



Aboriginal Cultural Heritage Due Diligence Assessment

FINAL REPORT

Prepared for Calibre Consulting on behalf of Mirvac Homes (NSW) Pty Ltd

21 August 2018

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Glossary

AHIMS	Aboriginal Heritage Information Management System
AMBS	Australian Museum Business Services
DECCW	Department of the Environment, Climate Change and Water
Due diligence code	<i>Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales</i> (DECCW 2010)
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Act	<i>Environment Planning and Assessment Act 1999</i>
GSV	Ground Surface Visibility
ICOMOS	International Council on Monuments and Sites
LEP	Local Environment Plan
LGA	Local Government Area
NPW Act	<i>National Parks and Wildlife Act 1974</i>
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
PAD	Potential Archaeological Deposit
Study area	Lot 201 DP 590247
The Code	<i>The Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW</i> (DECCW 2010)

Summary

Biosis Pty Ltd has been commissioned by Calibre (client) to undertake an Aboriginal Cultural Heritage Due Diligence Assessment for the proposed stage 1 subdivision of the approximately nine hectare site at Lots 201 and 202 DP 590247 and Lot 21 DP 581462, Station Street, Menangle NSW (the Project). The Project involves the development of approximately 100 residential lots, local roads, detention and water quality basin, and open space/park and services utilities. Separately bulk earthworks will be undertaken with an upgrade to the Menangle Road and Station Street intersection with a roundabout.

Background research was undertaken for the study area, including a search of the Aboriginal Heritage Information Management System (AHIMS) database and a review of relevant reports. No AHIMS sites are present with the study area (Lot 201 DP590247), however six previously recorded sites were identified adjacent to the study area within Lot 202 DP590247. The AHIMS search results identified 75 Aboriginal archaeological sites within a 5 kilometre by 5 kilometre search area centred on the study area.

A site survey of the study area was conducted on 18 April 2018 by Lian Flannery and Mathew Smith (Biosis). During the site survey areas of previous disturbance were noted and recorded. Areas of ground surface exposure were targeted in order to identify any Aboriginal objects, however due to the extensive grass coverage no areas of exposure were identified. No previously unrecorded sites or objects were located during the site survey.

Recommendations

The following management recommendations have been developed relevant to the study area and influenced by:

- Predicted impacts to Aboriginal cultural heritage.
- The planning approvals framework.
- Current best conservation practise, widely considered to include:
 - Ethos of the Australia ICOMOS Burra Charter (2013)
 - The code

Prior to any impacts occurring within the study area, the following is recommended:

Recommendation 1: No further archaeological assessment is required

No further archaeological work is required in the study area due to the entire study area assessed as having low archaeological potential.

Recommendation 2: Discovery of Unanticipated Aboriginal Objects

All Aboriginal objects and Places are protected under the NSW National Parks and Wildlife Act 1974. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage (OEH). Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders.

Recommendation 3: Discovery of Aboriginal Ancestral Remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains
2. Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location
3. Not recommence work at that location unless authorised in writing by OEH.

1 Introduction

1.1 Project background

Biosis Pty Ltd has been commissioned by Calibre on behalf of Mirvac Homes NSW (client) to undertake an Aboriginal Cultural Heritage Due Diligence Assessment for the proposed stage 1 subdivision of the approximately nine hectare site at Lots 201 and 202 DP 590247 and Lot 21 DP 581462, Station Street, Menangle NSW (the Project). The Project involves the development of approximately 100 residential lots, local roads, detention and water quality basin, and open space/park and services utilities. Separately bulk earthworks will be undertaken with an upgrade to the Menangle Road and Station Street intersection with a roundabout.

An assessment in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010a) has been undertaken for the study area in order to inform responsibilities with regards to Aboriginal cultural heritage in the area. In addition to the basic tasks required for a due diligence assessment, an extended background review, as well as an archaeological survey in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the Code') was conducted, in order adequately map areas of high, moderate and low archaeological sensitivity.

1.2 Location of the study area

The study area is located within the Wollondilly Local Government Area (LGA), Parish of Camden, County of Camden (refer to Figure 1). The study area incorporates Lot 201 DP 590247 and is bounded by the Nepean River to the north, Station Street to the south, the Hume Motorway to the east and Menangle Road to the west (refer to Figure 2).

1.3 Planning approvals

The proposed development will be assessed against Part 4 of the *Environmental Planning and Assessment Act 1979* NSW (EP&A Act). Other relevant legislation and planning instruments that will inform the assessment include:

- *National Parks and Wildlife Act 1974* (NSW) (NPW Act)
- *National Parks and Wildlife Amendment Act 2010* (NSW)
- *Wollondilly Local Environmental Plan 2011* (LEP)
- *Wollondilly Development Control Plan 2016* (DCP)

1.4 Scope of the assessment

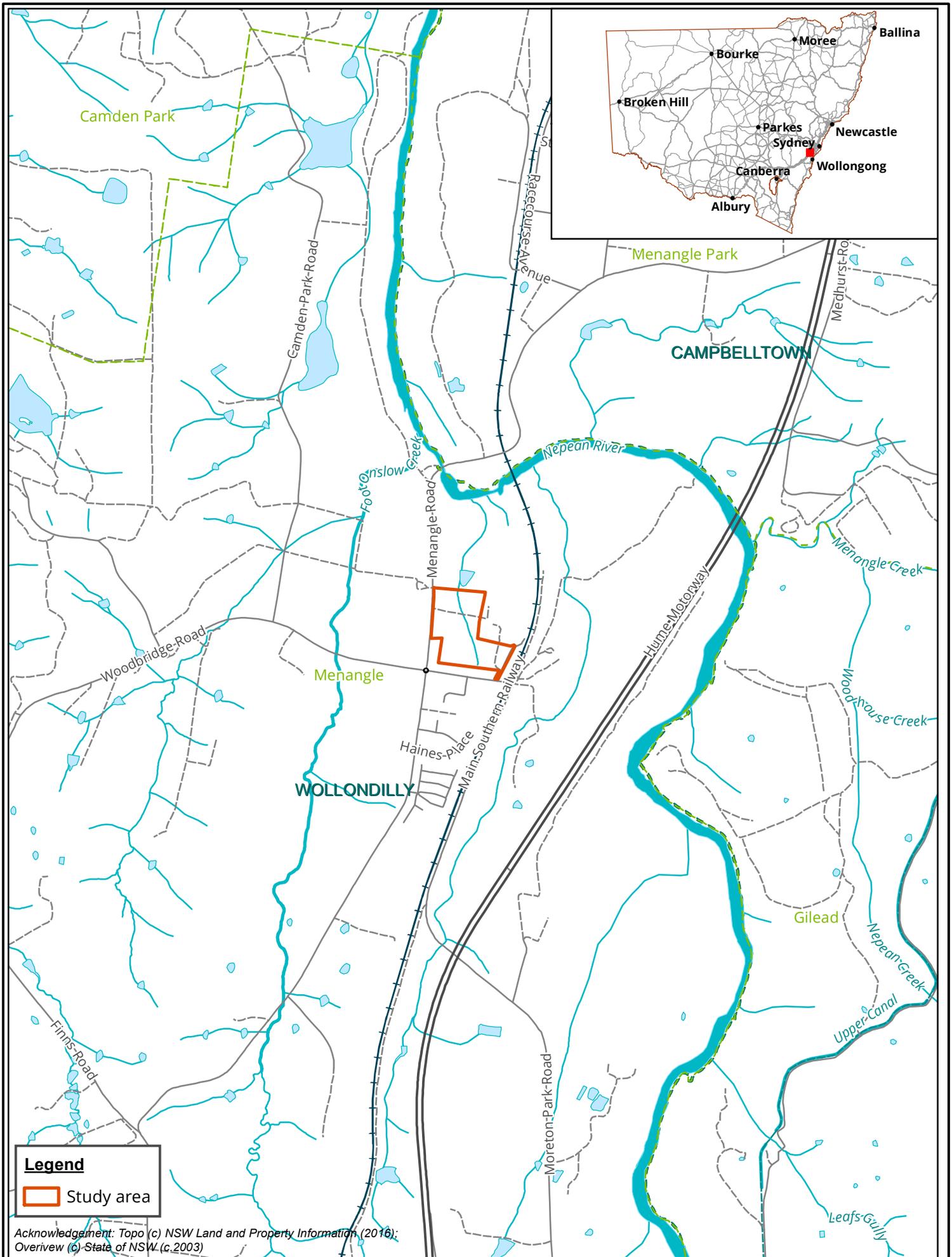
The following is a summary of the major objectives of the assessment:

- Conduct background research in order to recognise any identifiable trends in site distribution and location, including a search of the Aboriginal Heritage Information Management System (AHIMS).
- Undertake archaeological survey as per Requirement 5 of the Code, with particular focus on landforms with high potential for heritage places within the study area, as identified through background research.

-
- Record and assess sites identified during the survey in compliance with the guidelines endorsed by the NSW Office of Environment and Heritage (OEH).
 - Determine levels of archaeological and cultural significance of the study area.
 - Make recommendations to mitigate and manage any cultural heritage values identified within the study area.

1.5 Aboriginal consultation

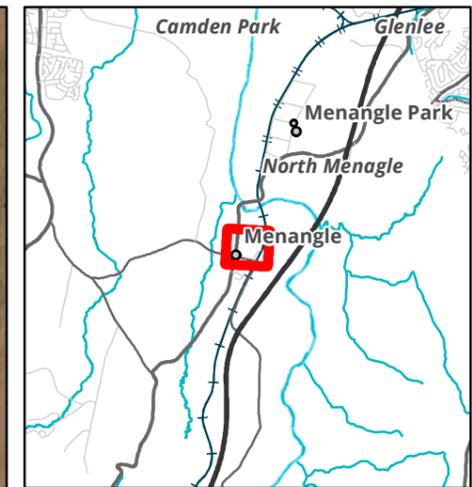
Consultation with the Aboriginal community is not a formal requirement of the due diligence process; however it is recognised in NSW that Aboriginal people are the primary determinants of the significance of their cultural heritage. A landscape may hold intangible values that can be assessed only by the Aboriginal community. This assessment has been prepared without consultation with the Aboriginal community. If impacts to Aboriginal heritage sites or objects are found to be a possibility from the proposed works then consultation should be undertaken to discuss management and mitigation options.



Legend
 Study area

Acknowledgement: Topo (c) NSW Land and Property Information (2016);
 Overview (c) State of NSW (c.2003)

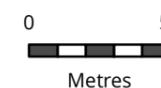
Figure 1: Location of the study area



Legend

 Study area

Figure 2: Study area detail



Scale: 1:2,500 @ A3
Coordinate System: GDA 1994 MGA Zone 56



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2 Desktop assessment

A brief desktop assessment has been undertaken to review existing archaeological studies for the study area and surrounding region. This information has been synthesised to develop some Aboriginal site predictive statements for the study area and identify known Aboriginal sites and/or Places recorded in the study area. This desktop assessment has been prepared in accordance with requirements 1 to 4 of the Code.

2.1 Landscape context

It is important to consider the local environment of the study area of any heritage assessment. The local environmental characteristics can influence human occupation and associated land use and consequently the distribution and character of cultural material. Environmental characteristics and geomorphological processes can affect the preservation of cultural heritage materials to varying degrees or even destroy them completely. Lastly, landscape features can contribute to the cultural significance that places can have for people.

2.2 Geology, soils and landforms

The study area is predominantly contained within the Wianamatta Group geological formation, itself lying within the Ashfield shale formation. This formation is underlain by the Mittagong Formation (interbedded shale, laminate and fine medium grained quartz sandstone). The Mittagong formation overlies the middle Triassic Hawkesbury Sandstone, consisting of medium to coarse grained quartz sandstone with minor shale or laminate bands (Hazelton and Tille 1990:2-4). The Ashfield shale formation is confined to the upper slopes of spurs with the Hawkesbury Sandstone being located along the lower slopes and gullies. Sandstone is present in lower slope contexts and as steep cliff edges long the course of Allens and Clements Creeks and their associated tributaries and provides good resources for rock art, grinding grooves and rock shelter sites (Hazelton and Tille 1990). The western portion of the study area is contained within Quaternary alluvium-quartz and lithic "fluvial sand, silt and clay. High level Tertiary alluvium – quartz and lithic silt and clay.

Topographically, the study area is located within three landscape types, Hawkesbury – Nepean channels and floodplains, The Cumberland Plain landscape and The Upper Nepean Gorges.

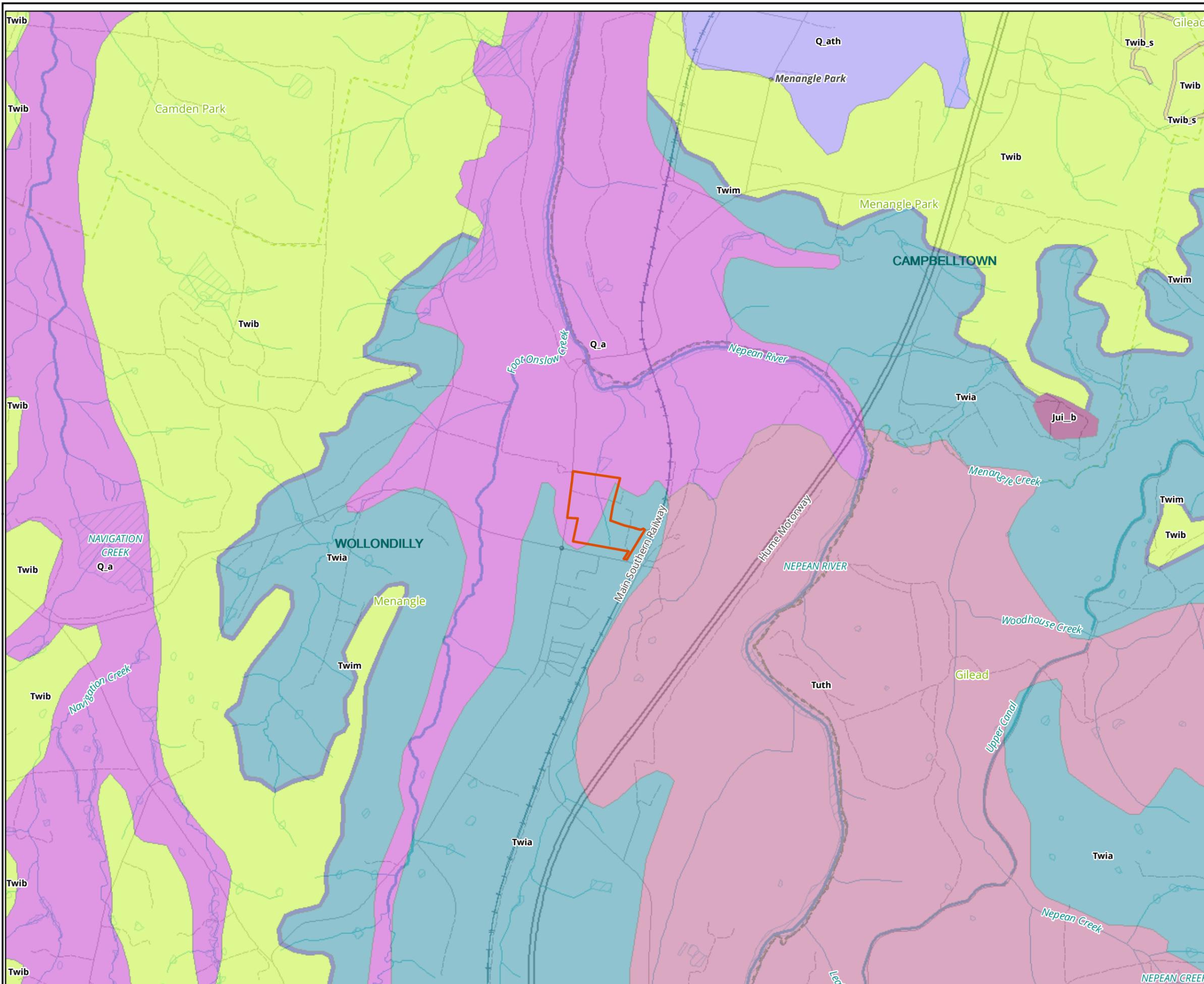
The Hawkesbury- Nepean Channels and floodplains is characterised by meandering channel and moderately wide flood plain of the Hawkesbury and Nepean rivers on Quaternary sand and gravel. Undifferentiated alluvial sand to poorly structured gradation profiles of sandy loam or clay loam. The Cumberland Plain landscape is characterised by low rolling hills and valleys in a rain shadow areas between the Blue Mountains and the coast on horizontal Triassic shales and lithic sandstones forming a down-warped block on the coastal side of the Lapstone monocline. Intruded by a small number of volcanic vents and partly covered by Tertiary river gravels and sands. Quaternary alluvium along the mains streams with a general elevation of 30 to 120m and a local relief of 50. The Upper Nepean Gorges is characterised by steep sided benched slopes of the Nepean River tributaries on Triassic quartz sandstones with general elevation of 250 to 350m with a local relief of 80m (Mitchell 2002).

Soil landscapes have distinct morphological and topological characteristics that result in specific archaeological potential. Because they are defined by a combination of soils, topography, vegetation and weathering conditions, soil landscapes are essentially terrain units that provide a useful way to summarise archaeological potential and exposure.

The Soil Landscape present within the study area is the Theresa Park Soil Landscape (refer to Table 1). Theresa park soil landscape is characterised by tertiary and quaternary floodplain and terraces of the Nepean River and is a fluvial soil landscape. It has Floodplain with levees and meander scrolls and terraces with local relief up to 60m. Slopes are generally <5% except on edges of terraces where some slopes may exceed 10% (Hazelton and Tille 1990). Soils consist of up to 30 centimetres of sandy loam overlying sandy clay loam on the floodplains and up to 15 centimetres of sandy clay on top of clay on drainage lines. The fluvial nature of soil deposition in this landscape indicates that soils are deposited by flooding. As a result sites are less likely to be intact in areas that are not elevated above the floodplain, as they will have been affected by flood waters in the past.

Table 1 Theresa Park soil landscape characteristics

Soil Material	Description
Theresa Park (tp)	Red earths and red podzolic soils occur on terraces and minimal Prairie soils on current floodplain. Alluvial bedding is sometimes evident with alluvial soils. Solodic soils occur in drainage lines. Soils are highly variable and include poorly structured orange to red silty loams, brown loams and sandy loams.



Legend

Study area

Geological Units

- Jui_b - Jurassic, unnamed igneous
- Q_a - Alluvium
- Q_ath - Alluvial terrace deposits-
- Tuth - Hawkesbury Sandstone
- Twia - Ashfield Shale
- Twib - Bringelly Shale
- Twib_s - Bringelly Shale - sandstone
- Twim - Minchinbury Sandstone

Figure 3: Geological units in the vicinity of the study area

0 510 1,020

Metres

Scale: 1:20,000 @ A3

Coordinate System: GDA 1994 NSW Lambert

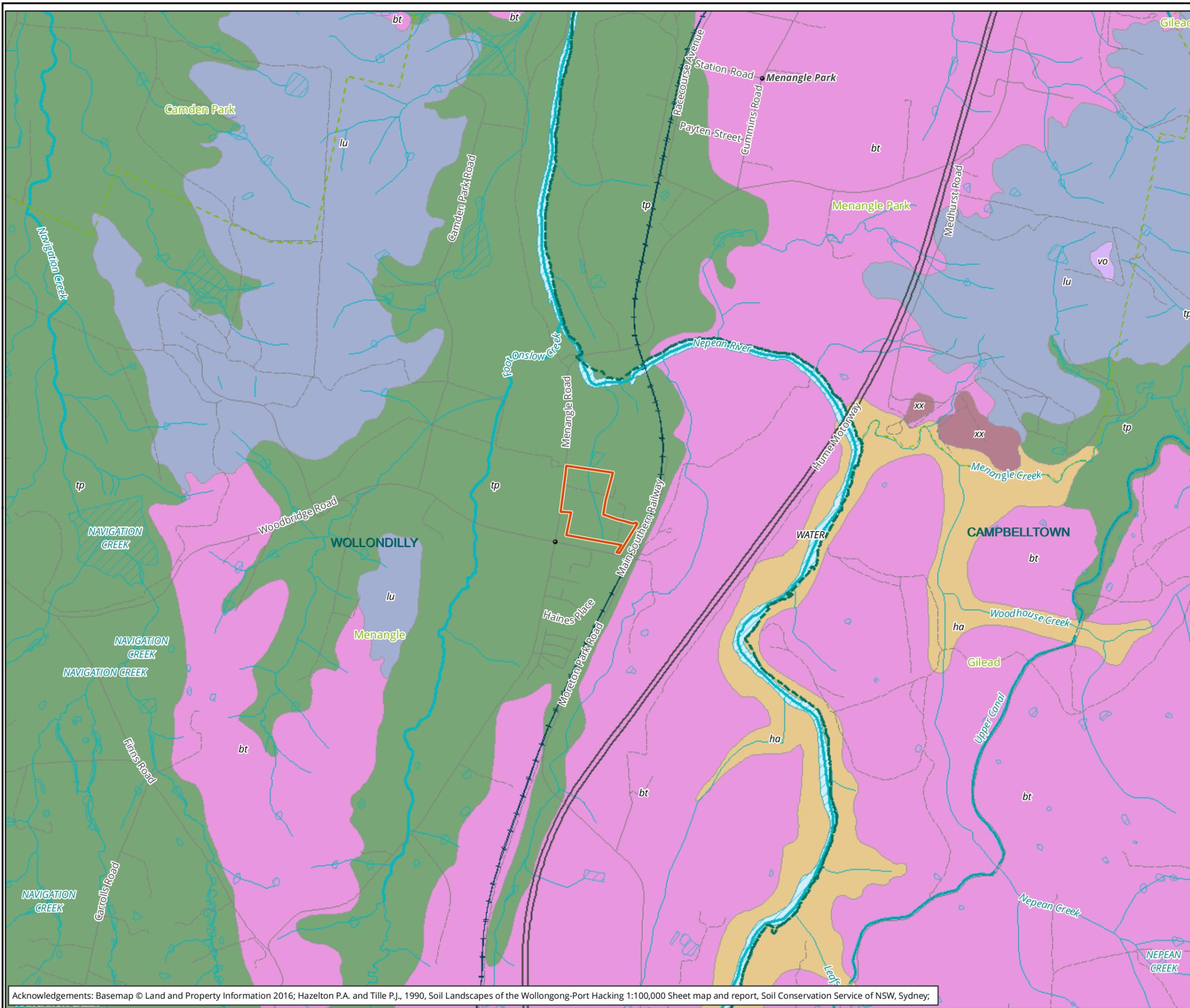


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Acknowledgements: Basemap © NSW Land and Property Information 2016
 Geology © Colquhoun G.P., Phillips, G., Hughes, K.S., Deysing L., Fitzherbert, J.A., & Troedson, A.L. 2015. New South Wales Zone 54/56 Seamless Geology, version 1 [Digital Dataset]. Geological Survey of New South Wales, Maitland

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Legend

- Study area
- Soil Landscape units**
- bt - BLACKTOWN
- ha - HAWKESBURY
- lu - LUDDENHAM
- tp - THERESA PARK
- vo - VOLCANIC
- WATER - WATER
- xx - DISTURBED TERRAIN

Figure 4: Mitchell landscapes within the study area

0 500 1,000
Metres
Scale: 1:20,000 @ A3
Coordinate System: GDA 1994 NSW Lambert



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Acknowledgements: Basemap © Land and Property Information 2016; Hazelton P.A. and Tille P.J., 1990, Soil Landscapes of the Wollongong-Port Hacking 1:100,000 Sheet map and report, Soil Conservation Service of NSW, Sydney;

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2.3 Flora and fauna

Within the Cumberland Plain subregion of the Sydney Basin Bioregion there are a variety of vegetation types present, with grey box, forest red gum, narrowed-leaved ironbark woodland, and spotted gum present on shale hills. Hard-leaved scribbly gum, rough-barked apple, and old man banksia have been identified on alluvial sands and gravels. Broad-leave apple, cabbage gum, forest red gum, and swamp oak are present on river flats. Tall spike rush, and juncus with Parramatta red gum is noted around lagoons and swamps (NPWS 2003, p.193).

The Hawkesbury- Nepean Channels and Floodplains subregion of the Sydney Basin Bioregion is also present with the study area. There is a variety of vegetation types present, including blue box, manna gum river peppermint in upstream sectors and dominated by river oak possibly originally with rainforest species such as white cedar in lower sectors. Common reed, cumbungi and other aquatic plants are found in the river. Deep organic loams and loamy sands on floodplain with river flat forest of Sydney blue gum, rounded-leaved gum, forest red gum, cabbage gum, rough barked apple and river oak (Mitchell 2002, p.110).

The Theresa Park soil landscape typically supports cleared tall open-forest which previously contained cabbage gum and broad-leaved apple (Hazelton and Tille 1990).

Native fauna that would have been present in the vicinity of the study area include: Australian wood duck, white-faced heron, eastern long-necked tortoise, eastern water skink, garden skink, welcome swallow, purple swamphen, as well as arboreal fauna including owls, ring and brushtailed possums, and gliders.

2.4 Resource statement

The wider region includes distinct ecological zones, including open forest and open woodland, with riparian vegetation extending along many of the watercourses. Each ecological zone hosts a different array of floral and faunal species, many of which would have been utilised according to seasonal availability. Aboriginal inhabitants of the region would have had access to a wide range of avian, terrestrial and aquatic fauna and repeated firing of the vegetation would have opened up the foliage allowing ease of access through and between different resource zones.

As well as being important food sources, animal products were also used for tool making and fashioning a myriad of utilitarian and ceremonial items. For example, tail sinews are known to have been used to make fastening cord, while 'bone points', which would have functioned as awls or piercers, are often an abundant part of the archaeological record. Animals such as Brush-tailed Possums were highly prized for their fur, with possum skin cloaks worn fastened over one shoulder and under the other. Kangaroo teeth were incorporated into decorative items, such as head bands (Attenbrow 2002).

2.5 Previous land use

European settlement of the region began in the early 1800s when attempts were made to domesticate cattle that had gone missing from the First Fleet, only to be found in 1795. The lure of this newfound venture to domesticate cattle attracted European visitors, and as such, a constable was appointed by then colony Governor Macquarie, to prevent unauthorised travel into the area. However, this did not prevent anyone from taking advantage of this area. By November 1810, a visit to the Cowpastures by Governor Macquarie found that the district was already under the plough with fields of wheat and grazing sheep and cattle (Liston 1988).

John Macarthur was granted 5,000 acres at Cowpastures in 1805, which was then known as the best land in the colony. This 5,000 acre land grant was called 'Camden' and was later known as 'Camden Park'. Macarthur

was granted the 5,000 acres in support of his idea that there was potential for the production of fine quality wool in the colony (Mylrea 2002). By the end of the decade Camden Park Estate was the 'first agricultural establishment in the Colony' with wool being the first main industry in the region and by the late 1830s Macarthur's property had expanded to 28,000 acres (Wrigley 2001).

John Macarthur died in 1834 leaving his Camden estate to his sons William and James as tenants in common. The estate's farm was extremely diversified as it focused on agricultural and horticultural activities. By 1849 the estate's livestock consisted of 22,000 sheep, 400 horses and 200 cattle (Beteridge 2012). By the 1850s pastoralism was on the decline and the estate turned to wheat and mixed grain production (Tanner, H 1983).

In 1920, the current study area was set up for a new venture in dairy farming. The Camden Vale Milk Company was set up and as such processed its milk at the Menangle factory. In 1921 there were approximately 1400 cows on the estate (Beteridge 2012). Menangle was now the primary site for the company's milk production with several upgrades to the dairy and in 1950 with the introduction of the Rotolactor, an automatic, rotating milking machine, increased the status of the factory. Overtime, the Rotolactor had its issues and the estate was slowly rolling in debt, this led to the sale of the Camden Park Estate in 1973 (Talga Ltd 1973).

3 Aboriginal context

3.1 Ethnohistory and contact history

It is generally accepted that people have inhabited the Australian landmass for at least 65,000 years (Clarkson et al 2017). Dates of the earliest occupation of the continent by Aboriginal people are subject to continued revision as more research is undertaken. The timing for the human occupation of the Sydney Basin is still uncertain. Whilst there is some possible evidence for occupation of the region around 40,000 years ago, the earliest undisputed radiocarbon date from the region comes from a rock shelter site north of Penrith on the Nepean River, known as Shaws Creek K2, which has been dated to 14,700 + 250 Before Present (BP) (Attenbrow 1987, 2002: 20). The assessment of the deposits concurred that the people living in the shelter exploited the food and resources from the nearby creeks and rivers, as well as the surrounding countryside. East of Campbelltown, a sandstone rock shelter site (known as Bull Cave) was excavated and yielded a basal date of 1820 + 90 BP (Koettig 1985). In general, the majority of both open and rock shelter sites in the Sydney region date to within the last 3,000 to 5,000 years.

Our knowledge of Aboriginal people and their land-use patterns and lifestyles prior to European contact is mainly reliant on documents written by non-Aboriginal people. The inherent bias of the class and cultures of these authors necessarily affect such documents. They were also often describing a culture that they did not fully understand, a culture that was in a heightened state of disruption given the arrival of settlers and disease. Early written records can, however, be used in conjunction with archaeological information and surviving oral histories from members of the Aboriginal community in order to gain a picture of Aboriginal life in the region.

The study area is situated within the traditional lands of the Wodi Wodi people. The traditional Wodi Wodi boundary extended from around Stanwell Park to the Shoalhaven River, and as far inland as Picton, Moss Vale and Marulan. The Wodi Wodi spoke the Dharawal language, however Dharawal (Tharwal) was not a word they had heard of or used themselves (Tindale 1974, Navin Officer 2000: 20).

The arrival of settlers in the region and new competition for resources began to restrict the freedom of movement of Aboriginal hunter-gatherer inhabitants from the early 1800s. European expansion along the Cumberland Plain was swift and soon there was considerable loss of traditional lands to agriculture. This led to violence and conflict between Europeans and Aboriginal people as both groups sought to compete for the same resources. In the Cowpastures region, it began following the murder of an Aboriginal woman and her children, which resulted in violent clashes between several Aboriginal men and European settlers between 1814 and 1816 (Liston 1988: 50). The violence had escalated by 1816 following the outlaw proclamation by Governor Macquarie, resulting in the massacre of 14 Aboriginal people hiding at Appin (Liston 1988: 54). This event is known as the 'Appin Massacre' and is regarded as a pivotal part of the history of the destruction of the Aboriginal people in the region. The outlaw proclamation was withdrawn in November 1816.

The Dharawal remained south of the Nepean River in Cowpastures after the conflicts in 1816. The Dharawal found themselves within the land grants of the Macarthur family, who were the main settlers in the region. The Macarthurs had lost a number of employees during the conflicts, but they did not wish to remove the Dharawal from the land they had acquired. In 1818, land was marked out within Camden Estate for the Dharawal to live there under the protection of the Macarthurs (Liston 1988:55).

3.2 Previous Archaeological work

A large number of cultural heritage surface (surveys) and sub-surface (excavations) investigations have been conducted throughout the Cumberland Plain and Hawkesbury-Nepean regions of New South Wales in the past 30 years. There has been an increasing focus on cultural heritage assessments in NSW due to ever increasing development, along with the legislative requirements for this work and greater cultural awareness of Aboriginal cultural heritage.

The archaeology of the Sydney Basin region has been well documented through a large number of academic and impact assessment investigations over the past 30 years (e.g. Kohen 1986, Haglund 1980, Smith 1989, McDonald and Rich 1993). This is particularly evident in the Cumberland Plain, largely as a result of archaeological studies related to rapid urban development across the area.

3.2.1 Regional context

As stated above, a large number of previous archaeological studies have been undertaken in the region over the past three decades. Those relevant to the current study have been summarised in the section below.

JMCHM (1996) has developed a predictive model for Aboriginal site distribution on the Cumberland Plain that will be applicable to the study area. This has been developed using the Aboriginal occupation models proposed for the Camden area by Haglund (1989) and data collected from other areas of the Cumberland Plain where trends in the distribution of archaeological sites have been apparent. JMCHM's (1996; 2000) predictive model identified that the size (density and complexity) of archaeological features will vary according to permanence of water, landscape unit and proximity to stone resources in the following way:

- At the headwaters of upper tributaries (first order creeks) archaeological evidence will be sparse and will comprise little more than background scatters of stone artefacts
- At the middle reaches of minor tributaries (second order creeks) archaeological evidence will be sparse but indicate focused activity
- At the lower reaches of tributary creeks (third order creeks) archaeological evidence will indicate more frequent occupation and evidence of repeated, more concentrated activities
- On major creek lines and rivers (fourth order creeks) archaeological evidence will indicate more permanent occupation, which is of greater complexity
- Creek junctions and swamps may provide foci for site activity
- Ridgetop locations between drainage lines will usually contain limited archaeological evidence.

AMBS (1997) undertook a large scale regional Aboriginal heritage study of part of the Cumberland Plain, north of Maldon. The study examined all previously recorded archaeological sites and studies completed across the region, including both field survey and subsurface investigation work. The Plumpton Ridge silcrete source work completed by McDonald in 1985 was used as a case study in determining accurate identification of silcrete artefacts from naturally spalled silcrete. The report concluded:

- Previous archaeological investigation on the Cumberland Plain has not contributed significantly to a hole / drill developed understanding of Aboriginal occupation and settlement patterns of the region. This was attributed to the isolated, small scale nature of the archaeological investigations dispersed throughout the region, and the use of intuitive and simple pattern recognition models and research designs. Further, where large scale research projects and models have been developed, they have not been adequately tested by ensuing investigations (AMBS 1997)

- Excavation projects have been limited and techniques have been restrictive and not interpreted the spatial structure of open sites adequately, as the focus of analysis has been on technology of the assemblages, limiting the interpretive potential of many archaeological investigations;
- The correct identification of silcrete artefacts is problematic, and the analysis of material excavated by McDonald (1985) at the Plumpton Ridge silcrete source revealed that a number of the artefacts did not exhibit attributes of cultural modification, but were naturally fractured or broken from farm machinery
- Regional planning approaches are inadequate for the assessment and conservation of Aboriginal heritage throughout the region. This was attributed to development pressures, minor reserve coverage and limited opportunities for establishing new protected areas.

More recent archaeological work (AECOM 2010) has indicated that while the most recognised Cumberland Plain predictive modelling is most relevant, it is not always typical. Archaeological material tends to occur anywhere on the Cumberland Plain and that while the size and frequency of sites can be linked with stream order, the complexity of sites cannot.

JMCHM's (2000) identified that sandstone features (overhangs or platforms) may have provided a focus for a number of activities including camping or art production or the sharpening of axes. Sandstone platforms may also have been used for the production of art (engravings), although these are very rare on the margins of the Cumberland Plain.

Niche (2013) undertook an Aboriginal due diligence assessment of a proposed residential and business zone development at Maryfields Estate, Campbelltown, NSW. The inspection of the study area identified one Aboriginal heritage site, Maryfields AS1 which consisted of a broken ground-edge axe. The Aboriginal object was located on a creek terrace, an area of PAD was also identified along the northern side of the creekline. The area of PAD was identified as it was associated with an Aboriginal site and contained intact soils and is located upon a sensitive landform. The northern side of the creek contained a slight rise overlooking the creek and was considered to have potential to contain intact archaeological deposit.

Eco Logical (2016) were engaged by Lucan Property Group Pty Ltd to prepare an Aboriginal heritage assessment to facilitate the proposed rezoning of 82-102 Amundsen Street, Leumeah. The site inspection resulted in the identification of an isolated artefact, which consisted of a quartz core. The isolated artefact is representative of artefacts present on the Cumberland Plain and as an isolated find, has low scientific significance. Based on predictive modelling of the landscape, the study area was considered to have low sensitivity for archaeological deposits and further sites to exist due to the steep slope of much of the study area; distance to waterways; past soil disturbance and erosion from vegetation clearance, agricultural activities, golf course; and construction of houses, sheds, dam and the electricity line.

3.2.2 Local context

Brayshaw McDonald (1990) undertook an archaeological survey at Menangle Park. The aims of the study were to identify areas of high Aboriginal/archaeological potential and significance; and to determine any threats that urban development might pose to archaeologically sensitive areas to make recommendations to the management of these areas. During the survey, two archaeological sites were located. It was recommended that subsurface testing take place to ascertain their extent and significance. Site 1 (MP1) is located towards the south of the study area on the ridgeline which runs parallel to the Nepean and consists of two silcrete artefacts. MP1 is located 2.1km north east of the current study area. The second site (MP2) is located adjacent to a creekline running north-south through the study area, the creek also drains the western slopes of Menangle Sugarloaf and Mouth Gilead. MP2 consists of seven artefacts which were located over a total area of approximately 40m x 10m, and were made up of a range of raw material, pink and red silcrete as well as volcanic material.

Dibden (2002) was commissioned by McRoss Developments Pty Ltd to undertake an Aboriginal cultural heritage assessment of land near Appin. Three sandstone shelters containing Aboriginal art and occupation deposit and two shelters assessed to potentially contain archaeological deposit were recorded either directly within or immediately adjacent to the study area. There had been one previously recorded site within the study area. Dibden suggested that it was highly probable that stone artefacts may be present in open contexts in the study area.

AHMS (2015) undertook an Aboriginal and Historical Heritage Gap Analysis of the Greater Macarthur investigation area. The analysis identified that the current study area played host to several instances of early Aboriginal-European interaction. The area was formerly a well-used series of swamps and waterways, and was likely to have formed a focus of activity and occupation in the past. It has remained largely unmodified since European arrival. Riparian and swampy areas along the Nepean River in the vicinity of Menangle have been documented as used extensively by Aboriginal people in the past. Limited assessments have been undertaken in these areas, with little evidence of cultural material to date. However, it is considered that these areas have high risk of significant material being presented and may form a constraint to future development.

Mary Dallas Consulting Archaeologists (MDCA 2014) undertook an Aboriginal due diligence assessment of the current study area at Station Street Menangle. MDCA (2014) targeted the eastern side of the railway line and the western side of the railway line which encompassed the current study area. The eastern side of the railway line was found to contain three artefact scatters, two areas of PAD and one rockshelter with PAD. The western side of the railway line was assessed with no archaeological sensitivity due to the substantial historical disturbance in the past.

As part of this assessment several Aboriginal groups were invited and attended the survey with MDCA. Comments were received from these groups in regards to the findings of the survey. Tharawal Local Aboriginal Land Council commented they were happy with the findings of the report. Cubitch Barta Native Title Claimants indicated that that the west side of the railway (current study area) had been heavily disturbed. They commented that they did not have any issues with the assessment of this area either due to this disturbance.

3.3 Identified Aboriginal archaeological sites

An extensive search of the AHIMS database was conducted on 10 April 2018 (Client service ID: 338151). The search identified 10 Aboriginal archaeological sites within a 1 kilometre search area, centred on the proposed study area (Appendix 1 and Table 2). None of these registered sites are located *within* the study area (Figure 5). The mapping coordinates recorded for these sites were checked for consistency with their descriptions and location on maps from Aboriginal heritage reports where available. These descriptions and maps were relied where notable discrepancies occurred.

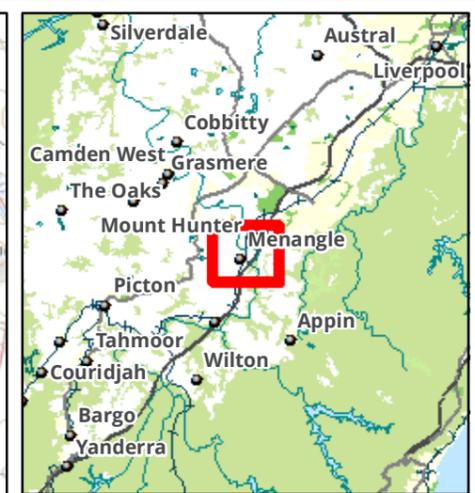
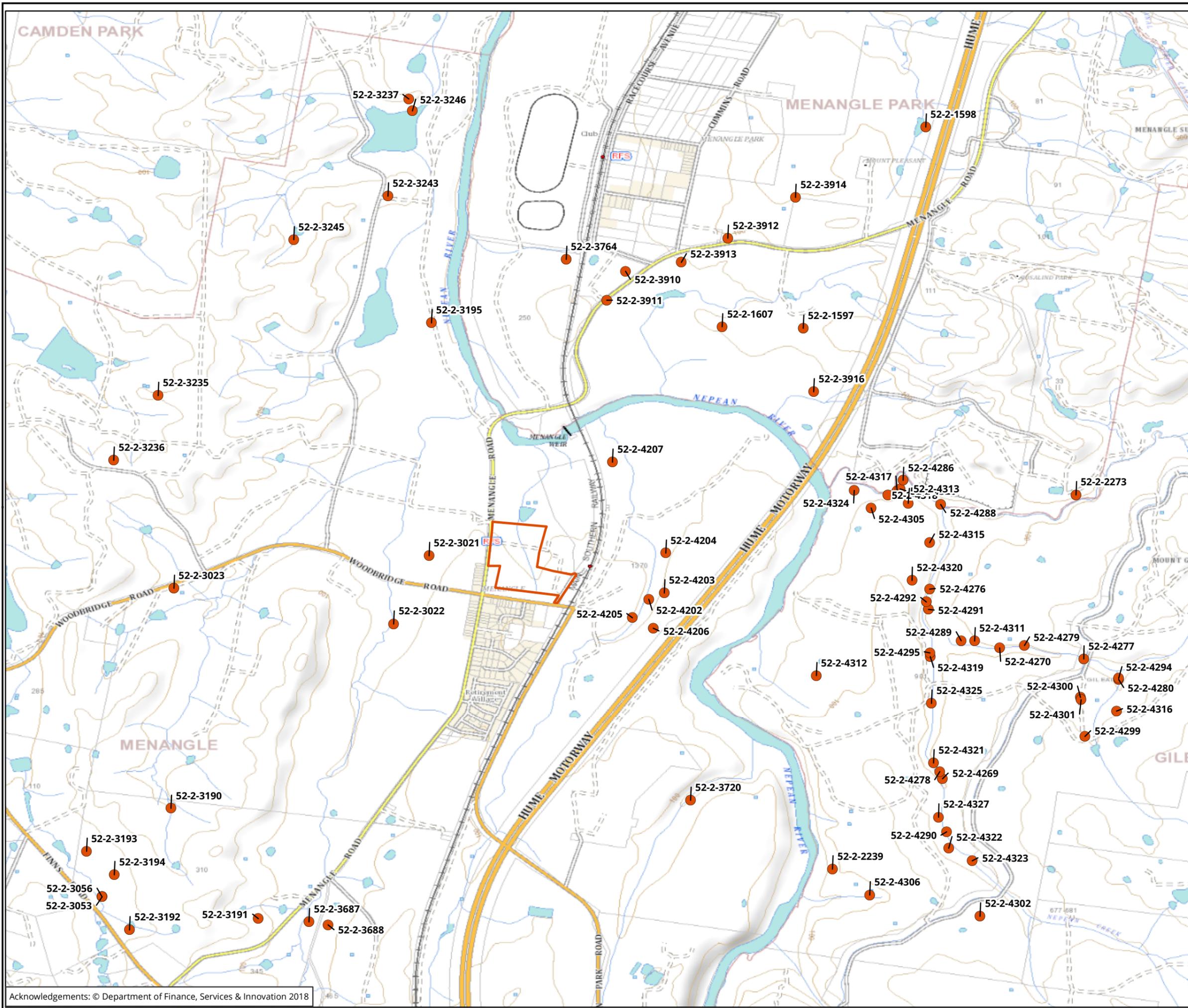
It should be noted that the AHIMS database reflects Aboriginal sites that have been officially recorded and included on the list. Large areas of NSW have not been subject to systematic, archaeological survey; hence AHIMS listings may reflect previous survey patterns and should not be considered a complete list of Aboriginal sites within a given area.

Table 2 AHIMS sites within the study area

Site type	Occurrences	Frequency (%)
Art	1	1.3

Site type	Occurrences	Frequency (%)
Artefact	41	54.7
Artefact, Art, Stone Arrangement	1	1.3
Habitation Structure, PAD	1	1.3
PAD	29	38.7
Scarred Tree	2	2.7
Total	75	100

A simple analysis of the Aboriginal cultural heritage sites registered within 5km of the study area indicates that the dominant site type is artefact representing 54.7% (n=41), with PAD of 38.7% (n=28). Scarred Tree was represented by 2.7% each (n=2). All the sites were located within close proximity to the reliable sources of water, were either exposed by the land clearing works (artefact scatters), in the areas with remnant native vegetation (scarred trees) or within areas of relevant sandstone outcrops for grinding grooves and overhang development (shelters with art/deposit).



Legend

- AHIMS Records
- Study area

Figure 5: AHIMS records near the study area

NOT TO BE MADE PUBLIC

0 210 420 630 840 1,050
Metres
Scale: 1:21,000 @ A3
Coordinate System: GCS GDA 1994

Biosis Pty Ltd
Ballarat, Brisbane, Canberra, Melbourne, Sydney, Wangaratta & Wollongong

3.4 Predictive statements

A series of statements been formulated to broadly predict the type and character of Aboriginal cultural heritage sites likely to exist throughout the study area and where they are more likely to be located.

This model is based on:

- Local and regional site distribution in relation to landform features identified within the study area.
- Consideration of site type, raw material types and site densities likely to be present within the study area.
- Findings of the ethnohistorical research on the potential for material traces to present within the study area;
- Potential Aboriginal use of natural resources present or once present within the study area; and
- Consideration of the temporal and spatial relationships of sites within the study area and surrounding region.

Based on this information, a predictive model has been developed, indicating the site types most likely to be encountered during the survey and subsequent sub-surface investigations across the present study area (Table 3). The definition of each site type is described firstly, followed by the predicted likelihood of this site type occurring within the study area.

Table 3 Aboriginal site prediction statements

Site Type	Site Description	Potential
Flaked Stone Artefact Scatters and Isolated Artefacts	Artefact scatter sites can range from high-density concentrations of flaked stone and ground stone artefacts to sparse, low-density 'background' scatters and isolated finds.	Moderate - High: Stone artefact sites have been previously recorded in the region on level, well-drained topographies in close proximity to reliable sources of fresh water. Due to the distance from permanent fresh water resources, the potential for artefacts to be present within the study area is assessed as moderate.
Shell Middens	Deposits of shells accumulated over either singular large resource gathering events or over longer periods of time.	Low: Shell midden sites have not been recorded within the vicinity of the study area. There is a very low potential for shell middens to be located in the study area
Quarries	Raw stone material procurement sites.	Low: There is no record of any quarries being within or surrounding the study area.
Potential Archaeological Deposits (PADs)	Potential sub surface deposits of cultural material.	Moderate to High: PADs have been previously recorded in the region across a wide range of landforms. PADs are likely to be present within areas adjacent to water courses or on high points in undisturbed landforms.

Site Type	Site Description	Potential
Modified Trees	Trees with cultural modifications	Moderate to low: Scarred trees have been previously recorded within the vicinity of the study area. Due to extensive vegetation clearance only a small number of mature native trees have survived within the study area.
Grinding Grooves	Grooves created in stone platforms through ground stone tool manufacture.	Low: There is no record of any Grinding Grooves being within or surrounding the study area.
Burials	Aboriginal burial sites.	Low: Aboriginal burial sites are generally situated within deep, soft sediments, caves or hollow trees. Areas of deep sandy deposits will have the potential for Aboriginal burials. The soil profiles associated with the study area are not commonly associated with burials.
Rock shelters with art and / or deposit	Rock shelter sites include rock overhangs, shelters or caves, and generally occur on, or next to, moderate to steeply sloping ground characterised by cliff lines and escarpments. These naturally formed features may contain rock art, stone artefacts or midden deposits and may also be associated with grinding grooves.	Low: The sites will only occur where suitable sandstone exposures or overhangs possessing sufficient sheltered space.
Aboriginal Ceremony and Dreaming Sites	Such sites are often intangible places and features and are identified through oral histories, ethnohistoric data, or Aboriginal informants.	Low: There are currently no recorded mythological stories for the study area.
Post-Contact Sites	These are sites relating to the shared history of Aboriginal and non-Aboriginal people of an area and may include places such as missions, massacre sites, post-contact camp sites and buildings associated with post-contact Aboriginal use.	Low: There are no post-contact sites previously recorded in the study area and historical sources do not identify one.
Aboriginal Places	Aboriginal places may not contain any "archaeological" indicators of a site, but are nonetheless important to Aboriginal people. They may be places of cultural, spiritual or historic significance. Often they are places tied to community history and may include natural features (such as swimming and fishing holes), places where Aboriginal political events commenced or particular buildings.	Low: There are currently no recorded Aboriginal historical associations for the study area.

4 Archaeological survey

An archaeological survey of the study area was undertaken by Biosis archaeologists, Lian Flannery and Mathew Smith on 18 April 2018. The survey sampling strategy, methodology and a discussion of results are provided below.

4.1 Archaeological survey aims

The principle aims of the survey were to:

- To undertake a systematic survey of the study area targeting areas with the potential for Aboriginal heritage.
- Identify and record Aboriginal archaeological sites visible on the ground surface.
- Identify and record areas of Aboriginal archaeological and cultural sensitivity.

4.2 Survey methods

The survey was conducted on foot. Recording during the survey followed the archaeological survey requirements of the Code and industry best practice methodology. Information that recorded during the survey included:

- Aboriginal objects or sites present in the study area during the survey.
- Survey coverage.
- Any resources that may have potentially have been exploited by Aboriginal people.
- Landform elements, distinguishable areas of land approximately 40m across or with a 20m radius (CSIRO 2009).
- Photographs of the site indicating landform.
- Ground surface visibility (GSV) and areas of exposure.
- Observable past or present disturbances to the landscape from human or animal activities; and,
- Aboriginal artefacts, culturally modified trees or any other Aboriginal sites.

Where possible, the identification of natural soil deposits within the study area was undertaken. Photographs and recording techniques were incorporated into the survey including representative photographs of survey units, landform, vegetation coverage, ground surface visibility and the recording of soil information for each survey unit were possible. Any potential Aboriginal objects observed during the survey were documented and photographed. The location of Aboriginal cultural heritage and points marking the boundary of the landform elements were recorded using a hand-held Global Positioning System and the Map Grid of Australia (94) coordinate system.

4.3 Constraints to the survey

With any archaeological survey there are several factors that influence the effectiveness (the likelihood of finding sites) of the survey. The factors that contributed most to the effectiveness of the survey within the

study area were ground surface visibility (GSV). The study area has a low GSV due to extensive grass coverage across the study area, and as a result no potential surface sites could be observed during the survey.

4.4 Visibility

In most archaeological reports and guidelines visibility refers to ground surface visibility, and is usually a percentage estimate of the ground surface that is visible and allowing for the detection of (usually stone) artefacts that may be present on the ground surface (DECCW 2010b). Ground surface visibility across the study area was typically low (10%) due to extensive grass covered. Small areas of GSV were present around fencing and gateways, access tracks and areas of animal grazing.



Plate 1 East facing photo of study area showing grass coverage and low visibility

4.5 Exposure

Exposure refers to the geomorphic conditions of the local landform being surveyed, and attempts to describe the relationship between those conditions and the likelihood the prevailing conditions provide for the exposure of (buried) archaeological materials. Whilst also usually expressed as a percentage estimate, exposure is different to visibility in that it is in part a summation of geomorphic processes, rather than a simple observation of the ground surface (Burke and Smith 2004: 79, DECCW 2010b). Overall, the study area displayed limited areas of exposure (0%) due to extensive grass coverage.

4.6 Disturbances

Disturbance in the study area is associated with natural and human agents. Natural agents generally affect small areas and include the burrowing and scratching in soil by animals, such as wombats, foxes, rabbits and wallabies, and sometimes exposure from slumping or scouring. Disturbances associated with recent human action are prevalent in the study area and cover large sections of the land surface. The agents include residential development such as landscaping and construction of residential buildings; farming practices, such as initial vegetation clearance for creation of paddocks, fencing and stock grazing; agricultural practices such as fruit orchards; light industrial practices such as nursery and creation of artificial dams throughout the entire study area.

A number of disturbances were observed in the study area which would have resulted in the removal of topsoil and its replacement with introduced material to varying degrees. The study area has been subject to the construction of a residential dwelling, access roads and associated agricultural structures and activities. Minor surface disturbances caused by cattle grazing were observed.



Plate 2 Photo of dwelling located within the study area



Plate 3 Photo of unsealed, gravelled driveway leading to dwelling.



Plate 4 Photo of sheds located in the study area.

4.7 Survey results and discussion

The archaeological survey was undertaken by two archaeologists and considered of a pedestrian survey that targeted areas of exposure across all landforms in the study area. This method was chosen as the high grass coverage across the study area made it impossible to identify surface artefacts outside of areas of exposure. The extensive grass coverage limited areas of exposure which were expressed as 0%.

A number of disturbances were identified in the eastern and western portions of the study area are associated with a dwelling and agricultural structures. A large portion of the disturbances within the whole of the study area can be attributed to farming practices, such as cattle farming and associated practices.

Background research of the study area revealed that the immediate study area and the areas surrounding were used expansively for farming practices such as, crop farming, dairy farming, sheep and cattle grazing. These practices, over a vast period of time would have subjected the study area to extensive amounts of ground surface disturbances.

5 Conclusions and recommendations

5.1 Conclusions

This assessment did not identify any Aboriginal objects or any areas of archaeological potential. Due to extensive grass coverage the potential to identify any Aboriginal objects was reduced to almost 0%. The site investigation determined that the study area had undergone a moderate to high amount of disturbance which also reduced the potential to identify any Aboriginal objects. Background research indicated that soils were likely to be flood affected due to their fluvial nature, and previous assessment of the study area by MDCA (2014) identified that the study area contained no archaeological sensitivity. This assessment had similar findings to MDCA (2014) and has assessed the potential for Aboriginal archaeological sites to be low in the study area.

As a result of Biosis' assessment, it is concluded that no further investigation of the study area is required. The results of Biosis' assessment is also demonstrated in the due diligence flowchart, provided by the due diligence code of practice (Figure 6).

5.2 Recommendations

The following management recommendations have been developed relevant to the study area and influenced by:

- Predicted impacts to Aboriginal cultural heritage.
- The planning approvals framework.
- Current best conservation practise, widely considered to include:
 - Ethos of the Australia ICOMOS Burra Charter (2013)
 - The code

Prior to any impacts occurring within the study area, the following is recommended:

Recommendation 1: No further archaeological assessment is required

No further archaeological work is required in the study area due to the entire study area assessed as having low archaeological potential.

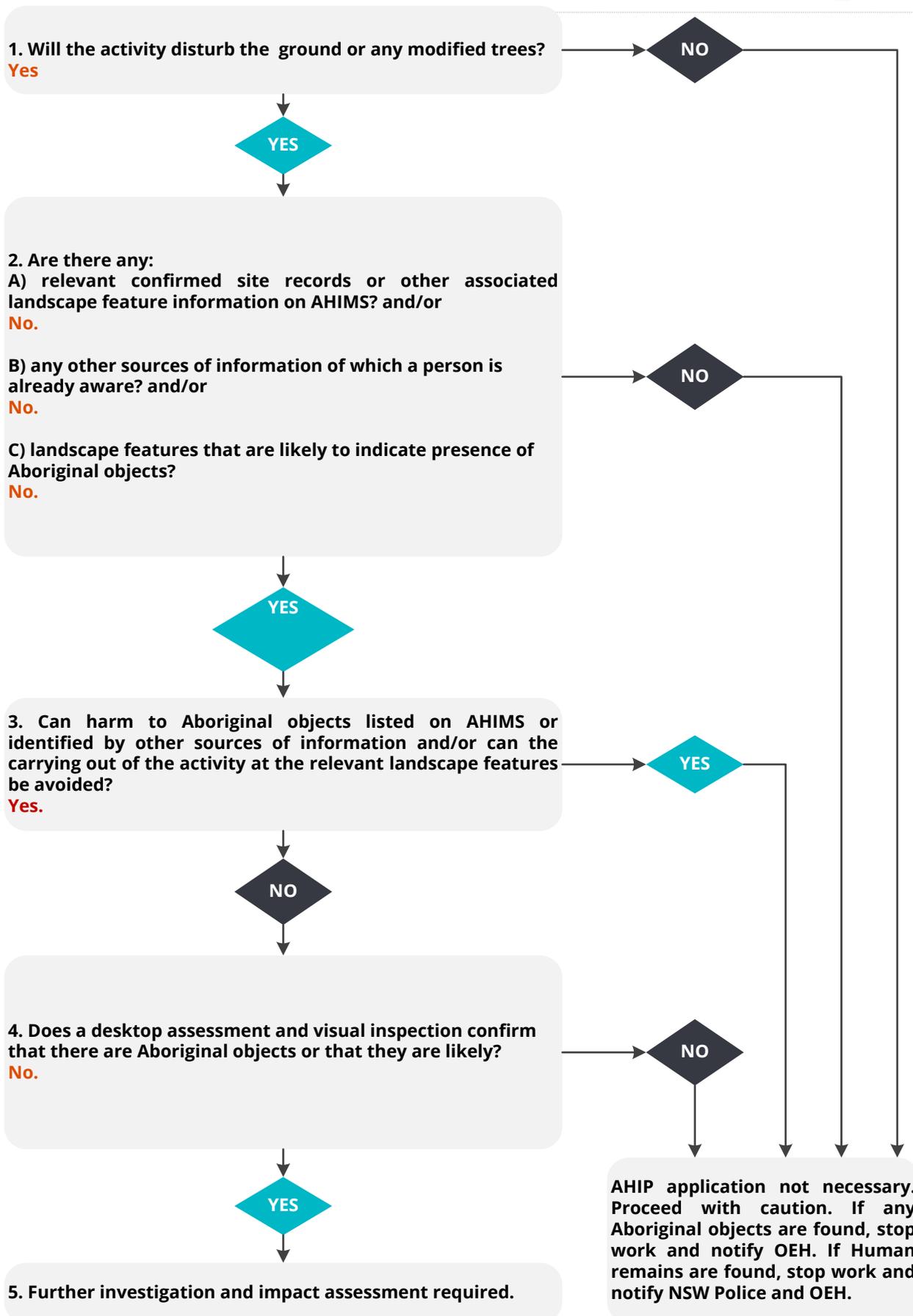
Recommendation 2: Discovery of Unanticipated Aboriginal Objects

All Aboriginal objects and Places are protected under the NSW National Parks and Wildlife Act 1974. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage (OEH). Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders.

Recommendation 3: Discovery of Aboriginal Ancestral Remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

4. Immediately cease all work at that location and not further move or disturb the remains
5. Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location
6. Not recommence work at that location unless authorised in writing by OEH.



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Appendices

Appendix 1 AHIMS search results

This Appendix is not to be made public.



SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
52-2-1597	Menangle Park 1; Contact	AGD	56	292890	6222870	Open site	Valid	Artefact : -	Open Camp Site	2038,2149
52-2-1598	Menangl Park 2; Contact	GDA	56	293574	6224269	Open site	Valid	Artefact : -	Open Camp Site	2038,2149
52-2-1607	Menangle Park 3; Contact	AGD	56	292490	6222870	Open site	Valid	Artefact : -	Open Camp Site	2149
52-2-3193	Wandinong 6 Contact T Russell	AGD	56	289417	6219684	Open site	Valid	Artefact : 2		
52-2-4202	SSM4 Contact	GDA	56	292267	6221433	Open site	Valid	Habitation Structure : -, Potential Archaeological Deposit (PAD) : -		
52-2-4203	SSM3 Contact	GDA	56	292343	6221472	Open site	Valid	Artefact : -		
52-2-4204	SSM2 Contact	GDA	56	292345	6221709	Open site	Valid	Artefact : -		
52-2-4205	SSM1 Contact	GDA	56	292189	6221321	Open site	Valid	Artefact : -		
52-2-4206	SSM PAD2 Contact	GDA	56	292293	6221262	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
52-2-4207	SSM PAD1 Contact	GDA	56	292070	6222244	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
52-2-3021	PAD1 Contact	AGD	56	291071	6221478	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
52-2-3022	PAD2 Mt Taurus Contact	AGD	56	290905	6221068	Open site	Valid	Potential Archaeological Deposit (PAD) : -		1915,1992
52-2-3023	IF1 Mt Taurus Contact	AGD	56	289814	6221256	Open site	Valid	Artefact : 1		1915

Report generated by AHIMS Web Service on 10/04/2018 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 289569 - 294569, Northings : 6219431 - 6224431 with a Buffer of 50 meters. Additional Info : To find is there are any sites within the study area. Number of Aboriginal sites and Aboriginal objects found is 75

This information is not guaranteed to be free from error omission. Office of Environment and 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
52-2-3720	Bulli Site 40	AGD	56	292395	6220053	Closed site	Valid	Art (Pigment or Engraved) : 1		
	Contact									Permits
52-2-3687	Bulli Site 7	AGD	56	290526	6219289	Open site	Valid	Artefact : 1		
	Contact									Permits
52-2-3688	Bulli Site 8	AGD	56	290621	6219273	Open site	Valid	Artefact : 1		
	Contact									Permits
52-2-3910	MPRP 3 Menangle Park Rezoning Project 3	AGD	56	292004	6223189	Open site	Valid	Artefact : 5		
	Contact									Permits
52-2-3911	MPRP 4 Menangle Park Rezoning Project 4	AGD	56	291915	6223016	Open site	Valid	Artefact : -		
	Contact									Permits
52-2-3912	MPRP 5 Menangle Park Rezoning Project 5	AGD	56	292506	6223397	Open site	Valid	Artefact : -		
	Contact									Permits
52-2-3913	MPRP 6 Menangle Park Rezoning Project 6	AGD	56	292279	6223248	Open site	Valid	Artefact : 3		
	Contact									Permits
52-2-3914	MPRP 7 Menangle Park Rezoning Project 7	GDA	56	292940	6223837	Open site	Valid	Artefact : 5		
	Contact									Permits
52-2-3916	MPRP 9 Menangle Park Rezoning Project 9	AGD	56	292951	6222494	Open site	Valid	Artefact : 6		
	Contact									Permits
52-2-2239	NEPEAN RIVER NO.8	AGD	56	293106	6219660	Closed site	Valid	Artefact : -		
	Contact									Permits
52-2-2273	RP2.	AGD	56	294260	6221910	Open site	Valid	Artefact : 30		
	Contact									Permits
52-2-3190	WG1, Wandinong	AGD	56	289829	6219948	Open site	Valid	Artefact : 1		
	Contact T Russell									Permits
52-2-3191	WG6, Wandinong	AGD	56	290275	6219303	Open site	Valid	Artefact : 1		
	Contact T Russell									Permits
52-2-3192	WG5, Wandinong	AGD	56	289640	6219222	Open site	Valid	Artefact : 3		
	Contact T Russell									Permits
52-2-3053	WG4 Wandinong (Unavailable)	AGD	56	289500	6219414	Open site	Valid	Artefact : -		
	Contact									Permits 2310
52-2-3194	Wandinong 5	AGD	56	289558	6219548	Open site	Valid	Artefact : 1		
	Contact T Russell									Permits
52-2-3195	EM13	AGD	56	291052	6222862	Open site	Valid	Artefact : 9		
	Contact T Russell									Permits

Report generated by AHIMS Web Service on 10/04/2018 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 289569 - 294569, Northings : 6219431 - 6224431 with a Buffer of 50 meters. Additional Info : To find is there are any sites within the study area. Number of Aboriginal sites and Aboriginal objects found is 75

This information is not guaranteed to be free from error omission. Office of Environment and 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
52-2-3056	WG4	AGD	56	289500	6219414	Open site	Valid	Artefact : 3		
	Contact Searle	Recorders Doctor.Julie Dibden								Permits
52-2-3243	CP - OS - 11	AGD	56	290820	6223610	Open site	Valid	Artefact : -		
	Contact Searle	Recorders Mr.Phil Hunt								Permits
52-2-3245	CP - ST - 09	AGD	56	290360	6223340	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact Searle	Recorders Mr.Phil Hunt						-		Permits
52-2-3246	CP - ST - 08	AGD	56	290930	6224120	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact T Russell	Recorders Mr.Phil Hunt						-		Permits
52-2-3235	CP - IF - 02	AGD	56	289710	6222400	Open site	Valid	Artefact : -		
	Contact T Russell	Recorders Mr.Phil Hunt								Permits
52-2-3236	CP - IF - 03	AGD	56	289500	6222010	Open site	Valid	Artefact : -		
	Contact T Russell	Recorders Mr.Phil Hunt								Permits
52-2-3237	CP - OS - 21	AGD	56	290910	6224190	Open site	Valid	Artefact : -		
	Contact Searle	Recorders Mr.Phil Hunt								Permits
52-2-3764	MPP-01-10	GDA	56	291814	6223443	Open site	Valid	Artefact : 1		
	Contact	Recorders AECOM Australia Pty Ltd (previously HLA-Envirosciences),						Artefact - Cultural Herit	Permits 3226,3645,3686	
52-2-4317	MG PAD33	GDA	56	293481	6222103	Closed site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes								Permits
52-2-4318	MG PAD34	GDA	56	293435	6222077	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes								Permits
52-2-4319	MG PAD41	GDA	56	293665	6221123	Closed site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes								Permits
52-2-4320	MG PAD36	GDA	56	293565	6221574	Closed site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes								Permits

Report generated by AHIMS Web Service on 10/04/2018 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 289569 - 294569, Northings : 6219431 - 6224431 with a Buffer of 50 meters. Additional Info : To find is there are any sites within the study area. Number of Aboriginal sites and Aboriginal objects found is 75

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
52-2-4321	MG PAD39	GDA	56	293696	6220492	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4322	MG PAD38	GDA	56	293782	6219987	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4323	MG PAD37	GDA	56	293900	6219914	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4324	MG PAD35	GDA	56	293268	6222102	Open site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4325	MG PAD40	GDA	56	293678	6220846	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4326	MG PAD32	GDA	56	293495	6222115	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4269	MG PAD27	GDA	56	293742	6220399	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4270	MG PAD21	GDA	56	294007	6221183	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4276	MG PAD25	GDA	56	293654	6221524	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4277	MG PAD19	GDA	56	294424	6221125	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
52-2-4278	MG PAD28	GDA	56	293728	6220440	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4279	MG PAD20	GDA	56	294129	6221199	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4280	MG PAD17	GDA	56	294599	6221007	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4286	MG PAD31	GDA	56	293509	6222167	Open site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4288	MG PAD30	GDA	56	293698	6222028	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4289	MG PAD22	GDA	56	293816	6221221	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4290	MG PAD26	GDA	56	293770	6220084	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4291	MG PAD23	GDA	56	293650	6221404	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4292	MG PAD24	GDA	56	293639	6221448	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							
52-2-4294	MG PAD18	GDA	56	294599	6221015	Closed site	Valid	Potential Archaeological Deposit (PAD) :-		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes							

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports	
52-2-4295	MG PAD29	GDA	56	293664	6221145	Closed site	Valid	Potential Archaeological Deposit (PAD) :-			
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd, Mrs. Nicola Hayes						Permits		
52-2-4299	MGA4	GDA	56	294440	6220666	Open site	Valid	Artefact : 1			
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
52-2-4300	MGA5	GDA	56	294414	6220897	Open site	Valid	Artefact : 1			
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
52-2-4301	MGA6	GDA	56	294416	6220882	Open site	Valid	Artefact : 1			
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
52-2-4302	MGA7	GDA	56	293946	6219586	Open site	Valid	Artefact : 1			
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
52-2-4305	MGA10	GDA	56	293354	6222000	Open site	Valid	Artefact : 1			
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
52-2-4306	MGA11	GDA	56	293397	6219700	Open site	Valid	Artefact : 1			
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
52-2-4311	MGA19	GDA	56	293883	6221221	Open site	Valid	Artefact : 1			
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
52-2-4312	MGA21	GDA	56	293105	6220997	Open site	Valid	Artefact : 1			
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
52-2-4313	MGA22	GDA	56	293536	6222031	Open site	Valid	Artefact : 1			
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
52-2-4315	MGA23	GDA	56	293647	6221800	Open site	Valid	Artefact : 1			
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
52-2-4316	MGA25	GDA	56	294594	6220819	Open site	Valid	Artefact : 1			
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
52-2-4327	MGA20	GDA	56	293727	6220170	Open site	Valid	Artefact : 1, Art (Pigment or Engraved) : 1, Stone Arrangement : 1			
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		

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