

**Proposed Rezoning,  
part of 20 Tylers Road (part Lot 2 DP270325),  
Bargo, Wollondilly Shire LGA, NSW**

Aboriginal Cultural Heritage Due Diligence Assessment

Prepared for L & R Projects Pty Ltd

December 2019

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# 1 INTRODUCTION

Kayandel Archaeological Services (Kayandel) has been commissioned by L & R Roberts Pty Ltd (the Proponent) to prepare an Aboriginal Cultural Heritage Due Diligence Assessment in relation to the potential for Aboriginal objects to be present within areas which could be affected by the construction of the proposed residential subdivision.

This report outlines the results of an Aboriginal heritage due diligence assessment which meets the requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales 2010* (herein referred to as the *Due Diligence Code of Practice*) (DECCW, 2010c), and includes recommendations regarding Aboriginal heritage constraints for the proposed works.

Please note that this report is an initial investigation of constraints and opportunities pertaining to identified Aboriginal heritage sites and places on and/or in the immediate vicinity of the proposed development site. This report is not an Aboriginal Cultural Heritage Assessment Report (ACHAR) prepared in accordance with the guidelines issued by the Department of Planning, Industry and Environment (DPIE) (formerly the Office of Environment and Heritage (OEH)). As such, it would not be sufficient to support an application for an Aboriginal Heritage Impact Permit, in accordance with Section 90 of the *National Parks and Wildlife Act 1974*. Similarly, the report does not consider historical heritage, and would not be sufficient to support an application for a permit under Section 60 or Section 140 of the *Heritage Act 1977*.

## 1.1 Location of the Subject Area

The Subject Area is located within the Wollondilly Shire Council Local Government Area (LGA) and the Tharawal Local Aboriginal Land Council (TLALC). The Subject Area is located within the Parish of Wilton, County of Camden.

The Subject Area is identified as part of 20 Tyler Road, Bargo (part Lot 2 DP270325) (see Figure 1). The Subject Area covers approximately 2.59ha of the 9.42ha property (see Figure 2).

## 1.2 Proposed Works

L & R Projects Pty Ltd is seeking to lodge a planning proposal to rezone a portion of land (see ) for a possible future residential development.

## 1.3 Limitations

The advice provided in this report is limited to Aboriginal heritage.

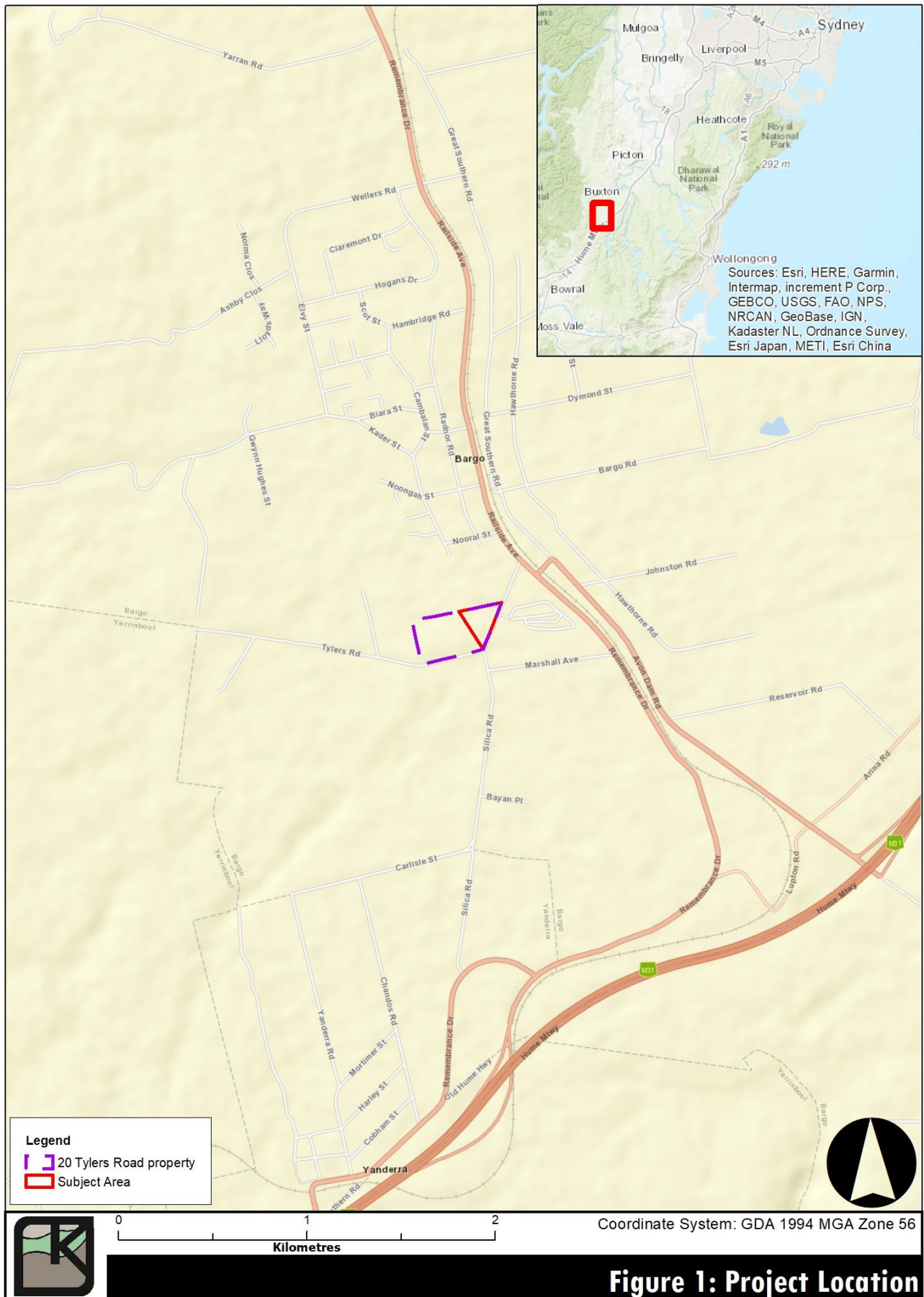
This report is based on a review of available Aboriginal archaeological assessments (sourced from AHIMS, grey literature and Kayandel's report library) and the field investigations. It is possible that further Aboriginal archaeological assessments or the emergence of new analysis of the Aboriginal archaeological landscape within the Bargo/Picton area may support different interpretations of the evidence in this report.

## 1.4 Personnel

This study has been carried out by Kayandel (refer to Table 1).

Person	Qualification	Experience	Tasks
Lawson Rennie	B. Arts (Anth/Arch), B. Arts (Honours) Anth	1 year	Background research, report drafting, field survey
Natalie Stiles	B. Arts (Arch/Paleo), Grad Cert. Arts (Arch), MGIS&RemoteSens	7 years	Mapping, field survey, report review
Lance Syme	B. Arts (Arch/Paleo), Grad. Dip (Heritage Cons.), M. ICOMOS	20 years	Project Supervision, report review

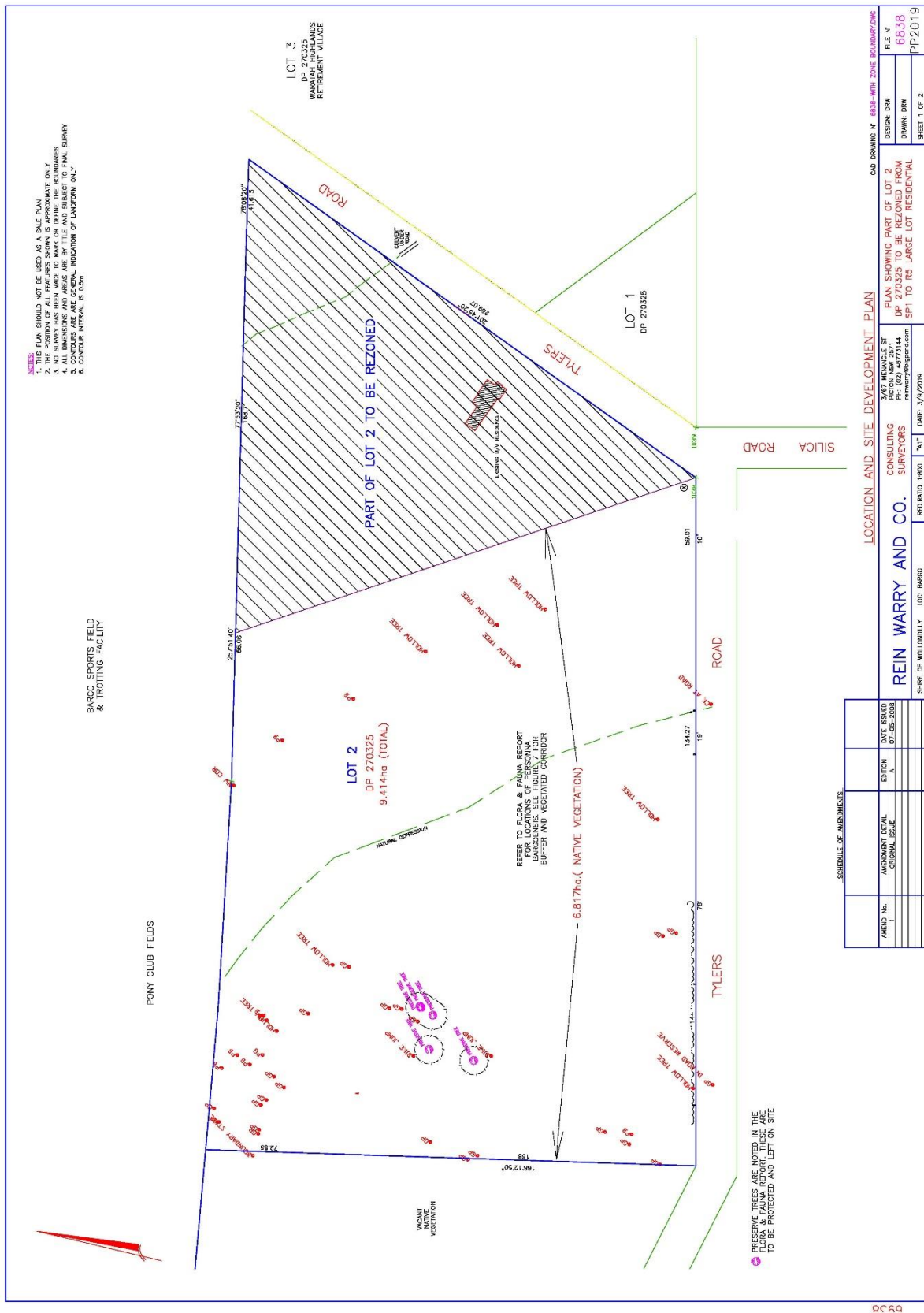
**Table 1:** Kayandel personnel involved in the preparation of this assessment











### Figure 3: Proposed Rezoning

## 2 LEGISLATIVE CONTEXT

The *National Parks & Wildlife Act 1974* provides statutory protection for all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW) and for 'Aboriginal Places' (areas of cultural significance to the Aboriginal community) under Section 86 of the Act.

Aboriginal objects are afforded automatic statutory protection in NSW whereby it is an offence to:

Damage, deface or destroy Aboriginal sites without the prior consent of the Director-General of the National Parks and Wildlife Service (now referred to as the Department of Planning, Industry and Environment (DPIE)).

The Act defines an Aboriginal 'Object' as:

Any deposit, object or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises New South Wales, being habitation before or concurrent with the occupation of that area by persons of non-Aboriginal European extraction and includes Aboriginal remains.

The *Due Diligence Code of Practice* (DECCW, 2010c) was introduced in October 2010 by the Department of Planning, Industry and Environment (DPIE) (formerly the Department of Environment, Climate Change and Water (DECCW)). The aim of the guidelines is to assist individuals and organisations to exercise due diligence when carrying out activities that may harm Aboriginal objects and to determine whether they should apply for consent in the form of an Aboriginal Heritage Impact Permit (AHIP).

A due diligence assessment should take reasonable and practicable steps to ascertain whether there is a likelihood that Aboriginal sites will be disturbed or impacted during the proposed works. If it is assessed that sites exist or have a likelihood of existing within the development area and may be impacted by the proposed development, further archaeological investigations may be required. If it is found that Aboriginal sites were to exist within the Subject Area, an AHIP would be required if the proposed impacts cannot be avoided. If it is found to be unlikely that Aboriginal sites were to exist within the Subject Area and the due diligence assessment has been conducted in accordance with the *Due Diligence Code of Practice*, then the proposed works could proceed without an AHIP.

The *Native Title Act 1994* was introduced to work in conjunction with the *Commonwealth Native Title Act 1993*. Native Title claims, registers and Indigenous Land Use Agreements are administered under the Act. A search of the Native Title register did not identify any active Native Title Claims over the Subject Area.

### 3 LANDSCAPE CONTEXT

Bargo is located in the eastern portion of the Sydney Basin Bioregion. The larger scale geology of the Sydney Basin Bioregion is characterised by marine deposition events from the Carboniferous to the early Permian. Numerous coal deposits accumulated before large river systems covered the region in quartz sandstone, known as the Hawkesbury sandstone. The Hawkesbury sandstone, which forms the bedrock for all of the Sydney Basin, dates to the mid Triassic. This bedrock of sandstone is then capped by a thin layer of shale (Branagan & Packham, 2000; NSW National Parks and Wildlife Service, 2003).

Broadly the area that the Subject Area is within the transitional zone between the Cumberland Plain and the Woronora Plateau within the Sydney Basin. This physiographic region is characterised as a mosaic of river valleys, sandstone cliff lines, ridges, spurs and hillock (Hazelton & Tille, 1990). Slopes vary from gently inclined to steep, with the low cliff lines associated with outcrops of Hawkesbury Sandstone. A series of deeply incised northeast-southwest trending river valleys lies along the eastern portion of the region, trending towards the Illawarra Escarpment and draining onto the Illawarra coastal plain.

The land surrounding the Subject Area is an undulating plain in a plateau environment that is bisected for the majority by 1<sup>st</sup> through to 4<sup>th</sup> order-streams (as defined by Strahler (1964)) that flow into Bargo River, and then flows north to north-east into the Nepean River.

The Subject Area is bisected by a 1<sup>st</sup> order stream that flows north-west into the 3<sup>rd</sup> order stream (which flows into the 3<sup>rd</sup> order, Hornes Creek) that runs through the western portion of the property.

Murphy (2000, p. 9) suggested that most Australian soils may be of great antiquity. The Last Glacial Maximum, a very cold phase between 30,000-21,000 BP, may have rejuvenated extensive soil erosion and deposition in the eastern highlands and many of today's soils in this region may date from that time (Hope, 2005; Petherick, McGowan, & Moss, 2008). Climate change between 1,500 and 4,000 years ago may have led to a new series of small but significant alluvial deposits on the landscape and a new round of soil formation (Murphy, 2000). The antiquity of soils and nature of soil development are relevant to the survival of Aboriginal archaeological materials.

In general, soils consist of A, B and C horizons. The A and B horizon soils are layers that have been modified by weathering and soil development, and the C horizon is weathering parent material. The A1 horizon is usually referred to as topsoil and includes an accumulation of organic matter, is darker in colour and has more biological activity than other horizons. The A2 horizon is usually paler in colour than the A1 and B horizons with less organic matter. It is often the zone of maximum leaching, clay translocation and weathering. When these processes are particularly strong the A2 horizon is white or grey and may be referred to as bleached. The underlying B horizon is usually more clayey, denser and stronger in colour (Murphy & Murphy, 2000, pp. 71-73). In open landscape settings (open sites) Aboriginal artefacts are most commonly found in A horizon soil, and especially the A2 horizon.

Soils within the Subject Area consists of the Lucas Heights soil landscapes.

The Lucas Heights residual soil landscape, is characterised by gently undulating crests, ridges and plateau surfaces, with local relief between 10 to 50 metres and slopes of less than 10%. The soils are generally yellowed to lateritic podsolic, however, this landscape is known for rocky outcrops and limited deep soil bases (Hazelton & Tille, 1990).

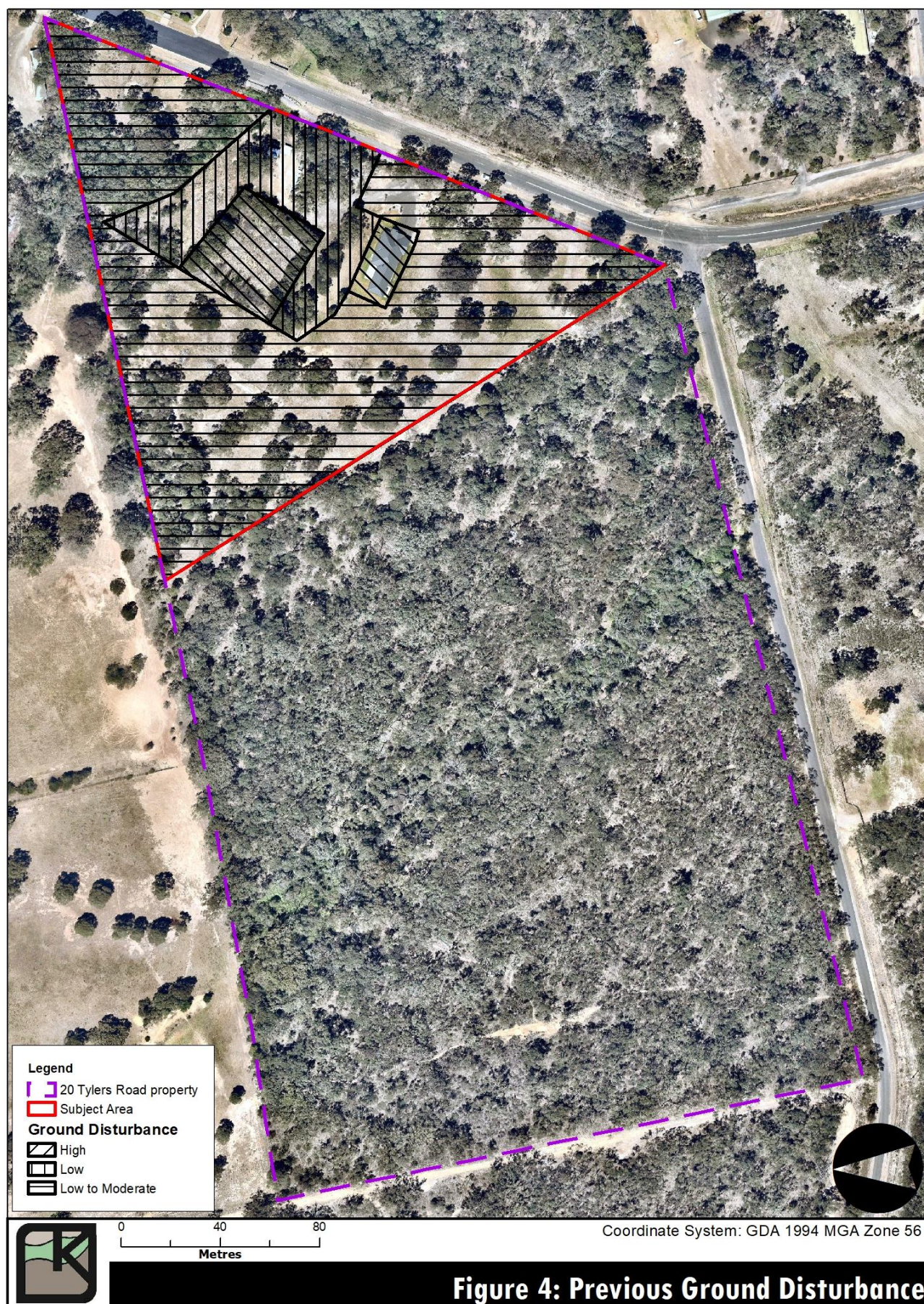
### 3.1 Historical Land-Use Disturbance

The Subject Area has undergone changes since European occupation which began in the early-mid 19th Century. The majority of the broader changes/impacts observed have occurred primarily as a consequence of European land management strategies.

There is a dwelling, earth bunds, drainage ditches and fence lines, and former sewerage treatment system present within the Subject Area.

As a result of previous activities undertaken, a portion of the Subject Area has undergone discreet levels of moderate ground disturbance (i.e. drainage ditches, former sewerage treatment system), while the remainder has undergone low levels of ground disturbance (see Figure 3).







## 4 ARCHAEOLOGICAL CONTEXT

### 4.1 Ethnohistory

At the time of initial European occupation of the Sydney region, systematic ethnographic study of Aboriginal society was not carried out, but various people made some observations which can be compiled to suggest something of Aboriginal lifeways at the time. Various observations have been compiled by Attenbrow (2010) and McDonald (2008). It is known that people lived in family groups, consisting of one or two adult males, their wives, and their dependants (young and old). It is also known that people belonged to named groups which were tied to places, and that people in different areas spoke different dialects (McDonald, 2008).

Due to unreliable sources of the time, exact pre-contact and contact boundaries of Aboriginal territories which existed prior to 1788 in the Sydney region are difficult to reconstruct. The Tharawal people are the local Aboriginal group who lived in the Subject Area (Tindale, 1974). Tharawal [Dharawal] people are thought to have covered an area stretching from the east coast (i.e. Botany Bay) to as far west as Camden and south as far as the Shoalhaven River (Liston, 1988, p. 49). The Gandangarra are thought to have inhabited areas westward and south west of the Dharawal (i.e. west of the Nepean River and into the Blue Mountains). The geographic extent of the Darug speaking groups is still debated, but Mathews records Darug dialects spoken at "Campbelltown, Liverpool, Camden, Penrith and possibly as far east as Sydney, where it merged with Thurawal" (Mathews & Everitt, 1900, p. 265; Tindale, 1974).

The radiocarbon date obtained from the RTA site in George Street, Parramatta indicates that the Sydney region has been inhabited by Aboriginal people for at least 30,000 years, and possibly longer (Jo McDonald CHM, 2007; McDonald, 2008). Archaeological sites from the Blue Mountains and Hawkesbury/Nepean River System have provided other evidence of early occupation within the region. Stockton and Holland (1974) produced a radiocarbon date of c.22,000 years BP from a site at Kings Tableland in the Blue Mountains. Excavation of the Greaves Creek rock shelter site of Walls Cave near Medlow Bath has produced a date of c.12,000 years BP. At Shaws Creek KII, a rock shelter on the west bank of the Nepean north of Penrith, a date of c.13,000 years BP is recorded (Kohen, Stockton, & Williams, 1984).

The arrival of settlers in the region and new competition for resources began to restrict the freedom of movement of Aboriginal hunter-gatherer inhabitants from the early 1800s. European expansion along the Cumberland Plain was swift and soon there was considerable loss of traditional lands to agriculture. This led to violence and conflict between Europeans and Aboriginal people as both groups sought to compete for the same resources. In the Cowpastures region, it began following the murder of an Aboriginal woman and her children, which resulted in violent clashes between several Aboriginal men and European settlers between 1814 and 1816 (Liston, 1988, p. 50). The violence had escalated by 1816 following the outlaw proclamation by Governor Macquarie, resulting in the massacre of 14 Aboriginal people hiding at Appin (Liston, 1988, p. 54). This event is known as the 'Appin Massacre' and is regarded as a pivotal part of the history of the destruction of the Aboriginal people in the region. The outlaw proclamation was withdrawn in November 1816.

## 4.2 AHIMS Database Search

The locations and details of Aboriginal sites are considered culturally sensitive information. It is recommended that this information, including the AHIMS data and GIS imagery, is removed from this report if it is to enter the public domain.

Kayandel carried out a search of the AHIMS database on the out 7<sup>th</sup> November 2019 using the Client Service ID 462775, with the coordinates set out in Table 2 below.

	Easting	Northing
Minimum	272250	6197150
Maximum	282250	6207150

**Table 2:** AHIMS Database Search Criteria

The search area was a 10km by 10km square centred upon the Subject Area, with a 0km buffer (see Figure 4). The results of the AHIMS search are presented in and Table 3. A total of 99 Aboriginal sites have been registered within the search area.

It should be noted that the distribution of sites in the AHIMS database is a reflection of where site surveys have been conducted (see Figure 4 and Figure 5), where exposure and visibility conditions have enabled the detection of sites, and where sites have survived modern land disturbance. The distribution of sites from AHIMS may not be a true reflection of the existing Aboriginal sites in an area.

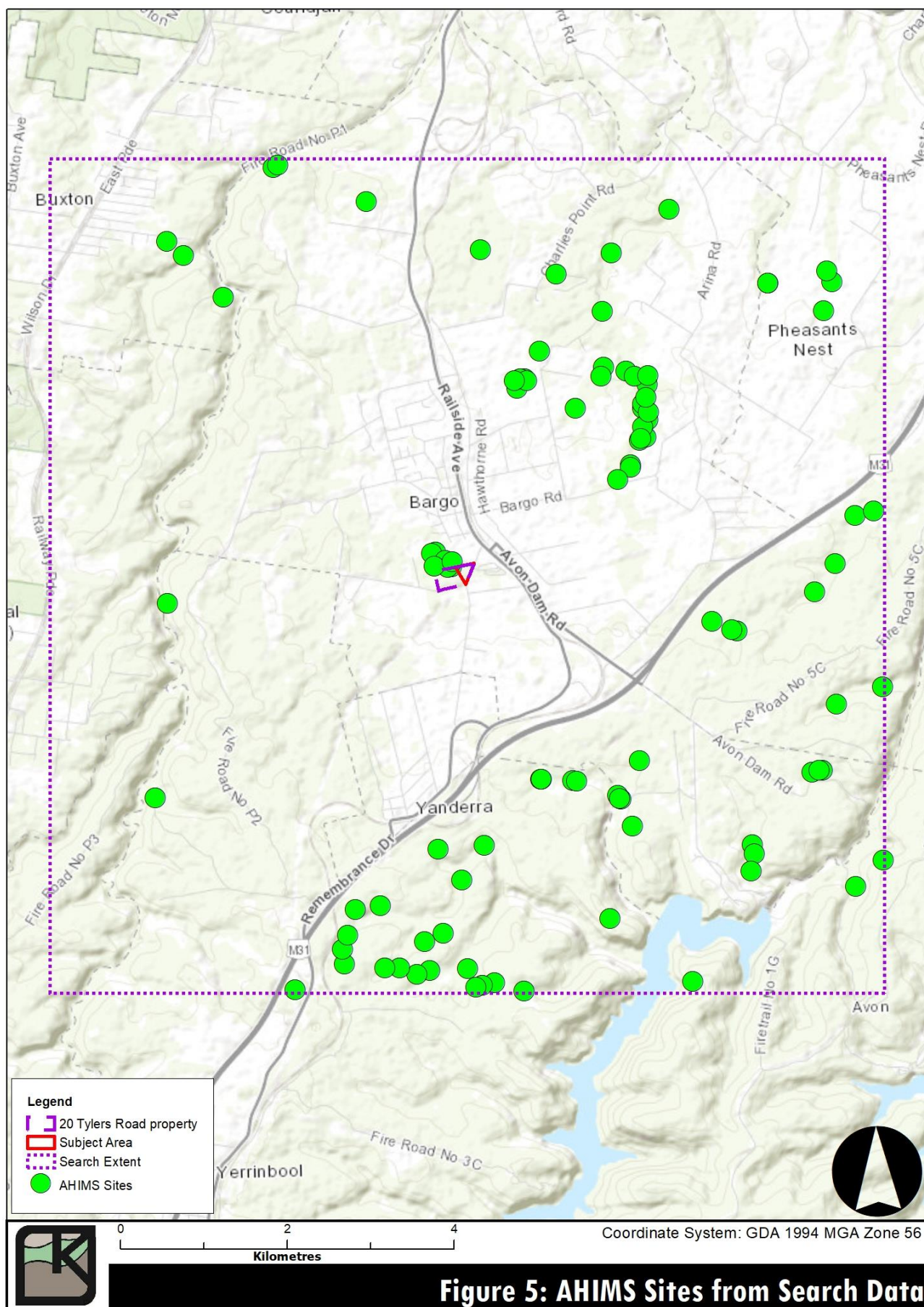
Site types	Frequency	%
Shelter with Art	41	41.41%
Open Camp Site	14	14.14%
Shelter with Artefact	12	12.12%
Shelter with Art and Artefact	8	8.08%
Isolated Find	6	6.06%
Axe Grinding Groove	4	4.04%
Shelter with Axe Grinding Groove	3	3.03%
Potential Archaeological Deposit	2	2.02%
Scarred Tree	2	2.02%
Shelter with Art and Axe Grinding Groove	2	2.02%
Rock Engraving	1	1.01%
Shelter with Art and PAD	1	1.01%
Shelter with Art, Artefact and PAD	1	1.01%
Shelter with Artefact and PAD	1	1.01%
Shelter with PAD	1	1.01%
<b>Total</b>	<b>99</b>	<b>100%</b>

**Table 3:** Site types from AHIMS search

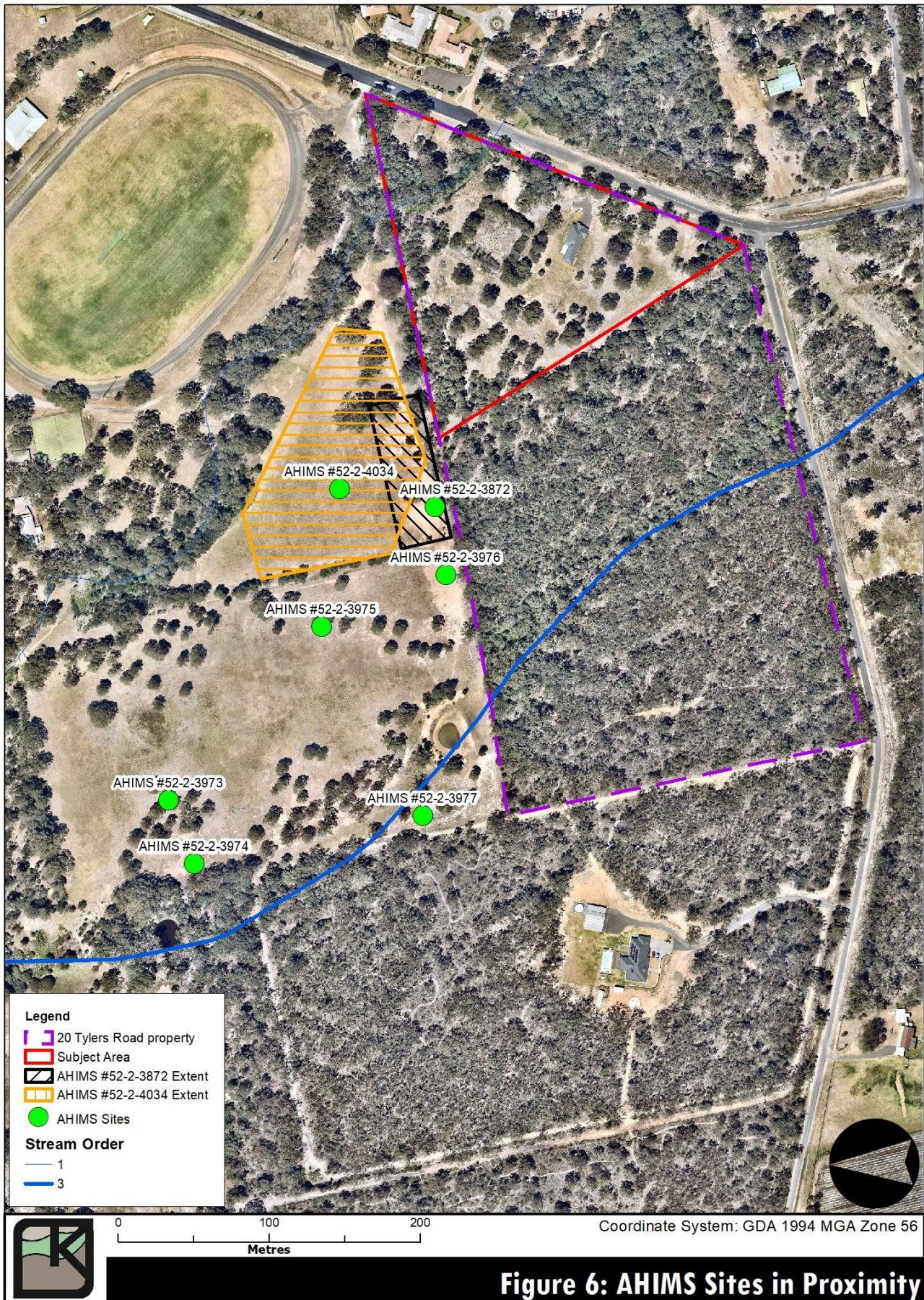
The AHIMS search indicates that 41 of the 99 sites within the search area are Shelter with Art, and another 14 of the sites are Isolated Finds (see Table 3).

There has been a progressive increase in the frequency of Open Camp Sites and areas of Potential Archaeological Deposit (PAD) being identified in recent years as residential land is developed.











### 4.3 Regional Archaeological Context

Archaeological investigations generally fall into three categories - large projects that have been carried out within a research-orientated academic framework and broad management context; archaeological surveys carried out by interested amateurs; and, archaeological investigations which have been carried out within a commercial contracting framework and deal with specific localities subject to development or redevelopment.

The spread of urban development across the Nepean Ramp, particularly over the last few years, has meant that archaeological investigations have intensified as a result for the need of Environmental Impact Assessments. Most archaeological investigations conducted within the Picton/Bargo area have been restricted to small study areas, defined by individual developments, and with limited project briefs. As a result, the understanding of Aboriginal utilisation and occupation of the Picton/Bargo area is constantly being revised and refined as archaeological data becomes available for the area (AHMS, 2014; Black Mountain Projects, 2013; Kayandel, 2015a; Mary Dallas Consulting Archaeologists, 2012; Niche Environment and Heritage, 2018a).

Aboriginal people occupied the Sydney Basin area from the Late Pleistocene. Several Pleistocene occupation sites have been identified in the Blue Mountains and within the NSW coastal regions Turbet (2001). Nanson, Young, and Stockton (1987) excavated a site at Cranebrook Terrace near Penrith with radiocarbon dates of 41,700 +/- 2000-3000 (Attenbrow, 2010); and Stockton and Holland (1974) excavated sites in the Blue Mountains with radiocarbon dates of 22,000 years BP. However, the majority of open sites and rock shelters in the Sydney region are dated within the last 5,000 years (Navin Officer, 2002), possibly due in part to older sites being subject to erosion and other destructive processes for a longer period of time (Hiscock, 2008). It is also possible that occupation of eastern NSW, including the Illawarra and Southern Highlands, increased substantially within the last few thousand years. Various sites such as artefact scatters, scarred trees, grinding grooves, and shelters with deposits and occasionally with art have been recorded in the wider area (Silcox, 1988). Rich (1993) documented the change in lithic assemblages over time on the Mount Flora excavation of the RC-PAD site which is approximately 40km to the southwest of the Subject Area. According to the results artefact density increased markedly during the last 4000 years with quartz being the highest percentage of the recovered artefacts.

### 4.4 Relevant Archaeological Investigations

#### **Black Mountain Projects (2013)**

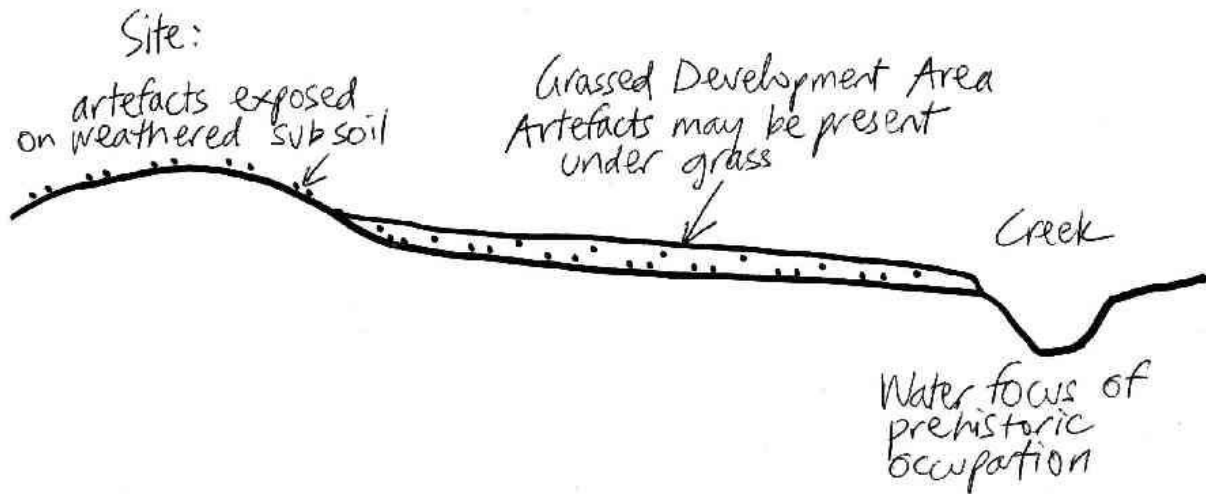
In August 2013, Wollondilly Shire Council commissioned Black Mountain Projects to undertake an Aboriginal heritage assessment of an area of Bargo Sportsground proposed for additional playing fields.

The Bargo Sportsground adjoins the Subject Area along the northern boundary.

Black Mountain Projects (2013, pp. 8-9) reinspected Bargo Sports Ground – AFT001 (AHIMS #52-2-3872) (refer to Figure 5) during the field survey, during which twelve (12) stone artefacts were identified:

- ✦ 7x Flakes;
- ✦ 2x Cores;
- ✦ 2x Blades; and,
- ✦ Hammerstone.

Black Mountain Projects (2013, p. 17) assessed that the surface artefacts that were identified during the reinspection of Bargo Sports Ground – AFT001 (AHIMS #52-2-3872) had “eroded out of soil that previously covered the site. As it eroded, the hard-underlying sub-soil has been exposed to the surface (termed “lag”)” (refer to Figure 6).



**Figure 6: Diagrammatic representation of artefact presence identified at Bargo Sports Ground – AFT001 (AHIMS #52-2-3872) (Black Mountain Projects, 2013, p. 17)**

Black Mountain Projects (2013, p. 17) assessed that an area of high potential archaeological deposit (PAD) (SW CORNER BARGO SPORTSGROUND (AHIMS # 52-2-4034)) which was associated with Bargo Sports Ground – AFT001 (AHIMS #52-2-3872) was likely to extend the study area, located on the western side of the 1<sup>st</sup> order stream that flowed northwest into Hornes Creek (refer to Figure 5).

During Kayandel's review of Black Mountain Projects (2013), it was assessed that the landform where with Bargo Sports Ground – AFT001 (AHIMS #52-2-3872), and SW CORNER BARGO SPORTSGROUND (AHIMS # 52-2-4034) were identified, extended into the Subject Area.

#### **Niche Environment and Heritage (2018a, 2018b)**

Niche Environment and Heritage was commissioned by Precise Planning, on behalf of Wollondilly Shire Council to prepare an Aboriginal heritage assessment for the proposed rezoning and subdivision of 1A Kader Street, Bargo NSW.

1A Kader Street adjoins the Subject Area at the northwest corner.

Niche Environment and Heritage (2018a, p. 27) conducted test excavations in September 2015 that focused on areas that were likely to be impacted by the proposed activity and that were identified as having potential for archaeological deposits during the surface survey in May 2012.

Test pits were placed to test the nature and distribution of known Aboriginal sites (Niche Environment and Heritage, 2018a, p. 27) (refer to Figure 5):

- ✧ Bargo Artefact Scatter 1 (AHIMS #52-2-3973);
- ✧ Bargo Artefact Scatter 2 (AHIMS #52-2-3974);
- ✧ Bargo Artefact Scatter 3 (AHIMS #52-2-3975);
- ✧ Bargo Isolated Find 1 (AHIMS #52-2-3976); and,
- ✧ Bargo Isolated Find 2 (AHIMS #52-2-3977).

Seven (7) test pits were excavated on Transect 1, five (5) test pits were excavated on Transect 2, five (5) test pits were excavated on Transect 3, seven (7) test pits were excavated on Transect 4, four (4) test pits on Transect 5, and two (2) test pits on Transect 6. Each test pit was 1m<sup>2</sup> in accordance with the project methodology sites (Niche Environment and Heritage, 2018a, p. 29).

A total of eleven (11) Aboriginal artefacts were located during the test excavations, all of which were recovered from test pits along Transect 4 (Niche Environment and Heritage, 2018a, p. 29).

Niche Environment and Heritage (2018a, p. 31) determined that the results of the archaeological investigation had confirmed the predictive model developed for the Bargo area, which predicted that low-density background scatters would be present across the Subject Area. On the basis of the investigation it was concluded that:

- ✦ Past Aboriginal land use could have been only infrequent and/or transitional to access areas with more reliable resources and more suitable for extended stay west of the Subject Area along the Bargo River.
- ✦ Traces of past land use could also have been destroyed and/or disturbed by intensive farming activities.

#### 4.5 Previous Predictive Models

In terms of a broader regional context, the Subject Area is located within the transitional zone between the Cumberland Plain and the Woronora Plateau within the Sydney Basin (Kayandel, 2018; Niche Environment and Heritage, 2018a). Review of reports prepared by Kayandel show that the majority of assessments undertaken within and around the Subject Area have been almost exclusively focused upon archaeological survey; only ten (10) archaeological excavations having been undertaken within 15km of the Subject Area. Acknowledging this limitation and recognising that the surrounding regions (Cumberland Plain to the northeast and Southern Highlands to the south) have had significant levels of archaeological excavations to develop robust models of Aboriginal occupation, it is appropriate to review the models for the surrounding regions and assess their relevance in determining an accurate model for Aboriginal occupation and predictions for site types and locations within the Subject Area (Kayandel, 2018).

The various models of past Aboriginal occupation which have been developed for the wider region and similar landscape contexts, i.e. (Koettig, 1986), may be extended to tableland environments; McDonald (2008) is pertinent to open plain contexts; and (Attenbrow, 2006) within the region of the central coast. These models indicate that sources of permanent or seasonally reliable water were not just a focus of past Aboriginal occupation but were a necessity for occupation to occur. Therefore, it is expected that the greatest evidence of occupation would be found in association with reliable water sources such as creeks, and rivers where they occur.

Further, the presence of suitable landforms was also extremely important for occupation to occur. Landform often determines the type of archaeological evidence that will be found or, in many instances, whether any evidence at all can be expected to occur (Kayandel, 2015b; White & McDonald, 2010). Streams on the Nepean Ramp are typically only 1<sup>st</sup> or 2<sup>nd</sup> order streams before entering the Rivers (Nepean and Cordeaux); while streams on the Cumberland Plain are typically 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> order stream that flow into the Hawkesbury River. While the Subject Area is located on a plateau in the Nepean Ramp, that is approximately 9km across, the local landforms and hydrology surrounding the Subject Area is similar to that found on the Cumberland Plain. As such many of the

more specific characteristics of the occupation models proposed for Nepean Ramps and the Cumberland Plain may hold true for the Subject Area.

### **White and McDonald (2010)**

White and McDonald (2010) analysed artefact distribution on the north of the Cumberland Plain by examining the results from a number of archaeological investigations in the Rouse Hill area. This research found that artefact distribution varies significantly with stream order, with higher densities of artefacts located next to larger streams. First order streams had a mean density of 0.7 artefacts/m<sup>2</sup>, while for 2nd order streams this was 6.5 artefacts/m<sup>2</sup> and 4th order streams this increased in 13.9 artefacts/m<sup>2</sup>. There was not enough data on 3rd order streams to make a comparison (White & McDonald, 2010, p. 32).

Distance from water was also tested, as this was believed to be a primary determinant of where people camped and hence where artefact density would be represented in the archaeological record. For 1st order streams, distance from water was not a statistically important, with this just being a background scatter. For 2nd order streams, artefact density is highest within 50m of water and declines with increasing distance from water. For 4th order streams, artefact density was found to be highest 51-100m from the stream and lower closer to the stream (<50m) and declining densities greater than 100m from the stream. White and McDonald propose that lower densities within 50m of larger streams may be reflective of a range of factors including erosion and sheet wash adjacent to major streams. Behaviour may also be a factor such as people conducting knapping, artefact discard and hunting activities slightly further away (White & McDonald, 2010, p. 33).

In terms of landforms, terraces yielded the highest densities. Terraces had a mean density of 20.8 artefacts/m<sup>2</sup>. Mean densities for other landforms are as follows: creek flat 3.8 artefacts/m<sup>2</sup>, lower slope 8.4 artefacts/m<sup>2</sup>, mid slope 3.8 artefacts/m<sup>2</sup> and upper slope and ridge top 0.4 artefacts/m<sup>2</sup> (White & McDonald, 2010, p. 33).

### **AHMS (2014)**

AHMS (2014, p. 20) suggested that:

- ✦ Low spurs/crest/terrace landforms situated within 100m of a waterway/drainage line had very high archaeological potential;
- ✦ Land within 50m of a waterway/drainage line had high archaeological potential;
- ✦ Land within 100m of a waterway/drainage line had moderate archaeological potential;
- ✦ Land within 200m of a waterway/drainage line had low archaeological potential. On the basis of the result from the Niche Environment and Heritage (2018a), where by test excavations occurred between 100m to 200m from a 3<sup>rd</sup> order watercourse, and where surface artefacts had been recorded within 200m of the same watercourse (Black Mountain Projects, 2013; Niche Environment and Heritage, 2018b), Kayandel has considers it likely that areas within 200m of a watercourse have low to moderate archaeological potential; however, the level of ground disturbance may reduce the archaeological potential;
- ✦ All other areas had very low sensitivity; and,
- ✦ Areas of high ground disturbance had very low to nil sensitivity.

### **Kayandel (2018)**

In recent years, Kayandel has developed a Utilisation Model for Aboriginal occupation for the Nepean Ramp Transitional Zone within the Wilton area, which aims to predict and explain the

presence of sites within proximity to the watercourses and escarpments. These utilisation zones are identified as follows (Kayandel, 2018, pp. 50-51):

- ✧ Zone 1 extends from the creek to the top of the escarpment, is believed to have been the main habitation area for the Wilton area, due to the large number of sandstone outcrops that have been identified as rock shelters suitable for habitation.
- ✧ Zone 2 extends from the top of the escarpment to the back of the flat behind the escarpment. A review of the AHIMS data for the Wilton area identified that the majority of Aboriginal sites were recorded in this landform, it is believed that artefact production may have been undertaken in Zone 2. It is also thought that game retrieved from Zone 3 may have been processed into more manageable sizes in this area.
- ✧ Zone 3 is located between the flat behind the escarpment and the highest point in the section. It is thought that Zone 3 may have been utilised as either for hunting and gathering purposes, before heading back down to the rock shelters in the gorge, or as an access point to the main ridge line.
- ✧ Zone 4 is identified as the highest point along the section and may have been utilised for strategic landscape visibility purposes.

#### **Niche Environment and Heritage (2018b)**

Niche Environment and Heritage (2018b, p. 16) suggested that:

- ✧ Stream order to identify potential site types and locations (proximity to water);
- ✧ Patterns of Aboriginal land use and occupation of the region, to identify those landscape areas where material is likely to have been deposited;
- ✧ Distribution of known Aboriginal sites within the Subject Area and broader Cumberland Plain, to identify the landforms known to contain archaeological materials (and patterning of those materials);
- ✧ Geomorphic evolution of the Subject Area, to identify those natural processes that may have affected the Aboriginal archaeological resource;
- ✧ Terrain integrity of the Subject Area, considering the impact of post-contact land use history on the survival of potential Aboriginal sites; and,
- ✧ Likely detection of Aboriginal archaeological materials within the Subject Area, considering the nature of the resource (surface/ subsurface materials) and ground surface visibility constraints.

#### **4.6 Aboriginal Heritage Predictions for the Subject Area**

The following predictions for Aboriginal sites to be present within the Subject Area are based on the landforms present:

- ✧ Surface artefacts may occur across the entire Subject Area;
- ✧ Subsurface archaeological deposits may be present in areas where no visible surface archaeological remains are evident;
- ✧ The size, density and significance of sites will vary, although it is anticipated that any sites will be considerably less complex and less dense at distances greater than 200m from major water sources such as Hornes Creek and the associated 3<sup>rd</sup> order tributaries. This is supported by the identification of Aboriginal stone artefacts at distances of 200m from major water sources (refer to Figure 4);
- ✧ Burials would not be expected due to the limited depth of soil deposits;

- ✦ Areas of PADs in locations with minimal previous land disturbance; and,
- ✦ As past land use disturbance increases in intensity, the ability for Aboriginal objects to provide spatial and chronological information about past Aboriginal land use will decrease.

#### 4.6.1 Expectations for Assemblage Composition

As a result of the review of archaeological reports (refer to Sections 4.4 and 4.5), the predictions made in Table 4, consider how distance from (or proximity to) lithic sources, and residential mobility (or sedentism) might have influenced lithic technology and the formation of artefact assemblages. These predictions have been compared to three modes of site use to develop a series of expectations against which the artefact assemblage recovered during the current project might be assessed (see Table 4).

Model for examination	Expectations for artefact assemblages
Highly mobile people making short-term visits along a travel corridor	Low artefact densities, rare exotic lithic materials/items from other locations that people might have visited on their travels
Highly mobile people making short-term visits while processing lithic materials for transport (mostly early to middle stages of flaking)	High artefact densities, predominantly early to middle stages of flaking, large to moderate artefact size, high frequencies of cortex, low proportions of good quality stone, low frequencies of tools, rare exotic lithic materials/items
Extended occupation while obtaining various lithic, plant and animal resources	High artefact densities, raw materials with diverse properties (fine and coarser grained), early & late stage flaking, diverse tool forms, imported lithic materials, especially if site used as an aggregation locale for people coming from diverse locations in the surrounding region.

**Table 4:** Summary of models and assemblage expectations



## 5 RESULTS OF THE ARCHAEOLOGICAL SURVEY

A pedestrian survey was undertaken on the 13<sup>th</sup> November 2019 by Natalie Stiles and Lawson Rennie.

The main aims of the field assessments were to identify Aboriginal objects, identify areas with potential to retain intact subsurface archaeological deposits, and to assess the overall intactness of the Subject Area.

The field assessments included the completion of visual inspections throughout all readily accessible portions of the Subject Area. Detailed inspections were carried out at the location of ground surface exposures, which may contain stone artefacts. All mature trees were also inspected for evidence of cultural modification as defined by Long (2005).

The Subject Area is open paddock with thick grass, scattered with groups and individual trees obscuring ground surface visibility. The Subject Area was heavily grassed, with few areas of exposure, primarily associated with fence lines, earth bunds, tracks, trees, and animal activities (rabbit warrens and wombat burrows).

Ground surface Visibility (GSV) across the Subject Area was limited, owing to the heavy grass cover and leaf litter in portions of the area surveyed, primarily in an area of native vegetation on the western edge along the adjoining properties boundaries. GSV is estimated <20% across the majority of the area and <10% in areas of heavy grass cover and leaf litter. Areas of exposure approximately 70% visibility.

The survey identified the area had been extensively modified at the northern side of the Subject Area. An earth bund had been constructed inside the eastern and southern fence line of the Subject Area (see Plate 2). A similar earth bund had been constructed near the centre of the Subject Area (see Plate 9). There was an area of erosion from water action located in the central zone of the Subject Area (see Plate 10 and Plate 13). A fenced off area is situated in the northern zone adjacent to Tylers Road, that contained large disused equipment and other debris (see Plate 12). This area was unable to be accessed during the survey. Located in the central zone and facing Tylers Road, modern house has been constructed with a fenced yard and it appeared that a septic system had been constructed for the house (see Plate 14).

No surface artefacts were identified during the site inspection.





**Plate 1:** General view of Subject Area looking south



**Plate 2:** Earth bund eastern fence line



**Plate 3:** Heavy leaf litter in Subject Area



**Plate 4:** Heavy Grass cover In Subject Area



**Plate 5:** View looking north to SW CORNER BARGO SPORTSGROUND (AHIMS # 52-2-4034)



**Plate 6:** View to western fence line of Subject Area from the adjoining property demonstrating the continuation of landform into Subject Area





**Plate 7:** Possible spoil heap



**Plate 8:** View general view looking south



**Plate 9:** Earth bund in central area of Subject Area



**Plate 10:** Erosion by water action in central zone of Subject Area



**Plate 11:** View looking north across the Subject Area



**Plate 12:** Possible septic system





**Plate 13:** Earth works in central area of Subject Area



**Plate 14:** View of modern house with fenced yard

## 5.1 Summary of Results

No Aboriginal sites were recorded during the survey.

Please refer to Section 6 regarding the preliminary assessment potential archaeological deposits within the Subject Area.

## 6 PRELIMINARY ASSESSMENT OF ARCHAEOLOGICAL POTENTIAL

This due diligence assessment provides a preliminary assessment of archaeological potential, that is to determine likelihood of PAD being present within the Subject Area. A more comprehensive and detailed investigation of the extent and nature of archaeological potential would be completed during an archaeological survey report (ASR), where required, under the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b).

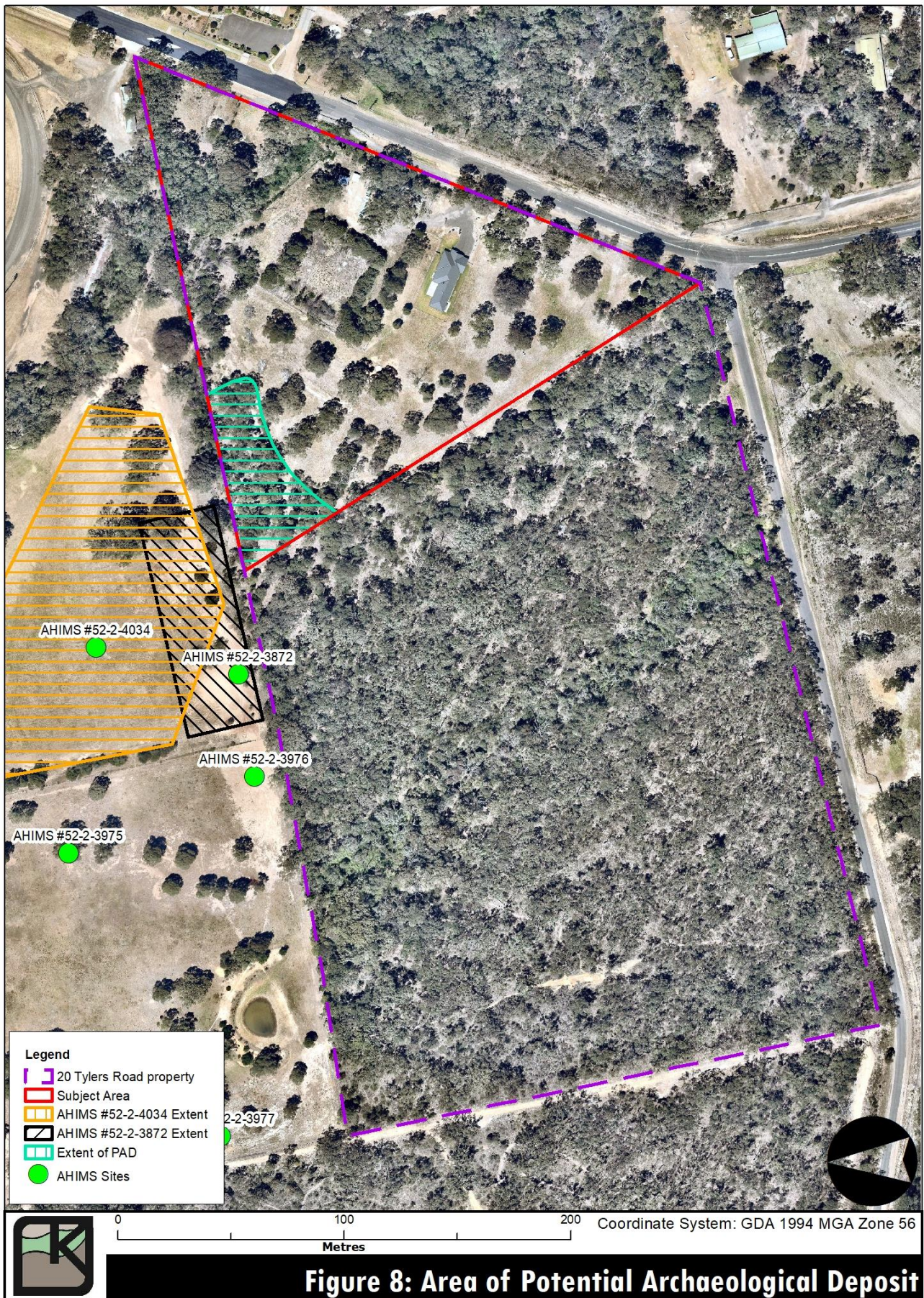
Archaeological sites have been identified in the properties immediately north of the Subject Area (Black Mountain Projects, 2013; Niche Environment and Heritage, 2018a) (see Sections 4.4 and 4.5).

During the Black Mountain Projects (2013) assessment of the sports ground immediately north of the Subject Area, an area of PAD was identified (refer to Figure 5).

During the excavation by Niche Environment and Heritage (2018a), Aboriginal objects were found to a maximum depth of 20cm excavation. Niche Environment and Heritage (2018a) noted that artefact distribution formed higher density clusters in test pits in close proximity to the undisturbed native vegetation along the western boundary of the property.

On the basis that the landform that was subject to test excavation by Niche Environment and Heritage (2018a), and surveyed by Black Mountain Projects (2013) extends across into the Subject Area, the northern portion of the Subject Area is assessed to have moderate potential to contain archaeological deposits. Therefore, further archaeological investigation in the form of an Aboriginal archaeological test excavation is recommended for the area identified in Figure 7.







## 7 DUE DILIGENCE ASSESSMENT

Kayandel was asked to conduct an Aboriginal archaeological assessment of the Subject Area in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010c). This *Due Diligence Code of Practice* sets out the matters which are to be addressed when assessing whether or not an activity may harm Aboriginal Objects.

The *Due Diligence Code of Practice*, with reference to the DECCW process (refer to Appendix V), outlines in regard to the proposed project within the Subject Area, the following:

1. It is not an activity under Part 3 under s.75B of the EP&A Act;
2. The proposed activity is not exempt under the *National Parks and Wildlife Act, 1974* or *National Parks and Wildlife Regulation, 2009*;
3. The proposed activity will not involve harm that is trivial or negligible;
4. The activity is not within an Aboriginal place and no previous investigations meeting the requirements of this code have identified Aboriginal objects;
5. The proposed activity is not a low impact one for which there is a defense in the *National Parks and Wildlife Regulation, 2009*; and,
6. The proponent is not eligible to use an industry specific code of practice.

Consequently the Generic Due Diligence Code of Practice (DECCW, 2010c) is to be followed. The decision process determining whether an Aboriginal Heritage Impact Permit (AHIP) is required is as follows Appendix V:

1. The activity (proposed rezoning) will not disturb the ground surface, and will not disturb any culturally modified trees that have been identified surrounding the Subject Area;
2. a. the Subject Area does not have previously confirmed site records or other associated landscape feature information on AHIMS;  
  
b. there are no sites identified within the Subject Area;  
  
c. there are landscape features that are likely to indicate the presence of Aboriginal objects;
3. The carrying out of the proposed activity cannot be avoided at the relevant landscape features identified over the Subject Area; and,
4. The desktop assessment and visual inspections confirm that the likelihood of Aboriginal objects being present is moderate.

As such, it is determined that a program of archaeological testing should be undertaken in order to determine the nature and extent of the archaeological deposits in the Subject Area due to the moderate potential that the Subject Area contains archaeological deposits.

## 8 LEGISLATIVE OBLIGATIONS AND RECOMMENDATIONS

Specific clauses within the *National Parks and Wildlife Act, 1974* (as amended) and the *National Parks and Wildlife Regulations 2009* give rise to certain obligations. Recommendations for other tasks and activities to be undertaken come from the application of industry standards. Where an activity or task must be undertaken to comply with relevant legislation it will be detailed in Section 8.1, where a task or activity is recommended to be undertaken to meet the current industry standards it is presented in Section 8.2.

### 8.1 Obligations

1. An Aboriginal Heritage Impact Permit under Part 6 of the *National Parks and Wildlife Act, 1974* for any impacts to Aboriginal objects. This Aboriginal Heritage Impact Permit should be sought for all known and unknown Aboriginal objects within the Subject Area as a strategy to minimise the risk of delays during works that may result from unexpected finds; and,
2. Site Cards to be prepared for all Aboriginal sites identified in this study that are not currently recorded in Aboriginal Heritage Information Management System (AHIMS) maintained by the Department of Planning, Industry and Environment.

### 8.2 Recommendations

The following recommendations regarding Aboriginal heritage are based on consideration of:

- ✦ The legal requirements of the *National Parks and Wildlife Act 1974* (as amended), whereby it is illegal to damage, deface or destroy an Aboriginal relic without first obtaining the written consent of the Director General of National Parks & Wildlife Service;
- ✦ The legal requirements of the *Heritage Act 1977*, whereby it is illegal to disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed unless the disturbance or excavation is carried out in accordance with an excavation permit;
- ✦ The results of the background research, archaeological survey, and assessment.

It was found that:

- ✦ It is likely that there are Aboriginal artefacts located within the Subject Area.
- ✦ A section of the Subject Area has moderate potential to retain intact archaeological deposits due to limited disturbance, and modification associated with land clearance, establishment of residential dwelling and associated earth bunds.

It is therefore recommended that:

1. Consultation with the Aboriginal community should be undertaken in accordance with DPIE's *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW, 2010a);
2. Archaeological testing in accordance with DPIE's *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010b) should be undertaken to determine the nature and extent of the archaeological deposit and archaeologically sensitive landforms within the Subject Area (refer to ). A Research Design which details the proposed methodology for the program of archaeological testing should be prepared in consultation with the Aboriginal community and submitted to DPIE 14 days prior to the program of archaeological testing commencing;
3. No actions that will result within the disturbance of the ground surface (including but not limited to geotechnical investigations, soil investigations, contamination investigations and/or



remediation, etc), are to occur within the areas that have been assessed as having moderate archaeological potential (refer to Figure 7). These actions may result in impacts to unknown Aboriginal objects;

4. A site card need to be prepared and submitted for the area of potential archaeological deposit (refer to Figure 7);
5. All relevant staff and contractors should be made aware of their statutory obligations for heritage under the *National Parks and Wildlife Act 1974*, which may be implemented as a heritage induction;
6. If, during the program of archaeological testing, no Aboriginal objects are uncovered, the proposed redevelopment can proceed without an AHIP;
7. However, if during the program of archaeological testing, Aboriginal objects are uncovered, it will be necessary to apply for an AHIP and possibly proceed to a program of archaeological salvage; and,
8. If, during the course of archaeological testing and/or development works, suspected historic cultural heritage material is uncovered, work should cease in that area immediately. The Heritage Division, Office of Environment & Heritage (Enviroline 131 555) should be notified and works only recommence when an approved management strategy has been developed.

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## APPENDIX I. State Heritage Register Search Results

**Listing Type:** ☒ All ☐ Aboriginal Places ☐ State Heritage Register

**Local government area:** Wollondilly

**Item name/Database ID:**

**SHR number:**

**Location:** Bargo

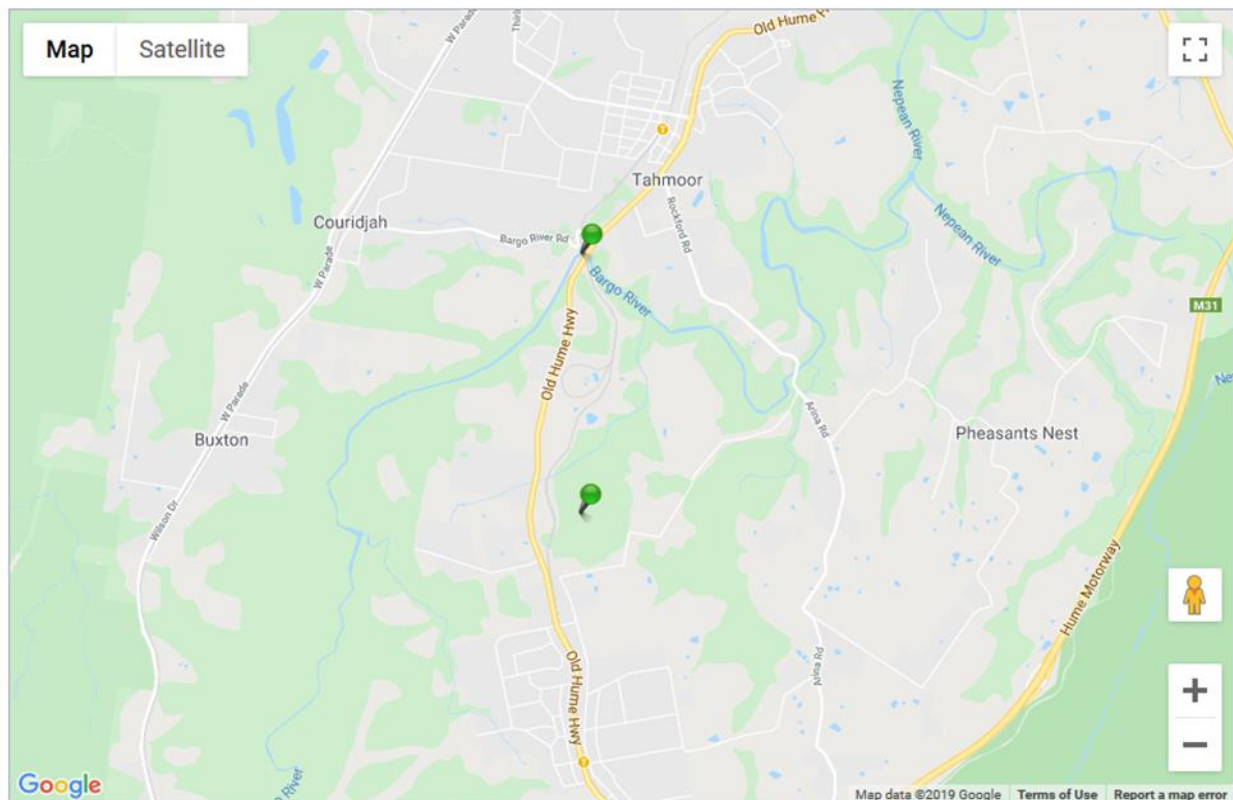
**Local Aboriginal Land Council (LALC):** Tharawal

**State theme:** Please Choose...

**Item type:** Please Choose...

**Item Group:** Please Choose...

**Item category:** Please Choose...



## Appendix II. State Heritage Inventory Search Results

### Section 1. Aboriginal Places listed under the National Parks and Wildlife Act.

Your search did not return any matching results.

### Section 2. Items listed under the NSW Heritage Act.

Your search returned 2 records.

Item name ▲	Address	Suburb	LGA	SHR
<a href="#"><u>Bargo Railway Viaduct</u></a>	Main Southern railway 96.265 kms	Bargo	Wollondilly	01024
<a href="#"><u>Wirrimbirra Sanctuary</u></a>	Hume Highway	Bargo	Wollondilly	01508

### Section 3. Items listed by Local Government and State Agencies.

Your search did not return any matching results.

There was a total of 2 records matching your search criteria.

## Appendix III. Register of the National Estate Search Results



Australian Government  
Department of the Environment and Energy

Heritage  
Australian Heritage Database

You are here: [Environment home](#) » [Heritage](#) » [Australian Heritage Database](#)


### Search Results

[new search](#) [edit search](#)

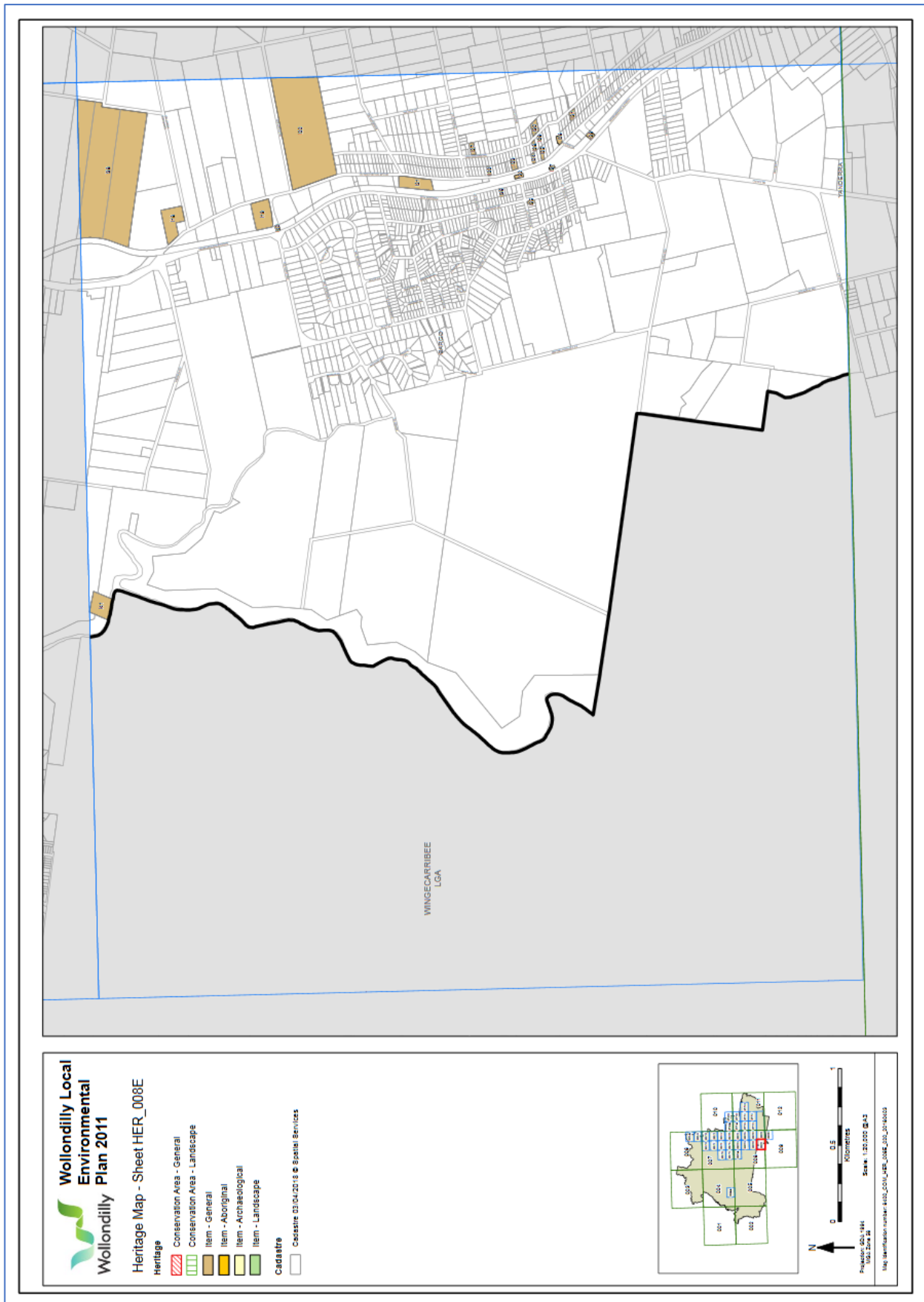
2 results found.

<a href="#">Bargo Railway Station</a> Old Hume Hwy	Bargo, NSW, Australia	( <a href="#">Indicative Place</a> ) Register of the National Estate (Non-statutory archive)
<a href="#">Wirrimbirra Sanctuary</a> Remembrance Dr	Bargo, NSW, Australia	( <a href="#">Registered</a> ) Register of the National Estate (Non-statutory archive)

Report Produced: Thu Nov 28 10:14:00 2019

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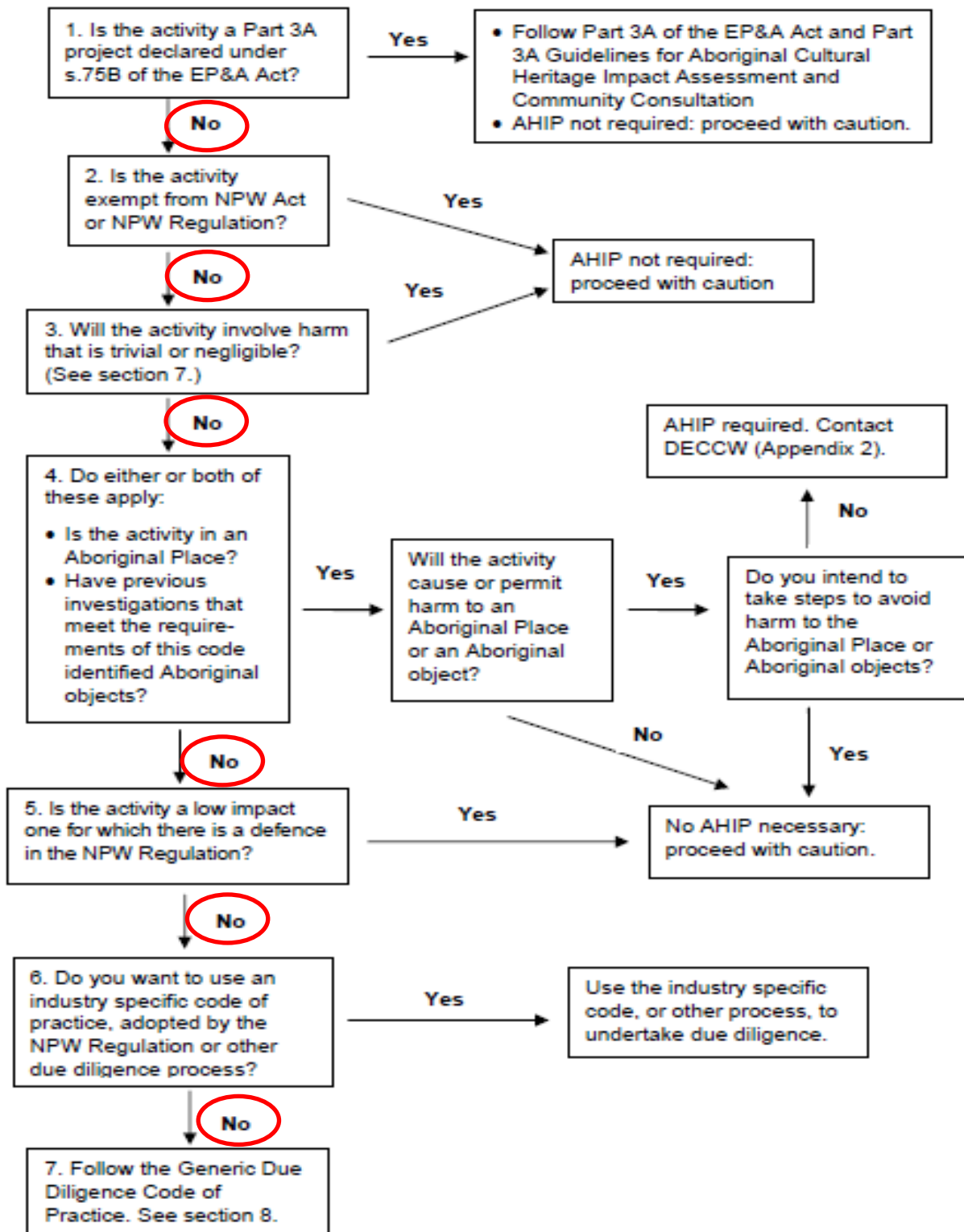
## APPENDIX IV. WOLLONDILLY LEP 2011





## Appendix V. Due Diligence Decision Process from (DECCW, 2010c, p. 1 & 10)

### 1 Do you need to use this due diligence code?



## 8 The generic due diligence process

