Aldington Road and Abbotts Road Upgrades, Kemps Creek, NSW: Aboriginal Due Diligence Assessment

FINAL REPORT

Prepared for AT&L on behalf of LOG-E

21 April 2023

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Document information

Report to:	AT&L on behalf of LOG-E
Prepared by:	Crystal Garabedian
Biosis project no.:	38335
File name:	38335.Aldington.Road.Upgrades.ADDA.FIN00.20230420.docx
Citation	Biosis (2023). Aldington Road and Abbotts Road Upgrades, Kemps Cree, NSW: Aboriginal Due Diligence Assessment. Report for AT&L on behalf of LOG-E. Garabedian. C, Biosis Pty Ltd. Sydney, NSW. Project no 38335.

Document control

Version	Internal reviewer	Date issue
Draft version 01	Ashleigh Keevers-Eastman	13/04/2023
Final version 01	Ashleigh Keevers-Eastman	19/04/2023

Acknowledgements

Biosis gratefully acknowledges the contributions of the following people and organisations in preparing this report:

- AT&L: Debbie Fransen, and Gabriel Vermeesch.
- Deerubbin Local Aboriginal Land Council: Steve Randall.
- Darug Custodian Aboriginal Corporation: Lana Wedgewood.

Biosis staff involved in this project were:

- Astrid Mackegard (mapping).
- Jen Townsend (mapping).

Glossary

ACHA	Aboriginal Cultural Heritage Assessment
ADDA	Aboriginal Due Diligence Assessment
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ASIRF	Aboriginal Site Impact Recording Form
AR	Archaeological Report
Biosis	Biosis Pty Ltd
Consultation requirements	*Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*
DCP	Development Control Plan
Due diligence code	*Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
GSV	Ground Surface Visibility
Heritage NSW	Heritage NSW, Department of Planning and Environment
ICOMOS	International Council on Monuments and Sites
LEP	Local Environment Plan
LGA	Local Government Area
NPW Act	*National Parks and Wildlife Act 1974*
NSW	New South Wales
MRP DCP	*Mamre Road Precinct Development Control Plan 2021*
PAD	Potential Archaeological Deposit
REF	Review of Environmental Factors
SEPP	State Environmental Planning Policy
SSD	State Significant Development
Study area	Aldington Road and Abbotts Road, Kemps Creek, New South Wales
The Code	The *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*

Summary

Biosis Pty Ltd (Biosis) has been commissioned by AT&L on behalf of LOG-E to undertake an Aboriginal Due Diligence Assessment (ADDA) for the proposed upgrades to Aldington Road and parts of Abbotts Road, Kemps Creek, New South Wales (NSW) (the project). The ADDA will inform design plans and will support a Review of Environmental Factors (REF) to be prepared by AT&L on behalf of LOG-E. The REF will be assessed under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

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

Background research included an extensive search of the Aboriginal Heritage Information Management System (AHIMS) database, which identified 112 Aboriginal archaeological sites within a 1.5 by 1.5 kilometre search area, centred on the study area. One of these registered sites is located within 10 metres of the study area (AHIMS 45-5-5607/Aldington Road 01), with three located within 200 metres of the study area (AHIMS 45-5-5504/Abbot's Rd Kemps Creek IF2, AHIMS 45-5-5505/Abbott's Rd Kemps Creek IF3 and AHIMS 45-5-5578/Aldington Road Kemps Creek PAD 1).

A review of the *Mamre Road Precinct Development Control Plan 2021* (MRP DCP) also identified that the study area contains areas of moderate-high Aboriginal potential along sections of Aldington Road as indicated in the. Background research indicates that the study area is located within the Bringelly Shale geological unit, commonly associated with Aboriginal artefact scatter sites and potential archaeological deposits (PADs). The study area is underlain by the residual Blacktown and erosional Luddenham soil landscapes. Due to their age and slow accumulation, residual soil landscapes such as the Blacktown landscape, have reasonable potential to preserve archaeological material, such as stone artefacts deposited by occupation sites, in areas of low disturbance. In comparison, the Luddenham soil landscape is characterised as highly erosional, which suggests that soil deposits have a greater capacity to be shallow and highly permeable, especially in disturbed contexts. This would create unfavourable conditions for the preservation of objects within soil layers, although material may still be present in a disturbed context.

Historical aerial photographs show significant development has occurred within the study area. Disturbances include historical vegetation clearance, the construction of Aldington Road, Abbotts Road, adjoining roads and streets, the establishment of dams, small structures and driveways, market gardening, and installation of surface and sub-surface infrastructure.

A field investigation was undertaken on 22 November 2022 by Anthea Vella (Biosis, Heritage Consultant), Steve Randall (Deerubbin Local Aboriginal Land Council (LALC), Cultural Sites Officer), and Lana Wedgewood (Darug Custodian Aboriginal Corporation, Cultural Sites Officer). During the field investigation no Aboriginal sites or objects were identified. The field investigation also identified that the study area has low potential to contain archaeological deposits due to unfavourable landforms present and disturbances. The location of AHIMS 45-5-5607/Aldington Road 01 was unable to be closely inspected due to land access issues, however photos of the site were taken from the road reserve. The proposed works are unlikely to impact AHIMS 45-5-5607/Aldington Road 01.

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

Recommendation 1: Avoid impacts to AHIMS 45-5-5607/Aldington Road 01

AHIMS 45-5-5607/Aldington Road 01 lies approximately six metres west of the study area. Biosis recommends that impacts to AHIMS 45-5-5607/Aldington Road 01 be avoided by establishing a buffer of no less than five metres that is clearly fenced around AHIMS 45-5-5607/Aldington Road 01, to protect it during construction.

If impacts to AHIMS 45-5-5607/Aldington Road 01 cannot be avoided, an Aboriginal Cultural Heritage Assessment (ACHA) will be required prior to the commencement of works. This would include the preparation of an ACHA to support an Aboriginal Heritage Impact Permit (AHIP) application. The ACHA must be prepared in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011). This includes an Archaeological Report (AR) prepared in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b) (the Code) and *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010c) (consultation requirements).

AT&L on behalf of LOG-E are to liaise with Dexus Wholesale Management Limited regarding the progression of the State Significant Development (SSD) application for 113–153 Aldington Road and the management of AHIMS 45-5-5607 to determine the status of the site and whether it has been destroyed. If the site has been destroyed, then an AHIP will not be required.

Recommendation 2: No further archaeological assessment in areas of low potential

No further archaeological assessment is required in areas of low archaeological potential that will be impacted by the proposed works. Works can proceed within these areas of low potential with caution subject to recommendations 3, 4 and 5.

Recommendation 3: 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 notification. Should unanticipated relics be discovered while 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 4: 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 knowingly disturb an Aboriginal site without a consent permit issued by Heritage NSW, Department of Planning and Environment (Heritage NSW). Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object, the archaeologist will provide further recommendations. These may include notifying Heritage NSW and Aboriginal stakeholders.

Recommendation 5: Discovery of Aboriginal ancestral remains

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

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and 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. Background

Biosis has been commissioned by AT&L on behalf of LOG-E to undertake an ADDA for the proposed upgrades to Aldington Road, and parts of Abbotts Road, Kemps Creek NSW (the project) (Figure 1, Figure 2, Figure 3). The ADDA will inform design plans to be prepared by AT&L on behalf of LOG-E. The ADDA will also support a REF for the proposed works which will be assessed under Part 5 of the EP&A Act.

An assessment in accordance with the due diligence code has been undertaken for the study area in order to inform responsibilities with regards to Aboriginal cultural heritage in the area. In addition to the basic tasks required for a due diligence assessment, an extended background review, as well as an archaeological survey in accordance with the Code was conducted, to adequately map areas of high, moderate and low archaeological potential.

1.2. Location of the study area

The study area is located within the Penrith Local Government Area (LGA), Parish of Melville, County of Cumberland (Figure 1). The study area incorporates Aldington Road and parts of Abbotts Road, and is bounded by private property to the north, south, east, and west (Figure 2).

1.3. Planning approvals

The proposed development will be assessed against Part 5 of EP&A Act. Other relevant legislation and planning instruments that will inform the assessment include:

- NPW Act.
- *National Parks and Wildlife Amendment Act 2010* (NSW).
- *State Environmental Planning Policy (Transport and Infrastructure) 2021*.
- *State Environmental Planning Policy (Industry and Employment) 2021*.
- *State Environmental Planning Policy (Western Sydney Aerotropolis) 2020*.
- MRP DCP.

1.3.1. Mamre Road Precinct Development Control Plan 2021

The MRP DCP aims to ensure that Aboriginal heritage values are managed appropriately to produce conservation outcomes. This includes archaeological and culturally significant areas. The DCP has mapped areas of high and moderate Aboriginal archaeological potential along Mamre Road; however, it was noted by Heritage NSW in their review of the DCP that the designations of potential were primarily based on a desktop assessment and predictive modelling with very limited field survey. The study area contains areas of moderate-high Aboriginal potential along sections of Aldington Road (Photo 1).

The DCP has a list of controls for completing assessments for Aboriginal heritage. For ground disturbing works this includes completing an ADDA for areas that have not yet been mapped or areas of low potential as a first step. If land is within or adjacent to land that contains a known Aboriginal cultural heritage site, assessments must consider and comply with the requirements of the NPW Act.

The DCP determines that an ACHA is required if the study area contains areas of moderate-high Aboriginal archaeological potential and that these areas would be impacted by the proposed development. The DCP also states that an AHIP will be required if impacts to Aboriginal heritage cannot be avoided.

Photo 1 MRP DCP 2021 archaeological potential (study area in red) (Source: NSW Planning portal)

1.4. Scope of the assessment

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

- Conduct background research to recognise any identifiable trends in site distribution and location, including a search of the AHIMS.
- Undertake archaeological survey as per requirement 5 of the Code, with particular focus on landforms with high potential for heritage places within the study area, as identified through background research.
- Record and assess sites identified during the survey in compliance with the guidelines endorsed by Heritage NSW.
- Determine levels of archaeological and cultural significance of the study area.
- Make recommendations to mitigate and manage any cultural heritage values identified within the study area.

1.5. Aboriginal consultation

Representatives from Deerubbin LALC (Steve Randall, Cultural Sites Officer) and Darug Custodian Aboriginal Corporation (Lana Wedgewood, Cultural Sites Officer) attended the field investigation on 22 November 2022. It was noted that there have been numerous assessments undertaken in the area, and that the road has likely disturbed PAD that may have otherwise been present. This was supported by both representatives. No specific significance of the study area was provided.

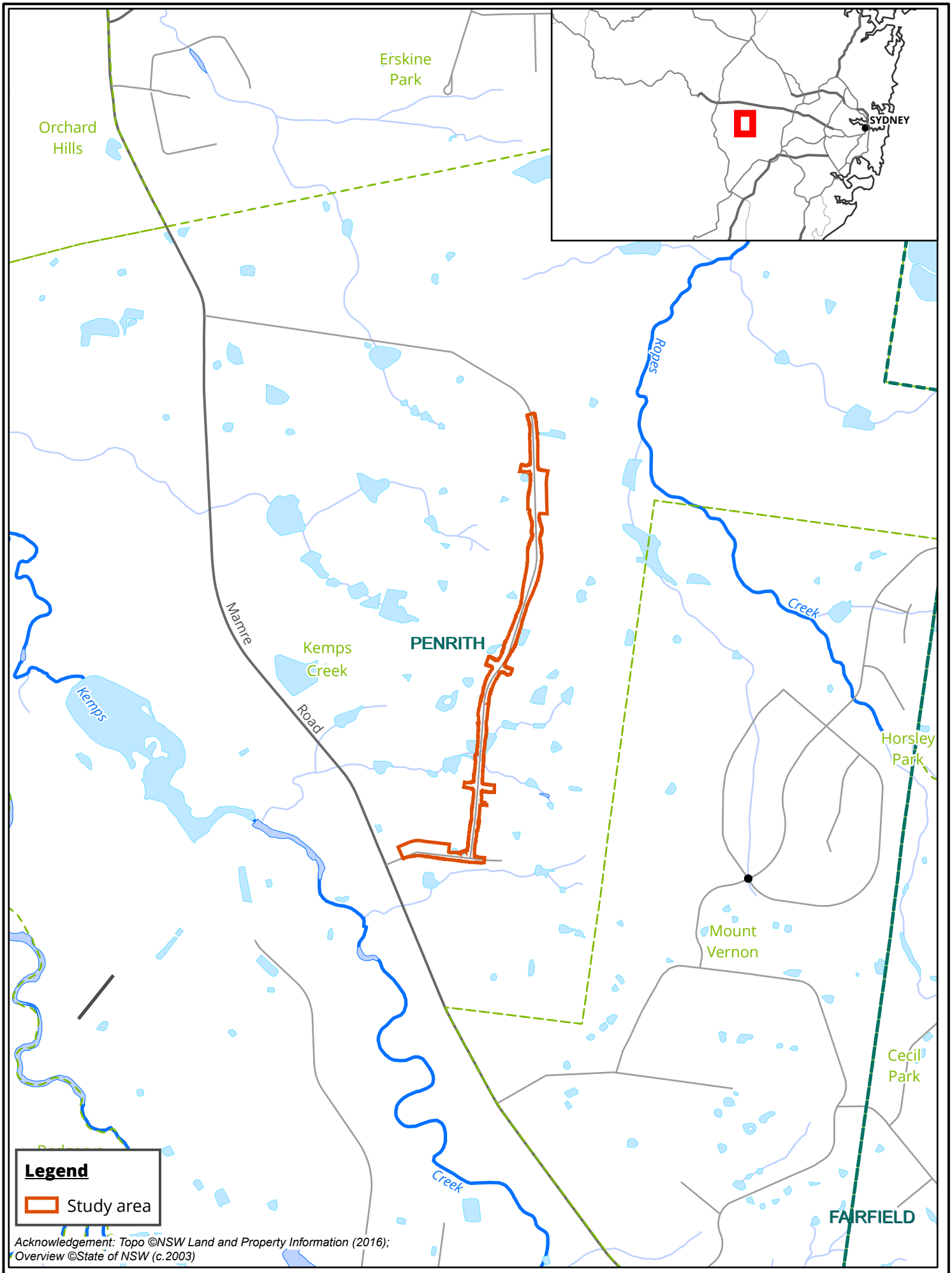

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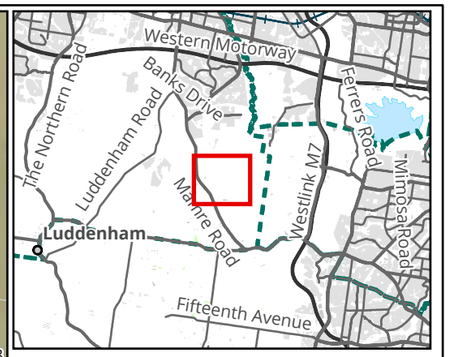
Figure 1 Location of the study area

Matter: 38335
Date: 30 March 2023,
Drawn by: AM, Checked by: AK, Last edited by: amackegard
Location:P:\38300s\38335\Mapping\38335_AldingtonRd

0 200 400 600 800 1,000
Metres
Scale 1:1:25,000@ A4, GDA 1994 MGA Zone 56

N



Legend

- Study area
- Lot

Figure 2 Study area detail

0 50 100 150 200

Metres
Scale: 1:9,000@ A3
Coordinate System:
GDA 1994 MGA Zone 56

N

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Matter: 38335, Date: 29 March 2023,
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Location: P:\38300s\38335\Mapping\
38335_AldingtonRd, Layout: 38335_ADDA_F2_StudyArea

Legend

- Study area

Proposed works

- 0
- BDY_EX_Bdy
- Batter
- Limit of works
- Road
- Site compound

Figure 3 Proposed works

0 50 100 150 200

Metres

Scale: 1:9,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

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Matter: 38335, Date: 29 March 2023,
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2. Desktop assessment

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

2.1. Landscape context

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

2.2. Geology, soils and landforms

The study area is located within the Cumberland Lowlands physiographic region that consists of low lying, gently undulating plains and low hills, with a dense drainage net of predominantly northward flowing channels (Bannerman & Hazelton 1990a, pp. 2). Topographically, the study area features a broad to moderate slope. This landscape is situated on the Bringelly Shale geological formation (Figure 4). The Bringelly Shale formation is part of the Wianamatta group, and consists of shale, carbonaceous claystone, laminate, lithic sandstone, and rare coal. Artefact scatters are common in this geological unit, 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.

There are two non-perennial first order creek lines that cross Aldington Road (Figure 5). The first-order creek lines feed into a non-perennial second-order watercourse that is a tributary of Kemps Creek, a perennial fourth-order creek line. Kemps Creek is located approximately 513 metres south-west of the study area at its closest point. Proximity to a permanent water source is considered a positive indicator for past Aboriginal land use.

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) (JMCHM 2000, JMCHM 2005a, JMCHM 2005b, JMCHM 2008). These predictive models tend to favour higher order streams as the locations of campsites and therefore archaeological deposits. 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 2. As stream order increases, so does the likelihood that the stream would be a perennial source of water.

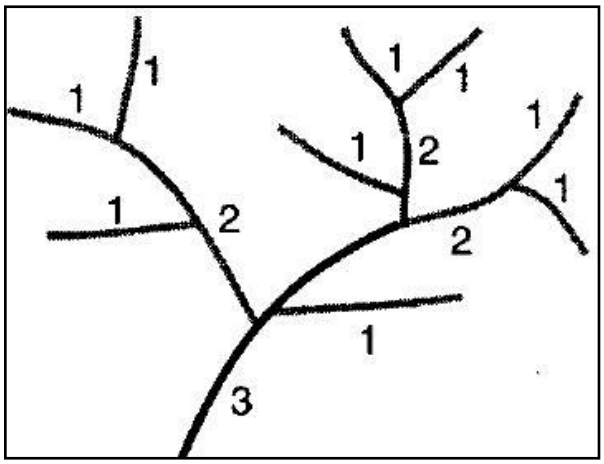


Photo 2 **Diagram showing Strahler stream order (Ritter, Kochel, & Miller 1995, pp. 151)**

2.2.1. Soil landscapes

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

The Luddenham soil landscape is the dominant landscape within the study area (Bannerman & Hazelton 1990a). The topography of this soil type consists of low rolling to steep low hills with local reliefs of 50–120 metres, slopes of 5–20%, convex narrow ridges and hillcrests with moderately inclined slopes containing drainage lines (Bannerman & Hazelton 1990a). The soil types that characterise the Luddenham soil landscape are summarised in Table 1 and Photo 3.

Table 1 **Luddenham soil landscape characteristics (Bannerman & Hazelton 1990a, pp. 63)**

Soil Material	Description
Luddenham 1 (*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 (A_1 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 10 cm becoming fewer with increasing depth. Charcoal fragments occur occasionally.
Luddenham 2 (*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 A_2 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.
Luddenham 3 (*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) to moderately acidic (pH 5.5). Shale rock fragments are common. Roots are rare and charcoal fragments are

Soil Material	Description
	absent.
Luddenham 4 (*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.
Luddenham 5 (*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 4/4–4/6) but ranges from dull reddish brown (5YR 4/4) to dull yellowish brown (10YR 5/4). This material is moderately acidic (pH 5.0) to neutral (pH 7.0). Roots are common. >10% of the volume may be small (2–6 mm) angular, well weathered shale fragments. Charcoal and other inclusions do not occur.

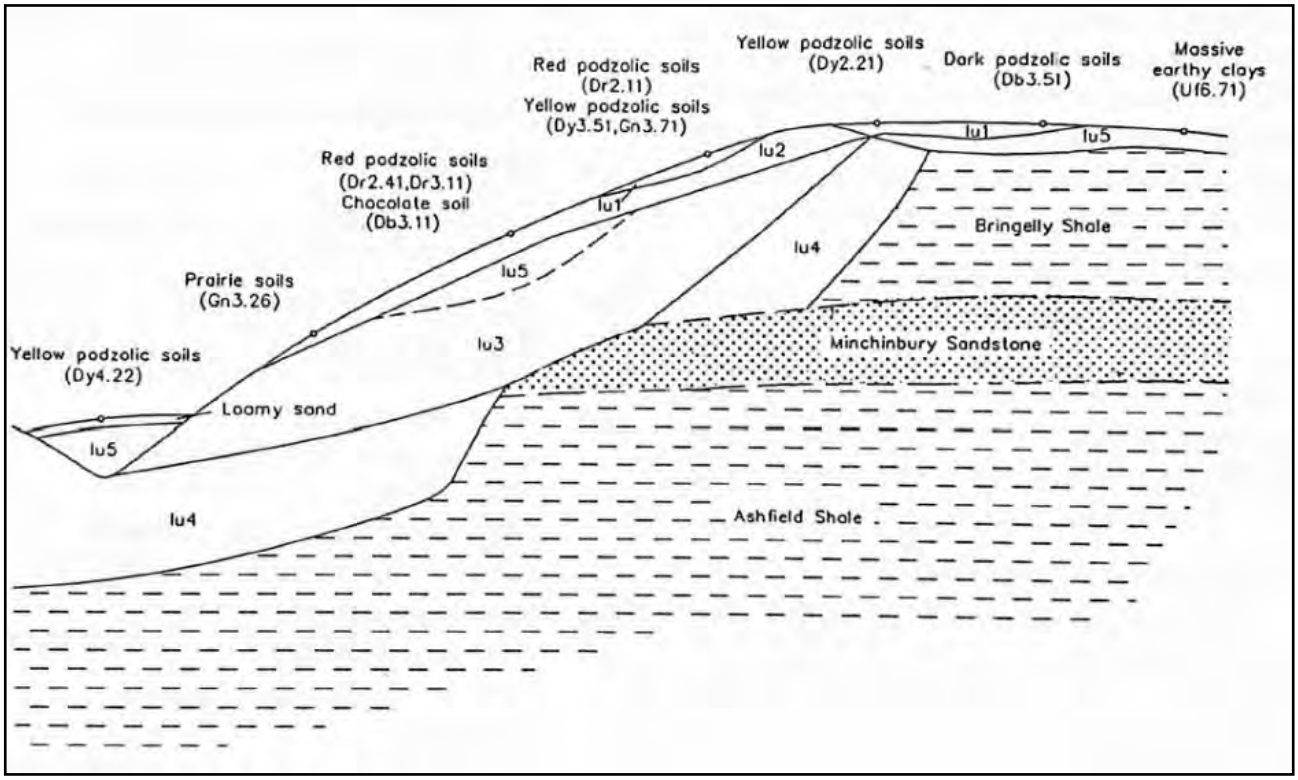


Photo 3 Schematic cross section of the Luddenham soil landscape (Bannerman & Hazelton 1990a, pp.63)

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 soil can be shallow and highly permeable, as well as producing low soil fertility. This would indicate that the presence of Aboriginal sites and objects is unlikely in areas of disturbance (Chapman et al. 1989, pp. 64–67, McInnes 1997, p.45, cited by Umwelt (Australia) Pty Limited 2016, pp. 13).

The Blacktown soil landscape is also located within the study area. This 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 lines (Bannerman & Hazelton 1990b, pp. 28). A description of the soil types within the Blacktown soil landscape are provided in Table 2 and Photo 4.

Table 2 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 10–30 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 (B3 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.

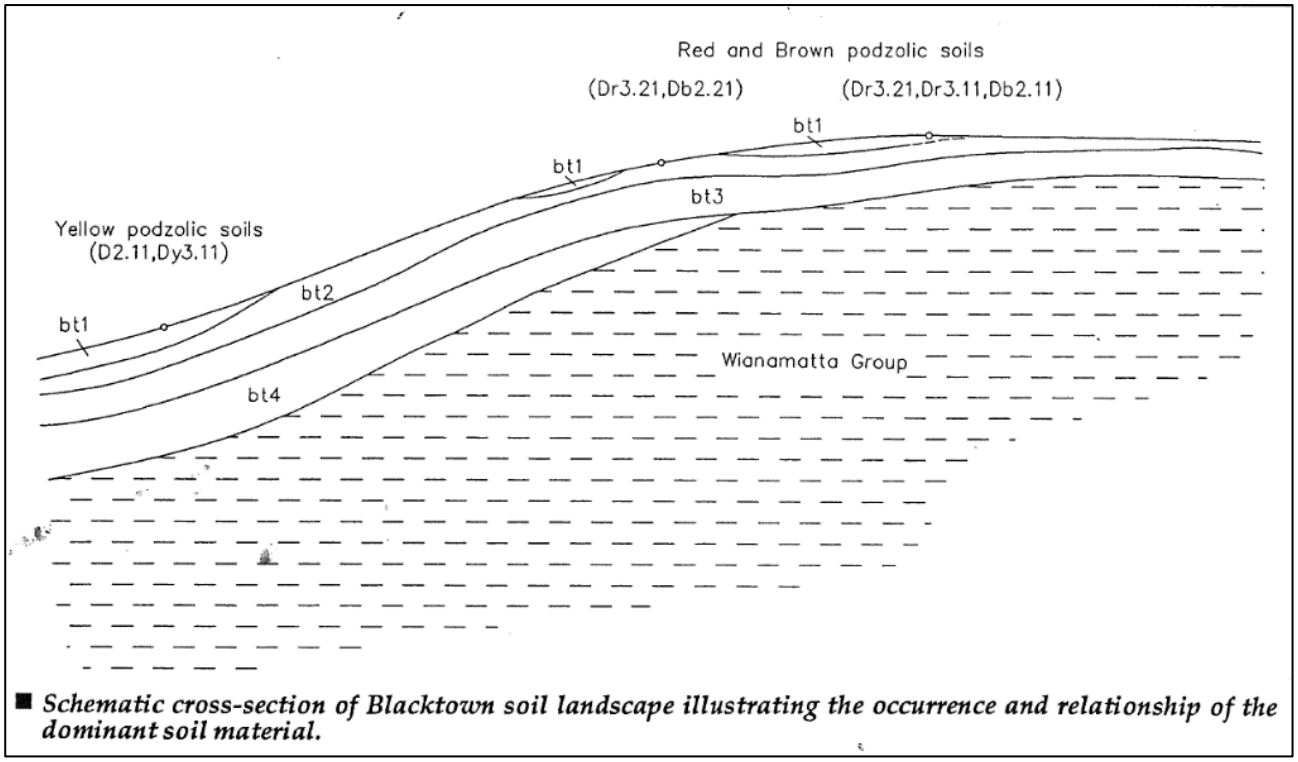


Photo 4 Schematic cross section of the Blacktown soil landscape (Bannerman & Hazelton 1990b, pp. 31)

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 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 could result in poor preservation of archaeological material in these locations of disturbance, and it is therefore likely archaeological sites will be preserved in areas where minimal disturbance has affected soils.

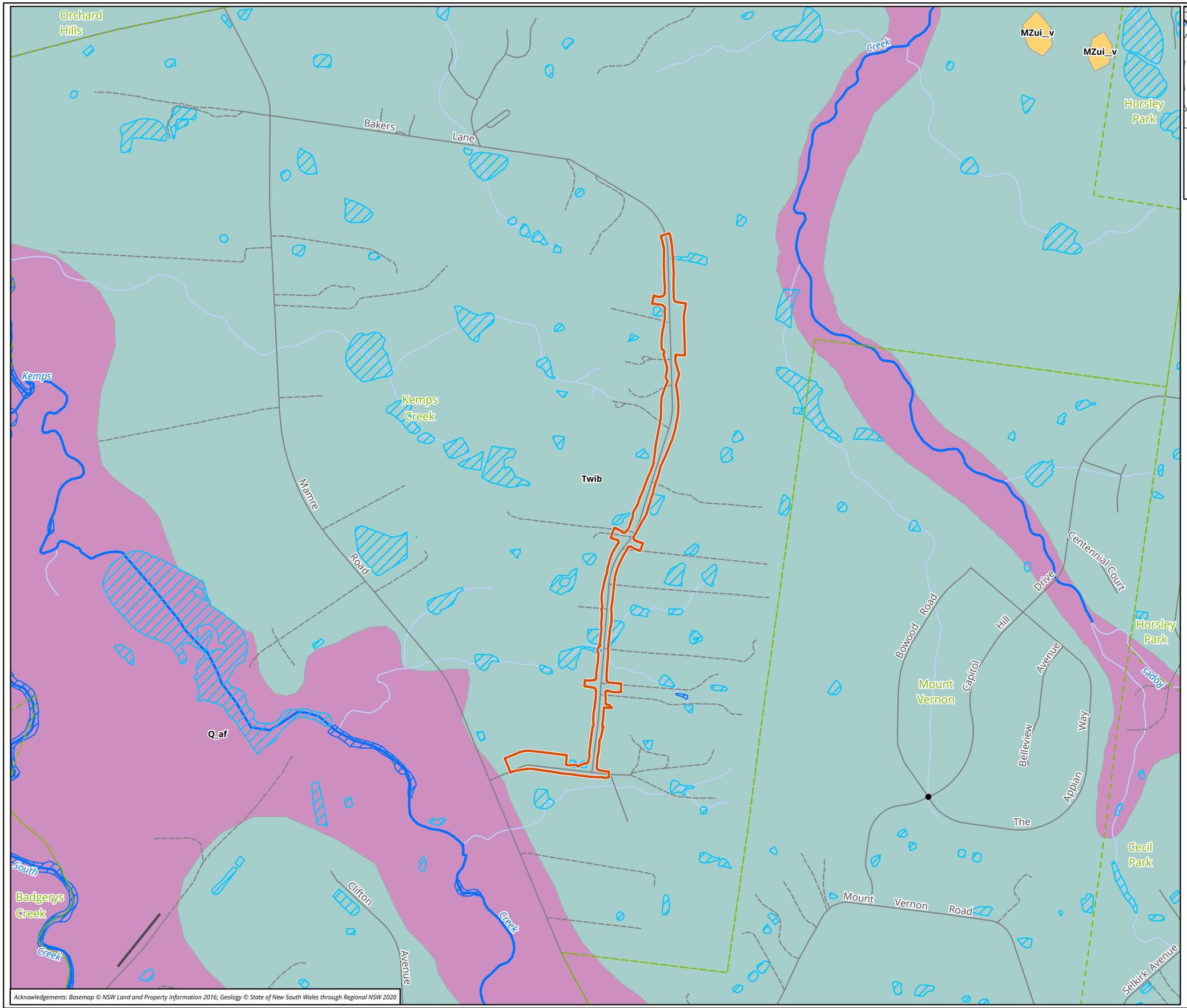
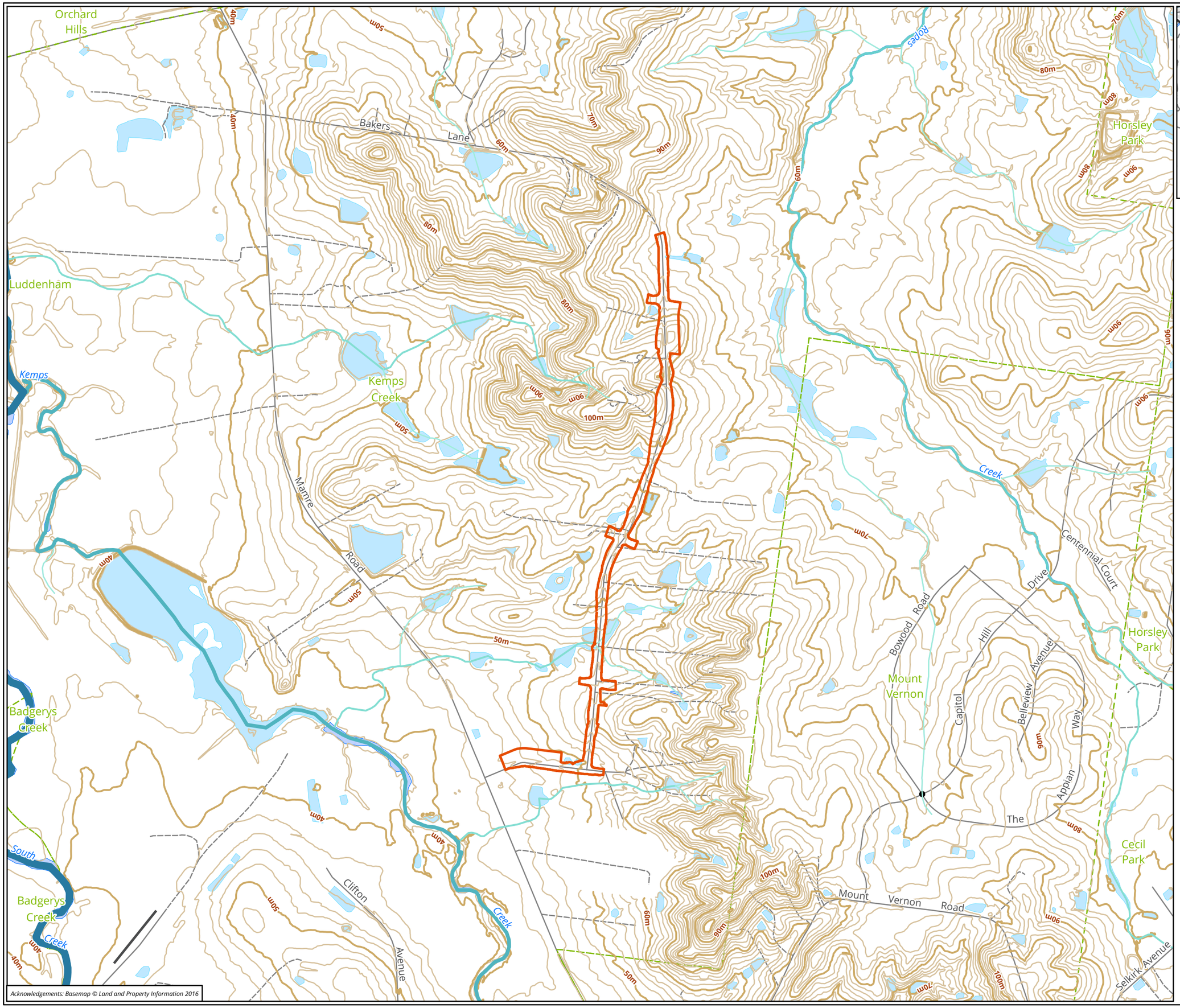
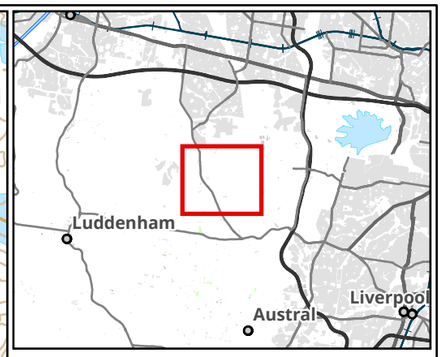


Figure 4 Geological units in the vicinity of the study area





Legend

- Study area
- Contour (2m)

Strahler Order

- 1
- 2
- 3
- 4
- 6

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

0 150 300 450 600

Metres

Scale: 1:15,000@ A3

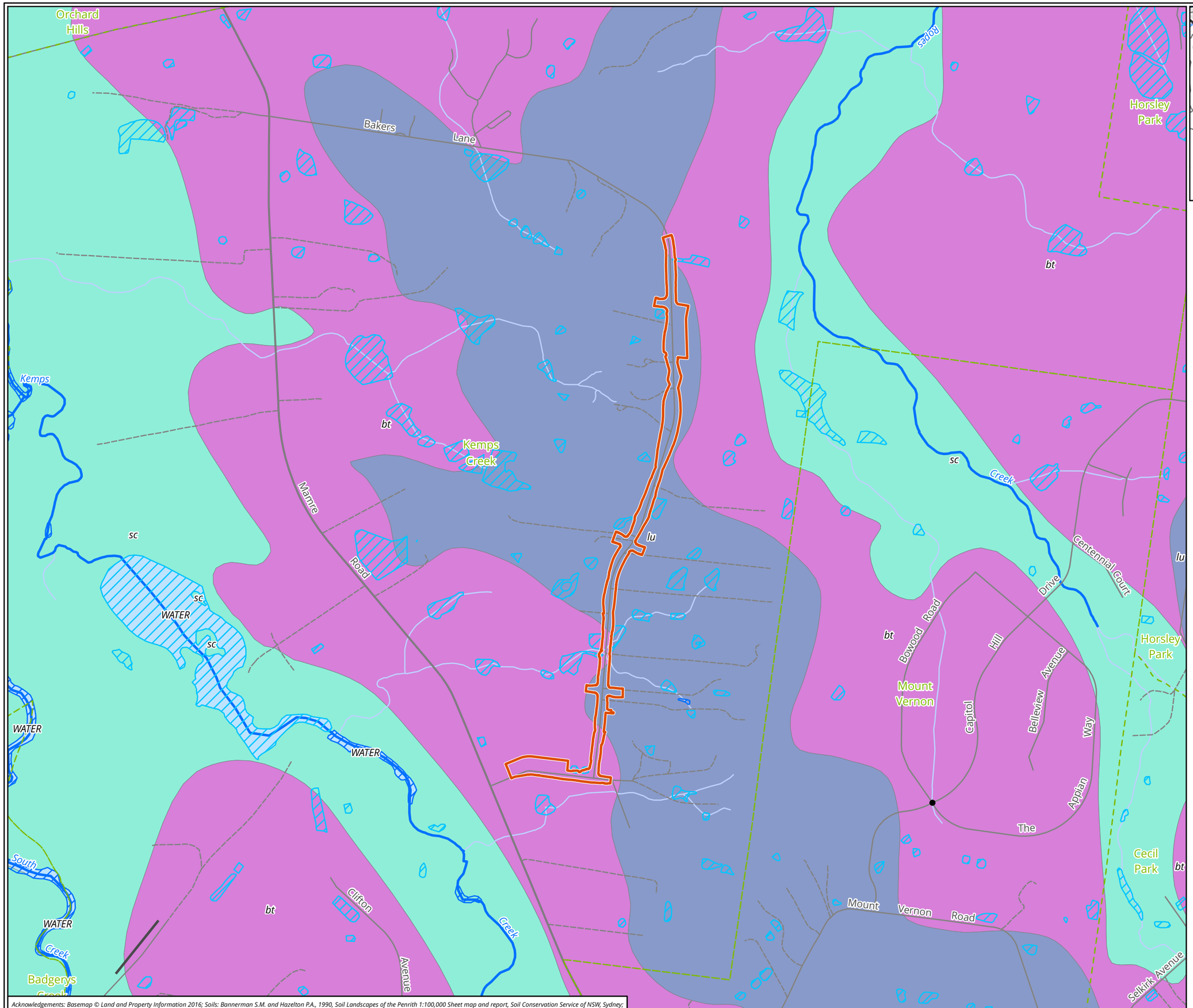
Coordinate System: GDA 1994 MGA Zone 56

N

biosis

Matter: 38335, Date: 29 March 2023,
Drawn by: JEt, Checked by: AK, Last edited by: amackegard
Location: P:\38300s\38335\Mapping\38335_AldingtonRd, Layout:38335_ADDA_F5_Hydrology

Acknowledgements: Basemap © Land and Property Information 2016



Legend

Study area

Soil landscape units

- bt - BLACKTOWN
- lu - LUDDENHAM
- sc - SOUTH CREEK
- WATER - WATER

Figure 6 Soil landscapes in the vicinity of the study area

0 150 300 450 600

Metres

Scale: 1:15,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

N

biosis

Matter: 38335Date: 29 March 2023,
Drawn by: JEt, Checked by: AK, Last edited by: amackegard
Location: P:\38300s\38335\Mapping\
38335_AldingtonRd, Layout: 38335_ADDA_F6_Soils

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;

2.3. Flora and fauna

Within the Cumberland subregion of the Sydney Basin Bioregion a variety of vegetation types are present, with Grey Box *Eucalyptus microcarpa*, Forest Red Gum *E. tereticornis*, Narrow-leaved Ironbark *E. crebra* woodland, and Spotted Gum *Corymbia maculata* present on shale hills. Hard-Leaved Scribbly Gum *E. 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 *E. amplifolia*, Forest Red Gum, and Swamp Oak *Casuarina glauca* are present on river flats. Tall Spike Rush *Eleocharis sphacelata*, and Juncus *Juncus effuses* and Parramatta Red Gum *E. parramattensis* are noted around lagoons and swamps (NPWS 2003, pp. 193). Many of these species are present across the Luddenham and Blacktown soil landscapes (Bannerman & Hazelton 1990b, pp. 29, 64, 68–69).

Aboriginal people used plant resources 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 sometimes present as 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).The presence of the landscape resources listed above would have increased the inhabitability of the study area and may have meant that the study area was used as a resource gathering zone.

2.4. Land use history

The earliest European 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. The group reached the Nepean River on 28 June 1789 (Oehm, A. 2006, Paul Davies Pty Ltd 2007a, pp. 11). Later that year, the Penrith Ford was crossed, and in 1791 the course of the Nepean River 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 (Thorpe 1986, pp. 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 1000 acres (404.6 hectares) and above. These were granted to officials, free settlers and military staff (Paul Davies Pty Ltd 2007a, pp. 11, Thorpe 1986, pp. 12). Over time, around 1699 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 (Thorpe 1986, pp. 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 which remained a small, roadside settlement into the 1830s (Thorpe 1986, pp. 12).

The development of the region was centred around agricultural and pastoral land use, which evolved from the 1830s to the mid-twentieth century. Historical aerial photography provides a record of development within the study area during the 20th century. Table 3 summarises the development of the study area with reference to the historical aerials.

Table 3 Summary of historical aerials

Aerial	Description
1947 (Photo 5)	The 1947 aerial shows that Mamre Road has been constructed, and there has been extensive historical land clearing within the study area. Aldington Road has not yet been constructed. There are few areas of remaining trees located within the study area, and several tracks. No structures are present in the study area.
1965 (Photo 6)	The 1965 aerials show some change from the 1947 aerial, including the construction of a transmission line along what will become Aldington Road. More vegetation clearance has been undertaken, and several dams and access tracks have been constructed in the surrounds of the study area.
1978 (Photo 7)	The 1978 aerial shows several developments, including the construction of Abbotts and part of Aldington Road. Mamre Road also appears to have been upgraded.
1991 (Photo 8)	By 1991 there has been further development of the study area. Aldington Road has been extended and there has been additional vegetation removal at the northern portion of Aldington Road. Three houses have been constructed within the study area alignment. The surrounding area has become large lot market gardens with some greenhouses, and pastoral land still present. Several driveways, and dams have been constructed in the study area.

Aerial	Description
2005 (Photo 9)	The 2005 aerial shows an increase in structures, landscaping around houses, construction of additional dams, and additional greenhouses and areas of cropping. The alignment of Aldington Road has remained the same.
Current (Figure 2)	Little change has occurred within the study area from 2005. Overall, the study area has been disturbed by the historical vegetation clearance, the construction of Aldington Road, the construction of dams and driveways, market gardening, construction of structures, and surface and sub-surface infrastructure.

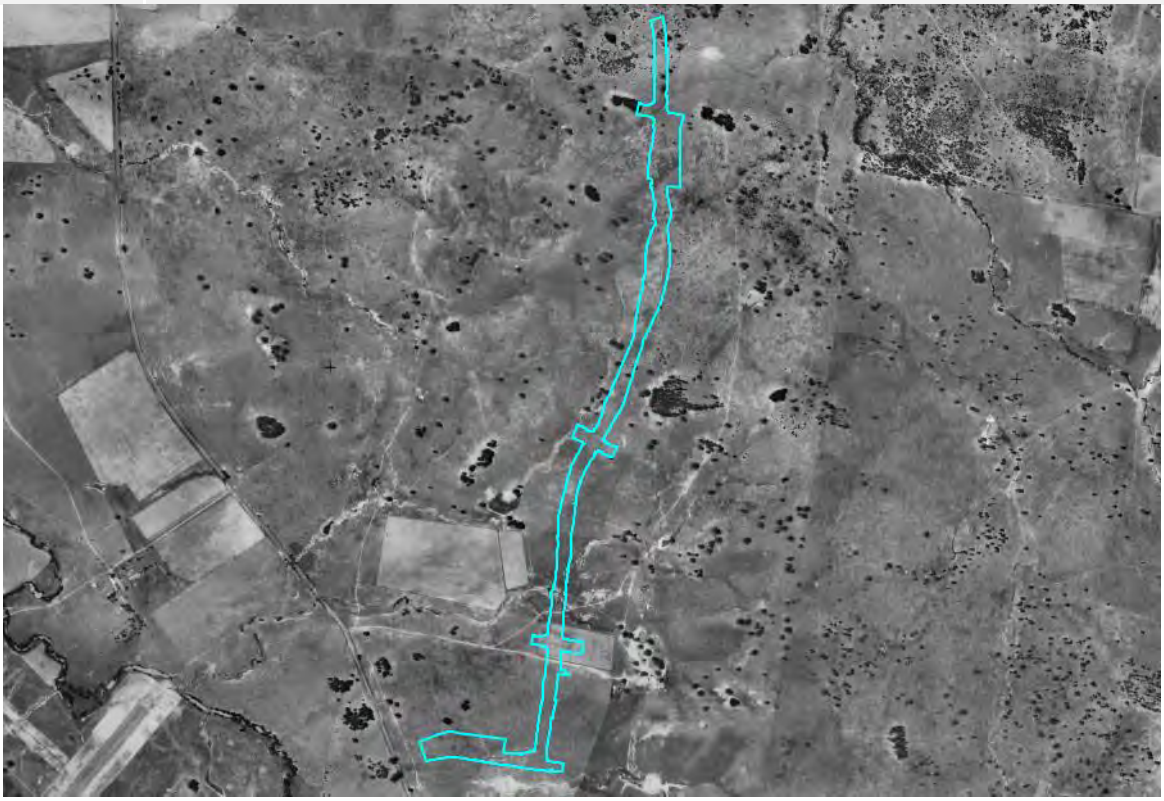


Photo 5 **1947 aerial with the study area outlined in blue (Source: NSW Spatial Services)**

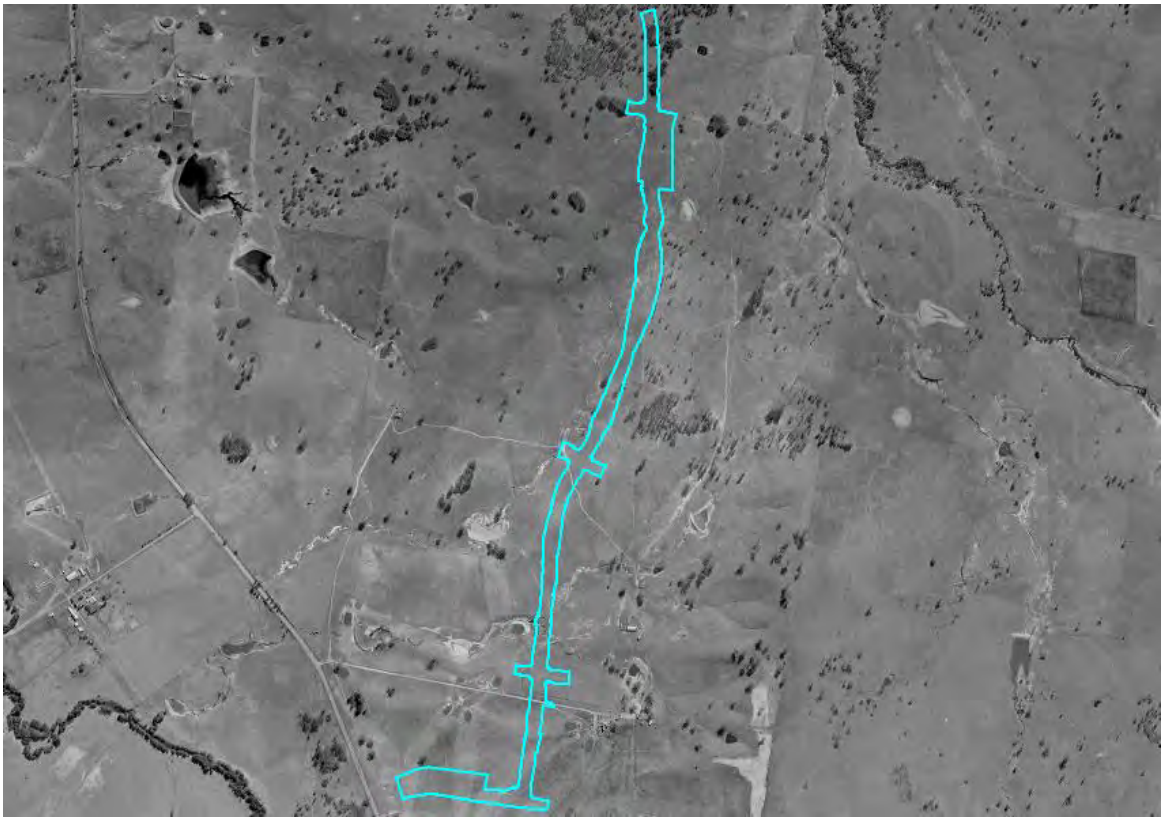


Photo 6 **1965 aerial with the study area outlined in blue (Source: NSW Spatial Services)**

Photo 7 **1978 aerial with the study area outlined in blue (Source: NSW Spatial Services)**

Photo 8 **1991 aerial with the study area outlined in blue (Source: NSW Spatial Services)**

Photo 9 **2005 aerial with the study area outlined in blue (Source: NSW Spatial Services)**

3. Aboriginal context

3.1. Ethnohistory and contact history

It is generally accepted that Aboriginal people have inhabited the Australian landmass for the last 65,000 years (Clarkson et al. 2017). Dates of the earliest occupation of the continent by Aboriginal people are subject to continued revision as more research is undertaken. The study area falls within the Sydney Basin. Aboriginal occupation of the region extends well back into the Pleistocene period (i.e., prior to 10,000 years before present (BP)). This is evidenced by radiocarbon dates retrieved from excavated sites at Shaw's Creek K2 (14,700 years BP) (Attenbrow 2010, pp. 18), at Windsor with 33,000 BP (Karskens, Burnett, & Ross 2019) as well as sites in Parramatta (approximately 25,000–30,000 BP and 14,000 BP) (JMCHM 2005a, 2005c, Williams et al. 2021).

Archaeological evidence of Aboriginal occupation of the Cumberland Plains indicates that the area was intensively occupied from approximately 6000 to 4000 years BP (Dallas 1982, Mcdonald 2008, White & McDonald 2010). 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.

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

Despite a proliferation of Aboriginal heritage sites there is considerable ongoing debate about the nature, territory, and range of pre-contact Aboriginal language groups in the greater Sydney region. These debates have arisen largely because, by the time colonial diarists, missionaries and proto-anthropologists began making detailed records of Aboriginal people in the late nineteenth century, pre-European Aboriginal groups had been broken up and reconfigured by European settlement activity. The following information relating to Aboriginal people on the Cumberland Plains is based on such early records.

There is some confusion relating to group names, which can be explained using differing terminologies in early historical references. Language groups were not the main political or social units in Aboriginal life. Instead, land custodianship and ownership centred on the smaller named groups that comprised the broader language grouping. There is some variation in the terminology used to categorise these smaller groups; the terms used by Attenbrow (2010) will be used here.

The study area is in the vicinity of three language groups, Dharawal, Gundungurra and the hinterland Darug. Attenbrow (2010, pp. 34) suggests:

- The Gundungurra covered "the southern rim of the Cumberland Plain west of the Georges River, as well as the southern Blue Mountains".
- The Dharawal covered "the south side of Botany Bay, extending as far as the Shoalhaven River; from the coast to the Georges River and Appin, possibly as far west as Camden".
- The hinterland Darug covered the area "from Appin in the south to the Hawkesbury River in the north; west of the Georges River, Parramatta, the Lane Cove River and Berowra Creek".

These areas are indicative only and would have changed through time.

After the arrival of European colonisers, the movement of Aboriginal people became increasingly restricted. European expansion along the Cumberland Plain was swift and soon there had been considerable loss of land to agriculture. At the same time diseases such as smallpox were having a devastating effect on the Aboriginal population. Death, starvation, and disease were some of the disrupting factors that led to a reorganisation of the social practices of Aboriginal communities after European contact. The formation of new social groups and alliances were made as Aboriginal people sought to retain some semblance of their previous lifestyle.

3.2. Regional context

Several Aboriginal cultural heritage investigations have been conducted for the Cumberland 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 which included a broad predictive study relating to Aboriginal sites in rural areas to the west of Liverpool, located approximately 12 kilometres 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 like 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 (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 creeklines 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.*
- *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).

Brayshaw McDonald Pty Ltd (1995) subsequently undertook salvage excavations at site WH3, as part of the Cowpasture Road, West Hoxton project (Rich & McDonald 1995). A total of 3686 artefacts were recovered and artefact densities were the highest within an alluvial terrace on the southern Cumberland Plain. The artefact-bearing deposit reached a depth of between 150 to 300 millimetres along the terrace; and two silcrete knapping floors of approximately three metres by 2.5 metres, and 4 metres by 4 metres, were identified. The artefact assemblage was mostly silcrete, with some mudstone and quartz present. Most of the assemblage comprised of debitage. A small component of the assemblage consisted of cores, backed artefacts, and retouched pieces. The worked portion of the silcrete component and the mudstone component totalled 2.1% and 8.8%, respectively. Bipolar cores and flakes were also present within the quartz assemblage. The site was interpreted as a low to moderate density artefact scatter over much of the site, with two knapping features present where backed blades were manufactured. Brayshaw McDonald suggested that the site size and the variety of raw material and artefact types indicated multiple visits by Aboriginal people and specialised tool production.

JMCHM (1997) conducted an archaeological investigation of the Australian Defence Industries (ADI) Site, at Saint Marys, for ADI-Lend Lease Joint Venture, located approximately 6.3 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 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*."

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, pp. 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. Most 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, discussing lithic artefact distribution in previous excavations carried out by JMCHM, approximately 20 kilometres north-east from the study area. The study considered several 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.

Kelleher Nightingale Consulting (2011) undertook an assessment of a 10 kilometre strip of Bringelly Road, approximately 12 kilometres south of 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 near 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, approximately 11 kilometres south-east from 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 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 near 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, pp. 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 kilometers 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 5000 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. Of these, 7956 lithic artefacts and 21 features were identified. Features included ground ovens, hearths, clay extraction pits and modified trees. Dominant material types were silcrete, mudstone 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. 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 are evidence of landscape use unique to this area of the site.

3.3. Local context

Several 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 on Mamre Road, Erskine Park, 1.3 kilometres north-west of the current study area. 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)**.** 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. Most 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).

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

- *"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 period (30,000 – 9,000BP), but is more likely to date to the Bondaian period (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, several 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).

The excavations consisted of testing followed by open area salvage at two locations with a total of 145 square metres and 153 square metres at each location. Both locations were located relatively close (within 100 metres) to creeklines in the study area. It was concluded that the site patterning in the area was typical of the Cumberland Plain, however artefact density was influenced by several 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).

DSCA (2003) undertook test excavation at Wallgrove Road, Eastern Creek approximately 7.8 kilometres north-east of the study area. The assessment built on several previous surveys conducted between 1980 and 2002. The assessment included predictive statements determined by the 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, 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 based on 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)These statements note a number of issues with predictive models that base their assessment of subsurface potential 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 one by one 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. Most of the deposit was identified as manuport, with some flake and core fragments present, and one potential broken axe.

Navin Officer Heritage Consultants (2005) conducted machine testing at the CSR lands, Erskine Park, approximately 1.8 kilometres to the north-west of the current study area. A total of 256 test pits were excavated, with 285 artefacts being identified across 88 of these pits. It is noted (JMCHM 2008, pp. 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 approximately 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).

Biosis (2017, 2018) completed an Aboriginal heritage assessment of the Mamre West Precinct located approximately 2.8 kilometres north-west of the study area. The initial assessment recorded three areas of potential within low rises adjacent to depressions (OA1, OA2, and OA3). Test excavations were conducted within these areas with OA1 and OA2 located the furthest distance from water and both containing low density artefact deposits, while a high density artefact deposit was identified at OA3 which was located closer to South Creek. Biosis found that the dominance of material types differed to those of the surrounding region. Within one portion of the site, chert and mudstone artefacts were found in higher proportions to silcrete, which is seen in higher proportions other sites in the region. The assemblage at OA3 contained a varied artefact deposit including several backed artefacts which placed it within the Middle Bondaian phase of occupation, approximately 4000–1000 years BP. Further investigation through salvage excavations was recommended.

Biosis (2019) carried out an ACHA as part of a two stage industrial development along Mamre Road, Kemps Creek, that incorporated Lots 210–215 DP 1013539, and Lots 1 and 2 DP 1233392, located approximately 3.3 kilometres north-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.

3.3.1. Assessments undertaken along Aldington Road and Abbotts Road

Numerous other Aboriginal cultural heritage assessments have also been undertaken along Aldington Road and Abbotts Road and are outlined in Table 4.

Please note that not all the assessments have been submitted to the AHIMS database and therefore were not available to be reviewed as part of this current assessment. A detailed summary of the results of the reports which were able to be obtained has been provided below.

Table 4 Assessments undertaken along Aldington and Abbotts Roads

Location of study	Lot and DP	Submission type	Report name
106–228 Aldington Road	Lot 200 DP1285691 (Previously Lots 20–23 DP255560 and Lots 30–32 DP258949)	ACHA, SSD-10479	**Biosis (2020)** Aldington Road, Kemps Creek Archaeological Report, report prepared for Fife Kemps Creek Pty Ltd.
290–308 Aldington Road and 59–63 Abbotts Road	Lot 11–13 DP253503	ACHA, SSD-9138102	**Urbis (2021)** 290–308 Aldington Road and 59–63 Abbotts Road Aboriginal Cultural Heritage Assessment, report for ESR Australia.
244–270 Aldington Road	Lot 16 and 17 DP253503	ADDA, DA with Penrith City Council	**Urbis (2021)** 244–270 Aldington Road Aboriginal Due Diligence Assessment.
155–217 Aldington Road	Lot 24–28 DP255560	ACHA, SSD-17552047	**Biosis (2021)** Aldington Road Estate, Kemps Creek: Aboriginal Cultural Heritage Assessment, report prepared for Frasers Property Industrial.
155–251 Aldington Road	Lot 24–28 DP255560, Lot 10 DP253503, and Lot 33 DP258949		**Biosis (2022)** Aldington Road Estate, Kemps Creek: Archaeological Report, report prepared for Frasers Property Industrial.
113–153 Aldington Road	Lot 34–36 DP258949	ACHA, SSD-32722834	**Austral Archaeology (2022)** 113–153 Aldington Road: Aboriginal Cultural Heritage Assessment, report for Dexus Wholesale Management Limited.
99–111 Aldington Road	Lot 37 DP258949	ACHA, DA with Penrith City Council	**Biosis (2023)** 99–111 Aldington Road, Kemps Creek, NSW: Aboriginal Cultural Heritage Assessment, report for Frasers Properties Australia.
253–267 Aldington Road	Lot 9 DP253503	ACHA, SSD-23480429	**Urbis (in prep)** 253–267 Aldington

Location of study	Lot and DP	Submission type	Report name
		(EIS not yet prepared, ACHA is currently being prepared by Urbis)	Road: Aboriginal Cultural Heritage Assessment.

Biosis (2020) completed a ACHA for 106–228 Aldington Road, Kemps Creek, NSW for SSD-10479, located adjacent to and overlapping in some areas with the current study area. The ACHA included archaeological survey of the study area and test excavations in three areas of moderate archaeological potential. The areas of moderate archaeological potential were located on creek terraces and hill crests in proximity to water sources within Blacktown and Luddenham soil landscapes. A total of 248 artefacts were identified across the three areas of potential (Photo 10):

- In Area 1 located on a hill crest, soils consisted of loam to loamy clay deposits of moderate to high compaction, with little disturbance identified. Test excavations within this portion of the study area encountered a low density archaeological deposit, with 19 artefacts identified.
- In Area 2 on a creek terrace, soils consisted of loamy clay deposits of moderate to high compaction, with little disturbance identified. Test excavations within this portion of the study area encountered a low density archaeological deposit, with 28 artefacts identified.
- Area 3 consisted of loosely to moderately compacted sandy to clay loamy soils on a creek terrace landform. A high density, intact subsurface archaeological deposit within 70 metres of Ropes Creek and 25 metres of a tributary of Ropes Creek was identified with a total of 201 artefacts recovered. The results of the test excavation supported predictive modelling within the local region.

The investigation concluded that while Area 1, Area 2 and part of Area 3 will be impacted by the proposed development, further testing and/or salvage of these sites was not recommended. It was also recommended that a CHMP should be developed to provide management and mitigation measures for cultural heritage values identified within the study area. The proposed works permitted to proceed with caution in those areas in line with an approved CHMP.

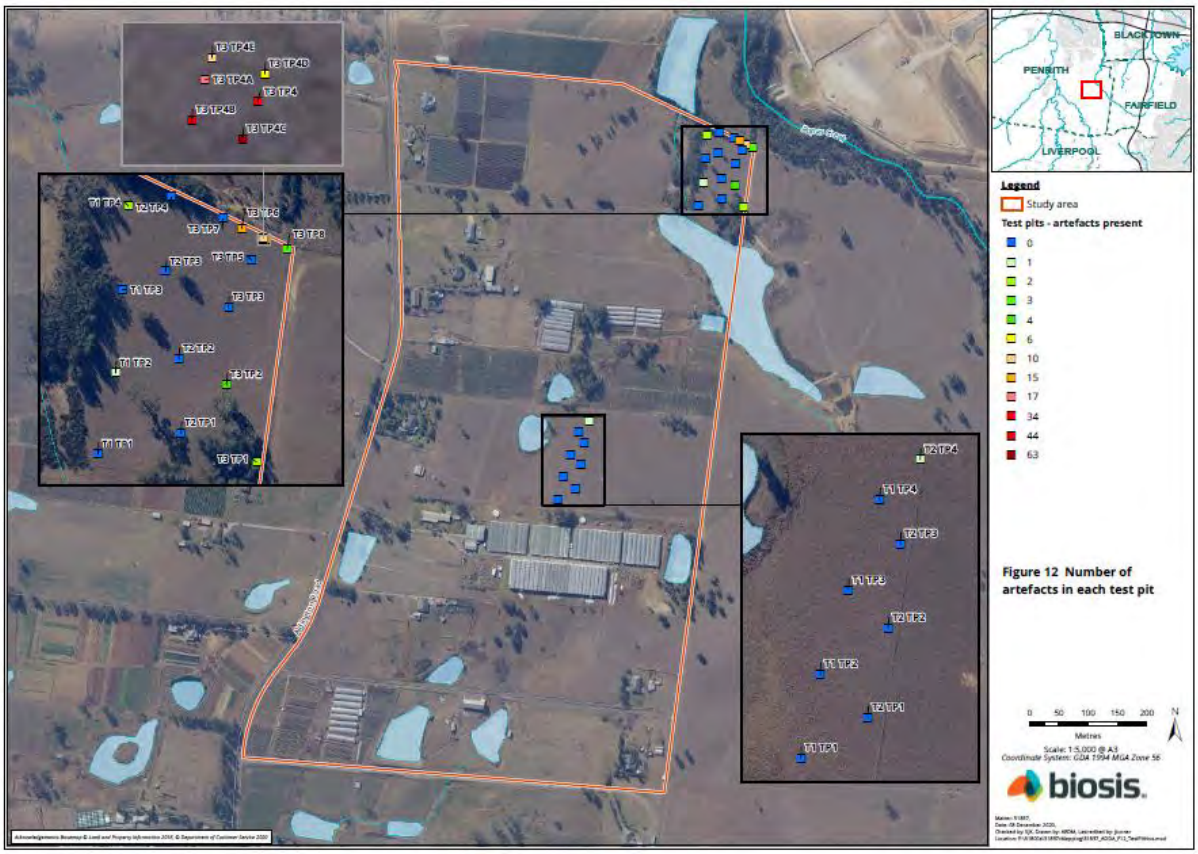


Photo 10 Test excavation results from 106–228 Aldington Road ACHA (Source: Biosis 2020, pp. 71)

Urbis (2021) completed an ACHA for 290–308 Aldington Road and 59–63 Abbotts Road for SSD-9138102, located adjacent to and overlapping in some areas with the current study area. The ACHA included Aboriginal community consultation, an archaeological survey, and test excavations. The survey identified three isolated finds within vehicle tracks, and the test excavations identified 13 subsurface artefacts, representative of a low density background scatter (Photo 11). Artefacts were identified within lower slopes, terraces adjacent to waterways, spurs, and ridge crests. The ACHA also noted the heavy disturbance across parts of the site due to construction and market gardening. The ACHA recommended that surface collection be undertaken, and Aboriginal cultural heritage induction material be prepared. Further consultation was also required to determine the long term care and control for the identified artefacts.

Photo 11 Test excavation results from 290–308 Aldington Road and 59–63 Abbotts Road ACHA (Source: Urbis Pty Ltd 2021, pp. 39)

Urbis (2021) also completed an ADDA for 244–270 Aldington Road, Kmeps Creek, NSW, within the boundary of the current Biosis study area (Photo 12). The report prepared by Urbis could not be obtained, however the site card for the registered site located within the study area provided some information. A previously unidentified Aboriginal site, AHIMS 45-5-5502/Aldington Rd Kemps Ck IF-1, was found within Lot 17 DP253503. The site contained a single indurated mudstone/tuff flake and was found in a disturbed context on the northern flank of the dam.

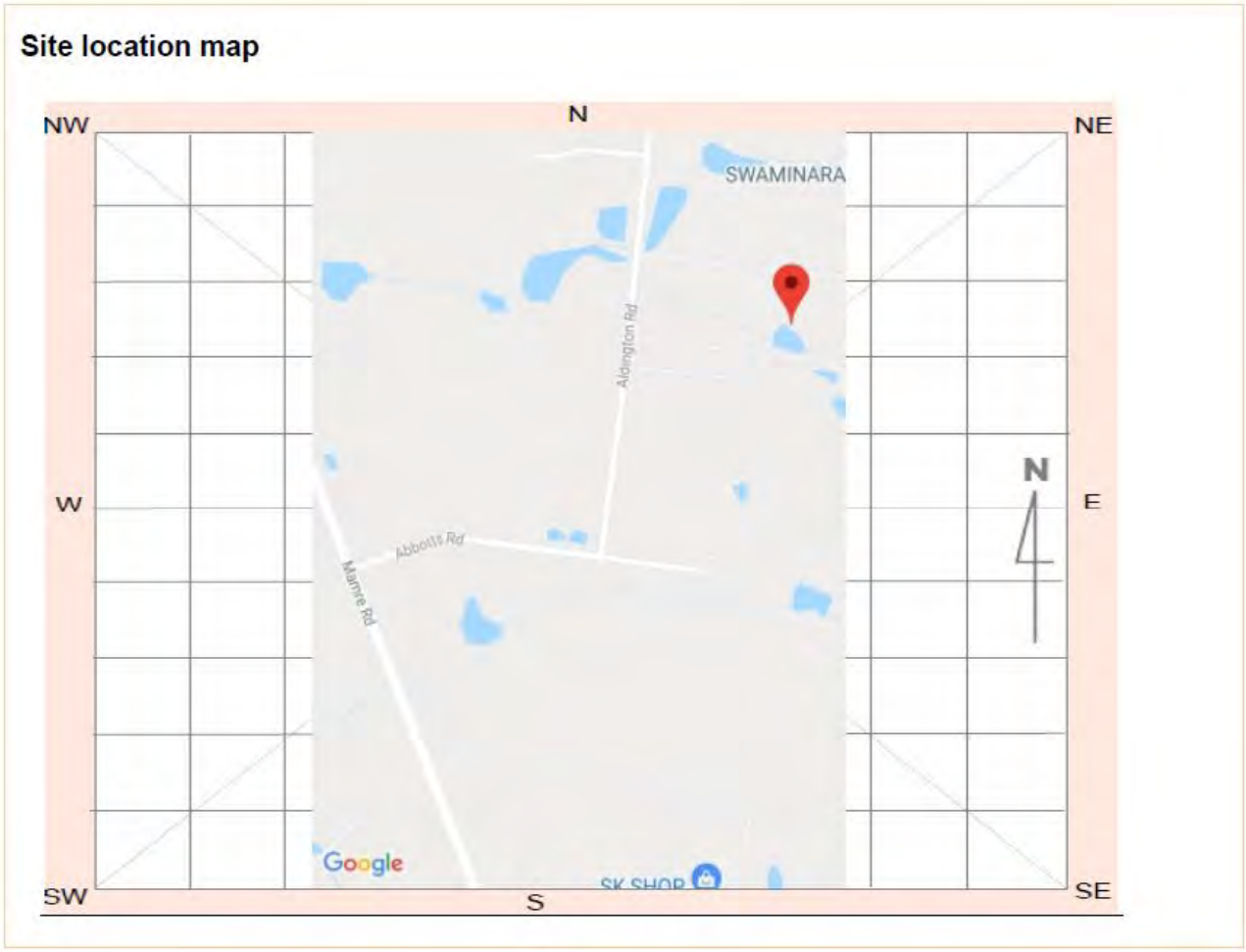


Photo 12 Site location map from site card for AHIMS 45-5-5502/Aldington Rd Kemps Ck IF-1

Biosis (2021) completed an ACHA for 155–217 Aldington Road, Kemps Creek , NSW for SSD-17552047, located adjacent to and overlapping in some areas with the current study area. A field investigation of the study area was conducted on 12 April 2021 and 15 December 2021. No Aboriginal objects were identified in the study area; however, one area of PAD (Aldington PAD 1) was identified on a relatively undisturbed, flat, hill crest at the headwaters of a dammed drainage line. The area of PAD was identified in consultation with Deerubbin Local Aboriginal Land Council (LALC) representative, Steven Randall during the field investigation. Test excavations were therefore undertaken within the study area in August 2021. One Aboriginal site (AHIMS 45-5-5578/Aldington Road PAD 1) was identified through these test excavations (Photo 13).

The results of the test excavations support predictive modelling for the region, having identified a low-density artefact scatter of two artefacts (AHIMS 45-5-5578/Aldington Road PAD 1) within a flat hill crest landform, within approximately 100–250 metres of two first-order creek lines. AHIMS 45-5-5238/Aldington Road PAD 1, was identified as having low scientific significance. Further testing and salvage of this site was not recommended. AHIMS 45-5-5578/Aldington Road PAD 1 is to be reburied in consultation with RAPs.

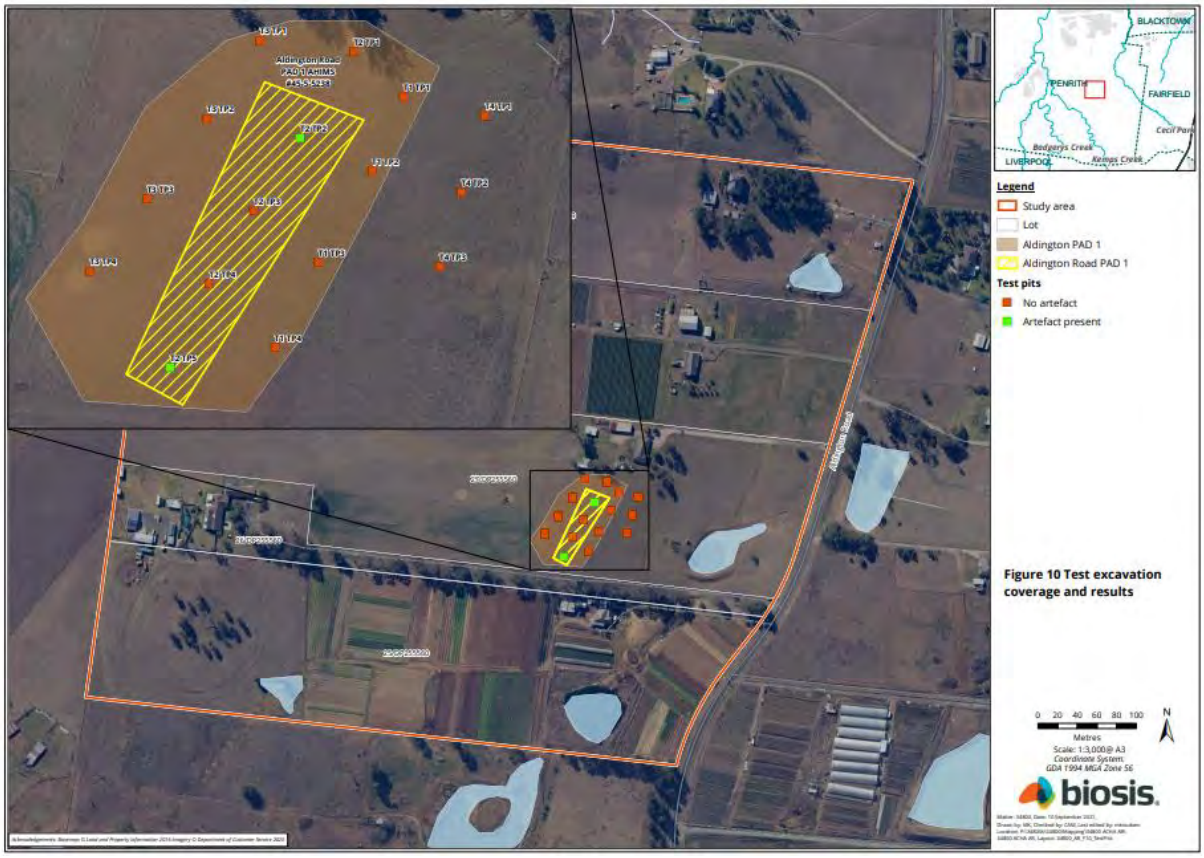


Photo 13 Test excavation results from 155–217 Aldington Road ACHA (Source: Biosis 2021, pp. 52)

Two additional lots were added to the study area in 2021, (Lot 24 DP 255560 and Lot 10 DP 253503) and an additional archaeological survey was undertaken on 15 December 2021 (Biosis 2022). No new areas of archaeological potential were identified during the additional survey (Photo 14).

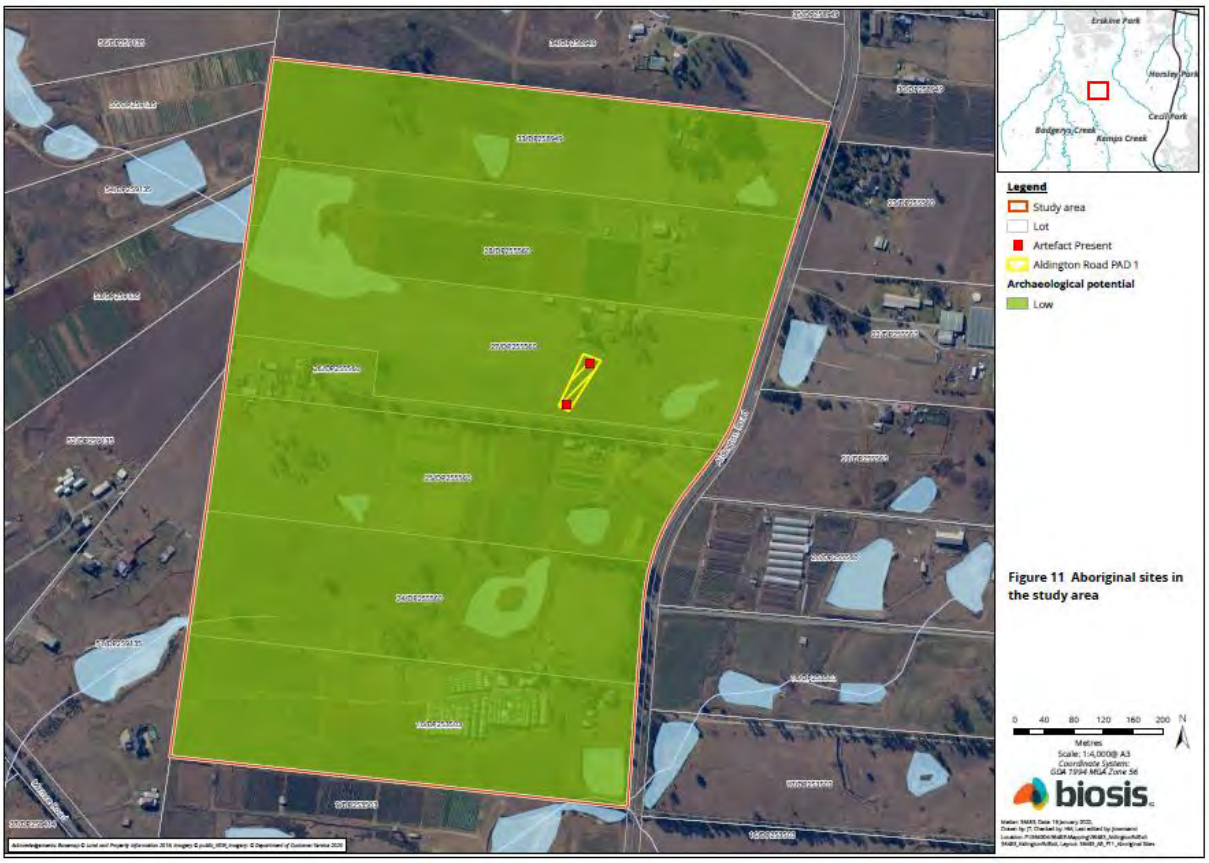


Photo 14 Aboriginal sites and results from 155–251 Aldington Road ACHA (Source: Biosis 2022, pp. 57)

Austral Archaeology (2022) completed an ACHA for an SSD submission for Dexus Wholesale Management Limited, at 113–153 Aldington Road, Kemps Creek, located adjacent to and overlapping in some areas with the current study area. Test excavations were undertaken on 17 November 2021 (Photo 15). They occurred within areas of moderate to high archaeological potential which had previously been identified during a field investigation undertaken by Austral Archaeology on 6 July. The test excavation program resulted in the identification of four low density subsurface artefact sites (AHIMS 45-5-5608/Aldington Road 02, AHIMS 45-5-5609/Aldington Road 03, AHIMS 45-5-5607/Aldington Road 01, and AHIMS 45-5-5610/Aldington Road 04). The assessment determined that AHIMS 45-5-5608/Aldington Road 02, AHIMS 45-5-5609/Aldington Road 03, AHIMS 45-5-5607/Aldington Road 01, and AHIMS 45-5-5610/Aldington Road 04 were likely representative of a continuous site extent, consisting of background scatter associated with ridges and slopes within the local region.

The assessment concluded that AHIMS 45-5-5608/Aldington Road 02, AHIMS 45-5-5609/Aldington Road 03, AHIMS 45-5-5607/Aldington Road 01, and AHIMS 45-5-5610/Aldington Road 04 each possessed low archaeological significance and would be directly impacted by the proposed development. No further archaeological investigation was recommended, however as part of the conditions of consent, AHIMS 45-5-5608/Aldington Road 02, AHIMS 45-5-5609/Aldington Road 03, AHIMS 45-5-5607/Aldington Road 01, and AHIMS 45-5-5610/Aldington Road 04 were proposed for reburial on site. The report recommended that along with reburial, an Aboriginal Site Impact Recording Form (ASIRF) should be submitted when impacts occur on site (Austral Archaeology 2022). The reburial location is to be determined in consultation with the proponent and RAPs. It was also recommended that works within Dexus' development footprint should not proceed until Development Consent and Conditions of Approval had been granted and complied with where appropriate.

Figure 7.10 Location of test pits and artefact densities

Photo 15 Test excavation results from 113–153 Aldington Road ACHA (Source: Austral Archaeology 2022, pp. 53)

Biosis (2023) conducted an ACHA for 99–111 Aldington Road, Kemps Creek, located adjacent to and overlapping in some areas with the current study area. A survey of the study area was conducted on 4 May 2021, where one area of moderate archaeological potential (AHIMS 45-5-5568/ALD-RD-PAD-01) was identified. AHIMS 45-5-5568/ALD-RD-PAD-01 is located on a flat relatively undisturbed terrace adjacent to a dammed second-order drainage line, in the easternmost portion of the site. All other areas within their study area were identified as possessing low archaeological potential. Test excavations were completed on 27 September 2021 for the portion of ALD-RD-PAD-01 which could not be avoided by the proposed works (Photo 16).

These excavations established the presence of one low density subsurface archaeological deposit, comprising of two artefacts. In 2022 the proposed works were updated, and it was therefore determined that AHIMS 45-5-5568/ALD-RD-PAD-01 would be directly impacted by the proposed works, resulting in total loss of value if not mitigated. Additional test excavations were therefore conducted on 20 and 22 December 2022 to determine the extent of the PAD associated with AHIMS 45-5-5568/ALD-RD-PAD-01, and to determine the full extent of impact the development would have on cultural heritage values within the study area. The excavations resulted in the location of an additional two artefacts. As the proposed development could not avoid impacts to AHIMS 45-5-5568/ALD-RD-PAD-01, an AHIP was recommended.

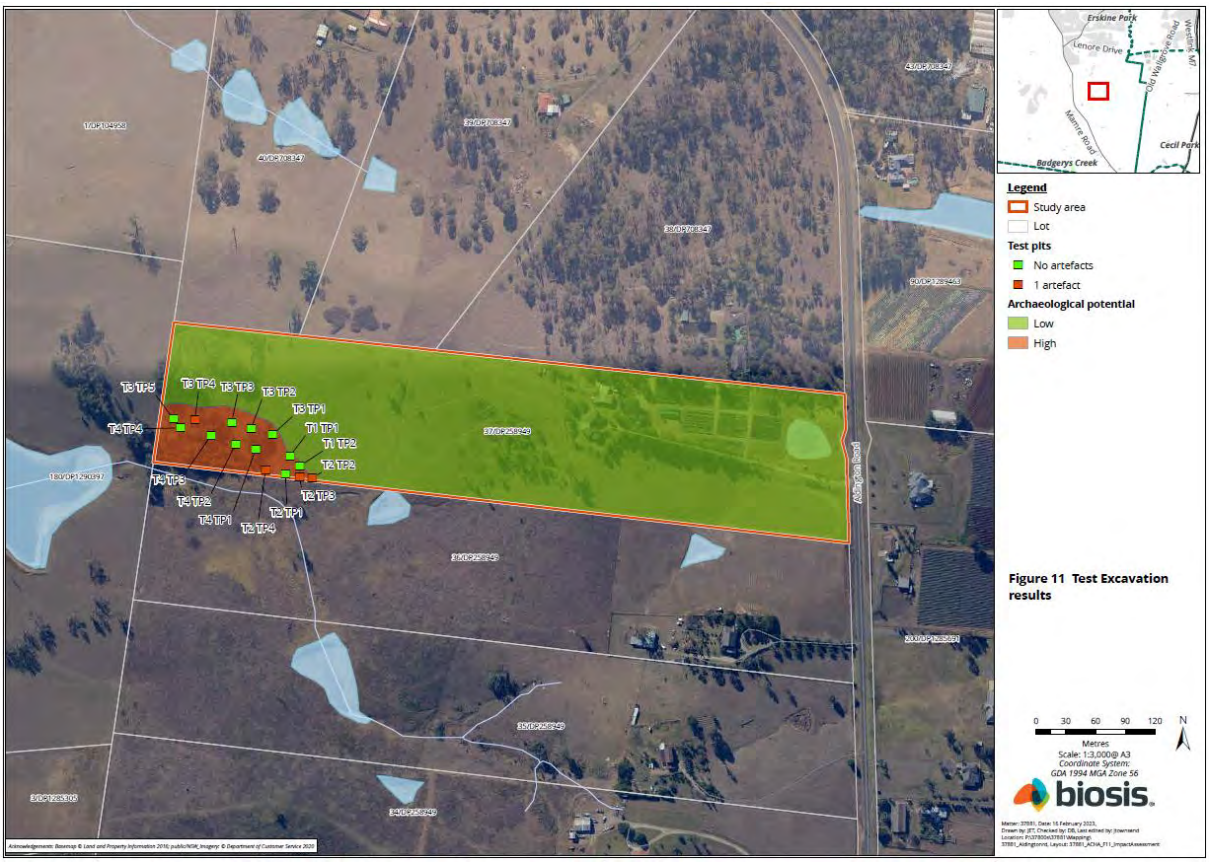
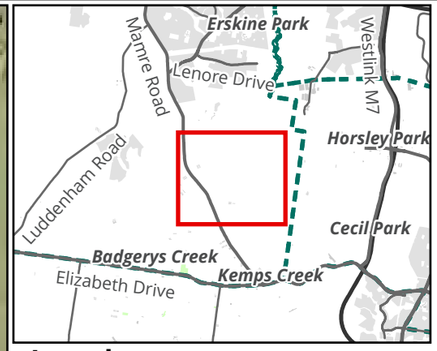


Photo 16 **Test excavation results from 99–111 Aldington Road ACHA (Source: Biosis 2023, pp. 37)**



Legend

Lot

Previous assessments

Austral Archaeology 2022
113-153 Aldington Rd
ACHA: SSD-32722534

Biosis 2020
106-228 Aldington Rd
ACHA: SSD10479

Biosis 2021
155-251 Aldington Rd
ACHA: SSD-17552047

Biosis 2021
74-78 & 82-90 Aldington Rd
Heritage Constraints Assessment

Biosis 2023
1 Abbotts Rd
ADDA Desktop Assessment

Biosis 2023
99-111 Aldington Rd
ACHA

Urbis 2021
240-270 Aldington Rd
ADDA

Urbis 2021
240-270 Aldington Rd
ADDA

Urbis
253-267 Aldington Rd
ACHA (Currently being undertaken): SSD-23480429

Figure 7 Previous Aboriginal heritage assessments along Aldington Road

0 100 200 300 400 N

Metres

Scale: 1:10,500@ A3

Coordinate System:
GDA 1994 MGA Zone 56

biosis

Matter: 39017, Date: 14 April 2023,
Drawn by: AM Checked by: CG, Last edited by: amackegard
Location: P:\39000s\39017\Mapping\
39017_AldingtonRd_TelstraUpgrades_20230331, Layout:
39017_ADDA_F7_PreviousAssessment

3.3.2. Identified Aboriginal archaeological sites

An extensive search of the AHIMS database was conducted on 17 November 2022 (Client service ID: 733150). The search identified 112 Aboriginal archaeological sites within a 1.5 by 1.5 kilometre search area, centred on the study area (Table 5). One of these registered sites is located six metres west of the study area (AHIMS 45-5-5607/Aldington Road 01), with three AHIMS sites located within 200 metres of the study area (AHIMS 45-5-5504/Abbot's Rd Kemps Creek IF2, AHIMS 45-5-5505/Abbott's Rd Kemps Creek IF3 and AHIMS 45-5-5578/Aldington Road Kemps Creek PAD 1) (Table 5). These sites are described below. 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 upon 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 PAD, 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 117 results presented here, compared to the 112 sites identified in AHIMS.

Table 5 AHIMS search results

Site type	Occurrences	Frequency (%)
Artefact	105	89.74
PAD	11	9.41
Grinding groove	1	0.85
Total	**117**	**100.00**

A simple analysis of the Aboriginal cultural heritage sites registered within a 1.5 by 1.5 kilometre search of the study area indicates that the dominant site type is artefact sites, representing 89.74% (n=105), with PAD sites represented by 9.41% (n=11). A single grinding groove site has also been recorded within 1.5 kilometres of the study area, representing 0.85% (n=1).

3.3.3. AHIMS within 200 metres of the study area

AHIMS 45-5-5607/Aldington Road 01

AHIMS 45-5-5607/Aldington Road 01 is a subsurface archaeological deposit consisting of a single silcrete proximal flake identified during test excavations. This site is located approximately six metres west of the study area. The site has an extent of 0.25 by 0.25 metres and is located on an upper slope. The site is located on the edge of the study area within 113–127 Aldington Road (Lot 36 DP 258949).

The site was identified during test excavations for an ACHA for an SSD application (113–153 Aldington Road, Kemps Creek). The associated report for the site card recommended that reburial should occur as a mitigation measure and ASIRF should be submitted when impacts occur (Austral Archaeology 2022).

AHIMS 45-5-5504/Abbot's Rd Kemps Creek IF2

AHIMS 45-5-5504/Abbot's Rd Kemps Creek IF2, is located on an exposed vehicle track, and consists of an isolated artefact find consisting of a single grey silcrete angular fragment. The artefact was identified on a slope within an undulating landform unit, 30 metres from water. The site is located approximately 126 metres south-east of the study area off Abbotts Road.

The site was identified during test excavations for an ACHA for an SSD application (113–153 Aldington Road, Kemps Creek). The associated report for the site card recommended that reburial should occur as a mitigation measure and ASIRF should be submitted when impacts occur (Austral Archaeology 2022).

AHIMS 45-5-5505/Abbot's Rd Kemps Creek IF3

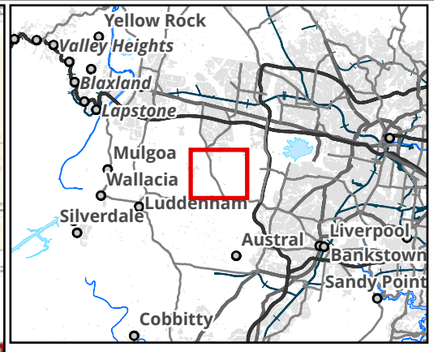
AHIMS 45-5-5505/Abbot's Rd Kemps Creek IF3 is located on an unsealed vehicle track on a slope, within a rolling hills landform. The artefact is a grey silcrete medial fragment, 67 metres from water. The site is located approximately 50 metres south-east of AHIMS 45-5-5504/Abbot's Rd Kemps Creek IF2, and approximately 171 metres south-east of the study area.

The site was identified during test excavations for an ACHA for an SSD application (113–153 Aldington Road, Kemps Creek). The associated report for the site card recommended that reburial should occur as a mitigation measure and ASIRF should be submitted when impacts occur (Austral Archaeology 2022).

AHIMS 45-5-5578/Aldington Road Kemps Creek PAD 1

AHIMS 45-5-5578/Aldington Road Kemps Creek PAD 1 is a subsurface archaeological deposit consisting of two angular fragments. One artefact is chert and the other is silcrete, with the area covering approximately 77 by 20 metres. The artefacts were recovered from depths of 0–300 millimetres, and the site card notes that the artefacts were likely not in situ due to the mixing of soil contexts. The site is located approximately 170 metres north-west of the study area, along Aldington Road.

The site was identified during test excavations for an ACHA for an SSD application (113–153 Aldington Road) (Biosis 2022). AHIMS 45-5-5238/Aldington Road PAD 1, was identified as having low scientific significance. Further testing and salvage of this site was not recommended. AHIMS 45-5-5578/Aldington Road PAD 1 is to be reburied in consultation with RAPs.



Legend

- Study area
- AHIMS

NOT TO BE MADE PUBLIC

Figure 8 AHIMS sites in the vicinity of the study area

0 200 400 600 800

Metres

Scale: 1:20,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

N

biosis

Matter: 38335, Date: 29 March 2023,
Drawn by: JEt, Checked by: AK, Last edited by: amackegard
Location: P:\38300s\38335\Mapping\
38335_AldingtonRd, Layout: 38335_ADDA_F7_AHIMS_AldingtonRd

3.3.4. Predictive statements

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

This model is based on:

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

Based on this information, a predictive model has been developed, indicating the site types most likely to be encountered during the survey and subsequent sub-surface investigations across the present study area (Table 6). The definition of each site type is described firstly, followed by the predicted likelihood of this site type occurring within the study area.

Table 6 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 in the region across a wide range of landforms including alluvial landforms, crests and gentle slopes, they have high potential to be present in undisturbed areas within the study area.
PADs	Potential sub surface deposits of cultural material.	High: PADs have been previously recorded in the region across a wide range of landforms including alluvial flats, gentle slopes, terraces and crests. There is high potential for PADs to be present in undisturbed areas within the study area.
Modified trees	Trees with cultural modifications	Moderate: Aerials dated to 1947 indicate that vegetation in the northern portion of the study area has not been removed. Therefore, there is moderate potential for modified trees within this area.
Axe grinding grooves	Grooves created in stone platforms through ground stone tool manufacture.	Low: There has been no previously recorded grinding groves within the vicinity of the study area. There is low potential for axe grinding grooves to be present as suitable sandstone exposures are unlikely to occur within the study area due to the underlying geology.
Shell middens	Deposits of shells accumulated over either	Low: Shell midden sites have not been recorded

Site type	Site description	Potential
	singular large resource gathering events or over longer periods of time.	within proximity to the study area. There are no perennial water sources within the study area therefore the potential for shell midden sites is considered low.
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.
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.
Quarries	Raw stone material procurement sites.	Low: There is no record of any quarries being within or surrounding 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.	Low: The sites will only occur where suitable sandstone exposures or overhangs possessing sufficient sheltered space exist, which are not present in the study area.

4. Archaeological investigation

An archaeological investigation of the study area was undertaken on 22 November by Anthea Vella (Biosis, Heritage Consultant), Steve Randall (Deerubbin LALC, Cultural Sites Officer), and Lana Wedgewood (Darug Custodian Aboriginal Corporation, Cultural Sites Officer). The survey sampling strategy, methodology and a discussion of results are provided below.

4.1. Archaeological survey aims

The principle aims of the survey were to:

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

4.2. Survey methods

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

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

Where possible, the identification of natural soil deposits within the study area was undertaken. Photographs and recording techniques were incorporated into the survey including representative photographs of survey units, landform, vegetation coverage, 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 and the Map Grid of Australia (94) coordinate system.

4.3. Constraints to the survey

With any archaeological survey there are several factors that influence the effectiveness (the likelihood of finding sites) of the survey. The factors that contributed most to the effectiveness of the survey within the study area were access, and extensive grass coverage. The survey was undertaken along the road reserve, where possible, and photos were taken of fence lines. Portions of the site were also unable to be investigated due to site access issues.

4.4. Visibility

In most archaeological reports and guidelines visibility refers to GSV, and is usually a percentage estimate of the ground surface that is visible and allowing for the detection of (usually stone) artefacts that may be present on the ground surface (DECCW 2010a). GSV across the site was low (0–10%), hindered by extensive grass coverage and access (Photo 17).

Photo 17 General visibility in the study area along Aldington Road, facing north

4.5. Exposure

Exposure refers to the geomorphic conditions of the local landform being surveyed and attempts to describe the relationship between those conditions and the likelihood the prevailing conditions provide for the exposure of (buried) archaeological materials. Whilst also usually expressed as a percentage estimate, exposure is different to visibility in that it is in part a summation of geomorphic processes, rather than a simple observation of the ground surface (Burke & Smith 2004, pp. 79, DECCW 2010b).

Overall, the study area displayed very few areas of high exposure, mainly present around vehicle access areas. Low areas of exposure were due to the extensive grass coverage. Approximately 5% of the study area was subject to exposure (Photo 18).

Photo 18 Exposure within the study area, facing south

4.6. Disturbances

Disturbance in the study area is associated with human agents. These are prevalent in the study area and cover large sections of the land surface. Examples of human agents can include the construction of roads and driveways, residential development such as landscaping and construction of residential buildings; farming practices, such as initial vegetation clearance for creation of paddocks, fencing and stock grazing; and agricultural practices.

Disturbance levels within the study area were assessed during the visual inspection. Levels of disturbance were categorised through an inspection of the ground surface, landforms, and aerial imagery. Disturbance levels within the study area have been categorised according to the following criteria:

- High disturbance—the landform has been heavily disturbed and all natural soil horizons have been displaced or removed, these areas are unlikely to contain Aboriginal cultural material.
- Moderate disturbance—the landform has undergone disturbances to a certain degree, but the extent and nature of these disturbances cannot be fully quantified. Aboriginal cultural material may be present within these locations but is unlikely to be *in situ*.
- Low disturbance—the landform has not been significantly disturbed and is highly likely to contain intact soil horizons. Aboriginal cultural material if present is likely to be *in situ*.

The study area has been subject to disturbance by human activity. Historic and recent aerials (Photo 5 to Photo 9) show that the study area has been subject to moderate–high levels of disturbance. This has occurred in the forms of vegetation clearance, the construction of Aldington Road, Abbotts Road and adjoining streets and roads, the construction of dams and driveways, market gardening, signage and surface and sub-surface infrastructure. Along sections of Aldington Road the road has been cut into the slope to create a level road surface. These disturbances were noted during the archaeological survey and are shown in Photo 19 to Photo 21.

Photo 19 Area of disturbance associated with drainage

Photo 20 **Area of disturbance along Aldington Road, facing south-east**

Photo 21 **Disturbances along Aldington Road: fencing and stockpile of soil associated with construction, facing north-east**

4.7. Investigation results and discussion

The archaeological investigation of the study area was undertaken by Biosis Heritage Consultant Anthea Vella, Cultural Sites Officer Steven Randall of Deerubbin LALC, and Cultural Sites Officer Lana Wedgewood of Custodian Aboriginal Corporation. The investigation consisted of a meandering transect walked across Aldington Road and Abbots Road, Kemps Creek, NSW. Portions of the site were unable to be physically surveyed due to site access issues, however, observations of these areas were made from the road reserve. No previously unrecorded Aboriginal sites were identified during the field investigation; however, this is likely attributed to poor GSV and ground disturbances, rather than an absence of Aboriginal occupation of the area. As portions of the study area were inaccessible, the identification of archaeological potential within the study area are based upon observations made in the field and predictive modelling for the local region. The results of the field investigation have been summarised below and transect locations are provided in Figure 9.

As discussed above a review of historical aerial photographs (Photo 5 to Photo 9) shows significant development has occurred within the study area resulting in moderate to high levels of disturbance. During the field investigation, it was discussed with Steve Randall of Deerubbin LALC, and Lana Wedgewood of Darug Custodian Aboriginal Corporation, that prior to development the road was likely to contain PAD, that may have otherwise been present had the road not been constructed. Therefore, the study area was considered likely to possess low archaeological potential.

This was supported by background research which identified that the study area is contained within the Blacktown and Luddenham soil landscapes. The Blacktown soil landscape is located within a small portion of the study area and is characterised as a residual soil landscape formed by the slow accumulation of sediment over extended periods of time. As a result of this slow aggregation process and the typical age of these soils, residual soil landscapes have reasonable potential to preserve archaeological deposits. As the study area is present within a broad, moderate slope, it is anticipated that the total depth of the soils within the study area are less than 100 centimetres deep with artefact bearing deposits typically ceasing at 30–40 centimetres upon clay/bedrock (Chapman et al. 1989, pp. 32). The soil depths throughout the Blacktown landscape suggests that intact, subsurface archaeological deposits could be found within the study area in areas subjected to minimal disturbances. However, the degree and nature of disturbances in the study area have varied from moderate to high throughout time. This coupled with the typical soil depths throughout the Blacktown landscape suggests that intact, subsurface archaeological deposits are unlikely to be in the study area.

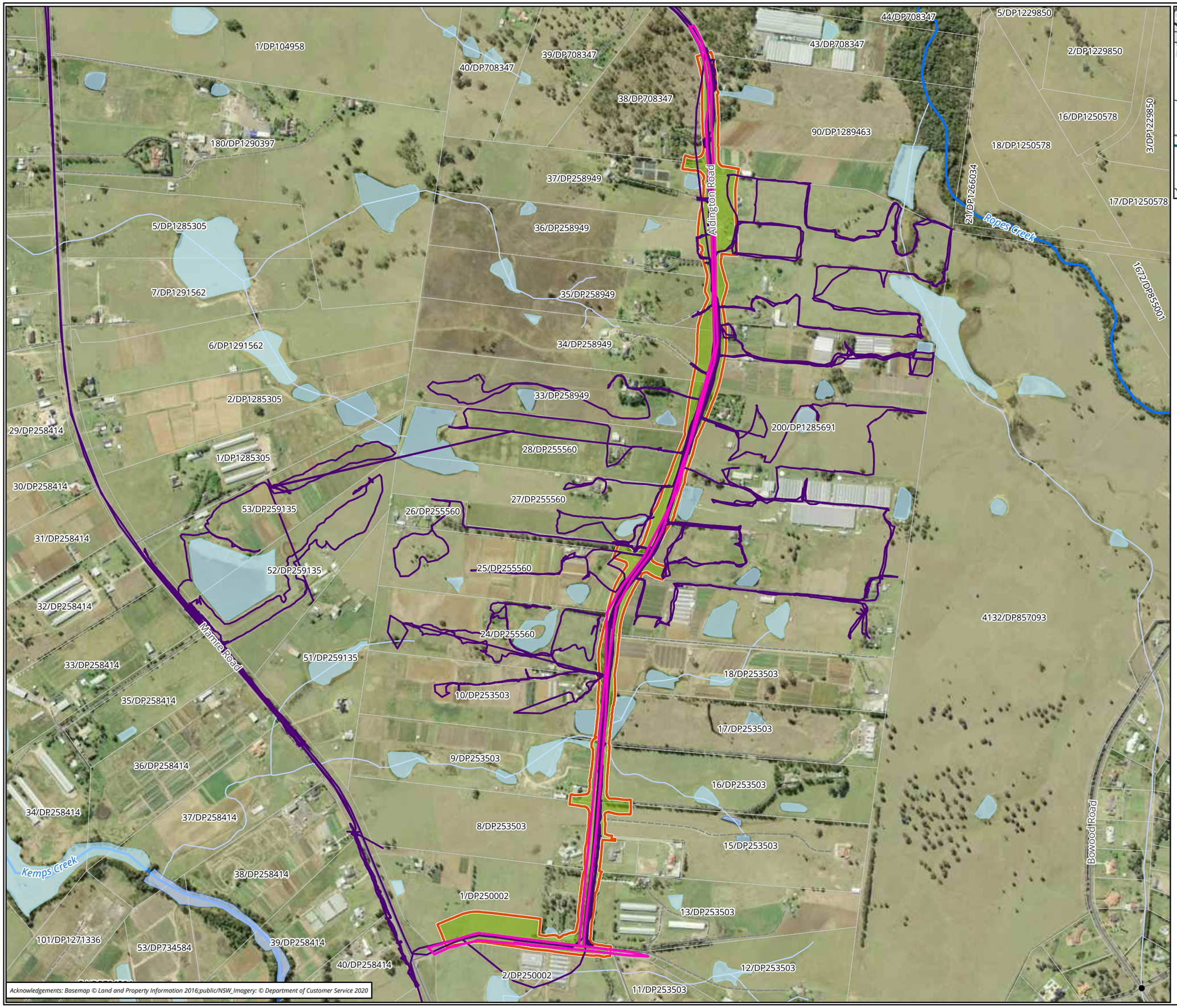
The Luddenham soil landscape dominates a vast majority of the study area and is characterised as an erosional soil landscape comprised of shallow, sandy soils that typically accumulate to a depth of <100 centimetres, that have high susceptibility to erosion where disturbance has occurred. This suggests that the presence of Aboriginal sites and objects may be unlikely within the study area due to moderate to high levels of disturbance having been noted throughout.

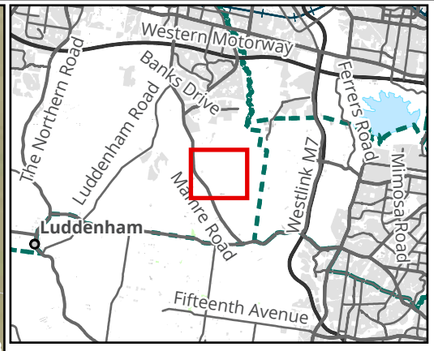
Furthermore, predictive modelling by JMCHM for the wider area primarily identified the potential for sites to be present in association with water sources, with the size and density increasing with stream order (JMCHM 2000). JMCHM (1997) suggested that the frequencies and densities of Aboriginal sites in association with lower order tributaries are likely to be low and to represent sites that were one-off camping locations. Predictive modelling established by AMBS (2012) suggested that sites are most frequently located in close proximity to permanent water courses on creek banks, alluvial flats, or high ground; and that large artefact scatters may be identified up to 200–250 metres away from water courses. Recent archaeological excavations undertaken by Biosis are congruent with these finding, with high-density deposits identified in proximity to perennial water sources (Biosis 2017, Biosis 2018, Biosis 2019, Biosis 2020). The current study area is in proximity to lower-order streams, and the nearest permanent, higher-order watercourse is located approximately 513 metres south-west of the study area at its closest point. This suggests that the site was unlikely to have been occupied for extensive periods of time by Aboriginal groups, and Aboriginal sites within

the study area are likely to be low density deposits found within intact soil deposits, if present, such as that found at AHIMS 45-5-5607/Aldington Road 01.

The location of AHIMS 45-5-5607/Aldington Road 01 was unable to be closely inspected due to land access issues, however, it was determined that the proposed works are unlikely to impact AHIMS 45-5-5607/Aldington Road 01 as it is located outside of the study area.

As part of Biosis' field investigation an assessment of areas of moderate-high Aboriginal potential along sections of Aldington Road as marked in the MRP DCP, was also undertaken. Most of the areas marked on the MRP DCP fall within Aldington Road and have therefore been disturbed during the construction of the road. In addition, the study area lacks favourable landforms that would indicate Aboriginal occupation. The field investigation therefore concluded that these areas of moderate–high Aboriginal potential rather possess low potential to contain archaeological deposits, based on observations made within the field and a review of background research.





Legend

- Study area
- Lot
- Survey track
- Survey tracks from previous assessments

Archaeological potential

- Low

Figure 9 Survey effort and results

0 50 100 150 200

Metres

Scale: 1:9,000@ A3

Coordinate System: GDA 1994 MGA Zone 56

N

biosis

Matter: 38335, Date: 31 March 2023,
Drawn by: AM Checked by: AK, Last edited by: lharley
Location: P:\38300s\38335\Mapping\38335_AldingtonRd, Layout: 38335_ADDA_F8_SurveyEffort

5. Conclusions and recommendations

5.1. Conclusions

The results of the desktop assessment and archaeological investigation have identified that the study area possesses low archaeological potential (Figure 9). This was determined based upon observations made in the field, preliminary Aboriginal community consultation, and through a review of historical aerials, previous archaeological studies, and the study area's landscape context, as discussed above.

AHIMS 45-5-5607/Aldington Road 01 lies approximately six metres west of the study area, and will not be impacted directly by the proposed development. If it is determined that impacts to the site cannot be avoided, an ACHA to support an AHIP application will be required prior to the commencement of works. The results of this assessment are also demonstrated in the due diligence flow chart provided by the Code (Figure 10).

5.2. Recommendations

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

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

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

Recommendation 1: Further archaeological assessment required for AHIMS 45-5-5607/Aldington Road 01

AHIMS 45-5-5607/Aldington Road 01 lies approximately six metres west of the study area. A buffer of no less than 5 metres that is clearly marked is to be placed around AHIMS 45-5-5607/Aldington Road 01 to protect it during the proposed works. If during development, impacts to AHIMS 45-5-5607/Aldington Road 01 cannot be avoided, an ACHA will be required prior to the commencement of works. This would include the preparation of an ACHA to support an AHIP application. The ACHA must be prepared in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011). This includes an AR prepared in accordance with the consultation requirements and the Code.

AT&L on behalf of LOG-E are to liaise with Dexus Wholesale Management Limited regarding the progression of the SSD application for 113–153 Aldington Road and the management of AHIMS 45-5-5607/Aldington Road 01.

Recommendation 2: Areas of low potential

No further archaeological work is required in areas of low archaeological potential. Works can proceed with caution following recommendation recommendations 3, 4 and 5.

Recommendation 3: 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 notification. Should unanticipated relics be discovered while 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 4: Discovery of unanticipated Aboriginal objects

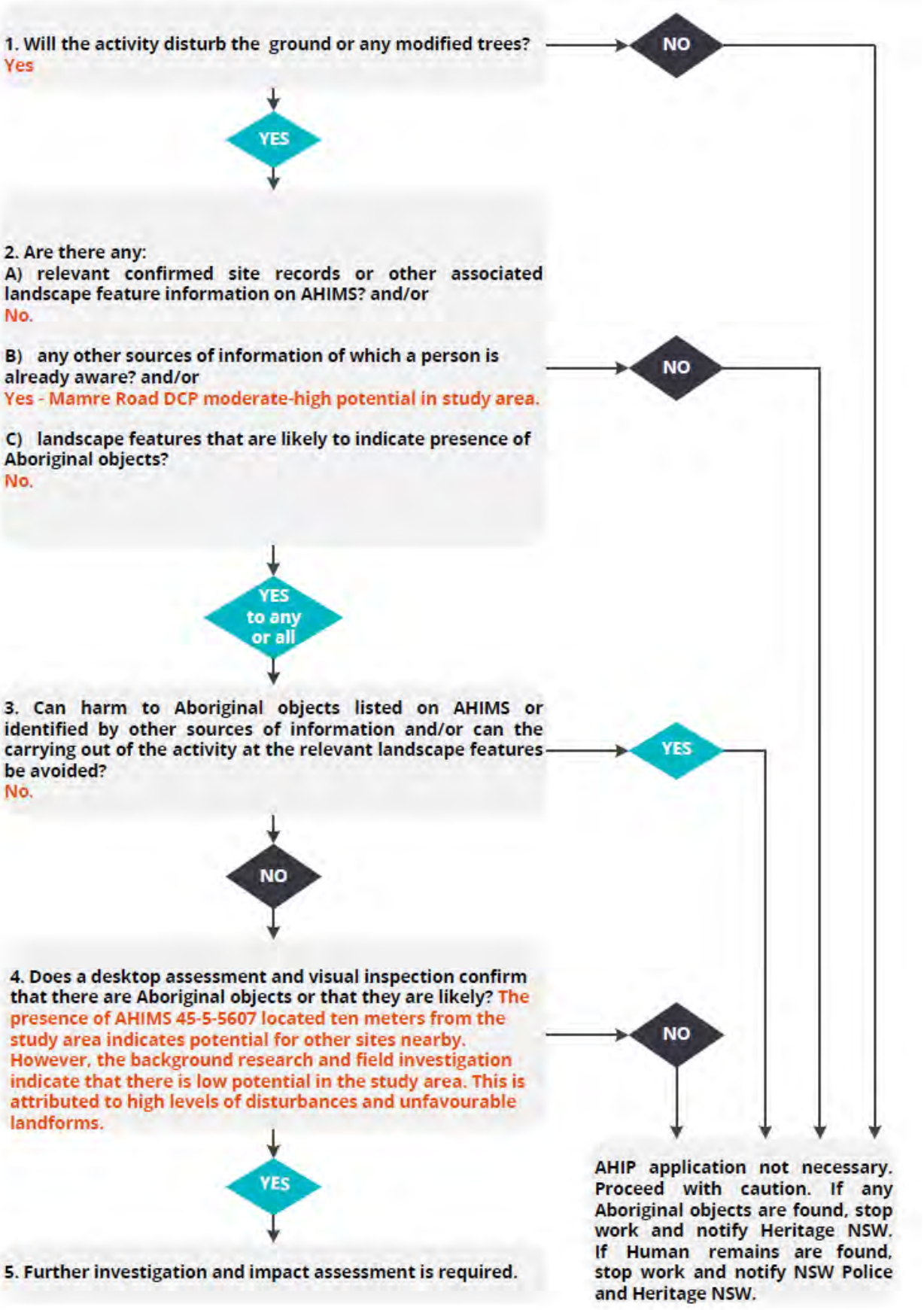
All Aboriginal objects and Places are protected under the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by Heritage NSW. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the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

Recommendation 5: Discovery of Aboriginal ancestral remains

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

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and 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.

Figure 10 Due diligence flow chart



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Appendices

Appendix 1 AHIMS search results

This Appendix is not to be made public.

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 38335 AV

Client Service ID : 733150

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-4-0971	EP3 - "Erskine Park 3"	AGD	56	295814	6254965	Open site	Valid	Artefact : -	Open Camp Site	97503
	Contact	**Recorders**	Doctor.Jo McDonald					**Permits**		
45-4-0972	EP4 - "Erskine Park 4 "	AGD	56	295740	6254900	Open site	Valid	Artefact : -	Open Camp Site	97503,98435
	Contact	**Recorders**	Doctor.Jo McDonald					**Permits**		
45-4-0973	EP5 - " Erskine Park 5 "	AGD	56	295349	6254843	Open site	Valid	Artefact : -	Isolated Find	97503,98435
	Contact	**Recorders**	Doctor.Jo McDonald					**Permits**		
45-4-0974	EP7 - "Erskine Park 7"	AGD	56	294580	6255220	Open site	Valid	Artefact : -	Open Camp Site	97503,98435
	Contact	**Recorders**	Doctor.Jo McDonald					**Permits**	2256	
45-4-0975	EP6 - " Erskine Park 6 "	AGD	56	294652	6255153	Open site	Valid	Artefact : -	Open Camp Site	97503,98435
	Contact	**Recorders**	Doctor.Jo McDonald					**Permits**		
45-4-0976	EP8 - " Erskine Park 8 "	AGD	56	294657	6254870	Open site	Valid	Artefact : -	Open Camp Site	97503,98435
	Contact	**Recorders**	Doctor.Jo McDonald					**Permits**		
45-4-0977	EP9 - " Erskine Park 9 "	AGD	56	295440	6254955	Open site	Valid	Artefact : -	Open Camp Site	97503,98435
	Contact	**Recorders**	Doctor.Jo McDonald					**Permits**		
45-4-0978	EP2 - " Erskine Park 2 "	AGD	56	295615	6254982	Open site	Valid	Artefact : -	Open Camp Site	97503,98435
	Contact	**Recorders**	Doctor.Jo McDonald					**Permits**		
45-4-0970	EP1 - "Esrkine Park 1"	AGD	56	295277	6254955	Open site	Valid	Artefact : -	Open Camp Site	97503,98435
	Contact	**Recorders**	Doctor.Jo McDonald,Stephanie Garling					**Permits**		
45-5-2516	Erskine Park Quarry 6 (EPQ6)	AGD	56	296580	6255120	Open site	Valid	Artefact : -	Open Camp Site	98435
	Contact	**Recorders**	Doctor.Jo McDonald,Mr.Mark Rawson					**Permits**	2076,2188	
45-5-0604	Cecil Park 1	AGD	56	297350	6251470	Open site	Valid	Artefact : -	Open Camp Site	1283,98435
	Contact	**Recorders**	Smith,M Hanckel					**Permits**	694	
45-5-0605	Cecil Park 2	AGD	56	297600	6251780	Open site	Valid	Artefact : -	Open Camp Site	1283,98435
	Contact	**Recorders**	Smith,M Hanckel					**Permits**		
45-5-0215	South Creek	AGD	56	293800	6249900	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	362
	Contact	**Recorders**	Ms.Laila Haglund					**Permits**		
45-5-0496	Fleurs1 Fleurs Radio Telescope	AGD	56	293750	6250730	Open site	Valid	Artefact : -	Open Camp Site	961,1018,98435
	Contact	**Recorders**	University of Sydney					**Permits**		
45-5-2857	HP1	AGD	56	297500	6255160	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.John Appleton					**Permits**		
45-5-3065	EPR1	AGD	56	294147	6255326	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Doctor.Susan (left ahms) Mcintyre-Tamwoy					**Permits**	2255	
45-5-3066	EPR2	AGD	56	294184	6255333	Open site	Valid	Artefact : -		
	Contact	**Recorders**	M McIntyre					**Permits**	2255	
45-5-3067	EPR3	AGD	56	294240	6255315	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 17/11/2022 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 293592.452 - 297716.899, Northings : 6249989.985 - 6255548.948 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 112

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 38335 AV

Client Service ID : 733150

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	M McIntyre					**Permits**	2255	
45-5-3058	EV1	AGD	56	295751	6254547	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Jim Wheeler					**Permits**		
45-5-3059	EV2	AGD	56	295663	6254735	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Jim Wheeler					**Permits**	2237	
45-5-3060	EV3	AGD	56	295666	6254988	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Jim Wheeler					**Permits**	2237,2391	
45-5-3061	EV4	AGD	56	295822	6254837	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Alan Wheatley					**Permits**	2391	
45-5-3028	EPTA3	AGD	56	294160	6254370	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3029	EPTA4	AGD	56	294850	6253540	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3030	EPTA5	AGD	56	295170	6253570	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3031	EPTA6	AGD	56	295210	6253410	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3032	EPTA10	AGD	56	293580	6253610	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3034	EP-I 1	AGD	56	295260	6253400	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3035	EP-I 2	AGD	56	295190	6253500	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-3036	EP-I 3	AGD	56	295240	6253710	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**	2188	
45-5-2992	Erskine Park Quarry (EPQ1)	AGD	56	296600	6255175	Open site	Valid	Artefact : -		
	Contact T Russell	**Recorders**	Doctor.Jo McDonald,Mr.Mark Rawson					**Permits**	2076,2188	
45-5-3266	Erskine Park Roadworks (EPR 3)	AGD	56	294240	6255315	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Doctor.Susan (left ahms) Mcintyre-Tamwoy					**Permits**		
45-5-3267	Erskine Park Roadworks (EPR 1)	AGD	56	294147	6255326	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Doctor.Susan (left ahms) Mcintyre-Tamwoy					**Permits**		
45-5-3268	Erskine Park Roadworks (EPR 2)	AGD	56	294184	6255333	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Doctor.Susan (left ahms) Mcintyre-Tamwoy					**Permits**		

Report generated by AHIMS Web Service on 17/11/2022 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 293592.452 - 297716.899, Northings : 6249989.985 - 6255548.948 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 112

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Extensive search - Site list report

Your Ref/PO Number : 38335 AV

Client Service ID : 733150

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-5-3273	erskine park roadworks (EPR 7)	GDA	56	294262	6255398	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Doctor.Susan (left ahms) Mcintyre-Tamwoy,Mrs.Tessa Boer-Mah					**Permits**		
45-5-3382	Oakdale Campsite 1	AGD	56	297377	6255038	Open site	Partially Destroyed	Artefact : 3		103482
	Contact Searle	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**	3728	
45-5-3383	Oakdale Campsite 2	AGD	56	297391	6254871	Open site	Valid	Artefact : 3		
	Contact Searle	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-3384	Oakdale Campsite 3	AGD	56	297295	6254935	Open site	Valid	Artefact : 3		
	Contact Searle	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-3385	Oakdale Campsite 4	GDA	56	296733	6254945	Open site	Destroyed	Artefact : 3		
	Contact Searle	**Recorders**	Dominic Steele Archaeological Consulting,Artefact - Cultural Heritage Management					**Permits**		
45-5-2518	Erskine Park Quarry 1 (EPQ1)	AGD	56	296600	6255175	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Unknown Author					**Permits**		
45-5-4102	Kemps Creek IF1	GDA	56	295565	6253701	Open site	Valid	Artefact : 1		104747
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-4103	Kemps Creeks IF2	GDA	56	294737	6254040	Open site	Valid	Artefact : 1		104747
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-4104	Kemps Creek (logosoc1)	GDA	56	295307	6254094	Open site	Valid	Artefact : 1		104747
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-4105	Kemps Creek (logosoc2)	GDA	56	295265	6254066	Open site	Valid	Artefact : -		104747
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-4328	Oakdale Central 2	GDA	56	297701	6255070	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	GML Heritage Pty Ltd - Surry Hills,Miss.Diana Cowie					**Permits**		
45-5-4329	Oakdale Central 3	GDA	56	297665	6255265	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	GML Heritage Pty Ltd - Surry Hills,Miss.Diana Cowie					**Permits**		
45-5-4330	Oakdale Central 4	GDA	56	297614	6255227	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	GML Heritage Pty Ltd - Surry Hills,Miss.Diana Cowie					**Permits**		
45-5-4524	Oakdale South AS1	GDA	56	297508	6254973	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Mr.Alex Timms					**Permits**		
45-5-4525	Oakdale South IF2	GDA	56	297566	6254552	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Mr.Alex Timms					**Permits**		
45-5-4526	Oakdale South AS2	GDA	56	297513	6254618	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Mr.Alex Timms					**Permits**		
45-5-4527	Oakdale South IF1	GDA	56	297516	6254817	Open site	Valid	Artefact : -		104331
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Mr.Alex Timms					**Permits**		
45-5-4528	Oakdale South AS3	GDA	56	297508	6254390	Open site	Valid	Artefact : -		104331
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Mr.Alex Timms					**Permits**		

Report generated by AHIMS Web Service on 17/11/2022 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 293592.452 - 297716.899, Northings : 6249989.985 - 6255548.948 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 112

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 38335 AV

Client Service ID : 733150

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-5-4529	Oakdale South AS4	GDA	56	297190	6253944	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Mr.Alex Timms					**Permits**		
41-5-0016	MNPAD01	GDA	56	293879	6255448	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats,Mrs.S					**Permits**	4655	
45-5-4672	Oakdale West Artefact Scatter 1 (OW AS 1)	GDA	56	297234	6255014	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Josh Symons					**Permits**		
45-5-4673	Oakdale West Isolated Find 1 (OW IF 1)	GDA	56	297349	6255114	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Mr.Josh Symons,Mr.Ryan Tadd					**Permits**		
45-5-4674	Oakdale West Artefact Scatter 2 (OW AS 2)	GDA	56	297355	6255099	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Josh Symons					**Permits**		
45-5-4675	Oakdale West Isolated Find (OW IF 2)	GDA	56	296627	6254876	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Mr.Josh Symons,Mr.Ryan Tadd					**Permits**		
45-5-4676	Oakdale West Isolated Find 3	GDA	56	295882	6254754	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Mr.Josh Symons,Mr.Ryan Tadd					**Permits**		
45-5-4718	Mamre West Precinct - Archaeological Deposit 2 (MWP-AD2)	GDA	56	294095	6255380	Open site	Valid	Artefact : -		104138,104145
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Miss.Shannon Smith					**Permits**		
45-5-4719	Mamre West Precinct - Archaeological Deposit 4 (MWP-AD4)	GDA	56	294089	6255064	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Miss.Shannon Smith					**Permits**		
45-5-4720	Mamre West Precinct - Archaeological Deposit 3 (MWP-AD3)	GDA	56	293670	6255005	Open site	Valid	Artefact : -		104138
	Contact	**Recorders**	Biosis Pty Ltd - Sydney,Biosis Pty Ltd - Wollongong,Mr.James Cole,Miss.Shannon Sn					**Permits**		
45-5-4749	M12 A4	GDA	56	293785	6251051	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes					**Permits**		
45-5-5133	Oakdale West 18 Isolated Find 01	GDA	56	296303	6254317	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Artefact - Cultural Heritage Ma					**Permits**		
45-5-5134	Oakdale West 18 Artefact Scatter 02	GDA	56	296886	6254515	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Artefact - Cultural Heritage Ma					**Permits**		
45-5-5135	Oakdale West 18 Artefact Scatter 03	GDA	56	296777	6254242	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Artefact - Cultural Heritage Ma					**Permits**		
45-5-5136	Oakdale West 18 Isolated Find 02	GDA	56	296659	6254589	Closed site	Destroyed	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Artefact - Cultural Heritage Ma					**Permits**		
45-5-5137	Oakdale West 18 Artefact Scatter 01	GDA	56	297167	6254820	Closed site	Destroyed	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Artefact - Cultural Heritage Ma					**Permits**		
45-5-5187	MSP-01	GDA	56	294210	6254558	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats,Mrs.S					**Permits**		
45-5-5188	MSP-02	GDA	56	293594	6253823	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats,Mrs.S					**Permits**		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 38335 AV

Client Service ID : 733150

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
41-5-0014	M12-AS-04	GDA	56	294361	6250957	Open site	Destroyed	Artefact : 1		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Miss.Chelsea Jones,Mr.Matthew Kellel					**Permits**		
45-5-5186	Mamre Road Artefact Scatter 1901 (MAM AS1901)	GDA	56	295114	6253373	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Artefact - Cultural Heritage Ma					**Permits**		
45-5-5274	Bakers Lane SLR AFT 1	GDA	56	295915	6254097	Open site	Partially Destroyed	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats,Mr.Matthew Kelleher,Kelleher Nig					**Permits**		
45-5-5268	Kemps Creek IF-02	GDA	56	295030	6253859	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Urbis Pty Ltd - Angel Place L8 123 Pitt Street,Miss.Meggan Walker					**Permits**		
45-5-5269	Kemps Creek IF-01	GDA	56	294976	6253943	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Urbis Pty Ltd - Angel Place L8 123 Pitt Street,Miss.Meggan Walker					**Permits**		
45-5-5303	Kemps North West (KNW) PAD	GDA	56	295455	6250265	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Mr.Andrew Costello,Jacobs Group (Australia) Pty Ltd - North Sydney					**Permits**		
45-5-5306	South Creek East (SCE)	GDA	56	293940	6251020	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Mr.Andrew Costello,Jacobs Group (Australia) Pty Ltd - North Sydney,Mr.Matthew K					**Permits**		
45-5-5315	MRP-OS2	GDA	56	296737	6253925	Open site	Valid	Artefact : -		
	Contact	**Recorders**	EMM Consulting - St Leonards - Individual users,Ms.Taylar Reid					**Permits**		
45-5-5316	MRP-OS1	GDA	56	294413	6252254	Open site	Valid	Artefact : -		
	Contact	**Recorders**	EMM Consulting - St Leonards - Individual users,Ms.Taylar Reid					**Permits**		
45-5-5358	OW 19 IF 2	GDA	56	296486	6254788	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Artefact - Cultural Heritage Ma					**Permits**		
45-5-5359	OW 19 IF 1	GDA	56	296535	6254830	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Artefact - Cultural Heritage Ma					**Permits**		
45-5-5340	MSP-05	GDA	56	294016	6254604	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5341	MSP-06	GDA	56	294123	6254552	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5342	MSP-07	GDA	56	294146	6254469	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5343	MSP-08	GDA	56	294155	6254417	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5344	MSP-09	GDA	56	294469	6253984	Open site	Valid	Artefact : -		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 38335 AV

Client Service ID : 733150

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5345	MSP-10	GDA	56	294548	6253896	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5357	Oakdale West Industrial Estate Artefact Reburial	GDA	56	297245	6255243	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Mr.Ryan Taddeucci					**Permits**		
45-5-5486	MR902TE_AS1	GDA	56	295460	6252681	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Austral Archaeology - Wollongong,Mr.Ricardo Servin					**Permits**		
45-5-5467	ARKC Area 1	GDA	56	296685	6252817	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5468	ARKC Area 3	GDA	56	296932	6253304	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5469	ARKC Area 2	GDA	56	296768	6253309	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5634	Mamre Road PAD 1	GDA	56	296283	6251079	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5565	BakersLn PAD3	GDA	56	295361	6253886	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5566	BakersLn PAD4	GDA	56	295463	6254049	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5567	BakersLn PAD5	GDA	56	295258	6253931	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5568	ALD-RD-PAD-01	GDA	56	295809	6253440	Open site	Valid	Potential Archaeological Deposit (PAD) : -		104841,104842
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5569	BakersLn PAD2	GDA	56	295194	6253772	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5570	BakersLn PAD1	GDA	56	295064	6254052	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5619	Bakers Lane PAD01	GDA	56	295382	6254225	Open site	Valid	Potential Archaeological Deposit (PAD) : -		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 38335 AV

Client Service ID : 733150

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Mr.Michael Lever					**Permits**		
45-5-5632	805MAMRE-AS01	GDA	56	294607	6253281	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Mr.Michael Lever					**Permits**		
45-5-5501	784 Mamre Rd AFT1	GDA	56	295424	6253360	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Urbis Pty Ltd - Angel Place L8 123 Pitt Street,Urbis Pty Ltd - Angel Place L8 123 Pitt					**Permits**		
45-5-5502	Aldington Rd Kemps Ck IF-1	GDA	56	296357	6251913	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Urbis Pty Ltd - Angel Place L8 123 Pitt Street,Mr.Owen Barrett					**Permits**		
45-5-5503	Abbot's Rd Kemps Creek IF1	GDA	56	296422	6251265	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Urbis Pty Ltd - Angel Place L8 123 Pitt Street,Mr.Owen Barrett					**Permits**		
45-5-5504	Abbot's Rd Kemps Creek IF2	GDA	56	296149	6251410	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Urbis Pty Ltd - Angel Place L8 123 Pitt Street,Mr.Owen Barrett					**Permits**		
45-5-5505	Abbott's Rd Kemps Creek IF3	GDA	56	296168	6251367	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Urbis Pty Ltd - Angel Place L8 123 Pitt Street,Mr.Owen Barrett					**Permits**		
45-5-5607	Aldington Road 01	GDA	56	296335	6253304	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Austral Archaeology - Wollongong,Miss.Stephanie Moore					**Permits**		
45-5-5608	Aldington Road 02	GDA	56	296072	6253285	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Austral Archaeology - Wollongong,Miss.Stephanie Moore					**Permits**		
45-5-5609	Aldington Road 03	GDA	56	296045	6253055	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Austral Archaeology - Wollongong,Miss.Stephanie Moore					**Permits**		
45-5-5610	Aldington Road 04	GDA	56	295845	6253075	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Austral Archaeology - Wollongong,Miss.Stephanie Moore					**Permits**		
45-5-5578	Aldington Road Kemps Creek PAD 1	GDA	56	296008	6252610	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		
45-5-5614	Bakers Lane IF 01	GDA	56	295828	6254057	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management - Pyrmont,Ms.Isabel Wheeler					**Permits**		

**** Site Status**

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

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