# Keyhole Lands, Horsley Park: Archaeological Report

FINAL REPORT

Prepared for Frasers Property Industrial

17 December 2021

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## Acknowledgements


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- Paul Solomon: Frasers Property Industrial.

Biosis staff involved in this project were:

- Caitlin McManus (Archaeological survey).
- Astrid Mackegard (GIS and mapping).



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# Glossary

| | |
|---|---|
| **ACHA** | Aboriginal Cultural Heritage Assessment |
| **AHIMS** | Aboriginal Heritage Information Management System |
| **AHIP** | Aboriginal Heritage Impact Permit |
| **AR** | Archaeological Report |
| **Biosis** | Biosis Pty Ltd |
| **Consultation requirements** | *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* |
| **DA** | Development Application |
| **DECCW** | Department of Environment, Climate Change and Water (now Heritage NSW) |
| **DP** | Deposited Plan |
| **EP&A Act** | *Environmental Planning and Assessment Act 1979* |
| **GPS** | Global Positioning System |
| **GSV** | Ground Surface Visibility |
| **Heritage NSW** | Heritage NSW, Department of Premier and Cabinet |
| **ICOMOS** | International Council on Monuments and Sites |
| **LALC** | Local Aboriginal Land Council |
| **LEP** | Local Environmental Plan |
| **LGA** | Local Government Area |
| **MGA** | Map Grid of Australia |
| **NPW Act** | *National Parks and Wildlife Act 1974* |
| **NPWS** | National Parks and Wildlife Service |
| **NSW** | New South Wales |
| **PAD** | Potential Archaeological Deposit |
| **SEPP** | State Environmental Planning Policy |
| **Study area** | Defined as 121-217 Chandos Road (Lot 54, 56 and 57 DP13961, Lot A and B DP361393, Lot 58B DP17288), 143-245 Redmayne Road (Lot 59A, 59B DP362022, Lot 1, 2 DP505934, Lot 61B DP17288, Lot A, B DP347034, Lot 63, 77 DP13961, Lot A, B DP357890, Lot A, B DP377249, Lot 74A, 74B DP17288) and 1617-1671 The Horsely Drive (Lot 79B DP347873, Lot 79A, 79B DP17288, Lot 1 DP8479699, Lot 81A, 81B DP348110), Horsley Drive, New South Wales. |
| **the Code** | *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* |

# Summary

Biosis Pty Ltd (Biosis) was commissioned by Frasers Property Industrial to undertake an Archaeological Report (AR) to support an Aboriginal Cultural Heritage Assessment (ACHA) for the proposed land rezoning of the Keyhole Lands (refer to Figure 1, Figure 2, and Table 1), at Horsley Park, New South Wales (NSW) (the study area). The project will be assessed under Part 3 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This AR documents the findings of the archaeological investigations conducted as part of the ACHA that is currently being prepared by Biosis. As required under Section 2.3 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010a) (the Code), the AR provides evidence about the material traces of Aboriginal land use to support the conclusions and management recommendations in the ACHA.

The study area is located in privately owned land approximately 31 kilometres west of the Sydney central business district (CBD).

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) database was conducted on 16 March 2021 (Client service ID: 576371). The search identified 103 Aboriginal archaeological sites within a 3.5 kilometre search area, centred on the study area. One registered Aboriginal site (AHIMS 45-5-3082/Horsley Dr PAD) was identified within the study area. AHIMS 45-5-3082/Horsley Dr PAD consists of an area of Potential Archaeological Deposit (PAD).

An archaeological survey was conducted on 5 April 2021 within the following lots; 58A, 58B, and 79B DP 17288, A and B DP 361393, 59A DP362022, 81A and 81B DP 348110, and part of Lot 1 DP849699. The survey effort targeted those portions of the study area which authorised access was obtained. Some portions of the study area such as part of Lot 81A and 81B DP 348110 were inaccessible due to chest high vegetation cover.

An additional archaeological survey was undertaken on 14 September 2021 within the following lots: 56 and 57 DP 13961, B DP 357890, 1 and 2 DP 505934, A DP 347034, 78B DP 347873, 1 DP849699, B DP 377249, and 61B, 74A, and 79A DP 17288 when further lots were accessible.

The overall effectiveness of each of the surveys for examining the ground for Aboriginal sites was deemed low. This was attributed to vegetation cover restricting ground surface visibility (GSV) combined with a low amount of ground surface exposure. No Aboriginal sites were identified within the study area, however, areas of low, moderate and high archaeological potential were recorded based upon observations made in the field and results of the background research. No physical cultural material was identified at the location of AHIMS 45-5-3082/Horsley Dr PAD upon the ground surface. However, this portion of the study area has not been significantly disturbed and still retains PAD.

There is potential for future development activities to impact upon AHIMS 45-5-3082/Horsley Dr PAD and the identified areas of moderate and high archaeological potential.

Strategies have therefore been developed based on the archaeological significance of cultural heritage relevant to the study area. The strategies also take into consideration:

- Predicted impacts to Aboriginal cultural heritage.
- The planning approvals framework.
- Current best conservation practice, widely considered to include:

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- The ethos of the Australia International Council on Monuments and Sites (ICOMOS) Burra Charter.
- the Code.

The recommendations that resulted from the consultation process are provided below.

**Management recommendations**

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

### Recommendation 1: Further archaeological survey of remaining portions of the study area

Biosis recommends that a comprehensive archaeological survey of the entire study area be undertaken to inform this assessment. It is recommended that portions of the site which were not investigated as part of the archaeological survey completed by Biosis on 5 April 2021 and 14 September 2021 (refer to Table 9), should be surveyed. Further archaeological surveys should be undertaken in accordance with the Code.

### Recommendation 2: Avoidance of AHIMS 45-5-3082/Horsley Dr PAD and areas identified as having moderate/high archaeological potential

Biosis recommends that avoidance of AHIMS 45-5-3082/Horsley Dr PAD and areas identified as having moderate/high archaeological potential should be undertaken wherever possible through redesign (Figure 12). If impacts to AHIMS 45-5-3082/Horsley Dr PAD and areas of moderate/high archaeological potential cannot be avoided Recommendation 3 must be undertaken prior to undertaking any works on site.

### Recommendation 3: Test excavations

Based on current development plans it is unlikely that AHIMS 45-5-3082/Horsley Dr PAD and areas identified as having moderate/high archaeological potential can be avoided. If impacts cannot be avoided through redesign, further investigation in the form of test excavations is recommended. Test excavations should be undertaken in accordance with the Code. This would also include any additional areas of moderate or high potential identified through the comprehensive archaeological survey as outlined in Recommendation 1.

### Recommendation 4: Areas identified as having low archaeological potential

No further investigations are required for areas assessed as having low archaeological potential. This recommendation is conditional upon Recommendations 7, 8, and 9.

### Recommendation 5: Consultation with the registered Aboriginal parties

It is recommended that consultation with registered Aboriginal parties (RAPs) be undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010b) (consultation requirements), as part of the ACHA currently being prepared by Biosis. The proponent should inform RAPs about the project and future development. RAPs should be given the opportunity to provide information regarding the cultural significance of the study area, and to provide comment on the management of Aboriginal cultural heritage values within the study area throughout the life of the project.

### Recommendation 6: Updates to AR and ACHA

Biosis recommends that following the completion of further investigations and consultation with RAPs that the AR and ACHA be updated and finalised.

### Recommendation 7:  Heritage interpretation strategy

The Horsley Park area has a rich Aboriginal history and it is recommended that opportunities for heritage interpretation are explored and implemented for the project in consultation with Aboriginal stakeholders. The purpose of the strategy is to ensure that the traditional, historical and contemporary cultural values and meanings held by Aboriginal people of the region are indelibly integrated into the Keyhole Lands project in a meaningful, culturally appropriate and practical way.

### Recommendation 8: Discovery of unanticipated Historical relics

Relics are historical archaeological resources of local or State significance and are protected in NSW under the *Heritage Act 1977* (Heritage Act). Relics cannot be disturbed except with a permit or exception/exemption notification. Should unanticipated relics be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. Heritage NSW, Department of Premier and Cabinet (Heritage NSW) will require notification if the find is assessed as a relic.

### Recommendation 9: Discovery of unanticipated Aboriginal objects

All Aboriginal objects and Places are protected under the *National Parks and Wildlife Act 1974* (NPW Act). It is an offence to disturb an Aboriginal site or object 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 the Heritage NSW and Aboriginal stakeholders.

### Recommendation 10: Discovery of human remains

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

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

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# 1 Introduction

## 1.1 Project background

Biosis was commissioned by Frasers Property Industrial to undertake an AR to support an ACHA for the proposed land rezoning of the Keyhole Lands (refer to Figure 1, Figure 2, and Table 1), at Horsley Park, NSW (the study area). The project will be assessed under Part 3 of the EP&A Act.

This AR documents the findings of the archaeological investigations conducted as part of the ACHA that is currently being prepared by Biosis. As required under Section 2.3 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010a) (the Code), the AR provides evidence about the material traces of Aboriginal land use to support the conclusions and management recommendations in the ACHA.

This investigation has been carried out under Part 6 of the NPW Act. It has been undertaken in accordance with the Code. The Code has been developed to support the process of investigating and assessing Aboriginal cultural heritage by specifying the minimum standards for archaeological investigation undertaken in NSW under the NPW Act. The archaeological investigation must be undertaken in accordance with the requirements of the Code.

It is stated in section 1.2 of the Code that where the ACHA report concludes that the proposed activity will result in harm to Aboriginal objects or declared Aboriginal Places, an application for an Aboriginal Heritage Impact Permit (AHIP) will be required. This application must be supported by an ACHA report.

The EP&A Act includes provisions for local government authorities to consider environmental impacts in land-use planning and decision making. Each Local Government Area (LGA) is required to create and maintain a Local Environmental Plan (LEP) that includes Aboriginal and historical heritage items. Local Councils identify items that are of significance within their LGA, and these items are listed on heritage schedules in the local LEP and are protected under the EP&A Act and Heritage Act.

## 1.2 Study area

The study area is located approximately 14 kilometres south west of Parramatta and approximately 31 kilometres west of the Sydney CBD (Figure 1). It encompasses approximately 64 hectares of private land and consists of the lots outlined below in Table 1.

**Table 1 Study area – Keyhole Lands**

| Lot No. | Deposited Plan | Address | Status of site access |
|---|---|---|---|
| 58B | 17288 | 211-217 Chandos Road, Horsley Park | Accessible |
| 58A | 17288 | 203-209 Chandos Road, Horsley Park | Accessible |
| 57 | 13961 | 187-201 Chandos Road, Horsley Park | Accessible |
| 56 | 13961 | 171-185 Chandos Road, Horsley Park | Accessible |
| A | 361393 | 155-169 Chandos Road, Horsley Park | Accessible |
| B | 361393 | 137-153 Chandos Road, Horsley Park | Accessible |
| 54 | 13961 | 121-135 Chandos Road, Horsley Park | No access |

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| Lot No. | Deposited Plan | Address | Status of site access |
|---|---|---|---|
| 59B | 362022 | 143-155 Redmayne Road, Horsley Park | No access |
| 59A | 362022 | 157-165 Redmayne Road, Horsley Park | Accessible |
| 1 | 505934 | 167-183 Redmayne Road, Horsley Park | Accessible |
| 2 | 505934 | 185-193 Redmayne Road, Horsley Park | Accessible |
| 61B | 17288 | 195 Redmayne Road, Horsley Park | Accessible |
| A | 347034 | 203-210 Redmayne Road, Horsley Park | Accessible |
| B | 347034 | 215-223 Redmayne Road, Horsley Park | No access |
| 63 | 13961 | 225-245 Redmayne Road, Horsley Park | No access |
| 77 | 13961 | 120-134 Redmayne Road, Horsley Park | No access |
| B | 357890 | 136-142 Redmayne Road, Horsley Park | Accessible |
| A | 357890 | 144-150 Redmayne Road, Horsley Park | No access |
| A | 377249 | 172-180 Redmayne Road, Horsley Park | No access |
| B | 377249 | 152-170 Redmayne Road, Horsley Park | Accessible |
| 74B | 17288 | 182-190 Redmayne Road, Horsley Park | No access |
| 74A | 17288 | 200-206 Redmayne Road, Horsley Park | Accessible |
| 78B | 347873 | 1671-1675 The Horsley Drive, Horsley Park | Accessible |
| 79A | 17288 | 1667 The Horsley Drive, Horsley Park | Accessible |
| 79B | 17288 | 1657-1665 The Horsley Drive, Horsley Park | Accessible |
| 1 | 849699 | 1637-1645 The Horsley Drive, Horsley Park | Accessible |
| 81A | 348110 | 1627-1635 The Horsley Drive, Horsley Park | Accessible |
| 81B | 348110 | 1617-1625 The Horsley Drive, Horsley Park | Accessible |
| C | 398446 | 1681 The Horsley Drive, Horsley Park | No access |
| D | 398446 | 1677-1679 The Horsley Drive, Horsley Park | No access |
| A | 394855 | 220 Redmayne Road, Horsley Park | No access |
| B | 394855 | 222-230 Redmayne Road, Horsley Park | No access |

## 1.3 Planning approvals

The proposed development will be assessed against Part 3 of the EP&A Act. Other relevant legislation and planning instruments that will inform this assessment include:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- *National Parks and Wildlife Act 1974* (NPW Act).
- *National Parks and Wildlife Amendment Act 2010.*
- *State Environmental Planning Policy (Infrastructure) 2007 (ISEPP).*

- *Fairfield Local Environmental Plan 2013* (FLEP).

## 1.4 Objectives of the investigation

The objectives of the investigation can be summarised as follows:

- To identify and consult with any RAPs and Deerubbin Local Aboriginal Land Council (LALC).
- To conduct additional background research in order to recognise any identifiable trends in site distribution and location.
- To search statutory and non-statutory registers and planning instruments to identify listed Aboriginal cultural heritage sites within the study area.
- To highlight environmental information considered relevant to past Aboriginal occupation of the locality and associated land use and the identification and integrity/preservation of Aboriginal sites.
- To summarise past Aboriginal occupation in the locality of the study area using ethnohistory and the archaeological record.
- To formulate a model to broadly predict the type and character of Aboriginal sites likely to exist throughout the study area, their location, frequency and integrity.
- To conduct an archaeological survey of the study area to locate unrecorded or previously recorded Aboriginal sites and to further assess the archaeological potential of the study area.
- To assess the significance of any known Aboriginal sites in consultation with the Aboriginal community.
- To identify the impacts of the proposed development on any known or potential Aboriginal sites within the study area.
- To recommend strategies for the management of Aboriginal cultural heritage within the context of the proposed development.

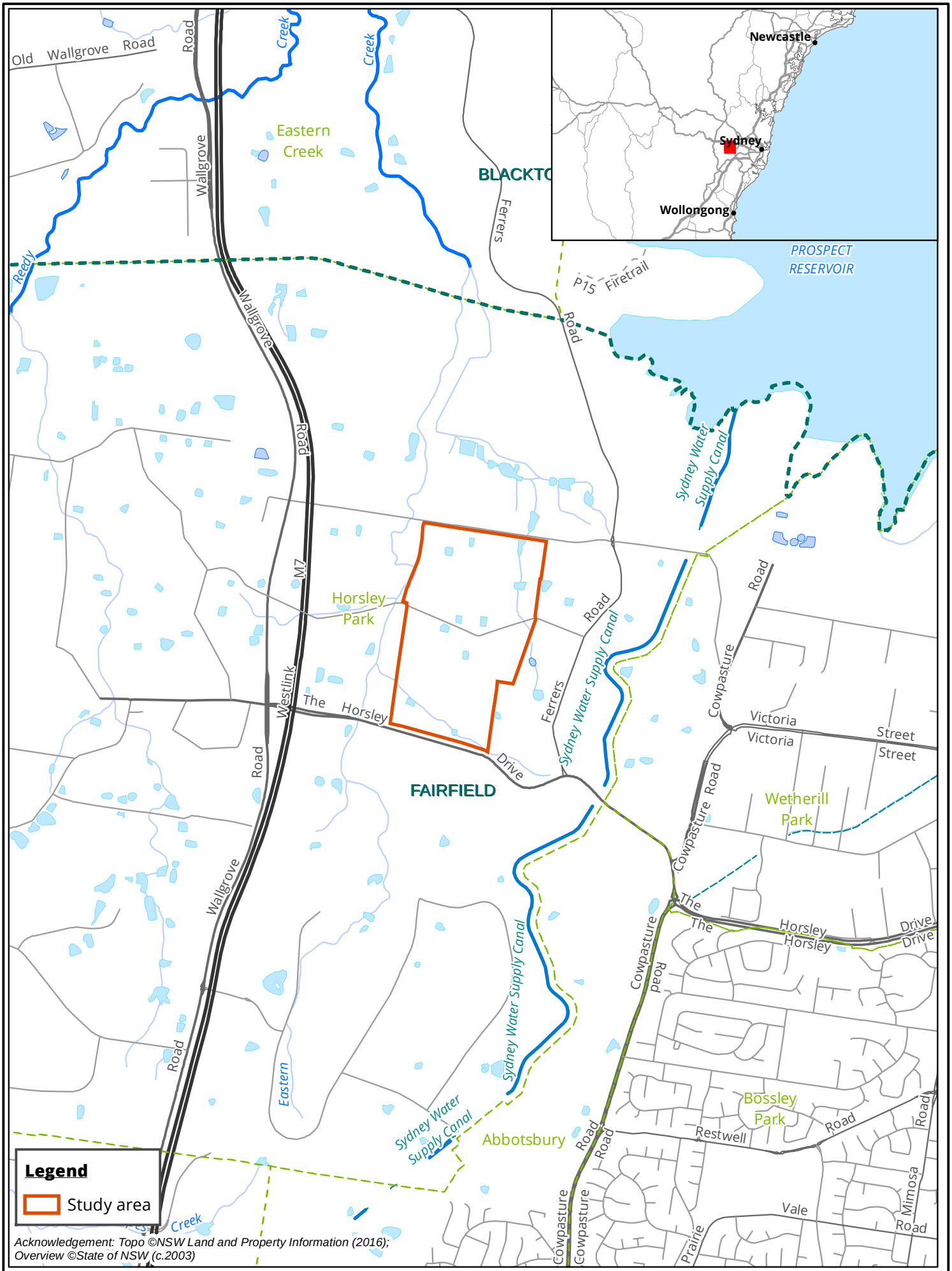
## 1.5 Investigators and contributors

The roles, previous experience and qualifications of the Biosis project team involved in the preparation of this archaeological report are described below in Table 2.

**Table 2 Investigators and contributors**

| Name and qualifications | Experience summary | Project role |
|---|---|---|
| **Taryn Gooley**<br>BASc (Hons) | Taryn has over 10 years' experience in archaeological consulting and has successfully completed numerous projects throughout NSW.<br>Taryn has extensive experience in undertaking Aboriginal archaeological assessments, archaeological surveys, and large scale archaeological testing and salvage excavation programs across NSW. Taryn has participated in and managed a number of long term archaeological programs under Part 4 and Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). | • Quality assurance. |

| Name and qualifications | Experience summary | Project role |
|---|---|---|
| **Maggie Butcher**<br>BSc/BA (Hons) | Maggie is an archaeologist and artefact specialist who has been practicing full time since 2015. Maggie has had experience working as an archaeologist on a number of European and Aboriginal heritage projects across New South NSW and report writing. | • Project Management. |
| **Ashleigh Keevers-Eastman**<br>BA (Hons) | Ashleigh is a Project Archaeologist with over four years' experience. Ashleigh has gained experience in conducting Aboriginal heritage assessments, field surveys, archaeological test excavations and salvage works across NSW. Ashleigh's strengths are in consulting with the Aboriginal community to build strong relationships that assist in the assessment of Aboriginal cultural heritage. Ashleigh possesses skills in lithic identification, technical report writing and project management. | • Archaeological survey.<br>• Reporting.<br>• Aboriginal community consultation. |
| **Anthea Vella**<br>B.Arch M.AHM | Anthea is an Archaeologist with three years' experience. Anthea has experience in conducting Aboriginal and historical heritage assessments, surveys and archaeological test excavations for a variety of projects throughout NSW. Anthea possesses specialist skills in analysing Ground Penetrating Radar data. Anthea also possesses skills in desktop research, project administration, and reporting. | • Archaeological survey.<br>• Reporting. |
| **Madeleine Lucas**<br>BSc/BA (Hons) | Madeleine is an Archaeologist with two years' experience. Madeleine possesses skills in zooarchaeological analysis and is experienced in the identification of faunal remains and taphonomic analysis. Since joining Biosis, Madeleine has further developed her skills in historical and Aboriginal background research, data entry, and report production. Madeleine is also experienced in undertaking Aboriginal community consultation. | • Background research. |
| **Caitlin McManus**<br>BA<br>Grad Cert MA<br>Grad Cert Project Management | Caitlin completed her Bachelor of Arts, majoring in Archaeology and Anthropology, her Graduate Certificate in Maritime Archaeology in 2018, and joined Biosis in 2019. Since employment at Biosis, Catlin has participated in a variety of Aboriginal and historic projects, developing her skills in archaeological surveys, test excavations, salvage excavations, archival recording, historical excavations, and background research. | • Archaeological survey. |




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

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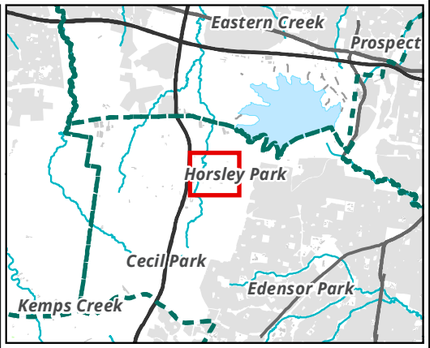
## Figure 1 Location of the study area

Matter: 34802
Date: 01 June 2021,
Checked by: AKE, Drawn by: LH, Last edited by: amackegard
Location:P:\34800s\34802\Mapping\

0 200 400 600 800 1,000
Metres

N

Scale 1:25,000 @ A4, GDA 1994 MGA Zone 56


**Legend**

- Study area
- Lot

**Figure 2 Study area detail**

0 40 80 120 160 200

Metres

N

Scale: 1:5,000 @ A3

*Coordinate System: GDA 1994 MGA Zone 56*

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Matter: 34802,
Date: 28 May 2021,
Checked by: AKE, Drawn by: LH, Last edited by: amackegard
Location: P:\34800s\34802\Mapping\34802_ADDA_F2_StudyArea.mxd

# 2 Proposed development

Frasers Property Industrial are preparing a Planning Proposal which will be assessed under Part 3 of the EP&A Act. The Planning Proposal will propose to amend the FLEP 2013 with the following amendments:

- Rezone the study area from RU2 Rural Landscape to IN1 General Industrial,
- Amend the Height of Buildings (HoB) Map to remove the building height limit applicable to the study area
- Amend the Minimum Lot Size Map to reduce the minimum subdivision lot size.

The proposed amendments to the FLEP 2013 seek to support the future development of a Warehouse, Logistics and Industrial Facilities Hub within the study area (Figure 3).

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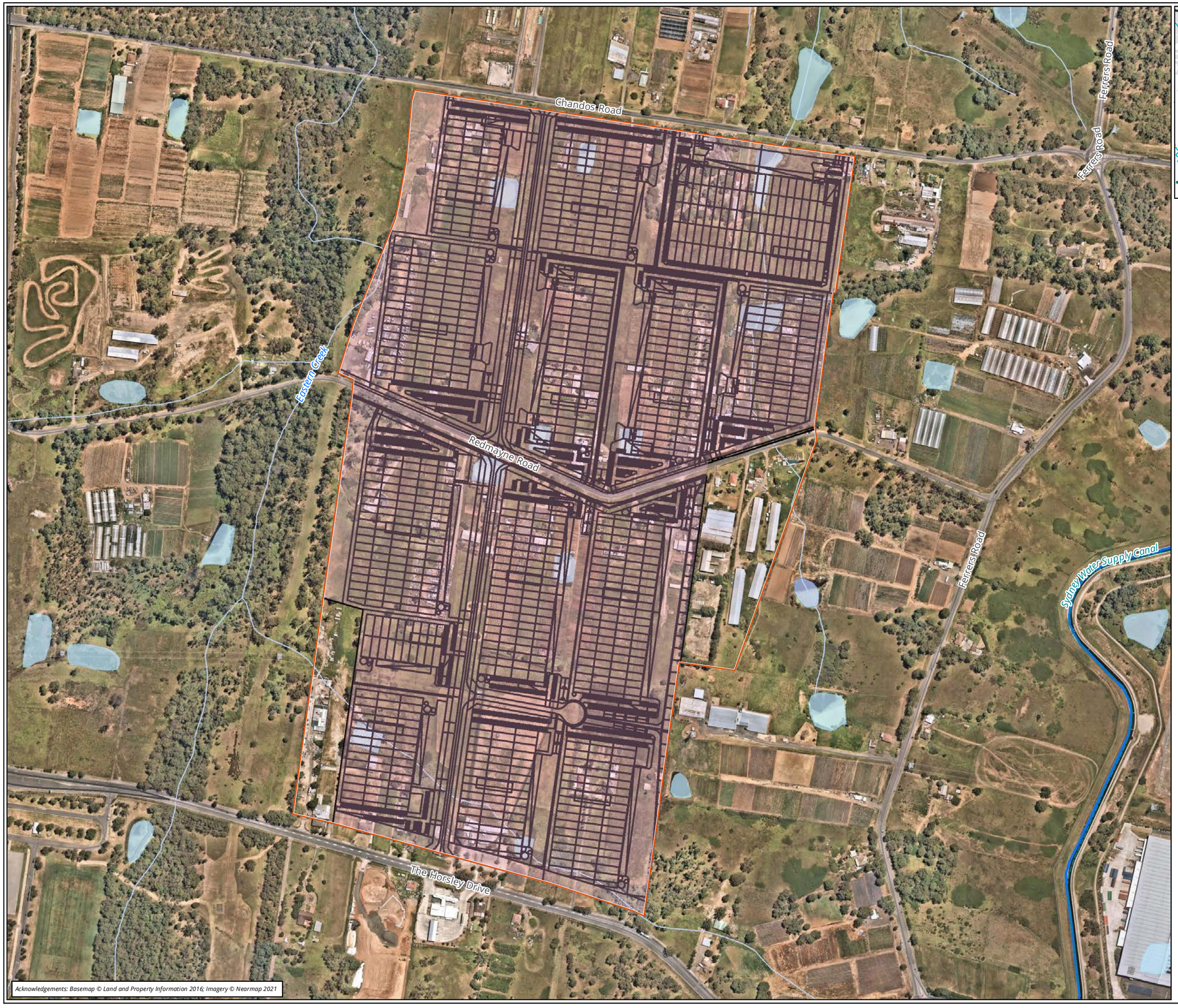


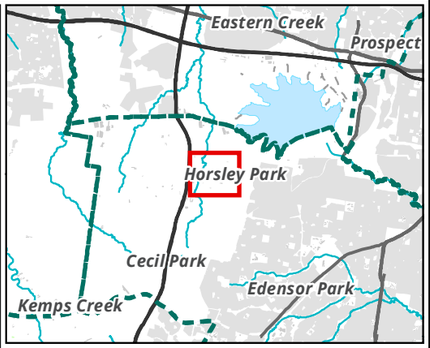


**Legend**

- Study area
- Draft Master Plan - future development
- Rezone to IN1 General Industrial

**Figure 3 Proposed works**

0 40 80 120 160 200

Metres

N

Scale: 1:5,000 @ A3

*Coordinate System: GDA 1994 MGA Zone 56*

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Matter: 34802,
Date: 31 May 2021,
Checked by: AKE, Drawn by: AM, Last edited by: amackegard
Location: P:\34800s\34802\Mapping\34802_ADDA_F3_PropDev.mxd

# 3 Desktop assessment

The desktop assessment involves researching and reviewing existing archaeological studies and reports relevant to the study area and surrounding region. This information is combined to develop an Aboriginal site prediction model for the study area, and to identify known Aboriginal sites and/or places recorded in the study area. This desktop assessment has been prepared in accordance with requirements 1 to 4 of the Code.

## 3.1 Landscape context

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

### 3.1.1 Topography and hydrology

The study area is located within the Cumberland Lowlands physiographic region, situated on the Bringelly Shale formation which is part of the Wianamatta group geological unit (Figure 4). The Bringelly Shale formation consists of shale (claystone and siltstone), carbonaceous claystone, laminate and fine to medium-grained lithic sandstone (Bannerman & Hazelton 1990, p.3). Aboriginal artefact scatter sites are common across the Bringelly Shale formation, as are PADs. The presence of underlying shale deposits suggests that sites commonly found within sandstone formations, such as grinding grooves and rock shelters/rock art, are less likely to be present.

The Bringelly Shale unit comprises of low lying, gently undulating plains and low hills, with a dense drainage net of predominantly northward flowing channels (Bannerman & Hazelton 1990, p.2). The topography of the study area consists of moderate to gentle slope which radiate from the south of the study area towards the west from a crest (Figure 5). In the north-east portion of the study area, a low lying crest forms a very gentle simple slope. Narrow ridgelines, hillcrests and valleys are also present within the surrounding landscape.

Hydrology within the study area includes two first order non perennial drainage lines running through the study area, one running parallel to the southern limit and one from Redmayne Road to Chandos Road in the south-eastern portion, and Eastern Creek which runs adjacent to and briefly intersects the western boundary of the study area (Figure 5). Stream order is recognised as a factor which assists the development of predictive modelling in Sydney Basin Aboriginal archaeology, and has seen extensive use in predictive modelling for the Sydney region, most notably by Jo McDonald Cultural Heritage management (JMCHM 2000, JMCHM 2005a, JMCHM 2005b, JMCHM 2008). These predictive models have a tendency to favour higher order streams as the locations of campsites and therefore archaeological remains. Larger water sources would have been more likely to provide a stable source of water and by extension other resources which would have been used by Aboriginal groups.

The stream order system used for this assessment was originally developed by Strahler (1952). It functions by adding two streams of equal order at their confluence to form a higher order stream, as shown in Photo 1. As stream order increases, so does the likelihood that the stream would be a perennial source of water.

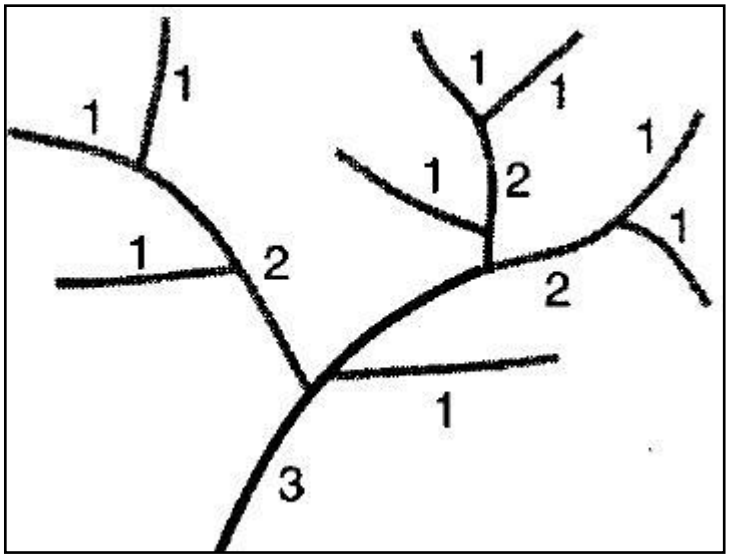


**Photo 1 Diagram showing Strahler stream order (Ritter et al. 1995, pp. 151).**

The drainage line in the southern portion of the study area is a tributary of Eastern Creek, a second order non-perennial water course, which runs parallel to and briefly enters the western limit of the study area. Eastern Creek enters the study area bounds just north of Redmayne Road as a second order non-perennial water course. The other first order non-perennial drainage line running from Redmayne Road to Chandos Road is a tributary to the second order unnamed non-perennial drainage line to the north of the study area. Both of the first order drainage lines that run through the study area are tributaries of the closest permanent water source to the site, Eastern Creek. Approximately 3.1 kilometres to the north of the study area Eastern Creek becomes a third order stream and a permanent water source. The proximity of a number of water courses to the study area is considered a positive indicator for Aboriginal sites to be present.

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### 3.1.2 Soil landscapes

Soil landscapes have distinct morphological and topological characteristics that result in specific archaeological potential. They are defined by a combination of soils, topography, vegetation and weathering conditions. Soil landscapes are essentially terrain units that provide a useful way to summarise archaeological potential and exposure. Two soil landscapes are present within the study area, Blacktown and Luddenham (Figure 6).

The northern and western portion of the study area is located within the Blacktown soil landscape (Figure 6). The Blacktown soil landscape is a residual soil landscape and consists of gently undulating rises, broad rounded crests and gently inclined slopes with a gradient of less than 5%. Local relief within the Blacktown soil landscape is up to 30 metres and rocky outcropping is absent. Dominant soils consist of shallow to moderately deep (<100 centimetres) red and brown podzols on crests and in well drained topographies, and deep (150-300 centimetres) yellow podzolic soils and soloths on lower slopes and drainage channels. The soils can be hard setting with moderate erodability (Bannerman & Hazelton 1990, p.28). A description of the soil types within the Blacktown soil landscape are provided in Table 3.

**Table 3 Blacktown soil landscape characteristics (Bannerman & Hazelton 1990, p.29)**

| Soil material | Description |
|---|---|
| **Blacktown 1 (*bt1*) - Friable brownish-black loam** | Friable brown loam to clay loam with a moderately pedal subangular block structure and rough-faced porous fabric ped fabric. This soil material generally occurs as a topsoil (A horizon) up to 30 cm in thickness. Peds are well defined and range from 2-20 mm. Rounded iron indurated fine gravel-sized shale fragments and charcoal fragments sometimes occur as inclusions. Soil colour is brownish black (10YR 2/2), and can also range from dark reddish brown (5YR 3/2) to dark yellowish brown (10yr 3/4). Soil varies from moderately acidic to neutral. |
| **Blacktown 2 (*bt2*) - Hardsetting brown clay loam** | Hardsetting brown clay loam to silty clay loam, with an apedal massive to weakly pedal structure and porous earthy fabric. Occurs as an A2 Horizon deposit and occasionally a nA1 horizon topsoil. Typically between 10 to 30 cm in thickness. Peds range from 20-50 mm. Platy, iron indurated gravel sized shale fragments are common, with rare inclusions of charcoal and roots. Soil colour is predominately dark brown (7.5YR 4/3), but can range from dark reddish brown (2.5YR 3/3) to dark brown (10YR 3/3). Soil acidity varies from moderately acidic to slightly acidic. |
| **Blacktown 3 (*bt3*) - Strongly pedal, mottled brown light clay** | Brown light to medium clay with strong pedal polyhedral or subangular-blocky structure and smooth faced dense ped fabric that occurs as a subsoil (B horizon). The soil texture increases with depth and peds range from 5-20 mm. Fine to coarse gravel sized shale fragments are a common inclusion and often occur within stratified bands, with roots and charcoal rarely being present. Soil colour is brown (7.5YR 4/6), and can range from reddish brown (2.5YR 2/6) to brown (10YR 4/6). The pH of this soil material varies from strongly acidic to slightly acidic. |
| **Blacktown 4 (*bt4*) - Light grey plastic mottled clay** | Plastic light grey silty clay to heavy clay with moderately pedal polyhedral to subangular blocky structure, and smooth-faced dense ped fabric, that occurs as a deep subsoil deposit overlying shale bedrock ($B^3$ or C Horizon). Peds range between 2-20 mm. Inclusion consists of weathered ironstone concretions and rock fragments. Gravel sized shale fragments and roots occur occasionally, but charcoal is rare within this soil deposit. Red, yellow and brown mottles are present and soil colour is usually light grey (10YR 7/1) or sometimes greyish yellow (2.5YR 6/2). Soil acidity ranges from strongly acidic to moderately acidic. |

Residual soils form from the in-situ weathering of bedrock material, resulting in slow accumulation of soils over long periods of time. Due to their age and slow accumulation, residual soil landscapes have reasonable potential to preserve archaeological deposits in an open context, such as stone artefacts derived from occupation sites. However, this slow accumulation when combined with extensive land clearing and land use (usually associated with pastoral and civic development) will result in an increased likelihood that soils will have been disturbed. This results in poor preservation of archaeological material in these locations.

The Luddenham soil landscape is located within the south western portion of the study area (Figure 6). It is characterised as an erosional soil landscape with a local relied of 50 to 80 metres and slopes of 5 to 20%. Shallow (< 100 centimetres) dark podzolic soils or massive earthy clays area located upon crests, while moderately deep (70 – 150 centimetres) yellow podzolic soils and prairie soils can be found in drainage lines. This soil landscape is impacted by high soil erosion. Moderate sheet erosion also occurs within areas of existing disturbance, particularly in cultivated lands where sheet erosion can become severe due to overgrazing (Bannerman & Hazelton 1990, pp.63–64). A description of soil types within the Luddenham soil landscape is provided in Table 4.

**Table 4 Luddenham soil landscape characteristics (Bannerman & Hazelton 1990, pp.64–65)**

| Soil Material | Description |
|---|---|
| **lu1 - Friable dark brown loam** | Dark brown, friable loam, silt loam or silty clay loam with moderate to strong structure and porous fabric. This material occurs as topsoil (A1 horizon). Surface condition is distinctly friable but may become hard setting when compacted and dry. Colour is dark brown (10YR 3/3, 7.5 YR 3/3) but can range from brownish black (5YR 3/1) to brown (10YR 4/4). This material is occasionally water repellent. The pH varies from moderately acidic (pH 5.0) to slightly acidic (pH 6.5). Roots are common to a depth of 10 cm becoming fewer with increasing depth. Charcoal fragments occur occasionally. |
| **lu2 – Hard setting brown clay loam** | This is a clay loam to fine sandy clay loam with an earthy or porous, rough faced fabric. This material occurs as an A2 horizon and is occasionally hard setting when exposed at the surface. Colour is brown (7.5YR 4/4) but can range between dull yellowish brown (10YR 5/4) and reddish brown (5YR 4/6). The pH varies between strongly acidic (pH 4.0) and slightly acidic (pH 6.5). Shale rock fragments, charcoal fragments and roots are present. |
| **lu3 – Whole coloured, strongly pedal clay** | This is a medium clay with strong structure and a smooth-faced, dense fabric. It occurs as subsoil (B horizon). Texture is commonly medium clay but can range from silty day to heavy clay. Colour is reddish brown (5YR 4/6- 8) and can range from bright reddish brown (2.5YR 4/8) to bright yellowish brown (10YR 6/6). The pH ranges from strongly acidic (pH 4.0) lo moderately acidic (pH 5.5). Shale rock fragments are common. Roots are rare and charcoal fragments are absent. |
| **lu4 – Mottled grey plastic clay** | A grey, mottled, medium clay with strongly pedal structure and dense, smooth fabric. It occurs as deep subsoil. Texture ranges to heavy clay. Colour is usually light grey (10YR 7/1) but ranges to light reddish grey (2.5YR 7/1). Yellow and red mottles are common. It is usually moist and is very plastic. The pH varies from strongly acidic (pH 4.0) to moderately acidic (pH 5.5). Shale rock fragments and gravel are common. Roots are rare, and other inclusions are absent. |
| **lu5 – Apedal brown sandy clay** | This is an apedal massive brown, sandy clay to light clay with a dense earthy fabric. It occurs as subsoil (B horizon). Occasionally weak sub angular blocky or polyhedral structure is evident. Colour is usually brown (7.5YR 4/4-6) but ranges from dull reddish brown (5YR 4/4) to dull yellowish brown (10YR 5/4). This material is moderately acidic |

| Soil Material | Description |
|---|---|
| | (pH 5.0) to neutral (pH 7.0). Roots are common. Up to 10% of the volume may be small (2-6 millimetres) angular, well weathered shale fragments. Charcoal and other inclusions do not occur. |

Erosional soils are generally subject to movement of shallow soils, which can result is poor preservation of the archaeological record. Dispersed sandy soils of sandstone bedrock and loose quartz sandy loam, and earthy clayey sands, which occur as A1 and B horizons, have a low erosion potential. However, when cleared of vegetation, the soils can be subject to high levels of erosion. As this soil landscape is characterised as highly erosional, the soils can be shallow and highly permeable, as well as producing low soil fertility. This would indicate that the presence of Aboriginal sites and objects may be unlikely where erosion has occurred (Chapman et al. 2009, pp.64–67, McInnes 1997, p.45, cited by Umwelt (Australia) Pty Limited 2016, p.13).

### 3.1.3 Landscape resources

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

Within the Cumberland subregion of the Sydney Basin Bioregion a variety of vegetation types are present, with Grey Box *Eucalyptus microcarpa*, Forest Red Gum *Eucalyptus tereticornis*, Narrow-leaved Ironbark *Eucalyptus crebra* woodland, and Spotted Gum *Corymbia maculata* are present on shale hills. Hard-Leaved Scribbly Gum *Eucalyptus sclerophylla*, Rough-Barked Apple *Angophora floribunda*, and Old Man Banksia *Banksia serrata* are identified on alluvial sands and gravels. Broad-Leaved Apple *Angophora subvelutina*, Cabbage Gum *Eucalyptus amplifolia*, Forest Red Gum *Eucalyptus tereticornis*, and Swamp Oak *Casuarina glauca* are present on river flats. Tall Spike Rush *Eleocharis sphacelata*, and Juncus *Juncus effusus* with Parramatta Red Gum *Eucalyptus parramattensis* noted around lagoons and swamps (NPWS 2003, p.193).

The Blacktown soil landscape typically supports dry sclerophyll forest; predominantly species of eucalypt, including Forest Red Gum *Eucalyptus tereticornis*, Narrow Leaved Ironbark *Eucalyptus crebra*, and Grey Box *Eucalyptus moluccana* (Bannerman & Hazelton 1990, p.29). Broad Leaved Ironbark *Eucalyptus fibrosa* and White Stringy Bark *Eucalyptus globoidea* are also occasionally present.

The type of vegetation found within the Luddenham soil landscape includes extensively cleared open dry sclerophyll forest (Bannerman & Hazelton 1990, p.64). The dominant tree species include Spotted Gum *Eucalyptus maculata* and Grey Box *E. moluccana.* Broad-leaved Iron Bark *E. fibrosa,* Narrow Leaved Ironbark *E. crebra*, Forest Red Gum *E. lereticornis* and Woolybutt *E. longifolia* are also present. The understory shrub species include Blackthorn *Bursaria spinose*, Coffee Bush *Breynia oblongifolia*, Forest Oak *Alocasuarina torulosa*, Hickory *Acacia implexa* and *Clerodendrum tomenlosum*. While common grasses include Speargrass *Aristida vagans*, Bordered Panic Grass *Entolasia marginate* and Paddock Lovegrass *Theineda australis* (Bannerman & Hazelton 1990, p.64).

Common tree species include Broad-leaved Apple *Angophora subvelutina*, Cabbage Gum *Eucalyptus amplifolia* and Swamp Oak *Casuarina glauca.* On elevated stream banks a tall shrubland of Paperbark *Melaleuca spp.* and Tea Tree *Leptospernu spp.* may occur.

Plant resources were used in a variety of ways. Fibres were twisted into string, which was used for many purposes, including the weaving of nets, baskets and fishing lines. String was also used for personal

adornment. Bark was used in the provision of shelter; a large sheet of bark being propped against a stick to form a gunyah (Attenbrow 2002).

Native fauna that would have been present in the vicinity of the study area include: Australian Wood Duck *Chenonetta jubata*, White-Faced Heron *Egretta novaehollandiae*, Eastern Long-Necked Tortoise *Chelodina longicollis*, Eastern Water Skink *Eulamprus quoyii*, Garden Skink *Lampropholis guichenoti*, Welcome Swallow *Hirundo neoxena*, Western Swamphen *Porphyrio porphyrio*, as well as arboreal fauna including owls Strigiformes, Ringtailed Possum *Pseudocheirus peregrinus* and Brushtailed Possums *Trichosrus vulpecula*, and gliders Petauridae.

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

### 3.1.4 Land use history

The earliest exploration of the Penrith region was led by Captain Watkin Tench, an officer in the Marine Corps, accompanied by Mr Lowe (surgeon's mate of the *Sirius*), Mr Arndell (assistant surgeon to the Colony), two other marines, and a convict, in 1789. The group reached the Nepean River on 28 June (Paul Davies Pty Ltd 2007, 11). Later that year, the Penrith Ford was crossed, and in 1791 the course of the Nepean had been explored from the ford to Grose River. By 1791, it had been confirmed that the Hawkesbury and Nepean rivers were the same watercourse; however, each of the names were kept, transitioning from one to the other at the junction with the Grose River (Thorp 1986, 12). From 1803, Charles Grimes and James Meehan surveyed areas of the eastern bank of the Nepean following the sanctioning of settlement in this area by Governor Philip Gidley King, likely in part for the fertile soils associated with the Nepean River floodplain. The portions of land ranged from 40 to 200 acres (approximately 16.2 to 81 hectares), with several of 1,000 acres (404.6 hectares) and above. These were granted to officials, free settlers and military staff (Paul Davies Pty Ltd 2007, 11, Thorp 1986, 12). Over time, around 1,699 Europeans had settled in the Nepean region, most of whom were of Irish and English heritage and were emancipists or convicts assigned to free settlers or those associated with the government or military (Paul Davies Pty Ltd 2007b). Until the establishment of the Great Western Road around 1815, there was no official passage to the Nepean area. In the same year, Governor Lachlan Macquarie conducted his inspection tour of the region (Thorp 1986, 12). The Great Western Road had developed into a main route for travel and communication for the Nepean region by 1817, and in this year the government town of Penrith was also established. Penrith remained a small, roadside settlement into the 1830s (Thorp 1986, 12).

A review of Melville Parish maps indicates that the study area was previously part of a 2,000 acre grant originally alienated in 1805 as a grant to George Johnston by Governor Phillip Gidley King, ostensibly as a gift for his part in stopping the 1804 insurrection at Vinegar Hill (Yarwood 1967). Johnston named the grant 'King's Gift'. George Johnston was a soldier and farmer, born in 1764 in Annandale, Scotland who served throughout England, France, and the East Indies. He played a pivotal role in the removal of William Bligh as Governor in 1808, and was court martialled for his role in this in 1811. Johnston had three sons and four daughters and died in Sydney in 1823 (Yarwood 1967).

After Johnston's passing, the land grant was passed to his daughter, Blanche, who married in 1829 to Captain Weston of the East India Company's Bengal Army. Moving to the 'King's Gift' in 1831 they lived in a marquee until the house was completed on the property in 1834. Weston renamed the property 'Horsley', after his birthplace in Surrey, England. The area later became known as 'Horsley Park' (Davidson 2003).The estate was put up for sale following Blanche's death in 1905, with the advertisement put in the Sydney Morning Herald

stating that it was 2,045 acres in size at that point. It is also noted that 'the Water Canal forms a boundary at one end', with a portion of the land having been resumed in the 1870s for the development of the Upper Canal. The Horsley complex, which includes the homestead, outbuildings, garden and farm is located approximately 1.8 kilometres to the south west of the study area. The property was given the following description (The Sydney Morning Herald 1905):

> *'The residence has for decades of years been a praise, fashioned after the style of the best Indian bungalow for coolness, and in the height of some of the rooms. It is built of brick, stout walls, cemented, contains wide verandahs, cloven rooms, pantries, detailed building of 3 bedrooms, kitchen, scullery, etc. Basement is superior, and very useful. The Stabling is 11 stalls, 2 loose boxes, coach, and harness rooms, men's rooms, with loft over all. Stockyards, barns, and barnsheds, orchard and vineyard, choice fruits. The Paddocks number sixteen in all, each with dam or creek. Valuable Timber for mill or fuel purposes is standing, computed as worth some thousands. Men's cottages, wine-house. A full detail of the extensive improvements (too numerous to publish) can be seen at the Auctioneers. The residence is on an eminence, surrounded by cleared paddocks, and commands wide and pretty views.*
>
> *To sum up, the points of Horsley are extent of land, excellent surface, and soil features, with nearness to city via a good road and quick trains. Therefore, it is worthy the attention of Squatters (an easy droving of sheep to Flemington), Retired Country or City Gentlemen, Stockbreeders, or it would suit for Scholastic Institution or Sanatorium. The climate is healthy, with crisp, dry atmosphere.*

As of 1906, the land was owned by Augusta Alice Smart, who converted the title from Old Systems to Torrens Title on 27 March of that year. By the 1920s the estate was owned by Arthur Rickard and Co Ltd, who proceeded to subdivide the estate and progressively sell off allotments over the course of the 1920s (NSW Land Registry Services, Primary Application 14277).

In 1925, the company reached an agreement with Fairfield Council to construct roads and approaches on the estate ('HORSLEY PARK ESTATE AGREEMENT' 1925) in advance of the sales which were advertised in 1926 and 1927 ('PICNIC SALE' 1927). The 1926 advertisement appears to mark the beginning of the sale of the estate, with the advertisement stating ('Special Sale' 1926):

> *Arthur Rickard and Co. Ltd are handling the property, and a marquee has been erected on the ground to enable the sale to proceed in the event of rain. The average price is estimated to be about £22 an acre, but parcels can be obtained for £13 an acre.*

Historical aerial photographs assist in identifying modern developments that occurred within the study area (Photo 2). An aerial photograph dated to 1930 shows that the initial clearance of trees had occurred. Two roads are visible within the central portion of the study area as an early form of Redmayne Road. A track is also visible within the north east portion. It is likely that the land was used for pastoral grazing at this point in time with no structures visible.

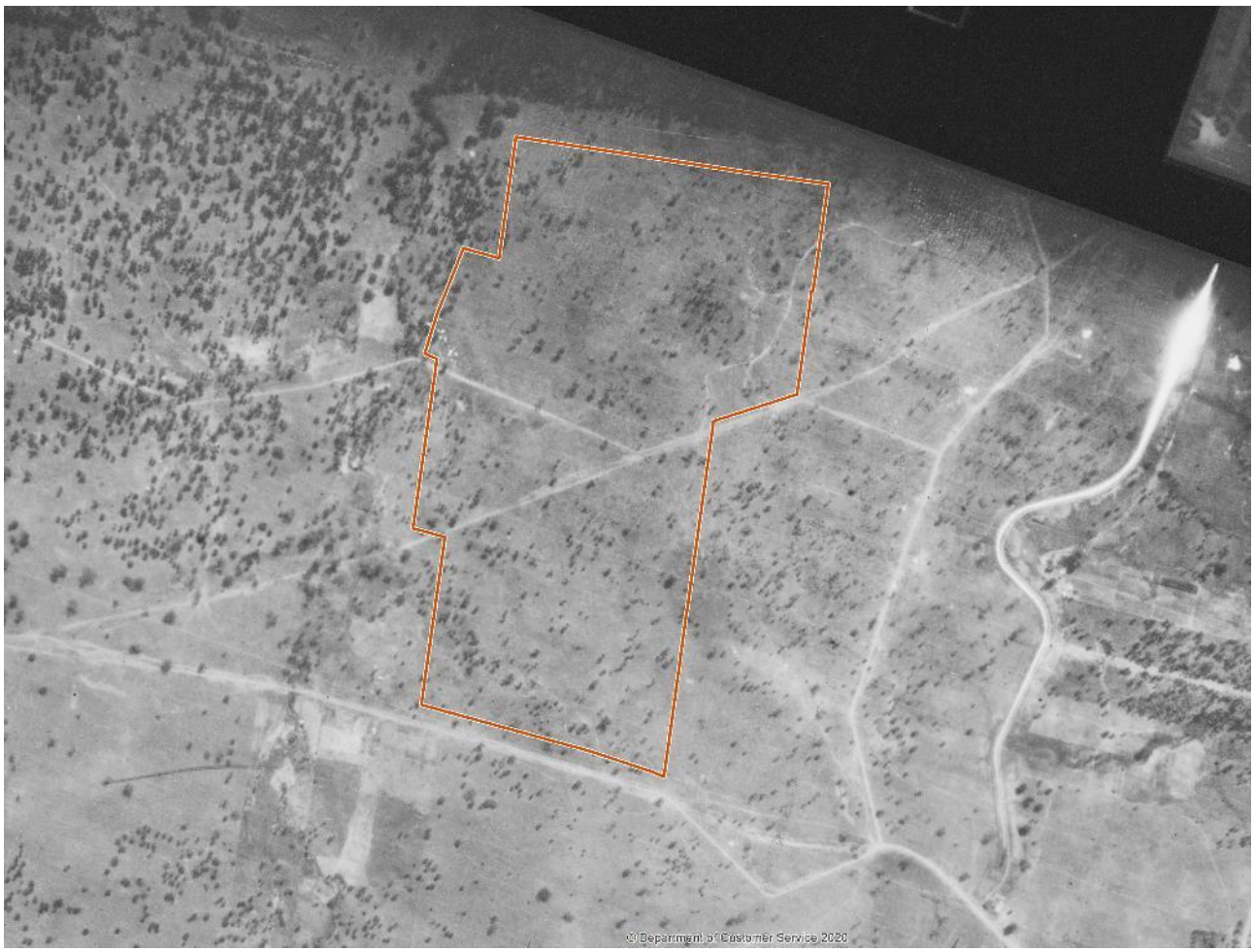



**Photo 2 Aerial photograph dated to 1930 with the study area oulined in red (Source: NSW Spatial Services 2021)**

An aerial photograph dated to 1961 shows that the land within the study area had been subdivided (Photo 3). Further tree clearance has occurred, while additional regrowth vegetation can be seen in the north and west. Redmayne Road has been further established, with the extension to the south west removed. Extensive agricultural use of the land is evident across almost the entirety of the study area. Approximately 27 residential properties and associated buildings have also been constructed throughout the study area and two dams within the central and southmost portions.


**Photo 3 Aerial photograph dated to 1961 with the study area oultined in red (Source: NSW Spatial Services 2021)**

An aerial photograph dated to 1978 shows continued use of the land for agricultural and market gardening purposes (Photo 4). Additional residential development can be seen throughout as well as a further six dams. Racing tracks are also visible in the west, while tree removal has occurred in the north with rubbish piling visible. The same can be said within a 1994 aerial photograph showing further residential and market gardening structures (Photo 5). Tracks within the west have been removed along with vegetation showing an asphalted area. The remaining land shows extensive cropping and agricultural use.

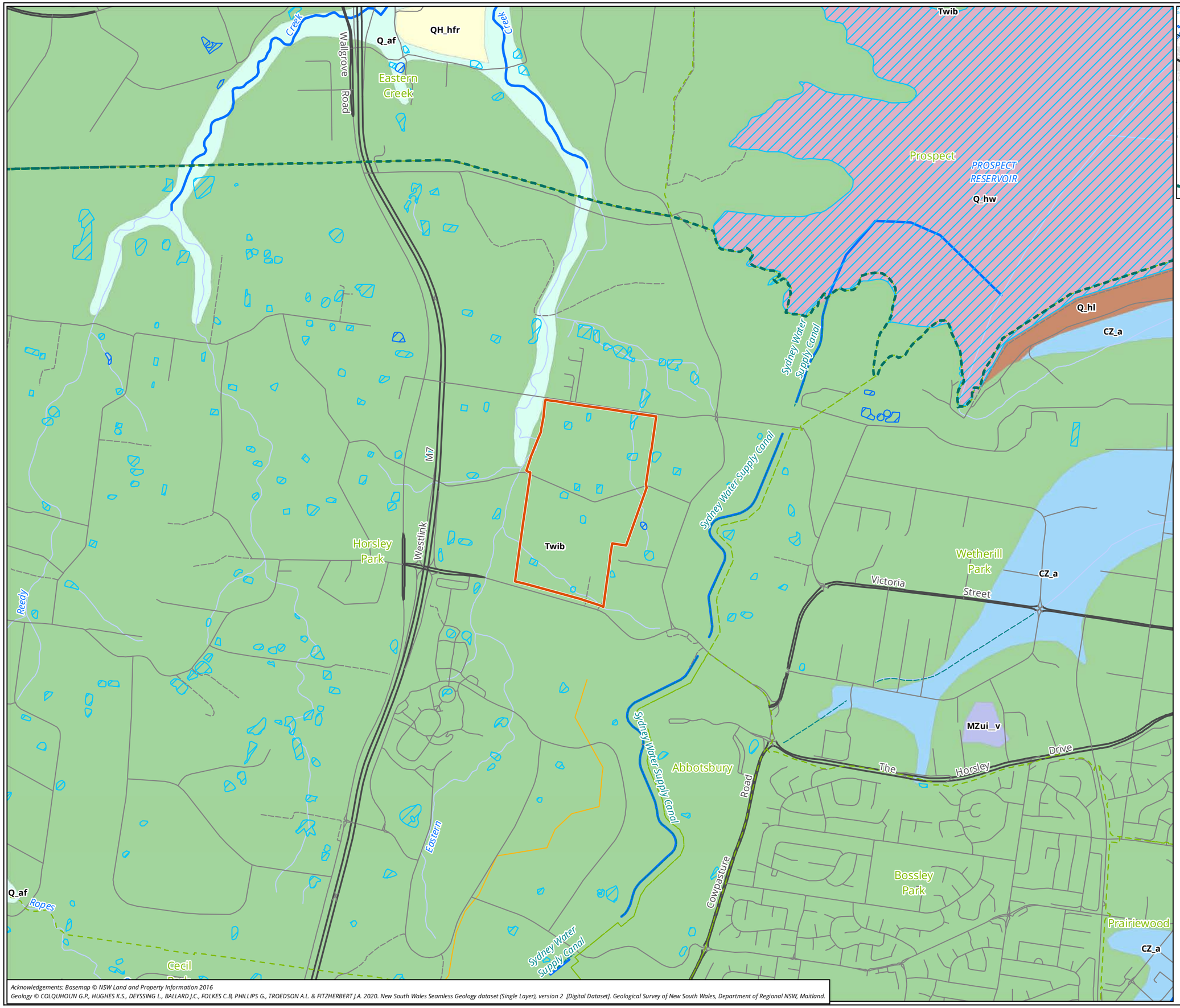
**Photo 4** **Aerial photograph dated to 1978 with the study area outlined in red (Source: NSW Spatial Services 2021)**

**Photo 5 Aerial photograph dated to 1994 with the study area outlined in red (Source: NSW Spatial Services)**

An aerial photograph dated to 2005 shows the concentration of development along Redmyane Road, with a number of further structures present within this area and to the south (Photo 6). The use of the land for cropping is still occurring while rubbish piling is visible in the north and west. A race track has also been constructed in the north west. Within the southern portion of the study area, a large scour also appears to be present and may be associated with earth works being undertaken in association with the golf driving range located in the southern portion of the study area.

**Photo 6 Aerial photograph dated to 2005 with the study area oultined in red (Source: NSW Spatial Services 2021)**

A current aerial photograph shows agricultural and market gardening practices continue to be prominent within the area (Figure 2). Further rubbish stockpiling can be seen in the west and north, while the majority of residential properties and associated structures remain.




**Legend**

Study area

**Geological Units**

- CZ_a,,,Alluvium
- MZui__v,,,Ungrouped Mesozoic igneous units - breccia
- QH_hfr,,,Anthropogenic deposits - fill on Quaternary deposits
- Q_af,,,Alluvial floodplain deposits
- Q_hl,,,Anthropogenic breakwaters, embankments and artificial levees
- Q_hw,,,Anthropogenic stored water, pondage, reservoirs, canals
- Twib,,,Bringelly Shale

**Figure 3 Geological units within the vicinity of the study area**

0 200 400 600 800 1,000

Metres

N

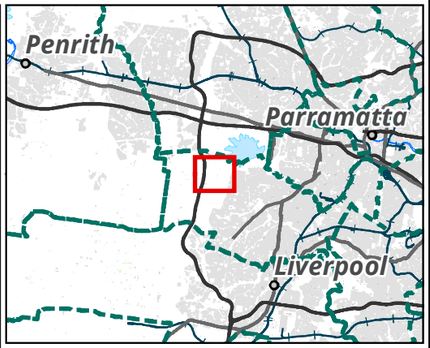
Scale: 1:20,000 @ A3

*Coordinate System: GDA 1994 MGA Zone 56*

biosis

Matter: 34802,
Date: 19 March 2021,
Checked by: AKE, Drawn by: LH, Last edited by: amackegard
Location: P:\34800s\34802\Mapping\34802_ADDA_F4_Geology.mxd

*Acknowledgements: Basemap © NSW Land and Property Information 2016*
*Geology © COLQUHOUN G.P., HUGHES K.S., DEYSSING L., BALLARD J.C., FOLKES C.B, PHILLIPS G., TROEDSON A.L. & FITZHERBERT J.A. 2020. New South Wales Seamless Geology dataset (Single Layer), version 2 [Digital Dataset]. Geological Survey of New South Wales, Department of Regional NSW, Maitland.*




**Legend**

- Study area
- Contour (2m)

**Strahler Order**

- 1
- 2
- 3

**Figure 5 Hydrology and topography in the vicinity of the study area**

0 100 200 300 400 500

Metres

N

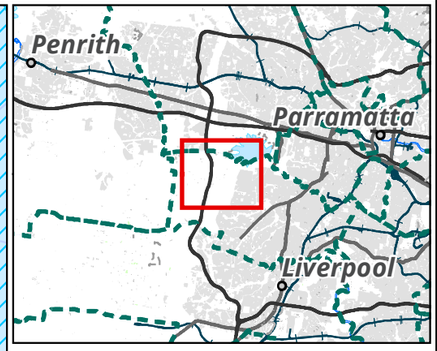
Scale: 1:10,000 @ A3

*Coordinate System: GDA 1994 MGA Zone 56*

biosis

Matter: 34802,
Date: 01 June 2021,
Checked by: [Consultant], Drawn by: [GIS], Last edited by: amackegard
Location: P:\34800s\34802\Mapping\34802_ADDA_F5_Hydrology.mxd

*Acknowledgements: Basemap © Land and Property Information 2016*




**Legend**

Study area

**Soil Landscape units**

- bt - BLACKTOWN
- lu - LUDDENHAM
- pn - PICTON
- sc - SOUTH CREEK
- WATER - WATER
- xx - DISTURBED TERRAIN

**Figure 5 Soil landscapes within the vicinity of the study area**

0 200 400 600 800 1,000

Metres

N

Scale: 1:20,000 @ A3

*Coordinate System: GDA 1994 MGA Zone 56*

biosis

Matter: 34802
Date: 19 March 2021,
Checked by: AKE, Drawn by: LH, Last edited by: amackegard
Location: P:\34800s\34802\Mapping\34802_ADDA_F6_Soils.mxd

*Acknowledgements: Basemap © Land and Property Information 2016; Soils: Bannerman S.M. and Hazelton P.A., 1990, Soil Landscapes of the Penrith 1:100,000 Sheet map and report, Soil Conservation Service of NSW, Sydney;*

## 3.2 Previous archaeological work

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

The timing for the human occupation of the Sydney Basin is still uncertain. While there is some possible evidence for occupation of the region around 40,000 years ago, the earliest known radiocarbon date for the Aboriginal occupation of the Sydney Basin is associated with a cultural/archaeological deposit at Parramatta, which was dated to 30,735 ± 407 Before Present (BP) (JMCHM 2005c, JMCHM 2005d).

Archaeological evidence of Aboriginal occupation of the Cumberland Plains indicates that the area was intensively occupied from approximately 4,000 years BP (Dallas 1982). Such 'young' dates are probably more a reflection of the conditions associated with the preservation of this evidence and the areas that have been subject to surface and sub-surface archaeological investigations, rather than actual evidence of Aboriginal occupation prior to this time.

### 3.2.1 Regional overview

A number of Aboriginal cultural heritage investigations have been conducted for the Cumberland Plain region. Models for predicting the location and type of Aboriginal sites with a general applicability to the Cumberland lowlands region and thus relevant to the study area have also been formulated, some as a part of these investigations and others from cultural heritage investigations for relatively large developments.

Brayshaw McDonald (1994) completed the Liverpool Rural Lands Study, located approximately 12 kilometres south east of the study area, which included a broad predictive study relating to Aboriginal sites in rural areas to the west of Liverpool, located south-east of the current study area. The report identified that the distribution of sites was mostly dependent on topography and the bedrock formation of the area, or geology. Background research supported predictive models 10 kilometres from the study area.

It identified that shelter sites, art sites, and grinding grooves were likely to occur on overlying sandstone formations where the appropriate topography was present. Sites over the remainder of the Cumberland Plain were likely to consist of open artefact scatters, quarries, modified trees, and stone arrangements. The report noted that occupation within the area was likely to be similar to the northern Cumberland Plain, as the landscape and geology were extremely similar. As such, predictive site modelling was summarised from an assessment which included test excavations completed by Rich and McDonald in 1993:

- Most of the areas tested (either with sparse or no surface manifestations) contained subsurface archaeological deposits.
- Sites which are on permanent water are more complex (ie they represent foci for larger groups or are used repeatedly by smaller groups over a long period of time) than sites on ephemeral or temporary water lines. Major confluences are prime site locations. Sparse sites also occur on major creek lines and not all confluences are locations of prime sites.
- Alluvial terraces (and other depositional environments) contain the best potential for intact archaeological remains. Some hillslope zones may also be intact and have good potential. In areas where there is deep alluvium many sites also have intact material below the plough zone. These sites often have artefact bearing deposit to a depth of 70-90 centimetres; the plough zone is (max) 25 centimetres deep.

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- Temporary and minor gullies tend to have one-off or occasionally repeated Aboriginal visits in prehistory and hence low density sites.
- Few ridgetop sites were located by the testing programme mostly because the associated development was located close to the creeklines, but also because of the higher levels of destructive disturbance in the more elevated locations, e.g. housing and ploughing of shallower deposit.
- While much of the Rouse Hill study area had been severely disturbed over the last 200 years, the areas tested on the whole revealed intact patterns in the archaeological material (Brayshaw McDonald Pty Ltd 1994, pp.20–21).

Jo McDonald Cultural Heritage Management (1997) conducted an archaeological investigation of the Australian Defence Industries (ADI) Site, at Saint Marys, for ADI-Lend Lease Joint Venture, located approximately 10 kilometres north west of the study area. The investigation included the refinement of existing Aboriginal site predictive models, by developing a framework for assessing Aboriginal site representativeness (JMCHM 1997, pp.1–2). A model was presented for the ADI site that predicted the character of Aboriginal sites in relation to landscape features; particularly water permanence, lithic resources and landscape unit. The study concluded that the model is applicable to the Cumberland Plains region, and provides a framework for which the correlation between sites and permanent water can be tested. The model predicts the following (JMCHM 1997, pp.56–57):

- The frequency and density of Aboriginal sites located in the headwaters of upper tributaries (first order watercourse) is likely to be low, and such sites are likely to represent a background scatter.
- The frequency and density of Aboriginal sites located in the middle reaches of minor tributaries (second order watercourses) is likely to be low, and such sites are likely to represent single events, for example, one-off camping locations or knapping episodes.
- The frequency and density of Aboriginal sites located in the lower reaches of tributary creeks (third order watercourses) is likely to be greater, and such sites are likely to represent repeated occupation, knapping events and more concentrated activities.
- The frequency and density of Aboriginal sites located on major creek lines is likely to be greater, and such sites are likely to represent or more permanent occupation and consequently will be more complex.
- The junctions of creeks may have been a focus of Aboriginal activity.
- The frequency and density of Aboriginal sites located on ridge tops between drainage lines is likely to be low, and such sites are likely to represent a single event.
- Outcrops of silcrete would have been exploited if known.
- The general size of stone artefacts is likely to decrease the further they are located from the quarry from which they were obtained. Similarly, the presence of cortex on artefacts is less likely to be present, or occur as smaller percentages that further artefacts are located from the quarry from which they were obtained due to the continued reduction sequence.
- Sandstone outcrops may have been the focus of camping and art production for sandstone overhangs as well as axe production/sharpening for sandstone platforms.

Jo McDonald Cultural Heritage Management (JMCHM) (2001) undertook an assessment at West Hoxton, approximately 12 kilometres south from the study area, in aid of the South Hoxton Park Aerodrome Master Plan. The background research for the area suggested that artefact scatters would likely be associated with streams, with the size and number of sites increasing with stream order. It also noted that smaller scatters

and isolated finds have the potential to be identified across a variety of landforms within the landscape, including hillslopes and ridges away from water (JMCHM 2001, p.9).

Survey efforts were hampered by land access issues, as the majority of the land in the area studied was privately owned; however a total of two artefact scatters and nine PADs were identified by the investigation, with one previously identified site (also an artefact scatter) being relocated. The majority of the PADs were assessed as having low to moderate potential, with JMCHM noting that the true potential of sites was difficult to assess in the absence of test excavations.

White & McDonald (2010) undertook a review of previous work in the Rouse Hill development area, located approximately 15 kilometres north of the study area, discussing lithic artefact distribution in previous excavations carried out by JMCHM. The study considered a number of factors including stream order, distance from water, landform, aspect, and distance to silcrete sources. As a result of the assessment, the following statements were made:

- Stream Order: water supply was a significant factor influencing Aboriginal land use and habitation in the area. There was a correlation between increasing stream order and larger numbers and higher densities of artefacts (from a comparison of first, second, and fourth order streams).
- Distance from water: the results showed that an assumption that sites would be clustered within 50 metres of water sources was not entirely correct from the data available. In first order stream landscapes, there was no significant correlation between artefact distribution and distance to water. In second order landscapes, artefact density was highest within 50 metres of water, and then declined with increasing distance. In fourth order landscapes, density was highest between 51-100 metres from water.
- Landform: Artefact density was considered to be lowest on upper slopes and ridgetops, with density increasing on mid and lower slopes. Density was highest in terrace landforms, and lower on creek flats, likely due to repeated flooding events and the erosion this caused.
- Distance to silcrete sources: the results of the study showed no significant difference between sites located closer to or further away from silcrete sources. However, 6 kilometres was the maximum tested distance from silcrete sources, so the sample is only representative of a limited area.
- Aspect: only appeared to have an influence on sites in the lower parts of valley. Locations may have been sited to take advantage of constant factors such as the rising/setting sun and wind direction. Sites in higher parts of valleys may have been influenced by weather and other factors.

The study concluded that landform and distance from water had an impact on site distribution, with artefacts becoming more numerous closer to creeks, and along higher order creeks. The study also found that although artefacts are found on all landforms, landform type influences artefact distribution, with the preference being for slightly elevated, well-drained areas in the lower parts of valleys.

Kelleher Nightingale Consulting (2011) undertook an assessment of a 10 kilometre strip of Bringelly Road, approximately 13 kilometres south from the study area, in advance of a proposed upgrade (taking the road from two to four lanes in size). Predictive modelling employed by KNC suggested that artefact scatters and isolated finds were the site types most likely to be identified, where exposure and visibility were high. These sites were considered most likely to be identified in close proximity to water sources, on either flat or gently sloping landforms. A total of 44 sites were identified in the design corridor of the proposed upgrade, all of which were either artefact scatters or isolated finds.

AMBS (2012) conducted a wide ranging report, assessing the entirety of the Austral and Leppington North precincts, located approximately 9 kilometres south of the study area. Although surveys were targeted at specific properties, which at the time represented accessible properties, the results of the survey were

combined with the existing regional model and a review of studies within the local area in order to produce sensitivity mapping for the entirety of the Austral and Leppington North precincts.

Regionally, trends noted as influencing this sensitivity model include the following statements:

- Sites are most frequently located in close proximity to permanent water courses on creek banks, alluvial flats, or high ground.
- Large artefact scatters may be identified up to 200 – 250 metres away from water courses.
- Additional factors need to be considered than just the presence or absence of surface artefacts when characterising an archaeological site.

The predictive model employed by AMBS stated that the most common site type occurring in the area would be stone artefacts scatters, and that undisturbed alluvial soils have the potential to be associated with stratified archaeological deposits (AMBS 2012, p.56). The results of the survey largely confirmed this predictive model, with AMBS identifying seven new sites including six isolated finds and one artefact scatter/PAD.

GML (2016) conducted an archaeological excavation and assessment of Stockland's land in East Leppington approximately 12 kilometres south-east of the study area, prior to the development of the residential estate Willowdale. Predictive modeling of the area has shown that Aboriginal people occupied East Leppington for over 5,000 years. Areas along Bonds Creek were used as camping sites meanwhile areas of tool manufacture and procurement was resource specific. Both survey and hand excavation were used to understand the area. In total, 12 locations were excavated over a total of 487 square metres. A total of 7,956 lithic artefacts and 21 features were identified. Features included eight ground ovens, hearths, clay extraction pits and modified trees. Dominant material types were silcrete, mudstone (IMSTC) and quartz, comprising 66%, 25% and 8% of finds respectively. Tool types included anvils, hammers and a possible grindstone fragment. Backing was visible in artefacts from all but two excavation areas (OA4 and OA11). A total of 253 cores and core fragments were also recovered, mostly of silcrete.

Overall, GML identified an area of domestic activity (associated with hearths and ovens), and an area of ceremonial activity associated with red paint pits, culturally modified trees and unusual stone arrangements. Pits at the base of these trees suggest evidence of landscape use unique to this particular area of the site.

### 3.2.2 Local overview

A number of Aboriginal cultural heritage investigations have been conducted within the local area (within approximately 10 kilometres of the study area). Most of these investigations were undertaken as part of development applications and included surface and sub-surface investigations. These investigations are summarised below.

JMCHM (2000) undertook a survey in advance of a proposed light industrial subdivision, 7 kilometres west of the study area along Mamre Road, Erskine Park. The predictive modelling undertaken primarily identified the potential for sites to be present in association with water sources, with the size and density increasing with stream order. It was also noted that creek junctions provide a focus for activity. Other locations such as ridgetops between drainage lines may provide evidence of occupation (JMCHM 2000 p. 19)**.** The area surveyed contained first and second order creeks, and so it was predicted that background scatters of artefacts may be associated with first order creeks, and that higher density sites may be identified in association with the second order creek.

The survey identified nine sites, including six artefact scatters and three isolated finds. Six of the identified sites were located on lower hillslopes, two on creek bank/lower hillslopes, and one on a creek bank/floodplain. The majority of sites were identified between 50 and 200 metres from water sources.

Subsequently, sensitivity mapping was developed and it was recommended that subsurface investigation take place in areas of higher sensitivity within the study area.

Excavations of the site were subsequently carried out by JMCHM (2008)**.** These salvage excavations retrieved a total of 8,867 lithics from 298 square metres, indicating a density of 29.8 artefacts per square metre. It was identified that the pattern of artefact distribution within the Austral Land site was typical for the Cumberland Plain and was likely higher due to the presence of second and third order streams (which indicates a permanent or semi-permanent water source).

The area assessed in this report contains a number of similarities to the study area, namely its relatively low relief (around 10 metres (JMCHM 2008 p.7)), and the presence of lower order water sources which would have provided a semi-permanent source of water to Aboriginal groups in the area.

Based on the review of previous work undertaken, a number of predictive statements were formulated for the study area, including the following (JMCHM 2008 p.11-15):

- There may be evidence of long or short term occupation with sporadic use and re-use of locations.
- Occupation may date to the pre-Bondaian (30,000 – 9,000BP), but is more likely to date to the Bondaian (9,000 BP – European Contact).
- A variety of activities are likely to have been carried out within the study area and discrete knapping floors may have been present in association with both creeks and the area of their confluence.
- The proximity of the salvage locations adjacent to second order streams and the confluence of these creeks (where they become a third order stream) would have suggested that there would be evidence for sparse, but focussed activity and potentially repeated occupation by small groups, knapping floors and evidence for more concentrated activities.

In addition to these predictions, a number of more general statements about the Cumberland Plain were made, including that large scale patterning of sites is identifiable based on environmental patterns, particularly stream order, with permanent sources of water being associated with more complex sites than ephemeral sources. Most sites will be dated to the mid to late Holocene, as geomorphic conditions necessary for the preservation of earlier sites are not common on the Cumberland Plain, most areas contain subsurface deposits, regardless of the presence or absence of surface artefacts, and that where silcrete outcrops are present, there will be evidence for quarrying (JMCHM 2008 p.11-12).

The excavations consisted of testing followed by open area salvage at two locations, EP6+7/1 and EP6+7/2 (a total of 145 square metres and 153 square metres at each location). Both locations were located relatively close (within 100 metres) of creeklines in the study area.

**Table 5 Lithologies from excavation conducted by JMCHM (2008 p.139)**

| Area | Silcrete | Silicified tuff | Quartz | S Wood | Fine-grained siliceous | Quartzite | Igneous | Unidentified | Total artefacts |
|---|---|---|---|---|---|---|---|---|---|
| **Testing** | 863 | 107 | 53 | 9 | 1 | | | 2 | 1,035 |
| **A** | 390 | 24 | 3 | | | | | | 417 |
| **B** | 2,482 | 194 | 40 | 7 | 6 | 11 | 1 | 5 | 2,746 |
| **C** | 2,302 | 130 | 125 | 5 | 1 | 1 | | 2 | 2,566 |
| **D** | 1,750 | 177 | 426 | 4 | 14 | | | 3 | 2,374 |
| **Total** | 7,491 | 637 | 666 | 25 | 22 | 12 | 2 | 12 | 8,867 |

It is evident from the data presented in Table 5 that across all areas excavated that the dominant material type encountered is silcrete. It has been noted that silcrete outcrops have been identified in the vicinity of the study area, and this may be a contributing factor to the result.

**Table 6 Artefact types from excavation conducted by JMCHM (2008 p.140)**

| Area | Multi cobble | Backed artefacts | Backing debitage | Tools & possible tools | Other retouched | Cores | Bipolar artefacts | Platform Debitage | FF/FP Debitage | Remnant flaked | Total artefacts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Testing** | | 19 | 1 | 8 | 8 | 19 | 9 | 334 | 543 | 94 | 1,035 |
| **Area A** | | 10 | | 1 | 3 | 11 | | 130 | 223 | 39 | 417 |
| **Area B** | | 88 | 2 | 11 | 11 | 23 | 8 | 847 | 1,648 | 108 | 2,746 |
| **Area C** | 1 | 62 | 6 | 21 | 22 | 74 | 7 | 998 | 1,259 | 116 | 2,566 |
| **Area D** | | 37 | 1 | 10 | 7 | 46 | 30 | 621 | 1,439 | 183 | 2,374 |
| **Total** | 1 | 211 | 9 | 51 | 50 | 166 | 58 | 2,831 | 4,958 | 535 | 8,867 |

Analysis of the artefacts shows that the dominant artefact types recovered from excavations were flake fragments/flaked piece debitage followed by platform debitage (Table 6). It is notable that there are a large number of cores and other retouched and backed artefacts.

It was concluded that the site patterning in the area was typical of the Cumberland Plain, however artefact density was influenced by a number of landscape and resource features in the area, with it being noted that artefact density decreases with stream order and use of silcrete as a raw material decreases with increasing distance from silcrete sources. As a whole, the site displayed a higher than average artefact density, likely due to the presence of nearby sources of silcrete (JMCHM 2008 p. i).

Dominic Steele Consulting Archaeology (DSCA) (2003) undertook test excavation at Wallgrove Road, Eastern Creek approximately 2 kilometres north west of the study area. The assessment built on a number of previous surveys conducted between 1980 and 2002 within the study area. The assessment included predictive statements determined by a JMCHM study from (1997), which stated that surface artefacts were not an effective way to characterise archaeological sites, and that at the time of writing:

- 17 out of the 61 excavated sites on the Cumberland Plain had no artefacts present on the surface prior to excavation however, most areas with sparse or no surface manifestations contained considerable archaeological deposits.
- The ratio of recorded surface to excavated artefacts is 1:25 across the Cumberland Plain.
- None of the excavated sites could be properly characterised on the basis of their surface artefacts alone.
- Open campsites are located in all landscapes on the Cumberland Plain. The predominance of sites recorded along creek banks is likely to be indicative of surface visibility conditions and taphonomic factors, rather than the human distribution of artefacts across the landscape (DSCA 2003, pp.19–20).

This statement notes a number of issues with predictive models that base their assessment of subsurface potential based entirely on the presence or absence of surface artefacts. Steele also reviewed previous work

carried out in the Rouse Hill area to create a predictive model for the nature and extent of subsurface deposits (DSCA 2003, pp.20–21). Some of the key factors noted include:

- Sites along permanent water courses tended to be more complex than those along ephemeral water courses, and the ideal site locations were at major confluences.
- Within the Rouse Hill area, alluvial areas along with intact hillslopes had the greatest potential to retain intact archaeology, with artefact deposits extending from 70 to 90 centimetres, while the typical plough zone extended to 30 centimetres.
- Hillslopes and ephemeral water courses which revealed sites typically showed evidence of limited occupation, with few producing artefact densities of greater than 20 artefacts per square metre.
- Sites located at the interface of sandstone and shale geologies tended to demonstrate evidence of single occupations by large groups, or multiple occupations by smaller groups.
- There is greater potential for complex archaeological sites to be located subsurface than is demonstrated by surface artefacts, with knapping floors, backed blade manufacturing sites, and other complex sites have been identified.
- There may be a correlation between artefact density and site function.

A total of 20 1 by 1 metre squares were excavated using a backhoe, and sieved through nested 5 and 2.5 millimetre sieves. The deposit encountered tended to be relatively shallow, with most pits not exceeding 20 centimetres. A total of 38 artefacts were identified by surface survey and excavation, with a density characterised by Steele as extremely low. The area was interpreted as being visited sporadically, and not the site of any sort of knapping or camping, but rather a general background scatter.

The deposit consisted primarily of silcrete, with quartz, tuff, and volcanic rock present in much lesser quantity. The vast majority of the deposit was identified as manuport, with some flake and core fragments present, and one potential broken axe.

Navin Officer Heritage Consultants Pty Ltd (2005) conducted machine testing at the CSR lands, Erskine Park, approximately 6 kilometres to the north west of the study area. A total of 256 test pits were excavated, with 285 artefacts being identified across 88 of these pits. It is noted in (JMCHM 2008, p.14) that only a sample of the excavated deposit was sieved, and that this may be a contributing factor to the relatively low number of artefacts identified at the site relative to other excavations in the area.

The assemblage was primarily comprised of silcrete and silicified tuff, making up about 81% of the total assemblage, and contained a range of artefact types, including microblades, Bondi points, and backed artefacts. Based on the results of this testing, Navin Officer characterised the site as having been used as a transient camp, or for peripheral activities in relation to a larger camping area, and stated that it had been subject to low intensity occupation (Navin Officer Heritage Consultants Pty Ltd 2005 p.ii)**.**

Haglund and Associates (2007) conducted test excavations for the upgrade of The Horsley Drive, Westlink M7 to Cowpasture Road, located adjacently south of the study area. A survey did not identify any sites due to dense vegetation coverage. However, the majority of areas bounded by the road reserve to be impacted by the upgrades were assessed to be PAD. It was noted that these areas of PAD (Sites1 – 6) were likely extend beyond the road reserve and their extents were not specified.

The test excavations took place to the south west of the current study area. Site 1 was located to the west of Eastern Creek containing 47 artefacts of silcrete, quartz and tuff across eight test pits. Site 2 was located on the southern side of Horsley Drive to the east of Eastern Creek, 191 artefacts of silcrete, tuff and quartz were identified across 8 test pits. Site 3 was located on the southern side of Horsley Drive overlooking a first order drainage line. A total of 19 artefacts were identified within five test pits comprising of silcrete, tuff and quartz. Site 5 was located to the south of Horsley Drive on the bend adjacently south east of the current study area. A

total of 27 test pits were excavated identifying two artefacts and a burnt clay feature. Site 6 was located adjacently south of the current study area and Horsely Drive identifying one artefact across 6 test pits.

Overall contexts were badly disturbed with a concentration of activity surrounding Eastern Creek. Further investigation was recommended at Site 2 through salvage excavations due to its assessment of moderate significance, while Sites 1, 5 and 6 were assessed to have low significance. No further assessment was recommended for Sites 3 and 4, however a significance assessment was not provided.

Richards (2014) conducted an ACHA for the Sydney International Equestrian Centre, Horsley Park located approximately 45 metres south west of the current study area. Previously, 197 artefacts had been recorded within the area as 'Site within Steeplechase Track (Conserved Area)' which was not registered as an AHIMS site. This was likely identified during the original assessment of the site for the Sydney 2000 Olympic Games by ERM 1996 (cited in Richards 2014, p.24). Fourteen sites were identified including 11 low density artefact scatters, one isolated find and two scarred trees. These sites were concentrated around Eastern Creek and drainage lines. Due to the low density nature of the artefact scatters, 11 were determined to have low archaeological significance, while scarred trees and one artefact scatter including a hammerstone were determined to have higher archaeological significance. It appears that these identified sites are not recorded on the AHIMS register, with the exception of the "Site within Steeplechase Track" (AHIMS 45-5-4488). The locations of these sites are provided in Photo 7.

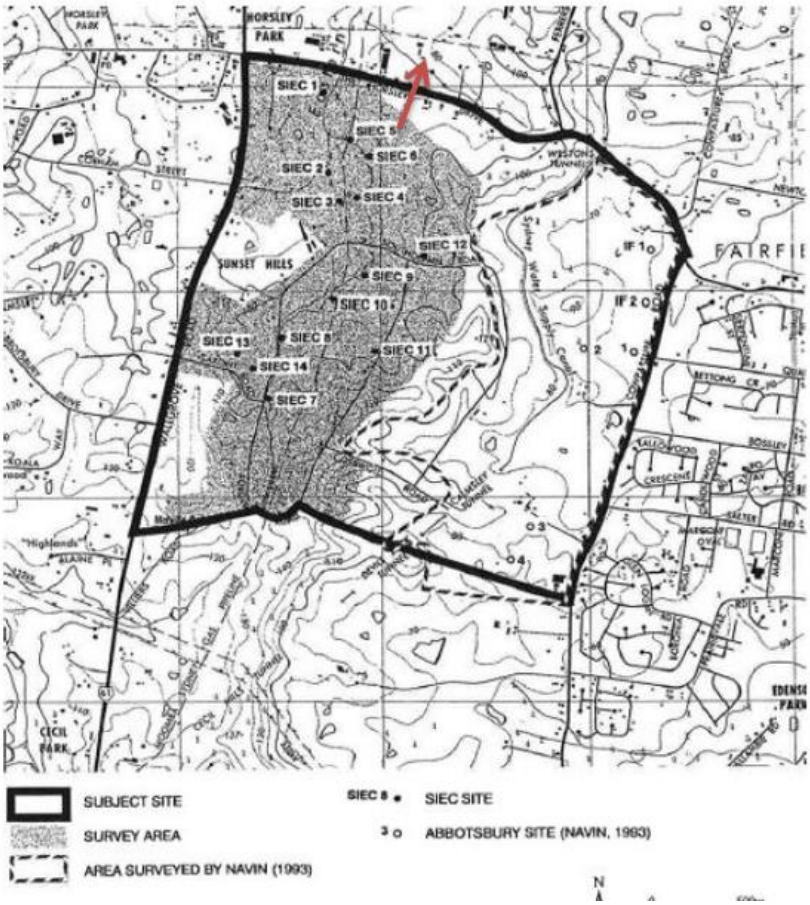



**Photo 7 Aboriginal site locations identified by ERM (1996) in Richards 2014, with the study area located directly north of the northern boundary (red arrow)**

Test excavations were conducted in the steeple chase area with 34 test pits. 780 artefacts were recorded in the steeple chase area consisting of silcrete, mudstone, quartz, chart, volcanic material, and glass. A scatter of 197 artefacts was recorded to the north in an area investigated by grader scrapes.

An additional survey was conducted by Richards (2014), which identified 16 silcrete and chert artefacts on the lower slope landform adjacent to Eastern Creek. Due to previous extensive works within the study area it was determined that intact subsurface deposits were unlikely. It was also noted that the study area was likely a major knapping area and a natural meeting place for Aboriginal people from the Hawkesbury-Nepean, Georges River/Botany Bay, and Parramatta River/Port Jackson areas (Richards 2014, p.42). An AHIP for the steeple chase scatter site was recommended prior to development.

Biosis (2017, 2018) completed an ACHA of the Mamre West Precinct located approximately 7.5 kilometres west of the study area. The initial assessment recorded a number of archaeological sites including MWP-AD3 which identified the highest density of artefacts. In total, 43 stone artefacts were recovered from 20 of the 39 test pits. The majority of these were recorded in the first 200 millimetres of the soil deposit, and were intermixed with European cultural material signalling historical disturbance had occurred.

Biosis found that the dominant material types differed to those of the surrounding region. At MWP-AD3, chert and mudstone artefacts were found in higher proportions to silcrete, which is seen in higher proportions in other sites in the region.

Biosis (2019) carried out an ACHA as part of a two stage industrial development along Mamre Road, that incorporated Lots 210 – 215 DP 1013539, and Lots 1 and 2 DP 1233392 approximately 7 kilometres west of the study area. The ACHA included archaeological survey and test excavations in an area of high subsurface archaeological potential. The results of the test excavations identified one subsurface archaeological deposit (AHIMS 41-5-0016/MNPAD01) consisting of 14 artefacts dispersed across an area of 105 metres by 17 metres of a gently sloping plain landform.

### 3.2.3 AHIMS site analysis

An extensive search of the AHIMS database was conducted on 16 March 2021 (Client service ID: 576371). The search identified 103 Aboriginal archaeological sites within a 3.5 kilometre search area, centred on the study area (Table 7). One of these registered sites is located *within* the study area (Figure 7). The mapping coordinates recorded for these sites were checked for consistency with their descriptions and location on maps from Aboriginal heritage reports where available. These descriptions and maps were relied where notable discrepancies occurred.

It should be noted that the AHIMS database reflects Aboriginal sites that have been officially recorded and included on the list. Large areas of NSW have not been subject to systematic, archaeological survey; hence AHIMS listings may reflect previous survey patterns and should not be considered a complete list of Aboriginal sites within a given area. Some recorded sites consist of more than one element, for example artefacts and a modified tree, however for the purposes of this breakdown and the predictive modelling, all individual site types will be studied and compared. This explains why there are 108 results presented here, compared to the 103 sites identified in AHIMS.

**Table 7 AHIMS sites within the study area**

| Site type | Occurrences | Frequency (%) |
|---|---|---|
| Artefact | 89 | 82.41 |
| PAD | 12 | 11.11 |
| Modified tree | 5 | 4.63 |
| Aboriginal ceremony and dreaming | 2 | 1.85 |
| **Total** | **108** | **100** |

A simple analysis of the Aboriginal cultural heritage sites registered within 3.5 kilometres of the study area indicates that the dominant site type is artefact, representing 82.41% (n=89), followed by PAD with 11.11% (n=12), and modified tree with 4.63% (n=5). Aboriginal ceremony and dreaming had the lowest site type frequency with 1.85% (n=2).

### 3.2.4 Sites located within the study area

One AHIMS site (AHIMS 45-5-3082/Horsley Dr PAD) is located within the study area.

#### AHIMS 45-5-3082/Horsley Dr PAD

The site is listed as 'Horsley Dr PAD' (AHIMS 45-5-3082) and is located in the southern part of the study area adjacent to Horsley Drive. Limited further information was available as the site card has not been digitized and was unavailable to be viewed. Two reports are available relating to AHIMS 45-5-3082/Horsley Dr PAD, this included 'Test excavations for Aboriginal heritage carried out along Proposed Upgrade of The Horsley Drive, Westlink M7 to Cowpasture Road, Horsley Park, NSW' (Haglund and Associates 2007). The test excavations conducted by Haglund and Associates took place outside of the current study area to the south west but the report noted that areas of PAD were likely to extend beyond the immediate area tested.

The other report that was listed to be associated with AHIMS 45-5-3082/Horsley Dr PAD is the 'Cross Country Course Modification, Sydney International Equestrian Centre, Horsley Park: Aboriginal Cultural Heritage Assessment' (Richards 2014). The report does not mention AHIMS 45-5-3082/Horsley Dr PAD except in *Appendix B: Aboriginal sites*, as previously recorded in the vicinity of the study area. It does not indicate the location of AHIMS 45-5-3082/Horsley Dr PAD.

### 3.2.5 AHIMS sites within 200 metres of the study area

AHIMS 45-5-4679/The Horsley Drive AFT 7, AHIMS 45-5-4682/The Horsley Drive AFT 2, AHIMS 45-5-4683/The Horsley Drive AFT 3, and AHIMS 45-5-4684/The Horsley Drive AFT 4, are located within 200 metres of the study area. They were all recorded by Kelleher Nightingale in 2015, and were excavated by Haglund and Associates in 2007. The site locations and extents are provided in Figure 8 and a summary of each of these sites is provided below.

#### AHIMS 45-5-4679/The Horsley Drive AFT 7

AHIMS 45-5-4679/The Horsley Drive AFT 7 is an artefact scatter located on a gentle slope landform within 65 metres of freshwater, in the vicinity of the current study area. The site comprised of three silcrete flake fragments, found on an exposure adjacent to Eastern Creek at the base of a gentle slope. The scatter consists of an area approximately 175 metres by 120 metres in size.

#### AHIMS 45-5-4682/The Horsley Drive AFT 2 (Site 2)

AHIMS 45-5-4682/The Horsley Drive AFT 2 is an artefact scatter located on an undulating slope landform within 35 metres of freshwater, in the vicinity of the current study area. The site comprised of 191 artefacts recovered from eight 1 metre squared test pits located within a 230 by 130 metre area. The artefacts included geometric microliths, microblades, a single core and bipolar silcrete flake. The artefact materials were predominantly silcrete, with silicified tuff, quart, and banded fine grained siliceous material. Soil profiles were identified to be intact with some fluvial disturbance from the watercourse.

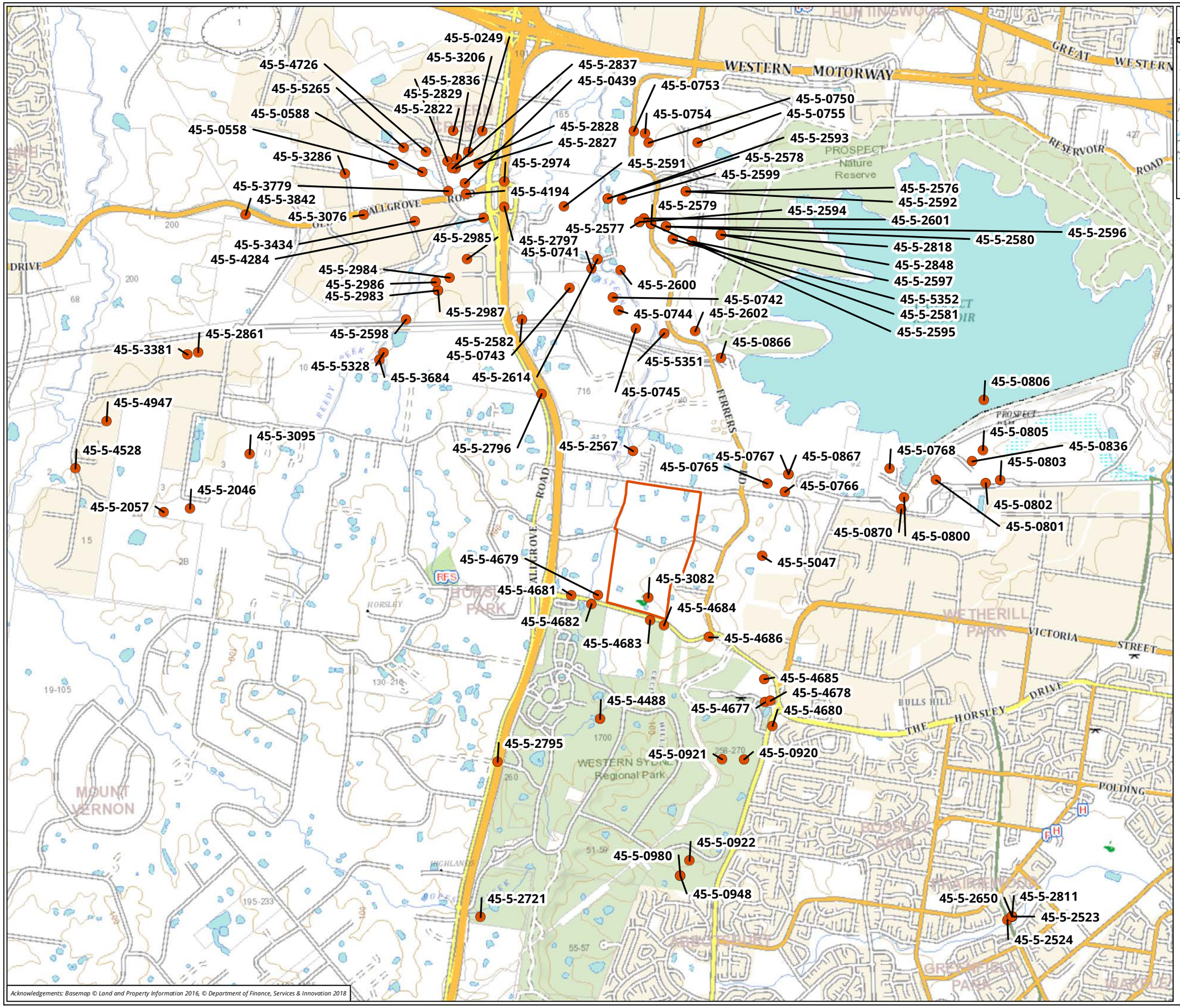
#### AHIMS 45-5-4683/The Horsley Drive AFT 3 (Site 3)

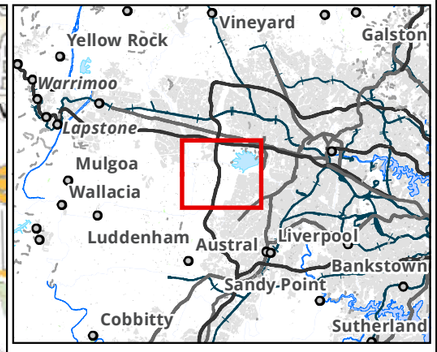
AHIMS 45-5-4683/The Horsley Drive AFT 3 is an artefact scatter located on a mid-lower hill slope landform within 75 metres of freshwater, adjacent to the current study area. Seven test pits were excavated within a 50 by 25 metre area, recovering 19 artefacts, including silcrete, tuff, and fine-grained siliceous material. The site

was characterised as a low density 'background scatter' location with incidental use, reflective of a low archaeological potential area.

### AHIMS 45-5-4684/The Horsley Drive AFT 4 (Site 4)

AHIMS 45-5-4684/The Horsley Drive AFT 4 is an artefact scatter located on an undulating slope landform within 45 metres of freshwater, adjacent to the current study area. The site comprised of 47 artefacts within a 157 by 47 metre area, and included a backed artefact fragment, recovered from 27 test pits. The test pits were shallow and comprised highly disturbed soils from vehicle and earth moving activities, and sheet erosion. Material types were not provided on the site card.




**Legend**

- Study area
- AHIMS record

**NOT TO BE MADE PUBLIC**

**Figure 7 AHIMS records near the study area**

0 200 400 600 800 1,000

Metres

N

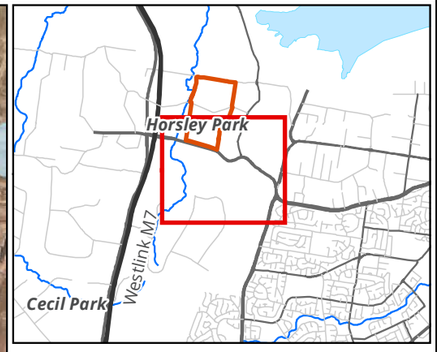
Scale: 1:30,000 @ A3

*Coordinate System: GDA 1994 MGA Zone 56*

biosis

Matter: 34802,
Date: 01 June 2021,
Checked by: MIB, Drawn by: AM, Last edited by: amackegard
Location: P:\34800s\34802\Mapping\34802_ADDA_F7_AHIMS.mxd

*Acknowledgements: Basemap © Land and Property Information 2016, © Department of Finance, Services & Innovation 2018*


**Legend**

- Study area
- AHIMS record
- Archaeological site

**NOT TO BE MADE PUBLIC**

**Figure 8 AHIMS site extents**

0 40 80 120 160 200

Metres

N

Scale: 1:6,000 @ A3

*Coordinate System: GDA 1994 MGA Zone 56*

biosis

Matter: 34802,
Date: 01 June 2021,
Checked by: AKE, Drawn by: AM, Last edited by: amackegard
Location: P:\34800s\34802\Mapping\34802_ADDA_F8_AHIMS_SiteExtents.mxd

*Acknowledgements: Basemap © Land and Property Information 2016,*

## 3.3 Discussion

The study area is located within the Bringelly Shale geological unit which underlies the residual Blacktown soil landscape and erosional Luddenham soil landscape. Two first order non perennial tributaries of Eastern Creek are located within the north eastern and south western portions of the study area. Eastern Creek also transects the western portion of the study area as a second order non-perennial creekline transitioning to a perennial watercourse approximately 3.1 kilometres north of the study area.

Artefact and PAD sites are considered the most common site types within the region and have frequently been identified within proximity to fresh water sources upon gentle slope or other low lying landforms with a lack of surface artefacts considered to be irrelevant to the presence of subsurface deposits (Brayshaw McDonald Pty Ltd 1994, JMCHM 2000, DSCA 2003, Haglund and Associates 2007, KNC 2011, Richards 2014).

Previous archaeological assessments within the local and regional context of the study area have identified varying trends between the presence of fresh water sources and Aboriginal sites. Jo McDonald Cultural Heritage Management's 2000 study concluded that artefact density on ridgetops and upper slopes was on average lower than upon hillslopes located within proximity to first and second order tributaries, such as those found within the study area, with artefact sites found within 50 to 200 metres of water sources. It is generally agreed that artefact sites found in association with non-perennial creek lines such as first and second order creek lines are likely to consist of low density artefact scatters or isolated finds representing isolated activities or transient occupation (Brayshaw McDonald Pty Ltd 1994, JMCHM 2000, DSCA 2003, Haglund and Associates 2007).

A review of aerial photographs of the study area shows the land has been extensively used for agricultural and market gardening practices. A number of residential properties and associated structures have also been developed in addition to areas of stockpiling and dams. This would have caused a number of disturbances within the area in addition to disturbance to topsoils through ploughing, which would have impacted to a maximum depth of 25 centimetres according to Brayshaw McDonald Pty Ltd (1994).

A search of the AHIMS register identified one PAD site (AHIMS 45-5-3082/Horsley Dr PAD) to be located within the study area in addition to four PAD sites (AHIMS 45-5-4679, 45-5-4682, 45-5-4683, and 45-5-4684) within 200 metres. These sites are located within close proximity to Eastern Creek and its associated tributaries, particularly the first order drainage line located within the south of the study area. The sites are predominately silcrete based artefact scatters, with silicified tuffs, quartz, and fine grained siliceous material present and are located upon hillslope/creekflat landforms within 100 metres of fresh water sources.

Haglund and Associates (2007) conducted test excavations along Horsley Drive directly south of the study area within AHIMS 45-5-4679, 45-5-4682, 45-5-4683, and 45-5-4684 identifying up to 259 artefacts, with concentrations identified within areas overlooking Eastern Creek. The nearby assessment of the Sydney International Equestrian Centre conducted by Richards (2014) also identified a number of artefact scatters, scarred trees and an isolated find. These assessments provide further indication of site types within the area and their potential to be present nearby watercourses within the surrounding area. Therefore there is potential for artefact scatters and PAD sites to be present within the study area upon gentle hillslopes and upon creek flats within 100 metres of Eastern Creek and the two first order tributaries identified in the study area.

### 3.3.1 Predictive model

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

This model is based on:

- Site distribution in relation to landscape descriptions within the study area.

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

Table 8 indicates the site types most likely to be encountered across the present study area. The definition of each site type is described firstly, followed by the predicted likelihood of this site type occurring within the study area.

**Table 8 Aboriginal site prediction statements**

| Site type | Site description | Potential |
|---|---|---|
| **Flaked stone artefact scatters and isolated artefacts** | Artefact scatter sites can range from high-density concentrations of flaked stone and ground stone artefacts to sparse, low-density 'background' scatters and isolated finds. | High: Stone artefact sites have been previously recorded within close proximity to the study area, particularly nearby Eastern Creek adjacently west of the study area. |
| **Potential Archaeological Deposits (PADs)** | Potential sub surface deposits of cultural material. | High: PADs have been previously recorded in the region across a wide range of landforms, including one within the study area. Although it is not confirmed that the site is located within the study area, a number of PADs have been recorded adjacently south. PADs are likely to be present within areas adjacent to water courses such as gently inclined hill slopes. |
| **Modified trees** | Trees with cultural modifications | Low: Due to extensive vegetation clearance only a small number of mature native trees are likely to have survived. |
| **Grinding grooves** | Grooves created in stone platforms through ground stone tool manufacture. | Low: Suitable horizontal sandstone rock outcrops are unlikely to occur along drainage lines due to the underlying geology consisting of Bringelly Shale deposits. |
| **Burials** | Aboriginal burial sites. | Low: Aboriginal burial sites are generally situated within deep, soft sediments, caves or hollow trees. Areas of deep sandy deposits will have the potential for Aboriginal burials. The soil profiles associated with the study area are not commonly associated with burials. |

| Site type | Site description | Potential |
|---|---|---|
| **Shell middens** | Deposits of shells accumulated over either singular large resource gathering events or over longer periods of time. | Low: Shell midden sites have not been recorded within the vicinity of the study area. There is a very low potential for shell middens to be located in the study area as the first order drainage line is not permanent water source. |
| **Quarries** | Raw stone material procurement sites. | Low: There is no record of any quarries being within or surrounding the study area. |
| **Aboriginal Ceremony and Dreaming sites** | Such sites are often intangible places and features and are identified through oral histories, ethnohistoric data, or Aboriginal informants. | Low: There are currently no recorded mythological stories for the study area. |
| **Post-contact sites** | These are sites relating to the shared history of Aboriginal and non-Aboriginal people of an area and may include places such as missions, massacre sites, post-contact camp sites and buildings associated with post-contact Aboriginal use. | Low: There are no post-contact sites previously recorded in the study area and historical sources do not identify one. |
| **Aboriginal places** | Aboriginal places may not contain any 'archaeological' indicators of a site, but are nonetheless important to Aboriginal people. They may be places of cultural, spiritual or historic significance. Often they are places tied to community history and may include natural features (such as swimming and fishing holes), places where Aboriginal political events commenced or particular buildings. | Low: There are currently no recorded Aboriginal historical associations for the study area. |
| **Rock shelters with art and / or deposit** | Rock shelter sites include rock overhangs, shelters or caves, and generally occur on, or next to, moderate to steeply sloping ground characterised by cliff lines and escarpments. These naturally formed features may contain rock art, stone artefacts or midden deposits and may also be associated with grinding grooves. | Nil: The sites will only occur where suitable sandstone exposures or overhangs possessing sufficient sheltered space exist, which not present within the study area. |

# 4 Archaeological survey

An archaeological survey of the study area was undertaken on 5 April 2021 and 14 September 2021. The survey sampling strategy, methodology and a discussion of results are provided below. Site access to all portions of the study area was not able to be obtained. Table 9 and Figure 9 summarises the status of lots which were surveyed as part of this archaeological survey.

**Table 9 Accessibility status**

| Lot No. | Deposited Plan | Status of site access | Status after survey | Date surveyed |
|---|---|---|---|---|
| 58B | 17288 | Accessible | Surveyed | 05/04/21 |
| 58A | 17288 | Accessible | Surveyed | 05/04/21 |
| 57 | 13961 | Accessible | Surveyed | 14/09/21 |
| 56 | 13961 | Accessible | Surveyed | 14/09/21 |
| A | 361393 | Accessible | Surveyed | 05/04/21 |
| B | 361393 | Accessible | Surveyed | 05/04/21 |
| 54 | 13961 | No access | Not surveyed | Not surveyed |
| 59B | 362022 | No access | Not surveyed | Not surveyed |
| 59A | 362022 | Accessible | Surveyed | 05/04/21 |
| 1 | 505934 | Accessible | Surveyed | 14/09/21 |
| 2 | 505934 | Accessible | Surveyed | 14/09/21 |
| 61B | 17288 | Accessible | Surveyed | 14/09/21 |
| A | 347034 | Accessible | Surveyed | 14/09/21 |
| B | 347034 | No access | Not surveyed | Not surveyed |
| 63 | 13961 | No access | Not surveyed | Not surveyed |
| 77 | 13961 | No access | Not surveyed | Not surveyed |
| B | 357890 | Accessible | Surveyed | 14/09/21 |
| A | 357890 | No access | Not surveyed | Not surveyed |
| A | 377249 | No access | Not surveyed | Not surveyed |
| B | 377249 | Accessible | Surveyed | 14/09/21 |
| 74B | 17288 | No access | Not surveyed | Not surveyed |
| 74A | 17288 | Accessible | Surveyed | 14/09/21 |
| 78B | 347873 | Accessible | Surveyed | 14/09/21 |
| 79A | 17288 | Accessible | Surveyed | 14/09/21 |
| 79B | 17288 | Accessible | Surveyed | 05/04/21 |

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| Lot No. | Deposited Plan | Status of site access | Status after survey | Date surveyed |
|---|---|---|---|---|
| 1 | 849699 | Accessible | Surveyed | 05/04/21 and 14/09/21 |
| 81A | 348110 | Accessible | Surveyed | 05/04/21 |
| 81B | 348110 | Accessible | Surveyed | 05/04/21 |
| C | 398446 | No access | Not surveyed | Not surveyed |
| D | 398446 | No access | Not surveyed | Not surveyed |
| A | 394855 | No access | Not surveyed | Not surveyed |
| B | 394855 | No access | Not surveyed | Not surveyed |

## 4.1 Archaeological survey objectives

The objectives of the survey were to:

- Attempt to re-identify Aboriginal archaeological sites and/or Aboriginal places previously identified in the study area.
- Undertake a systematic survey of accessible portions of the study area targeting areas with the potential for Aboriginal heritage.
- Identify and record Aboriginal archaeological sites visible on the ground surface.
- Identify and record areas of PAD.

## 4.2 Archaeological survey methodology

The survey methods were intended to assess and understand the landforms and to determine whether any archaeological material from Aboriginal occupation or land use exists within the study area.

### 4.2.1 Sampling strategy

The survey effort targeted those portions of the study area which authorised access was obtained. The survey within these areas focused on landforms with a higher potential for Aboriginal heritage or areas of exposure which would allow for Aboriginal objects to be identified on the ground surface. Some portions of the study area such as part of Lot 81A and 81B DP 348110 were inaccessible due to chest high vegetation cover.

### 4.2.2 Survey methods

The archaeological survey was conducted on foot with a field team of three members on 5 April 2021 (Biosis Archaeologists Ashleigh Keevers-Eastman, Anthea Vella and Caitlin McManus) and three members on 14 September 2021 (Biosis Archaeologists Anthea Vella and Caitlin McManus; Deerubbin Local Aboriginal Land Council Cultural Sites Officer, Steve Randall). Recording during the survey followed the archaeological survey requirements of the Code and industry best practice methodology. Information that recorded during the survey included:

- Aboriginal objects or sites present in the study area during the survey.
- Survey coverage.
- Any resources that may have potentially have been exploited by Aboriginal people.
- Landforms.

- Photographs of the site indicating landform.
- Evidence of disturbance.
- Aboriginal artefacts, culturally modified trees or any other Aboriginal sites.

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

## 4.3 Archaeological survey results

As discussed above, only portions of the study area which were able to be accessed (refer to Table 9) were targeted as part of the archaeological survey.

A single pedestrian transect was walked by three surveyors spaced at least two metres apart where practicable within the lots surveyed in Table 9 (

Figure 9). This follows the methodology set out in Burke and Smith (2004, p.65) which states that a single person can only effectively visually survey an area of two linear metres. However in order to cover a greater sample of each landform surveyors were at times spaced out at 10 metre intervals due to limited ground surface visibility.

Generally the survey was hampered by poor GSV (0-5%) as a result of high grass cover, with some portions of the site inaccessible due to chest height dense vegetation (81A and 81B DP 348110) (Photo 8) which hampered the surveyor's ability to identify Aboriginal sites which may have been present on the ground surface. Lot A DP 361393 was also being utilised as a public dumping site, therefore a survey of this area was limited to available cleared pathways where access of the site was safe and viable (Photo 9).

Within the southern portion of the study area (Lot 78B DP 347873, Lot 79A DP 17288, Lots 81A and 81B DP 348110, Lot 1 DP849699, and 79B DP 17288) disturbances are predominantly limited to small portions of the study area where residential development has occurred or where market gardens are currently being utilised (Photo 10). Lot 1 DP849699 was noted to have been heavily disturbed and modified due to its recreational use of the area as an active golfing range (Photo 11). Portions of the study area have also been overrun by Prickly Pear *Opuntia stricta*, and may be indicative of areas of gross disturbance associated with residential land use (Photo 12). The land has been extensively cleared, however, soils upon gentle hill slopes appear to be relatively intact. Observations of the low lying areas adjacent to the first order creek line suggested that there is potential for low level flooding to occur within the southern portion of the study area. Vegetation surrounding the creek line was dense and overgrown. As part of the survey of this portion of the study area, a physical inspection of the location of AHIMS 45-5-3082/Horsley Dr PAD was also undertaken. Material evidence of AHIMS 45-5-3082/Horsley Dr PAD was unable to be identified, however this portion of the study area has remained undisturbed and likely still possesses PAD (Photo 13), however, there is little information available on the sites exact location.

Within the north western portion of the study area (Lots 56 and 57 DP 13961, and Lots A and B DP 361393) disturbance as a result of large scale market gardening was noted. Within Lots 56 and 57 DP 13961, and Lot B DP 361393 the ground surface has been excavated to create garden rows, with irrigation piping uprooted throughout suggesting a moderate to high level of disturbance to subsurface soils which appear to be shallow Blacktown soils (Photo 14). Lot A DP 361393 is currently being utilised as a public dumping site, as stated above. It was difficult to discern the level of disturbance within this portion of the study area due lack of surface visibility, however it is assumed that soils are likely to be shallow and consistent with the Blacktown soil landscape. It is likely the rubbish dumping activities have contaminated the soils within this portion of the study area. Brick pathways have also been constructed in this portion of the study area and clay soil profiles were observed (Photo 15).

West of lots A and B DP 361393, a survey of lots 58A and 58B DP 17288 and 59A DP 362022 was completed. Lot 59A DP 362022 appeared relatively undisturbed, with residential development limited to the south of the property (Photo 16). Within lot 58A DP 17288, the southern portion had undergone recent ploughing activities which had exposed soil deposits, with surface visibility and exposure increasing to 100% (Photo 17). This portion of the site did not contain any Aboriginal sites, despite high ground visibility. Towards the north of lot 58A DP 17288, soils were observed to be shallow (30-40 centimetres deep) within an excavated exposure (Photo 18), and introduced soils were potentially observed in association with residential structures.

Adjacent to lot 58A DP 17288, lot 58B DP 17288 appears to have been utilised for equestrian agistment purposes, with a round yard and sheds constructed in close relation to the residential address. Some portions of lot 58B DP 17288 were unable to be accessed due to the presence of livestock. A high pressure gas main and tarred driveway run along the eastern boundary of the property. However the north western portions of the paddocks appeared to have undergone little disturbance (Photo 19).

Within the central portion of the study area (north of Redmayne Road) (Lots 1 and 2 DP 505934, Lot 61B 17288, and Lot A DP 347034) disturbance as a result of large scale market gardening was noted. Within these lots the ground surface has been excavated to create garden rows, with irrigation piping uprooted throughout suggesting a moderate to high level of disturbance to subsurface soils (Photo 20).

Within the central portion of the study area (south of Redmayne Road) (Lot B DP 357890, Lot B DP 377249, and Lot 74A DP 17288) the rear of Lot B DP 377249 and Lot 74 A DP 17288 were noted to be less disturbed than that of Lot B DP 357890. At the time of the survey, the rear of Lot B DP 357890 was used for storage of construction related equipment and the survey of this area was limited to available cleared pathways where access of the site was viable. This portion of the study area did not contain any Aboriginal sites, despite high ground visibility. Lot B DP 377249 and Lot 74 A DP 17288 both had residential or commercial structures within the northern portion of the properties and agricultural land within the southern portion. A crest and upper hillslope is located within the south-western corner of Lot 74A DP 17288 (Photo 21) with clear visibility to the neighbouring lots.

No Aboriginal sites were identified during the archaeological survey, however portions of the site were considered to have low, moderate and high archaeological potential based upon the results of background research and observations made in the field.

Areas of low archaeological potential were attributed to portions of the site which were observed to have undergone high levels of disturbance as a result or previous land use and residential development which would have impacted subsurface deposits that may have otherwise been present (Photo 9, Photo 14, Photo 15, Photo 17, and Photo 20).

Areas of moderate archaeological potential were attributed to undisturbed mid to upper hillslopes located a minimum of 150 metres from the first order drainage line within the southern portion and eastern portion of the study area (Photo 13 and Photo 20). Hillslopes within proximity to lower order drainage lines have been commonly associated with areas of PAD, and regional and local studies have determined that subsurface deposits and artefact sites have the potential to occur within 0-250 metres of water sources (Brayshaw McDonald Pty Ltd 1994, KNC 2011, AMBS 2012, White & McDonald 2010, JMCHM 2000, DSCA 2003). Aboriginal sites likely to be identified within these portions of the study area will likely consist of low density background artefact scatters or isolated finds.

Areas of high archaeological potential were defined as undisturbed mid to lower gently inclined hillslopes located between 0-150 metres from the first order drainage lines within the southern portion of the study area and Eastern Creek in the north-west (Photo 13, Photo 16, and Photo 19). As stated above, hillslopes have been commonly associated with areas of PAD. Previous test excavations undertaken by Haglund and Associates (2007) along Horsley Drive directly south of the study identified 259 artefacts across a number of PADs located within similar landforms (AHIMS 45-5-4679, 45-5-4682, 45-5-4683, and 45-5-4684), with concentrations identified within areas overlooking Eastern Creek. Therefore there is potential for low to high density subsurface artefact scatters of a similar nature to be present within areas of high archaeological potential identified within the study area.

**Photo 8** **South east facing view of chest height grass within Lot 81B DP 348110**

**Photo 9** **South facing view of Lot A DP 361393 being utilised as a public dump**

**Photo 10** **Small market garden and shallow incised drainage channel in Lot Lot 81A DP 348110**

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**Photo 11** **Ground exposure and disturbance within Lot 1 DP 849699**

**Photo 12** **Prickly Pear *Opuntia stricta* present in southern portion of the study area**

**Photo 13** **South facing view of hill slope containing AHIMS 45-5-3082/Horsley Dr PAD, assessed as possessing moderate/high archaeological potential**

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**Photo 14** **Large market garden in Lot Lot B DP 361393, showing incised rows containing irrgation piping, assessed as low archaeological potential**

**Photo 15** **Exposed rocky clay soil in Lot A DP 361393, assessed as low archaeological potential**

**Photo 16** **North west facing view towards Eastern Creek showing gentle hill slope in Lot 59A DP 362022**

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**Photo 17** **Ploughed field in Lot 58A DP 17288, assessed as low archaeolgical potential**

**Photo 18** **Isolated excavated exposure within Lot 58A DP 17288, showing shallow soil deposits**

**Photo 19** **South facing view of area of high archaeological potential in Lot 58B DP 17288**

**Photo 20** South-west facing view of overgrown area of market gardening within Lot 61B DP 17288

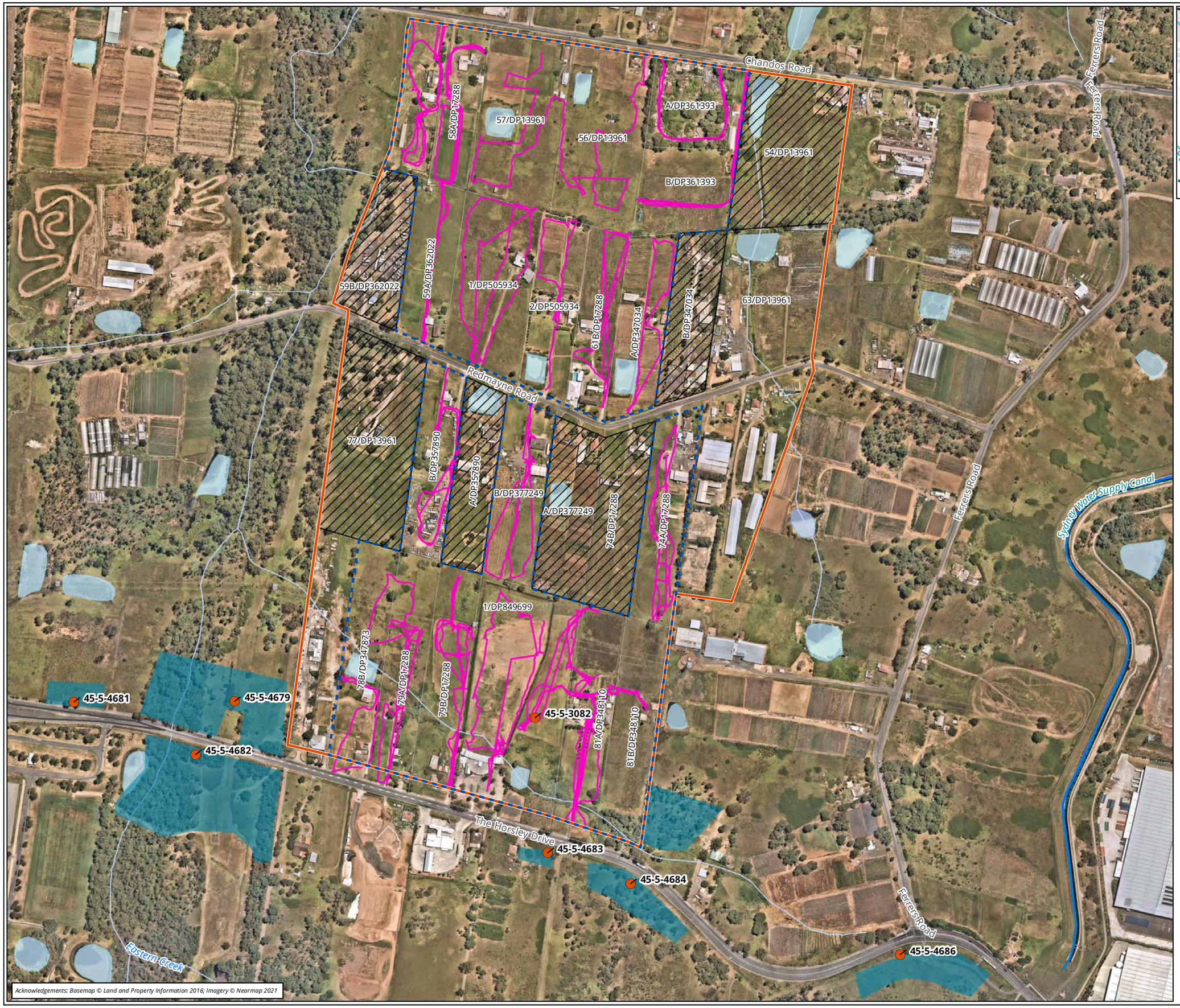
**Photo 21** South-west facing view of area of moderate archaeological potential in Lot 74A DP 17288

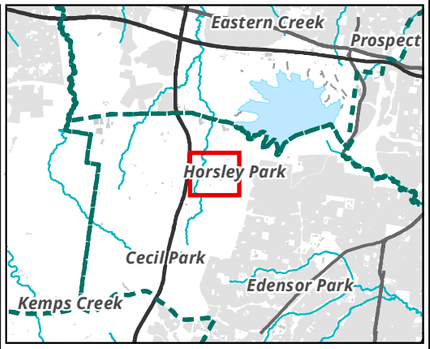
**Table 10 Survey coverage**

| Landform | Landform area (m²) | Visibility (%) | Exposure (%) | Effective coverage area (m²) | Effective coverage (%) |
|---|---|---|---|---|---|
| **Crest** | 32979.31 | 0 | 0 | 6280.92 | 19.05% |
| **Moderately inclined upper slope** | 101873.70 | 0-5 | 0-5 | 6518.62 | 6.40% |
| **Gently inclined upper/mid slope** | 350501.03 | 0-5 | 0-5 | 40959.39 | 11.69% |
| **Gently inclined lower slope** | 231883.26 | 0-100 | 0-100 | 17594.67 | 7.59% |

**Table 11 Landform summary**

| Landform | Landform area (m²) | Area effectively surveyed (m²) | Landform effectively surveyed (%) | No. of Aboriginal sites | No. of artefacts or features |
|---|---|---|---|---|---|
| **Crest** | 32979.31 | 6280.92 | 19.05% | 0 | 0 |
| **Moderately inclined upper slope** | 101873.70 | 6518.62 | 6.40% | 0 | 0 |
| **Gently inclined upper/mid slope** | 350501.03 | 40959.39 | 11.69% | 1 | 0 |
| **Gently inclined lower slope** | 231883.26 | 17594.67 | 7.59% | 0 | 0 |




**Legend**

- Study area
- Lot
- Survey track
- Surveyed
- Unable to be accessed
- AHIMS record
- Archaeological site

**NOT TO BE MADE PUBLIC**

## Figure 9 Survey effort

0 40 80 120 160 200

Metres

N

Scale: 1:5,000 @ A3

*Coordinate System: GDA 1994 MGA Zone 56*

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Matter: 34802,
Date: 11 October 2021,
Checked by: AKE, Drawn by: AM, Last edited by: amackegard
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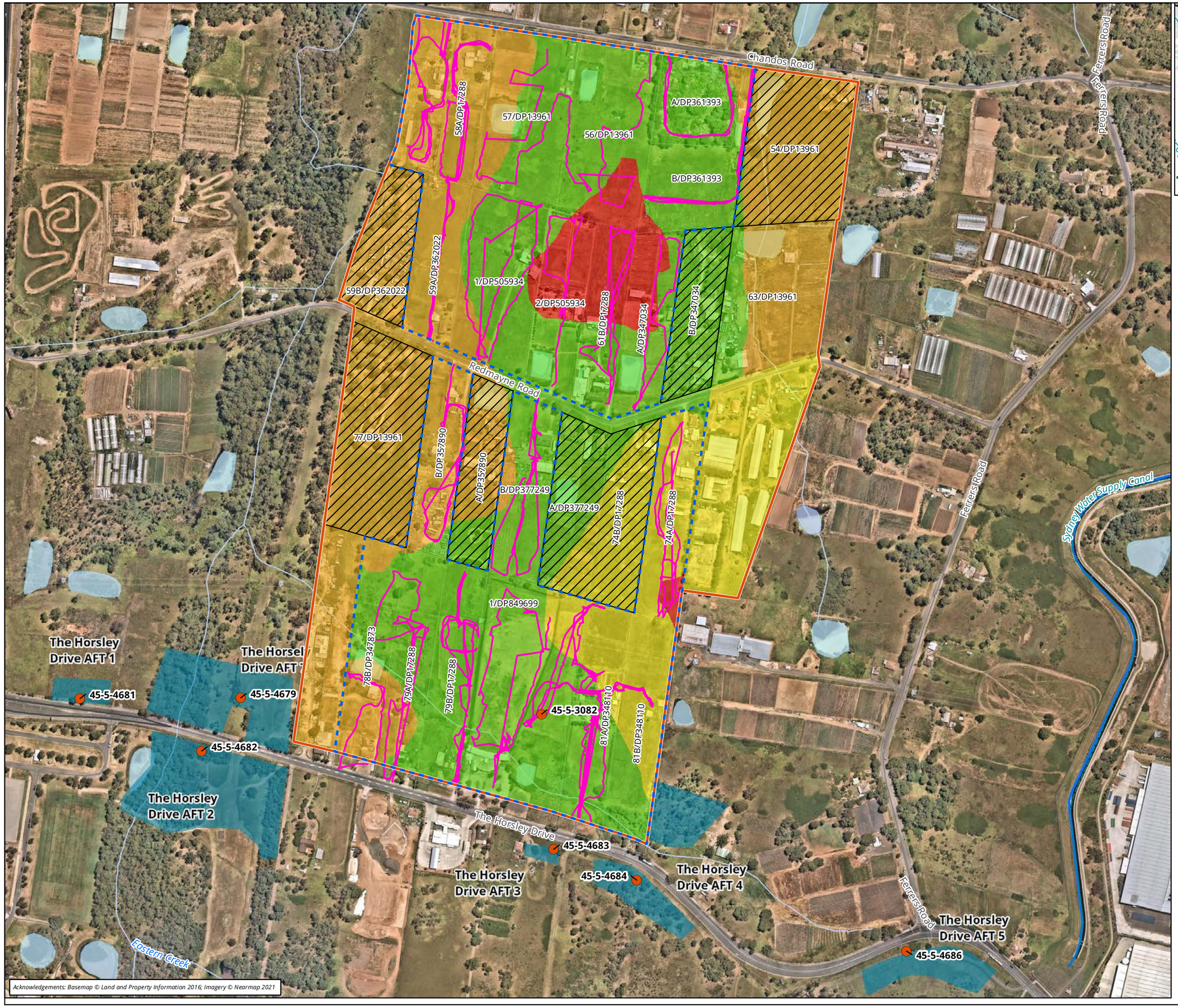


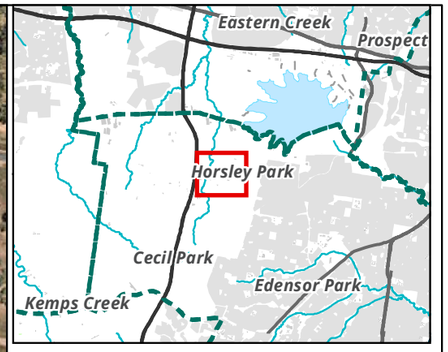


**Legend**

- Study area
- Lot
- Survey track
- Surveyed
- Unable to be accessed
- AHIMS record
- Archaeological site

**Landforms**

- Crest
- Gently inclined lower slope
- Moderately inclined upper slope
- Gently inclined upper/mid slope

**NOT TO BE MADE PUBLIC**

**Figure 10 Landform coverage**

0 40 80 120 160 200
Metres

N

Scale: 1:5,000 @ A3
*Coordinate System: GDA 1994 MGA Zone 56*

biosis

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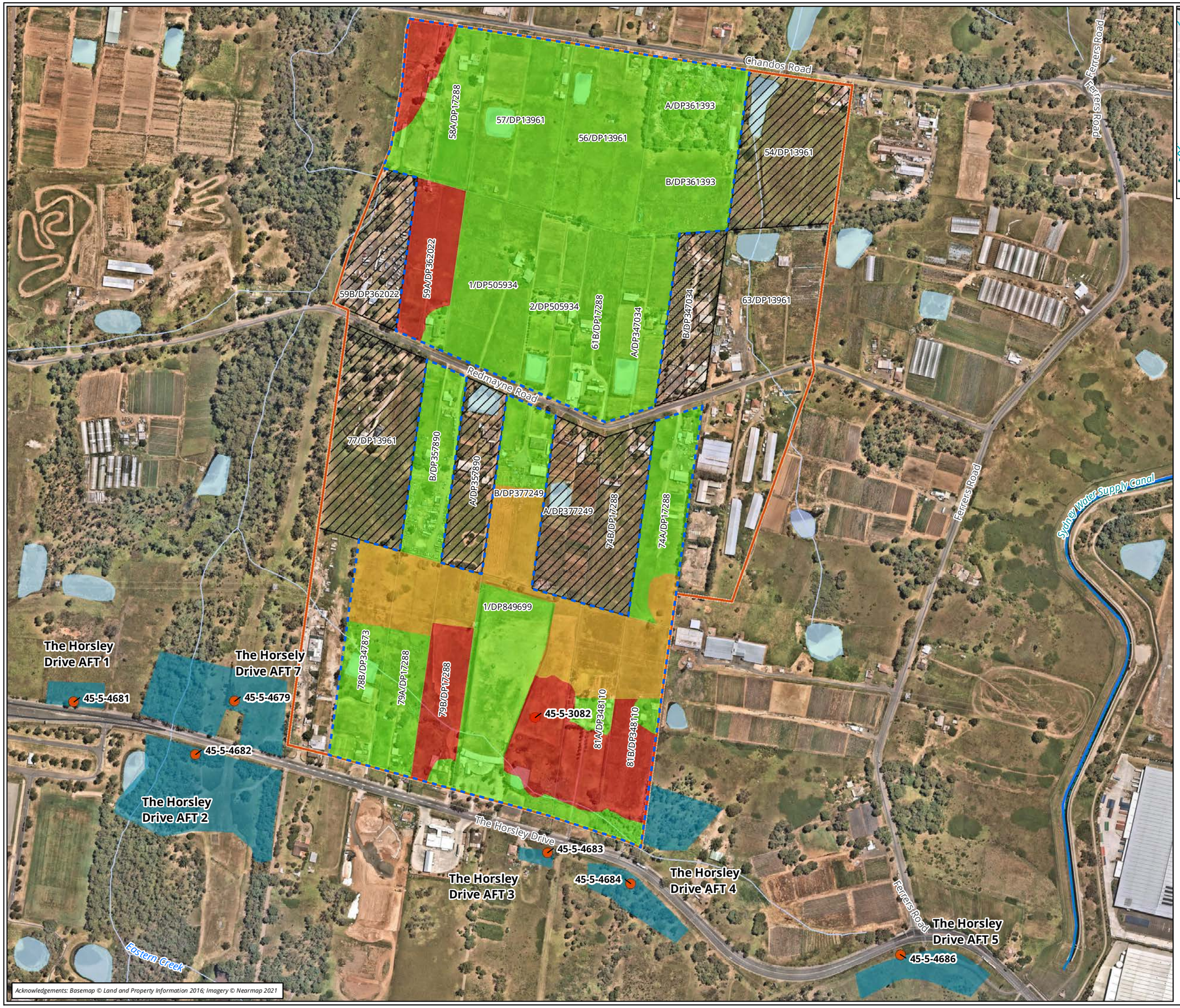


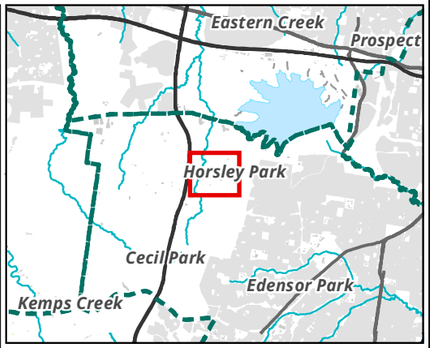


**Legend**

- Study area
- Lot
- Surveyed
- Requiring further investigation
- AHIMS record
- Archaeological site

**Archaeological potential**

- High
- Moderate
- Low

**NOT TO BE MADE PUBLIC**

**Figure 11 Survey results**

0 40 80 120 160 200

Metres

N

Scale: 1:5,000 @ A3

*Coordinate System: GDA 1994 MGA Zone 56*

biosis

Matter: 34802,
Date: 11 October 2021,
Checked by: AKE, Drawn by: AM, Last edited by: amackegard
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# 5 Scientific values and significance assessment

The two main values addressed when assessing the significance of Aboriginal sites are cultural values to the Aboriginal community and archaeological (scientific) values. This report will assess scientific values while the ACHA report will detail the cultural values of Aboriginal sites in the study area.

## 5.1 Introduction to the assessment process

Heritage assessment criteria in NSW fall broadly within the significance values outlined in the Australia International Council on Monuments and Sites (ICOMOS) Burra Charter (Australia ICOMOS 2013). This approach to heritage has been adopted by cultural heritage managers and government agencies as the set of guidelines for best practice heritage management in Australia. These values are provided as background and include:

- **Historical significance** (evolution and association) refers to historic values and encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section. A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.
- **Aesthetic significance** (Scenic/architectural qualities, creative accomplishment) refers to the sensory, scenic, architectural and creative aspects of the place. It is often closely linked with social values and may include consideration of form, scale, colour, texture, and material of the fabric or landscape, and the smell and sounds associated with the place and its use.
- **Social significance** (contemporary community esteem) refers to the spiritual, traditional, historical or contemporary associations and attachment that the place or area has for the present-day community. Places of social significance have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods or events. Communities can experience a sense of loss should a place of social significance be damaged or destroyed. These aspects of heritage significance can only be determined through consultative processes with local communities.
- **Scientific significance** (Archaeological, industrial, educational, research potential and scientific significance values) refers to the importance of a landscape, area, place or object because of its archaeological and/or other technical aspects. Assessment of scientific value is often based on the likely research potential of the area, place or object and will consider the importance of the data involved, its rarity, quality or representativeness, and the degree to which it may contribute further substantial information.

The cultural and archaeological significance of Aboriginal and historic sites and places is assessed on the basis of the significance values outlined above. As well as the ICOMOS Burra Charter significance values guidelines, various government agencies have developed formal criteria and guidelines that have application when assessing the significance of heritage places within NSW. Of primary interest are guidelines prepared by the Commonwealth Department of the Environment and Energy, Heritage NSW, NSW Department of Planning, Industry and Environment. The relevant sections of these guidelines are presented below.

These guidelines state that an area may contain evidence and associations which demonstrate one or any combination of the ICOMOS Burra Charter significance values outlined above in reference to Aboriginal heritage. Reference to each of the values should be made when evaluating archaeological and cultural significance for Aboriginal sites and places.

In addition to the previously outlined heritage values, the Heritage NSW Guidelines (OEH 2011) also specify the importance of considering cultural landscapes when determining and assessing Aboriginal heritage values. The principle behind a cultural landscape is that 'the significance of individual features is derived from their inter-relatedness within the cultural landscape'. This means that sites or places cannot be 'assessed in isolation' but must be considered as parts of the wider cultural landscape. Hence the site or place will possibly have values derived from its association with other sites and places. By investigating the associations between sites, places, and (for example) natural resources in the cultural landscape the stories behind the features can be told. The context of the cultural landscape can unlock 'better understanding of the cultural meaning and importance' of sites and places.

Although other values may be considered – such as educational or tourism values – the two principal values that are likely to be addressed in a consideration of Aboriginal sites and places are the cultural/social significance to Aboriginal people and their archaeological or scientific significance to archaeologists. The determinations of archaeological and cultural significance for sites and places should then be expressed as statements of significance that preface a concise discussion of the contributing factors to Aboriginal cultural heritage significance.

## 5.2 Archaeological (scientific significance) values

Archaeological significance (also called scientific significance, as per the ICOMOS Burra Charter) refers to the value of archaeological objects or sites as they relate to research questions that are of importance to the archaeological community, including indigenous communities, heritage managers and academic archaeologists. Generally the value of this type of significance is determined on the basis of the potential for sites and objects to provide information regarding the past life-ways of people (Burke & Smith 2004, p.249, NPWS 1997), For this reason, the NPWS summarises the situation as 'while various criteria for archaeological significance assessment have been advanced over the years, most of them fall under the heading of archaeological research potential' (NPWS 1997, p.26). The NPWS criteria for archaeological significance assessment are based largely on the ICOMOS Burra Charter.

### Research potential

Research potential is assessed by examining site content and site condition. Site content refers to all cultural materials and organic remains associated with human activity at a site. Site content also refers to the site structure – the size of the site, the patterning of cultural materials within the site, the presence of any stratified deposits and the rarity of particular artefact types. As the site contents criterion is not applicable to scarred trees, the assessment of scarred trees is outlined separately below. Site condition refers to the degree of disturbance to the contents of a site at the time it was recorded.

Table 12 and Table 13 outline the site content and site condition rating used for archaeological sites.

**Table 12 Site contents ratings used for archaeological sites**

| Rating | Description |
|---|---|
| 0 | No cultural material remaining. |
| 1 | Site contains a small number (e.g. 0–10 artefacts) or limited range of cultural materials with no evident |

| Rating | Description |
|---|---|
| | stratification. |
| 2 | Site contains a larger number, but limited range of cultural materials; and/or some intact stratified deposit remains; and/or are or unusual example(s) of a particular artefact type. |
| 3 | Site contains a large number and diverse range of cultural materials; and/or largely intact stratified deposit; and/or surface spatial patterning of cultural materials that still reflect the way in which the cultural materials were deposited. |

**Table 13 Site condition ratings used for archaeological sites**

| Rating | Description |
|---|---|
| 0 | Site destroyed. |
| 1 | Site in a deteriorated condition with a high degree of disturbance; lack of stratified deposits; some cultural materials remaining. |
| 2 | Site in a fair to good condition, but with some disturbance. |
| 3 | Site in an excellent condition with little or no disturbance. For surface artefact scatters this may mean that the spatial patterning of cultural materials still reflects the way in which the cultural materials were laid down. |

Pearson and Sullivan (1995, p.149) note that Aboriginal archaeological sites are generally of high research potential because 'they are the major source of information about Aboriginal prehistory'. Indeed, the often great time depth of Aboriginal archaeological sites gives them research value from a global perspective, as they are an important record of humanity's history. Research potential can also refer to specific local circumstances in space and time – a site may have particular characteristics (well preserved samples for absolute dating, or a series of refitting artefacts, for example) that mean it can provide information about certain aspects of Aboriginal life in the past that other less or alternatively valuable sites may not (Burke & Smith 2004, pp.247–8). When determining research potential value particular emphasis has been placed on the potential for absolute dating of sites.

The following sections provide statements of significance for the Aboriginal archaeological sites recorded during the sub-surface testing for the assessment. The significance of each site follows the assessment process outlined above. This includes a statement of significance based on the categories defined in the Burra Charter. These categories include social, historic, scientific, aesthetic and cultural (in this case archaeological) landscape values. Nomination of the level of value—high, moderate, low or not applicable—for each relevant category is also proposed. Where suitable the determination of cultural (archaeological) landscape value is applied to both individual sites and places (to explore their associations) and also, to the Study Area as a whole. The nomination levels for the archaeological significance of each site are summarised below.

### Representativeness

Representativeness refers to the regional distribution of a particular site type. Representativeness is assessed by whether the site is common, occasional, or rare in a given region. Assessments of representativeness are subjectively biased by current knowledge of the distribution and number of archaeological sites in a region. This varies from place to place depending on the extent of archaeological research. Consequently, a site that is assigned low significance values for contents and condition, but a high significance value for representativeness, can only be regarded as significant in terms of knowledge of the regional archaeology. Any such site should be subject to re-assessment as more archaeological research is undertaken.

Assessment of representativeness also takes into account the contents and condition of a site. For example, in any region there may only be a limited number of sites of any type that have suffered minimal disturbance. Such sites would therefore be given a high significance rating for representativeness, although they may occur commonly within the region.

Table 14 outlines the site representativeness ratings used for archaeological sites.

**Table 14 Site representativeness ratings used for archaeological sites**

| Rating | Description |
|---|---|
| 1 | Common occurrence. |
| 2 | Occasional occurrence. |
| 3 | Rare occurrence. |

Overall scientific significance ratings for sites, based on a cumulative score for site contents, site integrity and representativeness are provided in Table 15.

**Table 15 Scientific significance ratings used for archaeological sites**

| Rating | Description |
|---|---|
| 1-3 | Low scientific significance. |
| 4-6 | Moderate scientific significance. |
| 7-9 | High scientific significance. |

Each site is given a score on the basis of these criteria – the overall scientific significance is determined by the cumulative score. This scoring procedure has been applied to the Aboriginal archaeological sites identified during the sub-surface testing.

### 5.2.1 Statements of archaeological significance

The following archaeological significance assessment is based on Requirement 11 of the Code. Using the assessment criteria detailed in Scientific Values and Significance Assessment, an assessment of significance was determined and a rating for each site was determined. The results of the archaeological significance assessment are given in Table 16 below.

**Table 16 Scientific significance assessment of archaeological sites recorded within the study area.**

| Site name | Site content | Site condition | Representativeness | Scientific significance |
|---|---|---|---|---|
| **AHIMS 45-5-3082/Horsley Dr PAD** | To be determined | To be determined | To be determined | Unknown |

**Table 17 Statements of scientific significance for archaeological sites recorded within the study area.**

| Site name | Statement of significance |
|---|---|
| **AHIMS 45-5-3082/Horsley Dr PAD** | To be determined following archaeological test excavations. |

# 6 Impact assessment

As outlined above, Frasers Property Industrial are preparing a Planning Proposal to allow for amendments to the FLEP 2013, to support the future development of a Warehouse, Logistics and Industrial Facilities Hub within the study area.

## 6.1 Predicted physical impacts

A draft Master Plan of the proposed future development shows that the development will have the potential to impact AHIMS 45-5-3082/Horsley Dr PAD and areas of moderate and high archaeological potential identified by Biosis' assessment (Figure 12). Further investigation in the form of an additional archaeological survey of lots which were not surveyed on 5 April 2021 and 14 September 2021 (Table 9), and test excavations within areas of moderate and high archaeological potential, and AHIMS 45-5-3082/Horsley Dr PAD, will need to be completed so that an assessment of physical impacts can be completed for the proposed future development.

A summary of impacts is provided below in Table 18.

**Table 18 Summary of potential archaeological impacts**

| AHIMS site no. | Site name | Significance | Type of harm | Degree of harm | Consequence of harm |
|---|---|---|---|---|---|
| **AHIMS 45-5-3082** | Horsley Dr PAD | Unknown | Direct | Total | Total loss of value |

## 6.2 Management and mitigation measures

Ideally, heritage management involves conservation of sites through the preservation and conservation of fabric and context within a framework of 'doing as much as necessary, as little as possible' (Marquis-Kyle & Walker 1994, p.13). In cases where conservation is not practical, several options for management are available. For sites, management often involves the salvage of features or artefacts, retrieval of information through excavation or collection (especially where impact cannot be avoided) and interpretation.

### 6.2.1 Further assessment

Avoidance of impacts to archaeological and cultural heritage sites through design of the development is the primary mitigation and management strategy, and should be implemented where practicable. To adequately determine the potential impacts on archaeological sites in the study area, further investigation of lots which were not accessible during the archaeological survey undertaken on 5 April 2021 and 14 September 2021 is recommended. Test excavations will also need to take place within the areas of moderate and high archaeological potential, and within AHIMS 45-5-3082/Horsley Dr PAD, if impacts cannot be avoided through the redesign of the Master Plan. Test excavations will aim to identify whether Aboriginal archaeological deposits exist beneath the ground surface, and will define the nature and extent of potential archaeological deposits which may be present. This additional information will allow an accurate description of the archaeological significance of the study area to be developed, so that an assessment of impacts to Aboriginal cultural heritage values can be completed.

Following the completion of further investigations this AR will be updated with the results of the additional survey and test excavation efforts. If Aboriginal cultural heritage values are identified by the further

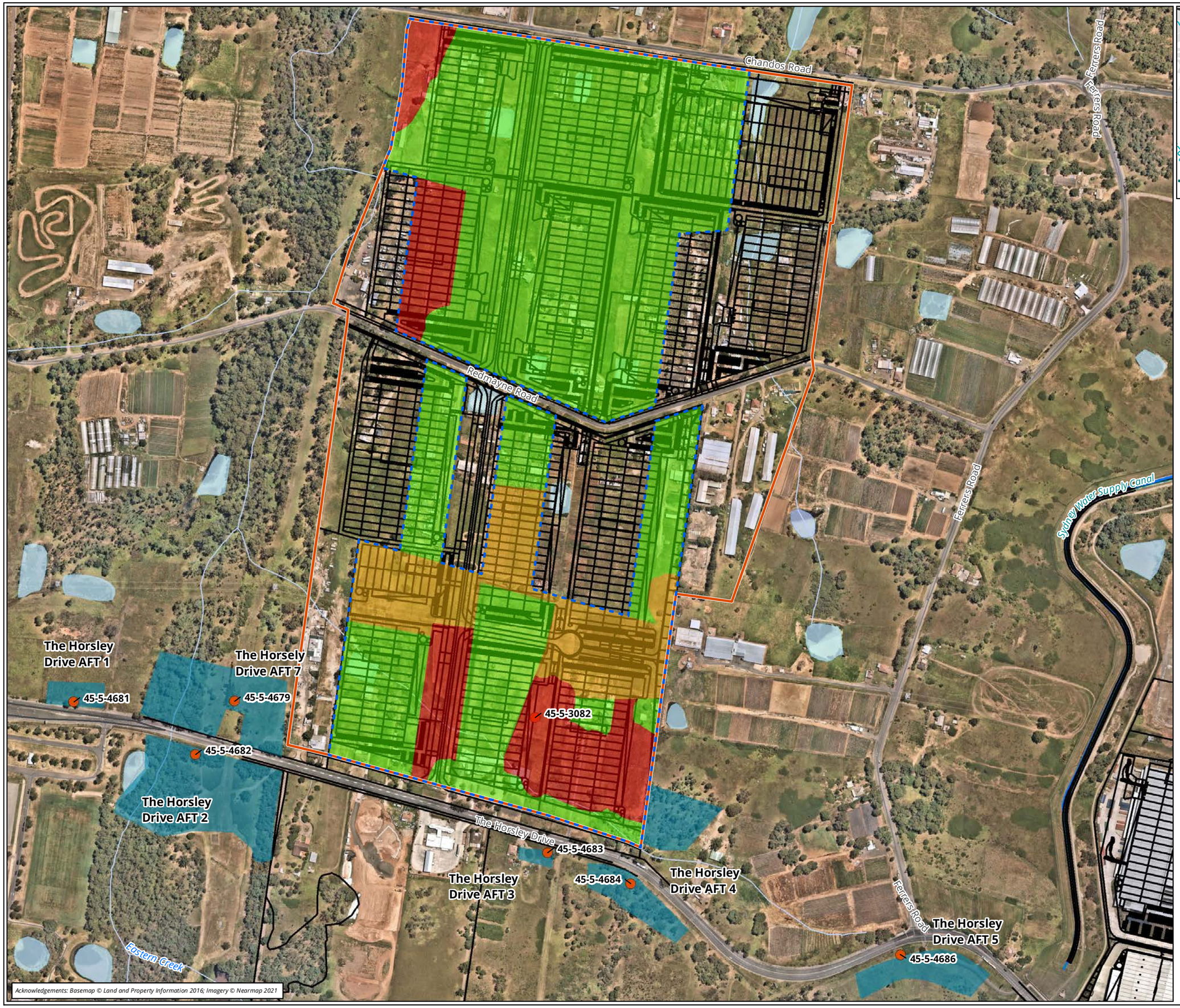
investigations and cannot be avoided through redesign, an AHIP may be required to allow for direct impacts to Aboriginal sites to occur.

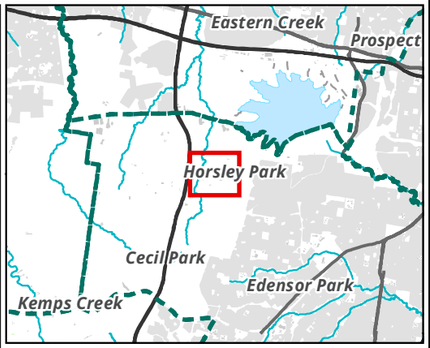
An AHIP is required for any activities likely to have an impact on Aboriginal objects or Places or cause land to be disturbed. Heritage NSW issues AHIPs under Part 6 of the NPW Act. The AHIP should be obtained prior to the proposed future development proceeding.

In order to obtain an AHIP, a complete ACHA prepared in accordance with consultation requirements and the *Guide to investigating, Assessing and Reporting on Aboriginal Cultural Heritage* (OEH 2011) must be provided as part of application requirements. Biosis therefore recommends that Aboriginal community consultation in accordance with consultation requirements be completed in order to finalise the ACHA currently being prepared by Biosis.

### 6.2.2 Heritage interpretation strategy

Consultation with the Aboriginal community has identified that the Horsley Park area has high cultural significance to the Darug Aboriginal community. It is recommended that opportunities for heritage interpretation are explored and implemented for the project in consultation with Aboriginal stakeholders. The purpose of the strategy is to ensure that the traditional, historical and contemporary cultural values and meanings held by Aboriginal people of the region are indelibly integrated into the Horsley Park project in a meaningful, culturally appropriate and practical way.




**Legend**

- Study area
- Surveyed
- AHIMS record
- Archaeological site
- Draft Master Plan - future development

**Archaeological potential**

- High
- Moderate
- Low

**NOT TO BE MADE PUBLIC**

**Figure 12 Impact assessment**

0 40 80 120 160 200

Metres

N

Scale: 1:5,000 @ A3

*Coordinate System: GDA 1994 MGA Zone 56*

biosis

Matter: 34802,
Date: 11 October 2021,
Checked by: AKE, Drawn by: AM, Last edited by: amackegard
Location: P:\34800s\34802\Mapping\34802_ADDA_F11_SurveyResults.mxd

# 7 Recommendations

Strategies have been developed based on the archaeological (significance) of cultural heritage relevant to the study area and influenced by:

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

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

### Recommendation 1: Further archaeological survey of remaining portions of the study area

Biosis recommends that a comprehensive archaeological survey of the entire study area be undertaken to inform this assessment. It is recommended that portions of the site which were not investigated as part of the archaeological survey completed by Biosis on 5 April 2021 and 14 September 2021 (refer to Table 9), should be surveyed. Further archaeological surveys should be undertaken in accordance with the Code.

### Recommendation 2: Avoidance of AHIMS 45-5-3082/Horsley Dr PAD and areas identified as having moderate/high archaeological potential

Biosis recommends that avoidance of AHIMS 45-5-3082/Horsley Dr PAD and areas identified as having moderate/high archaeological potential should be undertaken wherever possible through redesign (Figure 12). If impacts to AHIMS 45-5-3082/Horsley Dr PAD and areas of moderate/high archaeological potential cannot be avoided Recommendation 3 must be undertaken prior to undertaking any works on site.

### Recommendation 3: Test excavations

Based on current development plans it is unlikely that AHIMS 45-5-3082/Horsley Dr PAD and areas identified as having moderate/high archaeological potential can be avoided. If impacts cannot be avoided through redesign, further investigation in the form of test excavations is recommended. Test excavations should be undertaken in accordance with the Code. This would also include any additional areas of moderate or high potential identified through the comprehensive archaeological survey as outlined in Recommendation 1.

### Recommendation 4: Areas identified as having low archaeological potential

No further investigations are required for areas assessed as having low archaeological potential. This recommendation is conditional upon Recommendations 7, 8, and 9.

### Recommendation 5: Consultation with the registered Aboriginal parties

It is recommended that consultation with RAPs be undertaken in accordance with consultation requirements as part of the ACHA currently being prepared by Biosis. The proponent should inform RAPs about the project and future development. RAPs should be given the opportunity to provide information regarding the cultural significance of the study area, and to provide comment on the management of Aboriginal cultural heritage values within the study area throughout the life of the project.

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### Recommendation 6: Updates to AR and ACHA

Biosis recommends that following the completion of further investigations and consultation with RAPs that the AR and ACHA be updated and finalised.

### Recommendation 7: Heritage interpretation strategy

The Horsley Park area has a rich Aboriginal history and it is recommended that opportunities for heritage interpretation are explored and implemented for the project in consultation with Aboriginal stakeholders. The purpose of the strategy is to ensure that the traditional, historical and contemporary cultural values and meanings held by Aboriginal people of the region are indelibly integrated into the Keyhole Lands project in a meaningful, culturally appropriate and practical way.

### Recommendation 8: Discovery of unanticipated Historical relics

Relics are historical archaeological resources of local or State significance and are protected in NSW under the Heritage Act. Relics cannot be disturbed except with a permit or exception/exemption notification. Should unanticipated relics be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. Heritage NSW will require notification if the find is assessed as a relic.

### Recommendation 9: Discovery of unanticipated Aboriginal objects

All Aboriginal objects and Places are protected under the NPW Act. It is an offence to disturb an Aboriginal site or object 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 the Heritage NSW and Aboriginal stakeholders.

### Recommendation 10: Discovery of human remains

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

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

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# Appendices

# Appendix 1 AHIMS results

**THE FOLLOWING APPENDIX IS NOT TO BE MADE PUBLIC**

# AHIMS Web Services (AWS)

## Extensive search - Site list report

Your Ref/PO Number : 34802.2

Client Service ID : 576371

| SiteID | SiteName | Datum | Zone | Easting | Northing | Context | Site Status | SiteFeatures | SiteTypes | Reports |
|---|---|---|---|---|---|---|---|---|---|---|
| 45-5-2721 | PAD-OS-7 | GDA | 56 | 300988 | 6250533 | Open site | Valid | Artefact : - | | 103366 |
| Contact | Recorders | Mary Dallas Consulting Archaeologists (MDCA),Mrs.Robynne Mills,Ms.Tamika Gow | | | | | | Permits | 1396,1872 | |
| 45-5-2795 | WSO-IF-1 | AGD | 56 | 301030 | 6251680 | Open site | Destroyed | Artefact : - | | 103366 |
| Contact | Recorders | Mrs.Robynne Mills | | | | | | Permits | 1398 | |
| 45-5-2796 | WSO-IF-2 | AGD | 56 | 301410 | 6254840 | Open site | Valid | Artefact : - | | |
| Contact | Recorders | Mrs.Robynne Mills | | | | | | Permits | | |
| 45-5-2797 | WSO-OS-8 | AGD | 56 | 301090 | 6256450 | Open site | Destroyed | Artefact : - | | |
| Contact | Recorders | Mrs.Robynne Mills | | | | | | Permits | 1398 | |
| 45-5-2836 | IF:7 | AGD | 56 | 300600 | 6256840 | Open site | Valid | Artefact : - | | 4599,98444,100449 |
| Contact | Recorders | Dominic Steele Archaeological Consulting | | | | | | Permits | 1573,1609,2470 | |
| 45-5-2837 | IF:8 | AGD | 56 | 300640 | 6256780 | Open site | Valid | Artefact : - | | 4599,100449 |
| Contact | Recorders | Dominic Steele Archaeological Consulting | | | | | | Permits | 2470 | |
| 45-5-2818 | ECD1 | AGD | 56 | 302950 | 6256210 | Open site | Valid | Potential Archaeological Deposit (PAD) : - | | |
| Contact | Recorders | Navin Officer Heritage Consultants Pty Ltd | | | | | | Permits | 1445,1584 | |
| 45-5-2848 | ECD/1 | AGD | 56 | 302950 | 6256210 | Open site | Valid | Artefact : - | | 98343 |
| Contact | Recorders | Navin Officer Heritage Consultants Pty Ltd | | | | | | Permits | | |
| 45-5-2822 | WBP 1 | AGD | 56 | 300650 | 6257100 | Open site | Valid | Modified Tree (Carved or Scarred) : - | | 98444 |
| Contact | Recorders | Dominic Steele Archaeological Consulting | | | | | | Permits | 1573,1609 | |
| 45-5-2827 | AWL 4 | AGD | 56 | 300870 | 6256820 | Open site | Valid | Artefact : - | | 4599,98444 |
| Contact | Recorders | Dominic Steele Archaeological Consulting | | | | | | Permits | 1573,1609 | |
| 45-5-2828 | AWL 6 | AGD | 56 | 300670 | 6256780 | Open site | Valid | Artefact : - | | 4599,98444,100449 |
| Contact | Recorders | Dominic Steele Archaeological Consulting | | | | | | Permits | 1573,1609,2470 | |
| 45-5-2829 | AWL 7 | AGD | 56 | 300680 | 6256860 | Open site | Valid | Artefact : - | | 4599,98444,100449 |
| Contact | Recorders | Dominic Steele Archaeological Consulting | | | | | | Permits | 1573,1609,2470 | |
| 45-5-2811 | OSC-OS-1 | AGD | 56 | 305450 | 6250350 | Open site | Valid | Artefact : - | | 98743,102196 |
| Contact | Recorders | Megan Mebberson | | | | | | Permits | | |
| 45-5-2974 | Lucan Park PAD | AGD | 56 | 301090 | 6256666 | Open site | Destroyed | Potential Archaeological Deposit (PAD) : - | | |
| Contact | Recorders | Megan Mebberson | | | | | | Permits | 1941 | |

**Report generated by AHIMS Web Service on 16/03/2021 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 298810 - 305810, Northings : 6250294 - 6257294 with a Buffer of 0 meters. Additional Info : Due diligence. Number of Aboriginal sites and Aboriginal objects found is 103**

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

| SiteID | SiteName | Datum | Zone | Easting | Northing | Context | Site Status | SiteFeatures | SiteTypes | Reports |
|---|---|---|---|---|---|---|---|---|---|---|
| 45-5-2579 | EC5 | AGD | 56 | 302350 | 6256300 | Open site | Valid | Artefact : - | Isolated Find | 98435 |
| | **Contact** | **Recorders** | Mr.Kelvin Officer | | | | | **Permits** | | |
| 45-5-0948 | Abbotsbury 4; | AGD | 56 | 302600 | 6250700 | Open site | Valid | Artefact : - | Open Camp Site | 2620,98435,103366 |
| | **Contact** | **Recorders** | Elizabeth Rich | | | | | **Permits** | | |
| 45-5-0765 | GPR 1 (Prospect Reservoir) | AGD | 56 | 303350 | 6254070 | Open site | Valid | Artefact : - | Open Camp Site | 1723,1857,103366 |
| | **Contact** | **Recorders** | Elizabeth Rich,Laura-Jane Smith,Miss.Lisa Smith | | | | | **Permits** | | |
| 45-5-2600 | WSRA 2 | AGD | 56 | 302090 | 6255900 | Open site | Valid | Artefact : - | | |
| | **Contact** Colin Gale | **Recorders** | Navin Officer Heritage Consultants Pty Ltd | | | | | **Permits** | | |
| 45-5-4726 | Lot 40 PAD | GDA | 56 | 300521 | 6257112 | Open site | Valid | Potential Archaeological Deposit (PAD) : -, Artefact : - | | |
| | **Contact** | **Recorders** | GML Heritage Pty Ltd - Surry Hills,Doctor.Tim Owen,Doctor.Tim Owen | | | | | **Permits** | 4136 | |
| 45-5-4677 | The Horsley Drive IF 1 | GDA | 56 | 303433 | 6252382 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | Kelleher Nightingale Consulting Pty Ltd,Mr.Tyler Beebe | | | | | **Permits** | | |
| 45-5-4678 | The Horsley Drive IF 2 | GDA | 56 | 303479 | 6252394 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | Kelleher Nightingale Consulting Pty Ltd,Mr.Tyler Beebe | | | | | **Permits** | | |
| 45-5-4679 | The Horsely Drive AFT 7 | GDA | 56 | 301999 | 6253303 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | Kelleher Nightingale Consulting Pty Ltd,Mr.Tyler Beebe | | | | | **Permits** | | |
| 45-5-4680 | The Horsley Drive AFT 8 | GDA | 56 | 303498 | 6252176 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | Kelleher Nightingale Consulting Pty Ltd,Mr.Tyler Beebe | | | | | **Permits** | | |
| 45-5-4681 | The Horsley Drive AFT 1 | GDA | 56 | 301769 | 6253302 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson | | | | | **Permits** | | |
| 45-5-4682 | The Horsley Drive AFT 2 | GDA | 56 | 301943 | 6253227 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson | | | | | **Permits** | | |
| 45-5-4683 | The Horsley Drive AFT 3 | GDA | 56 | 302447 | 6253086 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson | | | | | **Permits** | | |
| 45-5-4684 | The Horsley Drive AFT 4 | GDA | 56 | 302566 | 6253042 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson | | | | | **Permits** | | |
| 45-5-4685 | The Horsley Drive AFT 6 | GDA | 56 | 303428 | 6252579 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson | | | | | **Permits** | | |
| 45-5-4686 | The Horsley Drive AFT 5 | GDA | 56 | 302952 | 6252940 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson | | | | | **Permits** | | |
| 45-5-5265 | Eastern Creek Lot 40 Artefact Reburial | GDA | 56 | 300327 | 6257149 | Closed site | Valid | Artefact : - | | |

**Report generated by AHIMS Web Service on 16/03/2021 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 298810 - 305810, Northings : 6250294 - 6257294 with a Buffer of 0 meters. Additional Info : Due diligence. Number of Aboriginal sites and Aboriginal objects found is 103**

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| SiteID | SiteName | Datum | Zone | Easting | Northing | Context | Site Status | SiteFeatures | SiteTypes | Reports |
|---|---|---|---|---|---|---|---|---|---|---|
| | Contact | Recorders | GML Heritage Pty Ltd - Surry Hills,Ms.Hannah Morris | | | | | Permits | | |
| 45-5-2576 | EC2 | AGD | 56 | 302650 | 6256580 | Open site | Valid | Artefact : - | Open Camp Site | 98435 |
| | Contact | Recorders | Kerry Navin,Mr.Kelvin Officer | | | | | Permits | 1382 | |
| 45-5-2577 | EC4 | AGD | 56 | 302250 | 6256320 | Open site | Valid | Artefact : - | Open Camp Site | 98435 |
| | Contact | Recorders | Mr.Kelvin Officer | | | | | Permits | | |
| 45-5-2578 | EC3 | AGD | 56 | 301980 | 6256520 | Open site | Valid | Artefact : - | Open Camp Site | 98435 |
| | Contact | Recorders | Mr.Kelvin Officer | | | | | Permits | | |
| 45-5-2580 | EC6 | AGD | 56 | 302480 | 6256280 | Open site | Valid | Artefact : - | Isolated Find | 98435 |
| | Contact | Recorders | Mr.Kelvin Officer | | | | | Permits | 1444 | |
| 45-5-2581 | EC7 | AGD | 56 | 302700 | 6256150 | Open site | Valid | Artefact : - | Open Camp Site | 98435 |
| | Contact | Recorders | Mr.Kelvin Officer | | | | | Permits | 1382 | |
| 45-5-2582 | EC8, | AGD | 56 | 301240 | 6255480 | Open site | Valid | Artefact : - | Isolated Find | 98435 |
| | Contact | Recorders | Mr.Kelvin Officer | | | | | Permits | 1444 | |
| 45-5-2567 | DLC1 | AGD | 56 | 302194 | 6254349 | Open site | Valid | Artefact : - | Open Camp Site | 98435,103366 |
| | Contact | Recorders | Annie Nicholson | | | | | Permits | | |
| 45-5-2523 | OSC-IF-1 | AGD | 56 | 305450 | 6250350 | Open site | Valid | Artefact : - | Isolated Find | 98743,102196 |
| | Contact | Recorders | Mrs.Robynne Mills | | | | | Permits | | |
| 45-5-2524 | OSC-IF-2 | AGD | 56 | 305410 | 6250320 | Open site | Valid | Artefact : - | Isolated Find | 98743,102196 |
| | Contact | Recorders | Mrs.Robynne Mills | | | | | Permits | | |
| 45-5-0800 | Scarred Tree Prospect Reservoir | AGD | 56 | 304525 | 6253950 | Open site | Valid | Modified Tree (Carved or Scarred) : - | Scarred Tree | 1857,103366 |
| | Contact | Recorders | Doctor.Jillian Comber,Elizabeth Rich | | | | | Permits | | |
| 45-5-0801 | PB1 (Prospect Reservoir) | AGD | 56 | 304800 | 6254100 | Open site | Valid | Artefact : - | Open Camp Site | 1857,1919,2295,103366 |
| | Contact | Recorders | Doctor.Jillian Comber,Elizabeth Rich | | | | | Permits | | |
| 45-5-0802 | PB2 (Prospect Reservoir) | AGD | 56 | 305225 | 6254075 | Open site | Valid | Artefact : - | Open Camp Site | 1857,98743 |
| | Contact | Recorders | Doctor.Jillian Comber,Elizabeth Rich | | | | | Permits | | |
| 45-5-0803 | PB3 (Prospect Reservoir) | AGD | 56 | 305350 | 6254100 | Open site | Valid | Artefact : - | Open Camp Site | 1857,98743 |
| | Contact | Recorders | Doctor.Jillian Comber,Elizabeth Rich | | | | | Permits | | |
| 45-5-0805 | PA1;Prospect Reservoir; | AGD | 56 | 305200 | 6254360 | Open site | Valid | Artefact : - | Open Camp Site | 1919,98743 |
| | Contact | Recorders | Doctor.Jillian Comber | | | | | Permits | | |
| 45-5-0806 | PA2;Prospect Reservoir; | AGD | 56 | 305210 | 6254790 | Open site | Valid | Artefact : - | Open Camp Site | 1919,98743 |
| | Contact | Recorders | Doctor.Jillian Comber | | | | | Permits | | |
| 45-5-0980 | Abbotsburry 4 - duplicate of 45-5-0948 | AGD | 56 | 302600 | 6250700 | Open site | Valid | Artefact : - | Open Camp Site | 2950,98435,103366 |

**Report generated by AHIMS Web Service on 16/03/2021 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 298810 - 305810, Northings : 6250294 - 6257294 with a Buffer of 0 meters. Additional Info : Due diligence. Number of Aboriginal sites and Aboriginal objects found is 103**

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| SiteID | SiteName | Datum | Zone | Easting | Northing | Context | Site Status | SiteFeatures | SiteTypes | Reports |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Contact** | **Recorders** | Kerry Navin,Doctor.Susan (left ahms) Mcintyre-Tamwoy | | | | | **Permits** | | |
| 45-5-0920 | Abbotsbury 1; | AGD | 56 | 303150 | 6251700 | Open site | Valid | Artefact : - | Open Camp Site | 103366 |
| | **Contact** | **Recorders** | Kerry Navin | | | | | **Permits** | 461 | |
| 45-5-0921 | Abbotsbury 2; | AGD | 56 | 302960 | 6251700 | Open site | Valid | Artefact : - | Open Camp Site | 98435,103366 |
| | **Contact** | **Recorders** | Kerry Navin | | | | | **Permits** | | |
| 45-5-0922 | Abbotsbury 3; | AGD | 56 | 302680 | 6250830 | Open site | Valid | Artefact : - | Open Camp Site | 98435,103366 |
| | **Contact** | **Recorders** | Kerry Navin | | | | | **Permits** | | |
| 45-5-0866 | TPP 1;Prospect Reservoir; | AGD | 56 | 302950 | 6255150 | Open site | Valid | Artefact : - | Open Camp Site | 2246,98435 |
| | **Contact** | **Recorders** | Denise Donlon | | | | | **Permits** | | |
| 45-5-0867 | TPP2;Prospect Reservoir; | AGD | 56 | 303530 | 6254150 | Open site | Valid | Modified Tree (Carved or Scarred) : - | Scarred Tree | 2246,103366 |
| | **Contact** | **Recorders** | Denise Donlon | | | | | **Permits** | | |
| 45-5-0870 | Prospect Lagoon 1;Prospect Reservoir;(PL1); | AGD | 56 | 304500 | 6253850 | Open site | Valid | Artefact : - | Open Camp Site | 2225,103366 |
| | **Contact** | **Recorders** | Denise Donlon | | | | | **Permits** | | |
| 45-5-0439 | Eastern Creek W1 | AGD | 56 | 300750 | 6256650 | Open site | Valid | Artefact : - | Open Camp Site | 1018,98435 |
| | **Contact** | **Recorders** | Doctor.Susan (left ahms) Mcintyre-Tamwoy | | | | | **Permits** | | |
| 45-5-0249 | Wallgrove Wallgrove Road | AGD | 56 | 300900 | 6257100 | Open site | Valid | Artefact : - | Open Camp Site | 367,1018,98435,98444,98677 |
| | **Contact** | **Recorders** | Ms.Laila Haglund | | | | | **Permits** | 1573,1609 | |
| 45-5-0836 | Prospect Tunnel;PT 1; | AGD | 56 | 305110 | 6254260 | Open site | Valid | Artefact : - | Open Camp Site | 2074,98743 |
| | **Contact** | **Recorders** | Doctor.Jillian Comber | | | | | **Permits** | | |
| 45-5-0741 | WDD1 | AGD | 56 | 301840 | 6255920 | Open site | Valid | Artefact : - | Open Camp Site | 98435 |
| | **Contact** | **Recorders** | Margrit Koettig | | | | | **Permits** | | |
| 45-5-0742 | WDD 2 | AGD | 56 | 302020 | 6255670 | Open site | Valid | Artefact : - | Open Camp Site | 1501,1530,1935,98435 |
| | **Contact** | **Recorders** | Margrit Koettig | | | | | **Permits** | | |
| 45-5-0743 | WDD3 | AGD | 56 | 301650 | 6255750 | Open site | Valid | Artefact : - | Open Camp Site | 1501,1530,98435 |
| | **Contact** | **Recorders** | Margrit Koettig | | | | | **Permits** | | |
| 45-5-0744 | WDD5 | AGD | 56 | 302070 | 6255560 | Open site | Valid | Artefact : - | Open Camp Site | 98435 |
| | **Contact** | **Recorders** | Margrit Koettig | | | | | **Permits** | | |
| 45-5-0745 | WDD 6 | AGD | 56 | 302220 | 6255400 | Open site | Valid | Artefact : - | Open Camp Site | 1530,1935,98435 |
| | **Contact** | **Recorders** | Margrit Koettig | | | | | **Permits** | | |
| 45-5-0750 | EC12 (Eastern Creek) | AGD | 56 | 302330 | 6257000 | Open site | Valid | Artefact : - | Open Camp Site | 1644,1646,1814,98435 |

**Report generated by AHIMS Web Service on 16/03/2021 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 298810 - 305810, Northings : 6250294 - 6257294 with a Buffer of 0 meters. Additional Info : Due diligence. Number of Aboriginal sites and Aboriginal objects found is 103**

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| SiteID | SiteName | Datum | Zone | Easting | Northing | Context | Site Status | SiteFeatures | SiteTypes | Reports |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Contact** | **Recorders** | Elizabeth Rich,Laura-Jane Smith | | | | | **Permits** | 131 | |
| 45-5-0753 | EC9 (Eastern Creek) | AGD | 56 | 302200 | 6257100 | Open site | Valid | Artefact : - | Open Camp Site | 1644,1814,98435 |
| | **Contact** | **Recorders** | Elizabeth Rich,Mr.David Crew | | | | | **Permits** | | |
| 45-5-0558 | Blacktown Southwest 5 Eastern Creek | GDA | 56 | 300240 | 6257000 | Open site | Destroyed | Artefact : - | Open Camp Site | 1007,1050,98435 |
| | **Contact** | **Recorders** | Jim Kohen,Mr.Matthew Kelleher,Kelleher Nightingale Consulting Pty Ltd (Generic u | | | | | **Permits** | 2610,4218 | |
| 45-5-0588 | Blacktown Southwest 1 Eastern Creek | GDA | 56 | 300490 | 6256935 | Open site | Destroyed | Artefact : - | Open Camp Site | 98435 |
| | **Contact** | **Recorders** | Jim Kohen,Mr.Matthew Kelleher,Kelleher Nightingale Consulting Pty Ltd (Generic u | | | | | **Permits** | 4218 | |
| 45-5-0766 | PR 2 (Prospect Reservoir) | AGD | 56 | 303500 | 6254000 | Open site | Valid | Artefact : -, Aboriginal Ceremony and Dreaming : - | | 1723,1857,98283,103366 |
| | **Contact** | **Recorders** | Elizabeth Rich | | | | | **Permits** | | |
| 45-5-0767 | PR 3 (Prospect Reservoir) | AGD | 56 | 303530 | 6254150 | Open site | Valid | Artefact : -, Aboriginal Ceremony and Dreaming : - | | 1723,1857,98283,103366 |
| | **Contact** | **Recorders** | Elizabeth Rich | | | | | **Permits** | | |
| 45-5-0768 | PR 4 (Prospect Reservoir) | AGD | 56 | 304400 | 6254200 | Open site | Valid | Artefact : - | Open Camp Site | 1723,1857,103366 |
| | **Contact** | **Recorders** | Elizabeth Rich | | | | | **Permits** | | |
| 45-5-2987 | AUS 1 | AGD | 56 | 300520 | 6255730 | Open site | Valid | Modified Tree (Carved or Scarred) : - | | |
| | **Contact** | **Recorders** | Doctor.Jo McDonald | | | | | **Permits** | | |
| 45-5-2983 | Austral 1 | AGD | 56 | 300520 | 6255730 | Open site | Valid | Modified Tree (Carved or Scarred) : -, Artefact : 6 | | |
| | **Contact** | **Recorders** | Doctor.Jo McDonald | | | | | **Permits** | | |
| 45-5-2984 | Austral 2 | AGD | 56 | 300620 | 6255840 | Open site | Valid | Artefact : 1 | | |
| | **Contact** | **Recorders** | Doctor.Jo McDonald | | | | | **Permits** | 1994 | |
| 45-5-2985 | Austral 3 | AGD | 56 | 300770 | 6256000 | Open site | Valid | Artefact : 1 | | |
| | **Contact** | **Recorders** | Doctor.Jo McDonald | | | | | **Permits** | 1994 | |
| 45-5-2986 | Austral PAD 1 | AGD | 56 | 300500 | 6255800 | Open site | Valid | Potential Archaeological Deposit (PAD) : - | | |
| | **Contact** | **Recorders** | Doctor.Jo McDonald | | | | | **Permits** | 1994 | |
| 45-5-3095 | PGH3 | GDA | 56 | 299004 | 6254512 | Open site | Valid | Artefact : 2 | | 103366 |
| | **Contact** T Russell | **Recorders** | Mary Dallas Consulting Archaeologists (MDCA),Noeleen Curran,Kelleher Nightingal | | | | | **Permits** | | |

**Report generated by AHIMS Web Service on 16/03/2021 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 298810 - 305810, Northings : 6250294 - 6257294 with a Buffer of 0 meters. Additional Info : Due diligence. Number of Aboriginal sites and Aboriginal objects found is 103**

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# AHIMS Web Services (AWS)

## Extensive search - Site list report

Your Ref/PO Number : 34802.2

Client Service ID : 576371

| SiteID | SiteName | Datum | Zone | Easting | Northing | Context | Site Status | SiteFeatures | SiteTypes | Reports |
|---|---|---|---|---|---|---|---|---|---|---|
| 45-5-3434 | Parramatta SWC PAD | AGD | 56 | 300320 | 6256325 | Open site | Valid | Potential Archaeological Deposit (PAD) : 1 | | |
| | **Contact** | **Recorders** | Heritage Concepts | | | | | **Permits** | 2965,2966 | |
| 45-5-3684 | WR1 (Prospect) | GDA | 56 | 300120 | 6255319 | Open site | Destroyed | Artefact : 4 | | 103004 |
| | **Contact** | **Recorders** | MCH - McCardle Cultural Heritage Pty Ltd,Australian Building Certification,Ms.Penr | | | | | **Permits** | | |
| 45-5-0754 | EC8 (Eastern Creek) | AGD | 56 | 302300 | 6257080 | Open site | Valid | Artefact : - | Open Camp Site | 1644,1814,98435 |
| | **Contact** | **Recorders** | Elizabeth Rich,S Lalor,Mr.David Crew | | | | | **Permits** | | |
| 45-5-0755 | EC7 (Eastern Creek) | AGD | 56 | 302750 | 6257000 | Open site | Valid | Artefact : - | Open Camp Site | 1644,98435 |
| | **Contact** | **Recorders** | Elizabeth Rich,S Lalor,Mr.David Crew | | | | | **Permits** | | |
| 45-5-4284 | Erskine Park Link Road 2 | GDA | 56 | 301017 | 6256543 | Open site | Destroyed | Artefact : 1 | | |
| | **Contact** | **Recorders** | Doctor.Alan Williams | | | | | **Permits** | 3625 | |
| 45-5-4194 | CONSERVATION AREA PAD | GDA | 56 | 300863 | 6256750 | Open site | Valid | Potential Archaeological Deposit (PAD) : 1 | | |
| | **Contact** | **Recorders** | Doctor.Alan Williams | | | | | **Permits** | 3625 | |
| 45-5-4488 | Site within Steeplechase Track | GDA | 56 | 302015 | 6252237 | Open site | Valid | Artefact : - | | 103366 |
| | **Contact** | **Recorders** | Ms.Ngaire Richards | | | | | **Permits** | 3776 | |
| 45-5-5047 | UC IA 17 | GDA | 56 | 303410 | 6253638 | Open site | Valid | Artefact : 1 | | 104331 |
| | **Contact** | **Recorders** | Extent Heritage Pty Ltd - Pyrmont - Individual users,Ms.Fenella Atkinson | | | | | **Permits** | 4303 | |
| 45-5-2614 | Eastern Creek 9 | AGD | 56 | 301890 | 6256000 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | Navin Officer Heritage Consultants Pty Ltd | | | | | **Permits** | | |
| 45-5-2650 | OSC-OS-1/PAD 3 | AGD | 56 | 305450 | 6250350 | Open site | Valid | Potential Archaeological Deposit (PAD) : - | | 98743,102196 |
| | **Contact** | **Recorders** | Mrs.Robynne Mills | | | | | **Permits** | 1320,1405 | |
| 45-5-2591 | EC1 | AGD | 56 | 301600 | 6256450 | Open site | Valid | Artefact : - | | |
| | **Contact** John Gallard | **Recorders** | Navin Officer Heritage Consultants Pty Ltd | | | | | **Permits** | | |
| 45-5-2592 | EC2 (Duplicate copy see 45-5-2576) | AGD | 56 | 302650 | 6256580 | Open site | Valid | Artefact : - | | |
| | **Contact** Colin Gale | **Recorders** | Navin Officer Heritage Consultants Pty Ltd | | | | | **Permits** | | |
| 45-5-2593 | EC3 (Duplicate copy of 45-5-2578) | AGD | 56 | 301980 | 6256520 | Open site | Valid | Artefact : - | | |
| | **Contact** Colin Gale | **Recorders** | Navin Officer Heritage Consultants Pty Ltd | | | | | **Permits** | | |
| 45-5-2594 | EC4 (Duplicate copy of 45-5-2577) | AGD | 56 | 302250 | 6256320 | Open site | Valid | Artefact : - | | |
| | **Contact** John Gallard | **Recorders** | Navin Officer Heritage Consultants Pty Ltd | | | | | **Permits** | | |
| 45-5-2595 | EC5 (Duplicate copy of 45-5-2579) | AGD | 56 | 302350 | 6256300 | Open site | Valid | Artefact : - | | |
| | **Contact** John Gallard | **Recorders** | Navin Officer Heritage Consultants Pty Ltd | | | | | **Permits** | 1444 | |

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| SiteID | SiteName | Datum | Zone | Easting | Northing | Context | Site Status | SiteFeatures | SiteTypes | Reports |
|---|---|---|---|---|---|---|---|---|---|---|
| 45-5-2596 | EC6 (Duplicate copy of 45-5-2580) | AGD | 56 | 302480 | 6256280 | Open site | Valid | Artefact : - | | |
| | **Contact** John Gallard | **Recorders** | Navin Officer Heritage Consultants Pty Ltd | | | | | **Permits** | | |
| 45-5-2597 | EC7 (Duplicate copy of 45-5-2581) | AGD | 56 | 302700 | 6256150 | Open site | Valid | Artefact : - | | |
| | **Contact** Colin Gale | **Recorders** | Navin Officer Heritage Consultants Pty Ltd | | | | | **Permits** | | |
| 45-5-2598 | EC8 (Duplicate copy of 45-5-2582) | AGD | 56 | 300245 | 6255480 | Open site | Valid | Artefact : - | | |
| | **Contact** John Gallard | **Recorders** | Navin Officer Heritage Consultants Pty Ltd | | | | | **Permits** | | |
| 45-5-2599 | WSRA 1 | AGD | 56 | 302100 | 6256510 | Open site | Valid | Artefact : - | | |
| | **Contact** John Gallard | **Recorders** | Navin Officer Heritage Consultants Pty Ltd | | | | | **Permits** | | |
| 45-5-2601 | IF1 | AGD | 56 | 302290 | 6256350 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | Navin Officer Heritage Consultants Pty Ltd | | | | | **Permits** | | |
| 45-5-2602 | IF2 | AGD | 56 | 302730 | 6255380 | Open site | Valid | Artefact : - | | |
| | **Contact** John Gallard | **Recorders** | Navin Officer Heritage Consultants Pty Ltd | | | | | **Permits** | 1444 | |
| 45-5-3076 | Austral 4 | AGD | 56 | 299880 | 6256380 | Open site | Valid | Artefact : -, Potential Archaeological Deposit (PAD) : - | | |
| | **Contact** | **Recorders** | Doctor.Jo McDonald | | | | | **Permits** | 2308 | |
| 45-5-3082 | Horsley Dr PAD | AGD | 56 | 302325 | 6253090 | Open site | Valid | Potential Archaeological Deposit (PAD) : - | | 100557,103366 |
| | **Contact** Searle | **Recorders** | Ms.Laila Haglund | | | | | **Permits** | 2328 | |
| 45-5-3206 | ISF11 | AGD | 56 | 300780 | 6256920 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | Jo McDonald Cultural Heritage Management see GML | | | | | **Permits** | | |
| 45-5-3286 | ISF2 Jacfin | GDA | 56 | 299824 | 6256919 | Open site | Destroyed | Artefact : - | | |
| | **Contact** | **Recorders** | Jo McDonald Cultural Heritage Management see GML,Kelleher Nightingale Consulti | | | | | **Permits** | 2610 | |
| 45-5-3779 | Link Road PAD | GDA | 56 | 300711 | 6256775 | Open site | Valid | Potential Archaeological Deposit (PAD) : - | | |
| | **Contact** | **Recorders** | Mr.Oliver Brown | | | | | **Permits** | 3206 | |
| 45-5-3842 | EPLR1 | GDA | 56 | 298970 | 6256569 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | Mr.Kelvin Officer,Biosis Pty Ltd - Sydney | | | | | **Permits** | 3262,3340 | |
| 45-5-5328 | Horsley Park 1 | GDA | 56 | 300158 | 6255383 | Open site | Valid | Artefact : - | | |
| | **Contact** | **Recorders** | MCH - McCardle Cultural Heritage Pty Ltd,Ms.Penny Mccardle | | | | | **Permits** | | |
| 45-5-5351 | SIS PAD 01 | GDA | 56 | 302569 | 6255550 | Open site | Valid | Potential Archaeological Deposit (PAD) : - | | |
| | **Contact** | **Recorders** | Artefact - Cultural Heritage Management - Pyrmont,Ms.Alyce Haast | | | | | **Permits** | | |



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# AHIMS Web Services (AWS)

## Extensive search - Site list report

Your Ref/PO Number : 34802.2

Client Service ID : 576371

| SiteID | SiteName | Datum | Zone | Easting | Northing | Context | Site Status | SiteFeatures | SiteTypes | Reports |
|---|---|---|---|---|---|---|---|---|---|---|
| 45-5-5352 | SIS PAD 02 | GDA | 56 | 302641 | 6256359 | Open site | Valid | Potential Archaeological Deposit (PAD) : - | | |

**Contact** **Recorders** Artefact - Cultural Heritage Management - Pyrmont,Ms.Alyce Haast **Permits**

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