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CATHERINE FIELD REZONING CATHERINE FIELD, NEW SOUTH WALES

ABORIGINAL CULTURAL HERITAGE DUE DILIGENCE ASSESSMENT

FINAL REPORT

SPRINGFIELD RD PTY LTD

1 February 2022

DOCUMENT INFORMATION

Project:	Catherine Field Rezoning
Services required:	ACHDDA
Client:	Springfield Rd Pty Ltd
Prepared by:	Stephanie Moore
Project number:	21148

DOCUMENT HISTORY AND APPROVAL STATUS

Version No.	Version Type	Issue Date	Authored by	Approved by	Date Approved
1	Draft	17/12/21	S. Moore, W. Andrews, D. Bezzina	S. Moore	17/12/21
2	Final	01/02/2022	S. Moore, W. Andrews, D. Bezzina	S. Moore	01/02/2022

DISTRIBUTION OF COPIES

Version No.	Quantity	Issue date	Issued to
1	1	17/12/2021	Springfield Rd Pty Ltd
2	1	01/02/2022	Springfield Rd Pty Ltd

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EXECUTIVE SUMMARY

Austral Archaeology Pty Ltd (Austral) has been engaged by Springfield Rd Pty Ltd (the Proponent) to provide Aboriginal Cultural Heritage Due Diligence Advice (ACHDDA) for the proposed rezoning of land within the suburb of Catherine Field, New South Wales (NSW) [the study area]. This advice is intended to assist Springfield Rd Pty Ltd in determining their obligations regarding 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.

The study area has been subject to minimal assessment and research and has no Aboriginal heritage object or sites contained within it. A search of the Aboriginal Heritage Information Management System (AHIMS) for an area of 3 kilometres surrounding the study area reveals that 110 sites in total have been registered. The most prevalent recorded site feature surrounding the study area is 'Artefact', relating to isolated finds and artefact scatters. These site types are common across the Cumberland Plain, particularly in proximity to water. Stone artefacts are also well represented in the archaeological record, as they are more likely to be preserved than objects manufactured from natural fibres. Artefacts with Potential Archaeological Deposit (PAD) are also common throughout the region, indicating the potential for subsurface archaeological material to be identified.

A visual inspection of the study area was undertaken by Stephanie Moore (Senior Archaeologist, Austral) on Monday 6 December 2021. Tharawal Local Aboriginal Land Council (TLALC) were invited to attend; however, they indicated that they did not have a sites officer available to participate.

The inspection was limited to properties within the study area for which an access agreement is in place (Figure 2.12). These properties were utilised as a representative sample of the study area during the physical inspection, with results supplemented by desktop research.

The physical inspection was undertaken on foot, using meander transects where access was available across the properties. Paddocks containing livestock were avoided and efforts were made to stay some distance from occupied residences.

No Aboriginal objects, sites or areas of archaeological potential were identified within any of the 5 survey units inspected.

It is recommended that:

1. All Aboriginal objects and Places are protected under the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by Heritage NSW. 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 Heritage NSW and Aboriginal stakeholders.
2. 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:
 - immediately cease all work at that location and not further move or disturb the remains
 - notify the NSW Police and Heritage NSW's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location
 - not recommence work at that location unless authorised in writing by OEH.

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1 INTRODUCTION

Austral Archaeology Pty Ltd (Austral) has been engaged by Springfield Rd Pty Ltd (the Proponent) to provide Aboriginal Cultural Heritage Due Diligence Advice (ACHDDA) for the proposed rezoning of land within the suburb of Catherine Field, New South Wales (NSW) [the study area]. This advice is intended to assist Springfield Rd Pty Ltd in determining their obligations regarding 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.

The study area consists of the following allotments:

- Lots 100 and 101 DP1173578
- Lots 1, 2, 3, 4, 5, and 8 DP203127
- Lots 30 and 31 DP1175280
- Lot 100 DP1149669
- Lots 2, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 131 DP27602
- Lot 20 DP1171869
- Lots 1301 and 1302 DP736633
- Lots 1 and 2 DP861247
- Lots 1331 and 1332 DP826048
- Lots 2, 3 and 4 DP518472
- Lots 301 and 302 DP709378
- Lot 101 DP547859
- Lots 204, 205, 206, 207 and 208 DP259147
- Lots 4001, 4002 and 4003 DP1121133
- Lot 302 DP716446
- Lots 1, 2, 3 and 4 DP215520

The study area is shown in Figure 1.1, Figure 1.2 and Figure 1.3. The study area is bounded by Camden Valley Way to the southeast, Springfield Road to the southwest, Catherine Fields Road to the northeast, and the proposed alignment of Rickard Road to the northwest.

The study area is currently zoned 'RU4 – Primary Production Small Lots' and 'R5 – Large Lot Residential', under the *Camden Local Environmental Plan 2010* (Camden LEP 2010). The proposed works involved rezoning of the subject land to allow residential and associated urban development. The Planning Proposal will zone the study area under the Growth Centres SEPP, and the zoning mapping will be informed by the Indicative Structure Plan (in preparation).

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). Harm is defined under the NPW Act as “*any act or omission that destroys, defaces or damages the object or place or 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* adopted the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010) [the Code] as guidance on reasonable and practicable steps which individuals and organisations need to take 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 through the completion of a desktop review of the study area. The Code provides a series of questions that clarify whether it applies to a proposed project. These questions are addressed in Section 2.

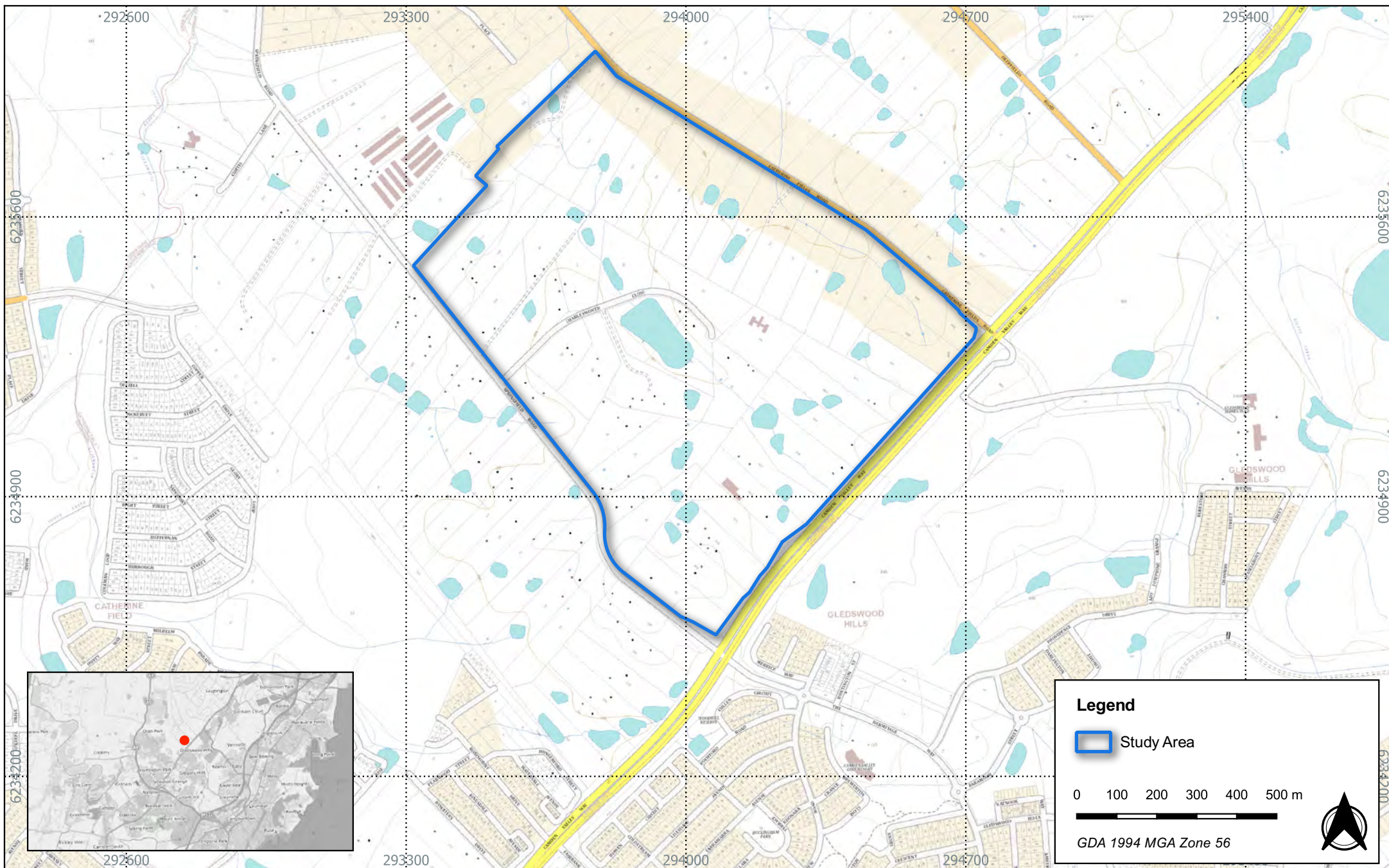


Figure 1.1 - Location of the study area

21148 - Springfield Road, Catherine Field - ACHDDA

Source: NSW LPI Basemap

Drawn by: ARH Date: 2021-12-13



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Figure 1.2 - Detailed aerial of the study area

21148 - Springfield Road, Catherine Field - ACHDDA

Source: NSW LPI Aerial

Drawn by: ARH Date: 2021-12-13



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1.2 PROJECT TEAM AND QUALIFICATIONS

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

Person	Title	Experience	Role
Stephanie Moore	Senior Archaeologist	6 years'	Primary author, project manager
William Andrews	Archaeologist	3 years	Secondary author
Adam Hansford	GIS Operator	2 years'	GIS Mapping
David Marcus	Director	20 years'	Technical lead, quality assurance review

1.3 ABBREVIATIONS

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

Austral	Austral Archaeology Pty Ltd
ACHDDA	Aboriginal Cultural Heritage Due Diligence Assessment
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
Austral	Austral Archaeology Pty Ltd
CBD	Central Business District
the Code	<i>Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECCW 2010)</i>
DECCW	Department of Environment, Climate Change and Water NSW
TLALC	Tharawal Local Aboriginal Land Council
EP&A Act	<i>Environmental Planning & Assessment Act 1979</i>
GST	Galvanised Steel Troughing
LGA	Local Government Area
NPW Act	<i>National Parks and Wildlife Act 1974</i>
NPW Regulation	<i>National Parks and Wildlife Regulation 2019</i>
NPWS	<i>National Parks and Wildlife Services</i>
NSW	New South Wales
OEH	Office of Environment and Heritage
PAD	Potential Archaeological Deposit
The Proponent	Springfield Rd Pty Ltd
QGIS	Open-source geographic information systems software
study area	Proposed Catherine Field rezoning area, as identified in Figure 1.1
TfNSW	Transport for New South Wales

2 DUE DILIGENCE ASSESSMENT

As noted in Section 1, The Code provides a series of questions that clarify whether it applies to a proposed project. These questions are addressed in Table 2.1 below.

Table 2.1 **Applicability of the Code to the proposed activity**

Question	Response
Is the activity a declared project under Part 3A of the EP&A Act?	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 2.1 apply to the project, due diligence must be established using the Code. The Code consists of a series of 5 steps outlined below

2.1 STEP 1: WILL THE ACTIVITY DISTURB THE GROUND SURFACE OR ANY CULTURALLY MODIFIED TREES?

Although rezoning is not an activity that will result in disturbance to the ground surface, rezoning will create an opportunity for residential subdivision and urban development. These activities, including bulk earthworks and trenching for construction and installation of surfaces, will result in impacts to the ground surface.

The study area contains no old-growth vegetation suitable for cultural scarring. No culturally modified trees will be impacted by the proposal.

2.2 STEP 2A: SEARCH THE ABORIGINAL HERITAGE INFORMATION MANAGEMENT SYSTEM (AHIMS) DATABASE AND USE ANY OTHER SOURCES OF INFORMATION OF WHICH YOU ARE ALREADY AWARE

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) database was conducted on 8 December 2021 (Client service ID: 645773). The search identified 110 Aboriginal cultural heritage sites within a 3-kilometre search area centred on the proposed study area. A summary of the sites identified in the search is provided in Table 2.2. None of these registered sites are located within the study area (Figure 2.1 and Figure 2.2).

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 2.2 AHIMS sites identified within 3 kilometres of the study area.

Site type	Occurrence
Artefact	86
Artefact, Potential Archaeological Deposit (PAD)	15
Potential Archaeological Deposit (PAD)	3
Modified Tree (Scarred or Carved)	3
Artefact, Modified Tree (Scarred or Carved)	1
Art (Pigment or Engraved), Potential Archaeological Deposit (PAD)	1
Aboriginal Resource and Gathering	1
Total	110

The most prevalent recorded site feature surrounding the study area is 'Artefact', relating to isolated finds and artefact scatters. These site types are common across the Cumberland Plain, particularly in proximity to water. Stone artefacts are also well represented in the archaeological record, as they are more likely to be preserved than objects manufactured from natural fibres. Artefacts with Potential Archaeological Deposit (PAD) are also common throughout the region, indicating the potential for subsurface archaeological material to be identified. A review of the AHIMS mapping indicates that PADs have been most frequently identified in proximity to watercourses (Figure 2.2).

Other recorded sites in the region include Modified trees, which occur in areas containing old-growth vegetation, and Art and Resource Gathering sites. These are poorly represented in the records, indicating that the region is unlikely to have landforms or resources suitable for these activities to occur.

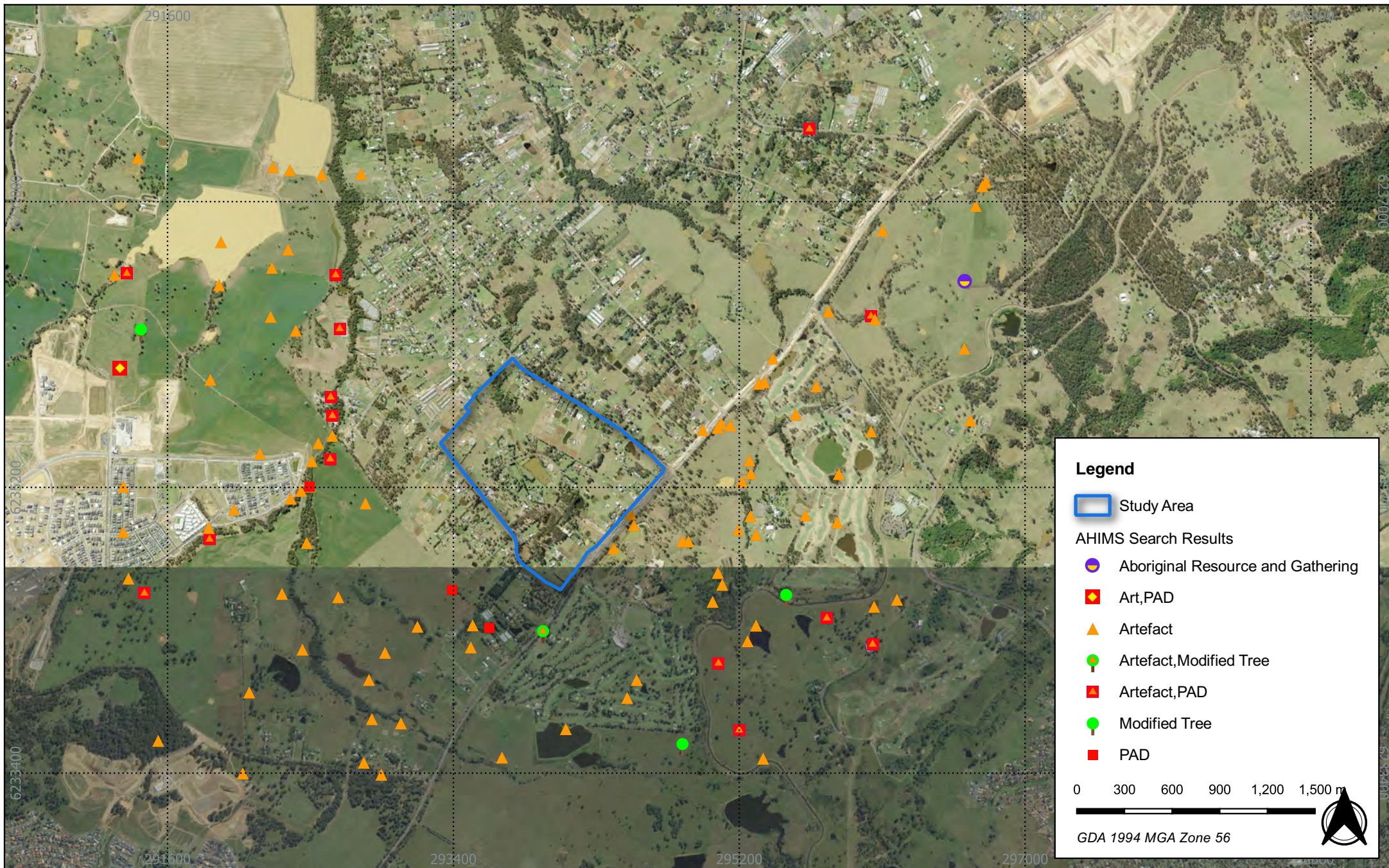


Figure 2.1 AHIMS within 3km of the study area

21148 - Springfield Road, Catherine Field - ACHDDA

Source: NSW LPI Aerial, AHIMS

Drawn by: ARH Date: 2021-12-13



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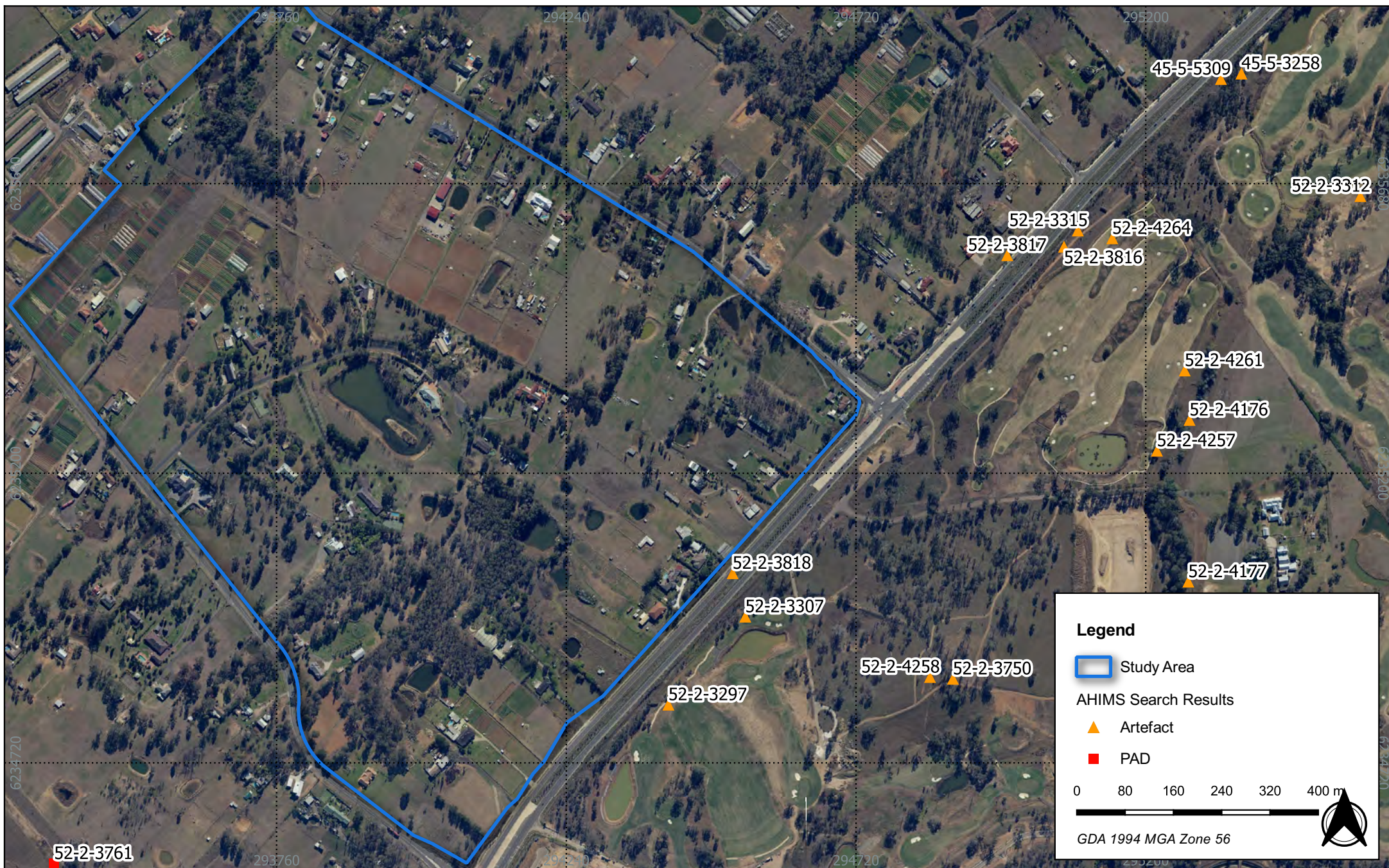


Figure 2.2 AHIMS sites within close proximity to the study area

21148 - Springfield Road, Catherine Field - ACHDDA

Source: NSW LPI Aerial, AHIMS

Drawn by: ARH Date: 2021-12-13



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2.2.1 LOCAL ARCHAEOLOGICAL CONTEXT

Archaeological investigations of the Camden and Campbelltown region have been conducted in response to development and within the framework of academic enquiries. The limited ethnographic accounts of early settlers and explorers were once considered the primary source for archaeological enquiry. Assessments within the Catherine Field study area are very limited and therefore the reports referred to are focused on surrounding suburbs.

The major studies which have contributed to our understanding of the study area, and those with direct relevance to the study area, are outlined in Table 2.3. 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 2.3 Summary of past reports within the vicinity of the study area.

Reference	Assessment Area	Results	Site Distribution
Navin Officer Heritage Consultants Pty Ltd 2002	Campbelltown LGA	At the time of this assessment, it was noted that 120 sites had been previously recorded in the Campbelltown LGA. Of these art sites were the most common, followed by rock shelters with PADs, open artefact scatters, isolated finds and grinding grooves, and scarred trees.	Sites across the Campbelltown LGA exists on 3 different landform types, the Cumberland Plain, the Woronora Ramp, and the transitional zone between them. The following predictions have been made based on the site distribution across these landforms. Cumberland Plain: • Sites occur on all major landforms • Most sites within 50 metres of water sources • Most sites with higher densities will occur near permanent water sources • Major streamline confluences act as prime site locations • Ridgetops and crests have limited site occurrence • Well-drained elevated landforms have a high potential for locating stone artefacts • Low gradients or mostly level ground are more likely to contain artefacts • Site distribution will be affected by proximity to resources Woronora Ramp • Dry rock shelters are likely to contain evidence of occupation particularly if they are close to water sources or a major ridgeline • Engraving sites are likely to be contained on sandstone platforms • Site density is concentrated at ecotones • Artefact scatters will generally occur on well-drained sources in proximity to freshwater and wetlands, or along crests • Burial sites are likely to be contained within soft sediments and deeply profiled landforms • Scarred trees and artefact scatters occur on all topographies

Reference	Assessment Area	Results	Site Distribution
			At the time of this assessment, little have been found within the transitional zone. Predictions were, therefore, made to be consistent with those of the Cumberland Plain and Worona Plateau.
Jo McDonald Cultural Heritage Management 2007	Situated within the South Western Growth Centres. The study focused on the Oran Park Precinct (1,120 ha) and Turner Road Precinct (540 ha). Approximately 500m to the west and 200m to the south-east respectively.	Ethnographic research found that the study areas may have been on the periphery of multiple linguistic groups territory, thus may have seen limited use. Background research found that previous archaeological investigations had identified low-density sites across the region.	The low density of artefacts within sites is thought to reflect the uncommon use of hillslopes that are distant from the Nepean River. Sites are likely to occur in areas of limited past disturbance, in proximity to a water source. The density and complexity of sites are likely to increase with the stream order. Ridgelines are unlikely to have dense archaeological sites only evidence of one-off occupations.
Biosis Research Pty Ltd 2012	Situated within Camden and Campbelltown LGAs including the suburbs Currans Hill, Varroville, Raby and Denham Court approximately 7 kilometres from the study area.	Before the survey, a total of five sites had been recorded in AHIMS including 2 PADS, an open campsite, a scarred tree, and an isolated artefact scatter. After archaeological studies had been completed in the assessment area a total of 28 new sites were recorded. Of these 12 were isolated artefacts, 12 open campsites, and 4 scarred trees.	Biosis notes that most of the sites recorded were in proximity to 1 st and 2 nd order streams or on hill or ridge crests. Potential archaeological deposits were identified based on water source proximity and the level of disturbance within the assessment area. The results of the survey area are representative of what is to be expected for archaeological surveys within the Cumberland Plain. Artefacts were predominantly made of silcrete.
Australian Museum Consulting 2014	Aboriginal Heritage Assessment of Commonwealth Land at Badgerys Creek, approximately 10 kilometres from the study area	While 60 sites have been previously identified within the assessment area, restrictions to site accessibility meant that a survey could only be conducted to target 21 Aboriginal heritage locations. These items included a potential scarred tree, artefacts scatters, and isolated artefacts. Stone artefacts were comprised of silcrete, chert, mudstones, and quartzite. Out of these sites, only 7 could be located and verified during the targeted survey – the scarred trees and 5 stone artefact sites.	It was noted that ongoing effects on the scarred trees led to their deterioration. Active impacts on the sites which may have led to the additional 14 artefacts not being located include water and stock movements, and vegetation overgrowth. No additional Aboriginal heritage objects were identified within the assessment area.

Reference	Assessment Area	Results	Site Distribution
Dominic Steele Consulting Archaeology 2014	Desktop Assessment performed covering 20 Ha at the corner of Bringelly Road and Stuarts Road, Bringelly, approximately 7.5 kilometres from the study area.	No Aboriginal archaeological sites or objects were identified within the assessment area via an AHIMS search.	It was determined that while the assessment area may contain landforms and landscapes features generally associated with Aboriginal cultural heritage value, the history of land use including farming, clearing, construction, and land improvement, has limited archaeological potential and the likelihood of locating in situ deposits or archaeological features is minimal.
Eco Logical Australia 2016	Lot 1201 and 1203 DP1187381 of the former Gledswood Estate and within lot 50 DP1175424 of the former El Caballo Blanco property at 900 Camden Valley Way and within the Camden Lakeside Country Club, Raby Road, Gledswood Hills NSW. Approximately 100 m east of the study area.	Within the assessment area, a total of 160 Aboriginal artefacts were recovered.	The majority of artefacts (n=132) were recovered from a transect that ran parallel to Rileys Creek, which is a 2 nd order stream at this point. The transect ran along an alluvial terrace next to the creek.
Archaeological and Heritage Management Solutions 2017	Desktop assessment area of 180.2 square kilometres within the Campbelltown and Wollondilly Local Government Areas including Glenlee, Appin, Gilead, Brooks Point, Wilton Menangle Park, Menangle, and parts of Glen Alpine, Rosemeadow, Douglas Park and Pheasants Nest.	A total of 574 sites were previously located within the assessment area. The site types include art sites, axe-grinding grooves, rock shelters with art, rock shelters with deposits, rock shelters with midden, burials, habitation structures, isolated finds, middens, moderate sized artefacts scatter, small artefact scatters, potential archaeological deposits, scarred trees stone arrangements, and undefined artefact sites. The most common of these sites are potential archaeological deposits, followed by isolated finds when undefined art sites and undefined artefacts sites.	It has been determined that site distribution is dependant on the substrate upon which the assessment is focused and the proximity to major river systems and their riparian corridors with the George's River and Nepean River being highlighted as key systems. To the north of the assessment area, urban spread has greatly impacted the archaeological record and, as such, Aboriginal sites are less commonly found in this portion of the assessment area.

Reference	Assessment Area	Results	Site Distribution
Austral Archaeology 2020	166-176 St. Andrews Road, Varroville NSW. Located approximately 3.5 km to the east of the current study area. Archaeological testing of an area 114 ha in size.	The salvage excavation recovered a total of 484 artefacts, with a surface collection totalling 31 additional artefacts. Silcrete was the dominant artefactual material with 86.57% of the total artefacts being made from it. Similar findings occurred at another large excavation in Leppington. The other materials found were mudstone, chert, quartz and tuff. A good deal of tools and cores were recovered suggesting that the material was being reduced on-site.	Hill crests were the landform where the highest densities of artefactual material were uncovered. The highest concentrations occurred neighbouring water sources and provided expansive views over the surrounding area. However, due to the landform and paucity of artefacts, the sites were thought to be temporary camps, mostly used for short-term occupation.

2.2.2 ETHNOHISTORY

Population estimates at the time of contact are notoriously problematic as Aboriginal groups avoided the early settlers and were highly mobile. Another factor that complicates an accurate estimation is the effect of European diseases such as influenza and smallpox, which decimated Aboriginal populations soon after contact.

The study area is believed to lie within the Tharawal and Darug language group territories, as mapped by Tindale (1974). The Tharawal territory is believed to have extended south from Botany Bay to the Shoalhaven River and inland as far as Campbelltown and Camden (Attenbrow 2003), while the Gundungurra occupied the land to the west of the Tharawal (AECOM Australia Pty Ltd 2010, Niche Environment and Heritage 2010). However, Aboriginal people formed part of a dynamic culture which encouraged movement throughout the landscape to assist in the ceremonial and functional practicalities of daily life (Niche Environment and Heritage 2010). As such, defined borders for tribal groups need to be recognised as an artificial constraint designed by anthropologists (Organ 1990) and, in the words of Traditional Owner Glenda Chalker of Cubbitch Barta, the area is both “Gundungurra and Tharawal tribal country” (Niche Environment and Heritage 2010).

Historical records show that Gandangara people visited the Campbelltown area. It is not known whether these visitations represented recent displacement patterns as a result of European colonisation or were part of a longer-term interaction with the Dharawal (Karskens 2010).

Laila Haglund has suggested that at contact the area would have been near the border of the Dharawal, Darug and Gandangara territories and that the current study area may have been part of a ‘travel corridor’ facilitating movement between the northern Cumberland Plain and the Illawarra (Haglund 1989).

The pre-contact population numbers for the study area are not known and, due to smallpox and influenza epidemics preceding the arrival of European settlers into the region (Attenbrow 2003), it is unlikely that the early European explorers were able to successfully grasp the traditional population size. This may have also been the reason why Colonial explorer Tench did not encounter Aboriginal people during his exploration of the Camden region during the first years of the colony (Tench 1793).

In the early 19th century, relationships between the local Aboriginal population of the area and the European settlers were generally peaceful. Grace Karskens notes several examples of close relationships between landowners and local Aboriginal people, including John Kennedy who gave the Dharawal protection on Teston Farm at Appin (Karskens 2010).

However, while early contact between Aboriginals and Europeans in the area was initially peaceful, a combination of a long drought and an influx of Aboriginal people pushed off neighbouring lands resulted in escalating violence throughout 1814 to 1816 (Austral Archaeology Pty Ltd 2011). The inevitable conclusion was reached in 1816 when troops under the command of Captain Wallis caused the death of several Aboriginal people camped at Cataract Gorge (Heritage Concepts Pty Ltd 2007). This saw the end of spirited resistance and led to an increased attempt by Aboriginal people to enter the cultural and economic lifestyle of the European settlers.

Following the massacre, the number of Aboriginal people in the Maldon area remained low, with 63 Aboriginal people being reported as living at Stonequarry in 1838, and only 80 Aboriginal people reported at Picton in 1862 (Dibden, in AECOM 2010:14). Despite these unfortunate setbacks, there were reports of Aboriginal people in the Camden area still hunting using traditional methods and camping along the Nepean River right up to the late 19th century (AECOM Australia Pty Ltd 2010, Atkinson 1988).

This ethnohistory should be employed with caution and Hiscock (Hiscock 2008) has argued that even very early historical accounts may not be a suitable basis for analogy. As Aboriginal groups had to change their economic, cultural and political practices to cope with the social impacts of disease in the historic period, he argues that it is likely that similar drastic changes happened in the past in response to “altered cultural and environmental circumstances” following the arrival of Europeans. Social disruption in the Cumberland Plains region caused by European settlement pushing Aboriginal people to the fringes of their traditional lands would have caused such drastic changes.

2.2.3 TOPOGRAPHY, LANDFORMS AND HYDROLOGY

The study area has limited landform variability, consisting of gently sloping plains with local relief of around 30 metres. The landforms consist of broad, rounded crests and ridges with gently inclined slopes with minimal variability.

The study area is bisected by an unnamed 1st tributary of Rileys Creek (Figure 2.3). The stream runs through an artificial dam situated at the centre of the study area. The size and location of the stream indicate it is likely to contain semi-permanent water, filling during wetter and cooler parts of the year. Many other smaller dams are located throughout the study area, utilised for stock grazing or crop irrigation.

The study area is also situated approximately 500 metres east of South Creek, a 3rd order watercourse, which would have provided permanent water year-round. The proximity to water sources would have allowed for the local Aboriginal population to exploit estuarine resources such as fish and shellfish, and faunal and avian resources that also utilised the creeks. Due to the availability of resources in proximity to the study area, it can be assumed that more permanent residential areas would have been set up by local populations (Australian Museum Consulting 2015).

2.2.4 GEOLOGY AND SOILS

The study area is situated wholly within the Bringelly Shale geological unit. Bringelly Shale is a Wianamatta Group sedimentary unit, formed in the Triassic period (Figure 2.3) [Herbert 1979]. Bringelly Shale is generally characterized by shale with occasional calcareous claystone, laminate and coal. Larger shale lenses can occur in association with Hawkesbury Sandstone in certain areas.

The study area is situated within the Blacktown soil landscape, which is often found on gently undulating rises of the Wianamatta Group shales. The Blacktown soil-landscape comprises 4 soil layers, as outlined below:

- **bt1** – friable greyish brown loam
- **bt2** – hard setting clay loam
- **bt3** – strongly pedal, mottled brown, light clay
- **bt4** – light grey plastic mottled clay

These layers are distributed variably across crests, slopes and drainage depressions. Total soil depth along crests is generally 150 centimetres, consisting of 30 centimetres of **bt1**, overlying 20-50 centimetres of **bt2** and a further 20-50 centimetres of **bt3**, which in turn overlies up to 100 centimetres of **bt4**. Soil is roughly similar for upper, mid and lower slopes, with variability in **bt1** and **bt2** expressions in these areas. In drainage depressions, up to 20 centimetres of **bt1** directly overlies **bt3**, which can extend for up to 2 metres depth. Soils in drainage depressions can become periodically waterlogged and saline (Mitchell 2002).

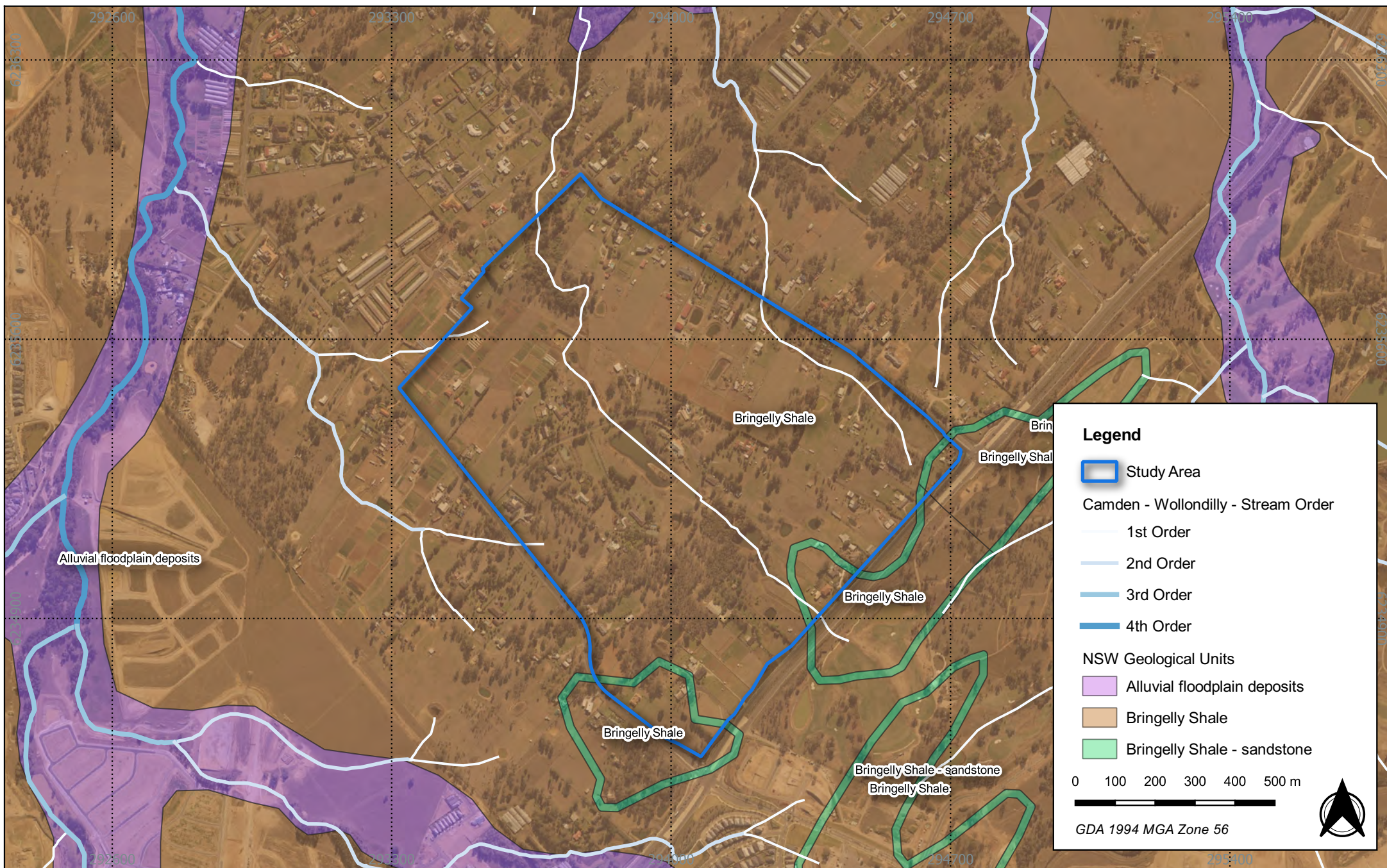


Figure 2.3 Hydrology and geology of the study area

21148 - Springfield Road, Catherine Field - ACHDDA

Source: NSW LPI Aerial, NSW Seamless Geology

Drawn by: ARH Date: 2021-12-15



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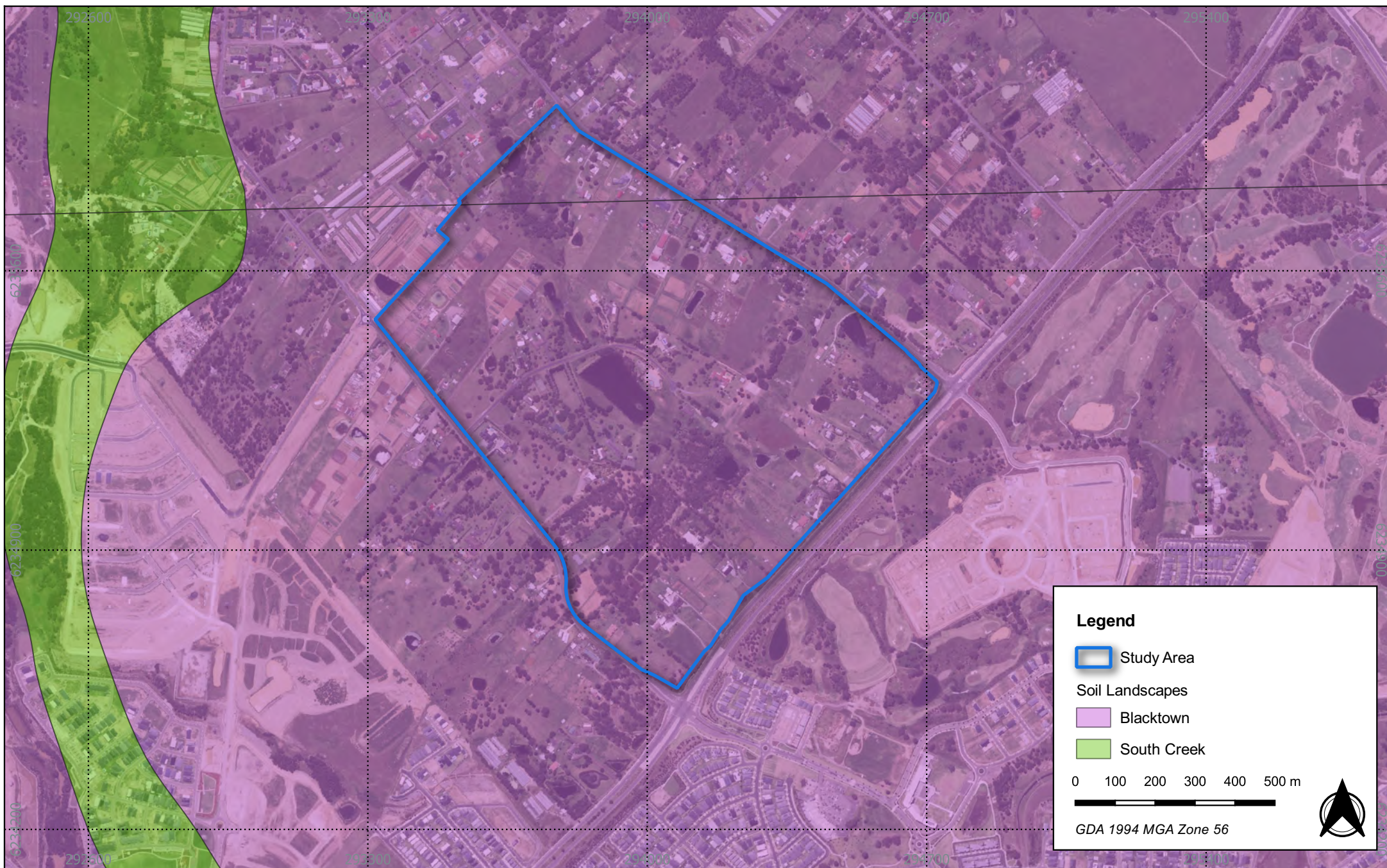


Figure 2.4 Soil landscapes identified within the study area and surrounds

21148 - Springfield Road, Catherine Field - ACHDDA

Source: NSW LPI Aerial, NSW Soil landscapes

Drawn by: ARH Date: 2021-12-13



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2.2.5 LANDSCAPE RESOURCES

A wide range of land mammals was hunted for food, including kangaroos, possums, wombats and echidnas as well as native rats and mice (Attenbrow 2002). Birds, such as the muttonbird and brush turkey, were eaten and it is recorded that eggs were a favourite food (Attenbrow 2002).

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 2002).” Several other plants have medicinal functions, many of which have only recently been discovered by science, although these were traditionally known to the Aboriginal people.

Observations from the earliest European settlers describe Aboriginal people in the Sydney region roasting fern-roots, eating small fruits the size of a cherry as well as a type of nut and the root of “a species of the orchid” amongst other types of plant food, and it was noted that their diet consisted of “a few berries, the yam and fern-root, the flowers of the different Banksia, and at times some honey” (Collins 1804). At other times, the Aboriginal people living in the woods would “make a paste formed of the fern-root and the ant bruised together; in the season, they also add the eggs of this insect” (Collins 1804).

However, as Attenbrow notes, the settlers’ lack of knowledge of the local plant species make actual identification of the various plants being discussed difficult, beyond vague terminology which compared plants to those which were known to the settlers (Attenbrow 2002). Of the numerous species which are known to have been used by Aboriginal people in the past, the ‘murrnong’, or yam daisy (*Microseris lanceolata*), was the most important staple food and it was the destruction of these plants that contributed to an increased strain on the food resources available to Aboriginal people in the early 19th century (Kohen 1995). Other important species to the Darug people included the ‘burrawang’ (*Macrozamia communis*), whose seeds had to be treated before being turned into flour, and the native yam (*Dioscorea transversa*) (Kohen 2009).

In summary, the Cumberland Plains and Georges River provided a wide variety of plants and animals which were used by the local Aboriginal populations for artefact manufacture, medicinal purposes, ceremonial items and food.

2.2.6 PAST LAND-USE PRACTICES

The study area has been utilised for rural residential living since the 1960s, with significant ground disturbance occurring associated with this land use. Excavation and levelling for construction of houses, dams, and sheds; associated landscaping; installation of fencing; and cultivation of market gardens have all resulted in disturbance to the ground surface (Figure 2.5). These disturbances are likely to have resulted in the movement or loss of subsurface Aboriginal cultural heritage across the study area.

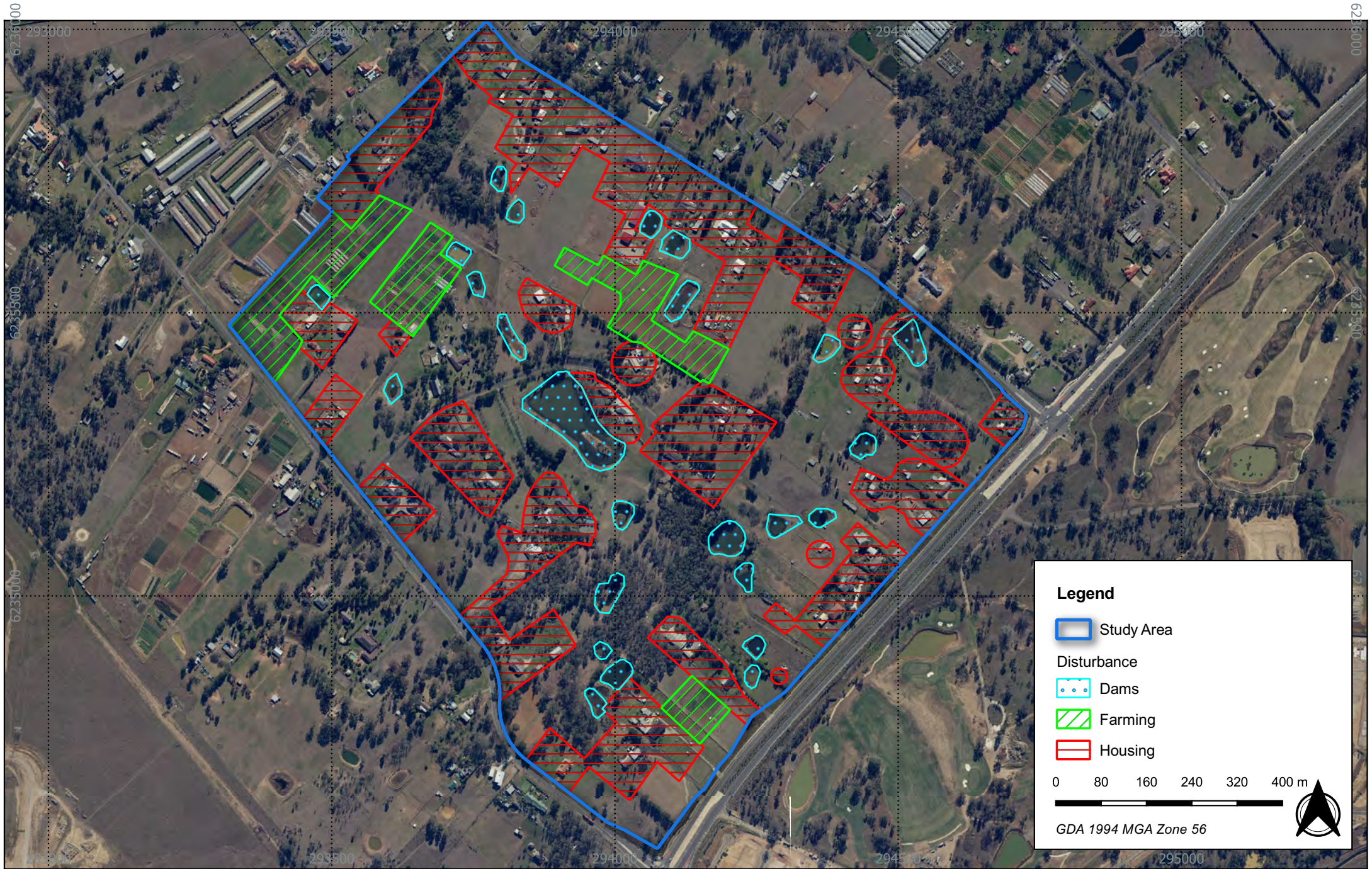


Figure 2.5 Land disturbance within the study area

21148 - Springfield Road, Catherine Field - ACHDDA

Source: NSW LPI Aerial

Drawn by: ARH Date: 2021-12-13



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2.2.7 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 degree of disturbance.

In summary, the main trends broadly seen across eastern New South Wales are that:

- archaeological sites occur on most landforms;
- site frequency and density are dependent on their location in the landscape;
- there is a dominance of low-density surface open artefact scatters and isolated finds;
- there is a noted paucity of scarred trees due to land clearance;
- artefact scatters are commonly located close to permanent water sources along creek banks, alluvial flats and low slopes, largely concentrated within the first 100 metres of the creek line. More complex sites are usually located close to water sources with major confluences being key locations for occupation sites.
- archaeological material is also present beyond the immediate creek surrounds in decreasing artefact densities;
- there may be concentrations of sites occurring on ridge tops and crests that are associated with pathways through the landscape;
- subsurface archaeological deposits are often recovered in areas where no visible surface archaeological remains are evident;
- the dominant raw material used in artefact manufacture is silcrete and fine-grained siliceous material with smaller quantities of chert, quartz and volcanic stone seen;
- artefact assemblages usually comprise a small proportion of formal tool types with the majority of assemblages dominated by flakes anddebitage;
- 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; and
- PADs are most likely to occur along valley floors and low slopes in well-drained areas.

While these statements provide an adaptable framework for applying a predictive model to the study area, surveying of the study area and an assessment of reports conducted around Catherine Fields and the wider Camden region have allowed for more site-specific predictions to be made. These predictions include:

- Due to the nature of the disturbance in the immediate study area, it is extremely unlikely that archaeological sites will be located.
- Should sites be found they are likely to be PADs, artefact scatters, or isolated artefacts.
- Stone artefacts are the most probably artefact type to be located.
- Archaeological potential will increase with proximity to waterways.

2.3 STEP 2B: ACTIVITIES IN AREAS WHERE LANDSCAPE FEATURES INDICATE THE PRESENCE OF ABORIGINAL OBJECTS

Table 2.4 Landscape features in the Code that indicate the likely existence of Aboriginal objects.

Question	Response
Is the activity within 200 metres of 'waters'?	No
Is the activity within a sand dune system?	No
Is the activity located on a ridge top, ridgeline or headland?	No
Is the activity located within 200 metres below or above a cliff face?	No
Is the activity within 20 metres 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 2A indicate Aboriginal Objects or places are likely to occur on any of the topographic elements of the activity area?	No

The proposed works are being undertaken within the suburb of Catherine Fields, an area which is low in archaeological potential and is yet to have Aboriginal sites registered within the area. With this knowledge and the survey demonstrating that the site is highly disturbed, it is considered unlikely that if any site were within the study area they will no longer be intact.

A site inspection has been conducted to determine whether any Aboriginal sites are present and whether they will be impacted by the proposed works. The findings of this inspection are outlined in Section 2.5.

2.4 STEP 3: CAN YOU AVOID HARM TO THE OBJECT OR DISTURBANCE OF THE LANDSCAPE FEATURE?

The proposed rezoning will allow for an increase in residential and associated urban development within the study area. Although the rezoning will have no physical impact, the resulting subdivision and construction activities will lead to ground impacts. No landscape features with archaeological potential have been identified within the study area.

2.5 STEP 4: DESKTOP ASSESSMENT AND VISUAL INSPECTION

2.5.1 DESKTOP ASSESSMENT

The desktop assessment indicates that the local Aboriginal people are likely to have used the study area as a transitional area through the Cumberland Plain and for the exploitation of the bountiful land resources indicated in section 2.2.5. The extensive disturbance of the study area, however, has led to the assumption that no deposits or evidence of Aboriginal land use will be visible within the archaeological record.

2.5.2 VISUAL INSPECTION METHODOLOGY

A visual inspection of the study area was undertaken by Stephanie Moore (Senior Archaeologist, Austral) on Monday 6 December 2021. Tharawal Local Aboriginal Land Council (TLALC) were invited to attend; however, they indicated that they did not have a sites officer available to participate.

The inspection was limited to properties within the study area for which an access agreement is in place (Figure 2.12). These properties were utilised as a representative sample of the study area during the physical inspection, with results supplemented by desktop research.

The physical inspection was undertaken on foot, using meander transects where access was available across the properties. Paddocks containing livestock were avoided and efforts were made to stay some distance from occupied residences.

The results of the inspection are outlined below.

2.5.3 VISUAL INSPECTION RESULTS

SURVEY UNIT 1

Survey unit 1 contains a large house and landscaped gardens, access by a long, fenced gravel driveway to Charlesworth close. Accompanying the house is an inground pool and tennis court, and ancillary structures. The lawns are well kept, and a number of non-native plantings have been installed surrounding the property, utilized for decoration and as screening vegetation.

Ground surface visibility through survey unit 1 was very limited (<10%), as thick grass covered the majority of the area (Figure 2.6). Exposure was noted along the gravel driveway, although it is acknowledged that these gravels are imported and are unlikely to yield evidence of Aboriginal occupation within the study area.

No Aboriginal objects, sites or areas of archaeological potential were identified within survey unit 1.



Figure 2.6 View southwest from survey unit 2 into survey unit 1, showing house and fences

SURVEY UNIT 2

Survey unit 2 is dominated by a large dam, situated across the north and west of the unit. Construction of the dam and installation of service infrastructure (including water pumps, overhead powerlines and irrigation) have resulted in impacts to the ground surface along the south and western edge of the survey unit. The eastern side of the survey unit shows less ground disturbance, although the installation of fences and construction of a smaller dam to the south have resulted in some impacts. The south-eastern corner of survey unit 2 contains a drainage line, running from the east into the large dam. At the time of the survey, the drainage line was marshy and contained some standing water, following several heavy rain events in the preceding weeks. A further disturbance was noted in the north of the study area, resulting from the construction of a house, inground pool and driveway.

Ground surface visibility was generally low (<10%) throughout survey unit 2, with areas of exposure only noted concerning service installations. The vegetation throughout survey unit 2 is scarce, consisting of imported species used in landscaping and as screening along property boundaries.

No Aboriginal objects, sites or areas of archaeological potential were identified within survey unit 2.



Figure 2.7 View east across survey unit 2, showing thick grass coverage and large dam



Figure 2.8 Area of exposure surrounding pump shed and utilities pole

SURVEY UNIT 3

Survey unit 3 was not walked on foot, due to livestock (goats and sheep) being present within the fenced paddocks. Observations were made from along the fences, looking east across the survey unit.

Survey unit 3 is more heavily vegetated than survey units 1 and 2, containing young growth pine trees across much of the southern and eastern portions of the unit. There are some young eucalypts noted in the south-eastern corner, although these do not appear to be old enough to feature cultural scarring. The northern portion of survey unit 3 contains a house and sheds, an inground pool, and landscaped gardens. There are two small dams, one of which feeds the drainage line which flows to survey unit 2.

Ground surface visibility was generally <10%, with exposures noted around the edges of the constructed dams and in proximity to structures.

No Aboriginal objects, sites or areas of archaeological potential were identified within survey unit 3.



Figure 2.9 View east across survey unit 3 showing pine trees, dam and drainage line

SURVEY UNIT 4

Survey unit 4 is a cleared residential property with a house and sheds situated in the north-eastern corner. There is a long gravel driveway extending north from Springfield Road, and a brick fence along the front boundary. The property has undergone extensive landscaping, particularly surrounding the house and along the east and west boundaries. There are some mature trees along the western boundary, although none appear to be suitable for cultural scarring.

Ground surface visibility was generally <10%, with thick grass coverage across much of the area. Exposures were noted along the driveway and in proximity to landscaped features.

No Aboriginal objects, sites or areas of archaeological potential were identified within survey unit 4.



Figure 2.10 View east across survey unit 4, showing house and sheds, driveways and landscaping disturbances

SURVEY UNIT 5

Survey unit 5 was not accessed in full due to livestock being present within fenced yards on the property. Observations were made from the fence facing Springfield Road.

Survey unit 5 is heavily vegetated with mature eucalypts, although the vegetation does not appear to be old growth. There is a house in the southeast corner of the survey unit, accompanied by several outbuildings to the north. Fences were noted along the southern boundary and throughout the property. There is a dam situated at the southwest corner, in proximity to the house. The area surrounding the dam is well vegetated and appeared marshy.

Ground surface visibility was generally <10%, with thick grass coverage across much of the area.

No Aboriginal objects, sites or areas of archaeological potential were identified within survey unit 5.



Figure 2.11 view east into survey unit 5, showing thick ground cover and vegetation

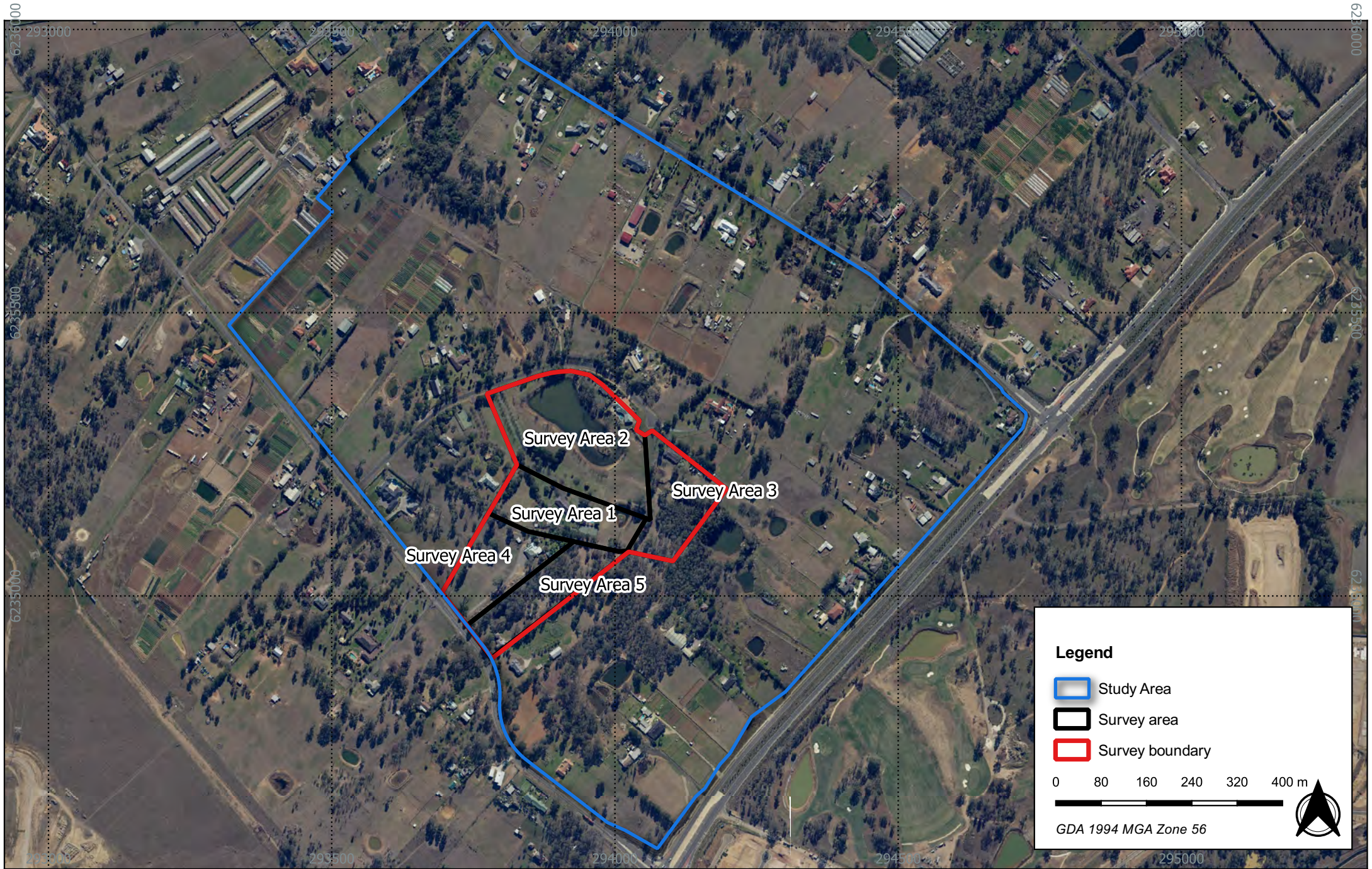


Figure 2.12 Survey areas within the study area

21148 - Springfield Road, Catherine Field - ACHDDA

Source: NSW LPI Aerial

Drawn by: ARH Date: 2021-12-13



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2.6 STEP 5: FURTHER INVESTIGATIONS AND IMPACT ASSESSMENT

Based upon the outcome of Steps 1 to 4 of the code, no further assessment is warranted.

The following recommendations are derived from the findings described in this ACHDDA. The recommendations have been developed after considering the archaeological context and environmental information.

It is recommended that:

1. All Aboriginal objects and Places are protected under the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by Heritage NSW. 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 Heritage NSW and Aboriginal stakeholders.
2. 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:
 - immediately cease all work at that location and not further move or disturb the remains
 - notify the NSW Police and Heritage NSW's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location
 - not recommence work at that location unless authorised in writing by OEH.

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