1377 Hue Hue Road, Wyee
Aboriginal Due Diligence Assessment

DRAFT REPORT

Prepared for TOPA Property Pty Ltd

18 August 2021

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Glossary

ACHA	Aboriginal Cultural Heritage Assessment
ADDA	Aboriginal Due Diligence Assessment
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
Consultation requirements	*Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*
Due diligence code	*Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*
EP&A Act	*Environmental Planning and Assessment Act 1979*
GSV	Ground Surface Visibility
Heritage NSW	Heritage NSW, Department of Premier and Cabinet (DPC)
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
PAD	Potential Archaeological Deposit
Study area	1377 Hue Hue Road, Wyee, NSW
The Code	The *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*

Summary

Biosis Pty Ltd (Biosis) has been commissioned by TOPA Property Pty Ltd (TOPA) to undertake an Aboriginal Due Diligence Assessment (ADDA) for the proposed land rezoning at 1377 Hue Hue Road, Wyee, New South Wales (NSW) (the project). The project involves the rezoning of the land to R2 Low Density Residential. This will be assessed as a planning proposal to be prepared by TOPA under Part 3 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Background research identified that the study area is located within the Tuggerah Formation and Alluvial Valley Deposits geological units. The moderately deep to deep (>100 millimetres) erosional Doyalson soil landscape and the alluvial Wyong soil landscape were identified to underlie the study area, which is contained within a gently sloping landform towards Mannering Creek, a third order non perennial water course located in the south.

Background research also included a search of the Aboriginal Heritage Information Management System (AHIMS) database and a review of relevant reports. The search identified 103 Aboriginal archaeological sites within a 4.5 kilometre search area, centred on the study area. None of these registered sites are located *within* the study area or a 200 metre proximity.

The study area is not located within the Sensitive Aboriginal Landscape identified by Umwelt (2011) within the Lake Macquarie LGA. However, an assessment undertaken immediately east of the study area identified two artefact sites along Mannering Creek (Insite Heritage 2010), which transects the southern portion of the study area. A review of historical aerials shows that limited development has occurred within the study area, with isolated disturbances located in the north west and west. Remnant vegetation is visible in the south of the study area indicating low levels of disturbance within this area. Crop lines are visible within the central and northern portions indicating superficial (approximately 200 millimetres in depth) disturbance. Due to the depth of the soil landscape, there is potential for undisturbed contexts to remain within areas of superficial disturbances and remnant vegetation.

A field investigation of the study area was conducted on 10 August 2021 by Anthea Vela (Biosis Archaeologist). A meandering transect was walked throughout the study area targeting areas of exposure and visibility. The north eastern and southern portions of the study area were identified to have been relatively undisturbed and contain flat landform features overlooking or located adjacent to Mannering Creek. The remaining area contained disturbances caused by residential development and associated structures, in addition to evidence of cropping. No Aboriginal objects were recorded during the field investigation, however this is likely attributable to the limited exposure and areas of disturbance seen during the field investigation, rather than an absence of Aboriginal occupation of the area.

Based on the results of the field investigation and background review, it is likely Aboriginal people utilised the study area for both occupation and resource gathering with Mannering Creek providing Aboriginal people access to a range of resources. The low levels of previous disturbance towards the north eastern and southern portions of the study area observed during the field investigation, in addition to the level and well draining landform features present suggests that there is moderate potential for intact archaeological deposits to exist within the study area. Areas containing extensive levels of residential development and associated structures contain a high likelihood for Aboriginal artefacts to have been removed during construction, therefore the potential for intact, Aboriginal deposits is low in these areas.

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

Recommendation 1: Avoid impacts to areas of moderate archaeological potential where possible

Areas identified as having moderate archaeological potential should be avoided wherever possible. It is recommended that avoidance of these areas is considered as part of the planning proposal.

If impacts to areas of moderate archaeological potential is not possible, further archaeological investigation in the form of an Aboriginal Cultural Heritage Assessment (AHCA), including Aboriginal community consultation and test excavations, must be undertaken prior to impacts occurring. Consultation must be undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (consultation requirements), and test excavations must be undertaken in compliance with *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b) (the Code). If any Aboriginal artefacts are identified during test excavations, an Aboriginal Heritage Impact Permit (AHIP) will be required prior to any works proceeding.

Recommendation 2: No further archaeological assessment is required throughout areas of low potential

No further archaeological assessment is required within areas assessed as having low archaeological potential. Works may proceed with caution in these areas subject to Recommendations 3 and 4 below.

Recommendation 3: Discovery of Unanticipated Aboriginal Objects

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

Recommendation 4: 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.

1 Introduction

1.1 Project background

Biosis has been commissioned by TOPA to undertake an ADDA for the proposed land rezoning at 1377 Hue Hue Road, Wyee, NSW (the project) (Figure 1 and Figure 2). The project involves the rezoning of the land to R2 Low Density Residential (Figure 3). This will be assessed as a planning proposal to be prepared by TOPA under Part 3 of the 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 an ADDA, an extended background review, as well as a field investigation in accordance with the Code was conducted, in order adequately map areas of high, moderate and low archaeological sensitivity.

1.2 Location of the study area

The study area is located within the Lake Macquarie Local Government Area (LGA), Parish of Morisset, and County of Northumberland (Figure 1). The study area incorporates Lot 437 DP 755242 and is bounded by Hue Hue Road to the north, private property to the east, and Digary Road and road reserve to the west and south (Figure 2).

1.3 Planning approvals

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

- NPW Act.
- *National Parks and Wildlife Amendment Act 2010* (NSW).
- *Lake Macquarie Local Environmental Plan 2011* (LEP).

1.4 Scope of the assessment

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

- Conduct background research in order to recognise any identifiable trends in site distribution and location, including a search of the AHIMS database.
- Undertake archaeological field investigation 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 field investigation 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.

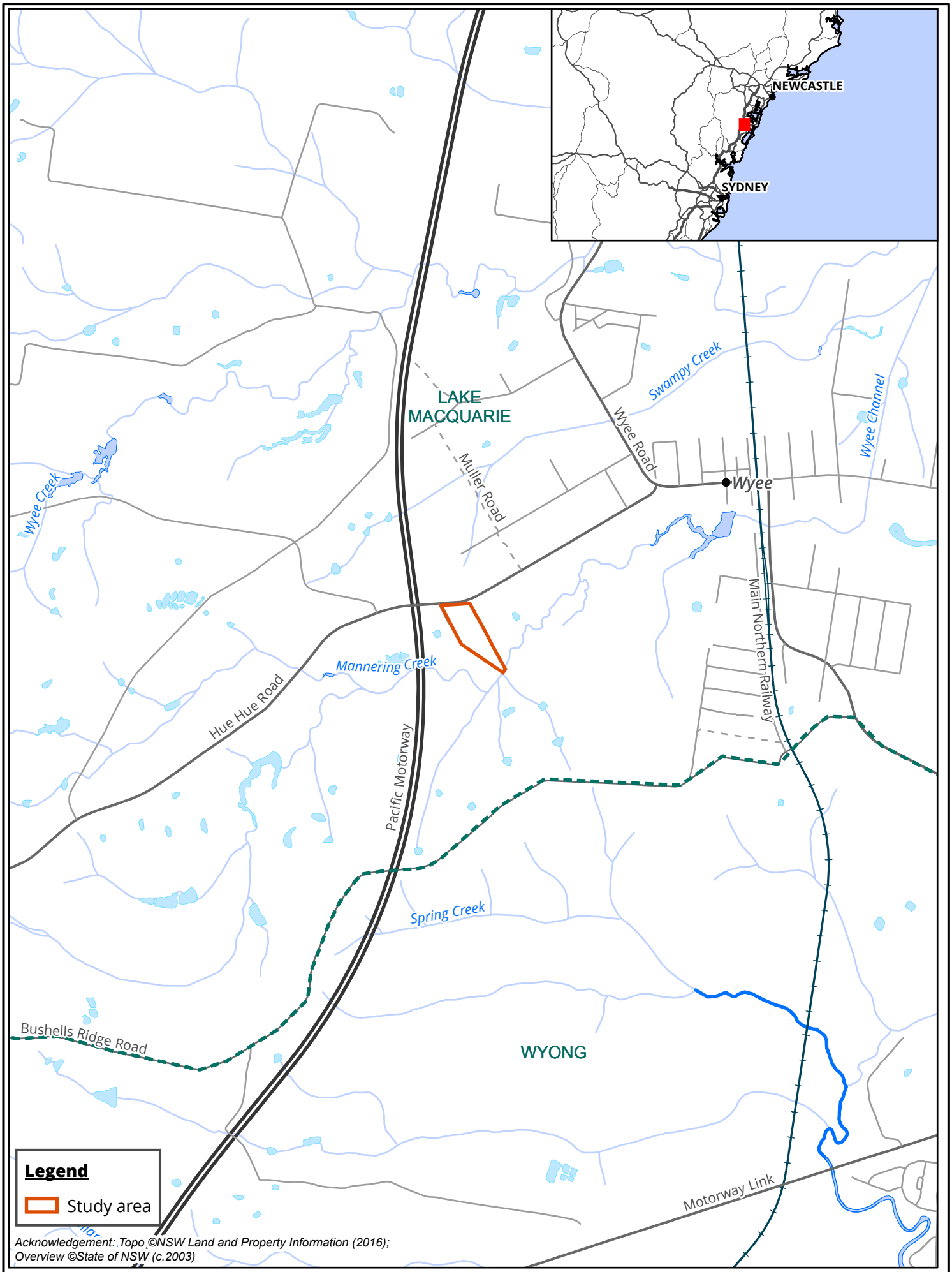

Figure 1 Location of the study area

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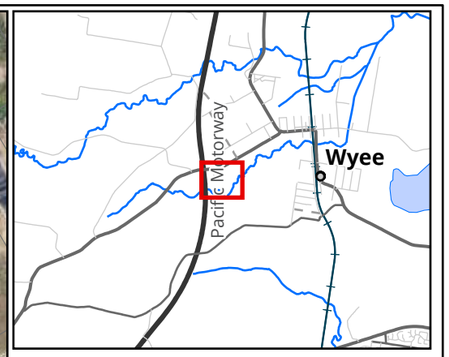
0 200 400 600 800 1,000
Metres
Scale 1:1:25,000@ A4, GDA 1994 MGA Zone 56

N



Legend

- Study area
- Lot

Figure 2 Study area detail

0 10 20 30 40 50

Metres

Scale: 1:2,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

N

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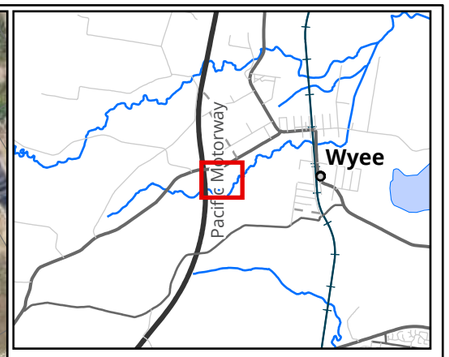

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Study area

Lot

Figure 3 Proposed works

0 10 20 30 40 50

Metres

Scale: 1:2,000@ A3

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

2.2 Geology, soils and landforms

The study area is located on the Central Coast Lowlands (Murphy 1993 p2) along the coastal strip bounded by the Watagan Mountains to the east, Terrigal to the south and Munmorah State Recreation Area to the north (Murphy 1993 p2). This area is characterised by low lying terrain with low rises, alluvial plains and dune fields along the coast, a series of coastal lakes, and is located on the Narrabeen Group.

Geological units underlying the study area include the Tuggerah Formation and Alluvial Valley Deposits (Figure 4). The Tuggerah formation comprises of grey to green-grey laminate, to red-brown claystone and siltsone, and fine to medium grained green grey sandstone. Alluvial Valley deposits are comprised of silt, clay, lithic to quartz lithic sand and gravel (Murphy 1993).

The surrounding topography includes undulating rises with local relief of 30 metres and slope gradients of less than 10%. Broad crests, ridges and long gently inclined slopes with broad drainage lines are common landform elements. Topographically the study area gradually slopes south with a crest located to the north west (Figure 5).

Stream order is recognised as a factor which aids in the development of predictive modelling in Aboriginal archaeology. Predictive models which have been developed have a tendency to favour permanent water courses as the locations of complex sites that have been continuously occupied, as they would have been more likely to provide a stable source of water and by extension other resources which would have been used by Aboriginal groups.

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

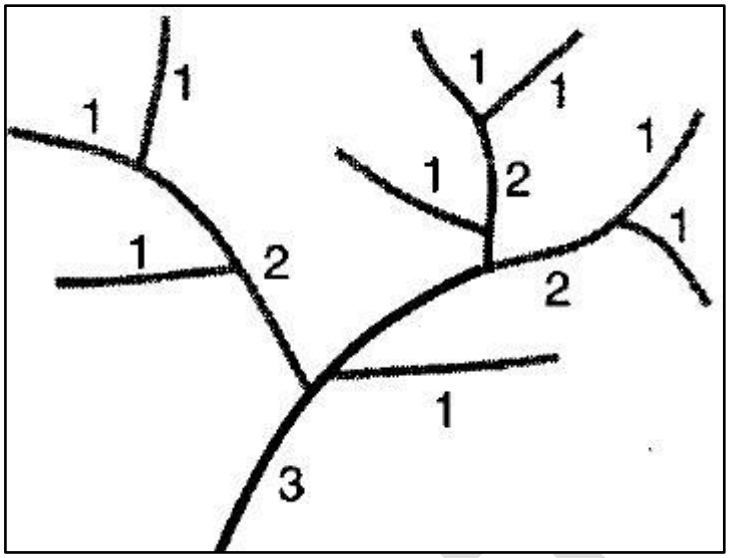

Photo 1 Diagram showing Strahler stream order (Ritter et al. 1995, p.151)

Hydrology within the study area includes Mannering Creek within the southernmost portion. This is a third order non perennial creek line (Figure 5). Lower order tributaries confluence to the south of the study area. The confluences of creeks and other water sources can be associated with Aboriginal sites. Mannering Creek is a tributary of Mannering Lake, a natural perennial water body located approximately 2.5 kilometres east and Wyee Creek, a fourth order perennial water course via the manmade Wyee Channel.

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

Two soil landscapes are present within the study area, Doyalson in the north and Wyong in the south (Figure 6).The Doyalson Soil Landscape is characterised as an erosional landform comprised of moderately deep yellow and some red podzolic soils and soloths, occurring on sandstone and conglomerate. Moderately deep to deep yellow leached earths, grey earths, soloths and gleyed podzolic soils occur along drainage lines. Broad crests, ridges and long gently inclined slopes are major landforms that occur within this landscape. This soil is subject to high erosional hazard (Murphy 1993 p49). A description of the soil types present within the Doyalson soil landscape are provided in Table 1.

Table 1 Doyalson soil landscape characteristics (Murphy 1993 p49-50)

Soil material	Description
Do1 – Brown loose loamy sand	0 – 20 centimetres of loose brown loamy sand, with coarse-grained texture and single-grained structure of sandy fabric that usually occurs as topsoil. When organic matter content is high, weak sub-angular structure with rough ped fabric is present within this soil material. Soil colour ranges from brownish black (10YR 3/1) to dull yellowish brown (10YR 5/3). Gravel-sized sandstone rock fragments, quartz and conglomerate pebbles are common inclusions, and roots and charcoal fragments are present within this soil context. pH ranges from 5.0 – 6.0.
Do2 – hard setting bleached yellowish brown clayey sand	10 – 30 centimetres of hard setting bleached yellowish brown clayey sand, with sandy fabric. This soil material occurs as a shallow subsoil, but is sometimes exposed as a surface deposit. This soil material is hard setting when dry. Soil colour ranges from dull

Soil material	Description
	yellowish brown (10YR 5/3) to yellow orange 910YR 7/3). When dry soil colours are often bleach (10YR 7/2 to 10YR 8/1). Pale orange mottles are present along root channels. Sandstone rock fragments, quartz and conglomerate pebbles are often present inclusions, and roots are common and charcoal fragments are few within this soil context. pH ranges from 4.5 – 5.5.
Do3 – earthy bright yellowish brown sandy clay loam	30 – 60 centimetres earthy bright yellowish brown light sandy clay loam to sandy clay loam soils with massive structure and porous earthy fabric, occurring as a subsoil. Occasionally soil texture reaches a clay with moderately developed blocky structure. Soils colours range from brown (10YR 4/4) to more commonly bright yellowish brown (10YR 6/6). Inclusions include orange mottles, and faunal casts which are present within the upper portions of this soil material. Sandstone rock fragments, quartz and conglomerate pebbles are often present, but roots are few and charcoal fragments are absent within this soil context. pH ranges from 4.5 – 5.5.
Do4 – earthy light grey clay	0 – 50 centimetres of earthy light grey sandy clay loam to medium clay with coarse sand grains, with massive structure and dense earthy fabric. Occurs as a deep subsoil overlying bedrock. Occasionally weak to moderate angular blocky structure present. Soil colours range from common light grey (2.5YR 8/1, 10YR 8/1) to dull yellow orange (10YR 7/2), 10YR 6/4). Red, yellow and orange mottles are common and sandstone rock fragments, quartz, and conglomerate pebbles are often present. Roots are few and no charcoal fragments are present within this soil material. pH ranges from 4.5 – 6.0.
Do5 – Strongly pedal clay	>100 centimetres of light to medium strongly pedal clays with strongly developed structure and smooth ped fabric. This soils material occurs as subsoil upon fine-grained bedrock. Ed sizes range from small polyhedral and sub-angular blocky to large prismatic or sub-angular blocky. This material has low wet bearing strength. Soil colour ranges from reddish brown (5YR 4/8) to dull yellow orange (10YR 7/2). Grey, orange and red mottles are present and increasing with depth. Inclusions include small rock fragments. Roots are few and charcoal fragments are rare if not absent from this soil material. pH ranges from 5.0 – 6.0.

The Wyong soil landscape is characterised as an alluvial landform comprising of deep yellow podzolic soils, brown podzolic soils, and soloths with some Humus Podzols surrounding lakes. Flooding is common with seasonal waterlogging. Common landforms include poorly drained deltaic floodplains and alluvial flats. Low lying slightly elevated terraces are occasionally present (Murphy 1993 p81). A description of the soil types present within this soil landscape are provided in Table 2.

Table 2 Wyong soil landscape characteristics (Murphy 1993 p81-82)

Soil material	Description
Wy1 - Brownish black pedal loam	Brownish black loam to silty clay loam with moderate sub-angular structure and a rough ped fabric that occurs as topsoil. This material usually has a friable surface condition and is occasionally hard setting when dry. Colour ranges from a common brownish black (10YR 7/1) when organic matter is abundant to greyish yellow brown (10YR 4/2). The pH ranges from strongly acid to slightly acid (pH6.0). Roots are common, but charcoal and rock fragments are absent.
Wy2 – Mottled brownish	Brownish slightly heavy clay with massive structure when wet and strong angular

Soil material	Description
grey plastic clay	blocky structure when dry occurring as subsoil. This material is often plastic and silty. It is often permanently waterlogged at depth with strong anaerobic odour. Colour ranges from brownish grey (10YR 6/1) to yellowish brown (10YR 4/8). Orange and straw coloured mottles are often present along root channels. The pH ranges from strongly acid (pH 4.0) to slightly acid (pH 6.0). Roots are rare and charcoal and rock fragments are absent.

Erosional soil landscapes such as the Doyalson soil landscape and alluvial soil landscapes such as the Wyong soil landscape can have a lower archaeological potential due to active removal and replacement of sediments causing the movement of surface artefacts. This is caused by erosion or flooding events that transport and remove deposits. However, high points within alluvial landscapes can hold archaeological potential as they are usually unaffected by flood water movements. Previous studies within the Lake Macquarie area have identified that artefact scatters are the most common site type identified within the Doyalson soil landscape and alluvial soils, in addition to shell, and Potential Archaeological Deposits (PAD) (Biosis 2018). Midden sites are also most likely to be identified within the Wyong soil landscape (Nelson 1995).

Legend

Study area

Geological Units

- QH_af,Alluvial floodplain deposits
- Q_ab,Alluvial backswamp deposits
- Q_acw,Alluvial channel deposits - subaqueous
- Q_af,Alluvial floodplain deposits
- Q_at,Alluvial terrace deposits
- Q_av,Alluvial valley deposits
- Q_avf,Alluvial fan deposits
- Q_h,Anthropogenic deposits
- Q_hl,Anthropogenic breakwaters, embankments and artificial levees
- Q_hw,Anthropogenic stored water, pondage, reservoirs, canals
- Tncm,Munmorah Conglomerate
- Tncp,Patonga Claystone
- Tnct,Tuggerah Formation

Figure 4 Geological units in the vicinity of the study area

0 200 400 600 800 1,000

Metres

Scale: 1:20,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

N

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Matter: 35633,
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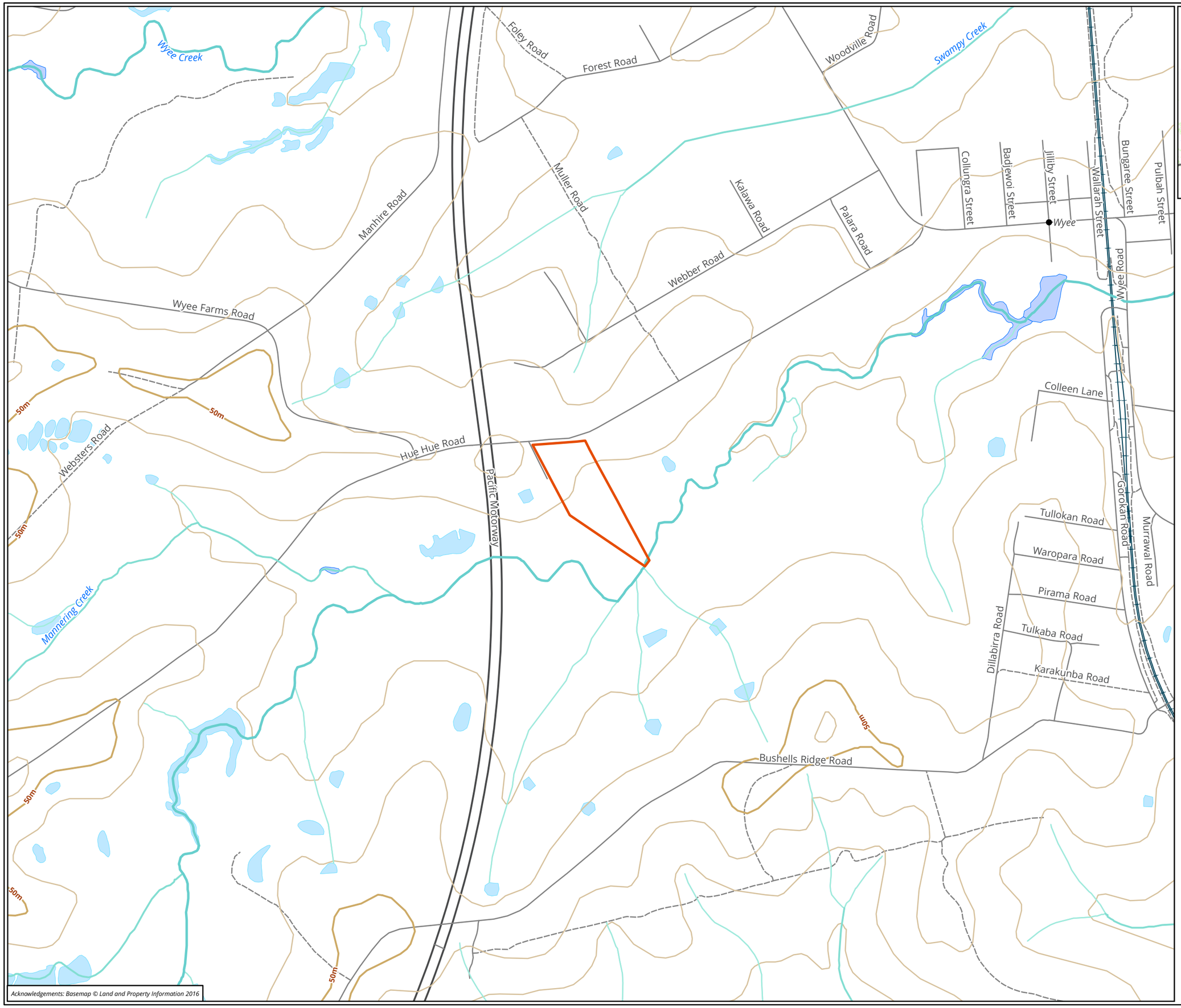
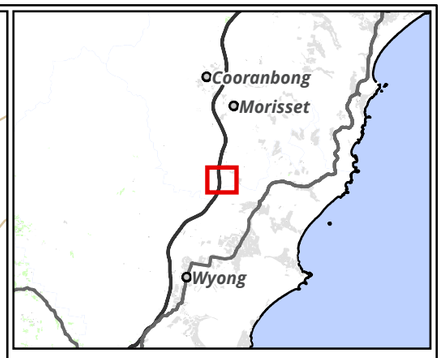
Location: P:\35600s\35633\Mapping\
35633_WyeeADDA, Layout: 35633_ADDA_F4_Geology

Acknowledgements: Basemap © NSW Land and Property Information 2016; Geology © State of New South Wales through Regional NSW 2020





Legend

- Study area
- Contour (10m)

Strahler Order

- 1
- 2
- 3

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

0 100 200 300 400 500

Metres

Scale: 1:10,000@ A3

Coordinate System:
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Legend

Study area

Soil Landscape units

- aw - AWABA
- do - DOYALSON
- gk - GOROKAN
- ml - MANDALONG
- ts - TACOMA SWAMP
- WATER - WATER
- wo - WOODBURYS BRIDGE
- wy - WYONG
- xx - DISTURBED TERRAIN

Figure 6 Soil landscapes in the vicinity of the study area

0 200 400 600 800 1,000

Metres

Scale: 1:20,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

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Location: P:\35600s\35633\Mapping\
35633_WyeeADDA, Layout: 35633_ADDA_F6_Soils

Acknowledgements: Basemap © Land and Property Information 2016; Soils: Murphy C.L., 1993, Soil Landscapes of the Gosford-Lake Macquarie 1:100,000 Sheet map and report, Department of Conservation and Land Management, Sydney;

2.3 Flora and fauna

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

Vegetation present within the Doyalson soil landscape includes Scribbly Gum *Eucalyptus haemastoma,* Red Bloodwood *E. gummifera,* Brown Stringybark *E. capitella*, Smooth-barked Apple *Angophora costala* and Grey Gum *E. punctate*. Understory species include Hill Banksia *Banksia spinulosa*, Banksia *B. oblongifolia*, and Mountain Devil *Lambertia Formosa* (Murphy 1993 p 49). Vegetation within the Wyong soil landscape includes *Melaleuca linarifolia*, Prickly-leaved Paperbark *M. stypheliodes*, Woolybutt *E. longidolia*, and Swamp Mahogany *E. robusta* (Murphy 1993 p 81).

Plant resources were used in a variety of ways. Fibres were twisted into string, which was used for many purposes, including the weaving of nets, baskets and fishing lines. String was also used for personal adornment. Bark was used in the provision of shelter; a large sheet of bark being propped against a stick to form a gunyah (Attenbrow 2002).

This vegetation would have supported a range of animals including Galah *Eolophus roseicapilla*, Sulphur-crested Cockatoo *Cacatua (Cacatua) galerita* Eastern Grey Kangaroo *Macropus giganteus,* Common Ringtail Possum *Pseudocheirus peregrinus,* Common Brushtail Possum *Trichosurus vulpecula,* Swamp Wallaby *Wallabia bicolor,* Red-necked Wallaby *Notamacropus rufogriseus,* Common Wombat *Vombatus ursinus,* Dingo *Canis familiaris,* Short-beaked Echidna *Tachyglossus aculeatus,* Northern Brown Bandicoot *Isoodon macrourus*, and Red-necked Pademelon *Thylogale thetis.*

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

2.4 Land use history

Historical aerial images allow for modern developments and disturbances to be identified within the study area. An aerial photograph dated to 1966 shows that initial tree clearance has occurred within the northern and central portion of the study area, while vegetation appears to remain in the south (Photo 2). Due to the quality of the aerial it is difficult to tell if any structures have been constructed on the land at this time.

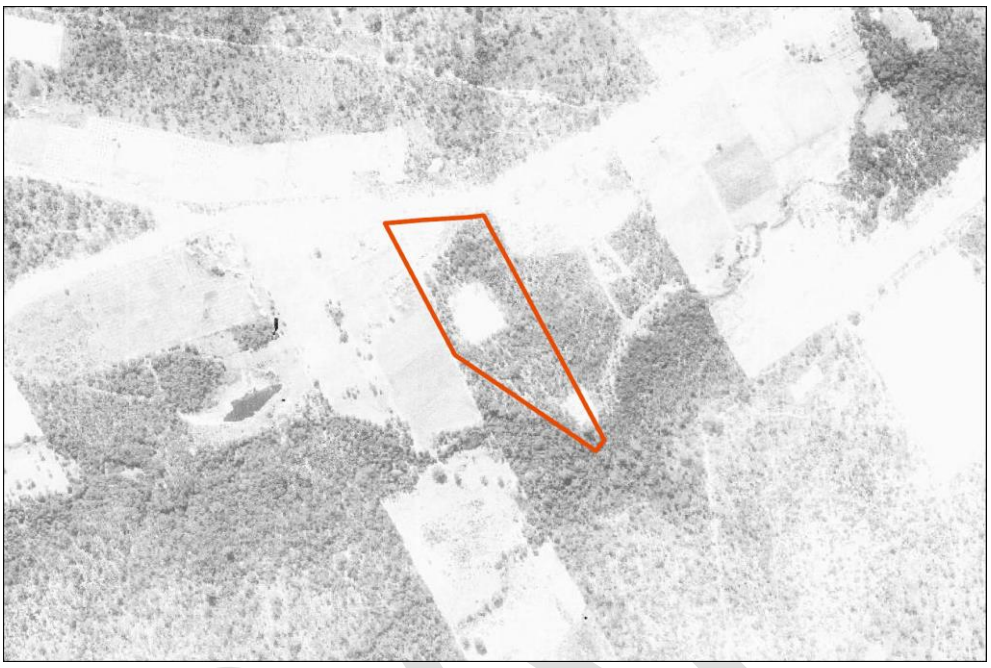


Photo 2 An aerial photograph dated to 1966 with the study area outlined in orange (Soruce: NSW Spatial services)

An aerial photograph dating to 1980 shows vegetation remaining in the south and a residential structure within the north western portion of the study area (Photo 3). Crop lines are visible in the remaining portion. An aerial photograph dated to 1994 shows additional structures have been constructed within the north western portion (Photo 4). Vegetation remains in the south, with little disturbance visible. Crop lines are present in the north east, and the M1 can be seen constructed to the west.

Photo 3 **An aerial photograph dated to 1980 with the study area outlined in orange (Soruce: NSW Spatial services)**

Photo 4 **An aerial photograph dated to 1994 with the study area outlined in orange (Soruce: NSW Spatial services)**

A current aerial photograph shows the structures remaining in the north west. Stables and a yard has been constructed on the central western border (Figure 2). Vegetation remains in the south with little disturbance visible and crop lines can be seen within the remaining land. Overall, minimal disturbance has occurred in the south fronting Mannering Creek. Isolated disturbances have occurred within the north west and west, with the remaining land containing surface impacts from agricultural use.

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 earliest undisputed radiocarbon date from the Lake Macquarie region comes from Mangrove Creek, approximately 35 kilometres south west of the study area. Excavations conducted at Mangrove Creek identified 31 shelters with datable material, with the oldest date being 11,050 years BP at Loggers Shelter (Attenbrow 1981). The majority of excavated shelter and open sites in the region however yield much younger dates of around 3,000 years BP (Attenbrow 1987, Koettig 1985, McDonald 1985).

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 in order 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. 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 within Lake Macquarie is based on such early records.

In 1892, a group extending from between the Macleay and Hasting Rivers near Port Macquarie in the north, along the coast to Bulli in the south and as far inland as the Great Dividing Range was identified as Kuring-Gai (Kuringai) by John Fraser (Attenbrow 2002, p.33). Several sub-groups were identified within this area, although all were considered to speak the Awabakal language. RH Matthews, writing at the beginning of the 20th century, considered Darginung (Darkinjung), a language spoken north-west of the Hawkesbury River, to be related to the Darug language, and that Darginung was a dialect (Attenbrow 2002, p.33). Tindale's 1974 map, although somewhat disputed due to the fluid nature of Aboriginal tribal boundaries, shows the Awabakal tribe located on the coast between what is now known as Newcastle and The Entrance, and extending inland as far as Toronto, with the Darkinjang (Darkinjung) tribe located immediately east of this area.

Vinnecombe (1980) places the Darkinjung people as living between the Hawkesbury and Hunter Rivers. Information gathered by R.H Matthews provides a valuable insight into the lives of the Darkinjung people, although this information was recorded within an already disjointed and numerically decimated community. He stated that all members of the Darkinjung community were segregated into two moieties Dilbi and Kuparthin, and each moiety was further divided into two sections (Mathews 1897). On the basis of these moieties and sections, totemic affiliation and marriage relations were determined. Totems consisted of animals or inanimate objects, such as plants, heavenly bodies, the elements or seasons.

It has been suggested that the Darkinjung would move to the coast, within Kuringai territory during summer months, to exploit the abundant coastal resources, and the reverse was true for the Kuringai who moved inland during winter months to participate in ritual kangaroo hunts (Vinnecombe 1980). These two groups had a cordial relationship, with reciprocal visits and regular trading of resources.

Norah Head, approximately 10 kilometres south of the study area, appears to be connected in some way with Bungaree, who is recorded in early colonial history as the chief of the Broken Bay tribe, although this is considered to be a fictitious title (McCarthy 1966, p.177). He achieved notoriety in the early nineteenth century through his sense of humour, grasp of the English language and ability to imitate conspicuous personalities in the colony (McCarthy 1966, p.177).

Bungaree sailed on the 'Norfolk' in 1799, and with Matthew Flinders on the 'Investigator' in 1801-02, thus becoming the first Aboriginal person to circumnavigate Australia (McCarthy 1966, p.177). Flinders reported he was very satisfied with Bungaree's services. In 1817 he sailed to the north of Western Australia with the surveyor Captain Philip Parker King. King noted that Bungaree was about 45 years of age at this time. Before this last trip, a brass plate given to him by Governor Macquarie granted him the title of "Chief of the Broken Bay Tribe" (McCarthy 1966, p.177). Governor Macquarie also set him up with 15 other Aboriginal people on a farm near Sydney. After Macquarie's death, Governor Brisbane gave him a fishing boat. He died in 1830 and was buried at Rose Bay (McCarthy 1966, p.177).

Since the arrival of European settlers the movement of Aboriginal people began to be increasingly restricted. Conflict between Europeans and Aboriginal people due to competition over the same resources led to violence. At the same time diseases such as small pox were having a devastating effect on the Aboriginal population (Attenbrow 2002, p 17). 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

Dallas (1986) completed a field investigation of a proposed pipeline between Gwandalan and Mannering Park Sewerage Treatment Works, located approximately 10 kilometres north west of the study area. One Aboriginal midden site was identified during the survey, consisting of a disturbed area of *Anadara trapezia* (cockle shells) over approximately 60 x 40 metres. The site was considered to be disturbed and of little scientific significance or research potential. It was recommended that the client apply for an s90 Consent to Destroy in order to construct the pipeline.

HLA (2005) undertook an archaeological excavation at Dora Creek 11 kilometres north of the study area, prior to the installation of a water pipeline, which passed through areas of PAD. The research design for the project stated that the aims were to "determine whether subsurface deposits with the potential for archaeological material existed within the alluvial flat around Dora Creek" (2005, p.20). Three boreholes were undertaken as part of geotechnical investigations at the development and the sediments were analysed in terms of their texture and colour to define the stratigraphy and placed into context within the broader region. No buried soil horizons were identified and no archaeological material was noted.

Insite Heritage Pty Ltd (Insite) (2011) conducted an Aboriginal archaeological assessment approximately 20 kilometres north of the study area, at Awaba. Insite also developed a predictive model for archaeological sites in the region which favoured river terraces as the location of archaeological sites. Site complexity would decrease as distance increased from water sources. In particular, grinding grooves are predicted to be located on creek lines where suitable rock exposures occur.

Although the field investigation was generally hindered by poor ground visibility three sites were identified on gentle slopes in the east and south-east of the assessment area:

- AWTF_ST1 (Photo 5) – A modified mahogany or stringybark tree with a scar measuring 116 centimetres long and 18 centimetres wide. The distance from the base of the tree was 75 centimetres. The scar is located on the south side of the tree.

- AWTF_ST2 – A modified tree which has been burnt and is dead. The scar has dimensions 171 centimetres long, 43 centimetres wide with a distance to the base of the tree being 116 centimetres.
- AWTF_ST3 – A modified tree with dimensions 78 centimetres long, 42 centimetres wide. Distance to ground level was 110 centimetres. The scar was located on the western side of the tree.

Photo 5 AWF_ST1 scar tree (source: Insite Heritage 2011, p.27)

Following the field investigation, a testing program was undertaken along creek lines within the site complex. Seven test pits were excavated in total to a maximum depth of 400 millimetres. Only one test pit contained no signs of disturbance and a single artefact; a silcrete flake found at the base of spit 3 (250 millimetres), was recovered.

Biosis (2018) completed a due diligence assessment for the NBN works at Toronto, NSW, a portion of which (Area 2TRT-22) was adjacent to and approximately 21 kilometres north of the study area. Background research conducted as part of this assessment identified high levels of archaeological potential for artefact sites and middens to be located within the development foot print based on AHIMS sites present within the site. Midden sites were concentrated along the shoreline of Lake Macquarie, while artefacts were identified within close proximity to permanent water sources. Subsequently, a field investigation was undertaken to test the results of the predictive modelling. The field investigation was hindered by high levels of disturbance in all parts of their study area. The field investigation of 2TRT-22 identified the area to have been impacted by previous residential and industrial development. Visibility was considered low at 15% and areas of exposure were limited to 10% where erosion from recent development and vehicle movement had occurred. Several previously recorded artefact and midden sites were relocated.

AMAC (2019) conducted an interim archaeological report for 26 Mann Street, Gosford located approximately 30 kilometres south of the study area. A previously recorded artefact site was present within the study area with moderate potential for intact deposits to remain. The site is located within 200 metres of Brisbane Waters and 100 metres of a lower order unnamed creek. A site inspection noted that although some modern disturbances have occurred, the site remained intact. Further investigation via an ACHA was recommended in addition to test excavation prior to development.

Biosis (2021) conducted an ACHA at Old Main Road, Fennel Bay, located approximately 20 kilometres north of the study area. Background research identified two AHIMS sites, a grinding groove and rock shelter, were previously recorded within 200 metres of the study area. Previous assessments in the area also noted potential for artefact scatters, being the most commonly occurring site type, in addition to middens, rock shelters and grinding grooves. Based on this, land form units including ridgelines, crest spurs and upper slopes were targeted during the field investigation. Lower slopes and creek terraces were also targeted. Scarred trees had potential to occur throughout the study area.

Predictive modelling for the site based on AHIMS results within the vicinity was also conducted and included the Doyalson soil landscape and Alluvial Valley deposits geological unit. Artefact scatters were the most common site type to occur within the Doyalson soil landscape followed by shell, PAD and Aboriginal ceremony and dreaming. Artefact scatters and PAD sites were the most common site types that occurred within the Alluvial Valley deposit geological unit, followed by water hole. Artefacts were found on average within 170 metres of ephemeral water courses, grinding grooves within 160 metres, shell within 190 metres, PAD within 150 metres and Aboriginal ceremony and dreaming within 270 metres. Within proximity to third order creek lines, which is present within the study area, artefact was the most common site type, followed by shell, PAD, water hole and grinding groove. These sites were predominantly found below 20 metres elevation.

A field investigation of the site identified an artefact scatter, four isolated finds, three rock shelters, three PAD sites, two areas of high archaeological sensitivity, four areas of moderate archaeological sensitivity and two areas of intangible Aboriginal Cultural Significance. Avoidance of the grinding groove, rock shelters, and areas of potential and intangible significance was recommended. Salvage of artefact, PAD and areas of potential that could not be avoided was also recommended, in addition to developing a Cultural Heritage Management Plan (CHMP) and long term care agreement.

3.3 Local context

J.C Lough and Associates Archaeological Field Surveyors (1981) conducted an archaeological field investigation for Freeway No.3 Wallarah Creek Interchange to Wallsend, located approximately 93 metres west of the study area. A field investigation of the proposed route identified 15 sites primarily consisting of artefacts. Artefact sites were identified on tracks and roads with exposure. They comprised of a chips, flakes, cores and a scraper, of chert and cryptocrystalline chert, in addition to three axe grinding grooves located within creek beds. As a result of the field investigation, low archaeological significance was determined with the exception of the grinding grooves. An unexpected finds procedure was put in place with no alterations to the proposed route location.

Dallas (1986) conducted an archaeological field investigation along Hue Hue Road approximately 4 kilometres south west of the study area. Based on the landscape and previous assessments within the area, artefact scatters were determined to be likely within flat landforms near water, and scarred trees in remnant vegetation. An artefact scatter containing three artefacts including a yellow mudstone flake, a grey silcrete flake, and a yellow chert flake, was identified within 90 metres of a creek line. This was determined to indicate a transitional landform rather than an occupation site. Further investigation was recommended.

Kuskie (1992) conducted a preliminary archaeological assessment for the proposed Optus communications fibre optic cable route between Wyong and Maitland, located approximately 30 metres west of the study area. Based on previously recorded sites, landforms and previous studies of the region it was determined that artefact scatters are most likely to occur, in addition to isolated finds. Middens and scarred trees also had potential to occur. A number of artefact scatters and isolated finds were identified during the field investigation. The majority of the proposed route was located within highly disturbed landform. No further assessment was recommended. If the route was altered to impact identified sites further assessment was recommended.

Navin Officer (1994) was contracted by Sinclair Knight and Partners to provide a preliminary cultural heritage assessment on behalf of Optus, for the proposed cable route to be installed from Sydney to Newcastle, and onwards to Orange, including the study area. The purpose of the assessment was to provide a predicative model for site locations within the study area that would influence the cable route. Within the report the archaeological sensitivity of five landforms (Sandstone Ranges of the Sydney Basin, Central Lowlands of the Hunter Valley, Cumberland Plain, the Coastal Margin and Plain, Western Rangelands) were assessed, and a predicted site location criteria was provided for each region. The Coastal Margin and Plain landform includes the study area. It was determined to have undergone extensive research, particularly along the coastline of the Central Coast and South Coast. This was used to make predictive statements for the area:

- Middens are the most common site type along the coast, often located on or near rocky headlands or rock platforms adjacent to a creek mouth or hind dune water system.
- Estuarine middens are commonly located close to the estuarine environment on or adjacent to well drained elevated areas.
- Artefact scatters are likely to occur on level, well drained ground, adjacent to fresh water and wetlands or level ground on crests of ridgelines.
- Hinterland ridgelines providing access across and relative to the surrounding landscape will tend to contain more and larger sites.
- Burial sites are generally found in landforms with deep profile soft sediments such as Aeolian sand and alluvium. They can also occur in occupation sites such as middens.
- Scarred trees may occur in areas of remnant vegetation containing trees of sufficient age.

Nelson (1995) produced a thesis on shell middens on the shores of Lake Macquarie, located approximately 6 kilometres north east of the study area. Nelson surveyed and recorded midden sites located along the lake foreshore, making particular reference to site size and complexity, to form a database of middens to test against environmental variables. It was assumed that large middens would reflect wider resource bases and more diverse environmental range, while smaller middens would reflect a less diverse environment. The study identified that this was not the case, with middens in Lake Macquarie reflecting "a singular pattern of simplicity in content" (Nelson 1995, p.5).

The field investigation covered approximately 100 kilometres (approximately 60%) of the foreshore and up to 10 to 20 m back from the water. The field investigation located 33 previously unrecorded sites and relocated 28 AHIMS sites. Analysis was conducted on 41 of the sites as 20 were too disturbed. Trends identified include:

- 43% of middens were located within the Wyong soil landscape, 38% in Doyalson soil landscape, 17% in Awaba soil landscape and 2% in Warners Bay soil landscape.
- Over 50% of the sites were 51 metres in length or larger. With large sites having greater potential for integrity. 20% of sites were less than 50 metres in length.
- There were no sites under 50 metres with duel aspects.

- Preference for the north-east quadrant of Lake Macquarie potentially due to cooling effect of the wind in summer.
- Smaller sites were more commonly associated with fresh water than large sites.
- The most common geological type containing midden sites was the Triassic Munmorah Conglomerate, and Quaternary fluvial alluvium.
- Middens were most commonly recorded in association with creeks.

The study area contains the Doyalson soil landscape which is shown to have lower percentages of midden sites compared to others within the Lake Macquarie area, likely due to the erosional nature of the soils. The Wyong soil landscape is also present within the study area and was noted to be favoured for midden sites (43%), in addition to Quaternal Fluvial alluvium. They were also most likely to occur within 50 metres of fresh water supporting shellfish species. Previous studies also recorded that sites were frequency identified within proximity to wetland areas. Nelson found that this is not the case within the Lake Macquarie area, with the majority of sites associated with creeks and smaller sites with wetlands. Larger sites (over 500 metres) were noted to be located within 3 kilometres of water, with a lesser tendency to be near water. It was therefore concluded that larger sites would be more likely to occur within the Wyong soil landscape and Quaternal Fluvial alluvium within 3 kilometres of a creek and smaller site types are more likely to occur within Doyalson and Wyong soil landscapes, close to wetland areas.

Officer et al. (1996) undertook a field investigation and subsequent archaeological excavation at Mannering Bay, approximately 5 kilometres north west of the study area. The identified archaeological site comprised of an open camp site with 137 artefacts recovered from surface and sub-surface contexts. All shell recovered from the site was not considered to be Aboriginal in origin (i.e was considered to be naturally occurring in that area or rubbish from fishing bait), which was considered surprising given the proximity to the coast.

Heritage Concepts (2006) were engaged to undertake a field investigation of a proposed gas pipeline at Munmorah Power Station, located approximately 7 kilometres south east of the study area. Five areas of moderate archaeological potential were identified within swamp lands. It was recommended that preliminary test excavations occur at these areas. No other Aboriginal sites were identified during the field investigation.

Insite Heritage (2010) conducted an Aboriginal and European heritage assessment for the Wyee local environmental study, located to the east of the study area. Based on the landform and previous studies within the area, artefact scatters and isolated finds were determined to be the most likely site type. Grinding grooves were also identified to have potential where suitable rock outcrops occur in creek lines. A field investigation of the site identified two artefact scatters along the margins of Mannering Creek and a stone formation in the south western corner. Artefacts included flakes and debitage of quartzite, chert, red silcrete, mudstone and basalt. The field investigation was impacted by dense vegetation however it was hypothesised that artefact density would decrease with distance from the creek line but needed to be tested. Three proposed testing areas for future investigation were outlined to the south of the creek and within the southernmost portion of the study area.

Umwelt (2011) conducted an Aboriginal Heritage Management Strategy report for the Lake Macquarie LGA, which includes the study area. As part of the assessment, culturally sensitive landscapes within the LGA region were mapped, including coastal hinterlands, lower alluvial reaches, upper catchment areas, escarpments of Sugarloaf and Watagan Ranges, lake shore contexts, deltas of major creek lines and coastal dunes and headlands. No Sensitive Aboriginal Landscape areas were identified within the study area by Umwelt's assessment (Photo 6).

Photo 6 Areas of Aboriginal sensitivity within the Lake Macquarie LGA in green hash and the study area shown in orange (Source: Lake Macquaire LEP sensitivity map CL2_007)

Fresh water creek corridors were considered to be utilised for their natural resources for intermittent occupation, as Aboriginal people moved from the coast line to the mountain ranges. Within Riverine or Riparian landscapes similar to those located within the study area, it was predicted that grinding groove sites were likely to be found in association with the creek bed, with artefact sites associated with alluvial deposits within creek terraces where intact subsurface deposits may be preserved by recent sediment. Artefact scatters also had the potential to occur upon bedrock based foot slopes in an open context.

The study area is located within the lower alluvial reaches of tributary catchment landform unit within the Lake Macquarie area. This is characterised to contain the following:

- Creek beds in alluvial fill with rare sandstone and conglomerate outcrops, with banks up to 3 metres high.
- Floodplain with stratified alluvial deposits including sand, gravel and clay.
- Terrace with high level of alluvium up to 50 metres above creek beds.
- Tributary creek channels with alluvial bed and rock outcropping.
- Low gradient foot slope with up to 10 metres local relief.
- Spur crest and steep upper slopes.
- Back swamp on floodplain, between valley side and low levee floodplain margin.
- Valley side slope with moderate to steep shallow duplex soils and relief of 20 to 40 metres
- Tributary valley side slopes with a local relief of up to 30 metres.

The alluvial reaches landform was predicted to contain artefact scatters, scarred trees, and story sites in floodplain wetlands, estuaries and fresh water areas. Artefact scatters were also present in low, extended ridges and spurs. Grinding grooves can be present in creek beds, and artefact scatters and scarred trees also have potential in levees and terraces (Table 3).

Table 3 Predicted Aboriginal site ypes within different landforms of the lower reaches (Umwelt 2011, p.Appendix 4)

Terrain unit	Predicted site types	Likelihood of occurring and site condition
Floodplain wetlands – estuarine and fresh water	Artefact scatters Scarred trees Story sites	In shallow soil units are the most likely site types. Extensive disturbance in wetlands. Likely site type in this landscape but few if any remain. Some wetlands are associated with community stories.
Low extended ridges and spurs	Artefact scatters	Most likely archaeological evidence, including isolated finds. High density deposits more likely in low spurs in close proximity to water.
Creek beds	Grinding grooves	Can occur if sandstone outcropping occurs.
Levees and terraces	Artefact scatters Scarred trees	Levees and terraces provide slightly elevated, level terrain adjacent to water. Artefact scatters are expected. Possible but few trees remain.

Biosis (2011) conducted an Aboriginal archaeological assessment for Lake Munmorah high voltage feeder lines, located approximately 6 kilometres west of the study area. Background research identified 36 sites within a 10 kilometre search area, none within the study area. Based on these results and previous research in the area scarred trees and artefact scatters were determined to be the most likely site type to occur. A field investigation of the study area did not identify any sites and was determined to have low archaeological potential. This was due to the disturbed nature of the area. No further assessment was recommended.

AMBS (2014) undertook an archaeological field investigation for the Pacific Motorway widening and replacement between Tuggerah and Doyalson, approximately 1 kilometre south of the study area. The assessment identified no sites, and determined that no further assessment was required. The study also identified a number of regional reports which have made predictions in relation to site locations and distribution. The review undertaken by AMBS (2014) made a number of points, including:

- Sites are less likely to be identified in low lying swampy areas. The areas focused on for this assessment were a series of excavations and field investigations to the south and west of the Tuggerah Lakes area. The majority of assessments identified few or no sites, and those that went to excavation tended to contain low numbers of artefacts, if any.
- There are a small number of sites that do contradict this trend, particularly one excavated by Therin. AMBS was unable to obtain the report for their assessment or state the landform, but noted the high number of artefacts recovered, with a density of two to 65 artefacts per square metre.
- Site variety and density is likely to be greater in coastal or estuarine environments.
- Stone artefact density is likely to be greater in closer proximity to major water resources, however these sites may still be of relatively low density.

RPS (2015) undertook a heritage impact assessment for the Mandalong Transmission Line Relocation Project, located approximately 6.3 kilometres north west of the study area. Previous assessments within the area had identified an abundance of fresh water sources within the area in addition to resources associated with Lake Macquarie and Lake Munmorah, likely being the focus of Aboriginal occupation. Despite this, evidence for frequent occupation of inland areas was also shown. Four AHIMS sites had previously been recorded within the study area, including three grinding groove sites, a scarred tree and a stone arrangement. A potential scarred tree was located during the survey but was determined not to be cultural. No other sites were identified. No go zones around the known AHIMS sites was recommended.

GML (2017) conducted an ADDA at Site 5 Wallarah, located approximately 3 kilometres south of the study area. A review of previous assessments and AHIMS sites identified that artefacts and midden sites were most common within the area. Grinding grooves were not considered likely due to lack of underlying sandstone. Artefacts were considered likely within raised landforms on alluvial deposits, low densities on ridgelines and large flat landforms near wetlands and waterways. Isolated finds were considered likely in areas of erosion. Scarred trees can be present in areas of remnant vegetation. A site inspection identified an anthropological and archaeological site within a large elevated flat landform associated with a local walking route. A fire trail was present within the area. This landform and another elevated landform was determined to have archaeological sensitivity. Further assessment and consultation was recommended.

3.3.1 Identified Aboriginal archaeological sites

An extensive search of the AHIMS database was conducted on 2 August 2021 (Client service ID: 609477). The search identified 103 Aboriginal archaeological sites within a 4.5 kilometre search area, centred on the study area (Table 4). None of these registered sites are located *within* the study area (Figure 7). The mapping coordinates recorded for these sites were checked for consistency with their descriptions and location on maps from Aboriginal heritage reports where available. These descriptions and maps were relied where notable discrepancies occurred.

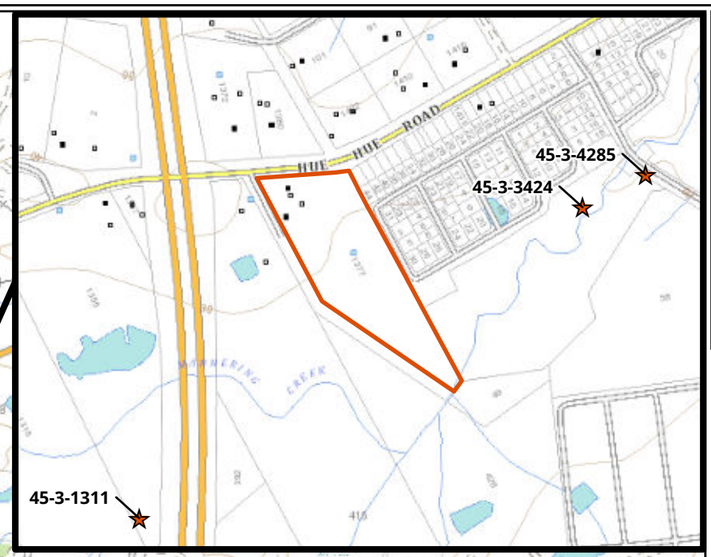
It should be noted that the AHIMS database reflects Aboriginal sites that have been officially recorded and included on the list. Large areas of NSW have not been subject to systematic, archaeological survey; hence AHIMS listings may reflect previous survey patterns and should not be considered a complete list of Aboriginal sites within a given area. Some recorded sites consist of more than one element, for example artefacts and a modified tree, however for the purposes of this breakdown and the predictive modelling, all individual site types will be studied and compared. This explains why there are 111 results presented here, compared to the 103 sites identified in AHIMS.

Table 4 AHIMS sites within the study area

Site type	Occurrences	Frequency (%)
Artefact	40	36.04
Grinding groove	36	32.43
Modified tree	12	10.81
Habitation structure	7	6.31
Shell	6	5.41
PAD	5	4.50
Stone arrangement	1	0.90
Art	1	0.90
Hearth	1	0.90
Restricted	1	0.90
Water hole	1	0.90
Total	**111**	**100**

A simple analysis of the Aboriginal cultural heritage sites registered within 4.5 kilometres of the study area indicates that the dominant site type is artefact, representing 36.04% (n=40), followed by grinding groove with 32.43% (n=36), modified tree with 10.81% (n=12), habitation structure with 6.31% (n=7), shell with 5.41% (n=6), and PAD with 4.50% (n=5). Stone arrangement, art, hearth, restricted and water hole all represented 0.90% (n=1 each).

No AHIMS sites are located within or within 200 metres of the study area, however a number of artefact sites have been found within the nearby vicinity along Mannering Creek.



Legend

- Study area
- AHIMS

NOT TO BE MADE PUBLIC

Figure 7 AHIMS in the vicinity of the study area

0 400 800 1,200 1,600 2,000

Metres

Scale: 1:35,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

N

biosis

Matter: 35633,
Date: 06 August 2021,
Drawn By: SB Prepared For: ML, Last edited by: sblades
Location: P:\35600s\35633\Mapping\
35633_WyeeADDA, Layout: F7_AHIMS

3.4 Summary

The study area is located on the Central Coast Lowlands, underlain by the Tuggerah Formation and Alluvial Valley Deposits geological units. Topographically, the study area is situated within a gently sloping landform towards Mannering Creek, a third order non perennial water course located in the south. Soil landscapes within the study area include the moderately deep to deep (>100 millimetres) erosional Doyalson soil landscape and the alluvial Wyong soil landscape. Artefact scatters are the most common site type identified within both soil landscapes, in addition to shell, and PAD (Biosis Pty Ltd 2021). Midden sites are also most likely to be identified within the Wyong soil landscape (Nelson 1995).

A search of the AHIMS register identified that no previously recorded sites were located within the study area or a 200 metre vicinity. Nearby sites include isolated finds and artefact scatters along Mannering Creek, which transects the southern portion of the study area. A review of historical aerials shows that limited development has occurred within the study area, with isolated disturbances located in the north west and west. Remnant vegetation is visible in the south of the study area indicating minimal disturbance has occurred, while crop lines are present within the remaining portion causing surface disturbance of approximately 200 millimetres in depth. Due to the depth of the soil landscape, there is potential for undisturbed contexts to remain within the areas of cropping despite disturbance present in the area.

The study area is not located within the Sensitive Aboriginal Landscape identified by Umwelt (2011). However, this study was based on a review of landforms and was not supported by a survey. An assessment conducted to the east of the study area identified a number of artefact sites nearby Mannering Creek, which is also located within the southern portion of the study area (Insite Heritage 2010). It was predicted that artefact densities were likely highest within proximity of the creek and decrease with distance. Therefore, Aboriginal sites have potential to occur within the study area.

As the study area is also located along Mannering Creek there is potential for artefact scatters, isolated finds and PAD be present, particularly within flat well draining and undisturbed areas nearby the creek (Kuskie 1992, Navin & Officer 1994, Umwelt 2011, AMBS 2014).

3.4.1 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.

These statements are 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.

Table 5 indicates the site types most likely to be encountered across the present study area. The definition of each site type is described firstly, followed by the predicted likelihood of this site type occurring within the study area.

Table 5 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 on level, well-drained topographies in close proximity to reliable sources of fresh water, including Mannering Creek. A number of artefact sites nearby the study area have been identified along this creek line. Therefore the potential for artefacts to be present within the study area is assessed as high.
Potential Archaeological Deposits (PADs)	Potential sub surface deposits of cultural material.	Moderate: PADs have been previously recorded in the region across a wide range of landforms. PADs are likely to be present within areas adjacent to water courses or on high points in undisturbed landforms.
Modified trees	Trees with cultural modifications	Moderate: Scarred trees have been recorded within the vicinity of the study area. Due to extensive vegetation clearance only a small number of mature native trees have survived within the southernmost part of the study area.
Hearth	Cultural deposit sometimes marked by hearth stones, usually also contains charcoal and may also contain heat treated stone fragments.	Moderate: A hearth has previously been recorded within the vicinity of the study area and Mannering Creek.
Grinding grooves	Grooves created in stone platforms through ground stone tool manufacture.	Low: Suitable horizontal sandstone rock outcrops are unlikely to occur along drainage lines.
Burials	Aboriginal burial sites.	Low: Aboriginal burial sites are generally situated within deep, soft sediments. 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.
Shell middens	Deposits of shells accumulated over either singular large resource gathering events or over longer periods of time.	Low: Shell midden sites have not been recorded within the vicinity of the study area and are concentrated towards Lake Macquarie. There is low potential for shell middens to be located in the study area due to Mannering Creek being a lower order creek line.

Site type	Site description	Potential
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.
Habitation structure	Structures constructed by Aboriginal people for short or long term shelter. More temporary structures are commonly preserved away from the NSW coastline, may include historic camps of contemporary significance. Smaller structures may make use of natural materials such as branches, logs and bark sheets or manufactured materials such as corrugated iron to form shelters. Archaeological remains of a former structure such as chimney/fireplace, raised earth building platform, excavated pits, rubble mounds etc.	Low: Habitation structures have previously been recorded within the vicinity of the study area, however not within the study area.
Stone arrangement	Human produced arrangements of stone usually associated with ceremonial activities, or used as markers for territorial limits or to mark/protect burials	Low: Stone arrangements have previously been recorded within the vicinity of the study area. However, they are unlikely to occur within the study area as they are typically identified in ridgeline landforms which area not present in the study area.
Waterhole	A source of fresh water for Aboriginal groups which may have traditional ceremonial or dreaming significance and/or may also be used to the present day as a rich resource gathering area (e.g. waterbirds, eels, clays, reeds etc.)	Low: Waterholes have previously been recorded within the vicinity of the study area, however they are unlikely to occur due to the underlying geology present within the study area.

Site type	Site description	Potential
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.	Nil: The sites will only occur where suitable sandstone exposures or overhangs possessing sufficient sheltered space exist, which are not present within the study area.

4 Archaeological investigation

An archaeological field investigation of the study area was undertaken on Tuesday 10 August 2021 by Biosis archaeologist Anthea Vella. The survey sampling strategy, methodology and a discussion of results are provided below.

4.1 Archaeological investigation aims

The principle aims of the field investigation were to:

- Undertake a systematic investigation 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 Field investigation methods

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

- Aboriginal objects or sites present in the study area during the field investigation.
- Field investigation coverage.
- Any resources that may have potentially have 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 field investigation including representative photographs of field investigation units, landform, vegetation coverage, GSV and the recording of soil information for each field investigation unit were possible. Any potential Aboriginal objects observed during the field investigation 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 field investigation

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

the field investigation within the study area are dense vegetation and leaf litter within the southern portion of the study area and horses rendering some portions within the south and north inaccessible.

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 2010b). Visibility within the study area was generally low (10%) due to extensive grass coverage, leaf litter (Photo 7), dense vegetation (Photo 8), and residential developments (Photo 9). Areas of higher visibility (80% to 100%) were associated with high traffic areas (Photo 10) and surrounding some trees (Photo 11).

Photo 7 Extensive grass coverage within the north of the study area

Photo 8 **Dense vegetation in the south of the study area**

Photo 9 **Residences within the north of the study area**

Photo 10 Visibility in high traffic area in the south

Photo 11 Higher visibility surrounding trees

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, p.79, DECCW 2010b). Overall, the study area displayed areas of exposure around high traffic areas (Photo 12), vehicle and access tracks (Photo 13 and Photo 14), and surrounding trees (Photo 15).

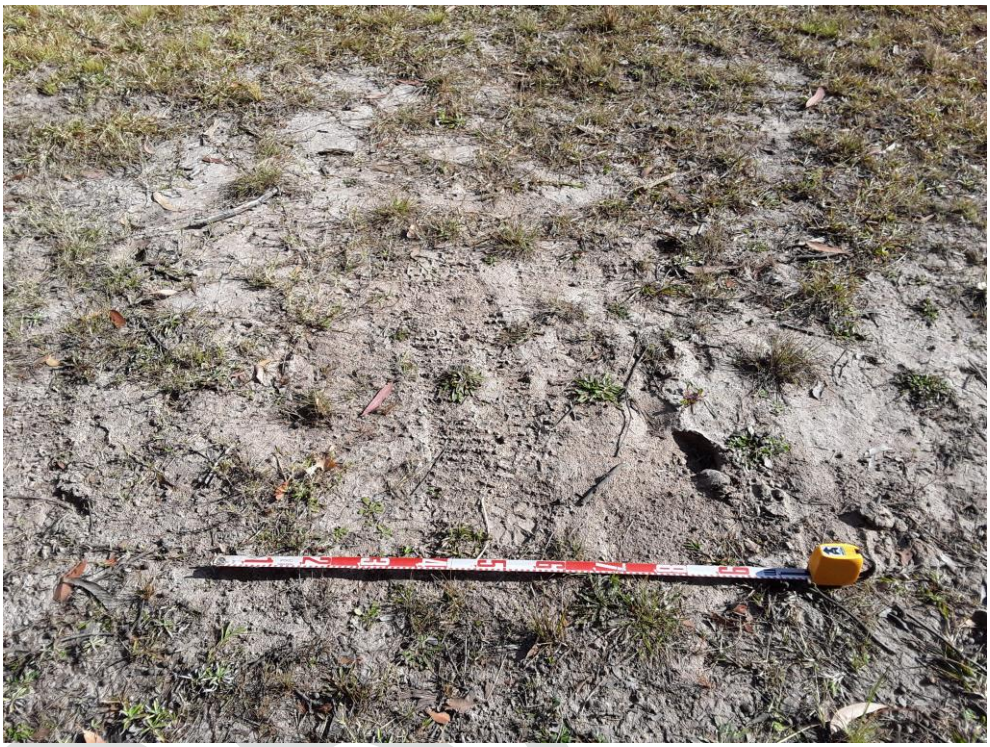


Photo 12 Exposure in high traffic area

Photo 13 Exposure within vehicle track

Photo 14 Exposure along access track

Photo 15 Area of exposure under trees adjacent to dam

4.6 Disturbances

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

Portions of the study area have been subject to disturbance by human activity. Historic and recent aerials (Photo 2, Photo 3, Photo 4 and Figure 2) show that the study area has been subject to tree clearing, agricultural use through cropping, pastoral grazing, and construction of a dam, the construction of stables and yards, access tracks and development of residential housing and associated structures over the past 50 years. These disturbances were also noted during the field investigation and are shown in Photo 9, Photo 15, and Photo 16. A concrete slab (Photo 17) and rubbish dumping (Photo 18) was also identified during the field investigation.

Photo 16 Stables and yard located within the south west of the study area

Photo 17 Concrete slab within the central portion of the study area

Photo 18 Rubbish dumping within the south of the study area

4.7 Investigation results and discussion

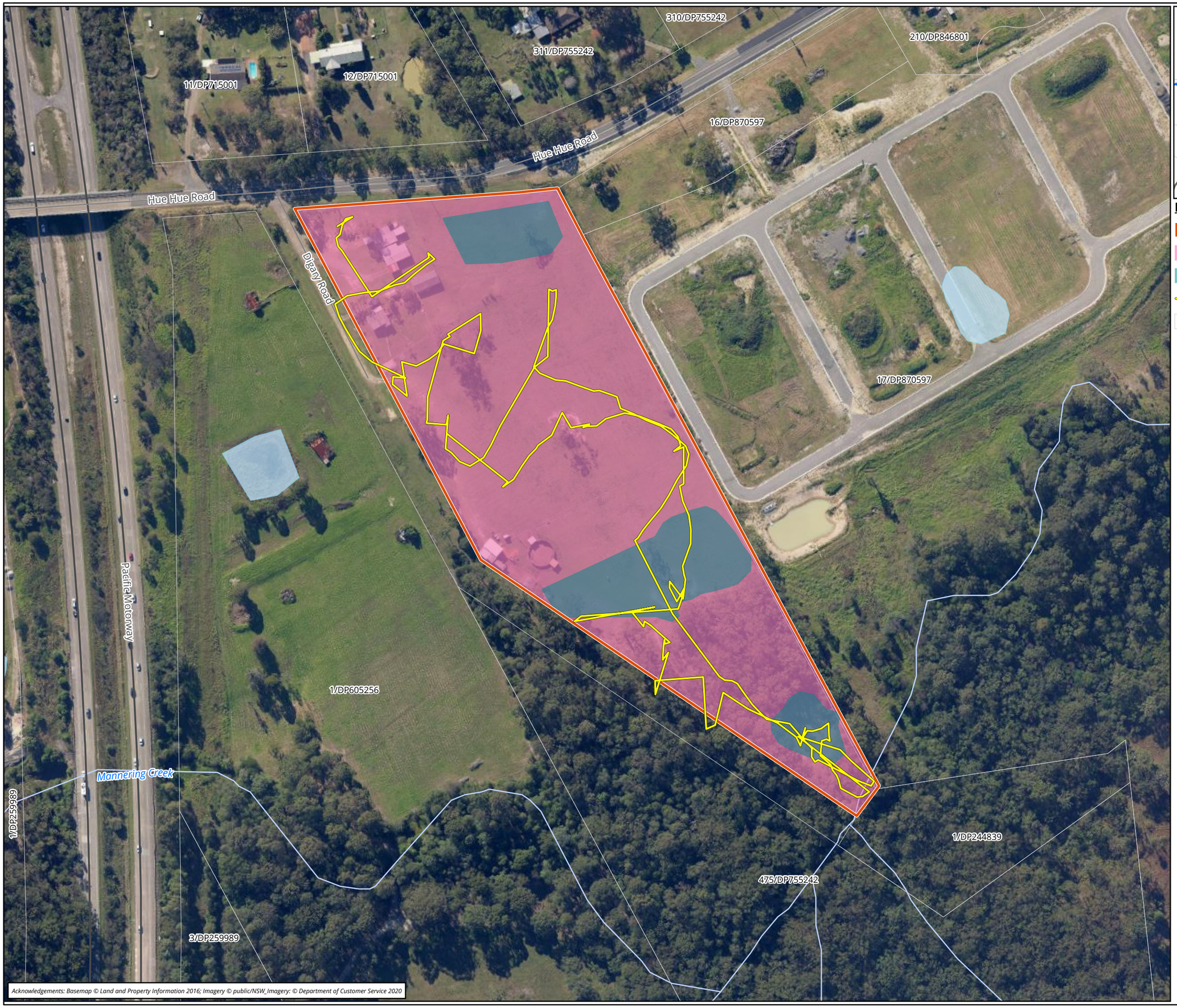
The archaeological investigation consisted of a meandering pedestrian field investigation with one large transect walked across the entire study area. The results of the field investigation have been summarised below in Figure 8.

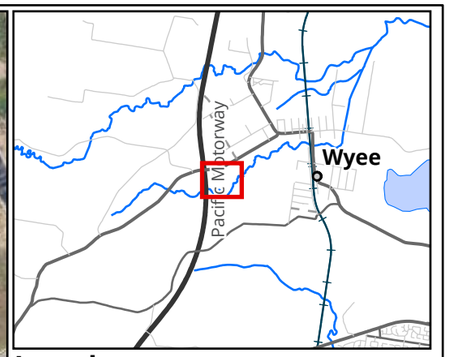
Moderately deep to deep soil landforms have been identified within the study area, with minimal disturbances present within the south and superficial disturbances in the north east. A gently sloping landform towards Mannering Creek, a third order water course is present, which has previously been associated with nearby artefact sites (Insite Heritage 2010). Based on this, background research identified that artefact scatters and isolated finds were the most likely site type to occur within the study area on flat and well draining landforms overlooking or nearby Mannering Creek (Kuskie 1992, Navin & Officer 1994, Umwelt 2011, AMBS 2014, Insite Heritage 2010).

A review of historical aerials shows that limited disturbance has occurred within the southernmost portion of the study area, surrounding Mannering Creek, and much of the central and north eastern portion of the study area. Remnant trees are present throughout the south, suggesting reduced disturbance within this area. Cropping and grazing has occurred within the central and north eastern portion of the study area, which would have caused superficial disturbances to the moderately deep to deep Doyalson and Wyong soil landscapes (Murphy 1993), therefore providing potential for archaeological deposits to be present within these areas. Development has occurred within the north west through the construction of residential buildings and associated structures and subsurface infrastructure, in addition to stables and yards in the west. It is likely that the construction of these buildings has caused significant disturbances within these areas.

During the field investigation, no Aboriginal sites or objects were identified. However, the lack of surface material does not indicate that there is an absence of archaeological deposits. This is instead likely attributable to the limited exposure and areas of disturbance seen during the field investigation, rather than

an absence of Aboriginal occupation of the area. As such, three areas of moderate archaeological potential within flat well draining areas overlooking and adjacent to Mannering Creek in the north east, central and southern portions of the study area were identified. These landform features have been subject to minimal and/or superficial disturbances providing further potential for archaeological deposits to remain intact. The remaining portions of the study area have been determined to contain low archaeological potential due to significant ground disturbances and sloping landforms unlikely to retain deposits. The areas of potential are shown in Figure 8.





Legend

- Study area
- Low archaeological potential
- Moderate archaeological potential
- Survey tracks
- Lot

Figure 8 Survey results and coverage

0 10 20 30 40 50

Metres

Scale: 1:2,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

N

biosis

Matter: 35633,
Date: 06 August 2021,
Drawn by: SB, Checked by: ML, Last edited by: sblades
Location: P:\35600s\35633\Mapping\
35633_WyeeADDA, Layout: 35633_ADDA_F8_SurveyResults

5 Conclusions and recommendations

5.1 Conclusions

Based on the results of the field investigation and background review, it is likely Aboriginal people utilised the study area for both occupation and resource gathering. The low levels of previous disturbance towards the north eastern and southern portions of the study area observed during the field investigation suggests that there is moderate potential for intact archaeological deposits to be present within the study area. The location of these areas within level ground overlooking and adjacent to Mannering Creek, a third order creek line, would have provided ideal areas of occupation with access to a range of resources within the area, increasing the potential for Aboriginal artefacts to exist in subsurface deposits. Areas containing extensive levels of residential development contain a high likelihood for Aboriginal artefacts to have been removed during construction, therefore the potential for intact Aboriginal deposits is low in these areas. The results of this assessment are also demonstrated in the due diligence flow chart provided by the Code (Figure 9).

5.2 Recommendations

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

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

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

Recommendation 1: Avoid impacts to areas of moderate archaeological potential where possible

Areas identified as having moderate archaeological potential should be avoided wherever possible. It is recommended that avoidance of these areas is considered as part of the planning proposal.

If impacts to areas of moderate archaeological potential is not possible, further archaeological investigation in the form of an AHCA, including Aboriginal community consultation and test excavations, must be undertaken prior to impacts occurring. Consultation must be undertaken in accordance with the consultation requirements, and test excavations must be undertaken in compliance with the Code. If any Aboriginal artefacts are identified during test excavations, an AHIP will be required prior to any works proceeding.

Recommendation 2: No further archaeological assessment is required throughout areas of low potential

No further archaeological assessment is required within areas assessed as having low archaeological potential. Works may proceed with caution in these areas subject to Recommendations 3 and 4 below.

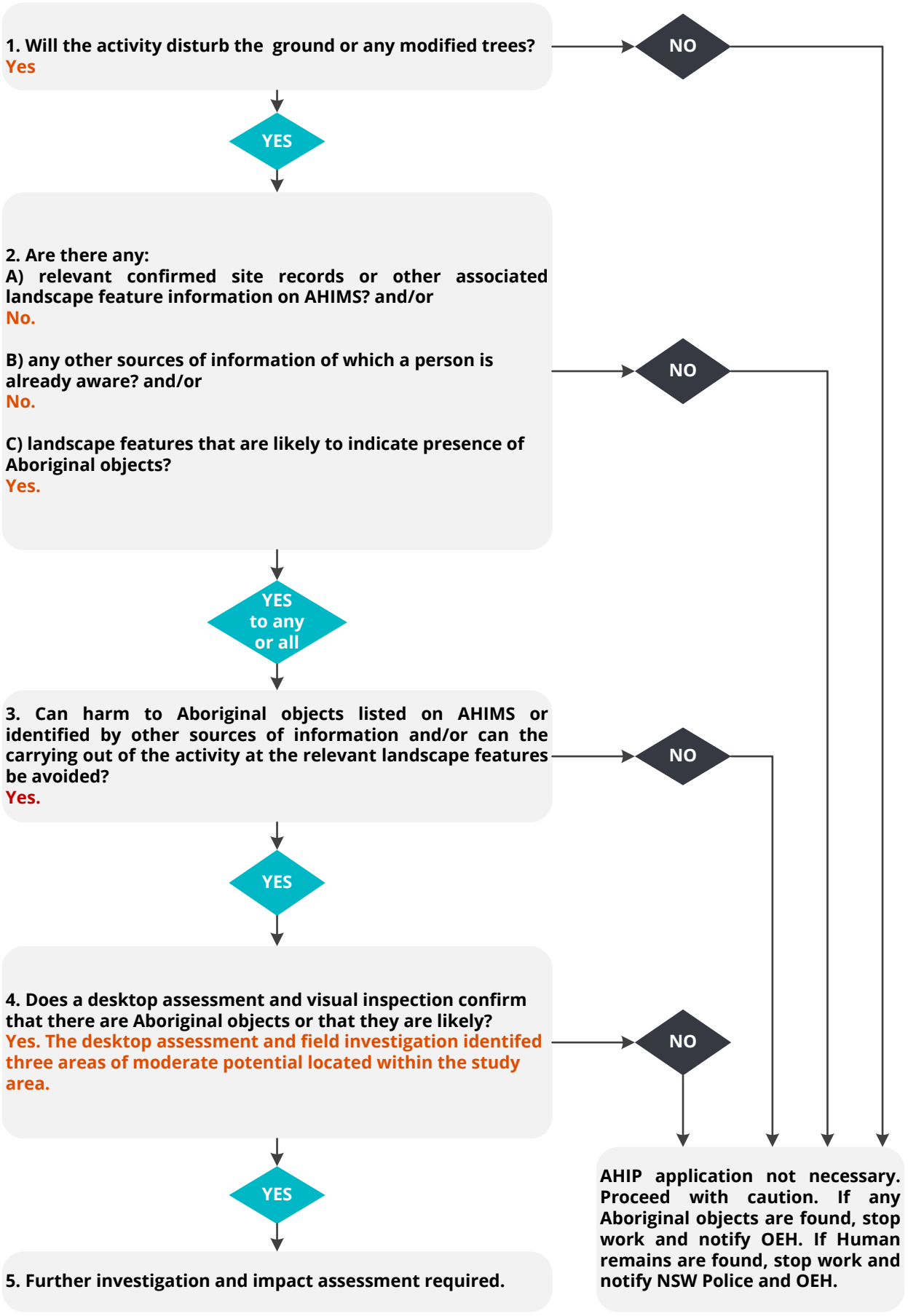
Recommendation 3: Discovery of Unanticipated Aboriginal Objects

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

Recommendation 4: 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.


1. Will the activity disturb the ground or any modified trees?
Yes
NO
YES
2. Are there any:
A) relevant confirmed site records or other associated landscape feature information on AHIMS? and/or
No.
B) any other sources of information of which a person is already aware? and/or
No.
C) landscape features that are likely to indicate presence of Aboriginal objects?
Yes.
NO
YES to any or all
3. Can harm to Aboriginal objects listed on AHIMS or identified by other sources of information and/or can the carrying out of the activity at the relevant landscape features be avoided?
Yes.
NO
YES
4. Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely?
Yes. The desktop assessment and field investigation identifed three areas of moderate potential located within the study area.
NO
YES
5. Further investigation and impact assessment required.
AHIP application not necessary. Proceed with caution. If any Aboriginal objects are found, stop work and notify OEH. If Human remains are found, stop work and notify NSW Police and OEH.

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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 : 35633 MEL

Client Service ID : 609477

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-3-3608	Duplicate of RPS MAND STH TBM 49	GDA	56	352837	6327793	Open site	Deleted	Grinding Groove : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Hamilton,RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3599	RPS MAND STH TBM 16	GDA	56	352918	6329416	Open site	Valid	Habitation Structure : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Hamilton					**Permits**		
45-3-3494	RPS CYL04b	GDA	56	352958	6328577	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3552	RPS MAND STH TBM46	GDA	56	353379	6327443	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3487	RPS MAND STH CYL02	GDA	56	354393	6328642	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3984	111 Scofield Wyee Scar Tree	GDA	56	356520	6330677	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	Mr.David Ahoy,lower hunter aboriginal incorporated - cardiff south					**Permits**		
45-3-3445	Wyee 3	GDA	56	358290	6326670	Open site	Valid	Stone Arrangement : -		
	Contact Mr.Shane Frost	**Recorders**	Insite Heritage Pty Ltd,Insite Heritage Pty Ltd,Ms.Elizabeth Wyatt,Ms.Elizabeth Wy					**Permits**	4550	
45-3-4287	Wyee 7	GDA	56	358559	6327310	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Insite Heritage Pty Ltd,Ms.Elizabeth Wyatt					**Permits**	4550	
45-7-0207	The Hole 1 (TH1)	AGD	56	361820	6329800	Open site	Valid	Artefact : -	Open Camp Site	3697,101093
	Contact	**Recorders**	Kerry Navin,Mr.Kelvin Officer,P Saunders					**Permits**		
45-3-3556	RPS MAND STH TBM52	GDA	56	352767	6327771	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3601	RPS MAND STH TBM 21	GDA	56	352843	6329264	Open site	Valid	Habitation Structure : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Hamilton					**Permits**		
45-3-3530	RPS MAND STH TBM19	GDA	56	352847	6329295	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3438	RPS Mandalong South 03	GDA	56	352856	6329404	Closed site	Valid	Artefact : -		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Blacktown,Mrs.Tessa Boer-Mah					**Permits**		
45-3-3493	RPS CYL04c	GDA	56	352972	6328558	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	R.R.P. Property Consultants Pty Ltd					**Permits**		
45-3-3468	RPS MAND STH AH02	GDA	56	353514	6330449	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		

Report generated by AHIMS Web Service on 02/08/2021 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 352766.0 - 362107.0, Northings : 6322725.0 - 6332079.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 103

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 35633 MEL

Client Service ID : 609477

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-3-3466	RPS MAND STH TBM11	GDA	56	354080	6327742	Open site	Valid	Artefact : 3		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Hamilton,Mrs.Tessa Boer-Mah					**Permits**		
45-3-3526	RPS MAND STH TBM12	GDA	56	354070	6330480	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3584	Wallarah Creek Open Site 2	GDA	56	356256	6324218	Open site	Valid	Artefact : 1		102920
	Contact	**Recorders**	OzArk Environmental and Heritage Management					**Permits**		
45-3-3424	Mannering Creek 1	GDA	56	357799	6327519	Open site	Valid	Artefact : 2		101909
	Contact	**Recorders**	Mrs.Angela Besant					**Permits**		
45-7-0251	PAD 3 - Munmorah	AGD	56	361000	6326250	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Heritage Concepts,Mr.Jakub Czastka					**Permits**		
45-3-3575	RPS MAND STH TBM49	GDA	56	352837	6327793	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3602	RPS MAND STH TBM 23	GDA	56	352843	6329249	Open site	Valid	Habitation Structure : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Hamilton					**Permits**		
45-3-3467	RPS MAND STH AH01	GDA	56	353235	6329591	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3563	Duplicate of RPS MAND STH TBM45	GDA	56	353387	6327468	Open site	Deleted	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria,RPS East Australia Pty Ltd - Echuca Vic					**Permits**		
45-3-3545	RPS MAND STH TBM38	GDA	56	354087	6327145	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3525	Duplicate of RPS MAND STH TBM11	GDA	56	354080	6327742	Open site	Deleted	Artefact : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria,RPS East Australia Pty Ltd - Echuca Vic					**Permits**		
45-3-3316	WC-IF1	GDA	56	355002	6324087	Open site	Valid	Artefact : -		102879,102920
	Contact Searle	**Recorders**	Doctor.Jodie Benton,Mr.Phillip Cameron					**Permits**		
45-3-3317	WC-OS1	GDA	56	355185	6324252	Open site	Valid	Artefact : -		102879,102920
	Contact	**Recorders**	Doctor.Jodie Benton,Mr.Phillip Cameron					**Permits**		
45-3-1235	Moran's Creek;	AGD	56	355300	6331100	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	294
	Contact	**Recorders**	ASRSYS					**Permits**		
45-3-3674	CASAR Park IF 1	GDA	56	357801	6325333	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Extent Heritage Pty Ltd - Pyrmont - Individual users,Mrs.Laressa Barry					**Permits**		
45-3-3425	Mannering Creek 2	GDA	56	358365	6327862	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : -		101909

Report generated by AHIMS Web Service on 02/08/2021 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 352766.0 - 362107.0, Northings : 6322725.0 - 6332079.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 103

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 35633 MEL

Client Service ID : 609477

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Mrs.Angela Besant,Insite Heritage Pty Ltd,Ms.Elizabeth Wyatt					**Permits**	4550	
45-3-3180	B14	AGD	56	359150	6325075	Open site	Valid	Artefact : -		100541,100863,101093
	Contact	**Recorders**	Michael Therin					**Permits**		
45-3-3176	B;1	AGD	56	359750	6324715	Open site	Destroyed	Artefact : -		100541,100863,101093
	Contact	**Recorders**	Michael Therin					**Permits**		
45-3-3259	B7	GDA	56	360227	6325388	Open site	Valid	Artefact : 1		
	Contact T Russell	**Recorders**	Michael Therin					**Permits**		
45-7-0291	RPS HSO M1	GDA	56	361555	6331952	Open site	Valid	Shell : -		
	Contact Koompahtoo LALC	**Recorders**	RPS Australia East Pty Ltd - Hamilton,Ms.Laraine Nelson					**Permits**		
45-3-3554	RPS MAND STH TBM50	GDA	56	352809	6327783	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3470	RPS MAND STH AH04	GDA	56	352880	6329942	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-1232	Wyee Creek	AGD	56	352800	6329300	Closed site	Valid	Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Deposit	294,101093
	Contact	**Recorders**	ASRSYS					**Permits**		
45-3-3489	RPS CYL04	GDA	56	352959	6328590	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3436	RPS Mandalong South 01	GDA	56	353007	6329206	Closed site	Valid	Artefact : 2		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Blacktown,Mrs.Tessa Boer-Mah					**Permits**		
45-3-3549	RPS MAND STH TBM43	GDA	56	353420	6327537	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3544	Duplicate of RPS MAND STH TBM37	GDA	56	354133	6327740	Open site	Deleted	Artefact : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria,RPS East Australia Pty Ltd - Echuca Vic					**Permits**		
45-3-3486	RPS MAND STH CYL01	GDA	56	354372	6328578	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3304	Halloran ISO 1	AGD	56	355000	6322650	Open site	Valid	Artefact : -		102647
	Contact T Russell	**Recorders**	Mr.John Appleton					**Permits**		
45-3-3488	RPS MAND STH CYL03	GDA	56	355610	6327400	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3496	Duplicate of RPS MAND STH CYL03a	GDA	56	355610	6327400	Open site	Deleted	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria,RPS East Australia Pty Ltd - Echuca Vic					**Permits**		

Report generated by AHIMS Web Service on 02/08/2021 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 352766.0 - 362107.0, Northings : 6322725.0 - 6332079.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 103

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-3-3187	BR13	AGD	56	359375	6325050	Open site	Valid	Artefact : -		100541,100863,101093
	Contact	**Recorders**	Michael Therin					**Permits**		
45-3-3179	B11	AGD	56	359563	6325450	Open site	Valid	Artefact : -		100541,100863,101093
	Contact	**Recorders**	Therin Archaeological Consulting					**Permits**		
45-3-3261	B9, Bushells Ridge	AGD	56	359601	6326537	Open site	Valid	Artefact : 2		
	Contact T Russell	**Recorders**	Michael Therin					**Permits**		
45-3-3186	BR10	AGD	56	359612	6326462	Open site	Valid	Artefact : -		100541,100863,101093
	Contact	**Recorders**	Michael Therin					**Permits**		
45-3-3531	RPS MAND STH TBM20	GDA	56	352853	6329261	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3600	RPS MAND STH TBM 18	GDA	56	352863	6329360	Open site	Valid	Habitation Structure : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Hamilton					**Permits**		
45-3-3495	Duplicate of RPS CYL04	GDA	56	352959	6328590	Open site	Deleted	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria,RPS East Australia Pty Ltd - Echuca Vic					**Permits**		
45-3-3564	Duplicate of RPS MAND STH TBM46	GDA	56	353379	6327443	Open site	Deleted	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria,RPS East Australia Pty Ltd - Echuca Vic					**Permits**		
45-3-3527	RPS MAND STH TBM13	GDA	56	354077	6330500	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-1311	Pasadena;	AGD	56	356972	6326822	Open site	Valid	Artefact : -	Open Camp Site	100541,100863,101093
	Contact	**Recorders**	Unknown Author					**Permits**		
45-3-4286	Mannering Ck 4 Potential Hearth & PAD	GDA	56	358193	6327689	Open site	Valid	Hearth : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Insite Heritage Pty Ltd,Ms.Elizabeth Wyatt					**Permits**	4550	
45-3-4288	Wyee 6	GDA	56	358373	6326732	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Insite Heritage Pty Ltd,Ms.Elizabeth Wyatt					**Permits**	4550	
45-3-3260	B3, Bushells Ridge	AGD	56	360187	6325275	Open site	Valid	Artefact : 1		
	Contact T Russell	**Recorders**	Michael Therin					**Permits**		
45-7-0245	B5, Bushells Ridge	GDA	56	360800	6325350	Open site	Valid	Artefact : 2		
	Contact T Russell	**Recorders**	Michael Therin					**Permits**		
45-3-3566	Duplicate of RPS MAND STH TBM50	GDA	56	352809	6327783	Open site	Deleted	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria,RPS East Australia Pty Ltd - Echuca Vic					**Permits**		

Report generated by AHIMS Web Service on 02/08/2021 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 352766.0 - 362107.0, Northings : 6322725.0 - 6332079.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 103

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 35633 MEL

Client Service ID : 609477

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-3-3603	RPS MAND STH TBM 24	GDA	56	352870	6329067	Open site	Valid	Habitation Structure : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Hamilton					**Permits**		
45-3-3598	RPS MAND STH TBM 15	GDA	56	352887	6329356	Open site	Valid	Habitation Structure : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Hamilton					**Permits**		
45-3-3604	RPS MAND STH TBM 25	GDA	56	352973	6329010	Open site	Valid	Habitation Structure : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Hamilton					**Permits**		
45-3-3565	Duplicate of RPS MAND STH TBM47	GDA	56	353023	6326746	Open site	Deleted	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria,RPS East Australia Pty Ltd - Echuca Vic					**Permits**		
45-3-3553	RPS MAND STH TBM47	GDA	56	353023	6326746	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-1312	Hue Hue Road;	AGD	56	353671	6322552	Open site	Valid	Artefact : -	Open Camp Site	101093,102647
	Contact	**Recorders**	Unknown Author					**Permits**		
45-3-3464	RPS MAND STH TBM10	GDA	56	353767	6327042	Open site	Valid	Grinding Groove : 29		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Hamilton,Mrs.Tessa Boer-Mah					**Permits**		
45-3-3524	Duplicate of RPS MAND STH TBM10	GDA	56	353767	6327042	Open site	Deleted	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria,RPS East Australia Pty Ltd - Echuca Vic					**Permits**		
45-3-3498	Duplicate of RPS MAND STH CYL01a	GDA	56	354372	6328578	Open site	Deleted	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria,RPS East Australia Pty Ltd - Echuca Vic					**Permits**		
45-3-3497	Duplicate of RPS MAND STH CYL02a	GDA	56	354393	6328642	Open site	Deleted	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria,RPS East Australia Pty Ltd - Echuca Vic					**Permits**		
45-3-3983	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			
	Contact	**Recorders**	GML Heritage Pty Ltd - Surry Hills,Ms.Jodi Cameron					**Permits**		
45-3-1310	Pourmalong Creek;	AGD	56	357823	6330130	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-3-3262	B4, Bushells Ridge	GDA	56	360008	6325262	Open site	Valid	Artefact : 1		
	Contact T Russell	**Recorders**	Michael Therin					**Permits**		
45-3-3568	Duplicate of RPS MAND STG TBM52	GDA	56	352767	6327771	Open site	Deleted	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria,RPS East Australia Pty Ltd - Echuca Vic					**Permits**		
45-3-3567	Duplicate of RPS MAND STH TBM51	GDA	56	352785	6327759	Open site	Deleted	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria,RPS East Australia Pty Ltd - Echuca Vic					**Permits**		
45-3-3537	Duplicate of TBM 30a	GDA	56	352887	6331365	Open site	Deleted	Artefact : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria,RPS East Australia Pty Ltd - Echuca Vic					**Permits**		

Report generated by AHIMS Web Service on 02/08/2021 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 352766.0 - 362107.0, Northings : 6322725.0 - 6332079.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 103

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 35633 MEL

Client Service ID : 609477

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-3-3532	RPS MAND STH TBM22	GDA	56	352975	6329179	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3538	RPS MAND STH TBM30B	GDA	56	352981	6331403	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3446	TBM 30a	AGD	56	352887	6331365	Open site	Deleted	Artefact : 14		
	Contact	**Recorders**	Mrs.Tessa Boer-Mah					**Permits**		
45-3-3437	RPS Mandalong South 02	GDA	56	353075	6329134	Closed site	Valid	Artefact : -		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Blacktown,Mrs.Tessa Boer-Mah					**Permits**		
45-3-3508	RPS MAND STH PS12B	GDA	56	353115	6327699	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3471	RPS MAND STH AH05	GDA	56	353088	6331036	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3550	RPS MAND STH TBM44	GDA	56	353389	6327486	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-1225	Wyee Creek	AGD	56	353500	6329600	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	294,101093
	Contact	**Recorders**	ASRSYS					**Permits**		
45-3-4289	Wyee 5	GDA	56	357889	6326888	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Insite Heritage Pty Ltd,Ms.Elizabeth Wyatt					**Permits**	4550	
45-3-3335	PAD 4 - Munmorah (not a PAD)	AGD	56	357900	6326000	Open site	Not a Site	Potential Archaeological Deposit (PAD) : -		100751,100944
	Contact	**Recorders**	Heritage Concepts,Mr.Jakub Czastka					**Permits**	2780,2781	
45-3-3188	BR12	AGD	56	359427	6325219	Open site	Valid	Artefact : -		100541,100863,101093
	Contact	**Recorders**	Michael Therin					**Permits**		
45-3-3555	RPS MAND STH TBM51	GDA	56	352785	6327759	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3529	RPS MAND STH TBM17	GDA	56	352843	6329468	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3678	RPS Mand 2016_1	GDA	56	352816	6331272	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Hamilton,Ms.Jo Nelson					**Permits**		

Report generated by AHIMS Web Service on 02/08/2021 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 352766.0 - 362107.0, Northings : 6322725.0 - 6332079.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 103

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 35633 MEL

Client Service ID : 609477

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-3-3463	RPS MAND STH TBM08	GDA	56	352915	6327374	Open site	Valid	Water Hole : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Hamilton,Mrs.Tessa Boer-Mah					**Permits**		
45-3-3507	RPS MAND STH PS12A	GDA	56	353111	6327672	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3551	RPS MAND STH TBM45	GDA	56	353387	6327468	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-1224	Wyee Creek;	AGD	56	353600	6328900	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	294,101093
	Contact	**Recorders**	ASRSYS					**Permits**		
45-3-3465	RPS MAND STH TBM37	GDA	56	354133	6327740	Open site	Valid	Artefact : 2		
	Contact	**Recorders**	RPS Australia East Pty Ltd - Hamilton,Mrs.Tessa Boer-Mah					**Permits**		
45-3-3528	RPS MAND STH TBM14	GDA	56	354245	6330532	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	RPS East Australia Pty Ltd - Echuca Victoria					**Permits**		
45-3-3315	WC-ST1	GDA	56	355162	6324145	Open site	Valid	Modified Tree (Carved or Scarred) : -		102879,102920
	Contact Searle	**Recorders**	Doctor.Jodie Benton,Mr.Phillip Cameron					**Permits**		
45-3-1309	Pourmalong Creek;	AGD	56	357361	6330396	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-3-4285	Mannering Ck 3	GDA	56	357902	6327572	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Insite Heritage Pty Ltd,Ms.Elizabeth Wyatt					**Permits**	4550	
45-3-4337	Mannering Creek AS1	GDA	56	358875	6328046	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Umwelt (Australia) Pty Limited - Individual users,Miss.Nicola Roche					**Permits**		
45-3-3263	B8, Bushells Ridge	GDA	56	359931	6325584	Open site	Valid	Artefact : 1		
	Contact T Russell	**Recorders**	Michael Therin					**Permits**		
45-7-0232	B2	AGD	56	360937	6325205	Open site	Valid	Modified Tree (Carved or Scarred) : -		100541,100863,101093
	Contact	**Recorders**	Michael Therin					**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

Report generated by AHIMS Web Service on 02/08/2021 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 352766.0 - 362107.0, Northings : 6322725.0 - 6332079.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 103