



Bulahdelah Cultural Heritage Assessment

Bulahdelah Residential Rezoning

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Executive Summary

RPS has been commissioned by Great Lakes Shire Council (GLC) to assess the potential Aboriginal and European cultural heritage of an area of land adjacent to the Bulahdelah Golf Course in the Great Lakes Council Local Government Area (LGA) to support a Local Environmental Study (LES). This report will form part of a strategic and statutory assessment to determine the suitability of the site for residential rezoning and land use.

This CHA has been prepared in accordance with guidelines and conditions set out by the Department of Conservation, Climate Change and Water (DECCW) pursuant to Section 62 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The report has been prepared to meet the heritage assessment requirements for the proposed rezoning of Part of Lot 1, Part of Lot 2 and Lot 3 in DP 1120817 Pacific Highway, Bulahdelah, New South Wales (Refer Figure 1-1). The study area is currently zoned 1(a) Rural and is located to the northeast of the town of Bulahdelah. This rezoning application seeks to determine whether residential zonings and land uses are suitable on the site.

A Development Application (DA 799/2007) was approved for a brewery and tourist resort on the site under the existing zoning 1(a) Rural. It is proposed that any future residential subdivision of the site be developed in association with a previously approved submission for a brewery and resort development permissible under the existing zoning 1(a) Rural.

A search of the Department of Environment, Climate Change and Water (DECCW), Aboriginal Heritage Information Management System (AHIMS), which covered a radius of 10km surrounding the study area, was conducted on 23rd of April 2010. The search revealed 52 sites in the regional area, but, no sites had been previously recorded in the immediate study area.

Extensive surveys have previously been undertaken in the regional and local area in association with various development works. These included a number of archaeological surveys relating to the upgrade of the Pacific Highway through the Bulahdelah area, and a comprehensive Aboriginal Cultural Heritage Assessment by Navin Officer as part of an Environmental Impact Statement in 2004 (Navin Officer 2004:13).

Bulahdelah Mountain was identified as a heritage item in the Great Lakes Local Environmental Plan 1996 (GLLEP 1996). The Great Lakes Council Draft Heritage Study (2003) adopted in May 2007 proposed that a part of Bulahdelah (Alum) Mountain be designated a Heritage Conservation Area but no determination has yet been made. Also pending is a nomination for an Aboriginal Place encompassing the upper slopes of Alum Mountain bounded by the Bulahdelah State Forest Boundary, to the south and east of the immediate study area.

The archaeological pedestrian survey was conducted by Gillian Goode, Senior Archaeologist for RPS and Colleen Perry and Benjamin Feeney, Sites Officers representing Karuah Local Aboriginal Land Council (KLALC) on Thursday 20th and Friday

21st May 2010. The possible impacts of the proposed development on Aboriginal cultural heritage were considered and articulated at that time.

One Scar Tree Site (RPS BD ST1) was identified during the course of the pedestrian survey. RPS BD ST1 was located in the Riparian Zone on the northern bank of Frys Creek and would therefore not be impacted upon by any development works. However, a buffer zone of 10m should be placed around the scar tree to ensure that the tree is protected from any impact.

At the end of the survey the Aboriginal Community Stakeholders present on the survey, (Colleen Perry and Ben Feeney of KLALC), in discussions with the archaeologist concluded that there were several Aboriginal cultural heritage sites located in the broader region. They indicated that there was no impediment due to cultural heritage values to the proposed rezoning in the immediate study area. As the Scar Tree site (RPS BD ST1) was located in the riparian zone of Frys Creek it would not be impacted on. However they stated that there were areas that were considered to have cultural heritage value on the top of Alum Mountain outside of the study area.

The management recommendations that are formulated from this archaeological assessment are based upon the legislation designed to address the impact of development on sites of cultural significance.

It is recommended that works may proceed with regard to the following:

Recommendation 1

The scar tree site RPS BD ST1 identified in the study area should not be impacted upon. A minimum buffer zone of 10 metres should be imposed around the tree in the event of any works being undertaken in its vicinity. However, as the site is located in the riparian zone of a major creek line it is unlikely to be impacted upon by future proposed works. If potential impact to the site occurs or is likely to occur at any time in the future then the local Aboriginal Community Stakeholders, the DECCW and a suitably qualified archaeologist should be contacted.

In general during the course of proposed construction work:

Recommendation 2

During the course of proposed construction work, if suspected Aboriginal cultural heritage material is encountered, work should cease in that vicinity immediately, the area cordoned off and contact made with the DECCW Enviroline 131555, a suitably qualified archaeologist and the relevant Aboriginal Community Stakeholders (including the KLALC), so that it can be adequately assessed and managed.

Recommendation 3

In the event that skeletal remains are uncovered whilst operations are underway, work must cease immediately in the vicinity and a 20m buffer zone be placed around the site. The area should be fenced and the NSW Police Coroner should be contacted to

determine if the remains are deemed to be of Aboriginal origin. If determined to be Aboriginal then contact should be made with the DECCW Enviroline 131555 and representatives of the local Aboriginal community stakeholders to determine an action plan for the management of the skeletal remains, formulate management recommendations and to ascertain when work can recommence.

European History:

No European cultural heritage sites were located during the survey of the Study Area. During the course of any construction work the following recommendation should be considered:

Recommendation 4

If, during the course of clearing works, significant European cultural heritage material is uncovered, work should cease in that area immediately. The NSW Heritage Branch should be notified and works only recommence when an appropriate and approved management strategy instigated.

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I Introduction

RPS has been commissioned by Great Lakes Shire Council (GLC) to assess the potential Aboriginal and European cultural heritage of an area of land adjacent to the Bulahdelah Golf Course in the Great Lakes Council Local Government Area (LGA) to support a Local Environmental Study (LES). This report will form part of a strategic and statutory assessment to determine the suitability of the site for residential rezoning and land use. The study area is currently zoned 1(a) Rural and residential development is not permissible under the current zone.

This CHA has been prepared in accordance with guidelines and conditions set out by the Department of Conservation, Climate Change and Water (DECCW) in response to consultation undertaken pursuant to Section 62 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.1 The Study Area

The study area is located within the Great Lakes LGA, in the Parish of Boolambayte, County of Gloucester. The study area comprises Part of Lots 1 and 2 and the whole of Lot 3 DP 1120817 (formerly Lot 1 DP 120651 and Pt 5 DP 863307) and is located to the northeast of the town of Bulahdelah on the eastern side of the Pacific Highway (Figure 1.1). The western limit of the study area is bounded by the Bulahdelah Golf Course and the Pacific Highway Road Reserve, the eastern boundary is defined by DP 753154 and the Bulahdelah State Forest, the northern limit of the study area by the Pacific Highway Road Reserve, and the southern and south western boundaries are defined by the break in slope between the mid slope and upper slope area of Alum Mountain.

1.2 Background

Extensive archaeological and cultural heritage surveys have previously been undertaken in the regional and local area in association with various development works including a Bulahdelah Aboriginal Place Nomination Assessment Report prepared for the NSW National Parks and Wildlife Service (Umwelt 2003) encompassing the upper slopes of Alum Mountain and parts of the Bulahdelah State Forest Area which are adjacent to, but, outside of the immediate study area.

A comprehensive Aboriginal Cultural Heritage Assessment was undertaken in 2004 for an Environmental Impact Statement (Navin Officer 2004) which addressed the Cultural Heritage Resources along and adjacent to the proposed Upgrade Route of the Pacific Highway and incorporated an extensive regional and local assessment of Aboriginal and non-indigenous cultural heritage in the Bulahdelah area and the area encompassing Alum Mountain. Extensive

Aboriginal Community Consultation was undertaken during the course of the survey and assessment works by both Umwelt (2003) and Navin Officer (2004).

Part of Bulahdelah (Alum) Mountain was identified as a heritage item in the Great Lakes Local Environmental Plan 1996 (Smith 2007). This heritage listing relates to the former Alunite Mine Site Complex with the first mining leases over the Bulahdelah deposit being established in 1888 by the Australian Alum Company. The Great Lakes Council Draft Heritage Study (Smith 2007) adopted in May 2007 proposed that certain lands around Bulahdelah Mountain, which is also known as Alum Mountain, be designated a Heritage Conservation Area, but no determination has been made on the proposal.

This report will form part of a strategic and statutory assessment to determine the suitability of the site for residential rezoning and land use. The study area is currently zoned 1(a) Rural and residential development is not permissible under the current zone. It is proposed that any future residential subdivision of the site be developed in association with a previously approved submission for a brewery and resort development permissible under the existing zoning 1(a) Rural. Both the brewery and tourist development have DA approval – Refer DA 799/2007.

1.3 Legislative Context

Aboriginal heritage (places, sites and objects) within NSW are protected by *National Parks and Wildlife Act (1974, as amended)*. In some cases, Aboriginal heritage may also be protected under the *Heritage Act (1977)*. The *Environmental Planning and Assessment Act (1979)*, along with other environmental planning instruments, trigger the requirement for investigation and assessment of Aboriginal heritage as part of the development approval process. For crown land, provisions under the Native Title Act (1993) may also apply.

1.3.1 National Parks and Wildlife Act (1974, as amended)

The primary state legislation relating to Aboriginal cultural heritage in NSW is the 1974 *National Parks and Wildlife Act*, as amended (NPW Act 1974). The legislation is overseen by the Department of Environment, Climate Change and Water (DECCW), and specifically the Director-General of the DECCW.

Protection for Aboriginal sites is provided under Part 6 of the NPW Act (1974). It is an offence for a person or company to:

- knowingly destroy, deface, damage, cause or allow the destruction/defacement to an Aboriginal object or Aboriginal place (Section 90);
- disturb, move, excavate for the purposes of finding Aboriginal objects, or take possession of Aboriginal objects (Section 86) unless a valid Permit under Section 87 of the Act has been issued by the Director General of the DECCW; and

- be aware of the location of an Aboriginal object and fail to report it to the DECCW (Director-General) within a reasonable timeframe (Section 91).

1.3.2 Heritage Act 1977

Historical archaeological relics, buildings, structures, archaeological deposits and features are protected under the Heritage Act 1977 (as amended 1999) and may be identified on the State Heritage Register (SHR) or subject to an active Interim Heritage Order; in such cases they would be protected under the Heritage Act 1977 and may require approvals or excavation permits from the NSW Heritage Branch.

1.3.3 Environmental Planning & Assessment Act 1979 (EP&A ACT)

This Act regulates a system of environmental planning and assessment for NSW. Land use planning requires that environmental impacts are considered, including the impact on cultural heritage and specifically Aboriginal Heritage. Assessment documents prepared to meet the requirements of the EP&A Act (1979) including: Review of Environmental Factors (REF), Environmental Impact Statements (EIS) and Environmental Impact Assessments (EIA), should address Aboriginal Heritage, and planning documents such as Local Environment Plans (LEP) and Regional Environmental Plans (REP) and typically contain provisions for Aboriginal heritage where relevant.

Further details on the relevant legislative Acts are provided in Appendix 1.

1.4 Great Lakes Shire Council & DECCW Project Requirements

The Great Lakes Shire Council is required to comply and to adhere to legislative requirements associated with Aboriginal Cultural Heritage in NSW. The Department of Environment, Climate Change and Water (DECCW), is the governing body with the responsibility for managing and administering all facets of Aboriginal cultural heritage in New South Wales. For this reason, DECCW was consulted under Section 34A and Section 62 of the EP&A Act to determine their requirements with respect to Aboriginal Cultural Heritage assessment to enable residential development within the subject site. DECCW (previously known as DECC) provided their advice in a letter dated 5th February 2009. A copy of the letter is provided in Appendix 1.

The DECCW Project Requirements specified in the above mentioned letter are considered to have been appropriately addressed within this CHA. The requirements that related specifically to Aboriginal cultural heritage values in their letter were:

- To address Aboriginal community consultation in accordance with the draft “Guidelines for Aboriginal Cultural Heritage Impact Assessment and

Community Consultation" (DEC 2005) – refer Section 1.7 and Appendices 3 and 7 of this report;

- Archaeological field survey was to be conducted by a suitably qualified archaeologist in consultation with traditional Aboriginal custodians – refer Appendix 7;
- To identify the areas for proposed impact on Aboriginal cultural heritage in the study area and adopt strategies to avoid/ minimise impacts – refer Section 12;
- To assess the archaeological and Aboriginal cultural significance of the study area with consideration of the Aboriginal cultural heritage values of the area – refer Section 8;
- To outline effective and reliable mitigation measures designed to avoid/ minimise any impact upon Aboriginal cultural heritage – refer Section 12; and
- To demonstrate effective communication with the Aboriginal community has been undertaken in assessing the impacts, developing options and formulating final recommendations – refer Appendices 3 and 7.

1.5 Scope of Assessment

This assessment has been prepared to meet the heritage requirements for a rezoning application for a residential development in the Bulahdelah area. It draws on the environmental and archaeological context of the study area, including known sites to inform the archaeological predictive model against which survey results are compared. This report provides an archaeological AHIMS map and assesses the significance of heritage sites/items within the study area. The proposed impacts of the development are assessed with consideration to the survey results, the AHIMS map data and assessment of significance. This assessment report includes:

The following methodology was adopted in the assessment process and preparation of this CHA report:

- Identification and review of the relevant statutory requirements in respect to cultural heritage;
- Ongoing consultation with the Aboriginal Community and ascertaining, where possible, the Aboriginal cultural heritage values for the local area including summary and appraisal of previously documented information in order to ensure a cultural heritage perspective was maintained;
- Search and review of the DECCW Aboriginal Heritage Management System (AHIMS database) to identify previously recorded/ known Aboriginal Sites and review of associated documenting evidence (Appendix 2);
- Review of archaeological heritage items for Aboriginal and non-Indigenous heritage sites on the Great Lakes Shire Council LGA Local Environmental Plan (LEP), State Heritage Register and Register of the National Estate;

- A review of the relevant environmental and archaeological background information to develop a predictive model of archaeological site patterning in the study area;
- A pedestrian survey aimed to gain a maximum cover of the study area in thick ground cover including coverage of all landforms, areas of exposure and vegetated areas with members of the local Aboriginal Community;
- Identification of heritage sites and archaeological sensitivity in the study area;
- Develop recommendations for the management for Aboriginal and non-Indigenous archaeological items identified in the study area during field survey.

This Cultural Heritage Assessment has been prepared accordance with:

- The *National Parks and Wildlife Act (1974)*;
- *The Heritage Act (1977)*; and
- The National Parks and Wildlife Service *Guidelines for Archaeological Survey and Reporting (1997)*.

1.6 Limitations

The desktop background review of the study area was limited to all available documents with regard to the project. The field survey covered all landform types occurring in the study area with inspection wherever possible of existing ground exposures. Visibility was poor in some of the treed areas due to dense undergrowth and ground cover. There were several dirt access tracks and various easements which did provide access to much of the survey area.

1.7 Aboriginal Community Consultation

The purpose of Aboriginal Community consultation is to provide an opportunity for the relevant Aboriginal people to have input into the heritage management process.

The Aboriginal field survey and accompanying report does not trigger a requirement to conduct the full Aboriginal consultative process under [Aboriginal cultural heritage consultation requirements for proponents 2010](#). As such there is no need to apply for an Aboriginal Heritage Impact Permit (AHIP) from DECCW as the development at this stage has no potential to harm Aboriginal objects or places.

The ACHR (2010):

- Apply to all activities throughout New South Wales that have the potential to harm Aboriginal objects or places and that require an AHIP.

- Replace the Interim Community Consultation Requirements for Applicants, December 2004; and support other DECCW policies and procedures that provide direction and guidance for AHIP proponents in determining Aboriginal cultural heritage impacts.

Relevant consultation with the local Aboriginal Community Stakeholders was undertaken for the project and a Consultation Log documenting correspondence and all other relevant material associated with the consultation process can be found in Appendix 3.

1.8 Authorship

Survey was undertaken by Gillian Goode, Senior Archaeologist with RPS. This report was written by Gillian Goode and Philippa Sokol, and reviewed by Darrell Rigby Archaeology Manager, all of RPS Newcastle.

1.9 Acknowledgements

RPS Newcastle would like to acknowledge the following people who assisted in this Aboriginal Cultural Heritage Assessment and to express their appreciation for the assistance given by the Aboriginal Community Stakeholders.

Name	Company
Colleen Perry	Sites Officer, Karuah Local Aboriginal Land Council
Benjamin Feeney	Sites Officer, Karuah Local Aboriginal Land Council

1.10 Terms and Abbreviations

Abbreviation	Description
ACH Consultation Requirements	Aboriginal Cultural Heritage Consultation Requirements for Proponents (2010), were released by DECCW on the 12 th of April, 2010. These consultation requirements are triggered if an AHIP is needed.
ACS	Aboriginal Community Stakeholders
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
BP	Before present (as in years before present)
cal. years BP	Calibrated years before present, indicates a radiocarbon date has been calibrated using the dendochronology curves, making the date more accurate than an uncalibrated date
CHA	Cultural Heritage Assessment

DECCW	Department of Environment, Climate Change and Water, formerly Department of Environment (DEC)
GIS	Geographical Information System
GLC	Great Lakes Council
ICCR	Interim Community Consultation Requirements for Applicants were released as guidelines for Aboriginal consultation by DEC in 2005
KLALC	Karuah Aboriginal Local Aboriginal Land Council
LEP	Local Environment Plan
LES	Local Environmental Study
LGA	Local Government Authority
PAD	Potential Archaeological Deposit
REP	Regional Environment Plan
REF	Review of Environmental Factors
RPS	Rural Planning Services

Figure 1-1: Location of Study Area

2 Environmental Context

An understanding of environmental context is important for the predictive modelling of Aboriginal sites, as well as, for their interpretation. The local environment provided natural resources for Aboriginal people, such as, stone (for manufacturing stone tools), food and medicines, wood and bark (for implements such as shields, spears, canoes, bowls, shelters, amongst others), as well as, areas for camping and other activities. The nature of Aboriginal occupation and resource procurement is related to the local environment and it therefore needs to be considered as part of the cultural heritage assessment process. The reporting of environmental context is also required by DECCW as specified in the NPW Standards and Guidelines Kit (1997).

2.1 Geology and Soils

The geology of the study area comprises the Bulahdelah formation as the overlying unit and the Bulahdelah Mountain Volcanics as the underlying unit. The study area lies within the Myall River Syncline in an area dominated by Carboniferous and Permian rocks (Great Lakes Council 1996).

The Bulahdelah Formation dominates the geology and soils in the region of the study area with a portion of the Alum Mountain Volcanics incorporating the mid sloped area in the southern part of the study area. The Bulahdelah Mountain formation is comprised of grey to brown, massive to thickly bedded lithic sandstone, occasional pebble layers and poorly exposed siltstone and clay stone (DECCW 2008). The underlying bedrock in this region includes sandstone, conglomerate and mudstone. Fine-grained, light grey homogenous clays were noted in the soil substrates in this region and these may be the result of alluvial sorting of weathered sediments from the acid volcanic rocks of the Bulahdelah Mountains (Great Lakes Council 1996).

The study area lies at the north western, upstream extent of the Myall River coastal plain, and is defined by the dominance of valley floor Quaternary alluvium. The ridgelines immediately surrounding the study area consist of Permian aged sandstones and shales belonging to the Bulahdelah Mountain Formation. These rocks support low-lying, broad spur lines and low gradient basal slopes adjacent to the valley floor (DECCW 2008).

The area has a shallow A horizon overlying extensive B horizon clay deposits. Soils in alluvial contexts are generally comprised of silts and sand and have considerable depth. Soil deposits on crests tend to be shallow and stony (DECCW 2008).

2.2 Topography and Hydrology

The study area is located within a terrain of hillcrests and ridges which run in a north-west to south-east orientation.

Frys Creek, a tributary of the Myall River, flows across the study area at the base of the north east facing slopes of Alum Mountain which comprises the south west portion of the study area. The basal slopes of the Alum Mountain Ridge are relatively flat, (Great Lakes Council 1996). Frys Creek is a 3rd order stream which flows into the Myall River. The Frys Creek valley floor is relatively flat, with numerous small drainage depressions which drain water to Frys Creek. There are low and ill-defined spurs and slopes in the mid and upper slope areas.

2.3 Climate

Approximately 18,000 years ago, climatic conditions began to alter which affected the movement and behaviour of past populations within their environs. During this time, notably at the start of the Holocene (more than 11,000 years ago), the melting of the ice sheets in the Northern Hemisphere and Antarctica caused the sea levels to rise, with a corresponding increase in rainfall and temperature. The change in climatic conditions reached its peak about 6,000 years ago (Short 2000:19-21). Up until 1,500 years ago, temperatures decreased slightly and then stabilised about 1,000 years ago, which is similar to the temperatures currently experienced. Consequently, the climate of the study area for the past 1,000 years would probably have been much the same as present day, providing a year round habitable environment.

The annual average maximum and minimum temperatures experienced at Bulahdelah are 23.6°C and 11.9°C respectively. The average annual rainfall is 1,178 millimetres, with an average of 111 rain days (Bureau of Meteorology 2010).

2.4 Flora and Fauna

The flora in the study area and immediate surrounds is predominantly comprised of forested vegetation characterised by a tall tree canopy dominated by eucalypt species. Generally, the canopy allows sunlight to penetrate supporting growth of a variety of shrub and grass species. The riparian zone along Frys Creek comprises tall forest on alluvium (Great Lakes Council 2005).

Flora is dominated in the canopied areas by Eucalyptus species such as Red Mahogany, Sydney Peppermint, Red Bloodwood, Thin-leaved Stringybark and Sydney Red Gum (DECCW 2008). Occasionally Eucalyptus Swamp Mahogany occurs (DECCW 2008). This type of vegetation would be regarded as a Mixed Hardwood Forest and is dominated by several distinct hardwood and gum species. Understory growth comprises various Callistemon, Banksia, Melaleuca

and Acacia species together with common native grasses and grass trees (*Xanthorrhoea malacophylla*) (DECCW 2008).

A number of faunal species may occur in the study area. These include an abundance of bird species attracted to local floral communities, arboreal mammals such as gliders and other marsupials in the tall canopy, together with various species of reptiles and amphibians, a number of bat species and the common bush rat (DECCW 2008).

2.5 Discussion

The regional and local landscape, environment and climate of the study area would have been suitable for maintaining Aboriginal occupation prior to the arrival of non-indigenous communities.

The study area and wider region offers a range of resources including shelter, fresh water, fauna and flora. Raw material for stone tool manufacture was available in the local area including fine grained siliceous material, volcanics and sedimentary and metamorphic rocks.

3 Aboriginal Prehistory

3.1 Historical Records of Aboriginal Occupation

The ethnographic information used to interpret the archaeological record is often biased and may be deeply prejudiced particularly in relation to lifestyle, social practices, community interactions, religion and other facets of Aboriginal life (L'Oste Brown 1998). It is important to recognise this possible bias when using early European accounts regarding the lifestyles of Aboriginal people, particularly in the interpretation of their daily life and beliefs.

Nonetheless, some of these ethnographic records can provide important information and insight on local Aboriginal customs and cultural materials evidenced during the early years of European settlement. A large number of journals, diaries and general reports of the first European settlement in the area and ethnohistoric data was recorded by Ebsworth (1826), Dawson (1830), Caswell (1841), Backhouse (1843) and Threlkeld (Threlkeld in Threlkeld in Gunson 1974).

3.2 The Traditional Owners

According to the tribal boundary information compiled by Tindale (1974), the tribal territory falls in the location of the Worimi people. Their territory was from Forster southwards to Raymond Terrace in the south, and west to Maitland and Martins Creek. However, Brayshaw (1987) suggests that the area may have been part of the Biripai tribe's territory which included the Barrington Tops, Gloucester and Forster areas.

3.2.1 Aboriginal Implements

The bark of the cabbage tree and kurrajong were used to make cord for the manufacture of fishing lines and nets and also for canoes (Ebsworth 1826). Some shields were produced from the bark of the nettle tree or mangrove wood. Brayshaw (Brayshaw 1987) noted that there were two types of shields manufactured along the coast. The type commonly found and a wide shield of hard wood was made to be used against the threat of opponents clubs. Boomerangs, clubs spear throwers and hatchets were also created from hard wood. Spears were comprised of both grass tree and hard wood (Dawson 1830). Caswell (1841) noted that there were three types of spears which were generally used in the coastal area, including the fishing spear, the hunting spear and the war spear. Tools such as chisels and small fishhook files, bone awls and sharpened shell knives and scrapers were also among the implements found in the Worimi tool kit.

3.2.2 Food and Useful Plants

According to Backhouse (Backhouse 1843) the Aborigines of the study area had an abundance of food resources. Their diet included marine and freshwater shell fish including mud oysters and rock oysters and fish caught with spears, lines and hooks, fish weirs or traps. Their environment was also rich in reptiles and mammals including snakes, lizards, kangaroo, wallabies and possums. Birds such as parrots, pigeons, emus and young mutton birds and eggs (Bennett 1929) were also part of the diet. Plant species such as the Bungall fern, bracken and Giant Lily and the fruit of the tree fern, apple – berry, lance leaf, geebung and lillipilli were also used as a food resource (Threlkeld in Threlkeld in Gunson 1974).

3.2.3 Clothing

In the summer, the weather would have permitted the Aborigines to wear minimal clothing. In winter the skin of both the kangaroo and possum was used as rugs and coats and fur cord was also used for clothing.

3.2.4 Campsites and Shelters

Tree bark was used for the construction of huts along with suitable timber lengths. Information regarding specific campsite locations is lacking although in the Karuah Valley to the south of the study region, Aboriginal camps were observed at the foot of a hill “at the margin of a brook” and also on the top of a “small rise” (Dawson 1830).

3.3 Aboriginal History before European Contact

The Worimi people were bordered on the north by the Birpai, the northwest by the Dungutti, the west by the Gringai and the Wonaruah, and the south by the Awabakal. Enright (1900) considered that the Worimi were divided into groups. Narelle Marr (nd) refers to these groups as ‘nurras’ and Enright (1900) identified ten nurras. Sokoloff (1973) identified eight nurras who occupied the Great Lakes area. Each of the nurras occupied a definite locality within the tribal territory but the exact boundaries are not known because of the extensive dispersal that occurred after European settlement. Coastal lakes, beaches and estuaries backed by wooded country of various kinds provided a rich food source and supported a high population. The Worimi and Birpai clan groups both spoke dialects of the Kattang language (Enright 1900).

3.4 Aboriginal History after European Contact

The earliest European contact with Aborigines in the wider region area probably occurred at Port Stephens in 1790 when five escaped convicts were rescued by Aborigines and taken into their community (Brayshaw 1987). Contact with cedar

cutters began in the Port Stephens area after 1816 (Brayshaw 1987). Aboriginal population numbers decreased rapidly after European settlement.

One important aspect which has shaped Aboriginal lifestyle and the lives of families for more than a century is the establishment of Aboriginal missions and the mission schools. Aboriginal Stations or Missions were established regionally at Purfleet, Forster and Karuah during the late nineteenth and early twentieth century's (Bennett 1929). Mission schools operated at Forster from 1891 to 1952, Purfleet from 1903 to 1953 and Karuah from 1916 to 1954 (Brayshaw 1987).

4 European History

4.1 General

The Bulahdelah (Alum) Mountain was first recorded by John Oxley, a Crown Surveyor, in 1818 (Carrall 1999a:10). It was known in those early times as Bulladella Mountain, and was used as a prominent landmark that marked the most northern boundary for convicts and bonded persons.

In the early 1800's, a settlement was founded around the point formed by the Myall Lake and Boolambayte Creek which then became known as Boolambayte (Carrall 1999a:33). The settlement was established due to the local timber resource suitable for boat building, barges and droghers (paddle-wheeled vessels). The settlement progressed rapidly, with small dwellings springing up along the lake shores and creeks, and the bush north and west of the lake at Boolambayte. On September 20th, 1836, John Edward Stacy applied for a timber grant and in 1837; the coastal area reverted to Crown land, which aimed to encourage settlement of the area (Carrall 1999a:34) but with little response. Advertisements in 1838 in Sydney calling for settlers for the region received no applications (Carrall 1999a:34).

In 1876 John Cassidy submitted a sample of powdered and heat affected rock extracted from the mountain for testing which proved to be a high grade of Alum (Carrall 1999a:40). Alunite was first quarried in the Bulahdelah area in 1878 by the Run Corn Alunite Co until 1884 (Carrall 1999a:41). The first mining leases over the Bulahdelah deposit were taken up in 1888 by the Australian Alum Company. The company commenced quarrying at the northern end of the Bulahdelah (Alum) Mountain, now known as 'The Big Quarry'. In 1897 Bulahdelah (Alum) Mountain was dedicated to Crown Land Reserve for mining purposes and was administered by the Department of Mines (Carrall 1999a:44). An Anglo – French Syndicate, owned by an English company, took out a prospecting lease in 1906 (Carrall 1999a:44). The syndicate went out of operation when the ore recovered was found to contain insufficient grading to export overseas. In 1910 the mine was sold to the 'Australian Alunite Company' which faced mining operating difficulties due to insufficient ore to maintain output demand. The company ceased extractions in 1927. In 1933 the 'Australian Alunite Company' was brought out by the Australian Alunite Syndicate who ceased its operations in 1952 as a result of low grade ore deposits (Carrall 1999a:45).

4.2 Heritage Register listed items

At the national level those items that are accorded National Significance status are under the control of the Commonwealth Government. These items are

recorded and protected under the National Heritage List and the Commonwealth Heritage List. The extensive Register of the National Estate lists those items considered of value for future generations.

The State Heritage database is maintained by the NSW Heritage Branch and lists all items that have been identified as of heritage value on Regional Environment Plans (REP) and Local Environment Plans (LEP) throughout NSW. The State Heritage Register lists those places which are of State Significance.

4.3 Commonwealth Heritage List

The Commonwealth Heritage List controls the Australian Heritage Database and maintains a record of all items that have been identified as of heritage value.

The search of the Commonwealth Heritage List identified no Commonwealth Significant items for the Bulahdelah area.

[NSW Commonwealth Heritage List](#)

4.4 New South Wales Heritage Branch Register

The State Heritage database is maintained by the NSW Heritage Branch (Refer Appendix 5) and lists all items that have been identified as of heritage value on Regional Environment Plans and Local Environment Plans throughout NSW.

The State Heritage Register lists those places which are of State Significance. Listed for the Bulahdelah area are:

Alunite Mine (former), Bulahdelah Mountain, Bulahdelah, NSW 2423

The above listed item is located approximately 1 kilometre south west of the Bulahdelah Study Area and comprises the majority of the upper slopes of Bulahdelah Mountain. The proposed rezoning application for the Study Area does not pose a threat to the State Listed item.

[Alunite Mine \(former\)](#)

Courthouse (former), Crawford Street, Bulahdelah, NSW 2423

The above listed item is located approximately 1.5 kilometres south west of the Bulahdelah study area and as such the proposed rezoning application does not pose a threat to the State Listed item.

[Courthouse \(former\)](#)

General Cemetery, Markwell Road, Bulahdelah, NSW 2423

The above listed item is located west of the Pacific Highway approximately 750 metres south west of the Bulahdelah study area and as such the proposed rezoning application does not pose a threat to the State Listed item.

[General Cemetery](#)

Kauri & Co's Railway, Bulahdelah, NSW 2423

The above listed item is located within the region of Bulahdelah but is not located in the immediate surrounds to the study area. Consequently, the proposed rezoning application does not pose a threat to the State Listed item.

[Kauri & Co's Railway](#)

Tramline Trestle Bridge, Horses Creek, Bulahdelah, NSW 2423

The above listed item is located within the region of Bulahdelah and is not located in the immediate surrounds to the study area. Consequently, the proposed rezoning application does not pose a threat to the State Listed item.

[Tramline Trestle Bridge](#)

Four of the listed items do not share a common boundary with the study area and they are located approximately half a kilometre or more away. The former Alunite Mountain Mine is located on the southern side of Alum Mountain. The above mentioned Commonwealth and Heritage listed items will not be incorporated in the proposed rezoning application for the study area and as such will not be impacted upon by it.

4.5 Great Lakes Council Local Environmental Plan (LEP)

The Great Lakes Council LEP (1996) contains a listing of Heritage listed items for the Bulahdelah region (Schedule 2) – The Great Lakes Council Local Environmental Plan 1996 ([LEP](#)).

4.6 Listed Historic Items in the Immediate Study Area

There are no heritage listed items or built structures contained in the immediate study area comprising Part of Lot 1, Part of Lot 2 and Lot 3 in DP 1120817, Pacific Highway, Bulahdelah. The Aluminium Mountain Mine lies on the south west side of the mountain and is not part of the rezoning application for the study area which lies on the north east foot slopes of Alum Mountain.

4.7 Discussion

Research of listed Heritage Items has provided evidence into the type and approximate distance of the listed State Heritage items from the proposed study area. A detailed desktop investigation for the location of these listed items has shown that they are positioned in such a way that they will not be affected by the proposed rezoning application, particularly the former Alunite Mine which is located on the opposite side of Bulahdelah Mountain in the south west.

It should be noted that the [Alunite Mine \(former\)](#) is recorded on the NSW Heritage Branch Register as “Aluminium Mine (Former)”. European historic records for the area show that the “Aluminium Mine (Former)” description is incorrect (Section 4.1), and should be listed as the Alunite Mine Site Complex which was mined for what was the biggest deposit of alunite in the world at the time in 1888 (Carrall 1999b:13).

4.8 Conclusion

It is considered that the proposed rezoning application area is well removed from any listed Heritage Items including the former Alunite Mine, and therefore the proposed development will have no impact upon them.

5 Aboriginal Archaeological Context

5.1 Aboriginal Heritage Information Management System

Previous archaeological studies have been conducted in the region of the study area. A search of the DECCW Aboriginal Heritage Information Management System (AHIMS) was conducted on 23rd of April 2010 comprising an area of ten square kilometres around the study area. A list of all Aboriginal cultural heritage sites identified on the AHIMS database search for the study area totalled 52 and is detailed in Table 5-1. A detailed list of the AHIMS search can be found in Appendix 2 and a glossary of Aboriginal site types can be found in Appendix 4.

A study of the AHIMS database revealed that there were several registered sites located in close proximity to the study area. However there were no registered Aboriginal archaeological sites in the Study Area.

The AHIMS results detailed in Table 5-1 show that the regional area features rock outcrops suitable for manufacturing stone tools. Stone artefact sites predominate comprising artefact scatters and isolated finds (n=22). In addition to these sites several artefacts (numbers unspecified) were also recorded. Also recorded in the regional area were potential archaeological deposits (n=8), and scarred trees (n=4). These results indicate that the regional area has a predisposition for stone artefact sites especially in relation to reliable water sources and good quality rock outcrop. Several other site types were also recorded in the regional area including Aboriginal ceremony and dreaming site (n=1), bora ceremonial with midden site (n=1) and stone arrangement (n=1). The bora ceremonial site with midden and the stone arrangement are located 5 to 10 kilometres to the south of the immediate study area.

The AHIMS data exhibits a high frequency of stone artefact sites. These sites generally occur in specific geological and topographical areas providing there is access to raw material for artefact procurement and the availability of water sources and associated fauna species capable of supporting local Aboriginal communities. Permanent water sources servicing the area include the Myall River and Frys Creek and corresponding tributaries which drain the study area from the south east to north west.

The results of the AHIMS search shows that it is unlikely that shelter sites will occur in the lower slopes of the study area. Conversely, much of the Bulahdelah State Forest is positioned to the south and east of the study area and has the potential for shelters because of the mountainous topography and potential availability of suitable outcropping rock. There are a number of sites located alongside the flood plain to the south east and west of the study area including a midden site. A midden site has been identified on the AHIMS database and

there is potential for more sites to be uncovered as long as there are fresh water shell fish accessible in local rivers and creek systems. Exposed sandstone outcrops along these river and creek systems and other tributary drainage lines are potential areas for grinding groove sites in the locality. Scar trees in the area that may have been utilised for making canoes are likely to be in close proximity to water, whereas trees that were used for making shields may have been some distance from water across a variety of landforms (DEC, 2005).

Figure 5-1 provides the location of the AHIMS sites in association to the Regional Study Area and Figure 5-2 in the Local Study Area.

Table 5-1: Summary of AHIMS Results Ordered by Sites Types and Frequency (Easting 417065 to 437065 and Northing 6405380 to 6425380)

Site Type	Frequency in Search Area
Artefact(s) Unspecified	15
Isolated Find	12
Artefact Scatter	10
Potential Archaeological Deposit	8
Scarred Tree	4
Aboriginal Ceremony and Dreaming	1
Bora/ Ceremonial; Midden	1
Stone Arrangement	1
Total	52

An analysis of the sites encompassing Alum Mountain and in close proximity to the immediate study area showed that artefact scatters, isolated finds and PADs predominate in the alluvial creek banks of Frys Creek and along the Myall River valley floor. Scarred trees (n=2) were found along the lower and mid slope areas (Refer figure 5-2).

Figure 5-1: AHIMS Sites - Regional

Figure 5-2: AHIMS Sites - Local

5.2 Regional Archaeological Context

Several cultural heritage assessments and archaeological test excavations have been undertaken in the Great Lakes region relating to transport and communication infrastructure installation, land and property development and environmental assessments. Based on the information available, a number of trends in site location and patterning are evident. The archaeological investigations incorporated the wider region in order to provide a comprehensive assessment of the archaeological resources of the Bulahdelah region and local significance. These reports were reviewed in light of current knowledge of the study area.

Regionally, the study area is close to the Myall River and valley floor area which incorporates an underlying geological syncline that defines the north west alignment of the coastal hinterland. The valley floor area comprises a series of alluvial terraces, large wetland basins, small lagoons situated on lower terrace levels, and levee deposits adjacent to the river banks.

5.3 Local Archaeological Context

This section details the most relevant investigations to the study area. The following information will assist with predictive modelling to help identify potential archaeological sites and allows for planning and management recommendations to be made with confidence.

To ensure a holistic approach to the study area assessment, all previous Aboriginal cultural heritage information provided by the ACS that was not restricted was included in this report in order to ascertain cultural stories, connections and the degree of significance of the study area. This was compiled with the assistance of the KLALC who were asked to comment on any Cultural Heritage Values of the area – Refer Appendix 7.

Various Aboriginal oral histories have suggested the presence of ‘Guardian Tree’ and a ‘Healing Stream’ at Alum Mountain with differing interpretations within the Aboriginal community on both the ‘Guardian Tree’ and the ‘Healing Stream’.

5.3.1 Cultural Heritage Value/s

The ‘Guardian Tree’

A non-Aboriginal Bulahdelah resident discovered an old growth Eucalyptus tree in August 2002 (Umwelt 2003). The tree had a burl that resembled a face and it was conveyed to consultants that the tree may have Aboriginal significance due to the resemblance to a face. A report by Umwelt Environmental Consultants referred to the tree as a ‘Guardian Tree’. This report cited an oral reference from one Aboriginal source stating that the ‘Guardian Tree’ was sacred and that “the face of an old Aboriginal woman can be seen on the trunk of the tree” (Umwelt

2003). It also stated that “A lady (Aboriginal teacher) who had arthritis has been coming and leaning on the tree – she says it has helped her” (Umwelt 2003). The ‘Guardian Tree’ was then inspected by Navin Officer in April 2004 in the presence of two Sites Officers of the Kaurah Aboriginal Land Council.

The tree was an old growth Eucalypt approximately 35 metres high. It was located on a small tributary drainage line, in a minor gully on the west facing basal slopes of Bulahdelah Mountain. The tree trunk was 3 metres to the south of the creek bed and the tree was located approximately 60 metres west of a cleared 132 kilovolt power line easement and 21 metres to the northeast of a dirt track which links the power line easement with the northern end of Mackenzie Street.

The tree had a circumference at breast height of 4.5 metres with a number of hollows. Navin Officer (Navin Officer 2004:30) described the ‘Guardian Tree’ as having good to fair health and, based on its form, circumference and the presence of trunk hollows that it was likely to be over 100 years old. The burl with a reported resemblance to a face was on the north eastern side of the trunk, approximately 2.5 to 3 metres above ground level. The burl was approximately 65 centimetres wide and 35 centimetres thick. Due to the low relief of the burl feature which composed the facial similarity, Navin Officer (Navin Officer 2004:30) considered the age of the burl to be between 30 – 50 years old and was therefore a modern phenomenon.

Moreover, the burl and its surface features did not appear to have been modified by people and as such could not be considered an artefact or an archaeological site. Two scars had been identified by Navin Officer (Navin Officer 2004:31) on the ‘Guardian Tree’. These occurred on the lower trunk; one was a triangular scar on the north eastern side, and a large scar and re-growth complex with two separate areas of scar surface on the northern side. Navin Officer (Navin Officer 2004:31) also assumed that the burl and the tree would be unlikely to be considered an Aboriginal object by the DECCW. Navin Officer (2004:31) stated that the cultural heritage value and significance of the tree should be determined by the Aboriginal community. It was determined that the tree could not be considered to be an archaeological site due to the age of the burl being of natural origin around 30 to 50 years old (Navin Officer 2004:40).

The ‘Healing Stream’

In 2001 Navin Officer was contacted by a National Parks and Wildlife Service Aboriginal employee who notified them of the presence of a ‘stream that runs off the Bulahdelah Mountain with healing powers’ (Navin Officer 2004:37). However no specific location for the stream was provided.

Leila McAdam of Umwelt Environmental Consultants was shown a ‘healing stream’ by another individual in 2003. This person provided the following information on the ‘healing stream’: “The Aboriginal women used to go there to

have the babies then the babies were placed into the stream for purification of the babies and then the women used to sit in the stream" (Umwelt 2003:8).

The stream is a small tributary which drains a narrow catchment on the western slope of the Bulahdelah Mountain. The creek flows along the northern boundary of Mountain Park at Bulahdelah and passes through an urban catchment in the Bulahdelah township. The creek line was vegetated with mature Eucalyptus forest and the sloped areas were substantially re-growth. There were cleared areas along the power line easements. The streamline had been previously impacted by the vegetation clearance and landfill associated with 'Mountain House'. In addition to this disturbance, earthworks and landfill associated with the construction and demolition of the adjacent nineteenth century alunite processing works and installation of metal water pipes along the valley floor had also disturbed the streamline.

Navin Officer did not determine if the identification of the 'healing stream' was based on traditional information or if the identification was widely accepted in the Aboriginal community. The historical cultural value of the 'healing stream' remained subject to confirmation by the local and custodial Aboriginal community. There was no recorded information as to the current status of the cultural values of the 'Healing Stream' at the time this report was concluded.

5.4 Local Archaeological studies in the Area

The following archaeological reports are summarised in ascending chronological order.

Rich, E. 1990. Proposed New Road Bulahdelah to Coolongolook. Archaeological Survey for Aboriginal Sites.

Rich (1990) conducted a number of archaeological assessments relating to the proposed Bulahdelah to Collongolook Pacific Highway project. The survey area was 9km along the proposed highway route which began south of the township of Bulahdelah and extended to the Pacific Highway at Coolongolook. The survey results revealed ten open artefact scatters and one isolated find.

Rich (1990) also identified a number of locations that were considered likely to contain archaeological material. Aboriginal sites were predominantly situated on spur, saddle and ridge tops with only two artefacts located on a rise adjacent to a creek. It was recommended that test excavations be carried out in these potential areas for archaeological material (Rich 1990).

Davies, S.J. 1991. An Archaeological Assessment of the Proposed Telecom Optic Fibre Cable Route between Squires Hill Road and Tritton Regenerator Stations, New South Wales.

University of Queensland Archaeological Services Unit (UQASU) was commissioned by Telecom Australia to undertake an archaeological assessment

of the proposed Optic Fibre Cable route between Squires Hill near Bulahdelah and Tritton Regenerator Stations on the Central Coast.

The total length of the area surveyed was 48km which included a 6m wide corridor which extended from Squire Hill Road to east of the Pacific Highway. This six metre wide corridor ran for 1.5km through grazing paddocks of relatively low relief to Stony Creek Road in the Bulahdelah State Forest.

The archaeological survey identified two localities of artefacts. One isolated find of an unmodified silcrete flake was observed at Boolambayte Creek. The second isolated mudstone core was found at School House Creek (Davies 1991).

Haglund, L. 1992. Bulahdelah to Coolongolook Deviation: Archaeological Survey 2 and Test Excavations.

Haglund (1992) investigated previously uninspected sections of the 21.5km Bulahdelah to Coolongolook Pacific Highway route. This comprised a 5km proposed link with the Lakes Way. The archaeological survey was commissioned by the NSW Roads and Traffic Authority (RTA). Test excavations of two sites were conducted; the first at BC5 and BC9 that were identified during the initial survey of the area, and; test pits at three potential sites, Areas A, B and C, that were identified in the second survey. Artefacts were found at each location.

The archaeological survey conducted by Haglund (1992) identified sparse scatters of stone artefacts along the proposed Pacific Highway route. Three sites were recorded; two of these were first identified by Rich in 1990. The third site was found on the side of a long flat topped spur and Haglund (1992) interpreted this site as remains of a stone knapping event with four of the six artefacts found in the erosion scour being considered to be of the same raw material, a distinctive grey fined siliceous rock with a silvery lustre (Haglund, 1992: 20). Haglund (1992) also interpreted these as debris associated with a traditional campsite rather than pieces lost or discarded en route between such camp sites.

Haglund, L. 1996. Pacific Highway (State Highway No. 10) Bulahdelah to Coolongolook Deviation: Third Archaeological Survey.

Haglund (1996) undertook an archaeological investigation along a proposed deviation of the Pacific Highway between Bulahdelah to Coolongolook. The report covered the results of an inspection of minor changes to the proposed route and formed an addendum to the previous reports (Rich 1990, Haglund 1992). The survey was conducted on foot and was divided into ten sections.

No additional Aboriginal sites were located during the survey and some of the isolated finds found in previous surveys were not relocated. The recommendations were made to remove the materials along the forestry tracks

and the application to obtain consent to destroy be processed by the RTA on behalf of the respective owners (Haglund 1996).

Ford Archaeological Services, 1999. Karuah to Bulahdelah - Archaeological Test Excavation Report to the NSW Roads and Traffic Authority.

NSW Roads and Traffic Authority commissioned Ford Archaeological Services to perform test excavations of three landscapes zones. There were 15 test trenches dug and one track was surveyed. Ten trenches were dug on the eastern and western sides of Bundabah Creek near to the Pacific Highway crossing, two were excavated on a ridge opposite The Tea Gardens intersection and three trenches were dug on the ridge overlooking Burdekin's Gaps, south of the township of Bulahdelah.

11 stone artefacts were found in the trenches and a further 29 were recorded on a track that was surveyed near Bundabah Creek. The artefacts comprised of mudstone and silcrete and were identified as either flakes and flake pieces. The artefacts were found in low densities and only on the east – west ridge lines which crossed the area. It was suggested that it was unlikely that similar sites would be spotted during earth moving excavations and that the majority of the easement was disturbed.

Navin Officer, 2000. Proposed Highway Bulahdelah Upgrade Route Selection Study.

Navin Officer (2000) was employed by the NSW Roads and Traffic Authority (RTA) to undertake an Aboriginal Cultural Heritage report to identify and assess Aboriginal sites and places of significance. A pedestrian survey was carried out over three days to cover the 7.7km length of the Pacific Highway study area, which ran from the south of Bulahdelah to the north of the Bulahdelah Golf Course.

The survey revealed 12 Aboriginal archaeological. Seven of the sites were artefact scatters; three were isolated finds and two were possible Aboriginal scarred trees. Based on surface evidence and assessment of the area, Navin Officer (2000) concluded that there were no known Aboriginal sites in their study area which would pose a permanent constraint on the proposed development (Navin Officer 2000).

Umwelt, 2003. Bulahdelah Aboriginal Place Nomination Assessment.

Umwelt (2003) was commissioned by the National Parks and Wildlife Service to investigate an Aboriginal Place nomination for Bulahdelah (Alum) Mountain. The aim of the study was to provide sufficient information and to formulate a decision on whether a declaration was justified. The area of study consisted of a portion of the Bulahdelah State Forest located east of the township of Bulahdelah. The report documented sources and oral testimony from 11 identified Aboriginal people and community representatives. The report did not provide boundaries of the area other than the State Forest boundary, however, it did present two

specific places within the area of the proposed Pacific Highway upgrade; an old growth tree referred to as a 'Guardian Tree', and a 'Healing Stream' (Umwelt 2003:8).

The report provided an assessment of the evidence and found that the oral testimony, documentary and archaeological evidence provided general support stating that the Bulahdelah (Alum) Mountain was and continues to be a place of significance to Aboriginal culture. It was consequently recommended that the area of study be nominated as an Aboriginal Place and a Cultural Heritage Management Plan be developed in consultation with all Aboriginal stakeholders (Umwelt 2003:18).

Navin Officer, 2004. Bulahdelah – Upgrading the Pacific Highway.

The Roads and Traffic Authority commissioned Navin Officer (2004) to provide a technical paper to address the heritage impacts of the Pacific Highway upgrade in an area stretching 2km west of Bulahdelah. Navin Officer (2000) also conducted a field survey of the ancillary work sites and areas identified for a sediment basin and water quality basins further to the west of the proposed highway upgrade.

Nine Aboriginal sites were identified in the study area. The sites included five scatters of stone artefacts, two scarred trees and two isolated finds. Eight areas of Potential Archaeological Deposit were also identified in the study area. (Navin Officer 2004).

5.5 Literature Review Discussion

The archaeological reports detailed in the local archaeological context (Section 5.4) together with results of the AHIMS search found that the most commonly occurring site type associated with the Bulahdelah study area were stone artefact sites followed by potential archaeological deposits and scarred trees. The large number of stone artefact sites supports the ethnographic evidence (Section 3) that the Aboriginal people readily exploited and relied on the natural landscape as a consistent and plentiful resource.

Oral histories were obtained by Navin Officer (2000) regarding the 'Guardian Tree' and 'Healing Stream'. The historical cultural value of the 'healing stream' remained subject to confirmation by the local and custodial Aboriginal community. There was no recorded information as to the current status of the cultural values of the 'Healing Stream' at the time this report was concluded. It was determined that the tree could not be considered to be an archaeological site due to the age of the burl being of natural origin around 30 to 50 years old (Navin Officer 200:40).

Recorded information contained in various archaeological reports support the premise of the exploitation of the area by Aboriginal people for extensive periods. Further archaeological investigation into the region may uncover supplementary information of pertaining to Aboriginal land use, cultural practices and occupation.

6 Predictive Model

A predictive model is created to provide an indication of Aboriginal sites likely to occur within the study area. It draws on the review of the existing information from the regional and local archaeological context, as well as, the environmental context. The predictive model is necessary to formulate appropriate field methodologies, as well as, providing information for the assessment of archaeological significance.

6.1 Predictive Model for Aboriginal Archaeology in the Study Area

The following is a predictive model designed for the broader area, but specifically focuses on the immediate study area. This model seeks to incorporate behavioural patterns associated with factors that affect the location of sites and the potential for preservation of material evidence. Generally, people exploit places to obtain resources and are therefore likely to utilise areas where resources are abundant. Resources considered essential for Aboriginal occupation of an area include a permanent water supply, flora and fauna species, stone raw material and shelter from environmental conditions. The social practices of the community and the link to the local environment are equally important in the choice of occupation areas, however, the evidence of these are not always present in a material form such as stone artefacts. The environmental relationship influencing occupation choice also includes (but is not limited to) ceremonial practices (e.g. corroborees), religious beliefs (e.g. mythological places) and social practices (e.g. collection of medicines) which are important for understanding how areas were utilised by past populations. The landscape of the study area would have provided little shelter from heavy rains, cool winter nights and strong winds. Forested areas of the state forest would provide for temporary shelter in warmer weather.

6.2 Site Predictions

The climatic information indicates that the area was suitable for habitation by the Aborigines for a majority of the year; colder months could have been spent in nearby mountainous areas where shelter may have been available to reduce exposure to cool winds. Shelter would also be desirable in the warmer months. Shelter sites have not been recorded on the AHIMS database; this may indicate that the surrounding high land does not contain appropriate outcropping or pagoda formations capable for temporary residence or archaeological investigations in the region have not fully investigated the elevated areas.

6.2.1 Aspect

The ridge line of Bulahdelah State Forest is aligned in a north west to south east direction. The landforms comprising the study area consist of the north east facing mid slope area and lower slopes in association with the nearby creek line (Frys Creek).

6.2.2 Slope

The study area was predominantly a gentle to moderate sloping landform which was bisected by Frys Creek.

6.2.3 Distance from Water

The study area is located in close proximity to several available water sources. Archaeological investigations in the vicinity of the study area have identified the preference for sites to be located along the creek banks of the high order streams that form the lower reaches of the Myall River and its tributaries. These waterways generally flow along the flat, broad valleys to the west of the study area. Frys Creek drains the area from the south east to the north west and would probably comprise fresh water runoff from the ridges of Bulahdelah Mountains after extended rain periods. Fresh water may have been available on a seasonal basis from the associated drainage lines and tributaries.

6.2.4 Resources

The Myall River and its tributaries would have provided for ample supplies of fresh water and local resources such as fish, gliders along with various species of reptiles and amphibians, a number of bat species and the common bush rat. These flora and fauna resources in both terrestrial and freshwater locations would have been available in the region for the majority of the year.

6.2.5 Summary

The area presents a diverse environment with a sufficient supply of resources for exploitation by Aboriginal peoples. The AHIMS results demonstrate regular use of local rock outcrops and the permanent creek lines such as the Myall River, Wild Cattle Creek and Crawford River about five kilometres to the south west. This is evidenced by the number of stone artefact sites and potential archaeological deposits identified in the regional area. The proximity of freshwater and terrestrial forested environments would have made the study area a potentially desirable location for habitation and as a base for targeting a multitude of flora and fauna species.

7 Field Survey

The archaeological pedestrian survey of the Bulahdelah study area was conducted on the 20th and 21st May 2010 in overcast weather. The survey was undertaken by Gillian Goode, Senior Archaeologist for RPS, in participation with Colleen Perry and Benjamin Feeney, both Sites Officers for Karuah Local Aboriginal Land Council (KLALC) who had been involved in all previous Aboriginal Cultural Heritage Assessments undertaken in the local area. There had been heavy rain and some areas with exposed clayey B horizon soils were fairly slippery which restricted 4WD access. The creek lines and low lying areas were also waterlogged.

The study area was located to the north east of the township of Bulahdelah on the eastern side of the Pacific Highway on the north east facing slopes of Alum Mountain, which form part of the Bulahdelah Mountain Range (Figure 7-1). The study area was predominantly a gentle to moderate sloping landform which was bisected by Frys Creek. The survey focused on landform units (SU1-SU6; Figure 7-2). State Forest lay to the south and east of the immediate study area (Figure 7-3). Landform types have been used for comparative purposes and predictive modelling.

7.1 Land Uses

The area had been heavily modified by land clearing and had been used for aquaculture, timber getting, cattle grazing, dam and fencing works, quarrying for road base material and easements for both water pipes and power lines. The study area was predominantly comprised of open and closed forest, with open woodland on the fringes of areas that had been previously cleared for the power line easements, the Bulahdelah Golf Course, the aquaculture ponds (yabby farming) and access roads.

7.2 Survey Strategy

The strategy for the survey was to gain maximum coverage of the study area in thick ground cover, including coverage of all landforms, areas of exposure and vegetated areas.

7.3 Survey Methodology

The survey was conducted on foot by three people walking abreast and spaced approximately 5 metres apart in order to maximise survey coverage and to increase the potential for identifying cultural heritage items and other archaeological material. The ground surface was inspected in order to identify Aboriginal cultural heritage material or objects. As visibility was low all

opportunistic exposures were examined. These included; vehicle tracks and access roads, erosion scalds and cleared areas resulting from previous land use.

7.1 Documentation of Results

The documentation of Aboriginal cultural heritage sites and areas of archaeological sensitivity was undertaken using the following methods:

- Digital Photography;
- Differential GPS recording; and
- Field notes.

The Aboriginal cultural heritage survey was conducted in accordance with DECCW guidelines for survey reporting as outlined in the Aboriginal Cultural Heritage Standards and Guidelines Kit (NSW National Parks and Wildlife Service 1997). Photographic recording of landforms, Aboriginal cultural material, areas of archaeological or cultural sensitivity, exposures and disturbed areas and other items of interest was undertaken during the course of the survey. Photographs were scaled, as appropriate.

Differential GPS units were used to record the location of Aboriginal heritage sites and areas of sensitivity. GPS tracking logs were also used for recording and identifying the location of each of the survey units.

Field notes incorporated the size, location, contents and condition of Aboriginal heritage in the area. Size was recorded, either by GPS or tape measure. Contents of sites included the listing of site type and raw material as well as other site features. The condition of Aboriginal sites/ areas of sensitivity were recorded so as to include a description of the level of disturbances such as, erosion, land clearing and similar factors.

7.2 Documentation of Aboriginal significance

Aboriginal Community Stakeholders participating in the survey were asked about the cultural significance of the survey area and where applicable and/or appropriate, about the significance of Aboriginal sites and areas of archaeological sensitivity. An opportunity to comment on cultural significance was also provided in the survey preparation documentation and post survey reporting.

7.3 Survey Coverage

The study area was divided into six survey units which comprised: SU1 treed mid slope areas; SU2 aquaculture farming (yabbies) on mid to lower sloped areas including ponds, dams, access roads and associated infrastructure; SU3 power line and pipeline easements; SU4 treed lower slopes; SU5 dense Melaleuca

Forest; and SU6 Riparian Forest (predominantly Eucalypt species) along Fry's Creek - Refer Figure 7-1.

The survey focused on visibility and exposure. A map showing identified Aboriginal archaeological sites from the field survey are detailed in Figure 7-2.

Survey units were described for each section surveyed. Exposure and ground surface visibility were reported to ensure comparability of survey results between different areas of the local landscape and to contextualise survey results. Areas with high visibility, ground surface disturbance and extensive exposure can expose high quantities of archaeological material (particularly stone artefacts). Conversely, areas with low visibility, few exposures and intact native vegetation coverage, generally retain more undisturbed landscapes. Whilst the identification of sites (particularly artefact scatters) in such areas is generally low, there is the potential for intact archaeological deposits which have been protected by overlying vegetation.

The survey was undertaken on foot by three people generally walking 5-7 metres apart or as dictated by the terrain, density of vegetation and ease of access.

Figure 7-1: Survey Units.

Figure 7-2: Sites Identified During Field Survey.

Figure 7-3: State Forest Boundary to south and east of Study Area.

7.3.1 Survey Unit 1 – Mid Slope Area

Survey Unit 1 (SU1) marked the southern boundary of the study area and comprised the north east facing mid slope area of Alum Mountain.

The area was accessed by an existing dirt road on the eastern side of the Pacific Highway between the township of Bulahdelah and the Bulahdelah Golf Course. There was significant surface disturbance in the sloped area directly below the dwelling and along the southern boundary of the Golf Course with some surface erosion from water runoff (Plate 1). There were several dirt roads traversing the study area and there were excavated drainage channels and soil windrows formed along the road edges (Plate 2). In the eastern part of SU1 a dirt access track led to a stone quarry which was probably used for extracting road base material (Plate 3).

SU1 was comprised predominantly of open forest and many of the trees in this area showed damage from previous bush fires. The gradient was moderately to gently sloping and there were numerous cobbles and pebbles on the surface of the clayey soil. Native grasses, shrubs and trees covered the slope. The trees in this part of the study area were predominantly regrowth with few mature trees (Plate 4). The fairly dense leaf litter hindered visibility in some of these areas particularly along the ephemeral creek lines (Plate 5). Three ephemeral 1st order creek lines were located in SU1. They were tributaries of Frys Creek, which is a 3rd order creek line. All the tributaries flowed in a north easterly direction and joined Frys Creek in the lower slopes of Alum Mountain.

No items of Aboriginal cultural heritage or significance were identified in Survey Unit 1.

7.3.2 Survey Unit 2 – Aquaculture Ponding and Associated Infrastructure

Survey Unit 2 covered the area that had previously been used for aquaculture (Australian Crayfish/ yabby) farming (Plate 6). There was an old shed adjacent to the dirt access track (Plate 7) and a number of ponds filled with layers of tyres which had been used as breeding ponds for the yabbies (Plate 8). The area was highly disturbed due to mounding of the earth to form the individual ponds. These areas had not regenerated and the banks were investigated for any artefacts that may have been exposed in this area, but none were found. The clayey B horizon soils had generally been exposed in this part of the study area and there were some erosion scalds covered with pebble and cobble laterite (Refer 9). Visibility was fair and as the area was highly disturbed it was considered unlikely that any artefacts would be located in subsurface soils.

No items of Aboriginal cultural heritage or significance were identified in Survey Unit 2.

7.3.3 Survey Unit 3 – Power line and Pipe line works and Easements

Areas on either side of electricity easements had been cleared of trees (Plate 10). These open woodland areas were severely disturbed due to the emplacement of the power lines. The grass in the area had been slashed and access tracks ran along the length of the power line easement (Plate 11). There were a number of erosion scalds in SU3 but no artefacts were found (Plate 12). Visibility in the lower sloped areas was fair particularly in the open grassed zones that had areas of exposure. However, visibility was poor where had been some vegetation regrowth (Plate 13). Water pipes also crossed the study area (Plate 14). As the ground surface along the easements was highly disturbed it was considered unlikely that any artefacts would be located in subsurface soils.

No items of Aboriginal cultural heritage or significance were identified in Survey Unit 3.

7.3.4 Survey Unit 4 – Lower Slopes

This survey unit comprised the lower sloped part of the study area. SU4 was located in the south eastern part of the survey area. A dirt access track divided SU1 from SU4 (Plate 15). The area was moderately treed with extensive regrowth and very thick ground cover in some parts and it was extremely difficult to traverse the eastern extent of SU4 (Plate 16). Ground surface visibility was generally very low hindering the ability to identify the presence or absence of surface artefacts in this area (Plate 17). In the northern and western part of SU4 there were a number of large erosion scalds and active erosion was evident at the break in slope to the south of Frys Creek (Plate 18).

No items of Aboriginal cultural heritage or significance were identified in Survey Unit 4.

7.3.5 Survey Unit 5 – Melaleuca Forest

The area was densely treed with very thick ground cover in some parts and was extremely difficult to cross (Plate 19). Much of the lower slope area was waterlogged. There were a number of mature trees in the mid slope area but no scar trees were identified.

Ground surface visibility was very low hindering the ability to identify the presence or absence of surface artefacts and no sites were located in this area.

No items of Aboriginal cultural heritage or significance were identified in Survey Unit 5.

7.3.6 Survey Unit 6 – Riparian Forest

This survey unit was located along both banks of Frys Creek in the riparian zone of this 3rd order stream. There was abundant water in the creek with a creek

crossing restricted to a formed crossing from the golf course side on the west (Plate 20) and to a formed track east of the study area (Plate 21). There was a large stand of mature trees on southern bank of Frys Creek but the majority of the trees showed evidence of bush fire damage and lightening strike (Plate 22). On the northern side of the creek there were a number of mature Eucalypt species and they were examined for evidence of scars. One tree was found to have been scarred and was considered to have been modified by Aboriginal people in the past (Plates 23 & 24).

No other sites were located in this area but visibility of the ground surface was severely hindered due to the dense vegetation in the area to the north of Frys Creek. The banks of Frys Creek showed evidence of repeated flooding events and extensive damage to a number of mature trees. Several trees had been struck by lightning and there were fallen trees and branches along the creek bank to the south of Frys Creek. There were no artefacts along either creek bank but it was noted that flood

An Aboriginal Scarred Tree was identified in Survey Unit 6 on the northern bank of Frys Creek within the Riparian Zone – AHIMS Sites Card RPS BD ST1 (Refer Appendix 6).

7.4 Effective Coverage

The amount of ground surface observed varies depending on factors such as soil type, vegetation cover and ground surface visibility (Refer Table 7-1).

Table 7-1: Ground Surface Visibility Rating.

GSV Rating	Description
0 – 9%	Heavy vegetation with scrub foliage, debris cover and/or dense tree cover. Ground surface not clearly visible.
10 – 29%	Moderate level of vegetation, scrub or tree cover. Small patches of soil surface visible resulting from animal tracks, erosion or blowouts. Patches of ground surface visible.
30 – 49%	Moderate levels of vegetation, scrub and/or tree cover. Moderate sized patches of soil surface visible possibly associated with animal tracks, walking tracks and erosion surfaces. Moderate to small patches across a larger section of the study area.
50 – 59%	Moderate to low level of vegetation, tree and/or scrub. Greater amounts of areas of ground surface visible in the form of erosion scalds, recent ploughing, grading or clearing.
60 – 79%	Low levels of vegetation and scrub cover. High incidence of ground surface visible due to recent or past land-use practices such as ploughing, grading and mining. Moderate level of ground surface visibility due to sheet wash erosion, erosion scalds and erosion scours.
80 – 100%	Very low to nonexistent levels of vegetation and scrub cover. High incidence of ground surface visible due to past or recent land use practices, such as ploughing, grading and mining. Extensive erosion such as rill erosion, gilgai, sheet wash, erosion scours and scalds.

The visibility rating and effective coverage (Refer Table 7-2) for the study area shows that vegetation cover was extensive in the densely treed areas on the lower sloped area at the eastern boundary close to Frys Creek (part of SU4), and thick undergrowth of the Melaleuca Forest (SU5) in the northern part of the study area. Conversely visibility was generally good in the areas of the easements (SU3), the aquaculture ponds and associated infrastructure (SU2), the access tracks and roads (SU1), and the open areas in SU4 resulting in higher levels of effective coverage in these areas. Exposures were predominantly the result of extensive active erosion in the previously disturbed areas which aided visibility. Pebbles and gravels were visible on the surface of the B horizon due to sheet wash erosion.

Table 7-2: Effective Coverage Table for Area Surveyed

Survey Unit	Survey Unit Area (Square metres)	Area Surveyed (Square metres)	Exposure (%)	Visibility (%)	Sample Fraction (percent)
1	369849.24	585000	60	49	46.5027
2	177712.74	116160	80	65	33.9892
3	83005.82	55410	90	79	47.4623
4	445811.68	297990	60	60	24.0632
5	72411.17	10350	20	9	0.2573
6	104105.11	43800	30	49	6.1847

7.5 Survey Results – Aboriginal Archaeology

Although visibility in these areas was good, no artefacts were found on any of the exposed areas during the survey. Visibility along the banks of Frys Creek was generally good with moderate levels of vegetation, but no artefacts were identified in this area. There was however evidence of previous flooding events that may have washed away any artefacts that may have been exposed on the surface of the disturbed soils along the creek banks.

All accessible mature trees were examined for scars. Only one scar tree was identified. There was evidence that the study area had undergone one or more bush fires in the recent past and many of the older trees had suffered extensive damage. Some of the new re-growth trees also showed damage from bush fire. Lightning damage was also high in a number of mature trees and some of them had damaged bark caused by lightning strikes. There were several fallen trees and some of the standing trees were severely damaged.

The results of the field survey identified only one Aboriginal archaeological site. The site was a scarred tree and a site card has been generated for RPS BD ST1 for submission to the DECCW for registration on the AHIMS Register (Appendix 6).

The scarred tree site was located in the riparian zone on the northern bank of Frys Creek, a 3rd order stream which flows into the Myall River to the north west of the study area.

The Aboriginal Community Stakeholders indicated that there was no impediment to cultural heritage values by the proposed rezoning in the immediate study area. However they stated that there were areas that were considered to have cultural heritage value on the top of Alum Mountain outside of the study area.

7.6 Survey Results – European Historic

No items of significant European heritage were identified in the study area and the proposed rezoning application area is well removed from any listed Heritage items including the former Alunite Mine. Therefore the proposed development will have no impact upon any significant Heritage items.

8 Aboriginal Significance Assessment

In order to develop appropriate heritage management outcomes, it is necessary for the significance of Aboriginal sites or areas of archaeological sensitivity to be assessed. Aboriginal heritage can be significant for cultural and/or scientific reasons. Aboriginal people are the best placed to assess cultural significance and are therefore consulted in the Aboriginal heritage management process. Scientific significance is assessed according to scientific criteria outlined in DECCW heritage guidelines.

8.1 Cultural Significance Criteria and Assessment

An assessment of cultural significance incorporates a range of values which may vary for different individual groups and may relate to both the natural and cultural characteristics of places or sites. Cultural significance and Aboriginal cultural views can only be determined by the Aboriginal community using their own knowledge of the sites and their own value system.

As part of this CHA cultural significance was discussed with KLALC Aboriginal representatives present during the survey and their response and comment on the study area was invited during the course of the current survey works. Further details are included in the Aboriginal consultation log – Refer Appendix 7.

8.2 Archaeological Significance Criteria

Archaeological significance, also referred to as scientific significance, is determined by assessing an Aboriginal Heritage Site or area according to archaeological criteria. The assessment of archaeological significance is used to develop appropriate heritage management and impact mitigation strategies. Criteria for archaeological significance has been developed in accordance with the principals of the ICOMOS Burra Charter (1999) and the DECC Aboriginal Cultural Heritage Standards and Guidelines Kit (1997). The archaeological significance criteria are usually assessed on two scales: local and regional; in exceptional circumstances, however, state significance may also be identified. Significance is assessed in three levels to which scores are assigned; low (score=1), moderate (score=2) and high (score=3). These scores are used to provide an overall assessment of significance:

- Low significance score 6-10
- Moderate significance 11-14
- High significance 15-18

Table 8-1 Archaeological Significance Criteria

Criterion	Description
Rarity	This criterion examines the frequency of the identified site types with others previously recorded in the local or regional landscape
Representativeness	All sites are representative of a site type, however, some sites may be in better condition, or demonstrate more clearly a particular site type. Representativeness is based on the understanding of extant sites in the local or regional landscape and the purpose of this criteria is to ensure a representative sample of sites area conserved for future generations
Integrity	This refers to site intactness. A site with contextual integrity can provide information relating to chronology, social systems, tool technology, site formation processes, habitation, frequency of use as well as other occupation indicators. Moderate to high levels of disturbance will generally result in low integrity.
Connectedness	Relates to inter-site relationships - that is whether a site can be linked to an archaeological complex, or where sequence of activities can be discerned. For example, a quarry (stone extractions site), may be linked to an adjacent heat treatment pit and knapping floor, these site thus could be linked as part of a stone tool production sequence.
Complexity	Refers to the contents of the site, such as, the variety and nature of features and/or of artefacts present. For example, rockart sites with many motifs may be ranked highly in terms of complexity, or artefact scatters with a wide variety of raw materials and/or or tool types may be more complex than surrounding sites.
Research Potential	This criteria is used to identify whether a site has the potential to contribute new information which to the interpretation of Aboriginal occupation in the area.

8.3 RPS BD ST I

A site card was generated for RPS BD ST1 for submission to the DECCW for registration on the AHIMS Register (Appendix 6). The scarred tree site was located in the riparian zone on the northern bank of Frys Creek, a 3rd order stream which flows into the Myall River to the north west of the study area and therefore will not be subject to impact from any development proposal. However, a buffer zone of 10m should be placed around the scar tree to ensure that the tree is protected from any future impact.

8.4 Assessment of Archaeological Significance

8.4.1 RPS BD ST1

The scar tree, RPS BD ST1 identified during the course of the field survey was located on the northern bank of Frys Creek in the north eastern part of the study area. The scar was located on a large, mature aged eucalypt and faced east. The girth of the tree was around 1 metre in diameter and the height of the tree was estimated to be around 30 metres. There were a number of trees of a similar size along both sides of Frys Creek, but most of them had suffered from severe bush fire and lightning strikes. It is considered that the scar tree RPS BD ST1 was likely to have been used for some type of implement due to its size and shape; the scar was oval in shape and was approximately 800mm long, 280mm wide and 200mm deep. The scar tree was in excellent condition and the scar was also in good condition (Refer Appendix 6 and Plates 23 & 24). As a result the tree was assessed as being moderately significant both on a local and a regional level.

Table 8-2: Assessed Levels of Significance for Aboriginal Sites

Site	Significance scale	Rarity	Represent- ativeness	Integrity	Connect- edness	Complexity	Research Potential	Overall Significance
RPS BD ST1	Local	2	2	3	2	1	1	11
	Regional	2	2	3	2	1	1	11

Table 8-3: Assessment of Scientific Significance.

Site	Significance scale	Rarity	Represent- ativeness	Integrity	Connect- edness	Complexity	Research Potential	Overall Significance
RPS BD ST1	Local	Moderate	Moderate	High	Moderate	Low	Low	Moderate
	Regional	Moderate	Moderate	High	Moderate	Low	Low	Moderate

A study of the AHIMS database revealed that there were four registered scar tree sites located in the regional area and two in close proximity to the study area. These results indicate that the regional area has a predisposition for scar tree sites especially in relation to reliable water sources. Scar trees for making canoes are likely to be found in close proximity to water, whereas trees for making shields may be some distance from water on a variety of landforms (DEC, 2005). Scar trees may also be utilised for making implements for carrying food and water. It is considered that the scar tree RPS BD ST1 was likely to have been used for some type of implement due to its size and shape (Refer Appendix 6).

9 European Historic Significance Assessment

No items of European cultural historical significance were recorded during the survey.

10 Discussion

Aboriginal Cultural Heritage

One scar tree (RPS BD ST1) was identified during the course of the field survey. It was located on the northern bank of Frys Creek in the north eastern part of the study area. The scar tree site was gently sloping in open forest with moderately thick understorey. The condition of both the tree and the scar were good and the site was therefore rated as being moderately significant, both at a regional and at a local level. The site was in the riparian zone north of Frys Creek and would therefore not be impacted upon by any proposed development.

The results of the AHIMS search showed that it was unlikely that shelter sites would occur in the lower slopes of the study area and that the potential for these site types were in the Bulahdelah State Forest to the south and east and in the more mountainous upper sloped areas of Alum Mountain due to the potential availability of suitable outcropping rock. There were no sandstone or rock outcrops observed that would have been suitable for rock shelters and none that could have been used for grinding stone tools along any of the creek lines.

The survey of the study area included transects along all creek and drainage lines. The shallow ephemeral drainage lines on the mid slope areas were not likely to be preferred occupation areas as they were not sheltered and water supply would have been irregular. As such ephemeral drainage lines were not considered to be archaeologically sensitive.

Conversely valleys with permanent water were often a preferred habitation area for the Aboriginal people with fresh water creeks and sheltered locations having a high potential for occupation sites and grinding grooves and artefact scatters are often located in or around creek lines. Artefact scatters and isolated finds were considered likely to occur along the permanently flowing creek and drainage lines. No artefacts were identified in these areas, but it is possible that the dense understorey particularly in the riparian corridors of Frys Creek, hindered visibility and prevented the detection of artefacts during the survey. It is considered that the permanently flowing Frys Creek, which was located in the lower sloped part of the survey area was archaeologically sensitive. However, as there was evidence of recent flooding events it is possible that any potential artefacts had been affected by water runoff. It is also possible that the wider, broader, more accessible areas along the banks of the nearby Myall River and lower reaches of Frys Creek may have been preferred occupation sites as evidenced by the AHIMS search which showed a predominance of these site types to the north west of the immediate study area.

The majority of the of the lower slope and mid slope areas in the south eastern part of the study area had suffered from a range of disturbances which included quarrying, aquaculture (including ponding and associated infrastructure, power and pipe line easements, erosion scalds, sheet wash, fencing and access roads). These areas had been significantly impacted upon and were considered to have nil to low potential archaeological sensitivity. The degree of slope in the mid slope areas would indicate that this would not be a preferred occupation area. Although the lower slope areas may have been considered more likely to have been suitable for occupation, the nearby broad valley area of the Myall River was close by and as such would be more likely to provide abundant and easily accessible flora and fauna resources more suitable for permanent occupation.

The field survey directed attention to all portions of the study area incorporating drainage lines, lower and mid slope areas. Soils in the study area were predominantly B horizon soils probably as a result of sheet wash erosion evident in the areas of high disturbance and from previous land clearing practices evident by the extensive areas of regrowth. The soils were not visible in the more densely vegetated areas particularly in the Melaleuca Forest in the northern part of the study area which was covered with leaf litter and fallen branches. Severe bush fire had affected the areas containing mature age trees on the southern bank of Frys Creek and visibility of the creek banks was fair in these areas due to the effects of recent flood events washing away the topsoil. However, vegetation on the northern bank of Frys Creek was less disturbed and there were a number of mature trees in good condition. RPS BD ST1 was located in this part of the study area. No artefacts were identified during the course of the survey.

European Cultural Heritage

No items of European cultural heritage were identified in the study area and there were no heritage listed items or built structures contained in the immediate study area. The Alunite Mountain Mine lies on the south west side of the mountain and is therefore not part of the rezoning application for the study area. None of the Commonwealth and Heritage listed items were incorporated in the proposed rezoning application area. All listed items are located some distance from the study area and four of the items that are listed are located approximately half a kilometre or more away. As such they will not be impacted upon by the proposed development.

II Conclusion

This cultural heritage assessment report has considered the environmental and archaeological context of the study area, has developed a predictive model and reported on the results of the field survey.

The Bulahdelah area was well resourced with a variety of fauna and flora, with ample water and shelter. The Alum Mountain would have provided a good vantage point, and the rocky outcrops on the upper slopes of Alum Mountain (outside of the study area) would have provided potential shelter and raw material for manufacturing artefacts. However there were no rock outcrops suitable for the manufacture of artefacts, or areas suitable for rock shelters or grinding grooves in the proposed rezoning area.

One Aboriginal scar tree site was identified during the course of the survey in a lower sloped area close to a 3rd order creek. There were no other scar trees identified along the creek bank to the north of Frys Creek, although dense vegetation in this area hindered visibility. Severe bush fire had damaged a number of mature trees along the southern bank of Frys Creek. There were no scarred trees in this area and none were identified in any of the remaining treed areas which were predominantly regrowth forest and therefore lacked the potential for trees of a size and age suitable for making canoes, shields or implements.

Although there were a number of artefact scatters and isolated finds located along the nearby Myall River valley and in the State Forest area to the east, no artefact sites were observed in the survey area. This may have been due in part to visibility in areas of dense vegetation. However, no artefacts were identified in the remainder of the study area which had been highly disturbed by erosion which had exposed the B horizon. These areas were considered to have low archaeological potential.

The representatives of KLALC who participated in the survey indicated, (during the course of the survey), that the proposed rezoning would not impact on any cultural heritage values in the immediate study area, although there were areas they considered to have high cultural heritage value outside of the study area such as the rocky outcrops on the top of Alum Mountain.

No items of European cultural heritage were identified in the study area.

It is considered that the proposed rezoning application area is well removed from any listed historic Heritage Items including the former Alunite Mine, and therefore the proposed development will have no impact upon them.

12 Recommendations

12.1 Recommendations for the management of the study area

The management recommendations that are formulated from this archaeological assessment are based upon the legislation designed to address the impact of development on sites of cultural significance.

12.1.1 Aboriginal Cultural Heritage

It is recommended that works may proceed with regard to the following:

Recommendations specific to identified Aboriginal site:

Recommendation 1

The scar tree site RPS BD ST1 identified in the study area should not be impacted upon. A minimum buffer zone of 10 metres should be imposed around the tree in the event of any works being undertaken in its vicinity. However, as the site is located in the riparian zone of a major creek line it is unlikely to be impacted upon by future proposed works. If potential impact to the site occurs or is likely at any time in the future then the local Aboriginal Community Stakeholders, the DECCW and a suitably qualified archaeologist should be contacted.

In general during the course of proposed construction work:

Recommendation 2

During the course of proposed construction work, if suspected Aboriginal cultural heritage material is encountered, work should cease in that vicinity immediately, the area cordoned off and contact made with the DECCW Enviroline 131555, a suitably qualified archaeologist and the relevant Aboriginal Community Stakeholders (including the KLALC), so that it can be adequately assessed and managed.

Recommendation 3

In the event that skeletal remains are uncovered whilst operations are underway, work must cease immediately in the vicinity and a 20m buffer zone be placed around the site. The area should be fenced and the NSW Police Coroner should be contacted to determine if the remains are deemed to be of Aboriginal origin. If determined to be Aboriginal then contact should be made with the DECCW Enviroline 131555 and representatives of the local Aboriginal community stakeholders to determine an action plan for the management of the skeletal

remains, formulate management recommendations and to ascertain when work can recommence.

12.1.2 European History

No items of European cultural historical significance were found during the survey of the Study Area.

However, during the course of any construction work the following recommendation should be considered:

Recommendation 4

If, during the course of clearing works, significant European cultural heritage material is uncovered, work should cease in that area immediately. The NSW Heritage Branch should be notified and works only recommence when an appropriate and approved management strategy instigated.

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14 Plates



Plate 1: SU1 showing surface erosion from water runoff at the southern boundary of the study area – view to west.



Plate 2: SU1 showing excavated drainage channels along existing dirt tracks – view to north.



Plate 3: SU1 showing access track to stone quarry probably for use as road base - view to south east.



Plate 4: SU1 showing regrowth of treed areas and previously cleared area adjacent to an access road for the power line (foreground) and revegetated slope (background) - view to south west.



Plate 5: SU1 showing leaf litter in ephemeral creek line in treed areas – view to north east.



Plate 6: SU2 showing aquaculture ponds for yabbies - view to north west.



**Plate 7: SU2 farm shed on access track associated with aquaculture farm complex
- view to south east.**



Plate 8: SU2 showing ponds filled with tyres for yabby farming - view to north west.



Plate 9: SU2 showing B horizon soils exposed across sloped area disturbed by aquaculture farming - view to south east.



Plate 10: SU3 showing cleared areas along path of power line easements - view to north.



Plate 11: SU3 showing dirt access track along east trending power line easement - view to east



Plate 12: SU3 showing slashed area along north trending power line easement with dirt access track and erosion scalds along - view to north.



Plate 13: SU3 showing open cleared areas along easement with some vegetation regrowth – view to north.



Plate 14: SU3 showing water pipe line trending in a south easterly direction - view to north west.



Plate 15: SU4 showing access track in eastern portion of lower sloped area – view to north



Plate 16: SU4 showing thick ground cover in treed area in the eastern portion of the lower slopes - view to north west



Plate 17: SU4 showing low ground surface visibility in treed area – view to north west.



Plate 18: SU4 showing erosion scald at break of slope to south of Frys Creek.



Plate 19: SU5 showing dense vegetation and poor ground surface visibility.



Plate 20: SU6 showing track on north western bank of Frys Creek.



Plate 21: SU6 showing creek crossing at north eastern part of Frys Creek



Plate 22: SU6 stand of mature trees on southern bank of Frys Creek.



Plate 23: SU6 treed area on northern bank of Frys Creek.



Plate 24: SU6 Site RPS BD ST1 - scarred tree on northern bank of Frys Creek in the riparian zone.

Appendix I

Legislation & Departmental Advice

SUMMARY OF STATUTORY CONTROLS

The following overview of the legal framework is provided solely for information purposes for the client, it should not be interpreted as legal advice. RPS Harper Somers O'Sullivan will not be liable for any actions taken by any person, body or group as a result of this general overview, and recommend that specific legal advice be obtained from a qualified legal practitioner prior to any action being taken as a result of the summary below.

COMMONWEALTH

Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (ATSHP Act), Amendment 2006

The purpose of this Act is to preserve and protect all heritage places of particular significance to Aboriginal and Torres Strait Islander people. This Act applies to all sites and objects across Australia and in Australian waters (s4).

It would appear that the intention of this Act is to provide national baseline protection for Aboriginal places and objects where State legislation is absent. It is not to exclude or limit State laws (s7(1)). Should State legislation cover a matter already covered in the Commonwealth legislation, and a person contravenes that matter, that person may be prosecuted under either Act, but not both (s7(3)).

The Act provides for the preservation and protection of all Aboriginal objects and places from injury and/or desecration. A place is construed to be injured or desecrated if it is not treated consistently with the manner of Aboriginal tradition or is or likely to be adversely affected (s3).

THE AUSTRALIAN HERITAGE COMMISSION ACT 1975

The Australian Heritage Commission Act 1975 established the Australian Heritage Commission which assesses places to be included in the National Estate and maintains a register of those places. Places maintained in the register are those which are significant in terms of their association with particular community or social groups and they may be included for social, cultural or spiritual reasons. The Act does not include specific protective clauses.

The Australian Heritage Council Act 2003 together with The Environment Protection and Biodiversity Conservation Act 1999 (Amended) includes a National Heritage List of places of National heritage significance, maintains a Commonwealth Heritage List of heritage places owned or managed by the Commonwealth and ongoing management of the Register of the National Estate.

STATE

It is incumbent on any land manager to adhere to legislative requirements that protect indigenous culture heritage in NSW. The relevant legislation includes but is not limited to:

National Parks & Wildlife Act 1974 (NPW Act), Amended 2001.

The DECC issued their Interim Community Consultation Requirements in January 2005 to replace all previous consultation guidelines that related to Part 6 of the NPW Act 1974. The requirement of the guidelines is for the proponent, or consultant for the proponent, to contact the Local Aboriginal Land Council(s), Registrar of Aboriginal Owners, Native Title Services, local councils and the DECC, to request contact information for any/all potential Aboriginal people/groups with an ancestral interest in the cultural heritage of the project area.

The NPW Act provides statutory protection for all Aboriginal relics (not being a handicraft made for sale), with penalties levied for breaches of the Act. Part 6 of this Act is the relevant part concerned Aboriginal objects and places, with the Section 86 and Section 90 being the most pertinent:

Section 91: Under Section 91 of the Act it stipulates that a person who is aware of unregistered Aboriginal sites must report these to the DECC, regardless of the land status (Freehold, leasehold, Crown land).

Section 90: "A person who, without first obtaining the consent of the Director-General, knowingly destroys, defaces or damages, or knowingly causes or permits the destruction or defacement of or damage to, an Aboriginal object or Aboriginal place is guilty of an offence against this Act." Under s.5 of the Act "object" means any deposit, object or material evidence (not being a handicraft made for sale) relating to indigenous habitation of the area. This applies to habitation both prior to and concurrent with the occupation of that area by persons of non Aboriginal extraction, and includes Aboriginal remains.

Section 87: Preliminary Research Permits issued under Section 87 of the Act, allow the permit holder to conduct investigations of areas considered to be potential sites for the purpose of research, and also for conservation work associated with known sites.

Impact Permits issued under Section 90 of the Act are for salvaging sites prior to ground disturbance works associated with construction. Any disturbance, damage or destruction of Aboriginal sites, known or unknown, is considered to contravene the NPW Act (1974) and the DECC will pursue the person/company responsible.

Penalties under these two sections are currently 50 penalty units, or 6 months in gaol, or both for an individual and 200 penalty units for a corporation. The DECC record all S.87 and S.90 permits issued in order to manage Aboriginal sites and ensure representative samples of sites are left in situ for future generations. In order to achieve this, the DECC need to be made aware of all Aboriginal sites located in NSW.

Section 86: This section of the Act states that “A person, other than the Director-General or a person authorised by the Director-General in that behalf, who:

- (a) disturbs or excavates any land, or causes any land to be disturbed or excavated, for the purpose of discovering an Aboriginal object,
- (b) disturbs or moves on any land an Aboriginal object that is the property of the Crown, other than an Aboriginal object that is in the custody or under the control of the Australian Museum Trust,
- (c) takes possession of an Aboriginal object that is in a national park, historic site, state conservation area, regional park, nature reserve, karst conservation reserve or Aboriginal area,
- (d) removes an Aboriginal object from a national park, historic site, state conservation area, regional park, nature reserve, karst conservation reserve or Aboriginal area, or
- (e) erects or maintains, in a national park, historic site, state conservation area, regional park, nature reserve, karst conservation reserve or Aboriginal area, a building or structure for the safe custody, storage or exhibition of any Aboriginal object,

except in accordance with the terms and conditions of an unrevoked permit issued to the person under section 87, being terms and conditions having force and effect at the time the act or thing to which the permit relates is done, is guilty of an offence against this Act.”

Section 84: Aboriginal places of traditional significance (that may or may not contain archaeological material) are given protection under Section 84 of the NPW Act. To be an Aboriginal place for the purposes of this Act, this is a place that, in the opinion of the Minister, is or was of special significance with respect to Aboriginal culture.

ENVIRONMENTAL PLANNING & ASSESSMENT ACT 1979 (EP&A ACT)

This Act regulates a system of environmental planning and assessment for New South Wales. Land use planning requires that environmental impacts are considered, including the impact on cultural heritage and specifically Aboriginal heritage. Within the EP&A Acts, Parts 3, 4, and 5 relate to Aboriginal heritage.

Part III regulates the preparation of planning policies and plans. Part 4 governs the manner in which consent authorities determine development applications and outlines those that require an environmental impact statement. Part 5 regulates government agencies that act as determining authorities for activities conducted by that agency or by authority from the agency. The National Parks & Wildlife Service is a Part V authority under the EP&A Act.

In brief, the NPW Act provides protection for Aboriginal objects or places, while the EP&A Act ensures that Aboriginal cultural heritage is properly assessed in land use planning and development.

Part 3A of the EPA relates to major projects, and if applicable, obviates the need to conform to other specific legislation. In particular, s75U of the EPA Act explicitly removes the need to apply for s87 or s90 permits under the NPW Act. This means that although Aboriginal cultural heritage is considered during the planning process, a permit is not required to disturb or destroy an Aboriginal object or place. However, the Director-General of Planning must nonetheless consult with other government agencies, including DECC and National Parks & Wildlife, prior to any decision being made.

THE HERITAGE ACT 1977

This Act protects the natural and cultural history of NSW with emphasis on non-indigenous cultural heritage through protection provisions and the establishment of a Heritage Council. Although Aboriginal heritage sites and objects are primarily protected by the National Parks & Wildlife Act 1974 (NPW Act), Amended 2001, if an Aboriginal site, object or place is of great significance, it may be protected by a heritage order issued by the Minister subject to advice by the Heritage Council.

Other legislation of relevance to Aboriginal cultural heritage in NSW includes the NSW Local Government Act (1993). Local planning instruments also contain provisions relating to indigenous heritage and development conditions of consent.

Appendix 2

AHIMS Registered Sites

Appendix 3

Aboriginal Consultation Log

Appendix 4

Glossary of Site Types

GLOSSARY OF SITE TYPES

The following is a brief description of most Aboriginal site types.

Artefact Scatters

Artefact scatters are defined by the presence of two or more stone artefacts in close association (i.e. within fifty metres of each other). An artefact scatter may consist solely of surface material exposed by erosion, or may contain sub-surface deposit of varying depth. Associated features may include hearths or stone-lined fireplaces, and heat treatment pits.

Artefact scatters may represent:

- Camp sites: involving short or long-term habitation, manufacture and maintenance of stone or wooden tools, raw material management, tool storage and food preparation and consumption;
- Hunting or gathering activities;
- Activities spatially separated from camp sites (e.g. tool manufacture or maintenance); or
- Transient movement through the landscape.

The detection of artefact scatters depends upon conditions of surface visibility, including vegetation cover, ground disturbance and recent sediment deposition. Unfavourable conditions obscure artefact scatters and prevent their detection during surface surveys.

Bora Grounds

Bora grounds are a ceremonial site associated with initiations. They usually comprise two circular depressions in the earth, and may be edged with stone. Bora grounds generally occur on soft sediments in river valleys, although they may also be located on high, rocky ground in association with stone arrangements.

Burials

Human remains were often placed in hollow trees, caves or sand deposits and may have been marked by carved or scarred trees. Burials have been identified eroding out of sand deposits or creek banks, or when disturbed by development. The probability of detecting burials during archaeological fieldwork is extremely low.

Culturally Modified Trees

Culturally modified trees include scarred and carved trees. Scarred trees are caused by the removal of bark for use in manufacturing canoes, containers, shields or shelters. Notches were also carved in trees to permit easier climbing. Scarred trees are only likely to be present on mature trees remaining from original vegetation. Carved trees, the easiest to identify, are caused by the removal of bark to create a working surface on which

engravings are incised. Carved trees were used as markers for ceremonial and symbolic purposes, including burials. Although, carved trees were relatively common in NSW in the early 20th century, vegetation removal has rendered this site type extremely rare. Modified trees, where bark was removed for often domestic use are less easily identified. Criteria for identifying modified trees include: the age of the tree; type of tree (the bark of many trees is not suitable, also introduced species would be unlikely subjects); axe marks (with the need to determine the type of axe - stone or steel – though Aborigines after settlement did use steel); shape of the scar (natural or humanly scarred); height of the scar above the ground (reasonable working height with consideration given to subsequent growth).

Fish Traps

Fish traps comprised arrangements of stone, branches and/or wickerwork placed in watercourses, estuaries and along coasts to trap or permit the easier capture of sea-life.

Grinding Grooves

Grinding grooves are elongated narrow depressions in soft rocks (particularly sedimentary), generally associated with watercourses, that are created by the shaping and sharpening of ground-edge implements. To produce a sharp edge the axe blank (or re-worked axe) was honed on a natural stone surface near a source of water. The water was required for lubricating the grinding process. Axe grinding grooves can be identified by features such as a narrow short groove, with greatest depth near the groove centre. The grooves also display a patina developed through friction between stone surfaces. Generally a series of grooves are found as a result of the repetitive process.

Isolated Finds

Isolated finds occur where only one artefact is visible in a survey area. These finds are not found in apparent association with other evidence for prehistoric activity or occupation. Isolated finds occur anywhere and may represent loss, deliberate discard or abandonment of an artefact, or may be the remains of a dispersed artefact scatter. Numerous isolated finds have been recorded within the study area. An isolated find may flag the occurrence of other less visible artefacts in the vicinity or may indicate disturbance or relocation after the original discard.

Middens

Shell middens comprise deposits of shell remaining from consumption and are common in coastal regions and along watercourses. Middens vary in size, preservation and content, although they often contain artefacts made from stone, bone or shell, charcoal, and the remains of terrestrial or aquatic fauna that formed an additional component of Aboriginal diet. Middens can provide significant information on land-use patterns, diet, chronology of occupation and environmental conditions.

Mythological / Traditional Sites

Mythological and traditional sites of significance to Aboriginal people may occur in any location, although they are often associated with natural landscape features. They include sites associated with dreaming stories, massacre sites, traditional camp sites and contact sites. Consultation with the local Aboriginal community is essential for identifying these sites.

Rock Shelters with Art and / or Occupation Deposit

Rock shelters occur where geological formations suitable for habitation or use are present, such as rock overhangs, shelters or caves. Rock shelter sites generally contain artefacts, food remains and/or rock art and may include sites with areas of potential archaeological deposit, where evidence of rock-art or human occupation is expected but not visible. The geological composition of the study area greatly increases the likelihood for rock shelters to occur.

Stone Arrangements

Stone arrangements include lines, circles, mounds, or other patterns of stone arranged by Aboriginal people. These may be associated with bora grounds, ceremonial sites, mythological or sacred sites. Stone arrangements are more likely to occur on hill tops and ridge crests that contain stone outcrops or surface stone, where impact from recent land use practices has been minimal.

Stone Quarries

A stone quarry is a place at which stone resource exploitation has occurred. Quarry sites are only located where the exposed stone material is suitable for use either for ceremonial purposes (e.g. ochre) or for artefact manufacture.

Appendix 5

NSW Heritage Branch Significance Criteria



Heritage Act 1977

CRITERIA FOR LISTING ON THE STATE HERITAGE REGISTER

The State Heritage Register is established under Part 3A of the Heritage Act (as amended in 1998) for listing of items of environmental heritage¹ which are of state heritage significance².

To be assessed for listing on the State Heritage Register an item will, in the opinion of the Heritage Council of NSW, meet one or more of the following criteria³:

- a) an item is important in the course, or pattern, of NSW's cultural or natural history;
- b) an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;
- c) an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;
- d) an item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons;
- e) an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history;
- f) an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;
- g) an item is important in demonstrating the principal characteristics of a class of NSW's
 - cultural or natural places; or
 - cultural or natural environments.

An item is not to be excluded from the Register on the ground that items with similar characteristics have already been listed on the Register.

¹ **environmental heritage** means those places, buildings, works, relics, moveable objects, and precincts, of state or local heritage significance (section 4, *Heritage Act, 1977*).

² **state heritage significance**, in relation to a place, building, work, relic, moveable object or precinct, means significance to the State in relation to the historical, scientific cultural, social, archaeological, architectural, natural or aesthetic value of the item (section 4A(1), *Heritage Act, 1977*).

³ Guidelines for the application of these criteria may be published by the NSW Heritage Office.

Appendix 6

Site Card

Appendix 7

Aboriginal Community Response

