

HGBE Properties Pty Ltd

M

256 Paterson Road, Bolwarra Heights

LGA: Maitland

Archaeological Due Diligence Assessment

28 May 2024

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Report No: J202456 DD

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EXECUTIVE SUMMARY

McCardle Cultural Heritage Pty Ltd (MCH) was engaged by HGBE Properties Pty Ltd to undertake an Archaeological Due Diligence Assessment for the proposed subdivision of 256 Paterson Road, Bolwarra Heights.

Consisting of the Branxton Geological formation, the project area is underlain by conglomerate, sandstone and siltstone (NSW Seamless Geology), none of which are used in the manufacturing of stone tools. The project area consists of the Bolwarra Heights erosional soil landscape that consist of an upper soil Horizon A and underlying. Unit A and Unit B are interpreted as being Holocene and Pleistocene in age respectively. Within the region, sites tend to occur on or within soil Horizon A or are often present at the interface of the A and B horizons. The project area is situated between two prominent and dependable fresh water sources. The Hunter River is located approximately 1.8 kilometres to the west, while the Paterson River is about 1.9 kilometres to the east. Additionally, there is a 3rd order creek and wetlands area situated approximately 650 meters northeast of the project area. On the western side of the property, there is a 1st order drainage line that flows northwest and connects with another 1st order outside the project area, forming a 2nd order stream located west of the project area. In terms of landuses and impacts to the landscape, the majority of the project area had been cleared by 1974 with the open woodland area having been subject to selective logging. It is likely that part of the project area may have been subject to some ploughing for improved paster grass and then utilised for grazing activities. Additionally, a number of structures have been constructed at the south eastern corner, a dam along the western border and a number of tracks are also present.

A search of the AHIMS register identified 24 known Aboriginal sites recorded within two kilometres of the project area and include 8 grinding grooves, 7 artefact sites, 12 scar trees, 2 PADs, 1 burial, 1 artefact and PAD site and 1 PAD and grinding groove site. There are no registered sites or Aboriginal Places within the project area. Based on the AHIMS results, local and regional archaeological investigations, and the environmental context, it is evident that the project area, being more than one and a half kilometres away from a reliable water source, lacked access to fresh water. This suggests that the project area and its immediate surroundings were likely used only for hunting and gathering, rather than as a site for large-scale long-term camping. The investigation area has been impacted by land uses such as clearing, ploughing, grazing, and construction work for the dam and structures. These land uses have had an adverse effect on the archaeological record, potentially redistributing or removing any cultural materials that might have existed in the project area and were located in areas affected by these land uses. Within the project area, it is plausible to expect the presence of very low-density artefact scatters and/or isolated artefacts.

The survey identified that the project area had been previously cleared, there was evidence of ploughing (eroded ridges and furrows) in the southern open paddock area and vegetation was new=growth open woodland with some scrub in the western side of the project area. A residential house and sheds are located at the south eastern corner of the project area and a n umber of tracks are located throughout the property. No sites or PADs were identified in the project area and as such there are no impacts on the archaeological record and the following recommendations are provided:

- 1) The persons responsible for the management of onsite works will ensure that all staff, contractors and others involved in construction and maintenance related activities are made aware of the statutory legislation protecting sites and places of significance. Of particular importance is the National Parks and Wildlife Regulation 2019, under the National Parks and Wildlife Act 1974;

- 2) An Unexpected Finds Procedure (Appendix B) will be implemented during all works,
- 3) Should any Aboriginal objects be uncovered during works, all work will cease in that location immediately, the Unexpected Finds Procedure followed and the Environmental Line contacted.

GLOSSARY

Aboriginal Place: are locations that have been recognised by the Minister (and gazetted under the *National Parks and Wildlife Act 1974*) as having special cultural significance to the Aboriginal community. An Aboriginal Place may or may not include archaeological materials.

Aboriginal Site: an Aboriginal site is the location of one or more Aboriginal archaeological objects, including flaked stone artefacts, midden shell, grinding grooves, archaeological deposits, scarred trees etc.

Artefact: any object that is physically modified by humans.

Artefact scatter: a collection of artefacts scattered across the surface of the ground (also referred to as open camp sites).

Assemblage: a collection of artefacts associated by a particular place or time, assumed generated by a single group of people, and can comprise different artefact types.

Backed artefact: a stone tool where the margin of a flake is retouched at a steep angle and that margin is opposite a sharp edge.

Background scatter: a term used to describe low density scatter of isolated finds that are distributed across the landscape without any obvious focal point.

Core: a chunk of stone from which flakes are removed and will have one or more negative flake scars but no positive flake scars. The core itself can be shaped into a tool or used as a source of flakes to be formed into tools.

Debitage: small pieces of stone debris that break off during the manufacturing of stone tools. These are usually considered waste and are the by-product of production (also referred to as flake piece).

Flake: any piece of stone struck off a core and has a number of characteristics including ring cracks showing where the hammer hit the core and a bulb of percussion. May be used as a tool with no further working, may be retouched or serve as a platform for further reduction.

Flaked piece/waste flake: an unmodified and unused flake, usually the by-product of tool manufacture or core preparation (also referred to asdebitage).

Harm: is defined as an act that may destroy, deface or damage an Aboriginal object or place. In relation to an object, this means the movement or removal of an object from the land in which it has been situated

In situ: archaeological items are said to be "in situ" when they are found in the location where they were last deposited.

Retouched flake: a flake that has been flaked again in a manner that modified the edge for the purpose of resharpening that edge.

Typology: the systematic organization of artefacts into types on the basis of shared attributes.

ACRONYMS

| | |
|--------------|---|
| ACHA | Aboriginal Cultural Heritage Assessment |
| ACHMP | Aboriginal Cultural Heritage Management Plan |
| AHIMS | Aboriginal Heritage Information Management System |
| AHIP | Aboriginal Heritage Impact Permit |

AHIMS SITE ACRONYMS

| | |
|------------|---|
| ACD | Aboriginal ceremonial and dreaming |
| AFT | Artefact (stone, bone, shell, glass, ceramic and metal) |
| ARG | Aboriginal resource and gathering |
| ART | Art (pigment or engraving) |
| BOM | Non-human bone and organic material |
| BUR | Burial |
| CFT | Conflict site |
| CMR | Ceremonial ring (stone or earth) |
| ETM | Earth mound |
| FSH | Fish trap |
| GDG | Grinding groove |
| HAB | Habitation structure |
| HTH | Hearth |
| OCQ | Ochre quarry |
| PAD | Potential archaeological deposit. |
| SHL | Shell |
| STA | Stone arrangement |
| STQ | Stone quarry |
| TRE | Modified tree (carved or scarred) |
| WTR | Water hole |

1 INTRODUCTION

1.1 INTRODUCTION

McCardle Cultural Heritage Pty Ltd (MCH) has been engaged by HGBE Properties Pty Ltd to undertake an Archaeological Due Diligence Assessment for the proposed subdivision of 256 Paterson Road, Bolwarra Heights.

The assessment has been undertaken to meet the Heritage NSW, Department of Premier & Cabinet Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW and the brief. The purpose of a due diligence assessment is to assist proponents to exercise due diligence when carrying out activities that may harm Aboriginal objects or Aboriginal places and to determine whether that should apply for a consent to harm Aboriginal objects or Places through an Aboriginal Heritage Impact Assessment (AHIP).

The purpose of this due diligence report is to demonstrate that all reasonable and practicable measures have been undertaken to prevent harm to any Aboriginal objects and/or place within the project area. This report has met the Heritage NSW Due Diligence requirements and considered the relevant environmental and archaeological information, the project land condition, the nature of the proposed development activity and impacts, as well as preparing appropriate recommendations.

1.2 THE PROJECT AREA

The project area is located at 256 Paterson Road, Bolwarra Heights. Including Lot C DP163627, the location of the project area is shown in Figures 1.1 and 1.2.

Figure 1.1 Location of the project area

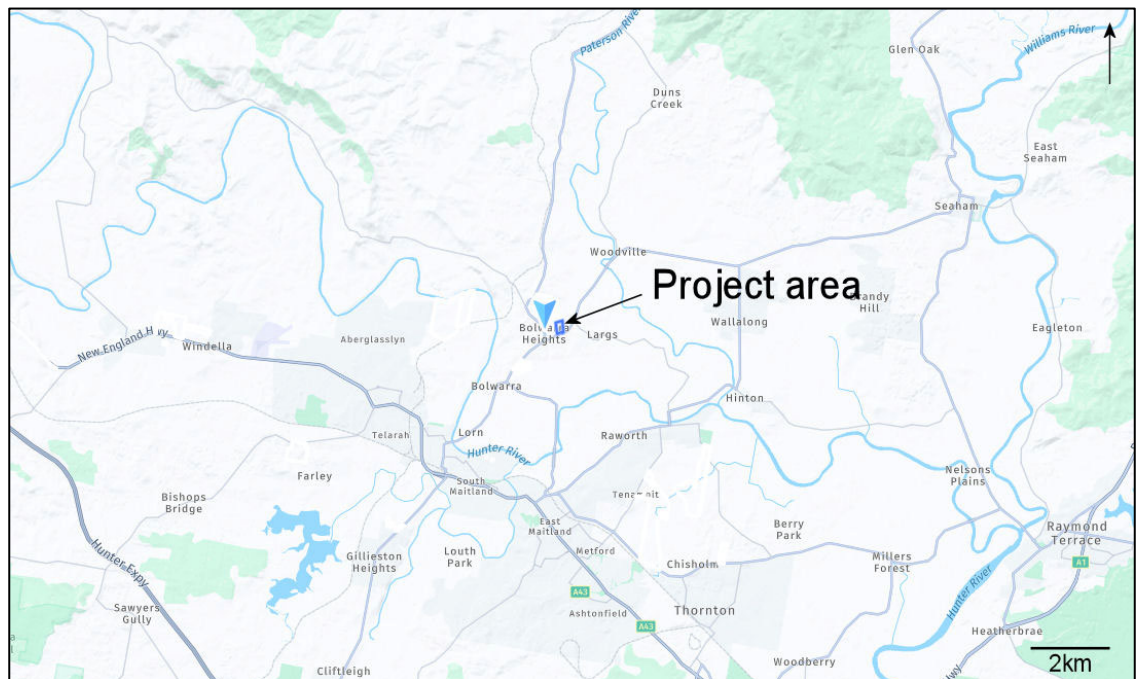


Figure 1.2 Aerial photograph of the project area (Nearmap 2024)



1.3 PROPOSED DEVELOPMENT

The project will include the subdivision of the project area into residential lots. Works typically associated with residential developments include clearing and demolition of existing structures, site remediation, bulk earthworks including construction of dwellings and roads, services reticulation: WW, PW, NBN, electrical and gas and landscaping.

1.4 OBJECTIVES OF THE DUE DILIGENCE ASSESSMENT

The objectives and primary tasks of this due diligence assessment were to:

- undertake a search of the Aboriginal Heritage Management System (AHIMS) and other relative registers;
- undertake research into the environmental and archaeological contexts of the project area;
- develop a predictive model of site location for the project area;
- undertake a field survey of the project area;
- assess the potential impacts of the proposed development on any identified Aboriginal sites or potential archaeological deposits (PADs) identified within the project area;
- assess the significance of any identified Aboriginal objects or sites identified within the project area;
- complete and submit site cards to AHIMS for any Aboriginal sites identified; and
- provide appropriate recommendations.

1.5 LEGISLATIVE CONTEXT

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

Land managers are required to consider the effects of their activities or proposed development on the environment under several pieces of legislation. Although there are a number of Acts and regulations protecting Aboriginal heritage, including places, sites and objects, within NSW, the three main ones include:

- National Parks and Wildlife Act (1974, as amended)
- National Parks and Wildlife Regulation (2019)
- Environmental Planning and Assessment Act (1979)

1.5.1 NATIONAL PARKS AND WILDLIFE ACT (1974, AS AMENDED)

The National Parks and Wildlife Act (1974), Amended 2019, is the primary legislation for the protection of Aboriginal cultural heritage in New South Wales. The NPW Act protects Aboriginal heritage (places, sites and objects) within NSW and the protection of Aboriginal heritage is outlined in s86 of the Act, as follows:

- “A person must not harm or desecrate an object that the person knows is an Aboriginal object” s86(1)
- “A person must not harm an Aboriginal object” s86(2)
- “A person must not harm or desecrate an Aboriginal place” s86(4)

Penalties apply for harming an Aboriginal object, site or place. The penalty for knowingly harming an Aboriginal object (s86[1]) and/or an Aboriginal place (s86[4]) is up to \$550,000 for an individual and/or imprisonment for 2 years; and in the case of a corporation the penalty is up to \$1.1 million. The penalty for a strict liability offence (s86[2]) is up to \$110,000 for an individual and \$220,000 for a corporation.

Harm under the National Parks and Wildlife Act (1974, as amended) is defined as any act that destroys defaces or damages the object, moves the object from the land on which it has been situated, causes or permits the object to be harmed. However, it is a defence from prosecution if the proponent can demonstrate that;

- 1) harm was authorised under an Aboriginal Heritage Impact Permit (AHIP) (and the permit was properly followed), or
- 2) the proponent exercised due diligence in respect to Aboriginal heritage.

The ‘due diligence’ defence (s87[2]), states that if a person or company has applied due diligence to determine that no Aboriginal object, site or place was likely to be harmed as a result of the activities proposed for the Project Area, then liability from prosecution under the NPW Act 1974 will be removed or mitigated if it later transpires that an Aboriginal object, site or place was harmed. If any Aboriginal objects are identified during the activity, then works should cease in that area and

Heritage NSW, Department of Premier & Cabinet notified (DECCW 2010:13). The due diligence defence does not allow for continuing harm or as defence to s.86(1) or (4).

The archaeological due diligence assessment and report has been carried out in compliance with the Heritage NSW (DECCW 2010) Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW.

1.5.2 NATIONAL PARKS AND WILDLIFE REGULATION (2019)

The National Parks and Wildlife Regulation 2019 provides a framework for undertaking activities and exercising due diligence in respect to Aboriginal heritage. The Regulation (201909) recognises various due diligence codes of practice, including the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW, but it also outlines procedures for Aboriginal Heritage Impact Permit (AHIP) applications and Aboriginal Cultural Heritage Consultation Requirements (ACHCRs); amongst other regulatory processes.

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

The *Environmental Planning and Assessment Act 1979* (EP&A Act) establishes the statutory framework for planning and environmental assessment in NSW and the implementation of the EP&A Act is the responsibility of the Minister for Planning, statutory authorities and local councils. The EP&A Act sets up a planning structure that requires developers (individuals or companies) to consider the environmental impacts of new projects. Under this Act, cultural heritage is considered to be a part of the environment. It provides for the identification, protection and management of heritage items through inclusion of these items into schedules of planning instruments, such as Local Environmental Plans (LEPs) or Regional Environmental Plans (REPs). This Act requires that Aboriginal cultural heritage and the possible impacts to Aboriginal heritage that development may have, are formally considered in land-use planning and development approval processes.

This Act has three main parts of direct relevance to Aboriginal cultural heritage. Namely, Part 3 which governs the preparation of planning instruments, Part 4 which relates to development assessment provisions for local government (consent) authorities and Part 5 which relates to activity approvals by governing (determining) authorities. Planning decisions within Local Government Areas (LGAs) are guided by Local Environmental Plans (LEPs). Each LGA is required to develop and maintain an LEP that includes Aboriginal and historical heritage items which are protected under the EP&A Act and the NPW Act. The Project Area is located within the Maitland City Council LGA and falls under the 2011 DCP.

1.5.4 LOCAL ENVIRONMENTAL PLAN

The project area is located within the Maitland City Council. Schedule 5 of the LEP 2011 details the included environmental heritage items covered by the plan. No Aboriginal sites or places are identified within proximity to the project area.

1.6 ABORIGINAL COMMUNITY CONSULTATION

A due diligence assessment relates to the physical identification of Aboriginal objects, sites and places. Community consultation is only required once Aboriginal objects, sites or places have been identified and an Aboriginal Heritage Impact Permit (AHIP) is deemed necessary. Section 5.2 of the

Heritage NSW (DECCW 2010) Due Diligence Code of Practice for the protection of Aboriginal Objects in NSW specifically states that;

'consultation with the Aboriginal community is not a formal requirement of the due diligence process' (2010:8).

1.7 QUALIFICATIONS OF THE INVESTIGATOR

Dr. Penny McCardle: Principal Archaeologist & Forensic Anthropologist has 23 years experience in Indigenous archaeological assessments, excavation, research, reporting, analysis and consultation and 20 years in skeletal identification, biological profiling and skeletal trauma identification for NPWS, NSW Police and the NSW Department of Forensic Medicine.

- BA (Archaeology and Palaeoanthropology): Indigenous archaeology, University of New England 1999
- Hons (Archaeology and Palaeoanthropology): Physical Anthropology, University of New England 2001
- Forensic Anthropology Course, University of New England 2003
- Armed Forces Institute of Pathology Forensic Anthropology Course, Ashburn, VA 2008
- Analysis of Bone trauma and Pseudo-Trauma in Suspected Violent Death Course, Erie College, Pennsylvania, 2009
- Documenting Scenes of War and Human Rights Violations. Institute for International Criminal Investigations, 2018
- PhD, University of Newcastle, 2019

1.8 REPORT STRUCTURE

The report includes Section 1 which outlines the project, Section 2 presents the environmental and archaeological context, Section 3 provides the results and discussion and Section 4 presents the Impact Assessment, Section 5 discusses the mitigation measures and Section 6 provides the management recommendations.

2 ENVIRONMENTAL AND ARCHAEOLOGICAL CONTEXT

The archaeological due diligence process and assessment requires that the available knowledge and information in relation to the environmental and archaeological contexts are considered. The purpose of this is to assist in identifying whether Aboriginal objects, sites or places are likely to be present within the project area based on archaeological predictive modelling and in what condition they may be found in given the environmental impacts, both natural and anthropogenic.

2.1 LOCAL ENVIRONMENT

Past site location and land use are closely linked to the environment including the landform, geology, geomorphology, soils, waterways and associated resources. The environmental context is important to identify potential factors relating to past Aboriginal land use patterns.

Story et al (1963) divided the Hunter Valley into eight main sub-regions including the Southern Mountains, Central Goulburn Valley, Merriwa Plateau, Liverpool and Mt Royal Ranges, Barrington tops, North-Eastern Mountains, Central lowlands and the Coastal Zone. The project area is situated in the Central Lowlands (a broad lowland belt of lowlands approximately 15 kilometres wide) which lies at the centre of the region extending from Murrurundi to Newcastle. Consisting of the Branxton Geological formation, the project area is underlain by conglomerate, sandstone and siltstone (NSW Seamless Geology), none of which are used in the manufacturing of stone tools.

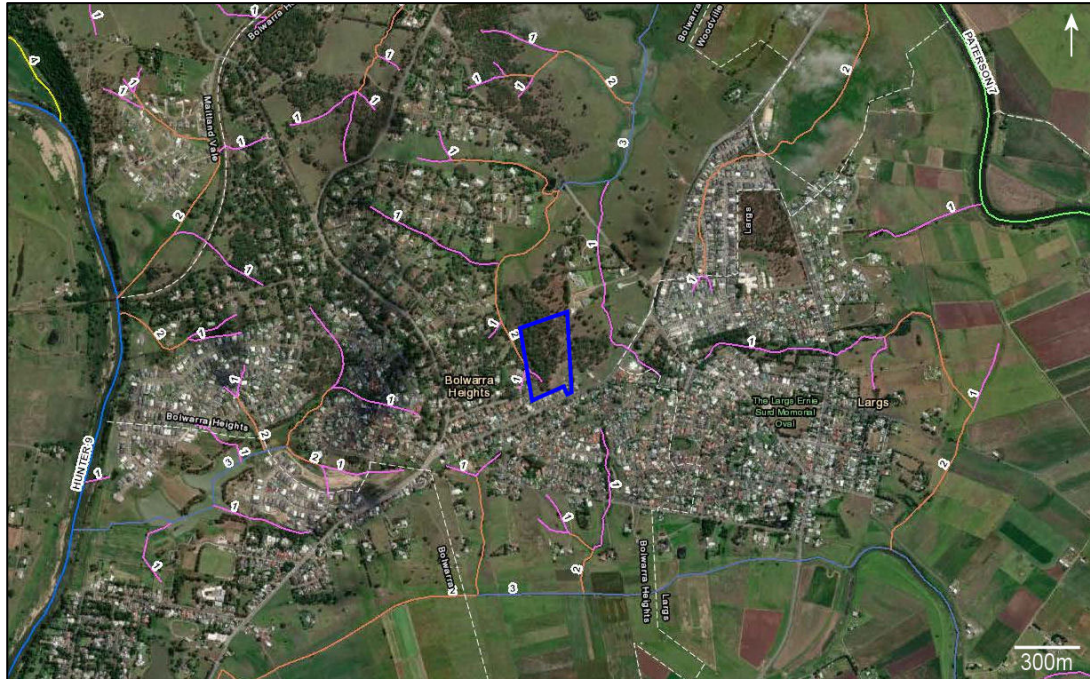
The project area consists of the Bolwarra Heights erosional soil landscape that typically features a brownish black gravelly loam A₁ horizon, approximately 25cm thick, overlaying a 15-20cm layer of earthy, gravelly fine sandy clay loam. Below this, the B Horizon consists of yellowish-brown pedal clay, ranging from 75-103cm. Erosion often removes the A₁ horizon, revealing the A₂ horizon at the surface. On well-drained upper slopes and crests, the A₁ horizon can be up to 25cm thick, overlaying the A₂ horizon (15-30cm thick), followed by 30-45cm of reddish-brown mottled clay in the B Horizon. In some cases, up to 35cm of A₁ Horizon directly overlays 30-40cm of the B Horizon. On resistant sandstone and conglomerate crests, a mere 5cm A₁ horizon overlays up to 100cm of A₂, which then directly overlays the bedrock. Poorly drained slopes consist of a 25cm A₁ horizon overlaying up to 20cm of A₂, and then another 30cm of the B Horizon (Matthei 1995: 108-110).

The geomorphology of the Hunter Valley is complex and include texture contrast soils that mantle the undulating to hilly landscapes on Permian and Carboniferous rocks and the older alluvial terraces and valley fills. These soils consist of an upper soil Horizon A and underlying (Galloway 1963; Hughes 1984). Unit A and Unit B are interpreted as being Holocene and Pleistocene in age respectively. Within the region, sites tend to occur on or within soil Horizon A or are often present at the interface of the A and B horizons. The A horizon of the Soil Landscape of the project area are generally 25cm or less in depth and soil deflation and erosion expose rather than bury former land surfaces on which stone artefacts may have been present, removing the upper part of the soil profile, usually to the exposed B horizon.

In terms of fresh water sources, the project area is located in between two major, and reliable fresh water sources. The Hunter River is located approximately 1.8 kilometres west and the Paterson River about 1.9 kilometres east of the project area. One 3rd order creek and wetlands area located approximately 650 metres north east of the project area. One 1st order drainage line is located in the western side of the property and flows north west to join another 1st order outside the project area, forming a 2nd order is located to the west of the project area (Figure 2.1). As water is necessary for survival, the project area may be considered under-resourced in terms of water availability and was

likely utilised for no more than traveling with opportunistic hunting and gathering activities on the way to the reliable fresh water sources located east and west of the project area.

Figure 2.1 Stream orders (NSW arcgis.com)



Heritage NSW (DECCW 2010) defines disturbed lands as land that has been altered by human activity, resulting in noticeable changes to the surface and/or subsurface. This definition aligns with the disturbances outlined in The Australian Soil and Land Survey Field Handbook (CSIRO 2010). Table 2.1 in the handbook provides a scale created by CSIRO to classify the levels of disturbances, which can be used to assess the impact of these disturbances on cultural material within the project area.

Table 2.1 Land use scale (CSIRO 2010)

| Minor disturbance | | Moderate disturbance | | Major disturbance | |
|---|--|--|---|---|---|
| Cleared and/or grazed at some time, but apparently never ploughed | | Cleared and/or grazed at some time, with ploughing also attested | | Severe disturbance to natural soil profiles; complete-to-near complete topsoil loss/disturbance | |
| 0 | No effective disturbance; natural | 3 | Extensive clearing (e.g., poisoning and ringbarking) | 6 | Cultivation: grain fed |
| 1 | No effective disturbance other than grazed by hoofed animals | 4 | Complete clearing: pasture native or improved, but never cultivated | 7 | Cultivation: irrigated, past and present |
| 2 | Limited clearing (e.g., selected logging) | 5 | Complete clearing: pasture native or improved, cultivated at some stage | 8 | Highly disturbed: e.g., quarry, road works, mining, landfill, urban |

Regionally, following European settlement of the area in the 1820s, the regional landscape has been subjected to a range of different modifactory activities including extensive logging and clearing, agricultural cultivation (ploughing), pastoral grazing, residential developments and other construction works. The associated high degree of landscape disturbance has resulted in the alteration of large tracts of land and the cultural materials contained within these areas.

Based on NSW historic imagery photography and Nearmap, the project area has been subject to a range of both moderate and high landuses disturbances and impacts. As shown in Figure 2.2, the majority of the project area had been cleared by 1974 with the open woodland area having been subject to selective logging. It is likely that part of the project area may have been subject to some ploughing for improved paster grass and then utilised for grazing activities. Additionally, a number of structures have been constructed at the south eastern corner, a dam along the western border and a number of tracks are also present.

Figure 2.2 1974 aerial photograph



There have been no obvious significant changes in the project area that is evident on the historical aerial photographs until 2021 where the south eastern section has been subject to additional clearing and track work and the open woodland area has expanded with regrowth (Figure 2.3). These landuses and how they impact on the landscape and deposits are discussed below.

Figure 2.3 2021 aerial photograph



Early vegetation clearing included the uprooting of trees by chaining which disturbed or destroyed that may be present near, or underneath trees and vegetation (Wood 1982). Alternatively, timber was harvested manually, using axes and hand saws and generally, only the trees that were wanted for timber were felled (selective logging). However, after the 1950s, there was an increase in mechanisation in the logging industry, and clear-felling became widely practised whereby the best logs were removed for processing, but nearly every other tree was bulldozed and burnt, and had increased impacts to the landscape.

Farming and agricultural activities also disturbed the landscape. Pastoralism activities result in disturbances due to vegetation clearance and the trampling and compaction of grazed areas which accelerate the natural processes of sheet and gully erosion, which in turn can cause the horizontal and lateral displacement of artefacts. Furthermore, grazing by hooved animals can affect the archaeological record due to the displacement and breakage of artefacts resulting from trampling (Yorston et al 1990). Pastoral land uses are also closely linked to alterations in the landscape due to the construction of dams, fence lines and associated structures. As a sub-set of agricultural land use, ploughing typically disturbs the top 10-35 centimetres of topsoil (Koettig 1986, Personal obs.) depending on the method and machinery used during the process. Ploughing increases the occurrence of erosion and can also result in the direct horizontal (up to 18 metres per plough run) and vertical movement of artefacts, thus causing artificial changes in artefact densities and distributions (e.g., Roper 1976; Odell and Cowan 1987; Lewarch and O'Brien 1981). Ploughing activities are typically evidenced through 'ridges and furrows' however a lengthy cessation in ploughing activities dictates that these features may no longer be apparent on the surface.

Excavation works required for developments, including but not limited to business, residential, industrial, works depots and associated infrastructure and utilities, require excavation, cut and fill methods. These direct impacts to the land and associated cultural materials that may be present are easy to see and understand. Any form of construction or resource exploitation that involves the removal of, relocation of or compaction or soils sediments or minerals, requires the modification of

the topography, thus displacing and/or destroying any cultural materials that may have been present (Wood 1982). These significant disturbances have results in none of the original topsoils remaining in situ.

In terms of everyday land uses, vehicular movements on sites have been well documented and based on several experiments (DeBloois, Green and Wylie 1974, Gallagher 1978), have shown that vehicle movements over an archaeological site are extremely destructive to the site through compaction and movement, thus altering the spatial relationship and location of the artefacts. Based on general observations it is expected that the creation of dirt tracks for vehicle access would also result in the loss of vegetation and therefore will enhance erosion and the associated relocation of cultural materials.

Additional disturbances would have derived from natural processes. The patterns of deposition and erosion within a locality can influence the formation and/or destruction of archaeological sites. Within an environment where the rate of erosion is generally high, artefacts deposited in such an environment will be eroded downslope after being abandoned (Waters 2000; Waters and Kuehn 1996). If erosion occurs after cultural material is deposited, it will disturb or destroy sections, or all of, archaeological sites even if they were initially in a good state of preservation. The more frequent and severe the episodes of erosional events the more likely it is that the archaeological record in that area will be disturbed or destroyed.

Bioturbation processes, such as burrowing and mounding by earthworms, ants, and other animals, contribute to the redistribution and mixing of cultural deposits. This movement can occur through various means, including root holes, gravity-induced sorting and settling, and translocation following tree falls (Balek 2002; Peacock and Fant 2002; Canti 2003; Stein 2003). Several studies have been conducted to evaluate the impact of bioturbation on materials. In a study conducted in abandoned cultivated fields in South Carolina, Michie (cited in Balek 2002:42-43) observed that over a span of 100 years, approximately 35% of shell fragments used for fertilisation were found between 15 and 60 centimetres below the surface. This observation was attributed to bioturbation and gravity. Earthworms can influence cultural deposits by creating false concentrations and stratigraphy, displacing artefacts during burrowing, burying artifacts through faecal deposition, and blurring the boundaries between natural and cultural materials. Furthermore, earthworms can also degrade seeds and organic remains through consumption (Fowler et al. 2004:462; Stein 1983:280-281).

The project area is located within an environment that provided limited resources. Without a fresh water supply, the project area may have been utilised for more transitory activities such as travel and hunting and gathering on the way to reliable water and associated subsistence resources. Such past Aboriginal land uses are manifest in the archaeological record as a background scatter of discarded artefacts (such as isolated artefacts and/or very low-density artefact scatters). In relation to modern alterations to the landscape, the previous large-scale clearing across the majority of the project area, ploughing, grazing, dam construction, housing and associated infrastructure and tracks can be expected to have had moderate to high impacts upon the archaeological record.

2.2 ARCHAEOLOGICAL CONTEXT

A review of the archaeological literature of the region, and more specifically the local area and the results of an AHIMS search provide essential contextual information for the current assessment.

While the Aboriginal occupation of Australia is currently accepted as beginning approximately 65,000 years ago (Clarkson et al. 2017), the Aboriginal occupation of the Hunter Valley has been dated to approximately 20,000 years (Brayshaw 1987:100). Radiocarbon dates obtained from charcoal

at a site in Glennies Creek, north of Singleton, found that artefacts within the deposit dated to approximately 20,200 years before present (BP). Despite this Pleistocene period site, most of the archaeology in the Hunter region has been dated to the Holocene period.

There are many types of evidence past Aboriginal occupation across the landscape which form the archaeological record of a region. Places which show evidence of Aboriginal occupation of an area are archaeological sites. These sites contain numerous site features, and some contain more than one features. The Aboriginal heritage information management system (AHIMS) provides information of the known archaeological sites in NSW.

2.2.1 ABORIGINAL HERITAGE INFORMATION MANAGEMENT SYSTEM (AHIMS)

It must be noted that there are many limitations with an AHIMS search including incorrect site coordinates due to errors and changing of computer systems at AHIMS over the years that failed to correctly translate old coordinate systems to new systems. Secondly, AHIMS will only provide up to 110 sites per search, thus limiting the search area surrounding the project area and limiting a more comprehensive analysis and finally, few sites have been updated on the AHIMS register to notify if they have been subject to a s87 or s90 and as such what sites remain in the local area and what sites have been destroyed, to assist in determining the cumulative impacts, is unknown.

A search of the AHIMS register (Appendix A) has identified 24 known Aboriginal sites currently recorded within two kilometres of the project area and include 8 grinding grooves, 7 artefact sites, 12 scar trees, 2 PADs, 1 burial, 1 artefact and PAD site and 1 PAD and grinding groove site (Figure 2.4). There are no registered sites or Aboriginal Places within the project area.

Figure 2.4 Location of AHIMS sites



2.2.2 HERITAGE REGISTER LISTINGS

The National Heritage List, the Commonwealth Heritage List, the Australian Heritage Database, Australia's National Heritage List, The National Trust Heritage Register State Heritage Inventory the and the relevant Local Environmental Plan have no Aboriginal objects, sites or places listed.

2.2.3 SUMMARY OF THE REGIONAL ARCHAEOLOGICAL CONTEXT

The majority of archaeological surveys and excavations throughout the region have been undertaken in relation to environmental assessments for various developments, including but not limited to, residential and industrial, infrastructure, utilities, mining and quarrying. A review of the of the most relevant investigations (Davidson et al 1993; Dean-Jones and Mitchell 1993; Koettig and Hughes 1984; McDonald 1997; Haglund 1999; Kuskie 2000; HLA-Envirosciences 2002; AMBS 2002; MCH 2004a, b) provides a regional archaeological context in terms of site location and distribution.

Based on the available information it is possible to identify a number of trends in site location and patterning within the regional area. Open campsites are by far the most common site type with isolated finds also comparatively well represented. A variety of other site types have been identified in far lower concentrations and include grinding grooves, scarred trees, rock shelters, shelters with art and burials. The high representation of sites containing stone artefacts is to be expected due to the durability of stone in comparison to other raw materials. Raw materials used for tool manufacture include mudstone (also called tuff by some) which is the most common lithic artefactual material found in the region, followed by silcrete and in lesser quantities chert, quartz, quartzite, petrified wood, porcellanite, basalt, limestone, sandstone, rhyolite, basalt, European glass and other non-specific lithic types also occur in smaller quantities. The most common stone artefacts include flakes, flake fragments and flaked pieces. Cores, edge ground axes, millstones, grindstones, hammer stones and backed artefacts including backed blades, bondi points, geometric microliths and eloueras also occur though in lower frequencies. In general, the stone artefact assemblage in the area has been relatively dated to what was previously known as the Small Tool Tradition (10,000 years BP). On the basis of stone tool technology, the overwhelming majority of Aboriginal open sites within the region are attributed to the Holocene period. However, at Glennies Creek, north of Singleton, based on radiocarbon dated charcoal and geomorphological evidence it is suggested that artefacts found in the B-horizon may have been deposited between 10,000 and 13,000 BP (Koettig 1986a, 1986b).

2.2.4 SUMMARY OF THE LOCAL ARCHAEOLOGICAL CONTEXT

All archaeological surveys throughout the local area have been undertaken in relation to environmental assessments for developments. The most relevant investigations indicate differing results and observations based on surface visibility and exposure, alterations to the landscape, proximity to water sources and geomorphology.

Previous assessments of the local area (Brayshaw 1984, 1995, Baker 1997, Dallas 2004, Hamm 2004, MCH 2006, 2011) have identified that artefact scatters and isolated finds are the most prominent site type. These assessments have also identified that both landform and distance to water were important factors in past Aboriginal land use with elevated landforms within 50 metres of reliable water to have been the most favoured. The higher the stream order (and more reliable water source) the higher the numbers of sites and site densities, and both decrease with distance from the water source, and a decrease in stream order. A number of sites were also found on slopes; however, it is likely they were eroded down slope and not found in their original location. All sites were noted to

have been disturbed through past landuses including but not limited to clearing, agricultural and pastoral activities, residential developments, utilities, infrastructure and erosion.

The following is a summary of the previous investigations and it is noted that there are various factors which will have skewed the results. Therefore, the summary provides an indication of what may be expected in terms of site location and distribution.

- a wide variety of site types are represented in the project area with open campsites and isolated artefacts by far the most common;
- lithic artefacts are primarily manufactured from mudstone and silcrete with a variety of other raw materials also utilised but in smaller proportions;
- sites in proximity to ephemeral water sources or located in the vicinity of headwaters of upper tributaries (1st order streams) have a sparse distribution and density and contain little more than a background scatter;
- sites located in the vicinity of the upper reaches of minor tributaries (2nd order streams) also have a relatively sparse distribution and density and may represent evidence of localised one-off behaviour;
- sites located in the vicinity of the lower reaches of tributaries (3rd order creeks) have an increased distribution and density and contain evidence that may represent repeated occupation or concentration of activity;
- sites located in the vicinity of major tributaries (4th and 5th order streams/rivers) have the highest distribution and densities. These sites tend to be extensive and complex in landscapes with permanent and reliable water and contain evidence representative of concentrated activity; and
- sites located within close vicinity at the confluence of any order stream may be a focus of activity and may contain a relatively higher artefact distribution and density.

These findings are consistent with models developed for the area.

2.3 SYNTHESIS OF ENVIRONMENTAL AND ARCHAEOLOGICAL CONTEXTS

When assessing sites in terms of distance to water, in the Hunter Valley there is a clear pattern of past land uses whereby the majority of high-density sites are situated within 50 metres of reliable fresh water (high order) and reduce in both numbers and densities with a decrease in stream order. Thus, it is apparent that open campsites/isolated finds are most concentrated in number and size within 50 metres of reliable fresh water.

As is to be expected, the majority of sites within 50 metres of water are present on elevated landforms in association with creek lines whilst slopes and crest/ridge formations are also common site locations, although with an absence of reliable fresh water, were used for more transitory activities. The frequent presence of sites on crest/ridges and slopes is also noticeable for sites located over 50 metres from water. Due to the importance of water in the grinding process, it is not surprising that sites of this type are situated close to water. Based on information gained from previous studies, both regionally and locally, and the environmental context, within a two-kilometre radius of our project area, it can be expected that:

- the likelihood of locating sites increases with proximity to available water;

- the likelihood of finding large sites of high densities increases markedly with proximity to reliable water and decreases with a reduction in stream order;
- grinding grooves may be located along or near water sources within sandstone formations;
- a variety of stone artefact types will be located though the majority will be flakes, flaked pieces and debitage;
- a variety of raw materials utilised in stone tool manufacture will be represented, though the majority of sites will be predominated by mudstone and silcrete;
- the likelihood of finding scarred trees is dependent on the level of clearing in an area; and
- the majority of sites will be subject to disturbances including human and natural.

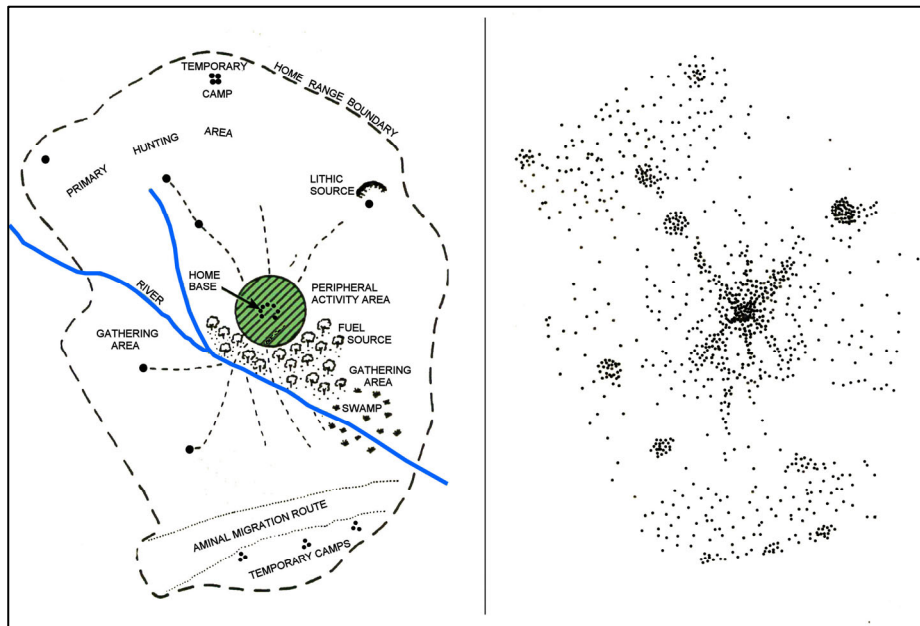
2.4 MODELS OF PAST ABORIGINAL LAND USE

The main aim of this project is to attempt to define both the nature and extent of occupation across the area. As a result, the nature of the analysis will focus on both the landform units and sites. The purpose of this strategy is to highlight any variations between sites and associated assemblages, landforms and resources across the area treating assemblages as a continuous scatter of cultural material across the landscape. In doing this, it is possible to identify variation across the landscape, landforms and assemblages that correspond with variation in the general patterns of landscape use and occupation. Thus, the nature of activities and occupation can be identified through the analysis of stone artefact distributions across a landscape. A general model of forager settlement patterning in the archaeological record has been established by Foley (1981). This model distinguishes the residential 'home base' site with peripheral "activity locations".

Basically, the home base is the focus of attention and many activities and the activity locations are situated away from the home base and are the focus of specific activities (such as tool manufacturing). This pattern is illustrated in Figure 2.5. Home base sites generally occur in areas with good access to a wide range of resources (reliable water, raw materials etc). The degree of environmental reliability, such as reliable water and subsistence resources, may influence the rate of return to sites and hence the complexity of evidence. Home base sites generally show a greater diversity of artefacts and raw material types (which represent a greater array of activities performed at the site and immediate area). Activity locations occur within the foraging radius of a home base camp (approximately 10 km); (Renfrew and Bahn 1991).

Based on the premise that these sites served as a focus of a specific activity, they will show a low diversity in artefacts and are not likely to contain features reflecting a base camp (such as hearths). However, it is also possible that the location of certain activities cannot be predicted or identified, adding to the increased dispersal of cultural material across the landscape. If people were opting to carry stone tools during hunting and gathering journeys throughout the area rather than manufacturing tools at task locations, an increased number of used tools should be recovered from low density and dispersed assemblages.

Figure 2.5 Foley's model (L) and its manifestation in the archaeological record (R), (Foley 1981).



2.5 MODEL OF OCCUPATION FOR THE LOCAL AREA

Work throughout NSW has aimed to understand the nature of Aboriginal occupation and to identify the nature of past Aboriginal land uses. This theme often aims to identify and explain archaeological patterning in site type, content and distribution. General theories have been developed outlining the relationship between land use patterns and the resulting archaeological evidence. A number of models developed for the region have been reviewed (McBryde 1976; Koettig 1994; Dean-Jones and Mitchell 1993; Rich 1995; Kuskie and Kamminga 2000). All models state that the primary requirements for repeated, concentrated or permanent occupation is access to reliable fresh water. Brief and possible repeated occupation may be represented in areas that have unreliable access to ephemeral water sources, however, these areas will not contain high archaeological evidence or potential (Goodwin 1999).

Kuskie and Kamminga (2000) established a general model of occupation strategies based primarily upon ethnographic research. Used as a starting point, it makes a general set of factors that are consistent with other studies (e.g., McDonald and White 2010, Nelson 1991). The model distinguishes between short-term or extended long-term occupation and makes some predictions about the likely location of different foraging and settlement activities. Combining this information with a review of assemblage contents from a sample of excavated sites within the region, a baseline of settlement activities may be determined (Barton 2001).

The model provides a number of archaeological expectations that may be tested. For example, the presence of features requiring a considerable labour investment (e.g., stone-lined ovens or heat-treatment pits) are likely to occur at places where occupation occurred for extended periods of time. The presence of grindstones is also a reliable indicator of low mobility and extended occupation as seed grinding requires a large investment of time and effort (Cane 1989). In most ethnographic examples, seed grinding is an activity that takes place over an entire day to provide adequate energetic returns (Cane 1989; Edwards and O'Connell 1995).

Where group mobility was high and campsites frequently shifted throughout the landscape, artefact assemblages are not expected to contain elements such as grindstones, heat-treatment pits, ovens

and the diversity of implements frequently discarded at places of extended residential occupation. It may also have been the case that the location of particular activities could not be predicted by tool users, adding to the increased low-density scattering of artefacts over the landscape. Also, if individuals were opting to carry a number of stone tools during hunting and gathering activities and maintaining these tools rather than manufacturing new tools at each task location, the ratio of used tools to unworn flakes in these assemblages should be high. Table 2.2 has been adapted from Kuskie and Kamminga (2000).

Table 2.2 Site descriptions (Kuskie & Kamminga 2000).

| Occupation Pattern | Activity Location | Proximity to water | Proximity to food | Archaeological expectations |
|--|---|-----------------------------------|---------------------|--|
| Transitory movement | all landscape zones | not important | not important | <ul style="list-style-type: none"> assemblages of low density & diversity evidence of tool maintenance & repair evidence for stone knapping |
| Hunting &/or gathering without camping | all landscape zones | not important | near food resources | <ul style="list-style-type: none"> assemblages of low density & diversity evidence of tool maintenance & repair evidence for stone knapping high frequency of used tools |
| Camping by small groups | associated with permanent & temporary water | near (within 100m) | near food resources | <ul style="list-style-type: none"> assemblages of moderate density & diversity evidence of tool maintenance & repair evidence for stone knapping & hearths |
| Nuclear family base camp | level or gently undulating ground | near reliable source (within 50m) | near food resources | <ul style="list-style-type: none"> assemblages of high density & diversity evidence of tool maintenance, repair, casual knapping evidence for stone knapping heat treatment pits, stone lined ovens grindstones |
| Community base camp | level or gently undulating ground | near reliable source (within 50m) | near food resources | <ul style="list-style-type: none"> assemblages of high density & diversity evidence of tool maintenance, repair, casual knapping evidence for stone knapping heat treatment pits, stone lined ovens grindstones & ochre large area >100sqm with isolated camp sites |

2.6 PREDICTIVE MODEL FOR THE PROJECT AREA

An archaeological predictive model is established to identify areas of archaeological sensitivity so it can be used as a basis for the planning and management of Aboriginal heritage. It involves reviewing existing literature to identify basic site distribution patterns. These patterns are then modified according to the specific environment of the project area to form a predictive model for site location within the current project area. A sampling strategy is then used to test the model and the results of the survey used to confirm, refute or modify the model.

Land-systems and environmental factors are commonly used factors in predictive modelling based on the assumption that they provide distinctive sets of constraints and opportunities that influenced past Aboriginal land use patterns. As land use patterns may differ between zones (due to different environmental conditions), this may result in the physical manifestation of different spatial distributions and forms of archaeological evidence. The predictive model presented here is based on landform units, previous archaeological assessments conducted within the region, distribution of

known sites and site densities and traditional Aboriginal land use patterns. Also taken into consideration are land use impacts (both natural and anthropomorphic) that may have resulted in a disturbed landscape and associated archaeological record.

Considering the AHIMS results, local and regional archaeological investigations as well as the environmental context, given that fresh water was necessary for survival and the project area is located over one and a half kilometres from a reliable water source, the absence of fresh water indicates the project area and immediate surrounds may have been used no more than hunting and gathering opportunities rather than large-scale long-term camping. Evidence of such past Aboriginal land uses manifest in the archaeological record as low-density artefact scatters and isolated artefacts.

Non-indigenous settlement and land uses have impacted the investigation area, most noticeably from clearing, ploughing, grazing and construction works for the dam and structures. These land uses would have impacted on the archaeological record by re-distributing or removing any cultural materials that may have been present in the project area at those locations impacted by these land uses. The site types that may be present within the project area include very low-density artefact scatters and, or isolated artefacts, both of which are described below.

- **Artefact scatters**

Also described as open campsites, artefact scatters and open sites, these deposits have been defined at two or more stone artefacts within 50 metres of each other and will include archaeological remains such as stone artefacts and may be found in association with camping where other evidence may be present such as shell, hearths, stone lined fire places and/or heat treatment pits. These sites are usually identified as surface scatters of artefacts in areas where ground surface visibility is increased due to lack of vegetation. Erosion, agricultural activities (such as ploughing, grazing) and access ways can also expose surface campsites. Artefact scatters may represent evidence of;

- Large camp sites, where everyday activities such as habitation, maintenance of stone or wooden tools, manufacturing of such tools, management of raw materials, preparation and consumption of food and storage of tools has occurred;
- Medium/small camp sites, where activities such as minimal tool manufacturing occurred;
- Hunting and/or gathering events;
- Other events spatially separated from a camp site, or
- Transitory movement through the landscape.

Artefact scatters are a common site type in the locality and the broader region. There is potential for low-density artefact scatters to occur within the project area. However, there is also the potential for such sites to be impacted on through past land uses.

- **Isolated finds**

Isolated artefacts are usually identified in areas where ground surface visibility is increased due to lack of vegetation. Erosion, agricultural activities (such as ploughing) and access ways can also expose surface artefacts. Isolated finds may represent evidence of;

- Hunting and/or gathering events; or
- Transitory movement through the landscape.

Isolated finds are a common site type in the locality and the broader region. There is potential for isolated artefacts to occur across the project area and across all landforms. There is also the potential for such sites to be impacted on through past land uses.

3 RESULTS AND DISCUSSION

To comply with the due diligence requirement that a visual inspection of the project area be undertaken, an archaeological survey across the project area was undertaken by MCH archaeologist Dr. Penny McCardle on 22nd May 2024. The survey focused on areas of high ground surface visibility and exposures (erosional features, tracks, cleared areas).

3.1 SURVEY UNITS

The project area, consisting of a very gentle slope was surveyed as one survey unit based on landform elements (following McDonald *et al* 1984). The survey identified that the project area had been previously cleared, there was evidence of ploughing (eroded ridges and furrows) in the southern open paddock area and vegetation was new-growth open woodland with some scrub in the western side of the project area. A residential house and sheds are located at the south eastern corner of the project area and a number of tracks are located throughout the property. Examples of the project area are provided in Figures 3.1 to 3.6.

Figure 3.1 South eastern side facing west



Figure 3.2 Track along the eastern side of the property (facing north)



Figure 3.3 Middle of the project area facing south



Figure 3.4 Track through the western side of the property (facing south)



Figure 3.5 North western side of the project area (facing west)



Figure 3.6 Paddock north of the house, facing south to the house



The effectiveness of the survey for both obtrusive and unobtrusive archaeological sites, is determined through ground surface visibility and exposures across the project area. Ground surface visibility is used to define the degree to which the surface of the ground can be observed and can be influenced by natural processes, such as the nature and type of vegetation cover, erosion, or land use practices (e.g., ploughing or grading). Existing exposures (visible at the time of the survey) are described in terms of the natural erosion processes responsible for its creation and any other contributing or primary processes (e.g., ploughing, stocking, machinery cutting, vehicle tracks, any ground disturbances). As shown in Table 3.1 the total effective coverage for the project area is 4,320m², or 6% reflecting the low surface visibility due to vegetation cover.

Table 3.1 Effective coverage for the investigation area

| SU | Landform | Area (m ²) | Vis. % | Exp. % | Exposure type | Previous disturbances | Present disturbances | Limiting visibility factors | Effective coverage (m ²) |
|-----------------------------|----------|------------------------|--------|--------|--------------------------------|---|----------------------|------------------------------|--------------------------------------|
| 1 | slope | 72,000 | 20% | 30% | erosion, tracks, cleared areas | clearing, ploughing, grazing, residential house | erosion, residential | vegetation cover, structures | 4,320 |
| Totals | | 72,000 | | | | | | | 4,320 |
| Effective coverage % | | | | | | | | | 6.00% |

The level and nature of the effective survey coverage is considered satisfactory to provide an effective assessment of the project area. The coverage was comprehensive for obtrusive site types (e.g., grinding grooves and scarred trees) but somewhat limited for the less obtrusive surface stone artefact sites by surface visibility constraints that included vegetation cover and minimal exposures.

In relation to land uses and the associated impacts on the landscape and any cultural materials that may have been present, the project area has been subject to clearing activities, ploughing, grazing and construction works in the south eastern corner and as indicated in Table 3.2, these disturbances range from minor to high.

Table 3.2 Land use scale (CSIRO 2010) and land uses in the project area

| Minor disturbance | | Project area | Moderate disturbance | | Project area | Major disturbance | | Project area |
|-------------------|--|--------------|----------------------|---|---------------------------------|-------------------|---|--------------|
| 0 | No effective disturbance; natural | | 3 | Extensive clearing (e.g., poisoning and ringbarking) | | 6 | Cultivation: grain fed | |
| 1 | No effective disturbance other than grazed by hoofed animals | | 4 | Complete clearing: pasture native or improved, but never cultivated | clearing, part improved pasture | 7 | Cultivation: irrigated, past and present | |
| 2 | Limited clearing (e.g., selected logging) | part | 5 | Complete clearing: pasture native or improved, cultivated at some stage | | 8 | Highly disturbed: e.g., quarry, road works, mining, landfill, urban | part |

3.2 ARCHAEOLOGICAL SITES AND ARCHAEOLOGICAL SENSITIVITY

No sites or areas of potential archaeological sensitivity were identified in the project areas during the survey and this is due to the impacts from previous land uses across the project area (clearing, ploughing, grazing). Additionally, being located at a distance from reliable fresh water and resources, indicates the project area may have been utilised for more transitory activities rather than camping. Evidence of such past Aboriginal land uses manifests in the archaeological record as a background scatter of discarded artefacts, which would have been disturbed/destroyed through past land uses.

In view of the predictive modelling and the results obtained from the effective coverage and disturbance rating, it is concluded that the survey provides a valid basis for determining the probable impacts of the proposal and formulating recommendations for the project. The survey results demonstrate the absence of Aboriginal objects within the project area. The results are consistent with those obtained from other studies in the local area in similar environmental contexts. The results indicate a number of possible past Aboriginal land use within the project area;

- No Aboriginal occupation
- Ground disturbances having disturbed or removed evidence

Considering general models of occupation for the locality, the results of this and local investigations, the locality may have been utilised by Aboriginal people. As the project area itself is located over 1.5km from reliable water and associated resources, the project area is unlikely to have been utilised more than a low intensity usage such as transitory movement or hunting/gathering activities.

3.3 CONCLUSION

It is well established that proximity to water was an important factor in past occupation of the area, with sites reducing in number significantly away from water with most sites located within 50 metres of the tributaries. The project area is located approximately 1.8 kilometres from the Hunter River, 1,9

Kilometres from the Paterson River and over 600 metres from a 3rd order creek and wetlands. The absence of fresh water in the project area indicates the area may have been used for traveling and opportunistic hunting and gathering activities on route to the two major water sources.

Archaeological evidence of such past Aboriginal land uses is typically found in the form of scattered artefacts dispersed sparsely across the landscape. Due to this distribution pattern, it is challenging to predict the exact locations of these artefacts. Regarding the contemporary modifications to the landscape, it is probable that such evidence would have been disturbed through prior extensive clearing, grazing, and construction activities carried out in association with the dam, structures, and associated utilities. These activities may have led to the redistribution or removal of any cultural materials that may have originally been present in the area. Natural factors such as erosion would also have impacted on the archaeological record, all of which would have displaced cultural materials and the likelihood of in situ cultural materials is very low.

4 ASSESSMENT OF IMPACTS

The archaeological record is a non-renewable resource that is affected by many processes and activities. As outlined in Section 2 and Section 3, the various natural processes and human activities have impacted on archaeological deposits through both site formation and taphonomic processes.

4.1 IMPACTS

The Heritage NSW Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (2010:21) describes impacts to be rated as follows:

- 1) Type of harm: is either direct, indirect or none
- 2) Degree of harm is defined as either total, partial or none
- 3) Consequence of harm is defined as either total loss, partial loss, or no loss of value

As no sites or PADs were identified, there are no impacts on the archaeological record.

5 MITIGATION AND MANAGEMENT STRATEGIES

Specific strategies, as outlined through the Heritage NSW Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010b), the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011), and the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW 2010c), are considered below for the management of the identified site(s) within the project area.

5.1 CONSERVATION/PROTECTION

Conservation is the first avenue and is suitable for all sites, especially those considered high archaeological significance and/or cultural significance. Conservation includes the processes of looking after an indigenous site or place so as to retain its significance and managed in a way that is consistent with the nature of peoples' attachment to them.

As no sites or PADs were identified conservation/protection is not required.

5.2 FURTHER INVESTIGATION

An Aboriginal Heritage Impact Permit (AHIP) is no longer required to undertake test excavations (providing the excavations are in accordance with the Code of Practice for Archaeological Investigations in NSW). Subsurface testing is appropriate when a PAD has been identified, and it can be demonstrated that sub-surface Aboriginal objects with potential conservation value have a high probability of being present, and that the area cannot be substantially avoided by the proposed activity.

As no sites or PADs were identified further investigations are not justified.

5.3 AHIP

If harm will occur to an Aboriginal object or Place, then an AHIP should be sought from Heritage NSW, Department of Premier & Cabinet as a defence to that harm. If a systematic excavation of the known site could provide benefits and information for the Aboriginal community and/or archaeological study of past Aboriginal occupation, a salvage program, and, or community collection, may be an appropriate strategy to enable the salvage of cultural objects.

As no sites or PADs were identified an AHIP is not required.

6 RECOMMENDATIONS

6.1 GENERAL

- 1) The persons responsible for the management of onsite works will ensure that all staff, contractors and others involved in construction and maintenance related activities are made aware of the statutory legislation protecting sites and places of significance. Of particular importance is the National Parks and Wildlife Regulation 2019, under the National Parks and Wildlife Act 1974;
- 2) An Unexpected Finds Procedure (Appendix B) will be implemented during all works; and
- 3) Should any Aboriginal objects be uncovered during works, all work will cease in that location immediately, the Unexpected Finds Procedure followed and the Environmental Line contacted.

REFERENCES

AMBS, 2002. Extension of Warkworth Coal Mine Archaeological Assessment of Aboriginal Heritage. Report to Coal and Allied.

Arnour-Chelu, M. and Andrews, P. 1994. Some Effects of Bioturbation by Earthworms (Oligochaeta) on Archaeological Sites. *Journal of Archaeological Science* 21:433-443.

Balek, C. 2002. Buried Artefacts in stable upland sites and the role of bioturbation: a review. *Geoarchaeology: An International Journal*, 17(1):41-51.

Baker, N. 1997. Archaeological Test Excavations at Landcom Project 12163.001, Bolwarra Heights, Hunter Valley, NSW. Report to Atkinson and Tattersall Pty Ltd for Landcom NSW.

Barton, H. 2001. Howick Coal Mine Archaeological Salvage Excavations, Hunter Valley, NSW. AMBS Consulting. Report Prepared for Coal & Allied.

Brayshaw, 1987. Aborigines of the Hunter Valley: A Study of Colonial Records, Scone N.S.W, Scone and Upper Hunter Historical Society.

Brayshaw, H. 1984. Archaeological Investigation for West Bolwarra Heights Planning Study. Report to Lester Firth Associates Pty Ltd.

Brayshaw, H. 1995. Bolwarra Heights Maitland NSW Archaeological Survey for Aboriginal Sites. Report to Telecal Pty Ltd, Landcom and Maitland City Council through Pulver, Cooper & Blackley Pty Ltd and Atkinson & Tattersall Pty Ltd.

Cahen, D. and J. Moeyersons. 1977. Subsurface movements of stone artefacts and their implications for the prehistory of Central Africa. *Nature*, 266:812-815.

Canti, M. 2003. Earthworm activity and archaeological stratigraphy: A review of products and processes. *Journal of Archaeological Science* 30:135-148.

Dallas, M. 2004. Aboriginal Archaeological Assessment Lots 80 and 81 in DP 524028, 41 in DP 611238, 11 in DP 1042562 and Portion 2 in DP 160043, Aberglasslyn, NSW. Report to Stockland Development Pty Ltd.

Davidson, I., R. James and R. Rife. 1993. Archaeological Investigation Proposed Bayswater No. 3 Colliery Authorisation Area (A437). Report to Resource Planning Pty Ltd.

Dean-Jones, P. and P. B. Mitchell. 1993. Hunter Valley Aboriginal sites assessment project. Environmental modelling for archaeological site potential in the Central Lowlands of the Hunter Valley. Report to NSW National Parks and Wildlife Service.

Department of Environment, Climate Change and Water (DECCW). 2010b. *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. Department of Environment, Climate Change and Water NSW, Sydney.

Department of Environment, Climate Change and Water (DECCW). 2010c. *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW*. Department of Environment, Climate Change and Water NSW, Sydney.

Edwards, D. and J. F. O'Connell 1995. Broad Spectrum Diets in Arid Australia. *Antiquity*, 69: 769-783.

Foley, R. 1981. A Model of regional archaeological structure. *Proceedings of the Prehistoric Society*. 47: 1-17.

Fowler, K.D, H.J. Greenfield and L.O. van Schalkwyk. 2004. The effects of burrowing activity on archaeological sites: Ndongondwane, South Africa. *Geoarchaeology*, 19(5):441-470.

Galloway, R.W. 1963. Geomorphology of the Hunter Valley. In R. Story, R.W. Galloway, R.W. van de Graff, and A.D. Tweedie. General report on the land of the Hunter Valley. Land Research Series No. 8, CSIRO, Melbourne.

Haglund, L. 1999. Warkworth Coal Mine: Survey for Aboriginal Heritage Material. Haglund & Associates. Report to Warkworth Mining Ltd.

Hamm, G. 2004. Archaeological Assessment of Lots: 1, 2, 10, 12, part of 15, 1411 & 1412, Aberglasslyn Road, Aberglasslyn, Maitland City Council. Report to Andrews Neil Environmental Pty Ltd.

HLA-Envirosciences. 2002. No.1 Open Cut Extension. Environmental Impact Statement. Report for Muswellbrook Coal Company Limited.

Hughes, R. 1984. An overview of the archaeology of the Hunter Valley, its environmental setting and the impact of development, NPWS Hunter Valley Region Archaeology Project Stage 1, Vol 1. Anutech Pty Ltd.

Koettig, M. 1986a. Test Excavations at Six Locations along the Proposed Pipeline Route between Glennies Creek Dam, Hunter Valley Region, NSW. A report to the Public Works Department, NSW.

Koettig, M. 1986b. Assessment of Archaeological Sites along the Proposed Singleton to Glennies Creek Water Pipeline Route and the Reservoir Site at Apex Lookout, Hunter Valley, New South Wales. Unpublished report for The Public Works Department.

Koettig, M. and Hughes, P. J. 1985. Archaeological Investigations at Plashett Dam, Mount Arthur North and Mount Arthur South in the Hunter Valley, New South Wales. Volume 2. The Archaeological Survey. A report to the Electricity Commission of New South Wales and Mount Arthur South Coal Pty Ltd.

Kuskie, P.J. 2000. An Aboriginal archaeological assessment of the proposed Mount Arthur North Coal mine, near Muswellbrook, Hunter Valley, New South Wales. Report to Dames and Moore.

Kuskie, P.J., and J. Kamminga. 2000. Salvage of Aboriginal archaeological sites in relation to the F3 Freeway near Lenaghans Drive, Black Hill, New South Wales. Report to Roads and traffic Authority New South Wales.

- Lewarch, D. E. and O'Brien, M. J. 1981. The expanding role of surface assemblages in archaeological research. In Schiffer, M. B. (ed) *Advances in Archaeological Method and Theory*, Volume 4. Academic Press, New York.
- McBryde, I. 1976. Subsistence patterns in New England prehistory. *University of Queensland Occasional Papers in Anthropology*, 6:48-68.
- McCardle Cultural Heritage Pty Ltd (MCH). 2004a. Singleton Council's Remaining Land: Archaeological Assessment. Report to Singleton Council.
- McCardle Cultural Heritage Pty Ltd (MCH) 2004b. Singleton Golf Course Indigenous Cultural Heritage Assessment. Report to Overdean Group Pty Ltd.
- McCardle Cultural Heritage Pty Ltd (MCH). 2006. Proposed Bolwarra Development Indigenous Archaeological Assessment. Report to Avalon Rural Holdings Pty Ltd.
- McCardle Cultural Heritage (MCH). 2011. Proposed Rosebrook Sand & Gravel Extension at Maitland Vale - Indigenous Archaeological Assessment. Report prepared for ADW Johnson Pty Ltd.
- McDonald, R.C., Isbell, R.F., Speight, J.G., Walker, J. and Hopkins, M.S. 1998. *Australian Soil and Land Survey Field Handbook, Second Edition*. Inkata Press, Australia.
- McDonald, J. 1997. The Bayswater Archaeological Research Project: Preliminary Fieldwork Report, Bayswater Colliery Company No. 3 Lease, March – June 1997. Report to Bayswater Colliery Company Pty Ltd.
- McDonald, J and White, B. 2010. Lithic Artefact Distribution in the Rouse Hill Development Area, Cumberland Plain, New South Wales. *Australian Archaeology* 70: 29-38.
- Mulvaney, J., and J. Kamminga. 1999. *Prehistory of Australia*. Allen and Unwin, Australia.
- Nelson, M. 1991. The study of technological organisation. In Schiffer, M. (ed.) *Archaeological Method and Theory*. Tuscon: University of Arizona Press. pp. 57-100.
- Odell, G. and F. Cowan. 1987. Estimating tillage effects on artifact distributions. *American Antiquity*, 52(3):456-484.
- Office of Environment and Heritage (OEH), 2011. *Guide to Investigating, Assessing and reporting on Aboriginal Cultural Heritage in NSW*. Department of Environment, Climate Change and Water NSW, Sydney.
- Peacock, E. and D. Fant. 2002. Biomantle Formation and Artifact Translocation in Upland Sandy Soils: An Example from the Holly Springs National Forest, North-Central Mississippi, U.S.A. *Geoarchaeology* 17(1):91-114.
- Renfrew, C., and Bahn, P. 1991. *Archaeology: theories, methods and practice*. Thames & Hudson.

Rich, E. 1995. Site W4 (NPWS#37-6-155), Warkworth, Hunter Valley: Artefacts Analysis. In Hugland, L. and Rich, E. Warkworth Open Cut Coal Mines: Report on Salvage Investigation of Site 37-6-155 (=Mt. Thorley E/W4), Carried out in Compliance with NPWS Consent #732. Volumes 1-111. Report to Warkworth Mining Pty.

Stein, J. 1983. Earthworm activity: A source of potential disturbance of archaeological sediments. *American Antiquity* 48(2):277-289.

Story, R. R.W. Galloway, R.H.M. van de Graaff, and A.D. Tweedie 1963, General Report on the Lands of the Hunter Valley, Land Research Series No. 8, Commonwealth Scientific and Industrial Research Organisation (C.S.I.R.O), Melbourne.

Waters, M. 2000. Alluvial Stratigraphy and Geoarchaeology in the American Southwest. *Geoarchaeology: An International Journal* 15(6):537-557.

Waters, M. and D. Kuehn. 1996. The Geoarchaeology of Place: The Effect of Geological Processes on the Preservation and Interpretation of the Archaeological Record. *American Antiquity* 61(3):483-496.

Wood, S. 1982. Mechanical treatment impacts to cultural resources in Central Arizona: The marden brush cutter. *Presented at the Symposium on Dynamics and Management of Mediterranean-Type Ecosystems*, June 22-26, 1981, San Diego, California.

Yorston, R.M., Gaffney, V.L. and Reynolds, P.J. 1990. Simulation of artefact movement due to cultivation. *Journal of Archaeological Science*, 17:67-83.

APPENDIX A

AHIMS Search Results

Penny Mccardle

Date: 02 May 2024

Po Box 166

Adamstown New South Wales 2289

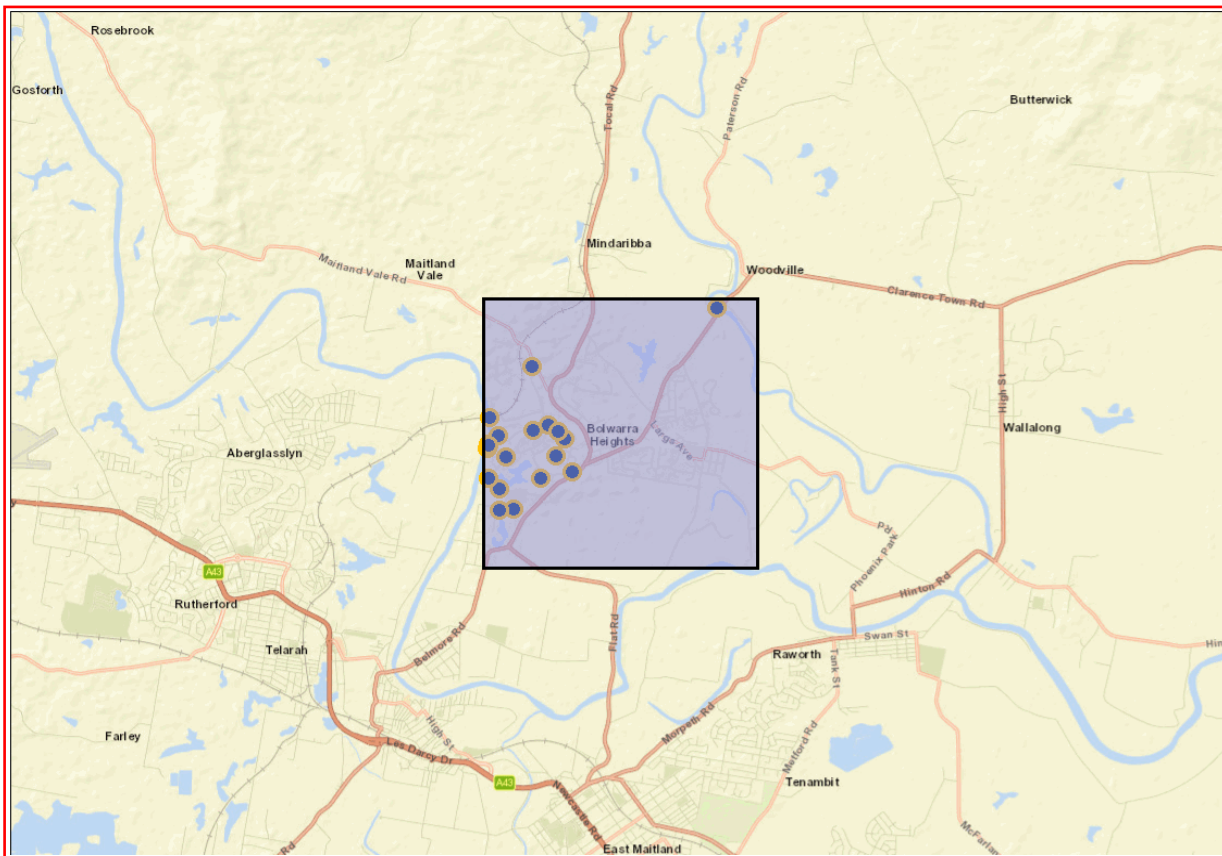
Attention: Penny Mccardle

Email: penny@mheritage.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 365800.0 - 369800.0, Northings : 6379400.0 - 6383400.0 with a Buffer of 0 meters, conducted by Penny Mccardle on 02 May 2024.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

| | |
|--|--|
| | 24 Aboriginal sites are recorded in or near the above location. |
| | 0 Aboriginal places have been declared in or near the above location. * |

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government Gazette \(https://www.legislation.nsw.gov.au/gazette\)](https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

| SiteID | SiteName | Datum | Zone | Easting | Northing | Context | Site Status ** | SiteFeatures | SiteTypes | Reports |
|-----------|-------------------------------------|-------|------|---------|----------|-----------|----------------|--|----------------|-------------------------------------|
| 38-4-1177 | RPS BH PAD 1 | GDA | 56 | 366109 | 6381012 | Open site | Destroyed | Potential Archaeological Deposit (PAD) : 1 | | 102158,10222 9 |
| | Contact | | | | | | | Permits | 3787 | |
| 38-4-1145 | Bolwarra Heights PAD 2 | GDA | 56 | 366633 | 6380706 | Open site | Destroyed | Potential Archaeological Deposit (PAD) : - | | 102158,10222 9 |
| | Contact Mr.Thomas Miller | | | | | | | Recorders Wildthing Environmental Consultants | | |
| 38-4-2292 | Bolwarra Public School 1 | GDA | 56 | 366239 | 6380233 | Open site | Valid | Artefact : - | | |
| | Contact | | | | | | | Recorders NSW Department of Education,Ms.Alexandra Byrne | | |
| 38-4-0119 | Bolwarra 2 Bolwarra Heights | AGD | 56 | 366880 | 6381110 | Open site | Valid | Modified Tree (Carved or Scarred) : | Scarred Tree | 3332,101043,1 02158,102229 |
| | Contact | | | | | | | Recorders Helen Brayshaw,Denis Byrne,Doctor.Jo McDonald | | |
| 38-4-0059 | Bolwarra Heights;Bolwarra; | AGD | 56 | 366635 | 6381321 | Open site | Valid | Modified Tree (Carved or Scarred) : | Scarred Tree | 123,101043,10 2158,102229 |
| | Contact | | | | | | | Recorders Helen Brayshaw | | |
| 38-4-1144 | Bolwarra Heights PAD 1 | GDA | 56 | 367093 | 6380810 | Open site | Destroyed | Artefact : 4, Potential Archaeological Deposit (PAD) : - | | 102158,10222 9 |
| | Contact Mr.Thomas Miller | | | | | | | Recorders Wildthing Environmental Consultants | | |
| 38-4-1604 | Bolwarra Heights Grinding Grooves 2 | GDA | 56 | 365854 | 6381190 | Open site | Valid | Grinding Groove : 1 | | |
| | Contact | | | | | | | Recorders Miss.Cheryl Kitchener,Kleinfelder Australia Pty Ltd - Cardiff | | |
| 38-4-0384 | Bolwarra 4 | AGD | 56 | 366780 | 6381220 | Open site | Valid | Artefact : - | Open Camp Site | 3332,101043,1 02158,102229 |
| | Contact | | | | | | | Recorders Helen Brayshaw,Denis Byrne | | |
| 38-4-0616 | B6/T145 | AGD | 56 | 366750 | 6380850 | Open site | Valid | Artefact : - | | 3868,102158,1 02229 |
| | Contact | | | | | | | Recorders Mr.Neville Baker | | |
| 38-4-0862 | AB Isf 1 | AGD | 56 | 366380 | 6382191 | Open site | Valid | Artefact : 1 | | 100253,10077 0,102158,1022 29 |
| | Contact Searle | | | | | | | Recorders Mary Dallas Consulting Archaeologists (MDCA) | | |
| 38-4-1605 | Bolwarra Heights Grinding Grooves 3 | GDA | 56 | 365849 | 6381183 | Open site | Valid | Grinding Groove : 1 | | |
| | Contact | | | | | | | Recorders Miss.Cheryl Kitchener,Kleinfelder Australia Pty Ltd - Cardiff | | |
| 38-4-1609 | B4 Grinding Grooves | GDA | 56 | 365859 | 6381209 | Open site | Valid | Grinding Groove : 1 | | |
| | Contact | | | | | | | Recorders Miss.Cheryl Kitchener,Kleinfelder Australia Pty Ltd - Cardiff | | |
| 38-4-0994 | Bolwarra PAD 1a | AGD | 56 | 365925 | 6380344 | Open site | Valid | Burial : 1 | | 102158,10222 9 |
| | Contact Searle | | | | | | | Recorders Ms.Penny Mccardle | | |

Report generated by AHIMS Web Service on 02/05/2024 for Penny Mccardle for the following area at Datum :GDA, Zone : 56, Eastings : 365800.0 - 369800.0, Northings : 6379400.0 - 6383400.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 24

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

| SiteID | SiteName | Datum | Zone | Easting | Northing | Context | Site Status ** | SiteFeatures | SiteTypes | Reports |
|-----------|--------------------------------------|------------------|--|---------|----------|-----------|----------------|---|----------------|-------------------------------|
| 37-5-0636 | Bolwarra Height Grinding Grooves 1 | GDA | 56 | 365859 | 6381209 | Open site | Valid | Grinding Groove : 1 | | |
| | Contact | Recorders | Miss.Cheryl Kitchener,Kleinfelder Australia Pty Ltd - Cardiff | | | | Permits | | | |
| 38-4-0430 | Bolwarra 5;B5; | AGD | 56 | 366400 | 6381230 | Open site | Valid | Artefact : - | Open Camp Site | 101043,10215 8,102229 |
| | Contact | Recorders | Mr.Neville Baker | | | | Permits | 1459 | | |
| 38-4-2081 | ACH_PAT_7735_R_GG6 | GDA | 56 | 369214 | 6383295 | Open site | Valid | Grinding Groove : -, Potential Archaeological Deposit (PAD) :- | | |
| | Contact | Recorders | Miss.Rachel (Elle) (left Virtus Company) Lillis,Virtus Heritage Pty Ltd - Pottsville | | | | Permits | | | |
| 38-4-0058 | Hunter River;Bolwarra; | AGD | 56 | 365928 | 6380028 | Open site | Valid | Artefact : - | Open Camp Site | 123,101043,10 2158,102229 |
| | Contact | Recorders | Helen Brayshaw | | | | Permits | | | |
| 38-4-1608 | B3 Grinding Grooves | GDA | 56 | 365854 | 6381190 | Open site | Valid | Grinding Groove : 1 | | |
| | Contact | Recorders | Miss.Cheryl Kitchener,Kleinfelder Australia Pty Ltd - Cardiff | | | | Permits | | | |
| 38-4-0383 | Bolwarra 3 | AGD | 56 | 365890 | 6381150 | Open site | Valid | Artefact : - | Open Camp Site | 3332,101043,1 02158,102229 |
| | Contact | Recorders | Helen Brayshaw,Denis Byrne | | | | Permits | 1093,1459,3536 | | |
| 38-4-0120 | Bolwarra 1;Bolwarra heights; | AGD | 56 | 365750 | 6380500 | Open site | Not a Site | Artefact : - | Open Camp Site | 101043,10215 8,102229 |
| | Contact | Recorders | Helen Brayshaw,Doctor.Jo McDonald,RPS AAP Consulting Pty Ltd - York Street Syd | | | | Permits | 3787 | | |
| 38-4-1603 | Bolwarra Heights Grinding Grooves 1a | GDA | 56 | 365834 | 6381147 | Open site | Valid | Grinding Groove : 1 | | |
| | Contact | Recorders | Miss.Cheryl Kitchener,Kleinfelder Australia Pty Ltd - Cardiff | | | | Permits | | | |
| 38-4-1606 | B1 Grinding Grooves | GDA | 56 | 365834 | 6381147 | Open site | Valid | Grinding Groove : 1 | | |
| | Contact | Recorders | Miss.Cheryl Kitchener,Kleinfelder Australia Pty Ltd - Cardiff | | | | Permits | | | |
| 38-4-1607 | B2 Grinding Grooves | GDA | 56 | 365849 | 6381183 | Open site | Valid | Grinding Groove : 1 | | |
| | Contact | Recorders | Miss.Cheryl Kitchener,Kleinfelder Australia Pty Ltd - Cardiff | | | | Permits | | | |
| 38-4-2080 | ACH_HUN_43760_L_GG1 | GDA | 56 | 365869 | 6381600 | Open site | Valid | Grinding Groove : -, Potential Archaeological Deposit (PAD) :- | | |
| | Contact | Recorders | Miss.Rachel (Elle) (left Virtus Company) Lillis,Virtus Heritage Pty Ltd - Pottsville | | | | Permits | | | |

**** Site Status**

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

APPENDIX B

Unexpected finds procedure

Unexpected finds procedures

Unexpected find protocols have been developed to provide procedures for unexpected finds including Aboriginal objects and the discovery of human remains. These protocols must be followed throughout all stages of the development.

Unexpected Aboriginal objects

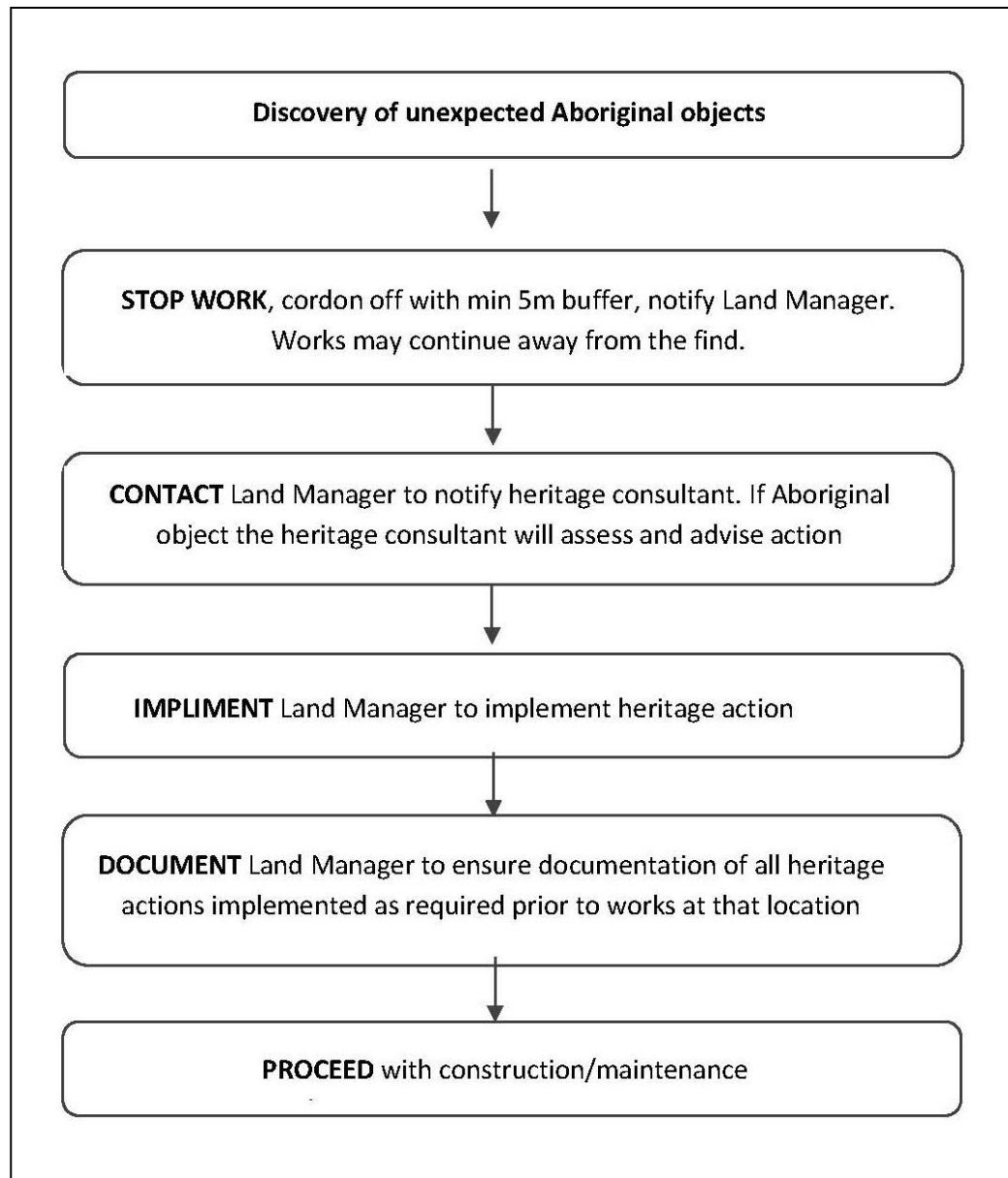
Should unexpected Aboriginal objects be uncovered during any stage of the development, Figure 1 illustrates the protocols. Unexpected Aboriginal objects may include, but not limited to, isolated artefacts, artefact scatters, scarred trees, hearths and shell middens (descriptions of such objects are provided).

Work must stop immediately in that location, the objects cordoned off with at least a 5m perimeter surrounding the object(s) with high visibility fencing/barrier and the Land Manager notified immediately. The Land Manager will then contact the heritage consultant who will assess the object(s) and recommend appropriate mitigation measures, including contacting the Environmental Line if required. The Land Manager is to implement all reasonable mitigation measures recommended by the heritage consultant and in accordance with Heritage NSW regulations and the NSW NPW Act.

If additional works are required, such as an Aboriginal Cultural Heritage Assessment (ACHA) (with or without test excavations) or an Aboriginal Heritage Impact Permit (AHIP) (with collection or salvage excavations), the Land Manager is to arrange for the heritage consultant to undertake those works in accordance with all Heritage NSW requirements, procedures and Code of Practice. The methodology for undertaking additional works will be dependant on a number of factors including, but not limited to, site/object type and disturbances. Due to the unknown nature of unexpected objects, methodologies for further investigations (if required) of unexpected Aboriginal objects will be determined during consultation with Heritage NSW.

Provided these heritage unexpected finds protocols have been followed, construction/maintenance works in that location may proceed.

Figure 1. Unexpected finds protocol flow chart



Discovery of human remains

Human skeletal remains are of the highest significance and importance to Aboriginal people, and all care, respect and dignity will be extended by all parties should human remains be uncovered.

If human remains or unidentified bone are uncovered during any stage of the development and maintenance activities, the appropriate State legislation will be followed. All human remains fall under the *Coroners Act 2009* in the first instance. If they are identified as Aboriginal and older than 100 years old, they will fall under the *NSW NPWS Act 1974* (as amended). If they are identified as Aboriginal and 100 years or less, they will remain under Police derestriction under the *Coroners Act 2009*. Figure 2 outlines the required protocols should human remains be uncovered.

Should any human remains or unidentifiable bone be found, work is to stop in that area immediately and an area of 15m cordoned off surrounding the remains/bone in high visibility fencing. The Land Manager is to be notified immediately.

The Land Manager will contact the heritage consultant and local NSW Police immediately, who will then contact the NSW Forensic Services who will determine if they are:

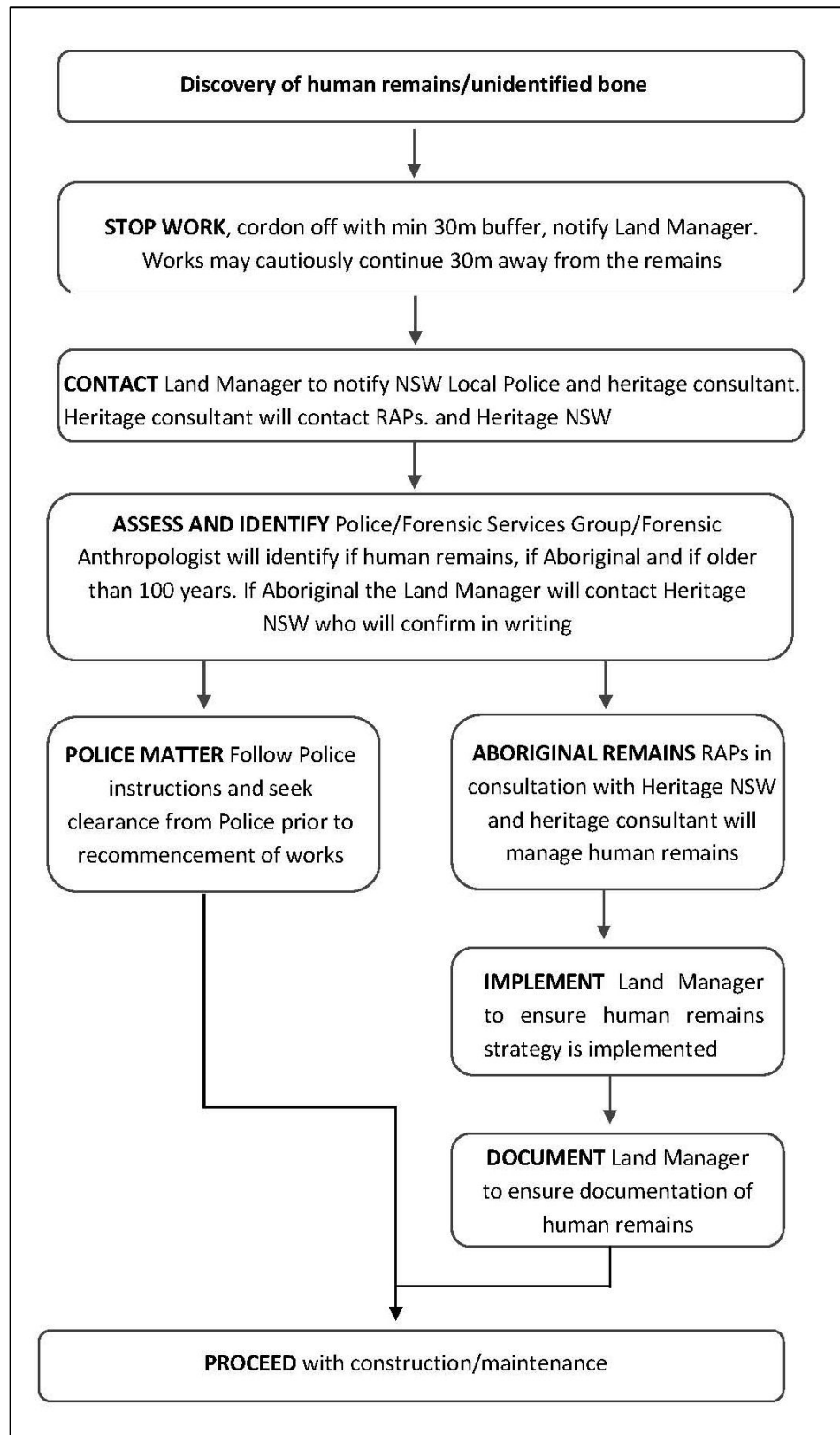
- 1) Human;
- 2) Aboriginal or non-Aboriginal;
- 3) If Aboriginal, determine antiquity (older or younger than 100 years)

If it is determined the remains are Aboriginal and older than 100 years old, the Police will notify the Land Manager who must contact the Environmental Line and Heritage NSW immediately. Heritage NSW, in consultation with the relevant Aboriginal community and the heritage consultant will develop a human remains management strategy and the Land Manager is to ensure this strategy is implemented. The Land Manager must also document the human remains management strategy and the heritage consultant will provide a letter of clearance prior to any works recommencing at that location.

If the remains are determined to be a Police matter, Police instructions will be followed and clearance to recommence works should be sought from the Police.

Provided the human skeletal protocols have been followed and documented, and a clearance letter from the heritage consultant has been obtained, construction/maintenance works may proceed in that location.

Figure 2 Human remains protocol flow chart



Verification of all Aboriginal objects (sites)

All potential Aboriginal sites will be verified by the heritage consultant in the first instance, and Heritage NSW if required.

The purpose of the verification process is to determine whether or not the objects in question are in fact Aboriginal objects to ensure appropriate management measures be implemented.

The verification process will include the following provisions:

1. A heritage consultant may assess the scientific status of the Aboriginal object (site) and provide evidence and justification for significance;
2. If it is an Aboriginal object the Environmental Line will be contacted and the site reported;
3. An AHIMS site card will be completed for each Aboriginal object (site); and
4. Management recommendations specific to each Aboriginal object (site), will be determined by Heritage NSW.

Surface Artefact scatters

Also described as open campsites, artefact scatters and open sites, these deposits have been defined at two or more stone artefacts within 50 or 200 metres of each other and may include archaeological remains such as stone artefacts, shell, and sometimes hearths, stone lined fire places and heat treatment pits. These sites are usually identified as surface scatters of artefacts in areas where ground surface visibility is increased due to lack of vegetation. Erosion, agricultural activities (such as ploughing) and access ways can also expose surface campsites. Artefact scatters may represent evidence of;

- Camp sites, where everyday activities such as habitation, maintenance of stone or wooden tools, manufacturing of such tools, management of raw materials, preparation and consumption of food and storage of tools has occurred;
- Hunting and/or gathering events;
- Other events spatially separated from a camp site, or
- Transitory movement through the landscape.

If a potential artefact scatter has been identified, the Unexpected Finds Protocol must be followed immediately.

Examples of artefact scatters (MCH)



Surface Isolated finds

Isolated artefacts are usually identified in areas where ground surface visibility is increased due to lack of vegetation. Erosion, agricultural activities (such as ploughing) and access ways can also expose surface artefacts. Isolated finds may represent evidence of;

- Hunting and/or gathering events; or
- Transitory movement through the landscape.

If a potential isolated find has been identified, the Unexpected Finds Protocol must be followed immediately.

Examples of isolated artefacts (MCH)

