial and campsite activities associated with the Tucki Tucki Bora Ring' (Appendix G *Aboriginal Cultural Heritage Assessment* 2008:5). Mr. Roberts' concerns over the proposed quarry extension were outlined in a telephone conversation (10-03-2008) included in the report cited (*Op. Cit.*: 31-2):

The area proposed for the expansion of Champion Quarry is important to Aboriginal Cultural Heritage. The Subject Lands are potentially archaeologically significant as Traditional people used this area when Tucki Tucki Bora Ground was in use.

Initiations would be carried out for two or three weeks. This included ceremonies at both the existing Tucki Tucki ring and a second ring some distance away. Thousands of people attended these ceremonies. The campsites of the people who attended these ceremonies were scattered all through the area on springs and creeks. All the springs would have campsites on them. If burials took place they would have been placed in a sitting formation on top of a hill or ridge if there was enough soil to dig a hole. The hole would be filled in and rocks placed on top. If there was not enough soil to be able to dig a hole the burial would be placed in a hole at the foot of the slope. There is deep

soil enough on top of the ridge for burials to take place and around the slopes in the northern part of the operations area north of the present access road.

In addition to the principal concern, the conduct of activities in the vicinity of the Tucki Tucki bora ring, the other primary concern raised by Mr. Roberts is the possible presence of burial sites on the property (Appendix H Cultural Heritage Assessment ERM 2009:7). This is largely an archaeological question that has been covered by the Cultural Heritage Assessment (2009: 8-9). This report, however, will also consider any further implications that may arise from the anthropology of Bandjatang burial practices, and attempt to assess the probability of their occurrence on the land in question in the light of those.

Finally, the proximity of the proposed quarry extension site to Tuckean Swamp, a place of considerable economic importance in traditional times, raises the possibility of the site possessing significance on that basis. This question too is explored.

Part A

Description of the Traditional Society

The site of the proposed extension to Champions Quarry can be said to sit squarely in the middle of Bandjatang country. By the term Bandjatang is meant the language and culture that extended just north of Grafton on the Clarence River and Evans Head on the Pacific Ocean coast north to the Logan River in Queensland and west to the lower slopes of the Great Dividing Range. Bandjatang as a term does not however describe a 'tribe' – a functioning political unit with a sense of unified and coordinated will. The term Bandjatang as an overarching term for a tribe with an accompanying sense of Bandjatang identity and solidarity is a post-colonial artefact (Calley 1959:5-6).¹ The interaction between Bandjatang-speaking groups in the classical period (i.e. pre-European) is described by Calley (*Op.Cit.*: 4) as follows:

¹ According to Calley (1959:5) the term in classical times identified only a local group or 'clan' ('Bandjatang is the name of a clan in the neighbourhood of Lismore.'). This is the dialect N.M.Holmer recorded in 1971, its speakers located at Coraki and Bungawalbin Creek; *cf.* also Crowley (1978:142).

Before European settlement the tribe on the far North Coast of New South Wales was vaguely defined and not closely integrated. Members were not in regular face to face contact. In fact, people in the north of Bandjatang territory could not have known those in the south of it. There were no tribal assemblies; even initiation ceremonies were attended by some clans of the tribe only. Sometimes Bandjatang attended ceremonies held outside their tribal territory.

Calley may have overstated his case here – or at least emphasised aspects that militate against co-ordinated action. There is no doubt, for example, that Richmond River peoples were in closer contact with each other than they were as a whole with Bandjatang-speaking groups of the Clarence River or the North Coast.

Calley (*Op. Cit.*: 58-9) lists 19 ‘clans’, a list he describes as ‘not exhaustive’; elsewhere he mentions the sum total of Bandjatang clans as ‘about thirty’ (*Ibid*). Crowley (1978:144) however, proceeding from a linguistic viewpoint, opts for ‘between one and two dozen separate dialects (or possibly in some cases even languages) within the Bandjatang complex [...] about 20 communities are proposed [...]’

Of these twenty to thirty clans, more correctly described by the neutral term ‘local groups’, that associated with the Tucki bora ground is Widjebal or, alternatively, Wiyabal. Calley (1959:58-60) ‘hazards a guess’ that ‘[...] a more numerous clan may have one hundred members, no more than thirty adult males [...]. This, I would suggest, based on the earliest accounts and the extent of the terrain recorded for these groups, is an underestimate.

Crowley (1978: 148) describes the territory of the Wiyabal as follows:

Past Coraki the Richmond River divides, with the North Arm passing through Lismore and the Richmond River proper passing through Casino. It seems that there was a separate dialect spoken along each arm [...] Smythe and the Geytenbeeks place Wiyabal to the north of Lismore, though the actual extent differs in each. Since no other dialect is known for this area, it will be suggested here that Wiyabal was spoken around Lismore, Alstonville, Dunoon and Nimbin [...]

It might appear, however, that the earlier linguist, W.E. Smythe, who worked about Casino, had a more accurate view of Wiyabal's distribution (Crowley *Op. Cit.*: 255):

The Wi:abal, located by Smythe around Lismore, apparently comprised two groups speaking different dialects, one along the North Arm of the Richmond River [...] and the second along the lower reaches of the Richmond River [...]

Sharpe (1997:369) advances the view that there are two dialects: 'Wiyabal and Wuyebal from Lismore and Coraki [respectively]'. Sharpe (*Op. Cit.*: 370) also notes another dialect 'possibly Wujehbal or Dinggabai [...] from speakers at Woodenbong'.²

Riebe's (2000:19) description of Widjabul country ('Wiyabal in some accounts') is both more detailed and more specific:

The Widjabul territory boundary is along Stibbard Creek across to the Wilson River through Paffs Hill, then along the Wilson River to Pelican Creek. Then the boundary follows Pelican Creek to the Mackellar Range, runs north-west of Hanging Rock into Mebbin State Forest then back down the watershed to Nightcap Range. From there it runs across to Koonyum Range, then along the main Coastal Range and Black Wall Range to the east and, taking in the upper Wilson River and tributaries, back down to Bagotville.

There is reason to believe, however, that the territory Riebe describes may well have been that of two groups in the classical period. From a linguistic point of view the names /Wiyabal/ and /Widjabal/ themselves embody a contrast. Sharpe (1997:375) differentiates 'a shift in pronouns' between /wiye/wiya/, /wudhah/, /wudhe/wudha/wuje/wuja/, and /wujeh/ for the second person singular pronoun (i.e. 'you') in various Bandjatang dialects. These sorts of variations typically define different dialects, which, in turn, imply local groups that have their own domain and distinguish themselves from their neighbours. In

² Note necessarily however a dialect of Woodenbong; simply that speakers of the dialect were residing at Woodenbong.

other words, the existence of the two names applied to the same area implies two (at least) dialects, and hence two local groups (*cf.* Calley 1959:60).

That the amalgamation of two (or more) local groups in the area defined in Riebe's description could have occurred is not unlikely. Prentis (1972:308 *quoted* Riebe 2000:21) noted 'The epidemics of 1854...reduced a population of 1,200 to only 807 in 1881'. This was one of several waves of disease which spread through the Aboriginal communities of this region to which can be added the indiscriminate violence permitted against Aboriginals and the effects of alcohol and the suppression of traditional economic activities. Lyle Roberts Snr. (Norledge 1960:411) stated:

[...] I was born in 1881, and am the last Aboriginal citizen on the Richmond to have passed through the full rite of the Initiation. Tribal life even at that time was being broken up. During my life we lived with three different tribes of people. Finally we went to Cabbage Tree Island [...]

Under the conditions of plummeting population and the disintegration of traditional economic and cultural practices certain local groups could disappear entirely or, more usually, amalgamations occurred between contiguous local groups. Calley (1959:63) cites an instance of this from the Bonalbo area:³

[...] It is also likely that in some cases, two clans have been treated as one. The Bonalbo and Old Bonalbo people may have formed two clans at the time of first contact, or one large clan may have been in the process of splitting into two smaller ones. It appears that a clan divided vertically and that either the territory was divided or one vertical segment pushed out into the territory of a contiguous clan. These were the first steps towards the formation of a two independent clans; they became fully independent only when they started to intermarry, when members of one could find affinal as well as agnatic relatives in the other.

³ As Calley asserts in the quote, in classical times the opposite could also occur, namely the fracturing of one large local group into two.

Certain specifics about the traditional owners of the actual site of the Champions Quarry extension and the Tucki bora ring are, however, available through source material. Calley (Op. Cit.: 61) makes only one reference to the traditional owners of this area (who he refers to as ‘the Lismore clan’):

[...] the Lismore clan speak of themselves as Guran-bil-beri (Pine tree – great – owners – of).

There can be little doubt that the hoop pine (*Araucaria cunninghamii*) was the patrilineal ‘totem’ (or, at least a major one of perhaps several) of the people of the North Arm of the Richmond River. References abound to their association with this tree. Norledge (1960:411) records Lyle Roberts Snr:

[...] But there was another similar custom that I remember very vividly. It concerns a Pine tree at what is now known as Parrots Nest (near Lismore). To us it was known as Goorambil and where the bushes that are to be seen now, this Pine tree was. Now no one could go near to this Pine tree, because the scrub was too dense. By that I mean too close to it. But the custom in connection with it was – if you had an enemy or had cause to resent any person, you plucked a leaf from that Pine tree, and pointed the leaf at what tribe you wanted to point it at, or person as the case might be, and blood would run out of their mouths. The name Goorambil to my certain knowledge means Pine Tree.

The importance of the hoop pine runs through Riebe’s (2000) *Assessment of Significance For Aboriginal Place Declaration [for] Parrots Nest [or] Goorumbil*. In addition, Steele’s reference to a major camp site on North Arm reflects the same association:

The river in the Wyrallah area is flanked by plains such as Steve King’s Plain. These plains were dotted with tea-tree and she oaks and covered with long, waving grass through which Aboriginals had worn prominent tracks. The banks of the river were shrouded in tall trees including many rain forest species. There is a picturesque clump of hoop pines on a small knoll beside the river. This was the main camp site of the Wyrallah clan and the hoop pine was their clan totem.

There is no doubt that the vicinity of North Arm and Pelican's Creek, including of course Goorambil or Parrots Nest, the Tucki bora ring, and the Wyrallah Ridge (and therefore the site of Champion Quarry including the proposed extension) is in the local group's country. This group is probably best described by Calley's term Guran-bil-beri (more correctly Gurambilbari), linguistic terms such as Wiyabal or Wudjabal being altogether more ambiguous and perhaps of wider application.

The identity of the present generation of Gurambilbari is not in doubt (Howell, n.d. RRHS file BT-4)⁴:

Johnnie Bob was the last of the traditional Elders of the Tucki Tucki Bundjalung people. His wife was Nellie. After the White man selected the Main Camp⁵ area around Tucki Tucki, Johnnie Bob and Nellie lived on the ridge at Tuckurimba. Johnnie Bob never left the Main Camp's hunting ground until he was an old and sick man. When this very old man was about to die, the people from Cabbage Tree Island (some of whom had previously lived around Wyrallah) took him across to Cabbage Tree Island where shortly after he passed away and was buried on Cabbage Tree Island.

Johnnie Bob had a son called Bob, who was born at the Tucki Tucki Main Camp. Bob's wife was Jinny and they had at least two children, Lily and Victor, who were the first known Aboriginal children to be enrolled at any European style school on the Richmond River. They went to Tucki Tucki School and their teacher, Miss Jessie Munro, when she enrolled them (before 1883) gave them the surname Roberts because their father's name was Bob.

Johnnie Bob, Elder of the Tucki Tucki people is not to be confused with Johnnie Bob of the Wiyabal people, who married Emily Richmond from the Tweed River people. This

⁴ Most of the information in this document appears to have been obtained from a letter sent by Myrtle Larrescy to Marjorie Oakes 15-07-1976.

⁵ Not to be confused with the place now known as Main Camp in the vicinity of Bungawalbin.

Johnnie Bob was the father of Lyle Roberts who was born in 1880 under a fig tree near the Lismore Hospital.

Part B

The Bandjalang Bora Ceremony: General Considerations

Mathews (1897:29) provides the fullest and most detailed account of the social context of the Wandarral, ‘ [...] the initiation ceremonies of the Aboriginal tribes who occupy the country watered by the Richmond and Clarence Rivers [...]’:⁶

When it has been determined to call the people together for the purpose of inaugurating the youths of the tribe into the privileges and duties of manhood, messengers are despatched to the different sections of the community, informing them of the time and place of the intended gathering. The head man of the tribe, whose turn it is to muster the people, is generally agreed upon at the last *Wandarral* which was held. That is to say, at the conclusion of the *Wandarral* ceremonies, before all the tribes disperse, their head men assemble in council and arrange amongst themselves which tribe shall take the initiative at the next gathering. It is the duty of the tribe, when the appointed time arrives, to prepare the *Wandarral* ground in some part of their own territory, and get everything ready prior to the arrival of the several contingents whom they may invite to attend the ceremony.

From Mathews’ account we learn that hosting the Wandarral was cycled among the local groups that comprised the Bandjalang people of the Richmond River area. It is unlikely, for logistic, as well as political reasons, that groups from beyond the compass of the Richmond River Valley attended the Tucki Tucki Wandarral.

Mathews (*Op. Cit.*: 29-30) further notes that in preparation for the Wandarral:

⁶ It should also be noted that Mathews, unlike that of the authors of accounts found in various reminiscences and newspaper articles (informative in their own right), was an ethnographer who dedicated a lifetime to the study of Aboriginal languages and cultures and languages. His observations and views therefore deserve more credibility than some others.

A suitable camping ground, capable of accommodating all the tribes who are expected to be present, is selected near some river, creek, or lagoon of water in a part of the tribe's domain in which there is sufficient game to furnish food for all the people during the continuance of the ceremonies [...]

Two important points emerge from this description. Firstly, the visiting groups all camped in the same place: 'The local mob now accord them the customary reception at the wandarral ring, after which the strangers proceed to pitch their quarters on the side of the general camping ground nearest their own country' *Op. Cit.*: 32). Second is the fairly obvious point that wherever the camp was it had to be proximate enough to resources to provide a large gathering of people with their sustenance, as well as permitting ready access to the bora ring and its immediate surrounds. Mathews (*Ibid*) goes on to record that a period elapsed as the various local groups made their way to the bora ring:

Several days, and in some cases weeks, may intervene between the arrival of the various tribes who are summoned to be present, and in order to occupy and amuse the people during this time, corroborees are held every fine night by the light of the camp fires, each tribe present taking their turn to provide the evening's amusement [...]

While the bora ring and its immediate proximity is the venue for the most important aspects of the initiation ceremonial, it also provided a focus for a range of activities that formed part of the initiation ritual or were social considerations. Mathews (*Op. Cit.*: 35-6) notes for example that:

[...] Shortly after the novices and their guardians have gone out of sight the women pack up all their baggage and start away to another site, which has been fixed upon by the old men, where they erect a new camp, the members of each tribe keeping by themselves on the side facing the district from which they have come – the camp of the local mob forming the initial point [...]

Of perhaps greater significance to an understanding of the country that surrounds a bora ring is the wanderings of the novices and their guardians that takes place after the initial

rituals and performances at the bora ring site and which forms an important part of the initiatory process (Mathews *Op. Cit.*: 34-6):

The guardians, with their novices accompanied by the rest of the men, then start away and proceed several miles into the bush. The novices have to walk along with their eyes cast down, and are not allowed to look at anything except the ground just in front of them, their guardians being beside them [...] On arriving at the camping place a yard is made for the boys, in which they are placed lying down upon leaves which are strewn thickly upon the ground and rugs are thrown over them [...] The following morning the men start out in search of game [...] It often happens that a fresh camping place is reached each night, and in that case it would be necessary for the novices and guardians to accompany the rest of the men when they start out in the morning. The novices march along with their heads bowed as usual, and when stoppages are made in the bush, they are put sitting on the ground, and are told not to gaze around them [...]

This excursion through the surrounding country lasts some ten days, winding up at the camp erected by the women and their minders where details of the intervening period are related, following which (*Op. Cit.*: 1897:37-8):

[...] if they are satisfied that the curriculum has been complied with and the novices kept away long enough, they arrange a meeting place in some well known locality, perhaps a couple of miles from the women's camp, where the mob who have charge of the boys can be found the next day or the day following. The messenger then goes away back to his own mob in the bush and tells them the meeting place which has been decided upon [...] On the day which has been thus appointed several old men start away from the women's camp towards the place where they expect to meet the bush mob. On getting about half-way there they form a temporary camping place, where they stop for the present, with the exception of two who go on [...]

As can be seen from the preceding descriptions the bora initiation traverses a reasonable area of country in the vicinity of the bora ring. In addition, several places are set aside as either semi-permanent (i.e. for the duration of the ceremonies) camping places or

temporary (i.e. overnight) camping places. Mathews' (*Op. Cit.*: 39) describes one of these as having particular significance:

The next morning the novices are taken some distance into the bush to a place where a circle about fifty feet in diameter has been formed on the ground, similar to the *wandarral*, but of smaller dimensions. This ring is called Mahgin, and the trees growing around it are marked with tomahawks in different patterns [...]

To conclude, the bora ceremony is centred on the bora ring. The bora ring, however, is the focus of various activities that take place in the country surrounding it during the period set aside for the initiation ceremonials. These include economic activities, the maintenance of sustenance for the large gathering of peoples attending the ceremonies; social considerations, the separation of women and children from initiated men during certain periods of the ceremonials, as well as entertainment, in the form of corroborees and fights for the benefit of social harmony between visitors and locals; political considerations, the holding of discussions between the senior men in secluded places, that, to some degree, the initiation provides a pretext for (*cf.* Mathews 1897:32, 40); and, lastly and most significantly, the peregrination and its attendant ritual activities undertaken by the novices and their guardians throughout the surrounding countryside during the period of the initiation.

The Tucki Tucki Bora Ring and the Surrounding Landscape.

This section seeks to map, or at least identify, parts and localities of the general area surrounding the Tucki Tucki bora ring within the context of the description provided by Mathews for Bandjalang initiation ritual in general.

First and foremost of these is that the point noted by Steele (1984:12):⁷ 'The ridge on which the bora ring stands extends in a north-south direction, and it was the main route of Aboriginals travelling to Lismore and beyond [...]

⁷ 'Obtained from Mrs M Larrescy, private communication 1980; also Currie 1925'

Everick (2008:23) also notes: '[...] An assessment of 55 ha of floodplain and hill slopes on Wyrallah Road at Gundurimba did not result in the location of any Aboriginal sites or relics [...] However it was noted the area held a particular significance to the Aboriginal community due to the close proximity of a traditional pathway between Goonellebah and the Tucki Tucki ceremonial ground (Piper 2000:27).'⁸

The site of the bora ring therefore is designed to be easily accessible from Widjabal and other Bandjalang-speaking groups from points both north and south.⁹ Several kilometres west of the bora ring, and parallel to the ridge ran the North Arm of the Richmond River. Munro (*Northern Star* 19-10-1927), an early settler on Steve King's Plains, on the eastern side of North Arm, mentions that¹⁰:

[...] They used to come to the river at our place and swim across. The men had nothing on them but a belt around their waist. The gins and young girls had tabi tabbies on. It was amusing to see the little ones, five or six years old, swimming across. The old gins used to make a sort of raft of sticks and put their things on it, and shove it before them [...]

I quote this in detail because it is obvious that the crossing was used not simply by individuals or even men, but was a significant passage for entire social groups. According to Munro (*Op. Cit.*): 'In 1868, a very large camp of Blacks gathered at Tucki Ridge, about a mile or so from where we lived.' Clearly then the line of march from the North Arm crossing to the bora ground was designed to be as straight and short as possible.

⁸ Cf. also Steele 1984:16): 'Gundurimba between Wyrallah and Lismore was a gathering point for various clans before they proceeded to Ballina for winter tournaments. They would camp at Gundurimba for several weeks, proceed to Bexhill on the edge of the Big Scrub and then pass through the scrub [...]

⁹ In all probability the present day Wyrallah Road follows the general line of the original Aboriginal path, as is often the case with roads: both parties were served by following the line of gentlest gradient.

¹⁰ Smith (n.d.) also mentions a major camp on the east bank of North Arm, as does Steele (1984:14): 'There is a picturesque clump of hoop pines on a small knoll beside the river. This was the main camp of the Wyrallah clan [...]

The Tucki bora site itself was chosen with particular criteria in mind. Currie (*Northern Star* 21-02-1925) notes in connection to the Tucki ring that '[...] the Blacks always chose a suitable position, preferably a hill near a dense scrub [...]'. In addition, a later visitor, the Rev. H.W.Ramsay (*Daily Examiner* 31-12-1920) noted the presence of a spring on the hill above the bora ground, a presence he considered significant: '[...] Beyond doubt this little spray was known to the Blacks of a bygone age, and most likely proved a determining factor in settling the site of the cabra ground [...]',¹¹

The other significant feature of the site of the bora ring is its open aspect in almost all directions. Steele (*Op.Cit.*:12) describes the site as '[...] the top of a ridge from which splendid views of the valley may be obtained'. This concurs with Ramsay (*Op. Cit.*), who noted the bora was on a hill '[...] from which a delightful view is to be obtained, the town of Coraki away in the distance being very conspicuous.' A Richmond River Historical Society Expedition report (29-10-1955) notes: 'The site of the Bora ring commands a magnificent view in all directions – for many miles.' From the Aboriginal viewpoint (and remembering the original vegetation of the ridge tops were open eucalyptus forest (*cf.* Everick 2008:12).) the significance of view was that allowed participants in the bora to see their home country, as well as which it was probable other sites of significance were also visible (*cf.* Reibe 2000:10-1).

As noted, consistent with Mathews' general account of the Bandjalang bora ceremony, as well as the attestations of contemporaries such as Munro and Currie, participants in the bora camped in close proximity to the actual ring. Ramsay's (*Op. Cit.*) mention of stone axes having been found in the immediate vicinity of the bora ring acts to confirm the anecdotal accounts.

There ought also, according to Mathews' description, be other campsites in the vicinity of the bora ring. These, as mentioned, form various functions throughout the ceremonial cycle: the seclusion of women and children, the entertainment of visiting groups, and various temporary camps that play a role in the initiation of the novices. One of these is

¹¹ Ramsay's term cabra refers to /gibar/ the young men who were initiated at bora ceremonies, a cabra ground is therefore the site of the bora ring. The spring is also noted by Steele (W.P. Larrescy interview 1980); whether independently or not is not ascertainable.

almost certainly Robson's Knob, described by Steele (*Op. Cit.*: 13) as being 'About two kilometres north-east of the Tucki Bora ring [...]'. Steele's information on Robson's Knob was obtained from Mrs Lottie Lang (*nee* Lottie Robson) who was 93 years of age when interviewed by W.P. Larrescy in 1972.¹² Steele (*Ibid*) calculates that 'She saw the corroboree when a small girl, aged five or six i.e. about 95 years ago, i.e. 1885.' According to Mrs Lang: 'They would always have their corroboree at Robson's Knob on the flat summit of it. There was no bora ring there. The Aborigines loved the district people to watch their corroborees...'

Riebe (2000:11; photograph: 'Tucki Bora ring and camp') identifies Robson's Knob merely as a camp but there is really no contradiction here, as the place served as both camp and corroboree ground, both activities in fact being linked. Mrs. Lang (Steele 1980 Larrescy interview and notes) mentions that 'There was an Aboriginal tribe who came down from Buryong Mt. [Mt. Archer in the Blackall Range], Queensland each year' with the implication that they would camp at Robson's Knob. In any case, the regular performance of corroborees at Robson's Knob, and its proximity to Tucki Bora Ring, lend credence to the belief that this place served as one of the important camping sites, if not *the* important camping site, during the initiation cycle.

It is probable the account of 'A Blacks Corroboree' given in the *Richmond River Herald* (11-03-1887) refers to this campsite:

A corroboree, or dance of the Blacks, taking place at Tucki, I acted upon the invitation of one of the tribe, and was present last night. About 150 natives mustered, this number being made up of the Ballina, Lismore and Tweed Rivers tribes, each tribe having their corroboree in turn to find out which is the best, as they were going to meet the Clarence Blacks at a stand-up fight and corroboree at the Pelican Tree (Codrington) in a fortnight.

The groups mentioned give an indication of the span of country from which people would come to attend the bora and corroborees at Tucki.

¹² Steele had access to Mrs Larrescy's notes.

There are two other sites recorded in proximity to the Tucki Bora ring. Everick (2008:23), having conducted a DECC AHIMS search reported the presence of a scar tree approximately 2 ½ kilometres south of the Tucki Tucki bora ring:

A scarred tree (#04-4-0126) is located approximately 650 m. north of the existing quarry on the western side of Wyrallah Road on slopes falling to the Wilson River floodplain.

According to Marcus Fergusson (*pers.comm.* 21-05-2010) the scar tree would have been one of a grove of such trees, as exist on Ngandawal land nearer the coast. This view conforms to observations found in the archaeological literature (*cf.* Morwood and Fillert 1976:97-107; Gilbert 1954:121-3).

In addition to the scar tree, Steele (1984:14) noted the presence of a cave that once contained drawings in approximately the same area:

To the south of the bora ring, about three kilometres along the ridge, are some small caves which contained stencilled drawings. These drawings were destroyed about 1930.¹³

Ashley Moran, Aboriginal Heritage Conservation Officer for the Northern Rivers (N.S.W. National Parks and Wildlife Service) (*pers. comm.* 14-05-2010) was able to show me the general position of the cave, which has an AHIMS restricted classification. It would appear to be approximately 500 metres to 1 km west of the Wyrallah Road, perhaps the same distance north of the present quarry site.

It is very probable both sites were linked to the initiation cycle centred on Tucki bora ring. As noted by Mathews' (1897:39), part of the cycle consisted of activities that took place in the bush an unspecified distance away from the main bora site '[...] where a circle about fifty feet in diameter has been formed on the ground, similar to the *wandarral*, but

¹³ On information provided by Mrs M. Larrescy 1980

of smaller dimensions. This ring is called Mahgin, and the trees growing around it are marked with tomahawks in different patterns [...]'. Mathews (*Ibid*) goes on to comment that, in addition,

[...] The turf is also marked in different wavy and zigzag lines cut into the surface of the ground with sharp pieces of wood used as spades. These grooves in the soil have narrow pieces of bark layed in them to make them all the more conspicuous and ornamental. All the drawings on the trees, and on the surface of the soil are called *moombeery* [...] they [the initiates] are next shown all the marked trees, one after another, in the same way [...]

It is undoubtedly the case that it is the designs, the images represented, that are the significant feature of this procedure – not necessarily the material means by which they were achieved. For example, Petrie (1904:49) describing similar initiation ceremonies in the Brisbane River Valley noted that the images shown to the initiates were three dimensional representations modelled with clay and grass.¹⁴ It is probable therefore that were environmental conditions unsuitable for the sort of representations observed by Mathews (the precise locality of his observations is unknown), then an alternative method of representation would be sought. This, in my view, explains the presence of the ‘stencilled drawings’ reported to Steele. The close proximity of the cave to the scarred tree, and the proximity of both to the Tucki bora ring, render this the most logical explanation for the conjunction of all three features.

Conclusion to Part B

The Champions Quarry extension falls within the orbit of the Tucki bora ring. Travel to and from the ceremonies by the Widjabal themselves and other Bandjalang-speaking groups, particularly those to the south beyond the Richmond River, the peregrinations of the initiates themselves during the ritual cycle, all passed within proximity of the land it is proposed to quarry. Having said that, however, there is no evidence in the ethnographic

¹⁴ Also, Hall (1917:5-6) who describes ‘[...] All kinds of animals [...] painted on the trees in a rough way with raddle, pipe clay and emu oil [...]’; and, Small (1898:47): ‘[...] there were two or three grotesque figures made of clay [...]’

record of any particular importance being accorded the land in question. It may well have been the site of a temporary camp, perhaps to pass in the direction of Tuckean Swamp and the country to the east (although other east west running spurs would have served the purpose equally as well). It may also possibly have been a route of transit for people coming to and from the bora, although, again, both the lay of the land and the ethnographic record, provide no support for this contention.

Nor is there evidence or knowledge of local spring water that might have served to encourage an important or semi-permanent camping place. Were the area to have been significant either as a camp or a corroboree ground it is probable some mention of it would have found its way into White folklore. This leaves only rites of a secret nature associated with the bora ceremony; again if such occurred at this place there is no record of them having done so (unlike the reasonable suppositions it is possible to make about such activity having taken place on the other side of Wyrallah Road, in the vicinity of the scarred tree and the cave). Also, as attested in the archaeological surveys (Appendix G Aboriginal Cultural Heritage Assessment, Everick Heritage Consultants 2008; Appendix H Cultural Heritage Assessment ERM 2009) there is no evidence of tool scatter that might indicate a camp (although this absence, in a very disturbed landscape, and in light of the poor tool finds reported from the Richmond River area in general, may not necessarily be significant.)

It cannot be claimed, therefore, on the basis of the evidence available, that the proposed quarry site holds a particular or special significance to the culture of Widjabal people.

PART C

Bandjalang Burials: General Considerations.

The second specific concern raised by the Widjabal Traditional Owners is the possible presence of burial sites on the Champions Quarry proposed extension site. (Appendix G *Aboriginal Cultural Heritage Assessment* Everick 2008:31-2; Appendix H *Cultural Heritage Assessment* ERM 2009:7). In the latter report it is stated of Mr. Murray John Roberts that '[...] he indicated it [the Project Area] may contain burials. His belief is that

there is local oral tradition suggesting that Aboriginal burials are present across the wider area' (*Ibid*). This section seeks to address those concerns.

The variety of burial practices employed by Aboriginal peoples is determined by two factors: firstly, the environment in which a particular people lived: obviously an environment bereft of trees does not allow a form of internment involving trees to take place; and, secondly, the ethnicity of the various Aboriginal peoples: there is a marked preference for a certain form or forms of burial according to 'tribe' (as commented on by a number of early ethnographers e.g. Craig 1875).

It is probable both considerations played some part in the burial practices of the Bandjalang as a whole, as well as which other factors have to be considered: the social status of the deceased, and the influence of Whites on accessibility to burial sites and burial practices. The last probability resulted in an increasing pragmatism and diminution of ritual and material attention to burials in the period of the late 19th century (when most observations of traditional Bandjalang practices were made.)

There are records of certain areas being put aside specifically for burials. The following communication between Louise T. Daley, Research Secretary of the Richmond River Historical Society and L.P. Winterbotham, University of Queensland (15-07-1956) describes such as place:

The third question, in a letter recently received from Mr. Dunlop, will, I believe, be of more interest to you. I quote: 'I would like to point out that there is an Aboriginal burial ground in this district (Mebbin State Forest) – the fact is perpetuated in the place name of Graveyard Creek, now known as Kunghur Creek. Most of the local folk claim these graves are marked with stone mounds of a sort and I would be obliged if you would advise me if this was a general practice of the local Aborigines [...]

Appendix H Cultural Heritage Assessment ERM 2009:8) states the following:

[...] There is an image taken south west of the current study area showing small pyramidal mounds of sticks and soil (see Steele 1983). These types of construction

would have been removed once European agriculture was established in the region; leaving little of any archaeological evidence for this mode of burial.¹⁵

Finally, Steele (1984:30-1; Fig. 19) also records specific burial caves:

West of Kyogle is Smith's Creek (a tributary of Eden Creek) where several important sites have been recorded [...] About five kilometres upstream on Smith's Creek on the right hand side, are some caves that once contained human bones, but the bones have been removed. Two photographs of the caves are in the Haddon Collection at the University of Cambridge. One of these photographs bears the remark: 'Cave where remains of ten to twelve Aborigines were found all laid left-hand end of cave, heads to west and feet to east. About twelve stone knives were found with them.

The photograph reproduced by Steele shows two men, one standing, in the cave.

From these references it is possible to deduce that specific sites were set aside for burials; and that these could vary in design, perhaps dependent on the different types of environment that comprise the totality of the Bandjalang region. Some of these, such as suggested in Daley's description of the Kunghur Creek burial site and Haglund's (1976) description of the Broadbeach burial ground, demonstrate that such burial sites could be both extensive and sophisticated.

In addition, there are a number of modes of burial recorded: Oakes (1972:2) describes two of these:

Burial was usually in the foetal or unborn baby position. The man was going back into his Mother, the earth. The grave was lined with paper-bark. The bound body sat into it, more paper-bark added and then earth on top. Above that a small fire was lit to control the spirit.¹⁶ [...] Another and earlier kind of funeral was 'burial' up a tree, a

¹⁵ I have not, however, been able to locate this photograph referred to or any specific reference in Steele to this burial site.

¹⁶ McQuilty, F., Daley, L.T., and Stitt, R., 1954. Tape RRHS Lismore.

method seen by early settlers at Maclean and Grafton too. Children were warned not to play under a funeral tree or they would ‘get sick’ [...]

The basis for Oakes (*Ibid*) assertion that the tree burial represents an ‘earlier kind of funeral’ is not stated. Nevertheless, that the platform burial was practised in the European era is evinced in Smith’s description of a funeral witnessed in the ‘late 1860s’ near the Smith family home on the ‘West bank of the North Arm of the Richmond River’:

[...] Next morning the funeral procession passed the Smith home [...] and so they passed on to Pelican Creek (about three miles) where, securing a suitable tree in the dense bush they placed little Agra in the fork of the tree about 12 feet from the ground, then built a canopy of branches over her head. They formed a circle (this time no fire) and the same stamping and chanting by the men while the gins clapped their hands and sang in unison [...] They had placed her where hawks or crows could not get at her and the dingoes could not enter the circle they had just made and then amid cries from the gins the men walked in silence and pulled down and shift camp.

There seems to have been no discernible reason for the preference of one form of burial over another. Oakes (1979:201) describes two burials that occurred near Lismore in the late 19th century:

[...] Early this century two men of the Bahmngin camp above the North Lismore cemetery died. There was a tallow-wood tree a few yards west of the cemetery fence. Old Wodjum died and they broke his bones and packed them into a cylindrical bundle about one foot by two. Then they placed him in the fork of the tallow-wood tree. The White children kept watching and noticing that the bundle became more and more decomposed till it was removed by the tribe. Not long after, Boori died (‘i’ as in Bondi). For him they decided to do a White man’s burial so they scooped out a grave near the cemetery fence and buried him prone.

There are couple of considerations: clearly there is no preference for one or the other form of internment based on gender, or apparently (as other accounts will attest) the social status

of the deceased. From the description given above, in which the bones of the man placed in the tree were later removed, and then most probably, one would think, interred in the ground, it is possible tree burials were dictated by environmental or weather conditions. It may have been the case that waterlogged ground, or the absence of suitable ground, resulted in tree burial after which, at some stage, followed burial in the ground. However, as stated by Oakes (1972:2), the most common form of burial, as attested in the literature at least, is burial directly in the ground. Currie (*Northern Star* 21-02-1925) provides a description of one of these that occurred in the aftermath of a Tucki bora ceremony:

Soon after the corroboree an old Black died. All the Blacks left the vicinity but four men. This was their custom. They would not return under six months [...] The body of the deceased Black was tied up in the smallest bundle possible and carried by two men, two others walking in front, towards the 'soil' spirits. A small hole 3 feet deep was dug, and the body placed in it and covered with earth and sticks. Those that took part in the burial then left for other districts.

Oakes (1979:201) gives a very similar account regarding a young girl:

[...] A girl about 17 called Mary died one day at about 2p.m. They took her away and buried her that night. They folded her limbs in the foetal position, tied her with vines and sat her in the grave. 'They just put a bit of dirt over them and a sheet of bark. Make a little fire on top of a bit of dirt on them and that's all done' [...]

Finally, L.T.Daley, researcher for the Richmond River Historical Society provided the following information for L.P. Winterbotham of Queensland University (07-02-1956):

The burial customs of the Richmond tribes was to place the body in a shallow hole, usually on the side of a hill – the skeleton in a seated position. It was then covered with loose dirt and leaves. Many early settlers have mentioned finding these skeletons on a hillside after wind and rain washed away the top covering.

From these accounts it is clear the method of internment was to reduce the bodies to the smallest possible size and then bury them in a sitting position in the grave. This is stated explicitly from Oakes description, and can be inferred from Currie's by the fact of the hole dug to receive the corpse being 3 feet deep. Both accounts serve to reinforce that of Murray John Roberts provided in Appendix H Cultural Heritage Assessment ERM 2009:8: 'Personal communications from Murray John Roberts indicates that burials were dug into the ground in an upright position and the graves in-filled and often marked with a burial stone [...]'

There is one mention of an Aboriginal burial ground in the Tucki general area. Mrs. E.C. Reading (RRHS file) states:

My maternal grandparents are buried in the Tucki-Tucki cemetery (Mr and Mrs Lew Tulk), and my mother used to say that the cemetery had been an old Aboriginal burial-ground. I do not know if this is true but this is where the tribe came together. My great grand parents were among the original settlers of this area.

The Probability of Burials Having Occurred on the Champions Quarry Proposed Extension Site

There is no evidence for the sort of extensive burial sites described by Daley, Haglund and Appendix H Cultural Heritage Assessment ERM 2009 for this area.

If internments were made in trees in the traditional manner described those trees have long since disappeared and their human remains along with them.

Although not the area of this author's expertise, Appendix H Cultural Heritage Assessment ERM 2009 statement that 'Geotechnical data for the study area (Coffey 2007) suggests that soil deposits across the surface of the proposed quarry areas would be too shallow to allow burial shafts to be excavated. It is suggested that any subsurface burials would have necessitated excavation through the sandstone bedrock', appears to

rule out the possibility of this area being used for burials in the earth. Almost certainly soil was the preferred medium for these burials.

One other possibility remains: the low sandstone overhangs that exist south of the Project Site, above the seasonal creek flowing through the area of the old motocross track could conceivably house the remains of Aboriginal people. Again, this is not the area of the author's expertise, and therefore my opinion must be qualified. These overhangs are wet and reasonably exposed. The archaeological surveys conducted hitherto have failed to find evidence of burials in these caves (Appendix G *Aboriginal Cultural Heritage Assessment* Everick 2008:5). In addition, an inspection undertaken by Cultural Heritage consultant Marcus Fergusson and myself (12-05-2010) failed to find any evidence of burials.

Conclusion to Part C

To conclude, on the basis of what the record tells us of traditional Widjabal funeral practices, the area was not used for burials, or, if internments, such as tree platform burials or cave internments did take place here, evidence for such has long since disappeared.

PART D

Traditional Economy and the Project Site

There is no need to recount the general features of the Wiyabal or Bandjalang economy, most of which are covered in Appendix G *Aboriginal Cultural Heritage Assessment* Everick 2008¹⁷ and do not have any particular relevance to the Project Site.

The most significant economic feature of the Project Site is the proximity, to the east, of Tuckean Swamp (most of which has now been drained). The swamp was important for obtaining particular foods and materials that were not obtainable in either the scrubs or

¹⁷ Also A. Mitchell (1978) 'Traditional Economy of the Aborigines of the Richmond River, N.S.W.', Masters thesis University of Queensland.

open forest country: fish, eels, tortoises, water birds, flying foxes, mussels and other shellfish, the bulbs of waterlilies, rushes and reeds (for basket and dilly making) and so on. Conceivably the ridge that is the proposed Champions Quarry extension site could have been used to access the swamp and as a camping place overlooking the swamp. It has to be pointed out, however, that a number of other places qualify for the same possibility and that the two archaeological surveys conducted were able to find no evidence of a permanent camp site on the project site.

PART E

Community Consultation

The following is a log of the community consultation process that occurred in the week allotted to the Champions Quarry extension anthropological report:

20-05-2010 Thursday approx. 10.00a.m.

<u>Traditional owner</u>	<u>outcome</u>
Dianne Harrington	will call back
Jenny Smith	not available on number provided
Gilbert King	not available on number provided
Rosslyn Sten	got through; wants to talk; will ring back
Tracey King	wants me to email her tracey.king@ngulingah.org.au to arrange meeting

20-05-2010 Thursday approx 5.00 p.m.

Tracey King	emailed Tracey King on address provided.
-------------	--

25-05-2010 Tuesday approx 2 p.m.

Dianne Harrington	will get back to me re. meeting with her sister (Jenny Smith) today or tomorrow. Commented, in response to my mentioning I had not been able to locate any sites on the Project Land to the effect that I would not as the tree cover, etc. had long been destroyed. Stated her family were the right people for this country. Stated there was a birthing site on the Project Land. Also stated her family had filled out forms for the Cultural Heritage Unit of the N.S.W. National Parks and Wildlife Dept. to register certain sites and these had not been acted on.
Tracey King	(at Ngulingah Land Council). Directed me to Murray John Roberts who is now site officer for Ngulingah replacing Tracey King.
Murray John Roberts	not interested in talking; had already requested from Champions Quarry cultural heritage and archaeological reports which he claimed were not forthcoming (and/or were unsatisfactory) (<i>cf.</i> <i>Appendix H Cultural Heritage Assessment</i> (ERM 2009: 7). He stated the matter would be decided in court.
Rosslyn Sten	call her back after 4 p.m. today

25-05-2010 Tuesday approx. 5 p.m.

Rosslyn Sten	arranged meeting at canteen, Southern Cross University, Conway Street, Lismore at 8.15 a.m. Wednesday 26-05-2010.
Diane Harrington	Diane told me Jenny Smith, her sister, like herself is

knowledgeable about the Tucki area. Jenny had also done a good deal of research on that area and would be the person to talk to. Gave me her number.

25-05-2010 Tuesday approx. 6.30 p.m.

Community Views

This general sense of responsibility and duty concurs with the comment made by Murray John Roberts to Mr. Jeff Champion on the occasion documented in *Appendix H Cultural Heritage Assessment* (ERM 2009:7), namely that sites were ‘everywhere, all over the place’ (or words to that effect) (Jeff Champion *pers. comm.* 14-05-10).

Interview with Jenny Smith and Rosslyn Sten 25-05-2010

The interview is recounted as follows verbatim, (the topics addressed in the order they came up) with some rationalisation of information where this was scattered through the conversation.

Jenny Smith became involved [in the Champions Quarry extension] last year. Jenny made the following comments about her early involvement in the project: She assumed this would be a ‘big public consultation’. Diana Neuweiger (of REM) went on holidays, did not get back to her. Jenny Smith was asked to go out to Champions Quarry which she was reluctant to do – wanted any meeting to be on ‘neutral ground’, and to have as many traditional owners present as possible. [This view is contradicted by ERM who state that a proper consultation process was enacted *cf. Appendix H Cultural Heritage Assessment* (ERM 2009).]

Jenny Smith mentioned a house on Wyrallah Road directly to the north of the present Champions Quarry entrance: ‘As you’re driving towards Coraki, before the split into Wyrallah and Tuckurimba Roads’. Jenny is unable to remember the name of the occupants [Wadsworths]; however, there is a row of pine trees in front of the house, a sign ‘Save the Koalas’, and a swimming pool at the back of the house. The house overlooks both sides of the hill [i.e. to both east and west]. The present Champions Quarry can be seen directly to the south.

While at the house Jenny noticed two stone axes lying in the garden that had been picked up on the property. These have been sent to Ashley Moran, Aboriginal Cultural Heritage Officer of N.S.W. National Parks and Wildlife Department. From the rear of the house, near the swimming pool, looking east, there is an old tree (or remains of?). ‘A spring used to flow down to Tuckean Swamp; When the couple [Wadsworths] cleared the paddock

there were large rocks from the overhang and markings of those rocks. This was an important camping site.’ Jenny Smith (and others) filled out a AIHMS site registration form, and sent it with accompanying material to Aboriginal Cultural Heritage Officer of N.S.W. National Parks and Wildlife Department. This was before Christmas 2009. As yet they have had no response from N.S.W. N.P.W. Jenny will email me relevant correspondence.

Ron Heron’s (2000) report [‘Wiy-abal Aboriginal Clan (Bundjalung Nation) Cultural Heritage and Values Relating to the Lismore City Council Local Government Area: An Archaeological and Anthropological Survey’] has references to sacred sites. However, Ron Heron only consulted certain families. Jenney Smith has been doing family history research and research on her people for 9 years.

7.30 p.m. Rosslyn Sten arrived and joined interview.

Rosslyn Sten’s nephew, David Mclean, lives down Mattheson Road (off Wyrallah Road): ‘There is a sacred site down there as well.’ This information was given to Dianne Harrington’s [i.e. Jenney Smith’s sister] husband Sheldon by his father-in-law Bob Smith (Jenny Smith’s father).

Wyrallah was a big meeting place. It was the avenue by which people followed the Richmond River down to Evans Head. It was a place of refuge during flooding. There were shelters on both sides of the ridge (i.e. on the eastern and western facing sides). People would camp on one side or the other depending on which way the wind was coming from. Rosslyn: ‘Its part of the [wider] connection: ‘Tatham, Casino, all came to Wyrallah’.

Birthing site was on the east facing side of the hill. The birthing site is visible from Wadsworth’s house. Rosslyn: ‘The whole shelf was important. It was where people gathered when they were walking between Wyrallah and Broadwater. Birthing site needed fresh water (spring water). This had to be a separate supply to drinking water. Birthing often took place in water. Rosslyn’s great grandmother was a birthing woman [midwife].

Henry Cook, Jenny's great great grandfather, was born on Wyrallah Ridge. Papa Cook, Jenny's grandfather. Louis Cook [who is on dialysis; knowledgeable informant mentioned by Marcus Fergusson][is a descendant of Papa Cook]. The Brown family from north Lismore is Jenny's father's mother's family. Her mother's father is the Cook side. Papa Cook's sister Charlotte is Rosslyn's great grandmother. They were both born at Tatham [i.e. Papa cook and Charlotte]. Their traditional land encompassed the Tatham/Wyrallah area.

Rosslyn Sten remembers what was said to us as children. Boundary Creek area (near Cabbage Tree Creek) was important to traditional people.

There were three bora rings at Tucki: the big one (that is still preserved) and the lower (or smaller) one which has been destroyed. There was another site connected to the bora ceremony towards Tuckurimba (i.e. to the south of the Tucki bora ring) on the western side of Wyrallah Road [*cf.* Mathews 1897 and account above].

Conclusion to Part E

Representatives of the Ngulingah Land Council were unwilling to meet with me in the preparation of this report. Other traditional owners were unavailable or could not be contacted. The principal interviewees were two Bandjalang women Jenny Smith and Rosslyn Sten. Both were knowledgeable about their family history and the Wyrallah area, which were closely linked. Most of the information they were able to provide had been received from family members (some of whom are now deceased) or, in some cases, from other members of the Bandjalang community. In addition, both women, but particularly Jenny Smith, had undertaken archival and library research. They were, however, clearly able to differentiate and delineate knowledge obtained by the two respective means. Their report of sites, and the activities associated with them, is consistent with the ethnographic literature. They are undocumented (however, it may be possible, through the Aboriginal Cultural Heritage Unit of the New South Wales National Parks and Wildlife Service to obtain records of their attempt to have these sites placed on the AIHMS register). In my opinion, the information provided by both women is credible.

BIBLIOGRAPHY

Books

Crowley, T., 1978

The middle Clarence dialects of Bandjalang

A.I.A.S., Canberra

Dawson, R.L., 1935

Aboriginal Words and Names

Sydney: W.C.Penfold and Co.

Flick, W., 1934

A Dying Race

Ballina: Deacon Printery

Haglund, L., 1976

An archaeological analysis of the Broadbeach Aboriginal burial ground

St. Lucia: University of Queensland Press, 1976

Hall, T., 1917

A short history of the Downs Blacks, known as 'the Blucher tribe'

Warwick

Hoff, Jennifer, 2006

Bundjalung Jugun

Lismore: Richmond River Historical Society Inc.

Holmer, Nils M., 1971

Notes on the Bandjalang dialect spoken at Coraki and Bungawalbin Creek, N.S.W.

Canberra: A.I.A.S.

Keats, N.C., 1988

Wollumbin: the creation and early habitation of the Tweed, Brunswick and Richmond Rivers, NSW'
self-published

Petrie, C.C., 1904
Tom Petrie's Reminiscences of Early Queensland
Brisbane: Government Printer

Ridley, W., 1875
Kamilaroi and Other Australian Languages
Sydney: Thomas Richards, Government Printer

Steele, J.G., 1984
Aboriginal Pathways in Southeast Queensland and the Richmond River
University of Queensland Press

Ryan, M. (ed.), 1979
Lismore: the story of a north coast city
Milson's Point: Currawong Press Pty. Ltd.

Articles, Pamphlets, Chapters

Anon., 1925
'Reminiscences (By An Early Settler)'
The Northern Star 21-02-1925

Anon., 1928
'Early history recalled'
unidentified newspaper 06-08-1928
Aboriginal Midden file, RRHS

Anon., 1938

‘Cedar-getting days on Far North Coast’

Northern Star 05-01-1938

Pioneers Charles Jarrett file RRHS

Anon., 1938

‘Cedar-getting days on Far North Coast’

Northern Star 24-10-1938

W.Flick file RRHS

Bray, J., 1900

‘The Bool (man-making ceremony)’

Science of Man No.3: 115, 22-08-1900

Bray, J., 1901

‘Tweed district and customs’

Science of Man No.4: 9, 21-02-1901

Bray, J., 1902

‘Aboriginal customs – Tweed River district ceremony’

Science of Man No.5: 8-9, 22-02-1902

Currie, J., 1925

‘Reminiscences (By An Early Settler)’

Northern Star 21st February 1925

Dawson, R.L., 1935

‘Some recollections and records of the Clarence and Richmond River Aborigines’

In *Aboriginal Words and Names*

Sydney: W.C.Penfold and Co.

Gilbert, L.A., 1954

‘An Old Aboriginal Site’

Victorian Naturalist 1954:121-3

Hewitt, N.C., 1926

‘Boorl Rings: Not Rare says Mr. N.C. Hewitt’

The Tweed Daily 06-08-1926

RRHS file B/B4

H.M.M., 1887

‘A Blacks Corroboree’

Richmond River Herald 11-03-1887

RRHS file B/B-4 Bora rings

Mathews, R.H., 1897

‘The Wandarral of the Richmond and Clarence River Tribes’

Proceedings of the Royal Society of Victoria

McFarlane, D., 1935

‘The Clarence River Aborigines’

Daily Examiner 25-01-1935

Meston, A., 1896

‘The bora ceremony’

The Queenslander 25-01-1896

Morwood. M.J. and Fillery, B.J., 1976

‘Carved trees in Queensland’

Occasional Papers in Anthropology No.6: 97-107

‘Munro, G., 1927

‘Early Days: Settlers on the North Coast’

The Northern Star 19-10-1927

Norledge, M., 1960

‘Bandjalang tribal memories’

Mankind V.5 No.9

Oakes, M., 1972

‘The Aborigines of the Richmond Area’

Lismore: Richmond River Historical Society, Pamphlet No.2

Oakes, M., 1979

‘The First Inhabitants: Aborigines in the Lismore District’

In Ryan, M. (ed.), 1979

Lismore: the story of a north coast city

Milson’s Point: Currawong Press Pty. Ltd.

Roberts, L., 1960

‘Bandjalang tribal memories’

Mankind V.5 No.9, July 1960

Roberts, Lyle, 1978

‘Letter to the editor: sacred sites’

The Northern Star 08-07-1978

Aboriginal Roberts Family file RRHS

Sharpe, M., 1997

‘Yugambeh-Bundjalung: What can be learnt from the dialect differences’

In Tryon, D. and Walsh, M. (eds)

Boundary rider: essays in honour of Geoffrey O’Grady

Canberra: Pacific Linguistics

Small, J.F., 1898

‘Customs and Traditions of the Clarence River Aborigines’

Science 21-03-1898

Wood, W.B., 1968

‘An Aboriginal Burial Ground at Broadbeach, Queensland: Skeletal Material’

Mankind, V.6. No.12 (1968:681-86).

Archaeological Reports

Everick Heritage Consultants Pty Ltd

Heritage Assessment, Champion Quarry 1586 Wyrallah Road, Tuckurimba NSW

April 2008

Environmental Resources Management Australia

Cultural Heritage Assessment, Champion Quarry 1586 Wyrallah Road, Tuckurimba NSW

September 2009

Cultural Heritage Reports

Riebe, Inga

Assessment of Significance for Aboriginal Place Declaration for New South Wales

National Parks and Wildlife Service

Parrot’s Nest (Goorumbil)

June 2000

Heron, R. and Collins, M.

Wiy-abal Aboriginal Clan (Bundjalung Nation) Cultural Heritage and Values Relating to the Lismore City Council Local Government Area: An Archaeological and Anthropological Survey

June 2000

Theses

Calley, M., 1959

Bandjalang social organisation

PhD thesis, University of Sydney

Mitchell, A., 1978

‘The traditional economy of the Aborigines of the Richmond River, NSW’

Anthropology thesis, University of Queensland

Manuscripts

Bray, E., 1923

untitled manuscript

Bundjalung file

Richmond River Historical Society

Bundock, M., 1898

‘Notes on the Richmond River Blacks’

In Dawson, R.L., 1940

manuscript

Mitchell Library, Sydney

Howell, R., n.d.

‘Johnnie Bob – Elder of the Tucki Tucki Bundjalung People’

RRHS file BT-4 Tucki-Tucki Bundjalung

Moehead, D.T., n.d.

‘In the Big Scrub near Lismore’

In Bray, E. (ed.), 1922

‘Signed reminiscences of some pioneers of early Lismore’

Richmond River Historical Society Collection

Munro family

‘Reminiscences’

typescript RRHS

Munro, George, 1922

‘Memoirs, 1922’

typescript RRHS

Reading, E.C., n.d.

[Notes on Tucki bora ring]

RRHS file BB-3 Bora rings, legends, letters

Richmond River Historical Society, 1955

Richmond River Historical Society Expedition

29-10-1955

RRHS file BB-3 Bora rings, legends, letters

Correspondence

Louise T. Daley, Hon, Secretary and Research Secretary, Richmond River Historical Society to L.P.Winterbotham 07-02-1956

RRHS file BB-3 Bora rings, legends, letters

Louise T. Daley, Hon, Secretary and Research Secretary, Richmond River Historical Society to L.P.Winterbotham 15-07-1956

A. Braid, Dunoon to Mrs. L. Daley RRHS 25-07-1955

RRHS file B/L Bundjalung dialect Wiyabal

Myrtle Larrescy to Marjorie Oakes 15-07-1976

Supplementary Report to Anthropological Assessment of proposed extension of
Champions Quarry, 1586 Wyrallah Road, Tuckurimba NSW

Purpose

The purpose of this supplementary report is to address issues arising from the identification of two sites on the Champions Quarry site identified by Bandjalang women Jenny Smith and Rosslyn Sten in the my Anthropological Assessment of the proposed extension of Champions Quarry 1586 Wyrallah Road, Tuckurimba, NSW dated 28 June 2010 (*cf.* p's 29-31 of my previous report plus accompanying map p.32). The two sites identified by Jenny Smith and Rosslyn Sten were a birthing site and caves, the location of both of which was marked on the map included in the original report.

The issues it was desired to clarify are as follows:

- To ascertain from Ashley Moran, Indigenous Heritage Officer of the National Parks and Wildlife Service, Alstonville Office NSW the process whether Jenny Smith and Rosslyn Sten contacted the NPSW as claimed and initiated action to have the birthing site registered as an Aboriginal site of significance (AIHMS register). As a supplement to this, enquire whether Ashley or anyone else at NPSW was able to ascertain anything about the process and provenance of the two stone axes that were picked up on the Wadsworth's property and sent to Ashley Moran.
- Reinterview Jenny Smith and Rosslyn Sten and enquire the specific source of their knowledge of the birthing site, and their source of knowledge for the location of the birthing site. Also, to request their correspondence undertaken with the NPWS regarding any attempt by them to have the birthing site declared a site of significance on the AIHMS register.
- In addition, discuss with Jenny Smith and Rosslyn Sten the caves marked on the map with the same questions: their source of knowledge for the caves, and their knowledge as to the specific location of these caves.

- Consider Professor Wayne Erskine's report on Hydrogeomorphology and comment in relation to the site identified by Jenny Smith and Rosslyn Sten as the birthing site.
- Review any available literature on birthing sites and springs in the region.
- Interview David McLean re. Aboriginal site stated in the original report to exist in the vicinity of Mathieson Lane, Tuckurimba.

Report

I attempted to contact Ashley Moran, NPSW several times on Tuesday 04-08-2010 and on Wednesday 05-08-2010 on both his work landline and mobile phone, leaving messages for him to return my call. Eventually about midday on Wednesday I rang the Alstonville office general line and was informed that Ashley was away for the week and was uncontactable. I then rang the head office of the Indigenous Heritage Section of the NPWS at Coff's Harbour to speak to Claude McDermott who I had spoken to previously and who was Ashley's superior. I was informed Claude was also out of the office and would return my call. That, however, did not happen.

I reinterviewed Jenny Smith on Sunday 25-07-2010 mainly with a view to seeing whether Jenny and Rosslyn Smith and perhaps other members of the family would visit the Champions Quarry site with a view to identifying the birthing site directly and meeting Mr. Champion to discuss preserving the site with Mr. Champion's approval and assistance (as previously agreed in principle between Mr. Champion and myself in conversation). The only question directly related to this brief was the source of her knowledge and Jenny Smith confirmed that it had come down through the female side of her family. As the interview was informal I did not take notes nor press her for the name or names of the specific individuals who were her source of information. Jenny told me at the end of this meeting that she would meet with Rosslyn Sten and others of her family and put the suggestion of a visit to the Champions Quarry site to them.

I rang Jenny Smith on her mobile number several times over the weekend of 31-07 and 01-08-2010 and on Monday 02-08-2010 without being able to get through. I left several messages for her to contact me. On Tuesday morning 03-08-2010 around 10.00 am. I was finally able to talk to Jenny on her work number. I explained to Jenny the purpose of my ringing her and the urgency of the information I sought. Jenny promised to again talk to Rosslyn Sten and try to meet with me before Wednesday 04-08-2010. That afternoon I received a phone call from Rosslyn Sten at approximately 2.30 pm. Rosslyn informed me that the family had just received some very bad news (from which I inferred there had been a bereavement) but that, nonetheless, they would try to meet with me before the deadline of completion of the supplementary report. As of this evening (Wednesday 04-08-2010) I have not heard back from either Jenny or Rosslyn.

I have read Professor Wayne Erskine's report on Hydrogeomorphology. In addition, on the morning of Tuesday 03-08-2010, Mr. Champion and myself made an on ground inspection of area identified as the birthing site with Mr. Champion explaining the lay of the land and some of its history of development (i.e. the improvements such as dams and a windmill etc.). I can only defer to Professor Erskine's assessment of the area on the Northern side of the quarry access road, namely that this is not suitable terrain for a birthing site and that there is no evidence to indicate the presence of a birthing site or of springs suitable for a birthing site (i.e. running water, birthing 'chairs', 'medicine bowls' etc.). Professor Erskine's analysis is consistent with my own field inspection to the degree that commonsense observations of the swampy nature of the wet areas and the evident lack of springs or running water in the hilly sandstone areas seem to confirm Professor Erskine's assessment).

I do not wish to speculate on the seeming misidentification of the location of the birthing site by Jenny Smith and Rosslyn Sten as marked with crosses on the plan they provided to me. They did not say to me that these were precise positions and I understood that these rough crosses represented at best, their understanding of the approximate location only. My understanding was they had never been to the sites or seen them first hand. My opinion is that the women are sincere and truthful in their belief that a birthing site does exist in the area - somewhere in this general vicinity – although, obviously, not necessarily at the exact location (site) where they have indicated on the map contained in my original

Anthropological Assessment report. The same applies in my opinion to their identification of caves on the property.

As regards reviewing any anthropological literature on birthing sites in the Northern Rivers region, I have discovered nothing of relevance in the literature so far. I have spoken to two female colleagues who are better versed on this question than myself and been informed by them that traditional Aboriginal birthing in general is not well documented, even on a continental basis. I have, however, been given some possible avenues of research:- Herron, R. and Walker, B., 'Aboriginal Cultural Heritage Values on the North Coast and within the Upper Clarence'; author unspecified, 'Aboriginal Women's Birthing Lakes at Byron Bay and Lennox Head' (no information as to whether this is a book, paper etc.); and the fact that 'mention has been made of birthing sites in a couple of archaeological reports (these too unspecified).

I consider that the caves identified by Jenny Smith and Rosslyn Sten are those that have already been identified in the two Cultural Heritage reports (Aboriginal Cultural Heritage Assessment 2008; Cultural Heritage Assessment ERM 2009:7) conducted on the Champions Quarry site. Jenny Smith has described these to me as the sandstone overhangs adjacent to the old motocross track to the south of the proposed extraction area, as indeed they are. However, the location of the caves has been marked incorrectly on the map submitted by the Bandjalang women in the original Anthropological Assessment (p.32). Rather than being within the proposed extraction area as they are marked the caves are in fact further south-east on the other side of the ridge in the area that has already been set aside for conservation. In my opinion this has been a genuine mistake arising from Jenny Smith and Rosslyn Sten's having never been on the property and lack of firsthand unfamiliarity with the country.

Finally, as regards David Mclean and his knowledge or otherwise of the Aboriginal site stated by Jenny Smith and Rosslyn Sten to exist in the vicinity of Matheson's Road Tuckurimba: I have not interviewed David Mclean but I was present during a phone conversation where he reportedly confirmed his ignorance of any such site in the Matheson's Road area. This is another issue I believe should be addressed with Jenny Smith and Rosslyn Sten when I get the opportunity to interview them again. I will however

draw the reader's attention to the original statement itself, and the rider at the beginning of the interview with Jenny Smith and Rosslyn Sten conducted on 25-05-2010, namely that this was a verbatim account of the interview conducted on the night before a deadline to submit the report. In other words the interview laid out in the report is taken directly from my notes with only matters considered completely irrelevant having been edited out. I draw the reader's attention to what is actually stated:

Rosslyn Sten's nephew, David McLean, lives down Mathieson Lane (off Wyrallah Road): 'There is a sacred site down there as well.' This information was given to Dianne Harrington's [i.e. Jenney Smith's sister] husband Sheldon by his father-in-law Bob Smith (Jenny Smith's father).

It can readily be seen that there is no actual comment that David McLean is the source of the information regarding the site, or that he even necessarily has knowledge of it. It has been confirmed that David McLean is, however, a relative of Jenny Smith and Rosslyn Sten (their nephew). It may therefore be entirely coincidental that David McLean's name is mentioned: simply the fact that he, a close relative, lives on Mathieson Road, the location of another traditional Aboriginal site close to Champions Quarry. In any event, this is another issue I could address in a supplementary interview with Jenny Smith and Rosslyn Sten.

Recommendations

A further course of action to investigate the matter is apparent, namely to request Ashley Moran when he is available to confirm whether Jenny Smith and Rosslyn Sten attempted to have the birthing site investigated and placed on the AIHMS register, as well as to access to whatever correspondence about this. I also think it is imperative to re-interview Jenny Smith and Rosslyn Sten with a view to putting the specific queries that have arisen to them. Jenny Smith did tell me originally that she believed she had the correspondence to NPWS somewhere in her possession and it ought to be possible to retrieve this. As stated, I do not believe the women have set out to be deliberately misleading but that, nonetheless, as is

obvious from Professor Erskines' report, some error has been made in the identification of the birthing site and also in relation to the specific site of the caves.

Annex D

Vegetation Management Plan

VEGETATION MANAGEMENT PLAN

Proposed Expansion of Champions Quarry,

1692 Wyrallah Road, Tuckurimba via Lismore

Prepared for

Reavill Farm P/L

Tucki Hills P/L

by

G.N. Elks B.Sc (Botany) M.Litt (Ecology) MECA

Idyll Spaces Environmental Consultants

21 Titans Close, Bonville 2441

02 6653 4190

gregelks@bigpond.com

13 May 2010

Introduction

This Vegetation Management Plan has been prepared for Reavill Farm Pty Ltd and Tucki Hills Pty Ltd to assess and advise on vegetation management activities to be undertaken in association with the proposed expansion of the existing sandstone quarry.

The proposed expansion would extend from the Central existing quarry pit to Southern Section and increase current production from 64,000 tonnes per annum to 250,000 tonnes per annum over a period of 25 years.

It is intended that all quarrying would be undertaken behind temporary surrounding bunds which are vegetated with fast growing grasses and groundcover species and that the trailing batters are progressively rehabilitated and vegetated as each 'work cell' deepens and extends. In addition, permanent plantings of trees will be strategically placed in corridors to lessen visual impact.

Quarrying of the Southern Section would commence at the western end behind a temporary vegetated bund at the leading quarry edge to the east. The western edge of the quarry would be completed to final batter and rehabilitated to grassland and planted with trees where appropriate, which is intended to provide a permanent green backdrop to minimise visual impact.

A similarly rehabilitated quarry and various existing plantings are contained nearby within the same larger rural holding.

Existing Plantings

Forest remnants and plantings of eucalyptus, pasture grasses and legumes located on the subject land, being the site of a proposed expansion of Champion's Quarry, and adjoining areas along Hazlemount Lane including the rehabilitated quarry, were inspected on 5 May 2010 in the company of Mr Jeff Champion representing the owners, Mr Allan Wyatt, Landscape and Visual consultant from ERM.

Plantings along Hazlemount Lane and in the vicinity of the Champion dwelling were identified by Mr & Mrs Champion as planted in about 1989. This date is supported by a 1990 aerial photo (held by Mr & Mrs Champion) showing visible saplings of about 1m in height. Species include Flooded Gum, Tallowwood, Forest Red Gum and Swamp Mahogany.

The trees were planted as tubestock into soil that had been loosened by deep ripping. Subsequent maintenance included initial watering, application of a 1 metre diameter circle of weed suppressing mulch, and pruning where required.

The height of a selection of these trees as measured by me with the aid of a clinometer was in the range 16 to 29.5 metres. (Table 1).

Table 1. Measured tree heights, Hazlemount Lane

<i>Scientific name</i>	<i>Common name</i>	<i>Height (m)</i>
<i>Eucalyptus grandis</i>	Flooded Gum	27
<i>Eucalyptus grandis</i>	Flooded Gum	29.5

<i>Eucalyptus grandis</i>	Flooded Gum	27
<i>Eucalyptus microcorys</i>	Tallowwood	19.5
<i>Eucalyptus microcorys</i>	Tallowwood	21
<i>Eucalyptus microcorys</i>	Tallowwood	21
<i>Eucalyptus microcorys</i>	Tallowwood	18
<i>Eucalyptus microcorys</i>	Tallowwood	18
<i>Eucalyptus robusta</i>	Swamp Mahogany	19
<i>Eucalyptus tereticornis</i>	Forest Red Gum	21
<i>Eucalyptus tereticornis</i>	Forest Red Gum	16
<i>Eucalyptus tereticornis</i>	Forest Red Gum	16.5
<i>Eucalyptus tereticornis</i>	Forest Red Gum	21

Recent tree plantings on a bund in the north-eastern corner of the subject land adjacent to an existing dwelling (Photo 1) were identified by Mr Champion as planted about 18 months ago. The planting as observed by me included Forest Red Gum, Tallowwood and Swamp Mahogany and was notable for Koala damage in the form of broken and defoliated branches.

The height of these trees ranged from about 2 metres to 3.5 metres, with Forest Red Gum and Tallowwood generally at the lower end of this range and Swamp mahogany at the upper end. There were also smaller trees and shrubs such as Lillypilly and Bottlebrush. The trees were planted into a bund of loose subsoil about 2m deep, watered, and mulched with woodchip.

An adjoining bund that had not been planted was also inspected. This was notable for the dense volunteer cover of grasses and legumes observed, both native and exotic, growing on untreated subsoil.

Other areas inspected included a rehabilitated former quarry on an adjoining property, notable for a dense cover of pasture grasses and legumes on rehabilitated slopes, and a recent boundary planting on an adjoining property.

Common remnant trees seen in areas adjoining those inspected above included Pink Bloodwood, Brush Box, Forest Red Gum and Flooded Gum and the non-eucalypts Hoop Pine, Red Ash and Silky Oak.

Some trees were seen growing out of sandstone including Hoop Pine and Red Ash close to the existing quarry pit growing on steep rocky terrain, conditions likely less favourable than the proposed battered rehabilitation areas.

Proposed Plantings

Proposed tree planting locations are shown in Figure 1 as prepared by ERM and provided in Attachment 1 to this report.

The tree plantings would function either solely as visual screens, or as combined visual screens and koala habitat corridors. Groundcover plantings would function as soil stabilisation and visual camouflage.

Predicted height of tree plantings at 6 and 11 years after planting was derived for this report by interpolation from heights of trees along Hazlemount Lane and on a bund in the north-eastern corner of the subject land, measured at 1.5 - 21 years and 1.5 years after planting (Table 2).

Table 2 Expected height growth of fast and slow growing eucalypts

Years after planting	1.5	6	11	21
Height of Slow growing species (m)	2	6.5	11	19
Height of Fast growing species (m)	3.5	10	16	28

Approximate heights measured at 1.5 years were 2 metres for Forest Red Gum and Tallowwood and 3.5 metres for Swamp Mahogany

Average measured heights at 21 years fell into two groups, being 27.8 metres for Flooded Gum, a very fast growing species, and about 19 metres (between 18.6 and 19.5 metres) for Tallowwood, Swamp Mahogany and Forest Red Gum, which were slower growing.

Koala screen corridors

Tree species should include Tallowwood, Forest Red Gum, Swamp Mahogany, Flooded Gum.

Tree spacings should be approximately 6 metres, in a corridor of minimum width 20 metres. Corridor width may vary upwards and corridors may be non-linear in places to better fit in with the shapes of stands of remnant vegetation.

Trees should be planted into soils formed from subsoil bunds with topsoil cover or into deep-ripped existing soil profiles. A slow-release fertiliser suitable for eucalypts should be used at recommended rates.

The ground within 1m of planted trees should be maintained in a weed-free condition from planting until the trees are at least 3 metres tall.

Trees should be mulched with woodchip mulch approximately 10 centimetres deep and extending for at least 1m radius around the tree.

Dead trees should be replaced at 1 month, 3 months and 12 months after initial planting.

Corridors should be fenced to exclude livestock.

Screen only corridors

Trees should include the following species:

<i>Lophostemon confertus</i>	Brush Box
<i>Corymbia intermedia</i>	Pink Bloodwood
<i>Eucalyptus dunnii</i>	Dunn's White Gum
<i>Eucalyptus pilularis</i>	Blackbutt.

The expected height growth of Brush Box and Pink Bloodwood would meet or exceed that of slow growing species in Table 2.

Dunn's White Gum and Blackbutt are widely planted tree species with fast growth rates and as such their expected height growth is likely to meet that of fast growing species (Flooded Gum) in Table 2.

Tree spacings should be approximately 6 metres, in a corridor of minimum width 10 metres.

Trees should be planted into soils formed from subsoil bunds with topsoil cover, or into deep-ripped existing soil profiles. A slow-release fertiliser suitable for eucalypts should be used at recommended rates.

The ground within 1m of planted trees should be maintained in a weed-free condition from planting until the trees are at least 3 metres tall.

Trees should be mulched with woodchip mulch approximately 10 centimetres deep and extending for at least 1m radius around the tree.

Dead trees should be replaced at 1 month, 3 months and 12 months after initial planting.

Corridors should be fenced to exclude livestock.

Groundcover plantings

Soils should be ripped and battered to a slope not exceeding 1:1 - 1:2

Perennial species should include *Setaria* sp, *Siratro* sp and Wynn Cassia (as planted in adjoining pastures).

Seasonally appropriate annual grasses (winter Ryegrass, summer Japanese Millet) should be used as quick cover where appropriate.

Target foliage cover of the ground surface should be 70% and it is expected that it would be achieved within 1 year of planting/sowing.

Attachment 1

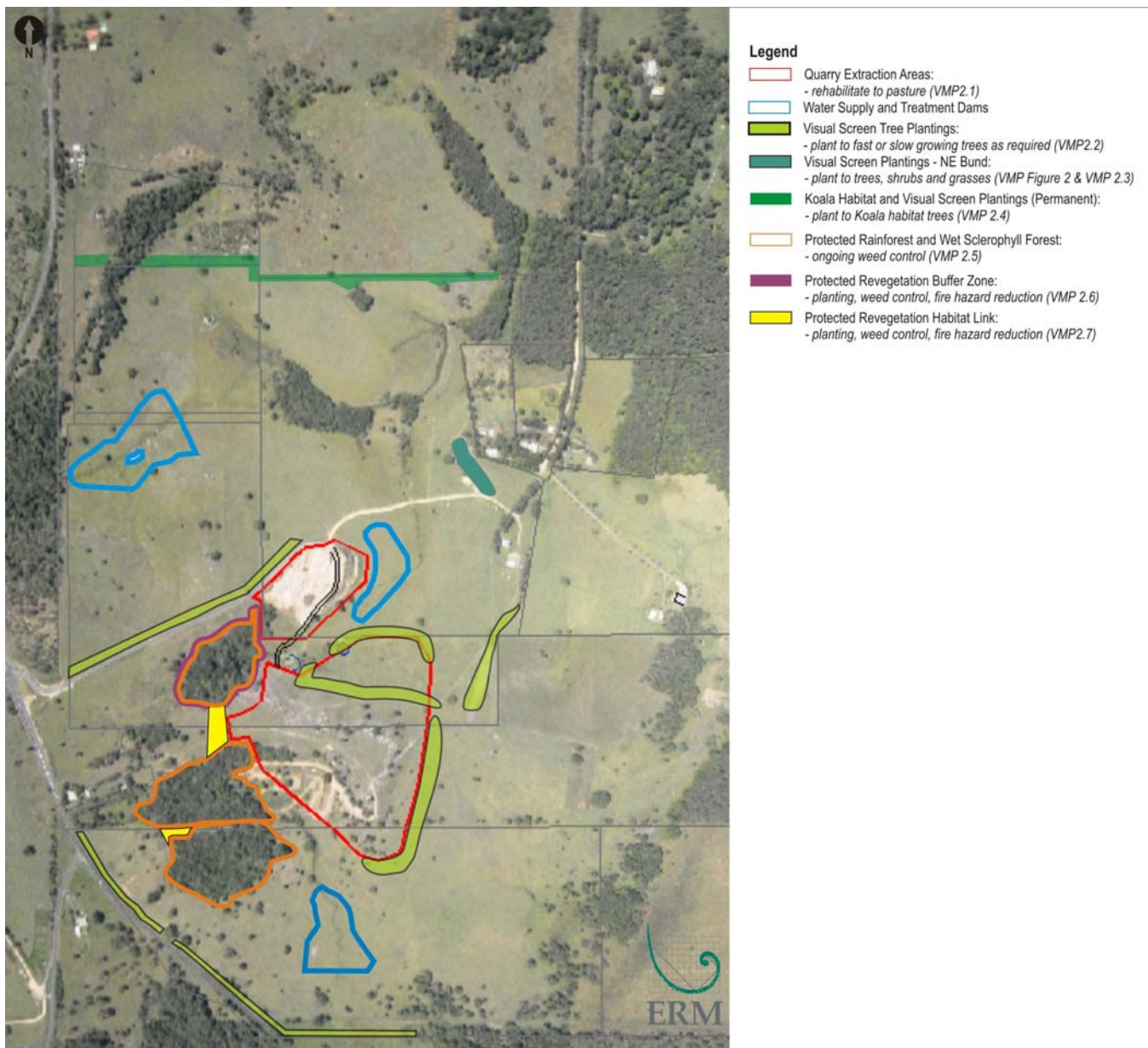


Figure 1 Proposed Tree Planting