



**80 SILVERDALE ROAD  
THE OAKS, NEW SOUTH WALES**

**ABORIGINAL CULTURAL HERITAGE DUE DILIGENCE ASSESSMENT**

**PREPARED FOR: MR & MRS NOCERA, C/- PROFICIENT CONSTRUCTIONS (AUST) PTY LTD**

**18 April 2024**

## DOCUMENT INFORMATION

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### PROJECT DETAILS

**Project:** 80 Silverdale Road, The Oaks

**Client:** Mr & Mrs Nocera, C/- Proficient Constructions (Aust) Pty Ltd

**Service:** Aboriginal Cultural Heritage Due Diligence Assessment

**Authors:** Felicity Smolenaers, Jake Allen

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## **ACKNOWLEDGEMENT OF COUNTRY**

We respect and acknowledge the First Nations Peoples of the lands and waterways on which we live and work, their rich cultural heritage, and their deep connection to Country, and we acknowledge their Elders past and present.

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Aboriginal and Torres Strait Islander readers are advised that this report may contain images or names of First Nations people who have passed away.



**AUSTRAL**  
ARCHAEOLOGY

## EXECUTIVE SUMMARY

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This report has been prepared for Mr & Mrs Nocera, C/- Proficient Constructions (Aust) Pty Ltd (the Client) and details the results of an Aboriginal Cultural Heritage Due Diligence Assessment (ACHDDA) prepared for land situated in 80 Silverdale Road, The Oaks, New South Wales (NSW) [the study area], within the Wollondilly Shire Local Government Area (LGA), and the boundaries of the Tharawal Local Aboriginal Land Council.

This ACHDDA was undertaken to assess the likelihood for Aboriginal cultural material or objects to be present within the study area, and the potential for any such materials to be impacted as a part of the proposed works to be undertaken. It is understood that this assessment has been completed to assist a planning proposal completed under Part 3 of the *Environmental Planning and Assessment Act 1979*, which will facilitate the subsequently proposed subdivision and development of the study area under Part 4 of the same Act.

This ACHDDA has been undertaken in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010a) [the Code]. As requested by the Client, this report has been completed in advance of an Aboriginal Cultural Heritage Assessment (ACHA), in order to assist council in their assessment of the planning proposal until the ACHA is fully completed.

### ASSESSMENT OF ARCHAEOLOGICAL POTENTIAL

A search of the Aboriginal Heritage Information Management System (AHIMS) identified 117 previously recorded sites within a 10-kilometre radius of the study area. None of these sites were located within any portion of the study area. Many of the AHIMS sites are artefacts, with art and modified trees also being common.

Background research suggested that no other archaeological assessments have been undertaken within the study area; however, a several such assessments are noted to have been undertaken within the suburbs surrounding the Oaks.

A survey of the study area was conducted on 12 March 2024 by Austral staff member, with assistance from members of the local Aboriginal community. The survey comprised pedestrian transects over the proposed development footprint. Several prior disturbances of varying impact were identified throughout. It was concluded that there was moderate potential for subsurface archaeological deposits throughout much of the surveyed landscape; down to low across the access tracks, drainage, spoil pile, and berm. Members of the Aboriginal community did not advise archaeologists on-site of any intangible cultural heritage within this zone.

### CONSIDERATION OF DUE DILIGENCE PROCESS

This assessment has determined that using the steps outlined in the Code is an acceptable means of determining the potential for the proposed works to impact on any Aboriginal cultural material which may be present within the study area. The following table summarises the steps undertaken in accordance with the Code.



**Table 1**      **Consideration of key steps in the Code in relation to the study area/ proposed works.**

|   |  |
|---|--|
| Step 1: Will the activity disturb the ground surface or any culturally modified trees?  | The proposed rezoning will not disturb the ground surface or impact any culturally modified trees; however, the subsequent planned development will involve ground-disturbance activities.   |
| Step 2a: Search the Aboriginal Heritage Information Management System (AHIMS) Database and use any other sources of information of which you are already aware. | A search of the AHIMS database identified no sites within the study area. A search of the surrounding area identified 117 previously recorded sites in the vicinity of the proposed works.   |
| Step 2b: Activities in areas where landscape features indicate the presence of Aboriginal objects.  | <p>The study area is primarily over a ridgeline with exceptional east-facing views, affording views well into Sydney proper. While there is evidence of several disturbance events, these are of varying impact and relatively localised to their respective zones.</p> <p>The predictive statements included in this step indicate that the study area contains topographic elements where Aboriginal objects or places are likely to occur.</p>        |
| Step 3: Can you avoid harm to the object or disturbance of the landscape feature?   | It is understood that no Aboriginal cultural objects have been identified to date and that no harm is planned for the landscape under the proposed rezoning of the study area; however, this is being undertaken to facilitate the subdivision and development of the property under Part 4 of the EPA Act. These activities will include disturbances to the landscape, including bulk earthworks and the installation of utilities and infrastructure. |
| Step 4: Desktop assessment and visual inspection.   | It was concluded that there was moderate potential for subsurface archaeological deposits throughout much of the surveyed landscape; down to low across the access tracks, drainage, spoil pile, and berm.   |
| Step 5: Further investigations and impact assessment.   | Based upon the outcome of steps 1 to 4 of the Code, further assessment is not warranted at this stage of the project.  |



## RECOMMENDATIONS

Based upon the outcome of steps 1 to 4 of the Code, further assessment is not warranted at this stage. This is based on the lack of associated impacts associated with the proposed rezoning. The following recommendations apply:

1. The proposed rezoning may proceed with caution.
2. No aspect of the subsequently proposed development works should commence prior to the completion of the forthcoming ACHA.
  - a. As areas with moderate potential to contain subsurface artefacts have been identified within the study area, no ground disturbing works should be undertaken prior to a program of archaeological testing. This will need to comply with the Code of Practice for Archaeological Investigation for Aboriginal sites in NSW (DECCW 2010b).
3. All Aboriginal objects and Places are protected in the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by Heritage NSW. In the event that any Aboriginal cultural heritage finds occur during any stage of works associated with this proposal:
  - a. Works must cease in the vicinity of the find, and this should not be moved until assessed by a qualified archaeologist.
    - i. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. This may include notifying Heritage NSW and Aboriginal stakeholders.
4. 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:
  - a. Immediately cease all works at that location and not further move or disturb the remains.
  - b. Notify the NSW Police and Heritage NSW's environmental line on 131 555 as soon as practicable, providing details of the remains and their location.
  - c. Not recommence work at that location unless authorised in writing by Heritage NSW.

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# 1. INTRODUCTION

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Austral Archaeology Pty Ltd (Austral) has been engaged by Mr and Mrs Nocera, C/- Proficient Constructions (Aust) Pty Ltd [the Client] to prepare an Aboriginal Cultural Heritage Due Diligence Assessment (ACHDDA) for the proposed rezoning of 80 Silverdale Road, The Oaks, New South Wales (NSW) [the study area]. It is understood that this assessment has been completed to assist a planning proposal completed under Part 3 of the *Environmental Planning and Assessment Act 1979*, which will facilitate the subsequently proposed subdivision and development of the study area under Part 4 of the same Act.

The study area consists of the entirety of 80 Silverdale Road, The Oaks, NSW, and is defined by the boundaries of Lot 3, DP1201486. It is located approximately 78 kilometres from the township of Sydney, within the Wollondilly Shire Council Local Government Areas (LGA), in the parish of Werombi and the county of Camden. It is also within the boundaries of the Tharawal Local Aboriginal Council (TLALC).

This advice is intended to assist the client in determining their obligations with regard to the *National Parks and Wildlife Act 1974* (NPW Act) and to determine whether the project will involve activities that may harm Aboriginal objects or places. As requested by the Client, this report has been completed in advance of an Aboriginal Cultural Heritage Assessment (ACHA), in order to assist council in their assessment of the planning proposal until the ACHA is fully completed.

The location of the proposed works are shown in Figure 1.1 and Figure 1.2.

## 1.1. ASSESSMENT OBJECTIVES

Section 87 of the NPW Act makes it a strict liability offence to knowingly or unknowingly harm Aboriginal objects or declared Aboriginal places without an Aboriginal Heritage Impact Permit (AHIP). Section 5 of the NPW Act defines harm as:

*any act or omission that – (a) destroys, defaces or damages the object or place or (b) in relation to an object, moves the object from the land on which it had been situated.*

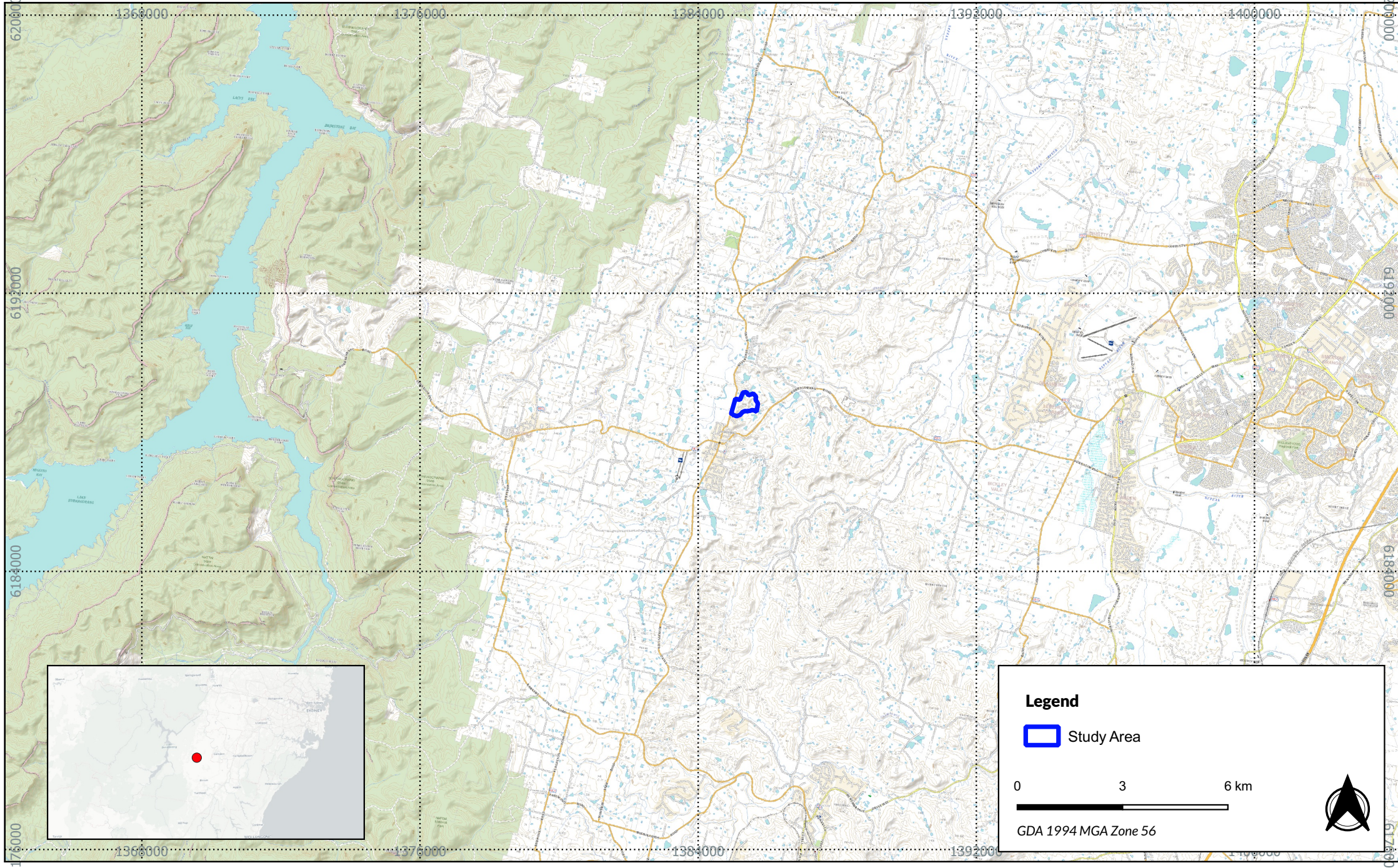
The NPW Act allows for a person or organisation to exercise due diligence in determining whether their actions will, or are likely to, impact upon Aboriginal objects or places. Any person or organisation who can demonstrate that they have exercised due diligence has a defence against prosecution under the strict liability provisions of the NPW Act. Where an activity is likely to harm Aboriginal objects or places, consent in the form of an AHIP is required.

The *National Parks and Wildlife Regulation 2009* (NPW Regulation) adopted the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010a) [the Code], which sets out the reasonable and practicable steps which individuals and organisations need to take in order to:

- Identify whether Aboriginal objects are, or are likely to be, present within the study area.
- If Aboriginal objects are, or are likely to be present, determine whether their activities are likely to cause harm.
- Determine whether further assessment or an AHIP application is required for the activity to proceed.

This advice has been formulated to provide a robust assessment that will identify whether Aboriginal objects or places are present, or are likely to be present, within the study area. This has been achieved by the completion of a desktop review and archaeological survey of the study area. An overview of the archaeological context of the site is presented in Section 2 of this assessment, and the due diligence questions are addressed in Section 4.





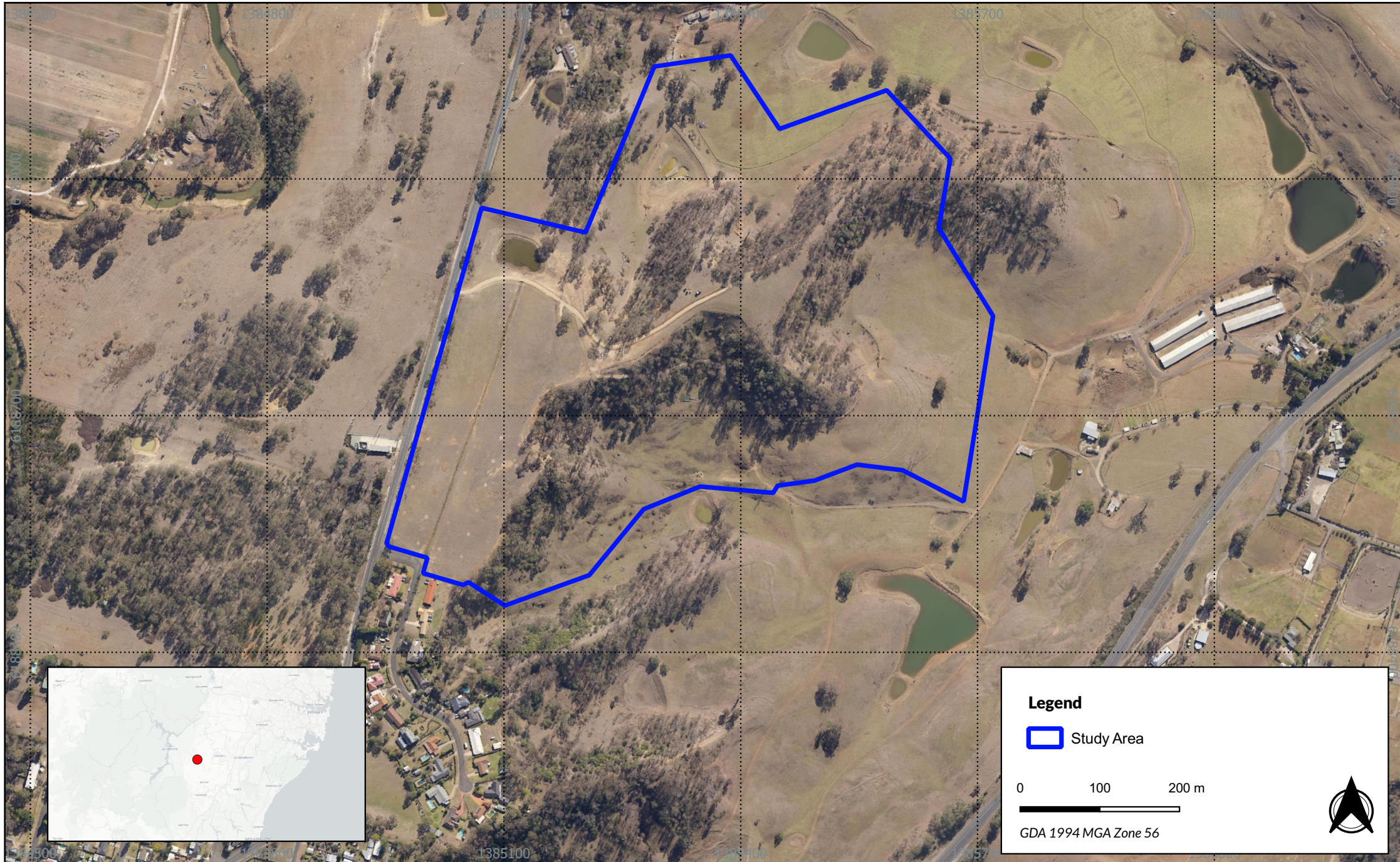
**Figure 1.1 - Location of the study area**

24004 - 80 Silverdale Road, The Oaks, NSW 2570 - ACHDDA

Source: NSW LPI Basemap, CartoDB Positron

Drawn by: ARH Date: 2024-02-16





**Figure 1.2 - Detailed aerial of the study area**  
24004 - 80 Silverdale Road, The Oaks, NSW 2570 - ACHDDA  
Source: NSW LPI Aerial, CartoDB Positron

Drawn by: ARH Date: 2024-02-16



## 1.2. PROJECT TEAM AND QUALIFICATIONS

The following personnel have been involved in the preparation of this ACHDDA.

### **JAKE ALLEN (GRAD DIP. ARCHAEOLOGY AND HERITAGE MANAGEMENT, MASTER OF MARITIME ARCHAEOLOGY [IN PROGRESS], BCMS, BA)**

Jake is an archaeologist with Austral specialising in maritime and historical cultural heritage. He has carried out several projects across NSW, Victoria, South Australia, and the Australian Capital Territory; as well as undertaking assessments on internationally significant monuments and sites. Jake's experience includes project management, report-writing, the production of predictive models, and the carrying out of archaeological surveys and excavations.

### **FELICITY SMOLENAERS (B. ARCHAEOLOGY)**

Felicity is a Graduate Archaeologist at Austral and has over 3 years' experience in the completion of both Aboriginal and Historical projects. Felicity has Heritage Advisor status with First Peoples-State Relations (FP-SR). Felicity has experience in consultation, background research and report writing for ACHAs, ACHDDAs, Cultural Heritage Management Plans and Preliminary Historical Heritage Assessments. She also has experience in excavation, Aboriginal and historical surveys, cataloguing and sorting historical artefacts, and Aboriginal lithic analysis. She has also been a member of the international archaeological team at Tell el Timai, Egypt.

### **AMANDA MARKHAM (BA [HONS], PhD ANTHROPOLOGY, GRAD CERT. ARCHAEOLOGY)**

Amanda is Principal Archaeologist/Team Leader - West at Austral. She has 25 years' experience as both an anthropologist and archaeologist working on major infrastructure projects across NSW, Vic, the NT, SA and WA. Amanda specialises in Aboriginal anthropology and archaeology, with a focus on arid region archaeology and skeletal remains. She has conducted hundreds of heritage assessments under state and territory legislation, NSW Due Diligence Code, the NSW Code of Practice, the NT Sacred Sites Act, as well as the SA and WA heritage act, successfully obtaining AHIPs and Permits to Disturb/Impact.

Amanda has reviewed this report for quality assurance and technical adequacy and provided input into the management recommendations.

### 1.3. ABBREVIATIONS

The following are common abbreviations that are used within this report:

|                |   |
|----------------|---|
| ACHA           | Aboriginal Cultural Heritage Assessment   |
| ACHDDA         | Aboriginal Cultural Heritage Due Diligence Assessment                                     |
| AHIMS          | Aboriginal Heritage Information Management System   |
| AHIP           | Aboriginal Heritage Impact Permit   |
| Austral        | Austral Archaeology Pty Ltd   |
| Burra Charter  | <i>Burra Charter: Australia ICOMOS Charter for Places of Cultural Significance 2013</i>   |
| Client, the    | Proficient Constructions (Aust) Pty Ltd.  |
| Code, the      | <i>The Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW</i> |
| EPA Act        | <i>Environmental Planning and Assessment Act 1979</i>                                     |
| EPBC Act       | <i>Environmental Protection and Biodiversity Act 1999</i>                                 |
| FGS            | Fine-grained siliceous material   |
| ICOMOS         | International Council on Monuments and Sites  |
| LGA            | Local Government Areas  |
| Navin Officer  | Navin Officer Archaeological Resource Management  |
| NPW Act        | <i>National Parks and Wildlife Act 1974</i>   |
| NPW Regulation | <i>National Parks and Wildlife Regulation 2009</i>  |
| NSW            | New South Wales   |
| PAD            | Potential Archaeological Deposit  |
| Study Area     | Lot 3, DP1201486, 80 Silverdale Road, The Oaks, New South Wales                           |
| TLALC          | Tharawal Local Aboriginal Land Council  |

## 2. ARCHAEOLOGICAL OVERVIEW

This section serves to provide a summary of previous heritage studies that are relevant to the study area, as well as the results of a search for previously known sites of Aboriginal cultural heritage either within or in close proximity of the study area in order to understand the regional context of how Aboriginal people occupied the land surrounding the study area. This will assist in determining the potential for the study area to contain Aboriginal cultural material which may be affected by the proposed works.

### 2.1. AHIMS DATABASE SEARCH

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) database was conducted on 13 February 2024 (Client service ID: 863833). The search identified 117 Aboriginal archaeological sites within a 10-kilometre search radius of the study area (Table 2.1 and Figure 2.1). None of these registered sites are located within the study area. The mapping coordinates recorded for these sites were checked for consistency with their descriptions and location on maps from Aboriginal heritage reports, if available. Where notable discrepancies occurred, these descriptions and maps were considered the determinant for site location.

Spatial information for this report is displayed using the GDA94 Datum. Where AHIMS site records were provided on a different datum, they were converted using standard functions in QGIS software.

**Table 2.1 AHIMS sites identified within a 10-kilometre radius of the study area.**

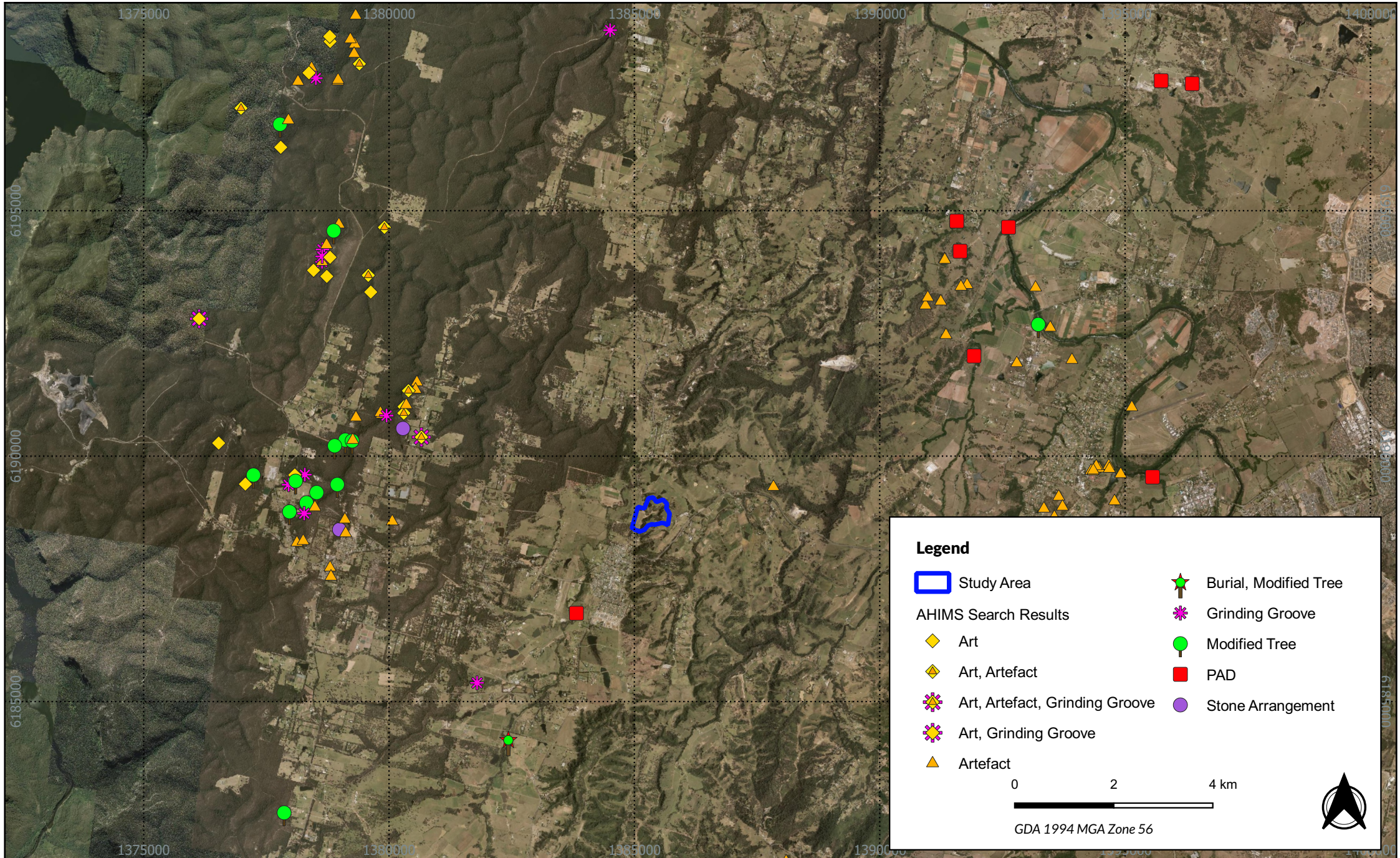
| Site Feature Type                          | Occurrence | Frequency (%) |
|--|------------|---------------|
| Artefact                                   | 59         | 50.43%        |
| Art (Pigment or Engraved)                  | 14         | 11.96%        |
| Modified Tree (Carved or Scarred)          | 13         | 11.12%        |
| Grinding Groove                            | 12         | 10.26%        |
| Potential Archaeological Deposit (PAD)     | 8          | 6.84%         |
| Artefact; Art (Pigment or Engraved)        | 7          | 5.98%         |
| Stone Arrangement                          | 2          | 1.71%         |
| Burial; Modified Tree (Carved or Scarred)  | 1          | 0.85%         |
| Art (Pigment or Engraved); Grinding Groove | 1          | 0.85%         |
| <b>TOTAL</b>                               | <b>117</b> | <b>100%</b>   |

Table 2.1 identifies the most common site types recorded within 10 kilometres of the study area. Looking at individual site components (n=126) rather than the number of sites (n=117), artefacts make up 52.38% (n=66) of the known sites within the search area, suggesting that there is a higher possibility of identifying artefacts than any other site type. Art sites are the next most commonly occurring site, (17.46%, n=22), followed by modified trees (11.11%, n=14), and grinding grooves (10.32%, n=13).

The closest sites to the study area are:

- AHIMS #52-2-1221 (Flaggy Creek 1), an artefact site approximately 2.5 kilometres east from the centre of the study area; and
- AHIMS #52-2-4670 (OA-PAD-2020-01) a PAD site, also located approximately 2.5 kilometres south-west from the centre of the study area.





**Figure 2.1 - AHIMS search results within 10km of the study area**

24004 - 80 Silverdale Road, The Oaks, NSW 2570 - ACHDDA

Source: NSW LPI Aerial

Drawn by: ARH Date: 2024-02-16



## 2.2. LOCAL ARCHAEOLOGICAL CONTEXT

Archaeological investigations of The Oaks region are generally conducted as a part of development assessments, including mining and residential proposals, or in response to proposed impacts to cultural heritage. The limited ethnographic accounts of early settlers and explorers were once considered the primary source for archaeological inquiry. However, with the recent spread of urban development within the Sydney Basin environs, archaeological investigations have increased accordingly.

The major studies which have contributed to our understanding of The Oaks region and those with direct relevance to the study area are outlined in Table 2.2. Reference is made to the main trends garnered from these investigations which serve to provide a broad framework on which to base the current study.

**Table 2.2 Archaeological studies undertaken in the vicinity of the study area.**

| Reference      | Details  |
|----------------|--|
| Koettig (1987) | <p>This report was commissioned by Geophysical Exploration Services on behalf of Australian Gaslight Ltd for the survey of three seismic reflection routes in the Camden Picton region. The pedestrian survey covered 6 locations across 3 routes and used a vibro-seismic machine to test the underlying geology of the area. No disturbance to the ground surface occurred. The landscape had predominantly been cleared, and the archaeological survey was specifically conducted on areas where major equipment could access the lands.</p> <p>The geology of the region identified included the Wianamatta Shale group, quaternary alluvium, Hawkesbury Sandstone and the Narrabeen Group.</p> <p>One new Aboriginal site, FC1 (AHIMS #52-2-1221), was identified and recorded during the survey. This is noted to be within the Wianamatta Shale geological group. The associated geology is characterised by narrow, steep-sided hills.</p> <p>FC1 (AHIMS #52-2-1221) is a rock shelter with occupational deposits. It measures 12 metres long × 5 metres; with an entrance approximately 3 metres high from track to dripline. Koettig noted that the site had been destroyed by the development of a track that passes directly in front of the shelter, and that any archaeological deposits were removed with the levelling of the track.</p> <p>A single isolated artefact was located on the slope of the truncated deposit, a small silcrete broken flake.</p> |
| Navin (1993)   | <p>Navin Officer Archaeological Resource Management (Navin Officer) was commissioned to complete an archaeological survey on the proposed eastern coal mining area of the Oakdale Coal Mine, approximately 6.9 kilometres west of the current study area. A total area of 414 hectares was surveyed on a steeply incised plateau landscape. The survey methodology focused on landform features identified as exhibiting heightened risk of impact from the proposed mining activities. This included:</p> <ul style="list-style-type: none"> <li>• rock exposures such as sandstone scarps;</li> <li>• boulder overhangs;</li> <li>• shelters; and</li> <li>• benches.</li> </ul> <p>The survey resulted in the identification and recording of 12 Aboriginal sites and 16 sites of PAD:</p> <ul style="list-style-type: none"> <li>• 4 shelters containing art;</li> <li>• 3 grinding grooves;</li> <li>• 2 shelters containing art and artefact deposits;</li> <li>• 2 artefact scatters; and</li> <li>• 1 shelter containing an artefact deposit.</li> </ul> <p>The raw materials identified across these deposits included quartzite, silcrete, chert, quartz (milky and crystal) and silicified wood. Site density was calculated at one site per 110 hectares, and one PAD per 17 hectares, with the shelter sites occurring close to the plateau break-of-slope, adjacent to tributary valleys or ridgelines.</p>  |

| Reference               | Details  |
|-------------------------|--|
| Navin (1994)            | <p>Clutha Limited commissioned Navin Officer to complete an archaeological assessment at the eastern coal mining reserves of the Oakdale Coal Mine for:</p> <ul style="list-style-type: none"> <li>Longwall Mining Application Area A-1; and</li> <li>Longwall Mining Application Area B-1</li> </ul> <p>This assessment was undertaken approximately 5.8 kilometres west-southwest of the current study area. This report follows on from Navin's (1993) survey report.</p> <p>Study area A-1 was 14 hectares located on dissected plateau landforms of both the Wianamatta Shale and Hawkesbury Sandstone geological units. In contrast, study area B-1 was bisected by a ridgeline that formed the watershed between Horse Creek and Back Creek.</p> <p>A pedestrian survey was conducted over both study areas and resulted in the identification and recording of 3 Aboriginal sites: a scarred tree (n=1), artefact scatter (n=1), and a shelter with occupational deposit and art (n=1); as well as 6 PADs. The raw materials identified in the scatters and deposits included chert and quartz (milky and crystal).</p> <p>A combined site density was calculated at 1 site per 58 hectares.</p> |
| Navin (1995)            | <p>Navin Officer was commissioned to complete an archaeological survey on coal mining areas 1 and 2 of the Brimstone Colliery, located approximately 10 kilometres northwest of the current study area.</p> <p>A total area of 105 hectares was surveyed on a moderate-steeply incised plateau landscape. The survey methodology employed targeted landform features identified as being at risk due to the proposed works. This included rock exposures such as sandstone scarps, boulder overhangs, shelters, and benches.</p> <p>The survey resulted in the identification and recording of 2 Aboriginal sites: a scarred tree (n=1), and shelter with art (n=1); as well as 2 PADs.</p> <p>A site density was calculated of 1 site per 57 hectares for Brimstone Area 1 and 1 site per 48 hectares for Brimstone Area 2. When placed in a regional context, these sites are comparable to others recorded during the larger Longwall Mining archaeological assessments.</p>  |
| Navin and Knight (1997) | <p>This report forms part of a series of archaeological surveys that were completed in the eastern coal reserves area of the Oakdale and Brimstone Collieries (Navin 1993, 1994, 1995). Area C is the focus of this assessment, located approximately 7 kilometres west of the current study area.</p> <p>The Oakdale Area C study area is 70 hectares on steeply incised and dissected plateau landforms, with geology dominated by Hawkesbury Sandstone. A pedestrian survey was completed focusing on rock exposures, leading to the re-identification and recording of 4 new Aboriginal sites. These sites were comprised of:</p> <ul style="list-style-type: none"> <li>A rock shelter with art (n=1);</li> <li>A scarred tree (n=1);</li> <li>An isolated artefact (n=1); and</li> <li>A rock shelter with an artefact deposit (n=1).</li> </ul> <p>The identified artefacts were a bifacially-flaked, ground-edge axe made of black basalt located in a rock shelter, and an isolated chert thumbnail scraper located on an access track.</p>   |

| Reference                                  | Details  |
|--|--|
| Australian Museum Business Services (2009) | <p>Australian Museum Business Services was commissioned in 2009 to complete an Aboriginal Heritage Impact (AHIP) for works at:</p> <ul style="list-style-type: none"> <li>• Theresa Park Weir (~12.5 kilometres northeast of the current study area);</li> <li>• Wallacia Weir (~23.8 kilometres north of the current study area); and</li> <li>• Sharpes Weir (~9.3 kilometres northeast of the current study area).</li> </ul> <p>The AHIP aimed to relocate and further record already identified artefacts at sites TPW01 (AHIMS #52-2-3626), WW01 (AHIMS #52-2-3627), and SW01 (AHIMS #52-2-3666) and relocate them under AHIP #1100332.</p> <p>The 4 artefacts (quartz [n=2], chalcedony [n=1], and fine-grained siliceous material [FGS] n=1) recorded at TPW01 (AHIMS #52-2-3626) were reidentified and relocated, along with a further 10 artefacts (FGS [n=5], quartz [n=1], mudstone [n=1], and silcrete [n=3]) identified on the day.</p> <p>Sharpes Weir (SW01 AHIMS #52-2-3666), involved 3 artefacts (silcrete [n=2], and quartz [n=1]) originally identified along an access track to the weir. These, along with a further 6 artefacts (silcrete [n=1], quartz [n=1], FGS [n=1], and mudstone [n=3]), were relocated from the assessed impact area.</p> <p>Forty-three artefacts (quartz [n=20], chert [n=8], silcrete [n=6], chalcedony [n=2], mudstone [n=1] and FGS [n=6]) originally recorded as WW01 (AHIMS # 52-2-3627) at the Wallacia Weir access track were reidentified and removed from the AHIP area. On the day, an additional 14 artefacts were identified as a part of this assemblage (quartzite [n=1], mudstone [n=2], quartz [n=9], and glass [n=2]). It is noted that only those artefacts that would be impacted were moved, with the remainder preserved <i>in situ</i>. A total of 10 artefacts (silcrete [n=1], mudstone [n=6], and quartz [n=30]) from the WW01 site (AHIMS #52-2-3626) were relocated.</p> <p>All the collected artefacts were relocated to a single undisturbed location within 10 metres of their respective disturbance boundaries.</p> |
| Kayandel Archaeological Services (2009)    | <p>Kayandel was commissioned to complete an Aboriginal Cultural Heritage Assessment (ACHA) for the proposed subdivision of Lots 1 and 3, DP863591, Werombi Road, Theresa Park. This assessment area is located 9.3 kilometres northeast of the current study area.</p> <p>A desktop study was undertaken prior to the completion of field surveys. This included research into previous archaeological reports and a search of the AHIMS database for registered Aboriginal sites. Based on these findings, Kayandel developed a predictive model. This identified artefact scatters, isolated finds, scarred and modified trees, rock art, and grinding grooves as the likely site features for the area.</p> <p>A pedestrian and vehicular survey was conducted over 3 days with poor visibility and low surface exposure, from natural erosion, over the study area. During the survey 8 new Aboriginal sites and 4 PADs were identified and recorded:</p> <ul style="list-style-type: none"> <li>• WER-IF1 to WER-IF5 were isolated finds;</li> <li>• WER-OS1 to WER-OS were open scatters;</li> <li>• WER-PAD1: comprised WER-IF1, WER-OS2, and WER-OS3, estimated 19 artefacts;</li> <li>• WER-PAD2: comprised WER-OS1, 2 artefacts;</li> <li>• WER-PAD3: comprised WER-IF2 and WER-IF3, 2 artefacts; and</li> <li>• WER-PAD4: no artefacts present.</li> </ul> <p>The artefacts located during this survey were manufactured from silcrete, quartz, mudstone, and chert. Kayandel concluded that there is a high potential for further surface and intact subsurface archaeological deposits across their assessment area.</p>  |

| Reference   | Details  |
|---|--|
| (Archaeological & Heritage Management Solutions 2014) | <p>This ACHA was commissioned by Archaeological and Heritage Management Solutions Pty Ltd for proposed land re-zoning in Picton, approximately 17 kilometres southeast of the current study area.</p> <p>A pedestrian survey was conducted over the entire study area, covering 8.1 hectares, with low ground surface visibility due to dense grasses. Their assessment area was adjacent to Stonequarry Creek (which feeds into the Nepean River) on a low-lying alluvial flat landform.</p> <p>No new Aboriginal sites were identified during this survey.</p> |

## 2.3. ETHNOHISTORY

The earliest accepted consensus of the first peopling of Australia dates Aboriginal inhabitation of the continent to 65,000 years before present (BP) (Clarkson et al. 2017). With regard to the Cumberland Plain, being the wider biogeographic region that houses the study area, the earliest identified sites have been dated in the range of 30,000 to 35,000 years ago (Jo McDonald Cultural Heritage Management. 2005, Williams et al. 2014), and potentially up to over 40,000 years BP (Nanson et al. 1987). One such site, Cranebrook Terrace, has been dated to this 40,000-year BP epoch and is in a similar landscape context to the study area, in proximity to the Nepean River (Attenbrow 2010). Despite this, ongoing assessments undertaken throughout the region have dated the majority of recovered samples to within the last 15,000 years, with most occurring within the last 2,500 years BP (NSW Department of Environment, Climate Change & Water 2011, p. 1).

The changing conditions and the broad range of landscapes throughout this bioregion would have had a profound influence of the lifeways of the traditional Aboriginal communities who lived within the region. The transitory nature of their communities likely determined population size and influenced socio-cultural interactions. These, in turn, likely informed the range of habitation activities and lengths of occupation at specific sites. Each of these factors is responsible for and reflected in the modern archaeological record (Allen and O'Connell 2003). The Wollondilly locality is a region associated with the intersection of the Dharawal and Gundungurra language groups; which shared a common structure, but differing vocabulary (Mathews as cited in Attenbrow 2010, p.32). The Dharawal group generally occupied the coastal environment, with their territory spanning from the Shoalhaven River to Botany Bay, and as far inland as Camden. The Gundungurra were noted to have occupied regions to the west and southwest of the Dharawal (Attenbrow 2010, p. 34). However, traditional Aboriginal communities established a dynamic culture that encouraged movement throughout the landscape to facilitate the ceremonial and functional practicalities of daily life. As such, defined borders for tribal groups need to be recognised as an artificial constraint designed by anthropologists (Organ 1990).

The arrival of British colonialists to the wider Sydney area led to the destabilisation of local Aboriginal groups. Europeans transformed the landscape to facilitate use for settlement and agriculture. As the colony expanded, Aboriginal people were increasingly denied access to fresh water and traditional hunting grounds. Interactions between the local Aboriginal groups and European settlers became increasingly hostile, with Aboriginal people eventually being largely driven out of their homelands. Following the European invasion, Aboriginal groups had to change their economic, cultural, and political practices to cope with the social impacts and diseases that arose from European contact in the historic period. Hiscock argues that it is likely that similar drastic changes happened prior, in response to "altered cultural and environmental circumstances" before the arrival of Europeans. By 1816, the initial conflicts had ended and, with dwindling natural resources due to the continued expansion of farmland and an influx of European settlers, local Aboriginal people came to rely increasingly on the settlers for necessities such as food, clothing, and shelter (Kohen 1985).



Population estimates from the time of European contact are notoriously problematic. Such estimates were complicated, as Aboriginal groups were highly mobile and avoided early European settlers. In turn, these complications were compounded by the introduction of European diseases, such as influenza and smallpox, displacement from Country, and warfare; all of which significantly impacted Aboriginal populations. In 1792, Governor Arthur Philip estimated that the local Aboriginal populations of coastal Sydney were in the order of 1,000 individuals. However, it is unlikely that colonial settlers were able to successfully grasp traditional population sizes. More recent estimates of the Aboriginal population of greater Sydney at the time of first European contact place the number between 5,000 to 8,000, although these numbers too are a source of debate (Turbet 2001).

However, the material culture of the Aboriginal people within the Sydney basin at the time of European contact was diverse, with the Aboriginal people of the Wollemi and Wollondilly region utilising materials derived from a variety of plants, animals, and stone, from both terrestrial and maritime contexts. Wood was used in the production of a variety of tools and weapons, including throwing sticks, clubs, shields, spears, spear-throwers, digging sticks, and containers (Kohen 1985, Turbet 2001, Attenbrow 2010). Spears were usually made of a grasstree spike (for the shaft) with a hardwood point; with stone, bone, shell or wood commonly used as barbs. Thin and straight spear-throwers were made from wattle and fishing spears were usually tipped with four hardwood prongs with bone points (Turbet 2001, Attenbrow 2010). Fish were also caught using shell or bird talon fish hooks (Turbet 2001, Attenbrow 2010). Various types of bark were also used diversely, examples of this use include wrappings for newborn babies, shelters, canoes, paddles, shields, netting, and torches. Resin from the grass tree was used as an adhesive in tool and weapon production (Turbet 2001, Attenbrow 2010).

## 2.4. GEOLOGY

Geological units are used to predict the presence and/or absence of certain Aboriginal site types including rock shelters, grinding grooves or quarries in addition to providing an insight into the range of raw material types that may have been available to past Aboriginal groups for stone tool production.

The study area is located in the Sydney Basin bioregion, an area characterised by extensive riverine floodplains with low relief. Most of the study area is located on the Ashfield Shale geological unit and is described as black mudstones and grey shales with frequent sideritic clay ironstone bands (Geoscience Australia 2023). Natural outcrops of shale and mudstone among other materials occurring in the area provide suitable resources for stone tool manufacture, while the presence of sandstone provides suitable landforms for art sites to be present in the area. The Ashfield Shale forms part of the Wianamatta Group and is dated to the Middle Triassic (257.2 – 237.0 million years ago) [Colquhoun et al. 2019].

The remaining portion of the study area lies on Bringelly Shale, a sub-unit of the Wianamatta Shale Group. Bringelly Shale is the youngest Triassic unit in the Sydney Basin as well as one of the thickest, reaching depths of up to 250 metres. This geological unit is noted to contain finely bedded shale, siltstones, and laminate (Geoscience Australia 2023). Bringelly Shale has the potential for quartzite deposits to occur within sandstone. This presence of this quartzite, however, is subject to heating events. As such, there is only potential for the production of lithics in special circumstances within these formations.

Geological units identified within the study area are shown in Figure 2.2.

## 2.5. SOILS AND TOPOGRAPHY

Understanding soil landscapes is critical to interpreting the archaeological landforms, and subsequently their uses by the traditional communities occupying the region. Soil landscapes can have a major impact on the preservation potential of many Aboriginal artefacts and may dictate the archaeological potential of a given landscape.

The study area is within the Blacktown (bt) and Picton (pn) soil landscapes. Landforms associated with Blacktown (bt) soils are characterised by gently undulating rises on Wianamatta Group shales with local relief of 30 metres. The soils are moderately erodible, with topsoils (bt1 and bt2) being generally hard setting with significant fine sand and silt contents, offset by moderate amounts of organic matter (Table 2.3) (Department of Environment, Climate Change and Water NSW 2010). Areas with the Blacktown (bt) soil landscape have the potential for subsurface artefacts to be identified, as the soil profile is suitable for the retention of deposited objects.

Comparatively, the Picton landscape that runs through the centre of the study area is characterised by steep to very steep hills, with concave upper slopes and irregular lower slopes. These soils are shallow to deep red and brown podzolic soils on the upper slopes with brown to yellow podzolic soils of the lower slopes.

As a part of the Wollemi sub-region within the Sydney Basin, the study area is on Triassic Quartz sandstone and shale, or reef. It is noted to be within the 'Kurrajong Fault Scarp' Mitchell Landscape, which has a general elevation of 100–200 metres, with a local relief of 100 metres (Mitchell 2002). The soil landscapes of the study area and surrounds are shown in Figure 2.3.

**Table 2.3** Soil landscapes identified as being within the study area

| Soil Landscape | Description  |
|----------------|--|
| Blacktown      | <p>The dominant soil materials are:</p> <ul style="list-style-type: none"> <li>• <b>bt1</b> – Friable blackish-brown loam A horizon (10YR 2/2 can range from 5YR 3/2 to 10YR 3/4). pH from 5.5 to 7.0. Ironstone, shale fragments and charcoal are sometimes present.</li> <li>• <b>bt2</b> – Hard setting dark brown clay loam A2 horizon (7.5YR 4/3 can range from 2.5YR 3/3 to 10YR 3/3). pH from 5.5 to 7.0. Ironstone and shale gravel are common.</li> <li>• <b>bt3</b> – Strongly pedal, mottled brown light clay subsoil B horizon (7.5YR 4/6 can range from 2.5YR 4/6 to 10YR 4/6). Frequent red, yellow or grey mottles occur. pH 4.5 to 6.5. Shale gravel is common in stratified bands.</li> <li>• <b>bt4</b> – Light grey plastic mottled clay B3 or C horizon (10YR 7/1 or 2.5YR 6/2). pH 4.0 to 5.5. Ironstone is common, charcoal rare.</li> </ul> |

| Soil Landscape | Description  |
|----------------|--|
| Picton         | <p>The dominant soil materials are:</p> <ul style="list-style-type: none"> <li>• <b>pn1</b> – Apedal dark brown, hard-setting sandy loam. Colour ranges from 5YR 3/4 to 10YR 3/3 with a pH range of 5.5 to 6.5. Irregular sub-rounded gravels may make up to 60% of this material. Highly erodible.</li> <li>• <b>pn2</b> – Strongly pedal reddish brown sandy. Small (2-5mm) peds that decrease with depth. Colour ranges from 5YR 3/2 to 5YR 3/4 with a pH range of 5.0 to 6.5. Occasion red or grey mottles occur at depth. Low fertility and permeability.</li> <li>• <b>pn3</b> - Highly pedal, brown stony light clay, with small peds (6-20mm). Colour ranges from 7.5YR 3/4 to 2.5YR 3/4 with a pH range of 5.0 to 4.0. Extreme erodibility, sodic and low fertility.</li> </ul> |

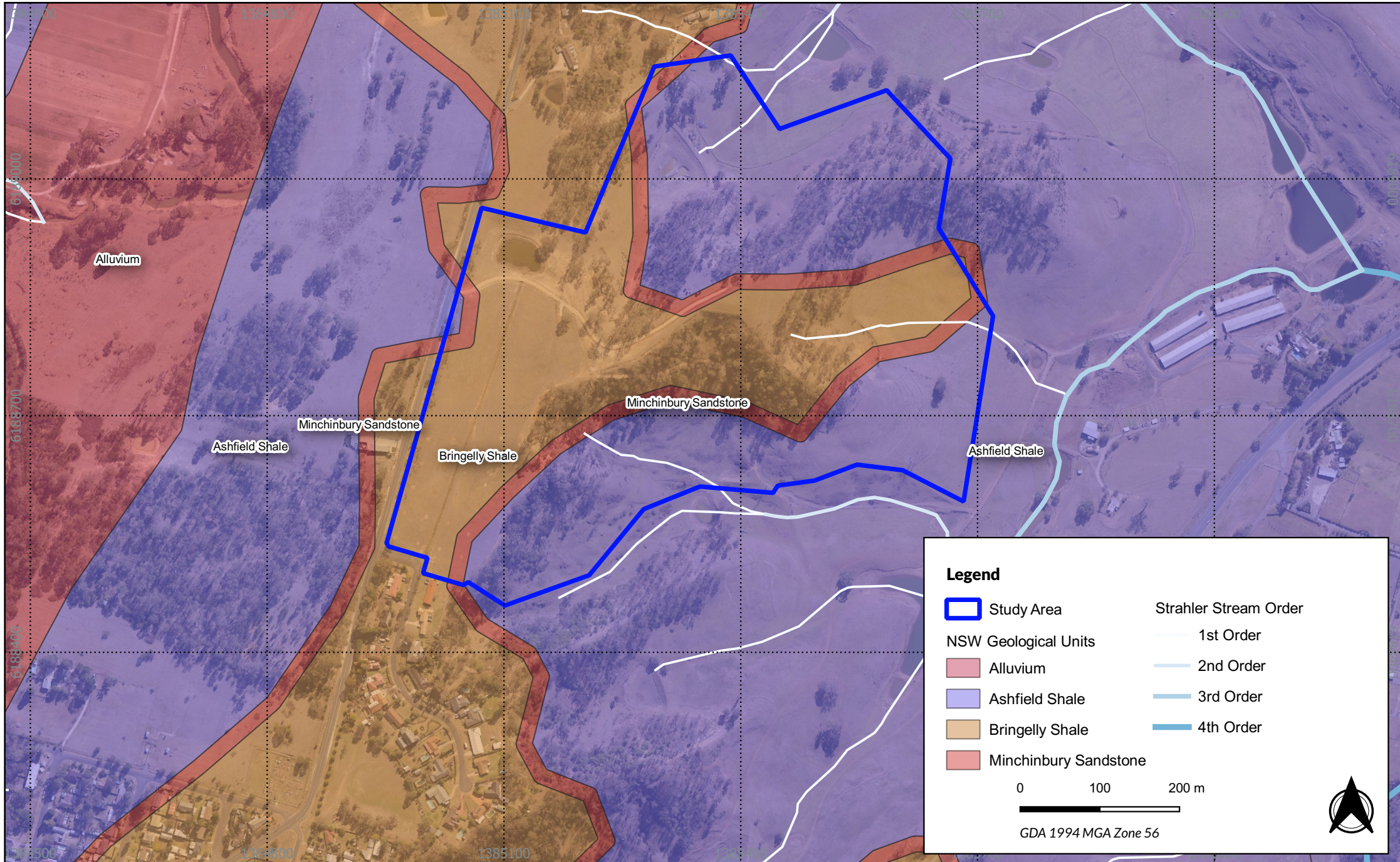
## 2.6. HYDROLOGY

Three unnamed first order tributaries of Flaggy Creek run into the study area from the north, east and southeast respectively. The natural water flow appears to have been modified by the construction of dams along these streams, these were likely installed to act as reservoirs for the storage of water for agricultural practices.

Flaggy Creek is located approximately 1.1 kilometres east of the centre of the study area, while the Nepean River is approximately 11 kilometres further east still. A significant portion of the AHIMS registered sites exist along these waterways, or alternatively, along Horse Creek approximately 6 kilometres west of the study area. This suggests that these larger watercourses would have provided invaluable resources for Aboriginal people.

The hydrology and stream order mapping for the study area and surrounds are shown on Figure 2.2.





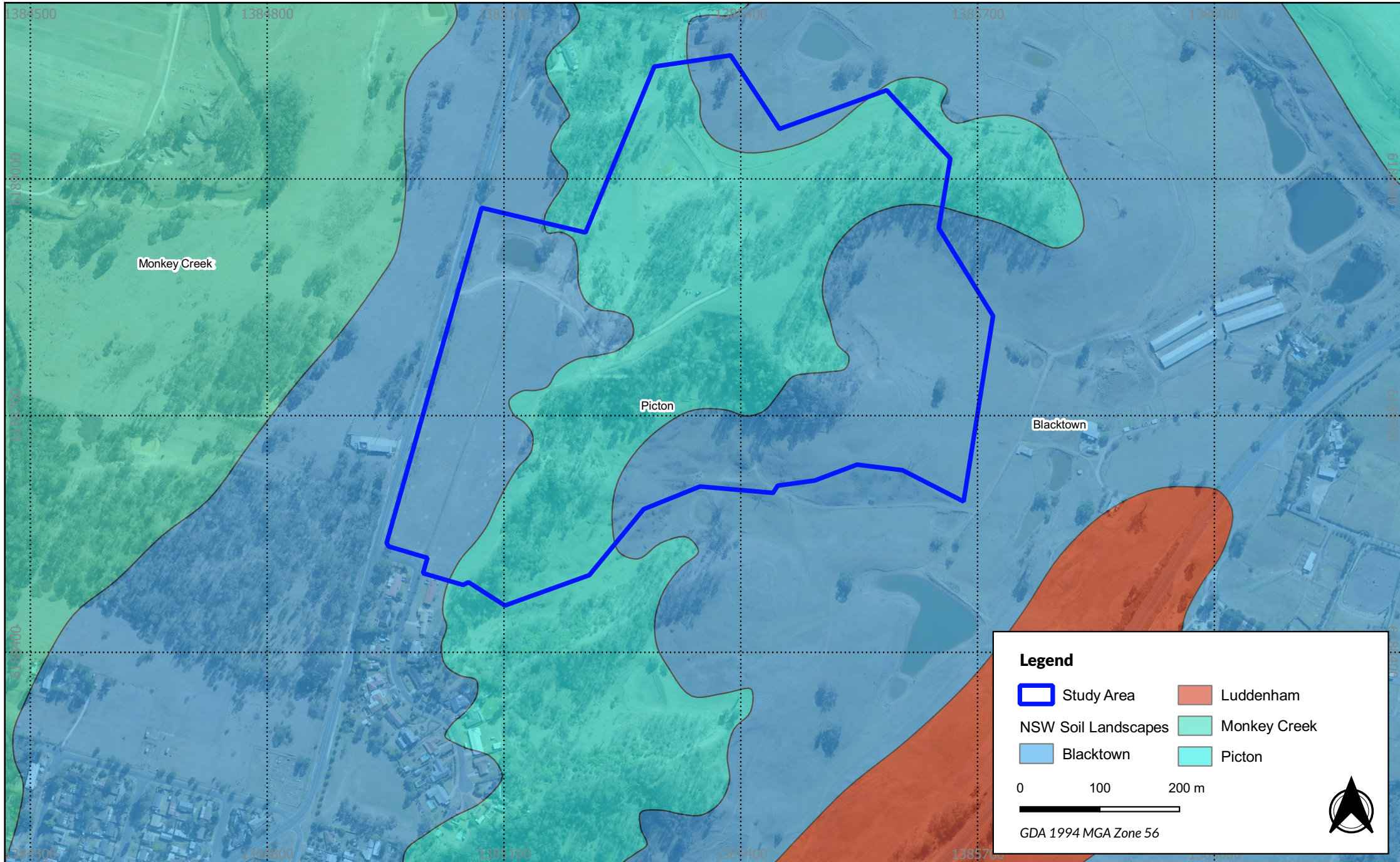
**Figure 2.2 - Geology and Hydrology of the study area**

24004 - 80 Silverdale Road, The Oaks, NSW 2570 - ACHDDA

Source: NSW LPI Aerial

Drawn by: ARH Date: 2024-02-16





**Figure 2.3 - NSW soils landscapes of the study area**

24004 - 80 Silverdale Road, The Oaks, NSW 2570 -

ACHDDA  
Source: NSW LPI Aerial

Drawn by: ARH Date: 2024-02-16



## 2.7. LANDSCAPE RESOURCES

The study area lies in a landscape that would have been rich in biological and ecological diversity before European clearing practices. The landscape would have typically supported a wide variety of flora and fauna, which coupled with proximity to watercourses, would have provided abundant natural resources for past Aboriginal people utilising the area. Aboriginal people could use many of the plants found in the region for numerous purposes. These include using wood to make implements, berries, leaves and tubers for food and medicines as well as bark for shelter construction (Smith 1989). Various faunal species within the region would have provided numerous resources for the Aboriginal peoples. Terrestrial resources such as kangaroos and wallabies as well as arboreal mammals such as possums can be used as a food source, for tool making, and social and ceremonial aspects of Aboriginal life. Aquatic species such as fish, eels and crayfish would have been easily accessible in larger waterways.

The Werriberri Creek and other unnamed creeks and tributaries near the study area would have provided reliable sources of water, that would have supported a wide variety of flora and faunal resources. Larger tributaries would have provided access to aquatic vertebrates, including fish and eels (Attenbrow 2010). A range of land mammals were hunted for food, including kangaroos, possums, wombats and echidnas as well as native rats and mice (Attenbrow 2003, p. 70). Birds such as the Muttonbird and the Bush Turkey were eaten, and it is recorded that eggs were a staple food for the Aboriginal people of the area (Attenbrow 2003, pp. 75–76). The variety of faunal resources would have supported the production of tools and cultural material, from animal parts including claws, talons, teeth, fur, feathers, shells, and bones (Attenbrow 2010). Attenbrow has noted that:

*“Sydney vegetation communities include over 200 species that have edible parts, such as seeds, fruits, tubers/roots/rhizomes, leaves, flowers and nectar (Attenbrow 2003, p. 76).*

Eucalypt leaves may have been used for medicinal purposes and the sap may have been used in the construction of shelters as well as used as a sweet food source (Biosis Research Pty Ltd 2010 as originally sourced from Rhoads and Dunnet 1985).

Early European documentary sources state that the settlers observed Aboriginal communities roasting fern root, small fruits, nuts, and orchid root, amongst other such resources. Attenbrow notes, however, the settlers’ lack of knowledge of the local floral species makes identification of the various plants used difficult (Attenbrow 2003, pp. 76–79).

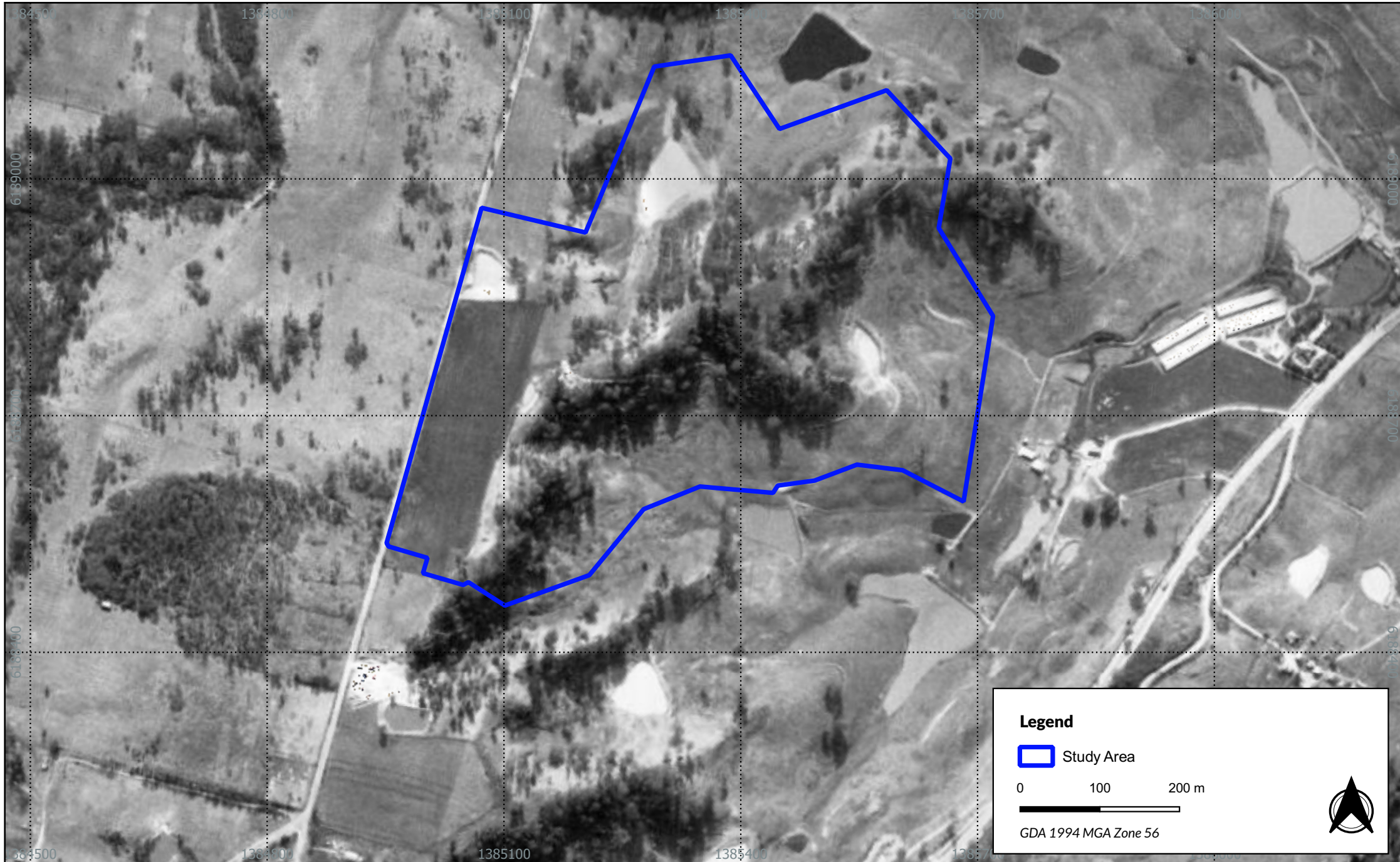
In summary, the Wollemi and the Nepean River environment provided a wide variety of plants and animals that were used by the local Aboriginal populations for artefact manufacture, medicinal purposes, ceremonial items, and food.

## 2.8. PAST LAND USE PRACTICES

When compared to the increasing urbanisation of the wider The Oaks area, most of the study area seems to exhibit comparatively low disturbances. A comparison of the historic aerials shows that the study area has had the same layout since 1969, suggesting that undeveloped areas are less likely to have been disturbed (c.f. Figure 2.4 and Figure 2.5).

The 2005 aerial (Figure 2.5) shows that minor disturbances and additions to the study area have been made when compared to the 1969 aerial (Figure 2.4). This includes the installation of access tracks along the western and southern boundaries of the study area. While not in the study area it should be noted that land clearing along Silverdale Road and outside the southwestern portion of the study area has occurred for residential development





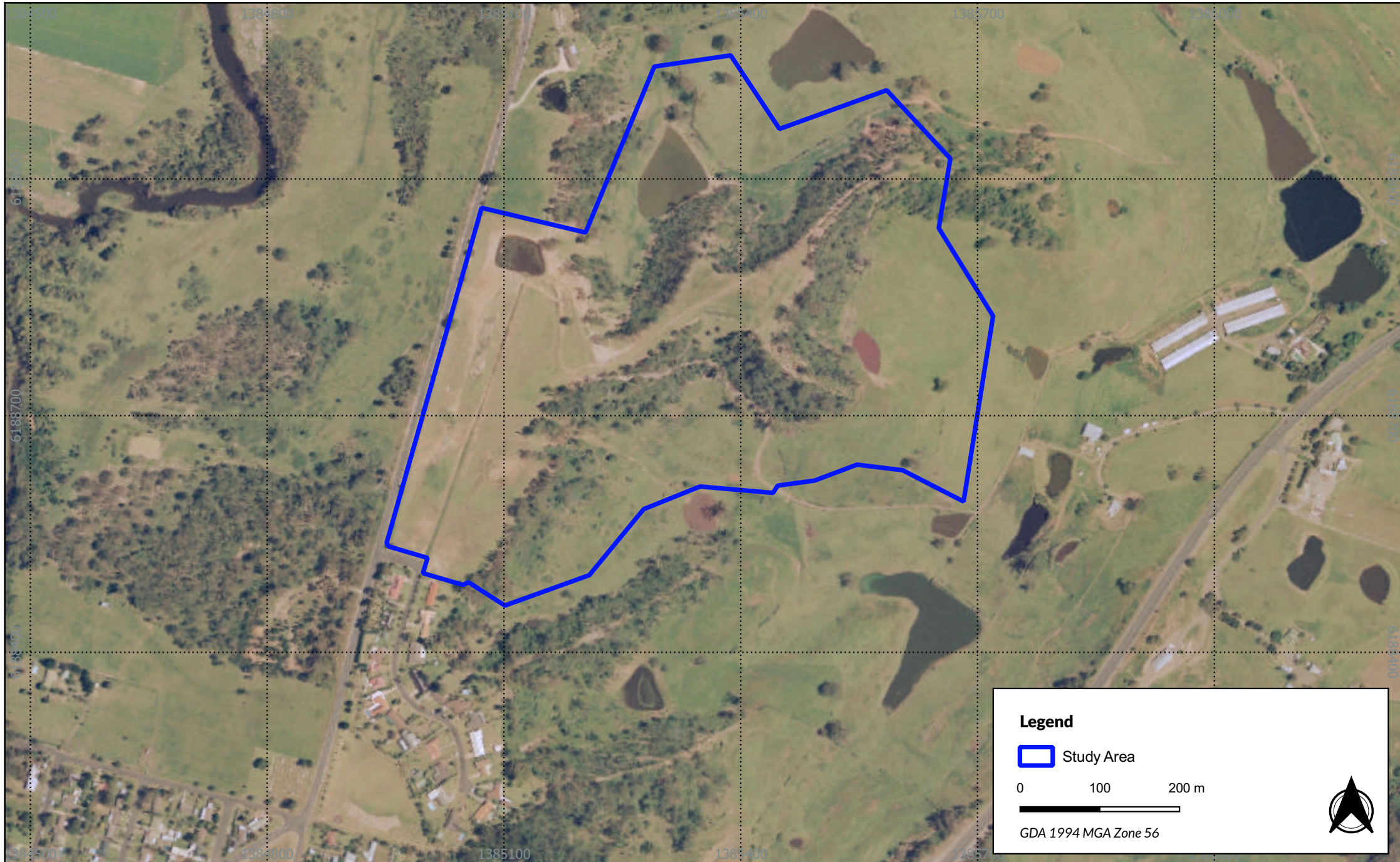
**Figure 2.4 - 1969 aerial of the study area**

24004 - 80 Silverdale Road, The Oaks, NSW 2570 - ACHDDA

Source: NSW Spatial Services

Drawn by: ARH Date: 2024-02-16





**Figure 2.5 - 2005 aerial of the study area**

24004 - 80 Silverdale Road, The Oaks, NSW 2570 - ACHDDA

Source: NSW Spatial Services

Drawn by: ARH Date: 2024-02-16

## 2.9. PREDICTIVE STATEMENTS

In general, an archaeological predictive statement for any study area draws on surrounding environmental data, previous archaeological research, and predictive models for Aboriginal occupation. Another essential aspect to predicting the archaeological integrity of a site and something that must be considered is previous land uses of the study area and the degree of disturbance.

- Archaeological sites occur on most landforms.
  - Site frequency and density are dependent on their location in the landscape. More complex sites are usually located close to major water sources.
  - Artefact scatters are commonly located in close proximity to permanent water sources: along creek banks, alluvial flats, and low slopes.
- Artefact assemblages usually comprise a proportion of formal tool types with the majority of assemblages dominated by flakes and debitage.
- The dominant raw material used in artefact manufacture is silcrete and FGS.
  - Chert, quartz, and mudstone are noted to occur frequently, albeit in smaller quantities.
- While surface artefact scatters may indicate the presence of subsurface archaeological deposits, surface artefact distribution and density may not accurately reflect those of subsurface archaeological deposits.
- Aboriginal scarred trees may be present in areas where remnant old growth vegetation exists.

While these statements provide an adaptable framework for applying a predictive model to the wider region, Austral has been able to develop a series of predictive statements relating to the type and character of Aboriginal cultural heritage likely to exist in the study area. These predictive statements indicate that:

- Aboriginal heritage sites are likely to occur within 200 metres of past or current water sources.
  - Archaeological material is also present beyond the immediate river surroundings in decreasing artefact densities.
- Artefact scatters are a common site type in the area and are most likely to occur on raised, level ground, near sources of freshwater or wetlands, or along spur crests or ridgelines.
- Given the presence of prior disturbances within portions of the study area, it is unlikely any potential artefacts will present within these zones.
  - Should cultural materials be identified in the study area, they may be slightly displaced from their original context due to vegetation clearance and associated disturbances and erosion.
- It is unlikely that culturally modified trees are present, due to the lack of vegetation of substantial age.
- It is unlikely that there will be art or rock shelters within the study area, due to the lack of appropriate outcrops.



### 3. SITE INSPECTION

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In order to ground truth the predictive model as outlined above, a visual inspection of the study area was undertaken on 12 March 2024 by Lindsay Costigan, with assistance from Kiahni Chalker (Site Officer, Cubbitch Barta) and apprentice. This survey targeted the proposed development footprint, and a separate area identified by the client as likely to be developed for a residential house.

The visual inspection consisted of a systematic survey of the study area to identify and record any Aboriginal archaeological sites visible on the surface or areas of Aboriginal archaeological potential and cultural sensitivity. The archaeological survey was conducted on foot. The methods used during the visual inspection conformed to requirements 5 to 8 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b).

#### 3.1. SURVEY RESULTS

The visual inspection of the study area began in the northeast of the proposed subdivision zone. The ridgeline was surveyed first from north to south, and several areas with expansive views across the Southern Highlands to Sydney Central Business District were noted.

The survey then covered each side of the drainage ditch, as well as the large berm along Silverdale Road. Communications with the client dated the excavation of the ditch as being contemporaneous with the construction of housing south of the current study area.

One tree was noted to be within the proposed development footprint and was confirmed as being planned for removal; it was concluded that the conditions were indicative of new-growth vegetation and contained no scars or markings.

Several previous disturbances were identified within the study area, including:

- Construction of an access road;
- Installation of fencing;
- Creation of informal livestock trails throughout the property;
- Creation of the drainage depression;
  - the subsequent deposition of spoil to the immediate west of said depression; and
- Addition of the large berm along Silverdale Road.

Overhead powerlines were identified as running east-west across the study area. However, there was no evidence of their installation and ongoing use having contributed to any significant disturbances within the study area proper. Though much of the survey area has been farmed, historical aerial imagery indicates the ridgeline portion was not heavily disturbed during the farming period.

Visibility was estimated to be approximately 10% – 20% based on the presence of dense grasses. Some areas of exposure were present along the drainage and ridgeline, as well as within livestock trails. This accounted for approximately 10% of the survey area. Exposures were noted to contain worn sandstone pebbles but no artefacts.

The survey area was found to be relatively flat, though a roughly 15-metre swatch on either side of the drainage appears to have been excavated to channel surface water into the channel. Most notably, a ridgeline is present along the treeline at the eastern perimeter of the survey area, which provides exceptional eastern views.



It was concluded that there was moderate potential for subsurface archaeological deposits throughout much of the surveyed landscape; down to low across the access tracks, drainage, spoil pile, and berm. Communications with Kiahni Chalker confirmed the requirement for an ACHA and associated testing prior to any development works.

## 4. DUE DILIGENCE PROCESS

This section considers the information provided in previous sections of the assessment in the context of the Code and the steps that it outlines. The Code initially provides a series of questions that clarify whether it is the applicable document for a given project. These questions are addressed in Table 4.1.

**Table 4.1** Assessing the applicability of the Code to the proposed activity.

| Question  | Response |
|---|----------|
| Is the activity a declared project under Part 3A of the <i>Environmental Planning &amp; Assessment Act 1979</i> ? | No       |
| Is the activity an exempt activity listed in the NPW Act or other legislation?                                    | No       |
| Will the activity involve harm that is trivial or negligible?   | No       |
| Is the activity in an Aboriginal place or are you already aware of Aboriginal objects on the land?                | No       |
| Is the activity a low impact activity for which there is a defence in the NPW Regulation?                         | No       |
| Do you want to use an industry specific code of practice?   | No       |
| Do you wish to follow your own procedure?   | No       |

As none of the questions outlined in Table 1 apply to the project, due diligence must be established through the Code; this consists of a series of 5 steps, outlined below.

### STEP 1. WILL THE ACTIVITY DISTURB THE GROUND SURFACE OR ANY CULTURALLY MODIFIED TREES?

These proposed works will consist of the rezoning of the property for the proposed subdivision and the development of the study area. It is noted that will not involve any ground-surface disturbance or the removal of associated vegetation. However, it is noted that the proposed subdivision works for which this planning proposal has been developed to facilitate are likely to involve such activities.

In order to future-proof this assessment, given the scale of the subsequent works proposed, consideration of steps 2a and 2b of the Code is required.

### STEP 2A. SEARCH THE ABORIGINAL HERITAGE INFORMATION MANAGEMENT SYSTEM DATABASE AND USE ANY OTHER SOURCES OF INFORMATION OF WHICH YOU ARE ALREADY AWARE.

Section 2.1 details the results of an extensive search of the AHIMS database, which identified 117 Aboriginal archaeological sites within a 10-kilometre search radius of the study area (Table 2.1 and Figure 2.1).



A review of heritage reports identified as being relevant to the study area is detailed in Section 2.2 of this report, while details of ethnographic information relevant to the study area is included in Section 2.3. The information identified here, along with consideration of various other geological and resource-driven factors (sections 2.4 to 2.7) and the site disturbance history contained in Section 2.8 has enabled the preparation of predictive models which consider the potential for the study area to contain Aboriginal cultural material. These are outlined in Section 2.9 of the report and are copied below.

#### Regionally:

- Archaeological sites occur on most landforms.
  - Site frequency and density are dependent on their location in the landscape. More complex sites are usually located close to major water sources.
  - Artefact scatters are commonly located in close proximity to permanent water sources: along creek banks, alluvial flats, and low slopes.
- Artefact assemblages usually comprise a proportion of formal tool types with the majority of assemblages dominated by flakes and debitage.
- The dominant raw material used in artefact manufacture is silcrete and FGS.
  - Chert, quartz, and mudstone are noted to occur frequently, albeit in smaller quantities.
- While surface artefact scatters may indicate the presence of subsurface archaeological deposits, surface artefact distribution and density may not accurately reflect those of subsurface archaeological deposits.
- Aboriginal scarred trees may be present in areas where remnant old growth vegetation exists.

#### Locally:

- Aboriginal heritage sites are likely to occur within 200 metres of past or current water sources.
  - Archaeological material is also present beyond the immediate river surroundings in decreasing artefact densities.
- Artefact scatters are a common site type in the area and are most likely to occur on raised, level ground, near sources of freshwater or wetlands, or along spur crests or ridgelines.
- Given the presence of prior disturbances within portions of the study area, it is unlikely any potential artefacts will present within these zones.
  - Should cultural materials be identified in the study area, they may be slightly displaced from their original context due to vegetation clearance and associated disturbances and erosion.
- It is unlikely that culturally modified trees are present, due to the lack of vegetation of substantial age.
- It is unlikely that there will be art or rock shelters within the study area, due to the lack of appropriate outcrops.

## STEP 2B. ACTIVITIES IN AREAS WHERE LANDSCAPE FEATURES INDICATE THE PRESENCE OF ABORIGINAL OBJECTS.

The following table considers whether the study area is located in a landscape which is likely to be conducive to use of the area by Aboriginal people.

**Table 4.2** Presence of sensitive landscape features listed in the Code.

| Question   | Response |
|--|----------|
| Is the activity within 200m of 'waters'?   | Yes      |
| Is the activity within a sand dune system?   | No       |
| Is the activity located on a ridge top, ridge line or headland?  | Yes      |
| Is the activity located within 200m below or above a cliff face?   | No       |
| Is the activity within 20m of or in a cave, rock shelter or cave mouth?  | No       |
| Is the activity (or any part of it) on land that is disturbed?   | Yes      |
| Do the predictive statements of Step 2A indicate Aboriginal objects or places are likely to occur on any of the topographic elements of the activity area? | Yes      |

The study area is primarily over a ridgeline with exceptional east-facing views, affording views well into Sydney proper. While there is evidence of several disturbance events, these are of varying impact and relatively localised to their respective zones.

As the study area has been identified as being within an archaeologically sensitive landscape, it is necessary to consider Step 3 of the Code.

## STEP 3. CAN YOU AVOID HARM TO THE OBJECT OR DISTURBANCE OF THE LANDSCAPE FEATURE?

It is understood that no Aboriginal cultural objects have been identified to date and that no harm is planned for the landscape under the proposed rezoning of the study area; however, this is being undertaken to facilitate the subdivision and development of the property under Part 4 of the EPA Act. These activities will include disturbances to the landscape, including bulk earthworks and the installation of utilities and infrastructure.

As such, Step 4 of the Code has been undertaken as a precautionary measure.

## STEP 4. DESKTOP ASSESSMENT AND VISUAL INSPECTION

The results of a visual inspection of the study area are documented in Section 3 of this assessment.

It was concluded that there was moderate potential for subsurface archaeological deposits throughout much of the surveyed landscape; down to low across the access tracks, drainage, spoil pile, and berm. Communications with stakeholder group Cubbitch Barta confirmed the requirement for an ACHA and associated testing.

## STEP 5. FURTHER INVESTIGATIONS AND IMPACT ASSESSMENT

Based upon the outcome of steps 1 to 4 of the Code, further assessment is not warranted at this stage. This is based on the lack of associated impacts associated with the proposed rezoning. The following recommendations apply:

1. The proposed rezoning may proceed with caution.
2. No aspect of the subsequently proposed development works should commence prior to the completion of the forthcoming ACHA.
  - a. As areas with moderate potential to contain subsurface artefacts have been identified within the study area, no ground disturbing works should be undertaken prior to a program of archaeological testing. This will need to comply with the Code of Practice for Archaeological Investigation for Aboriginal sites in NSW (DECCW 2010b).
3. All Aboriginal objects and Places are protected in the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by Heritage NSW. In the event that any Aboriginal cultural heritage finds occur during any stage of works associated with this proposal:
  - a. Works must cease in the vicinity of the find, and this should not be moved until assessed by a qualified archaeologist.
    - i. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. This may include notifying Heritage NSW and Aboriginal stakeholders.
4. 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:
  - a. Immediately cease all works at that location and not further move or disturb the remains.
  - b. Notify the NSW Police and Heritage NSW's environmental line on 131 555 as soon as practicable, providing details of the remains and their location.
  - c. Not recommence work at that location unless authorised in writing by Heritage NSW.



## 5. REFERENCES

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- Allen, J. and J. O'Connell 2003 The long and the short of it: archaeological approaches to determining when humans first colonised Australia and New Guinea. *Australian Archaeology* 57:5–19.
- Archaeological & Heritage Management Solutions, S. 2014 Stonequarry Commercial Picton: Lot 7 DP1072259 and Lot 4 Section 13 DP939379, Cliffe Street, Picton, NSW: ACHA. Archaeological & Heritage Management Solutions Pty Ltd.
- Attenbrow, V. 2003 *Sydney's Aboriginal Past: Investigating the Archaeological and Historical Records*. Australia, University of New South Wales Press Ltd.
- Attenbrow, V. 2010 *Sydney's Aboriginal Past: Investigating the Archaeological and Historical Records*. 2nd edition. Sydney, University of New South Wales Press.
- Australian Museum Business Services 2009 Aboriginal Heritage Impact Permit Works: Upper Nepean River Environmental Flow Releases. Report for Snowy Mountains Engineering Corporation Australia Pty Ltd on behalf of the Sydney Catchment Authority.
- Biosis Research Pty Ltd 2010 Camden Gas Project: Northern Expansion Part 3A Aboriginal Archaeological Assessment. AECOM Pty Ltd.
- Clarkson, C., Z. Jacobs, B. Marwick, R. Fullagar, L. Wallis, M. Smith, R.G. Roberts, E. Hayes, K. Lowe, X. Carah, A. Florin, J. McNeil, D. Cox, L.J. Arnold, Q. Hua, J. Huntley, H.E.A. Brand, T. Manne, A. Fairbairn, J. Shulmeister, L. Lyle, M. Salinas, M. Page, K. Connell, G. Park, K. Norman, T. Murphy, and C. Pardoe 2017 Human Occupation of Northern Australia by 65, 000 Years Ago. *Nature* 547:306–310.
- Colquhoun, G.P., K.S. Hughes, L. Deyssing, J.C. Ballard, G. Phillips, A.L. Troedson, C.B. Folkes, and J.A. Fitzherbet 2019 NSW Seamless Geology Dataset v. 1.1 (Digital Dataset). Maitland, NSW Department of Planning and Environment.
- DECCW 2010a Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales.

DECCW 2010b Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW. Sydney, Department of Environment, Climate Change and Water.

DECCW 2010c Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.

Department of Environment, Climate Change and Water NSW 2010 Blacktown (bt) Residual soil landscape.

Geoscience Australia 2023 Stratigraphic Unit Details: Bringelly Shale. Retrieved < <https://asud.ga.gov.au/search-stratigraphic-units/results/2570> >.

Jo McDonald Cultural Heritage Management. 2005 *Archaeological Salvage Excavation of Site RTA-GI, 109-113 George Street, Parramatta, NSW. Unpublished Report for the NSW Roads and Traffic Authority.*

Kayandel Archaeological Services 2009 Aboriginal Archaeological Heritage Assessment of Lots 1 and 3 DP863591, Werombi Road, Theresa Park NSW.

Koettig, M. 1987 Survey for Aboriginal Sites Along Selected Sections of Three Vibroseismic Survey Routes Near Camden, NSW. 1281.

Kohen, J. 1985 *Aborigines in the West: Prehistory to the Present*. Seven Hills, Western Sydney Project.

Mitchell, P. 2002 Descriptions for NSW (Mitchell) Landscapes Version 2. 2002nd edition. Department of Environment and Climate Change.

Nanson, G.C., R.W. Young, and E.D. Stockton 1987 Chronology and palaeoenvironment of the Cranebrook Terrace, near Sydney, containing artefacts more than 40,000 years old. *Archaeology in Oceania* 22:72–78.

Navin, K. 1993 Archaeological Survey for Proposed Longwall Mining Application, Oakdale Colliery, NSW.

Navin, K. 1994 Archaeological Survey and Assessment of Longwall Mining Application Areas A-1 and B-1, Oakdale Colliery, NSW.

Navin, K. 1995 Archaeological Survey and Assessment of Longwall Mining Application Areas 1 and 2, Brimstone Colliery, NSW.

Navin, K. and T. Knight 1997 Archaeological Survey and Assessment of Longwall Mining Application Area C, Oakdale Colliery, NSW.

NSW Department of Environment, Climate Change & Water 2011 Aboriginal Heritage of Mosman.

Organ, M. 1990 *A Documentary History of the Illawarra and South Coast Aborigines 1770-1850*. Wollongong, Aboriginal Education Unit, Wollongong University.

Smith, L. 1989 Interim Report: Site Survey and Site Analysis on the Cumberland Plain. Report for NSW Parks and Wildlife Service.

Turbet, P. 2001 *The Aborigines of the Sydney District Before 1788 Revised Edition*. East Roseville, Kangaroo Press.

Williams, A., F. Atkinson, M. Lau, and P. Toms 2014 A Glacial cryptic refuge in southeast Australia: Human occupation and mobility from 36,000 years ago in the Sydney Basin, New South Wales. *Journal of Quaternary Science* 29(8):735–748.