

Commercial 7 Pty Ltd

M

34 Wyndella Rd, Lochinvar

LGA: Maitland

Archaeological Due Diligence Assessment

27 September 2023

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EXECUTIVE SUMMARY

McCardle Cultural Heritage Pty Ltd (MCH) has been engaged by Commercial 7 Pty Ltd as trustee for Commercial 7 Investment Trust to undertake an Archaeological Due Diligence Assessment for the proposed development of 34 Wyndella Road, Lochinvar, Maitland Local Government Area (LGA).

Consisting of the Permian Dalwood Group of the Lochinvar geological formation of siltstone, sandstone, basic lava and tuff (Singleton Geological Map Sheet 1969), the presence of tuff within the geology of the project area indicates that stone materials suitable for manufacturing stone artefacts may occur in various locations throughout the project area. The project area consists of the Lochinvar Soil Landscape that consist of an upper soil Horizon A and underlying B. 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.

In terms of fresh water sources, the project area is located over 300 metres from an un-named 3rd order creek and the closest reliable fresh water source Lochinvar Creek (4th order) located over one kilometre to the west of the project area. Three 1st order drainage depressions are located in the project area (one along the western boundary, one through the centre and another in between these two). As water is necessary for survival, the project area may be considered under-resourced in terms of water availability and not suitable for camping but may have been utilised for hunting and gathering on the way to reliable water sources.

The project area has been subject to a range of both moderate and high landuses disturbances and impacts. The project area has been completely cleared and primarily used for pastoral purposes (grazing), involving at least one ploughing event for improved pasture grass, the construction of two dams, an access road along the southern border that leads to the residential house and associated utilities (water, electricity, telephone). These landuses can be expected to have had moderate to high impacts upon the archaeological record at those locations.

A search of the AHIMS register has identified 51 known Aboriginal sites currently recorded within two kilometres of the project area and include 39 artefact sites, 6 PADs and 2 artefacts with PAD sites. Additionally, 4 previously recorded PADs have been re-assessed as not being sites. There are no registered sites or Aboriginal Places within the project area. 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 kilometre from a 4th order creek (Lochinvar Creek) and over 300 metres from a 3rd order creek, 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 shell middens and/or artefact scatters and isolated artefacts.

The project area, consisting of simple slopes dissected by drainage lines, the project area was surveyed as one survey and clarified that the project area had been previously cleared, there was evidence of ploughing (eroded ridges and furrows). Additionally, the residential house and the associated infrastructure (established gardens, sewer) and utilities (electricity, telephone) were located in the eastern part of the project area. A built-up access road was along the southern boundary to the house. Two dams were located in the project area and cattle were present. Vegetation consisted predominantly of pasture grass with the only trees associated with the house. Erosion was significant with exposed bedrock in some locations and hoof prints from grazing cattle throughout.

No sites or PADs were identified in the project area and as such there are no impacts to 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; 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.

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 Commercial 7 Pty Ltd as trustee for Commercial 7 Investment Trust to undertake an Archaeological Due Diligence Assessment for the proposed development of 34 Wyndella Road, Lochinvar, Maitland Local Government Area (LGA).

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 34 Wyndella Road, Lochinvar. Including Lot 225 DP246447, the location of the project area is shown in Figures 1.1 and 1.2.

Figure 1.1 Location of the project area

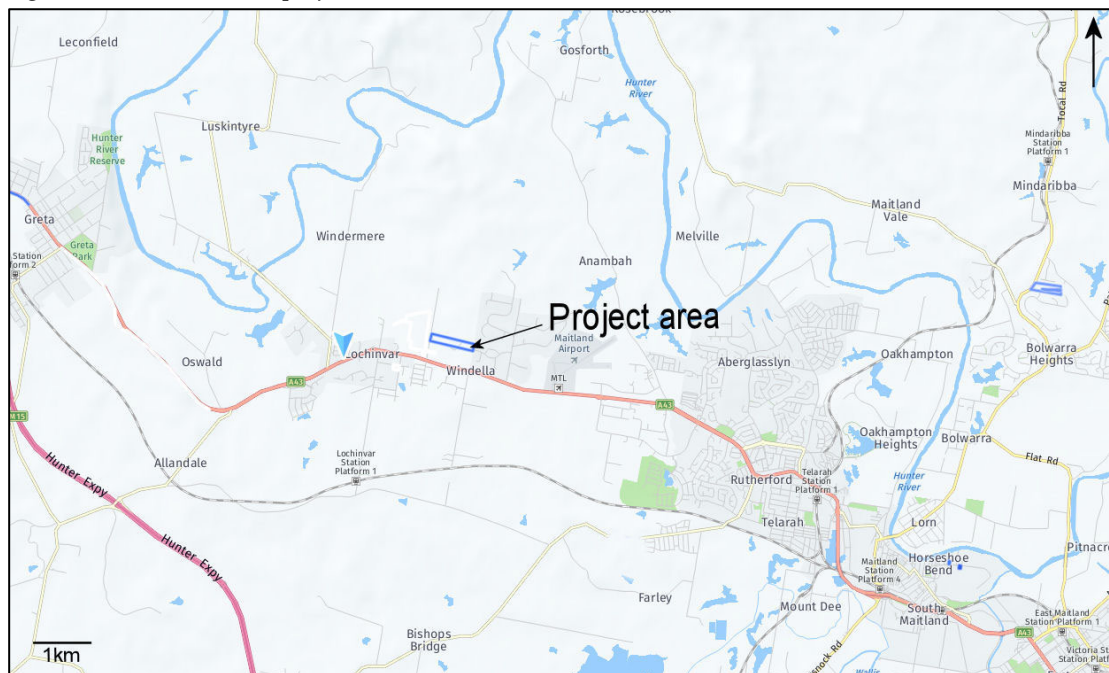


Figure 1.2 Aerial photograph of the project area (Nearmap 2023)



1.3 PROPOSED DEVELOPMENT

The project will include the subdivision of the project area into a manufactured home estate. Works typically associated with such 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 off 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 LGA and falls under the 2011 LEP.

1.5.4 LOCAL ENVIRONMENTAL PLAN

The project area is located within the Maitland Valley LGA. 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 22 years experience in Indigenous archaeological assessments, excavation, research, reporting, analysis and consultation and 19 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 Permian Dalwood Group of the Lochinvar geological formation of siltstone, sandstone, basic lava and tuff (Singleton Geological Map Sheet 1969), the presence of tuff within the geology of the project area indicates that stone materials suitable for manufacturing stone artefacts may occur in various locations throughout the project area. The project area consists of the Lochinvar Soil Landscape that includes topsoils (A horizon) on the gentle slopes consisting of dark brown silty clay loam (up to 40 centimetres in depth). This overlies a subsoil with a clear change to brown medium clay (B horizon). The steeper areas have topsoils that are brown to brownish black light sandy clay loam to silty clay loam and sometimes an A₂ horizon is present and is a bleached bright brown sandy loam. This topsoil is up to 35 centimetres in depth and overlies a B horizon that consists of a change to brown sand to medium clay (Kovac and Lawrie 1991:258-259). On the mid to lower slopes the top soils are dark brown loam and are up to 20 centimetres in depth and a thin layer of bleached A₂ may be present. This overlays a subsoil with a clear change to yellowish brown light clay B horizon.

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 B (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. Within the A horizon the lowermost (in terms of vertical positioning) artefact assemblages tend to contain artefacts that are typically attributed to the mid-Holocene, as characterised by an increase in the number of backed artefacts. The A horizon of the Lochinvar Soil Landscape of the project area are generally 30cm 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 over 300 metres from an un-named 3rd order creek and the closest reliable fresh water source Lochinvar Creek (4th order) located over one kilometre to the west of the project area. Three 1st order drainage depressions are located in the project area (one along the western boundary, one through the centre and another in between these

two). As water is necessary for survival, the project area may be considered under-resourced in terms of water availability and not suitable for camping but may have been utilised for hunting and gathering on the way to reliable water sources.

In relation to land uses and associated impacts, Heritage NSW (DECCW 2010) defines disturbed lands as land that has been the subject of human activity that has changed the lands' surface and, or subsurface, these changes being changes that remain clear and observable. This definition is based on the types of disturbances classified in The Australian Soil and Land Survey Field Handbook (CSIRO 2010) and Table 2.1 provides a scale formulated by the CSIRO of the levels of disturbances and their classification, which will assist in determining the level of disturbance across the project area and its impact on potential cultural material that may be present.

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 aerial photography and Nearmap (2010 – 2023), (no NSW Historic Imagery covers the project area), the project area has been subject to a range of both moderate and high landuses disturbances and impacts. The project area has been completely cleared and primarily used for pastoral purposes (grazing), involving at least one ploughing event for improved pasture grass, the construction of two dams, an access road along the southern border that leads to the residential house and associated utilities (water, electricity, telephone). These landuses and how they impact on the landscape and deposits are discussed below.

Early vegetation clearing included the uprooting of trees by chaining which disturbed or destroyed cultural materials 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 hoofed 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 of 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.

Additionally, bioturbation processes such as the redistribution and mixing of cultural deposits occurs as a result of burrowing and mounding by earthworms, ants and other species of burrowing animals. Artefacts can move downwards through root holes as well as through sorting and settling due to gravity, and translocation can also occur as a result of tree falls (Balek 2002; Peacock and Fant 2002; Canti 2003; Stein 2003:). Experiments to assess the degree that bioturbation can affect material have been undertaken. In abandoned cultivated fields in South Carolina, Michie (summarised in

Balek 2002:42-43) found that over a 100-year period 35% of shell fragments that had been previously used to fertilise the fields were found between 15 and 60 centimetres below the surface, inferred to be as a result of bioturbation and gravity. The ways in which earthworms can affect cultural deposits includes: creating false artefact concentrations and stratigraphy (for example biomantles) by moving artefacts downwards through the soil; indirectly displacing larger artefacts as they burrow through the soil; burying artefacts through the deposition of faecal material on the surface; and blurring natural and cultural boundaries. They can also destroy remains of seeds and organic materials as they eat them (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 to enable camping, 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, ploughing, grazing, dam construction, housing and associated infrastructure and tracks can be expected to have had moderate to high impacts upon the archaeological record at those locations.

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.

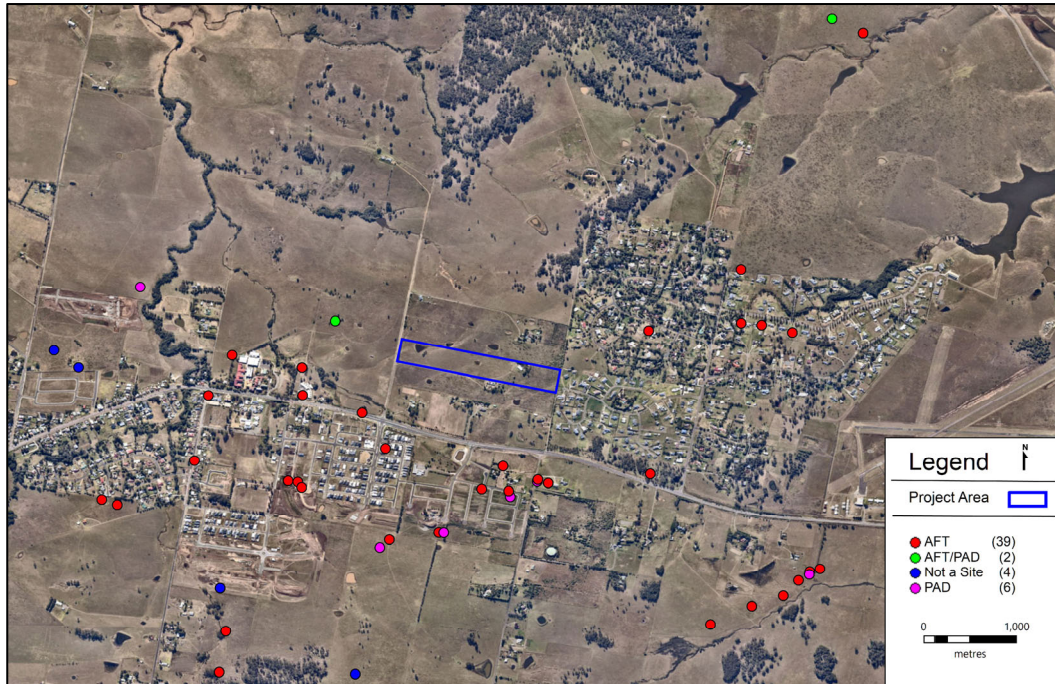
There are many types of evidence past Aboriginal occupation across the landscape which form the archaeological record of a region. Places which show evidence of Aboriginal occupation of an area are archaeological sites. These sites contain numerous site features, and some contain more than one features. 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 51 known Aboriginal sites currently recorded within two kilometres of the project area and include 39 artefact sites, 6 PADs and 2 artefacts with PAD sites. Additionally, 4 previously recorded PADs have been re-assessed as not being sites (Figure 2.1). There are no registered sites or Aboriginal Places within the project area.

Figure 2.1 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 (Enviroscience 1994, Dallas 1985, Ruig 1997, MCH 2005a, b, 2009, 2020, 2021, 2022, 2023, Garvey 2007, Insite Heritage 2010, Umwelt 2016, Heritage Now 2020, AECOM 2022) 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

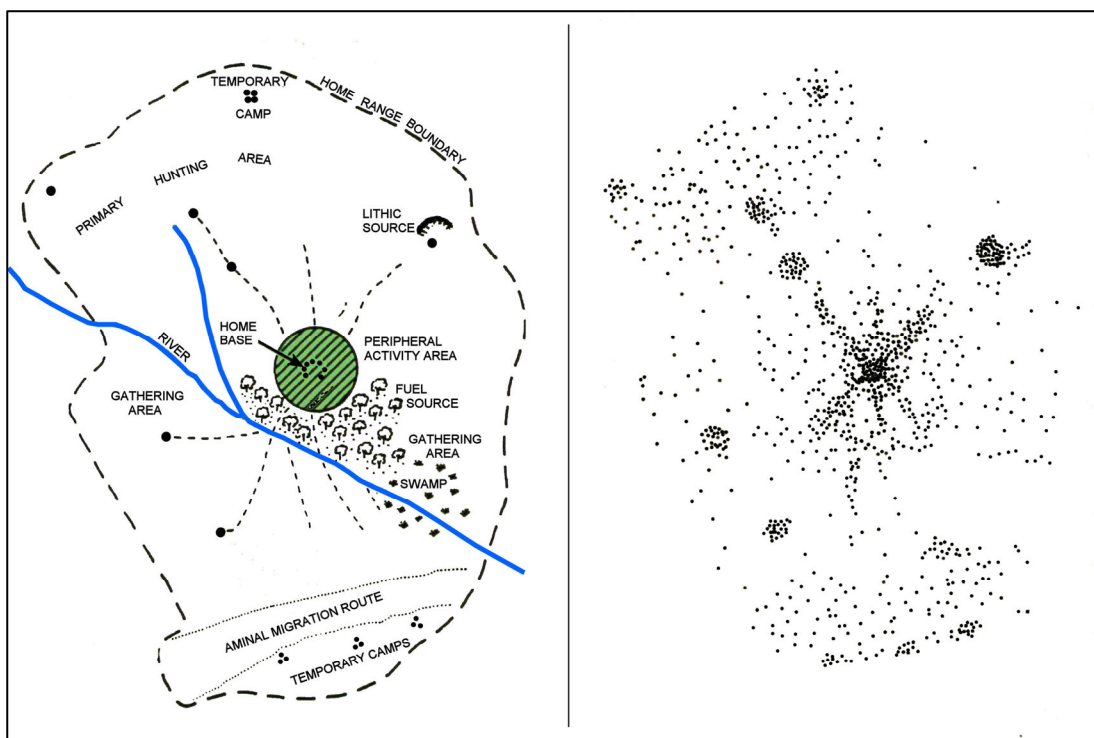
The main aim of this project is to attempt to define both the nature and extent of occupation across the area. As a result, the nature of the analysis will focus on both the landform units and sites. The purpose of this strategy is to highlight any variations between sites and associated assemblages, 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 2.2. 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 2.2 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
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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 kilometre from a 4th order creek (Lochinvar Creek) and over 300 metres from a 3rd order creek, the absence of reliable 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 shell middens and/or artefact scatters and isolated artefacts.

Non-indigenous settlement and land uses have impacted the investigation area, most noticeably from complete clearing, ploughing, grazing and construction works undertaken for the 2 dams, access road, residential structures and the associated utilities. These land uses would have impacted on the archaeological record by re-distributing any cultural materials that may have been present in the project area.

The presence of past Aboriginal people and their use of the landscape are undeniable and evidence is seen in the cultural materials that have survived both natural and human land uses since colonisation of the area in the 1800's. Whilst it is clear Aboriginal people lived across the landscape, the evidence will have been impacted and/or destroyed through such land uses.

The site types that may have been 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 artefact scatters to occur within the project area in areas close to the drainage depressions. 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 13th September 2023. 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 simple slopes dissected by drainage lines, the project area 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). Additionally, the residential house and the associated infrastructure (established gardens, sewer) and utilities (electricity, telephone) were located in the eastern part of the project area. A built-up access road was along the southern boundary to the house. Two dams were located in the project area and cattle were present. Vegetation consisted predominantly of pasture grass with the only trees associated with the house. Erosion was significant with exposed bedrock in some locations and hoof prints from grazing cattle throughout. Examples of the project area are provided in Figures 3.1 to 3.4.

Figure 3.1 South of the house facing east



Figure 3.2 View from the driveway to the residential house, facing west



Figure 3.3 View from the centre dam (middle of the project area) facing east to the house



Figure 3.4 View from the eastern side of the western dam, facing west



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 5,400m², or 5% 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	108,000	25%	20%	erosion, dams, tracks	clearing, ploughing, grazing, access road, house, dams	erosion, residential	vegetation	5,400
Totals		108,000							5,400
Effective coverage %									5.00%

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, ploughing, grazing and construction works undertaken for the 2 dams, access road, residential structures and the associated utilities and as indicated in Table 3.2, these disturbances range from moderate 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	yes	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	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 high impacts from previous land uses across the project area (clearing, ploughing, grazing and construction works undertaken for the 2 dams, access road, residential structures and the associated utilities). 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 one kilometre from Lochinvar Creek 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 over one kilometre from Lochinvar Creek (4th order) and associated subsistence resources. The project area was unsuitable for sustained camping but may have been utilised for transitory movement or hunting/gathering activities only.

In relation to modern alterations to the landscape, previous large-scale clearing, clearing, ploughing, grazing and construction works undertaken for the 2 dams, access road, residential structures and the associated utilities can be expected to have had moderate to high impacts upon the archaeological record. 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.

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APPENDIX A

AHIMS Search Results

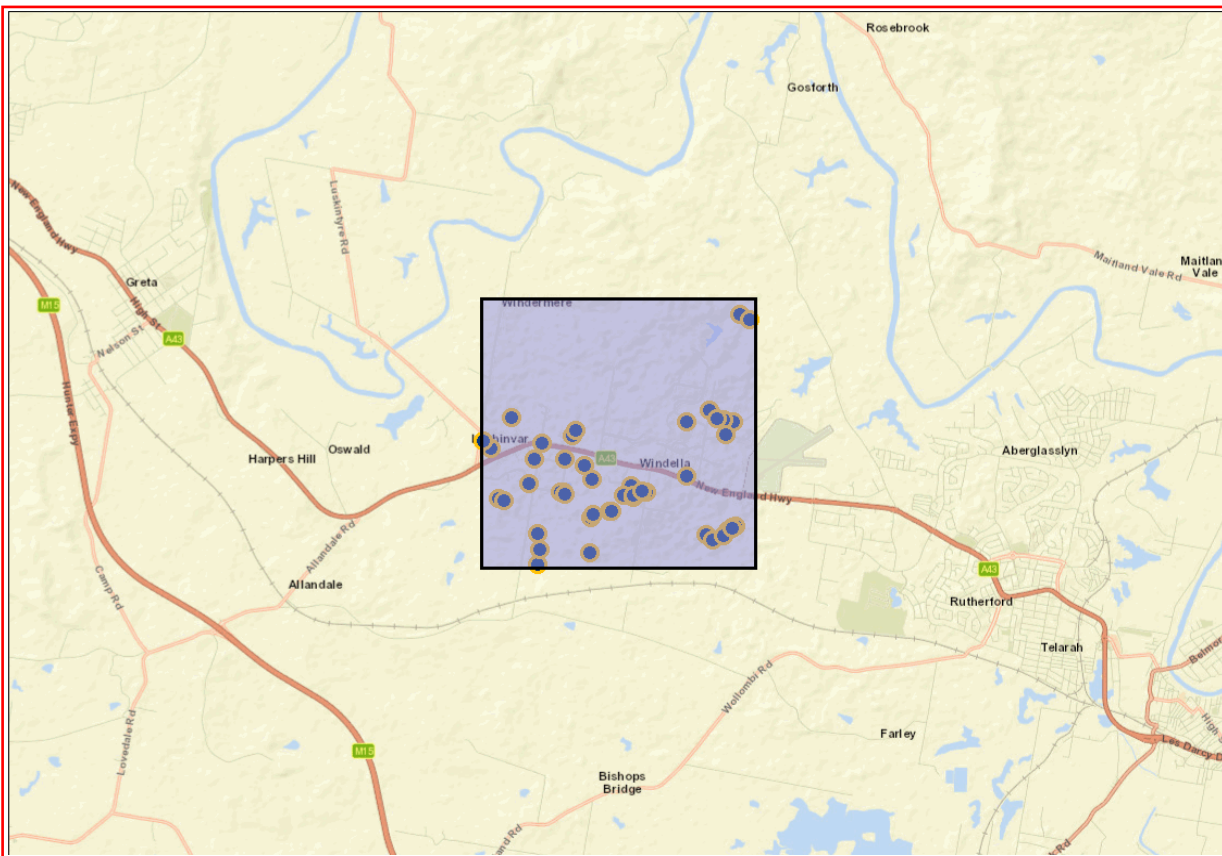
Penny Mccardle
 Po Box 166
 Adamstown New South Wales 2289
 Attention: Penny Mccardle
 Email: penny@mcheritage.com.au

Date: 12 September 2023

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 354300.0 - 358300.0, Northings : 6379200.0 - 6383200.0 with a Buffer of 0 meters, conducted by Penny Mccardle on 12 September 2023.

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:

	51 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
37-6-1123	ISF 2 Rutherford	AGD	56	357200	6381200	Open site	Valid	Artefact : 1		
	Contact	Recorders				Mary Dallas Consulting Archaeologists (MDCA)		Permits		
37-6-2861	Christopher Road Site 1	GDA	56	355504	6380299	Open site	Destroyed	Artefact : 1		
	Contact	Recorders				Umwelt (Australia) Pty Limited - Individual users,Mr.Kirwan Williams,Mr.Giles Har		Permits	3963,4080	
37-6-1827	East Lochinvar Site 9	GDA	56	356502	6380405	Open site	Destroyed	Artefact : -		
	Contact	Recorders				Mr.Giles (dup ID#12832) Hamm,RPS AAP Consulting Pty Ltd - York Street Sydney ,		Permits	4482	
37-6-2862	Christopher Road Site 2	GDA	56	355456	6380305	Open site	Partially Destroyed	Artefact : 1		
	Contact	Recorders				Umwelt (Australia) Pty Limited - Individual users,Mr.Kirwan Williams,Mr.Giles Har		Permits	3963,4080	
37-6-2214	Christopher Road 2	GDA	56	355457	6380305	Open site	Partially Destroyed	Artefact : 6		
	Contact	Recorders				Umwelt (Australia) Pty Limited - Individual users,Mr.Paul Irish,Ms.Mary Dallas,Mr.		Permits	3963	
37-6-0122	Lochinvar;Farley;H;	AGD	56	357526	6379503	Open site	Valid	Artefact : -	Open Camp Site	102646
	Contact	Recorders				Len Dyall		Permits		
37-6-0989	Penn Park 1	AGD	56	357220	6380370	Open site	Valid	Artefact : -		4102
	Contact	Recorders				Jim Ring		Permits	2279	
37-6-1835	East Lochinvar Site 1	GDA	56	355811	6380701	Open site	Valid	Artefact : -		
	Contact	Recorders				Mr.Giles (dup ID#12832) Hamm		Permits	4704	
37-6-4191	Airds of lochinvar PAD 3	GDA	56	355909	6379924	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders				Archaeological Risk Assessment Services (ARAS),Mr.Giles Hamm		Permits		
37-6-2963	26 Windemere Rd Site 1 (PAD 1)	GDA	56	354426	6380945	Open site	Not a Site	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders				Archaeological Risk Assessment Services (ARAS),Ms.Penny Mccardle		Permits		
37-6-4247	HN-SL-A08	GDA	56	355135	6379676	Open site	Valid	Artefact : -		
	Contact	Recorders				Heritage Now - Belmont,Ms.Lara Tooby		Permits		
33-6-0040	HN-SL-PAD 01	GDA	56	355135	6379677	Open site	Not a Site	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders				Heritage Now - Belmont,Heritage Now - Belmont,Ms.Lara Tooby,Ms.Lara Tooby		Permits		
37-6-1946	Rutherford Employment Area 7 (REA7)	GDA	56	357951	6379762	Open site	Valid	Artefact : 2		101300
	Contact	Recorders				Ms.Penny Mccardle		Permits		
37-6-1054	R-1	AGD	56	357900	6381200	Open site	Valid	Artefact : -		
	Contact	Recorders				Mary Dallas Consulting Archaeologists (MDCA)		Permits		
37-6-2225	LOC4	GDA	56	354551	6380185	Open site	Destroyed	Artefact : 3		
	Contact	Recorders				MCH - McCardle Cultural Heritage Pty Ltd,Mr.Paul Irish,Ms.Penny Mccardle,Ms.Mar		Permits	3963	
37-6-1832	East Lochinvar Site 4	GDA	56	355955	6379972	Open site	Destroyed	Artefact : -		

Report generated by AHIMS Web Service on 12/09/2023 for Penny Mccardle for the following area at Datum :GDA, Zone : 56, Eastings : 354300.0 - 358300.0, Northings : 6379200.0 - 6383200.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 51

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
37-6-1824	East Lochinvar Site 6	GDA	56	356724	6380310	Open site	Destroyed	Artefact : -	4482	
	<u>Contact</u>									
	<u>Recorders</u>									
37-6-2221	Station Lane OC1	GDA	56	355061	6380792	Open site	Valid	Artefact : 1	3963	
	<u>Contact</u>									
	<u>Recorders</u>									
37-6-1831	East Lochinvar Site 3	GDA	56	355955	6379972	Open site	Destroyed	Artefact : -		
	<u>Contact</u>									
	<u>Recorders</u>									
37-6-4189	Airds of lochinvar PAD1	GDA	56	356670	6380319	Open site	Valid	Potential Archaeological Deposit (PAD) : -	4482	
	<u>Contact</u>									
	<u>Recorders</u>									
37-6-1948	Rutherford Employment Area 9 (REA9)	GDA	56	358005	6379815	Open site	Valid	Artefact : 1		101300
	<u>Contact</u>									
	<u>Recorders</u>									
37-6-3571	Anambah SAC 14 and PAD 15	GDA	56	358068	6383015	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	<u>Contact</u>									
	<u>Recorders</u>									
37-6-1607	Lochinvar 1	AGD	56	355515	6380960	Open site	Valid	Artefact : 2		99841
	<u>Contact</u> Searle									
	<u>Recorders</u>									
37-6-2228	LCC1 and PAD	GDA	56	355673	6381234	Open site	Partially Destroyed	Artefact : 15, Potential Archaeological Deposit (PAD) : -		
	<u>Contact</u>									
	<u>Recorders</u>									
37-6-2218	PAD 1 Lochinvar URA	AGD	56	355800	6379200	Open site	Not a Site	Potential Archaeological Deposit (PAD) : 1		
	<u>Contact</u>									
	<u>Recorders</u>									
37-6-2863	Christopher Road Site 3	GDA	56	354999	6380414	Open site	Valid	Artefact : 1		
	<u>Contact</u>									
	<u>Recorders</u>									
37-6-1944	Rutherford Employment Area 5 (REA5)	GDA	56	357726	6379611	Open site	Valid	Artefact : 16		101300
	<u>Contact</u>									
	<u>Recorders</u>									
37-6-1945	Rutherford Employment Area 6 (REA6)	GDA	56	357878	6379673	Open site	Valid	Artefact : 4		101300
	<u>Contact</u>									
	<u>Recorders</u>									
37-6-1125	ISF 3 Rutherford	AGD	56	357750	6381240	Open site	Valid	Artefact : 1		
	<u>Contact</u>									
	<u>Recorders</u>									
37-6-1949	Rutherford Employment Area 10 (REA10)	GDA	56	358054	6379831	Open site	Valid	Artefact : 3		101300
	<u>Contact</u>									
	<u>Recorders</u>									

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
37-6-3830	SITE 11 LOT 310 LOCHINVAR	GDA	56	355523	6380268	Open site	Valid	Artefact : 1		104406,104715
	Contact									
	Recorders			Mr.Giles Hamm					Permits	4693
37-6-2213	Christopher Road 1	GDA	56	355520	6380800	Open site	Destroyed	Artefact : 2		
	Contact									
	Recorders			Umwelt (Australia) Pty Limited - Individual users,Mr.Giles (dup ID#12832) Hamm,					Permits	3963
37-6-2217	LIF3	GDA	56	354627	6380156	Open site	Destroyed	Artefact : 1		
	Contact									
	Recorders			MCH - McCardle Cultural Heritage Pty Ltd,Mr.Paul Irish,Ms.Penny Mccardle,Ms.Mar					Permits	3963
37-6-2219	PAD 2 Lochinvar URA	GDA	56	354720	6381415	Open site	Partially Destroyed	Potential Archaeological Deposit (PAD) : 1		
	Contact									
	Recorders			Niche Environment and Heritage,Mr.Paul Irish,Ms.Mary Dallas,Miss.Kate Morris					Permits	
37-6-2222	LOC2	GDA	56	355137	6379201	Closed site	Destroyed	Artefact : 10		
	Contact									
	Recorders			Mr.Paul Irish,Ms.Mary Dallas,RPS AAP Consulting Pty Ltd - York Street Sydney ,Mrs					Permits	4482
37-6-4231	HN-SL-A07	GDA	56	355166	6379431	Open site	Valid	Artefact : -		
	Contact									
	Recorders			Heritage Now - Belmont,Ms.Lara Tooby					Permits	
37-6-1834	East Lochinvar Site 5	GDA	56	356195	6380016	Open site	Destroyed	Artefact : -		
	Contact									
	Recorders			Mr.Giles (dup ID#12832) Hamm,RPS AAP Consulting Pty Ltd - York Street Sydney ,					Permits	4482
37-6-4192	Airds of lochinvar PAD 4	GDA	56	356219	6380015	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact									
	Recorders			Archaeological Risk Assessment Services (ARAS),Mr.Giles Hamm					Permits	
37-6-1828	East Lochinvar Site 10	GDA	56	356400	6380271	Open site	Destroyed	Artefact : -		
	Contact									
	Recorders			Mr.Giles (dup ID#12832) Hamm,RPS AAP Consulting Pty Ltd - York Street Sydney ,					Permits	3963,4482
37-6-4190	Airds of lochinvar PAD 2	GDA	56	356540	6380229	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact									
	Recorders			Archaeological Risk Assessment Services (ARAS),Mr.Giles Hamm					Permits	
37-6-1947	Rutherford Employment Area 8 (REA8)	GDA	56	358003	6379797	Open site	Valid	Artefact : 3		101300
	Contact									
	Recorders			Ms.Penny Mccardle					Permits	
37-6-3581	Anambah SAC 22 and PAD 11	GDA	56	358220	6382935	Open site	Valid	Artefact : -		
	Contact									
	Recorders			Miss.Diana Cowie					Permits	
37-6-2964	26 Windemere Rd Site 2 (PAD 2)	GDA	56	354305	6381044	Open site	Not a Site	Potential Archaeological Deposit (PAD) : -		
	Contact									
	Recorders			Archaeological Risk Assessment Services (ARAS),Ms.Penny Mccardle					Permits	
37-6-3654	Cantwell Rd 1	GDA	56	355173	6381028	Open site	Destroyed	Artefact : -		
	Contact									
	Recorders			Umwelt (Australia) Pty Limited - Individual users,Umwelt (Australia) Pty Limited -					Permits	
37-6-1830	East Lochinvar Site 2	GDA	56	355928	6380499	Open site	Valid	Artefact : -		
	Contact									
	Recorders			Mr.Giles (dup ID#12832) Hamm					Permits	4704

Report generated by AHIMS Web Service on 12/09/2023 for Penny Mccardle for the following area at Datum :GDA, Zone : 56, Eastings : 354300.0 - 358300.0, Northings : 6379200.0 - 6383200.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 51

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
37-6-1826	East Lochinvar Site 8	GDA	56	356532	6380262	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm,RPS AAP Consulting Pty Ltd - York Street Sydney , Permits 3963,4482							
37-6-1825	East Lochinvar Site 7	GDA	56	356673	6380330	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Mr.Giles (dup ID#12832) Hamm,RPS AAP Consulting Pty Ltd - York Street Sydney , Permits 4482							
37-6-3569	Anambah SAC 12	GDA	56	357645	6381559	Open site	Valid	Artefact : -		
	Contact	Recorders	Miss.Diana Cowie Permits							
37-6-1122	ISF 1 Rutherford	AGD	56	357650	6381250	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mary Dallas Consulting Archaeologists (MDCA) Permits							
37-6-1907	R1 (Greta)	GDA	56	357900	6381200	Open site	Valid	Artefact : 4		4119
	Contact	Recorders	Ms.Mary Dallas Permits							
37-6-1937	Rutherford Employment Area PAD1	GDA	56	358003	6379797	Open site	Valid	Potential Archaeological Deposit (PAD) : -		101300
	Contact	Recorders	Ms.Penny Mccardle 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

Report generated by AHIMS Web Service on 12/09/2023 for Penny Mccardle for the following area at Datum :GDA, Zone : 56, Eastings : 354300.0 - 358300.0, Northings : 6379200.0 - 6383200.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 51

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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

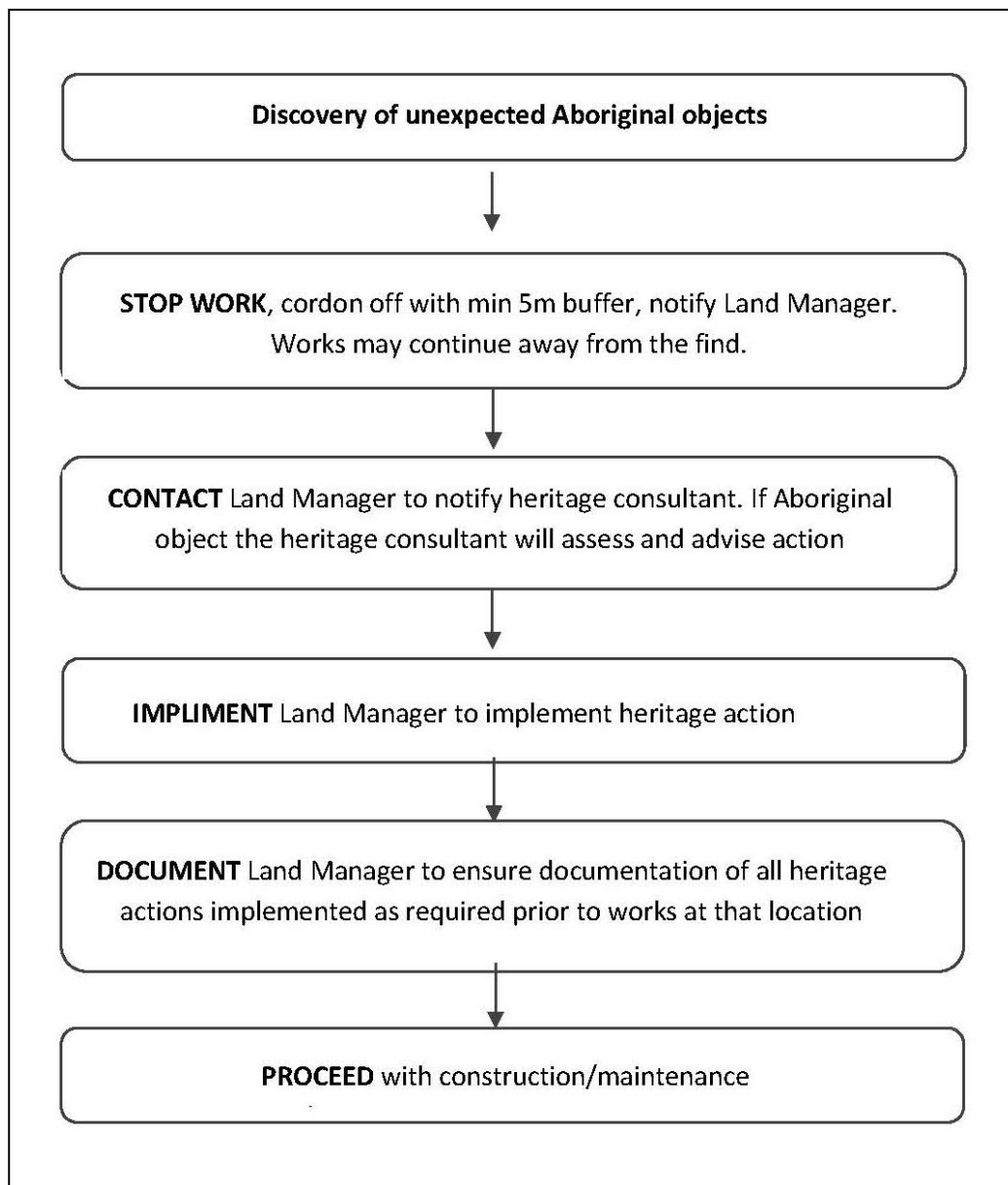
Should unexpected Aboriginal objects be uncovered during any stage of the development, Figure 1 illustrates the protocols. Unexpected Aboriginal objects may include, but not limited to, isolated artefacts, artefact scatters, scarred trees, hearths and shell middens (descriptions of such objects are provided).

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:

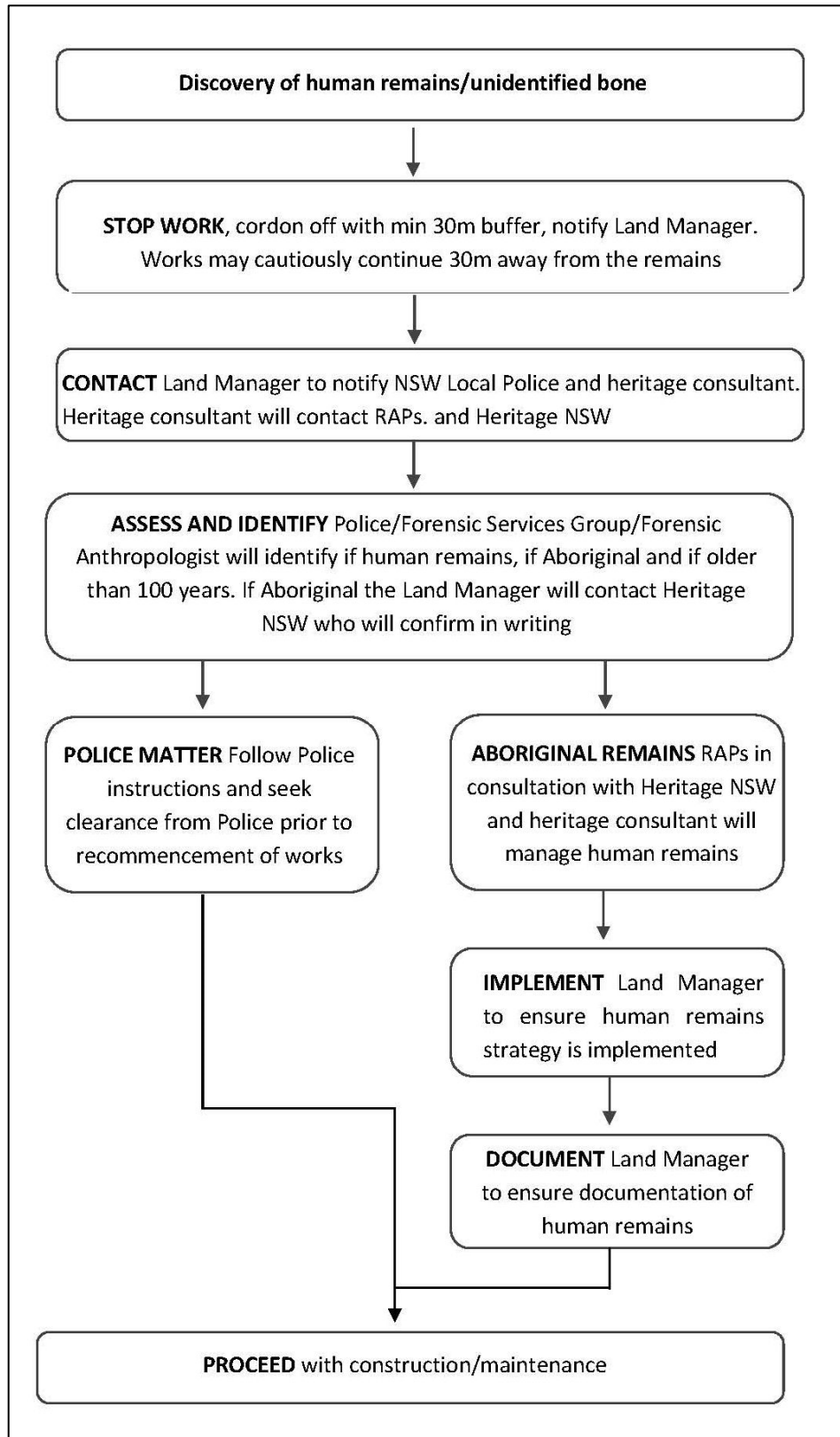
- 1) Human;
- 2) Aboriginal or non-Aboriginal;
- 3) If Aboriginal, determine antiquity (older or younger than 100 years)

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.

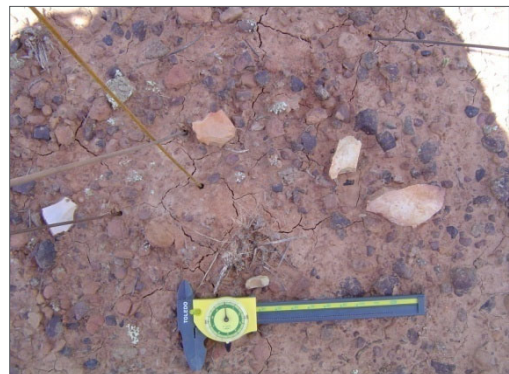
Surface Artefact scatters

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)

