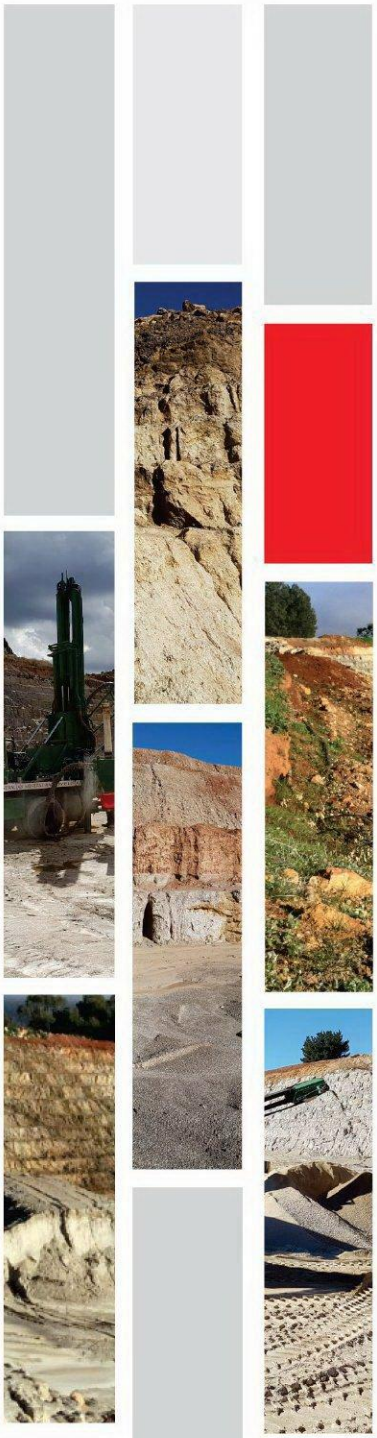

APPENDIX F

Aboriginal Cultural Heritage Assessment Report

DOC18/188649

Report Title	Aboriginal Cultural Heritage Assessment Anderson's Clay Mine Extension
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Date of Report	29 August 2018
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Aboriginal Cultural Heritage Assessment

ANDERSONS CLAY MINE

AUGUST 2018

ngh environmental

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Final	29/07/18	Doug Williams, Emily Dillon, Matthew Barber	Matthew Barber & VGT	Matthew Barber

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EXECUTIVE SUMMARY

INTRODUCTION

NGH Environmental has been contracted by PGH Bricks & Pavers Pty Limited (PGH) to prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the proposed expansion of the Anderson Clay Mine extraction area, Springdale Heights, NSW.

PGH are seeking to undertake work that may impact Aboriginal heritage objects, as defined under the NSW *National Parks and Wildlife Act 1974*. The purpose of the Aboriginal Cultural Heritage Assessment (ACHA) is therefore to investigate the presence of any Aboriginal sites and to assess the impacts and management strategies that may mitigate any impact.

This ACHA Report was prepared in line with the following:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011);
- *Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales* (OEH 2010a), and
- *Aboriginal cultural heritage consultation requirements for proponents 2010* (ACHCRP) (OEH 2010b) produced by the NSW Office of Environment and Heritage (OEH)

The proposal area is within the Albury Local Government Area.

PROJECT PROPOSAL

The Andersons Clay Mine proposal area is located approximately 6 km north of Albury. The Mine is currently operating in a 7.975 hectare area within Lot 35, DP1007803 and the proposed expansion would involve the extension of the mine into Lot 2 DP 856969 Shaw Street, Springdale Heights in the Albury Local Government Area (See Figure 1).

The expansion area is approximately 7.3 hectares in size, consisting of predominantly cleared grazed paddocks, some areas of remnant Box Gum Woodland, Exotic Cyprus plantings and two dams.

The Andersons Clay Mine expansion would involve the following works:

- Extension of existing extraction operations to include the north west corner of the property
- Installation of crushing and screening facilities at the quarry
- Extraction would be undertaken using a combination of dozers, dump trucks and excavators which would rip the shale and push the clay/shale up into one or more internal stockpiles within the mine floor.
- Vegetation clearing

ABORIGINAL CONSULTATION

The consultation with Aboriginal stakeholders was undertaken in accordance with clause *80C of the National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2010* following the consultation steps outlined in the ACHCRP guide provided by OEH.

The full list of consultation steps, including those groups and individuals that were contacted and a consultation log is provided in Appendix A.

Letters outlining the development proposal and the need to carry out an ACHA were sent to the Albury and District LALC and various statutory authorities including OEH, as identified under the ACHCRP. An advertisement was placed in the local newspapers, the Border Mail on the 23rd of June 2017 seeking registrations of interest from Aboriginal people and organisations. A further series of letters was sent to other organisations identified by OEH in correspondence to NGH Environmental. In each instance, the closing date for submission was 14 days from receipt of the letter.

As a result of this process, two groups contacted the consultant to register their interest in the proposal. The groups who registered interest Yalmambirra and Leonie McIntosh. No other party registered their interest and no response was received from the Albury and District LALC despite multiple follow-up calls and emails.

An Assessment Methodology document for the Andersons Clay Mine Expansion was sent to Yalmambirra and Leonie McIntosh for the proposed field survey. Subsequently, as a result of the identification of a potential archaeological deposit and the need for subsurface testing, a further methodology was sent to both registered parties for further comment. A minimum of 28 days was allowed for a response to each document. No comments were received on the methodology from either registered party.

The *Assessment Methodology* outlined in Stage 2 included a written request to provide any information that may be relevant to the cultural heritage assessment of the study area. It was noted that sensitive information would be treated as confidential. No response regarding cultural information was received.

In July 2018 a draft version of this *Aboriginal Cultural Heritage Assessment Report* for the proposal (this document) was forwarded to the Aboriginal stakeholders inviting comment on the results, the significance assessment and the recommendations. A minimum of 28 days was allowed for responses to the document. No comments were received from either party.

ARCHAEOLOGICAL CONTEXT

No Aboriginal sites have previously been recorded within the proposal area.

Based on site modelling and the prevalence of sites in the surrounding area the site types most likely to be encountered at the Anderson Clay Mine are quartz lithic scatters, isolated artefacts and scarred trees in remnant old growth vegetation bordering the cleared development area.

SURVEY RESULTS

The field survey identified two PADs in the subject area, termed Andersons PAD 1 and Andersons PAD 2. Under the current development proposal disturbance to Andersons PAD 1 is unavoidable, and poor surface visibility meant the PAD could not be fully assessed for its potential to contain Aboriginal objects. Accordingly, a program of test excavation was undertaken to test the subsurface archaeological signature of Andersons PAD 1.

TEST EXCAVATION RESULTS

The field survey results concluded there were a number of questions regarding the cultural resources of the study area that could not be answered based on the results of field survey, but which would be better

able to be resolved using test excavation techniques. Broadly, the aims of the subsurface testing excavation were:

- Identify the presence or absence of Aboriginal cultural material.
- Assess the likely extent and nature of any such cultural material.
- Assess the archaeological significance of any cultural material.
- Provide an opportunity for Aboriginal stakeholders to assess the cultural significance of any material.
- Assess the management requirements for any cultural material that might be affected as the result of the development of the stage 2 phase, including the need for an AHIP.

More specifically, if possible, given the results of the testing, the aims of the investigation would be to:

- Analyse the characteristics of the stone artefact assemblage.
- Identify any activity areas or other cultural features present.

While there were 25 test pits proposed for excavation (Figure 7), only 13 were excavated in the test program. At the completion of these test pits enough data had been gathered to conclude that the area of Andersons PAD 1 had very little topsoil deposit in place, although the reason for that could be previous farming practices or a naturally thin profile. **NO ABORIGINAL OBJECTS WERE RECOVERED FROM THE EXCAVATED TEST PITS.**

Evidence of significant disturbance to the study area was found in the form of a soil mound or bund, constructed along the southern margin of the identified PAD (Plate 18). The benched area is ~6m wide and up to ~2m high, and its origin is unknown as the quarry operator has indicated that no topsoil stripping has been undertaken in the area by them. It is possible that the mound was formed through stripping of the topsoil during the orchard phase most likely in order to create a wider flat area at the crest of the ridge. The bench extends into the neighbouring property to the west. The conclusion therefore is that the ridge crest through the two paddocks has been subject to ground disturbance.

The presence of this feature, and the shallow topsoil led to the conclusion that the area of Andersons PAD 1 is in fact highly disturbed and modified, and the likelihood of *in situ* archaeology occurring is very low.

Despite the highly disturbed area, during test excavation field work one isolated artefact was observed 6 m south west of probe 3. It was recorded as Andersons PAD 1-1 and shows that despite the apparent surface disturbance, the area most likely contained an Aboriginal heritage site which has now been largely removed.

RECOMMENDATIONS

It is recommended that:

1. Prior to commencing construction the proponent must apply for Aboriginal Heritage Impact Permit (AHIP) that covers the development area. The AHIP must be granted and received by the proponent prior to any on ground works commencing.
2. The AHIP application should make allowance for the management of Aboriginal heritage material discovered during construction or ongoing operation of the clay mine.
3. Although very unlikely, if any object is found suspected to be human remains work at the location must cease and the following must be contacted immediately:
    a. NSW Police – Albury Police Station
    b. NSW OEH Environment Line, Phone 131555

c. The location is to be made secure to prevent unauthorised access. Work on the development project may continue at a suitable distance from the potential human remains – not closer than 100m.

4. Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation. This would include consultation with the registered Aboriginal parties and may include further field survey.

5. PGH, its employees and agents are reminded that it is an offence under the *NSW National Parks and Wildlife Act 1974* to disturb, damage or destroy and Aboriginal object without approval.

1 INTRODUCTION

NGH Environmental has been contracted by PGH Bricks & Pavers Pty Limited (PGH) to prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the proposed expansion of the Anderson Clay Mine extraction area, Springdale Heights, NSW in the Albury Local Government Area (Figure 1). The Mine is currently operating in a 7.975 hectare area within Lot 35, DP1007803 and the proposed expansion would involve the extension of the mine into Lot 2 DP 856969 Shaw Street, Springdale Heights in the Albury Local Government Area (See Figure 2).

NGH Environmental has been contracted by PGH to prepare an Aboriginal Cultural Heritage Assessment (ACHA) to investigate and examine the presence, extent and nature of any Aboriginal heritage for the proposal area as part of an Environmental Impact Assessment (EIS). A surface survey of the areas was carried out and identified a potential archaeological deposit (PAD) that necessitated further archaeological assessment in the form of subsurface testing. This report presents the results of those two assessments.

The Andersons Clay Mine expansion proposal would involve ground disturbance that has the potential to impact on Aboriginal heritage sites and objects which are protected under the NSW *National Parks and Wildlife Act 1974* (NPW Act). The purpose of the Aboriginal Cultural Heritage Assessment (ACHA) is therefore to investigate the presence of any Aboriginal sites and to assess the impacts and provide management strategies that may mitigate any impact.

1.1 DEVELOPMENT CONTEXT

The ACHA has been prepared in accordance with the requirements of the Secretary of the Department of Planning and Environment (DPE). The Secretary of the DPE Environmental Assessment Requirements (SEARs) relating to Aboriginal heritage were as follows:

> "an assessment of the potential impacts on Aboriginal heritage (cultural and archaeological), including evidence of appropriate consultation with relevant Aboriginal communities/parties and documentation of the views of these stakeholders regarding the likely impact of the development on their cultural heritage." (SEARS for Andersons Clay Mine 18/05/17).

The assessment area of the proposed clay mine expansion comprised approximately 2.8 hectares of Lot 2, DP856969.

1.2 THE SITE

The proposed Andersons Clay Mine expansion would be located on an approximately 2.8 hectare property, part of Lot 2 DP 856969 adjacent to the existing 7.975 hectare Clay Mine within Lot 35, DP1007803. The existing clay mine property has been heavily disturbed by the extraction process but, the surrounding land is predominantly open paddock with a small tree plantation and some areas of remnant box Eucalypt vegetation.

1.3 THE PROPOSAL

The Andersons Clay Mine proposal area is located approximately 6 km north of Albury. The Mine is currently operating in a 7.975 hectare area within Lot 35, DP1007803 and the proposed expansion would involve the extension of the mine into Lot 2 DP 856969 Shaw Street, Springdale Heights (See Figure 1).

The expansion area is approximately 7.5 hectares in size, consisting of predominantly cleared grazed paddocks, some areas of remnant Box Gum Woodland, Exotic Cyprus plantings and two dams.

The Andersons Clay Mine expansion would involve the following works:

- Extension of existing extraction operations to include the north west corner of the property
- Installation of crushing and screening facilities at the quarry
- Extraction would be undertaken using a combination of dozers, dump trucks and excavators which would rip the shale and push the clay/shale up into one or more internal stockpiles within the mine floor.
- Vegetation clearing

1.4 PROJECT PERSONNEL

The field survey assessment was undertaken by archaeologist Emily Dillon of NGH Environmental, including research, Aboriginal community consultation, field survey and report preparation. Test excavation was undertaken by Doug Williams, Tanya Erofeev and Bill Williams.

Consultation with the Aboriginal community was undertaken following the process outlined in OEH's *Aboriginal cultural heritage consultation requirements for proponents 2010.* Two Aboriginal groups registered their interest in the proposal. These groups were:

- Yalmambirra
- Leonie McIntosh

No representative was available to undertake the field survey or test excavation over. Further detail and an outline of the consultation process is provided in Section 2.

1.5 REPORT FORMAT

For the purposes of this assessment of the proposed Andersons Clay Mine Expansion, we have prepared the report in line with the following:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011);
- *Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales* (OEH 2010a), and
- *Aboriginal cultural heritage consultation requirements for proponents 2010* (ACHCRP) (OEH 2010b) produced by the NSW OEH.

The purpose of this ACHA Report is therefore to provide an assessment of the Aboriginal cultural values associated with the study area and to assess the cultural and scientific significance of any Aboriginal heritage sites. This conforms to the intention of the SEARs.

The objectives of the assessment were to:

- Conduct Aboriginal consultation as specified in clause 80c of the *National Parks and Wildlife Regulation 2009*, using the consultation process outlined in the ACHCRP*;*
- Undertake an assessment of the archaeological and cultural values of the study area and any Aboriginal sites therein;
- Assess the cultural and scientific significance of any archaeological material, and
- Provide management recommendations for any objects found.

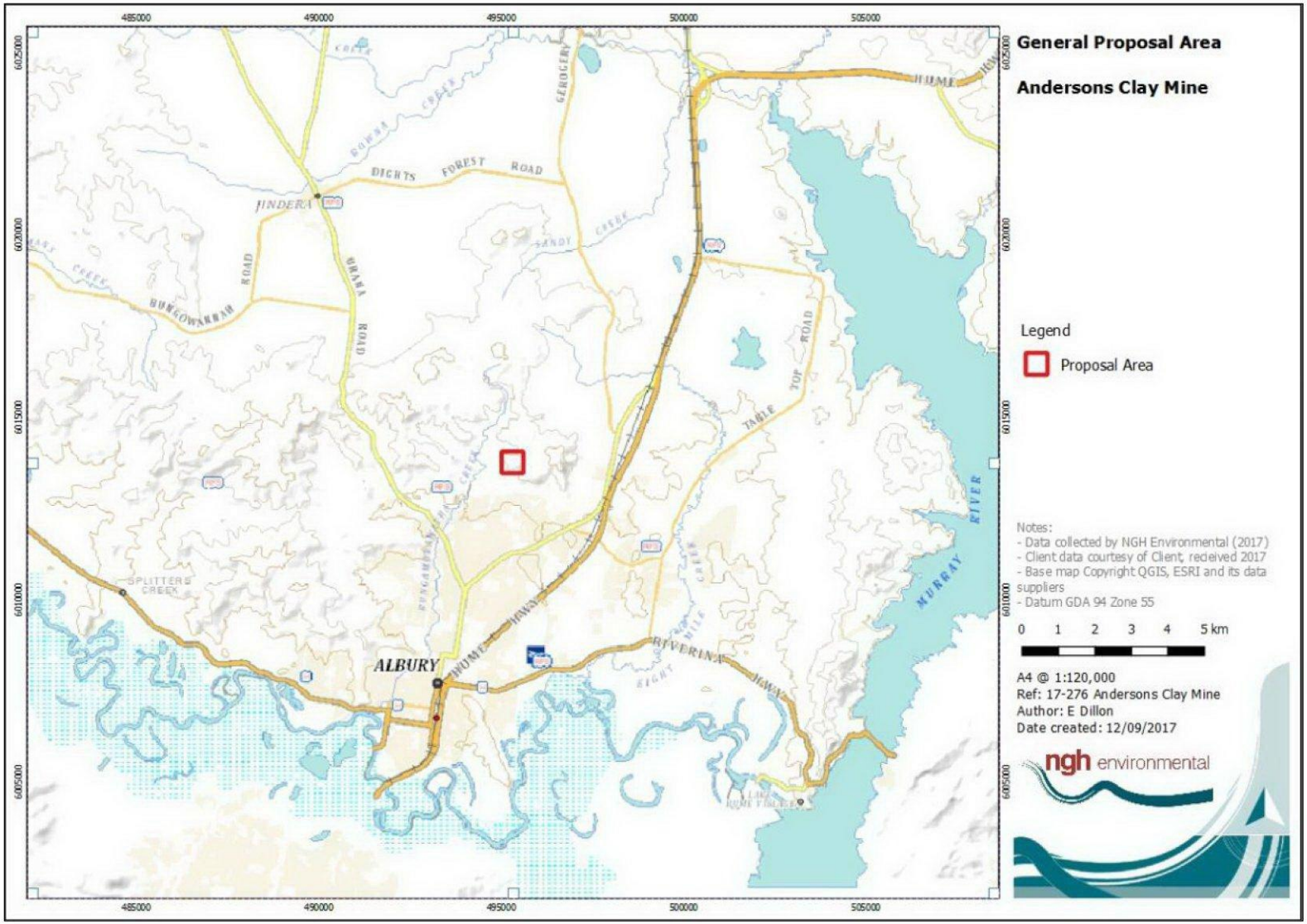


Figure 1 General proposal area.

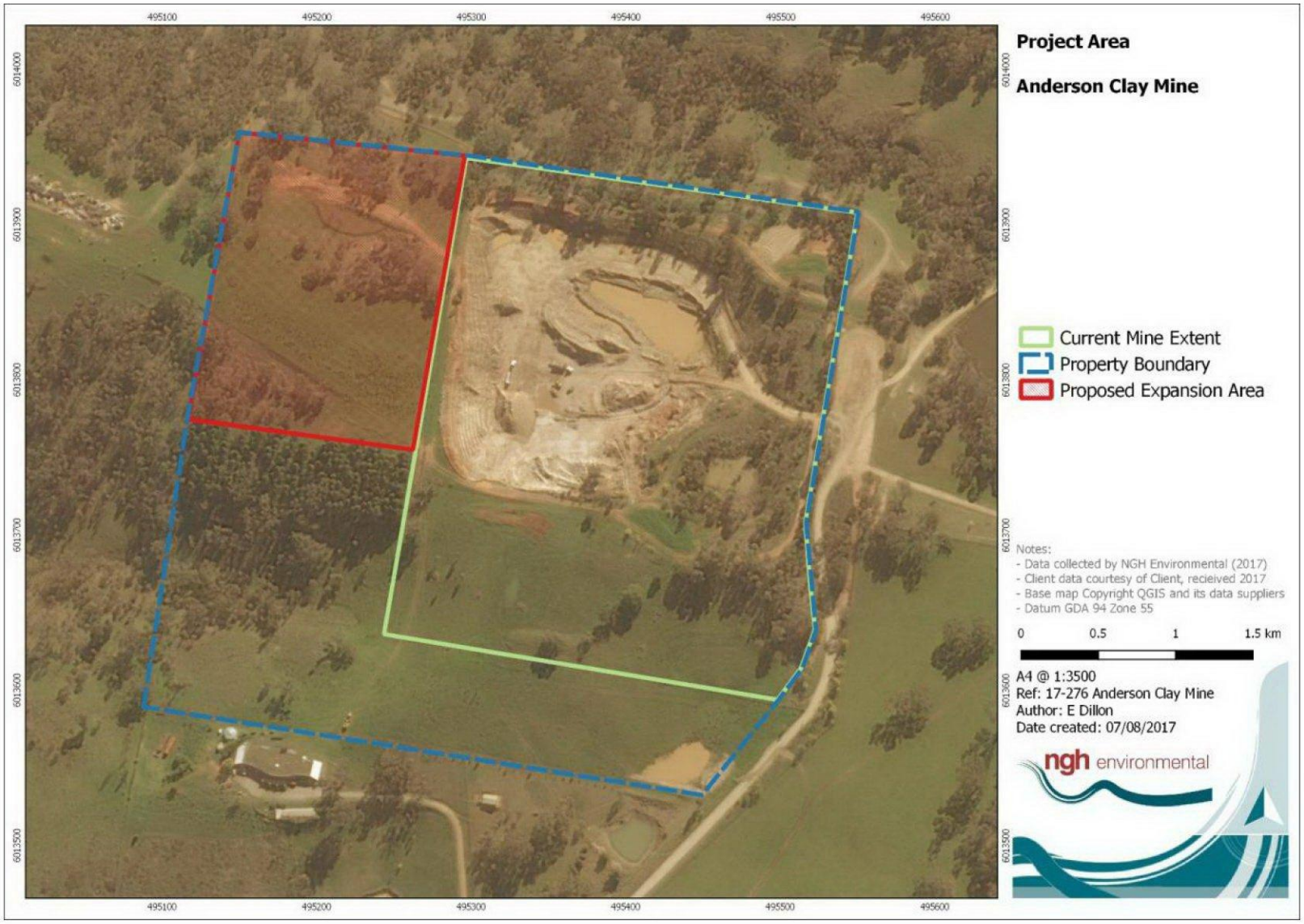


Figure 2. Proposal area.

2 ABORIGINAL CONSULTATION PROCESS

The consultation with Aboriginal stakeholders was undertaken in accordance with clause *80C of the National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2010* following the consultation steps outlined in the ACHCRP guide provided by OEH. The guide outlines a four-stage process of consultation as follows:

- Stage 1 – Notification of project proposal and registration of interest.
- Stage 2 – Presentation of information about the proposed project.
- Stage 3 – Gathering information about cultural significance.
- Stage 4 – Review of draft cultural heritage assessment report.

The full list of consultation steps, including those groups and individuals that were contacted and a consultation log is provided in Appendix A. A summary of actions carried out in following these stages are as follows.

Stage 1. Letters outlining the development proposal and the need to carry out an ACHA were sent to the Albury and District LALC and various statutory authorities including OEH, as identified under the ACHCRP. An advertisement was placed in the local newspapers, the Border Mail on the 23rd of June 2017 seeking registrations of interest from Aboriginal people and organisations. A further series of letters was sent to other organisations identified by OEH in correspondence to NGH Environmental. In each instance, the closing date for submission was 14 days from receipt of the letter.

As a result of this process, two groups contacted the consultant to register their interest in the proposal. The groups who registered interest Yalmambirra and Leonie McIntosh. No other party registered their interest and no response was received from the Albury and District LALC despite multiple follow-up calls and emails.

Stage 2. On the 15th of August 2017, an Assessment Methodology document for the Andersons Clay Mine Expansion was sent to Yalmambirra. On the 29th of August 2017, an Assessment Methodology document for the Andersons Clay Mine Expansion was sent to Leonie McIntosh. This document provided details of the background to the proposal, a summary of previous archaeological surveys and the proposed heritage assessment methodology for the proposal, which involved pedestrian survey of the proposal area. The document invited comments regarding the proposed methodology and sought any information regarding known Aboriginal cultural significance values associated with the subject area and/or any Aboriginal objects contained therein. A minimum of 28 days was allowed for a response to the document. No comments were received on the methodology from either registered party.

Subsequent to the survey, and as a result of the identification of a potential archaeological deposit, another project methodology was sent to the two Aboriginal parties identifying the proposed testing method. A further 28 days was provided for comments.

Stage 3. Each of the *Assessment Methodologies* outlined in Stage 2 included a written request to provide any information that may be relevant to the cultural heritage assessment of the study area. It was noted that sensitive information would be treated as confidential. No response regarding cultural information was received.

For the first stage, fieldwork was organised and Yalmambirra was asked to participate in the survey. However, due to a lack of insurances he was unable to participate. The survey fieldwork was carried out on 9 November 2017 and the subsurface testing from 15 – 17 May 2018. Yalmambirra was unable to attend the subsurface testing fieldwork again due to lack of insurance cover.

Stage 4 In July 2018 a draft version of this *Aboriginal Cultural Heritage Assessment Report* for the proposal (this document) was forwarded to the Aboriginal stakeholders inviting comment on the results, the significance assessment and the recommendations. A minimum of 28 days was allowed for responses to the document.

2.1 ABORIGINAL COMMUNITY FEEDBACK

No comments were received from either of the registered Aboriginal parties.

3 BACKGROUND INFORMATION

3.1 REVIEW OF LANDSCAPE CONTEXT

3.1.1 Geology, Topography and Soils

The landscape context assessment is based on a number of classifications that have been made at national and regional level for Australia. The national Interim Biogeographic Regionalisation for Australia (IBRA) system identifies the proposal area as located within South Western Slopes Bioregion and the Upper Slopes Subregion (DE&E 2016). The South Western Slopes Bioregion is a large area of foothills and ranges comprising the western fall of the Great Dividing Range. The area lies entirely within the eastern section of the Lachlan Fold Belt and consist of a complex series of north to north westerly trending folded bodies of Cambrian to Early Carboniferous sedimentary and volcanic rocks. Soils on the tops of ridges and hills tend to be shallow, stony with downslope contrast soils derived from underlying weathered rock and topsoils comprised of homogenised surface mantle. More specifically within the Upper Slopes subregion the landforms consist of steep, hilly and undulating ranges and granite basins with shallow stony soils on steep slopes, texture contrast soils grading from red subsoils on upper slopes to yellow subsoils on lower slopes and alluvial sands, loams and clays.

The proposed Andersons Clay Mine area is wholly within the Albury - Oaklands Hills and Footslopes of the Mitchell Landscapes (DECC 2002) (See Figure 4). This unit is described as

"Isolated hills and rises on folded lower Ordovician greywacke, phyllite, chert, schist and small areas of Silurian-Devonian granite, general elevation 150 to 480m, local relief 20 to 150m. Shallow gritty loam amongst rock outcrop on hills, red-brown texture-contrast soil on slopes with bleached A2 horizons and strongly structured subsoil. Low open woodland of; Dwyer's mallee gum (*Eucalyptus dwyeri*), grey box (*Eucalyptus microcarpa*), white box (*Eucalyptus albens*), currawang (*Acacia doratoxylon*), drooping she-oak (*Allocasuarina verticillate*), with understorey of; *Gonocarpus elatus*, *Erodium botrys*, and nodding blue-lily (*Stypandra glauca*). Yellow box (*Eucalyptus melliodora*) and grey box grassy woodlands on foot slopes." (DECC 2002, p.90)

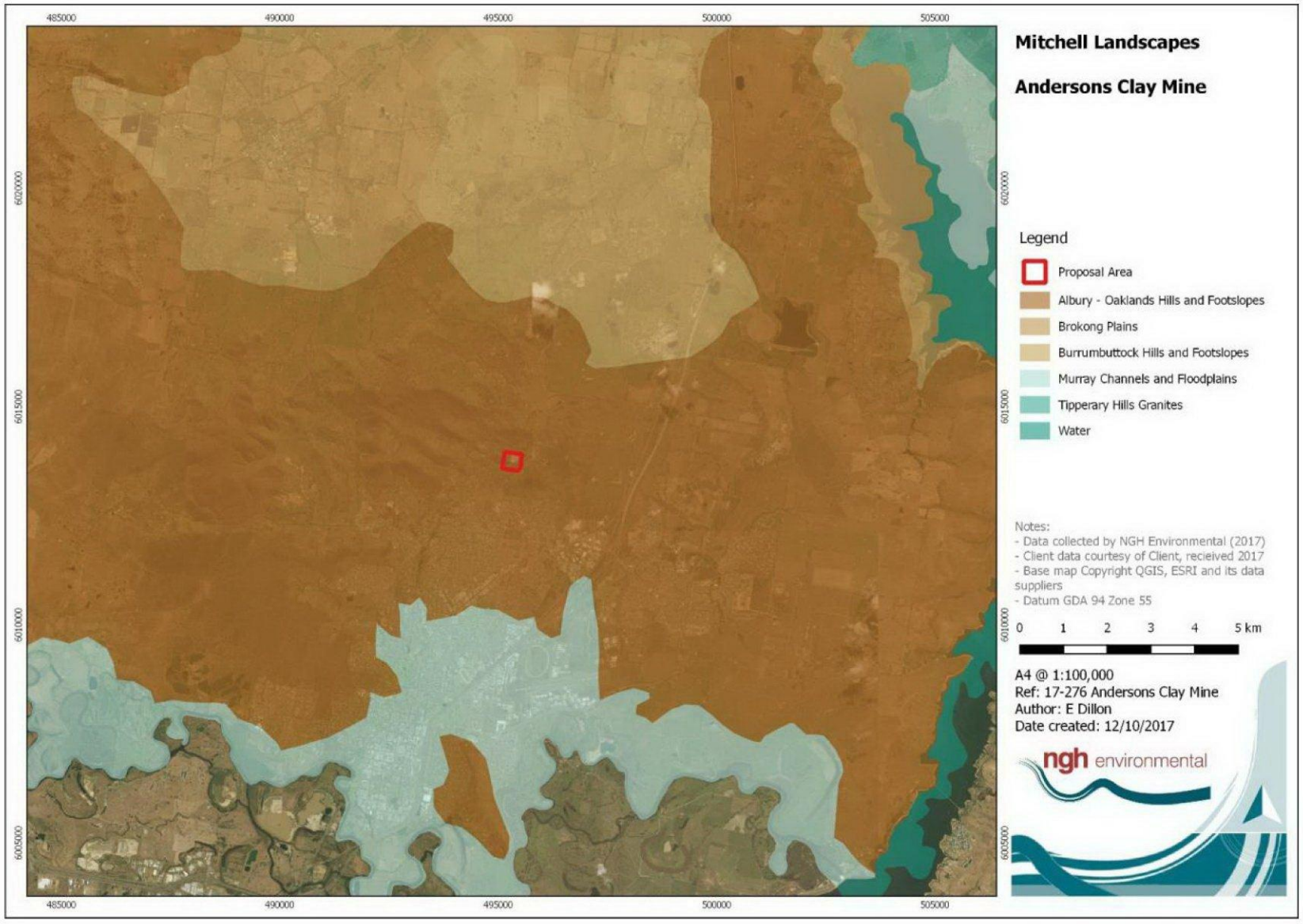


Figure 3. Location of Mitchell landscapes in relation to the proposed project area.

3.1.2 Flora and Fauna

The biodiversity assessment carried out by NGH Environmental on the 17th of May 2016 identified two distinct vegetation communities within the proposal area:

1. White Box Yellow Box Blakely's Red Gum Woodlands and derived native grassland (Box-Gum Woodland).
2. White Box - Blakely's Red Gum-Red Box-Red Stringybark Woodland.

In addition, there were two vegetation assemblages which do not conform with any native vegetation communities:

1. Exotic Vegetation.
2. Planted White Cypress Pine trees.

3.1.3 Historic Landuse

It is understood that the extraction activity commenced on the property adjacent to the subject land under a Permanent Mining Agreement in 1969. In August 1983, the Albury -Wodonga Development Corporation granted a permit (number N72), which approved the extraction of clay brick within the north-eastern portion of the subject land. The activity involved an area of 7.975 hectares. The permit did not include an end date to the approval.

In August 1990, a Mining Lease (number ML1229) was granted to permit the extraction of clay and shale (from an area of 7.975ha) for the purpose of making bricks. The lease was renewed in 2013 with an end date of 23/8/2032. Clay and shale has been extracted continuously from the site in accordance with the approvals.

It is also understood that the area of the proposed extension was previously used as an orchard, possibly 30 to 40 years ago. This would have resulted in significant ground disturbance and potentially disturbance of any Aboriginal archaeological material and deposits present (VGT pers comm).

3.1.4 Landscape Context

Most archaeological surveys are conducted in a situation where there is topographic variation and this can lead to differences in the assessment of archaeological potential and site modelling for the location of Aboriginal archaeological sites.

The landforms identified for the survey were determined based on topography with three main areas delineated, the ridge crest, the associate side slopes and the drainage line in the south western corner of the project area.

The nearest permanent water is likely to be Bungambrawatha Creek, located about 750 m to the west.

3.2 REVIEW OF ABORIGINAL ARCHAEOLOGICAL CONTEXT

3.2.1 Ethnohistoric Setting

There are several ethnographic recordings of Aboriginal life in the Riverina region from the 1800s that notably focus on the prevalence of Aboriginal people around waterways in the region. It is however important to consider that the Aboriginal people alive at the time of such observations were survivors of serious epidemics of infectious disease such as smallpox, bought by Europeans, that greatly affected the population sizes and

distribution of people within the landscape. Consequently, European records may not necessarily reflect pre-contact population distributions and traditional ways of life (Dowling 1997, Littleton and Allen 2007).

Tribal Boundaries

Cultural areas are difficult to define and "must encompass an area in which the inhabitants have cultural ties, that is, closely related ways of life as reflected in shared meanings, social practices and interactions" (Egloff, Peterson & Wesson 2005, p.8). Depending on the culture defining criteria chosen - i.e. which cultural traits and the temporal context (historical or contemporary) - the definition of the spatial boundary may vary. In Australia, Aboriginal "marriage networks, ceremonial interaction and language have been central to the constitution of regional cultural groupings" with the distribution of language speakers being the main determinate of groupings larger than a foraging band (Egloff, Peterson & Wesson 2005, pp.8 & 16).

Early mapping of tribal boundaries by Tindale (1940) and Tindale (1974) and subsequent mapping by Horton (1994) identified the proposal area as within the Wiradjuri language group. It should be noted that today not all Aboriginal groups agree with the mapped boundaries presented in Tindale and other publications.

These borders were not static, they were most likely fluid, expanding and contracting over time to the movements of smaller family or clan groups. These boundaries ebbed and flowed through contact with neighbours, the seasons and periods of drought and abundance. The close proximity to each other also meant that people likely spoke multiple languages and dialects (Howitt 1904, Tindale 1974, MacDonald 1983, Horton 1994).

The Wiradjuri language group was the largest in NSW prior to European settlement extending from the east side of the Riverine plain to the Great Dividing Range and extended from the Murray River at Corowa/Albury north to Dubbo.

Social Structures

It was the small family group that was at the core of Aboriginal society and the basis for their hunting and gathering life. The immediate family camped, sourced food, made shelter and performed daily rituals together. The archaeological manifestations of these activities are likely to be small campsites, characterised by small artefact scatters and hearths across the landscape. Places that were visited more frequently would develop into larger site complexes with higher numbers of artefacts and possibly more diverse archaeological evidence.

These small family units were part of a larger band which comprised a number of families. They moved within an area defined by their particular religious sites (MacDonald 1983). Such groups might come together on special occasions such as pre-ordained times for ceremonies, rituals or simply if their paths happened to cross. They may also have joined together at particular times of the year and at certain places where resources were known to be abundant. The archaeological legacy of these gatherings would be larger sites rather than small family camps. They may include large hearth or oven complexes, contain a number of grinding implements and a larger range of stone tools and raw materials.

Identification and differentiation of such sites are difficult in the field. A family group and their antecedents and descendants occupying a particular campsite repeatedly over a long period of time may leave a similar pattern of archaeological signatures as a large group camped over a shorter period of time.

Aboriginal population declined due to disease such as small pox and influenza as well as dispossession from traditional lands and acts of violence against the Aboriginal people which meant that there was great social upheaval and partial disintegration of the traditional way of life. This meant that access to traditional

resource gathering and hunting areas, religious life and marriage links and access to sacred ceremonial sites were disrupted or destroyed.

However, despite these disruptions, Aboriginal people continued to maintain their connections to sites and the land in the early days of European settlement. Where Aboriginal people were taken to places like Warangesda, a mission established near Darlington Point in 1880, Brungle Reserve between Gundagai and Tumut, or Moonahcullah mission approximately 50 km west of Deniliquin that was established in 1916, people were able to maintain at least some form of association with country and maintain traditional stories.

Material culture

Accounts of the material culture of Aboriginal people in the Murray Darling Basin have been detailed extensively by Oxley (1820), Bennet (1834) and later Beveridge (1883) and include descriptions of tools kits, weapons and clothing.

Bennet (1834) detailed the manufacture of possum and kangaroo skin coats using mussel shell scrapers to render the skin pliable. Kangaroo tail sinew made into thread and bone awls were used to stitch the skins into cloaks, many of which had ornamental patterns scratched onto the inner side. The kangaroo sinew was also recorded as used to create head ornaments in the form of hair nets stained with ochre or pipeclay for both men and women (Bennet 1834). Both Oxley (1820) and Bennet (1834) observed that both sexes had the *septum naris* perforated in which a bone, straw or stick was worn. The adult men were also missing an upper incisor attributed to a marker of initiation (Oxley 1820, Bennet 1834) .

A range of tools and weaponry were recorded including spear throwers, parrying shields, broad shields, clubs, shovels, axes and varieties of throwing sticks (Oxley 1820, Bennet 1834, White 1986) as well as trapping nets made from plant fibre cord (Beveridge 1883).

Digging sticks were used by women to collect vegetable foods and 'grub shovels' or small wooden spades were described by Eyre (1845) as being used to dig up grubs, ants and Mallee roots. Skin bags and bark troughs were used to carry water and baskets were made from grasses, rushes and netting (Beveridge 1889, Lawrence 1967). Beverage (1883) describes a wooden trough placed over coals for cooking and 'flints, mussel shells, kangaroo bones and split reeds were used in cutting and skinning foods' (Lawrence 1967, p. 86). Grindstones and pestles were used to pound roots and mill seed and along the Darling River the deliberate cultivation and harvesting of wild millets was recorded (Mitchell 1839, Allen 1974).

In an archaeological context, few of these items would survive, particularly in an open site context. Anything made from bark and timber and animal skins would decay quickly in an open environment. However, other items, in particular those made of stone would survive where they were made, placed or dropped. Shell material may also survive in an archaeological context. Sources of raw materials, such as the extraction of wood or bark would leave scars on the trees that are archaeologically visible, although few trees of sufficient age survive in the modern context.

Food and Resources

There are a number of ethnographic recordings of Aboriginal life in the Riverina region from the 1800s. Most notably, the observations of Beveridge (1883) focused on the prevalence of Aboriginal people around water ways in the region. Early settlers and others who wrote about the Wiradjuri people and customs differentiated between the origin of some groups, referring to people as the Lachlan or Murrumbidgee tribes, or the Levels tribe for those between the two major rivers (Woolrych 1890). The extent of the Wiradjuri group means that there were many different environments that were exploited for natural resources and food. Like everywhere in Australia, Aboriginal people were adept at identifying and utilising resources either on a seasonal basis or all year round.

Historic accounts of Aboriginal people in the Riverine Plains of south eastern Australia reflect a group of people reliant on a range of both aquatic and terrestrial food resources. During certain seasons, fish, shellfish and waterfowl provided a significant part of the flesh diet and corresponds to periods where relatively small areas of land could support large groups of people. In other seasons populations living along the rivers was greatly reduced and the focus on and acquisition of aquatic resources changed. It is during these periods that terrestrial resources became more important and food gathering activities diversified.

During the annual flooding of the rivers, swamps and river flats were inundated and billabongs filled. Under these conditions the netting and trapping of fish by large groups of people became prevalent. The base of a large fibre net would be weighted down with clay heat retainers and at the top of the net reed bundles would be attached as floats. One man would hold one end of the net on the shore while the other would wade into the lagoon gradually dropping the net, once he reached the shore, forming a semi-circle. The two people would start pulling the net back, moving towards one another, hauling the catch of fish towards them. Such activities were recorded to have produced very large volumes of fish (Sturt 1833, p. 92, Beveridge 1883, pp. 28–30). Within major billabongs log traps were also constructed to trap fish within a smaller area, for easier access and often associated with large gatherings of people (Gilmore 1934). Additionally, women were recorded catching crayfish, where two women would trawl a fine gauged net along the lagoon bottom.

The trapping of ducks and other waterfowl in lagoons using large nets has also been observed and Beveridge suggests that over a season hundreds of birds are caught in this manner (Beveridge 1883). Additionally huge numbers of waterbird eggs during breeding season are collected using canoes (Beveridge 1883, p. 18).

Beveridge (1883) observed canoes being manufactured from a single sheet of Red Gum bark that was propped and moulded into the desired shape and left to season in the sun for ten to fifteen days (Beveridge 1883, pp. 24–25). He details pronged fish spears that doubled as a means to pole and paddle the canoes, used to harpoon fish in areas of reedy shallow water (Beveridge 1883, Kabaila 1999). Lawrence (1967) suggests that these spears were probably only used when the reed beds were filled with water and consequently not as important during the remainder of the year.

As the flood waters began to subside, the number of people the land could support began to decline. People began to fish in the broader reaches of the rivers using short, stout spears (Lawrence 1967, p. 76) and women would create weirs made of wooden stakes to trap larger fish in pools as the waters receded (Beveridge 1883, p. 30). Other types of fish traps across rivers have been recorded such as the bridging of a watercourse with a tree trunk with interwoven brush or saplings forming a net beneath the tree preventing larger fish from moving on. As the river flow dwindled and the fish became concentrated in smaller and smaller pools, fish-poisoning could be effectively employed (Lawrence 1967, p. 76).

Collection of river mussels using the toes was recorded by (Sturt 1833) and Balme suggested that mussels were the most common item in the remains of open midden sites along the Darling River and associated lakes in western NSW.

The range of methods employed to exploit aquatic resources were not a matter of random choice, but instead formed part of an annual cycle of fluctuations in river level and flow (Lawrence 1967).

A range of reptiles, other mammals and insects were also a common food type, in particular grubs and ants and ant eggs (Fraser 1892, Pearson 1981). Plant foods were equally as important and mostly consisted of roots and tubers, such as *Typha* or Cumbungi whose tubers were eaten in late summer and shoots in early spring. Other edible plants from the Wiradjuri region include the Yam Daisy or *Murnong*, eaten in summer and autumn, the Kurrajong seeds and roots, Acacia seeds and other rushes too (Gott 1982).

3.2.2 AHIMS Search

The Aboriginal Heritage Information Management System (AHIMS) is maintained by OEH and provides a database of previously recorded Aboriginal heritage sites. A search provides basic information about any sites previously identified within a search area. However, a register search is not conclusive evidence of the presence or absence of Aboriginal heritage sites, as it requires that an area has been inspected and details of any sites located have been provided to OEH to add to the register. As a starting point, the search will indicate whether any sites are known within or adjacent to the investigation area.

A search of the AHIMS database was conducted over an area approximately 13 km east-west x 13 km north-south centred on the proposal area, was undertaken on the 19th of June 2017. The AHIMS Client Service Number was: 287062. There are 77 Aboriginal sites recorded in the search area and no declared Aboriginal Places. Table 1 below shows the site types previously recorded in the region and Figure 3 shows the location of AHIMS sites in relation to the Anderson Clay Mine Proposal Area.

Table 1 Breakdown of previously recorded Aboriginal sites in the region.

Site Type	Number
Artefact	53
Modified Tree	16
Artefact and PAD	4
PAD	4
TOTAL	**77**

None of the sites are located within the current proposal area and the closest site to the project area is AHIMS # 60-3-0011 a scarred tree approximately 1 km to the south west of the project area.

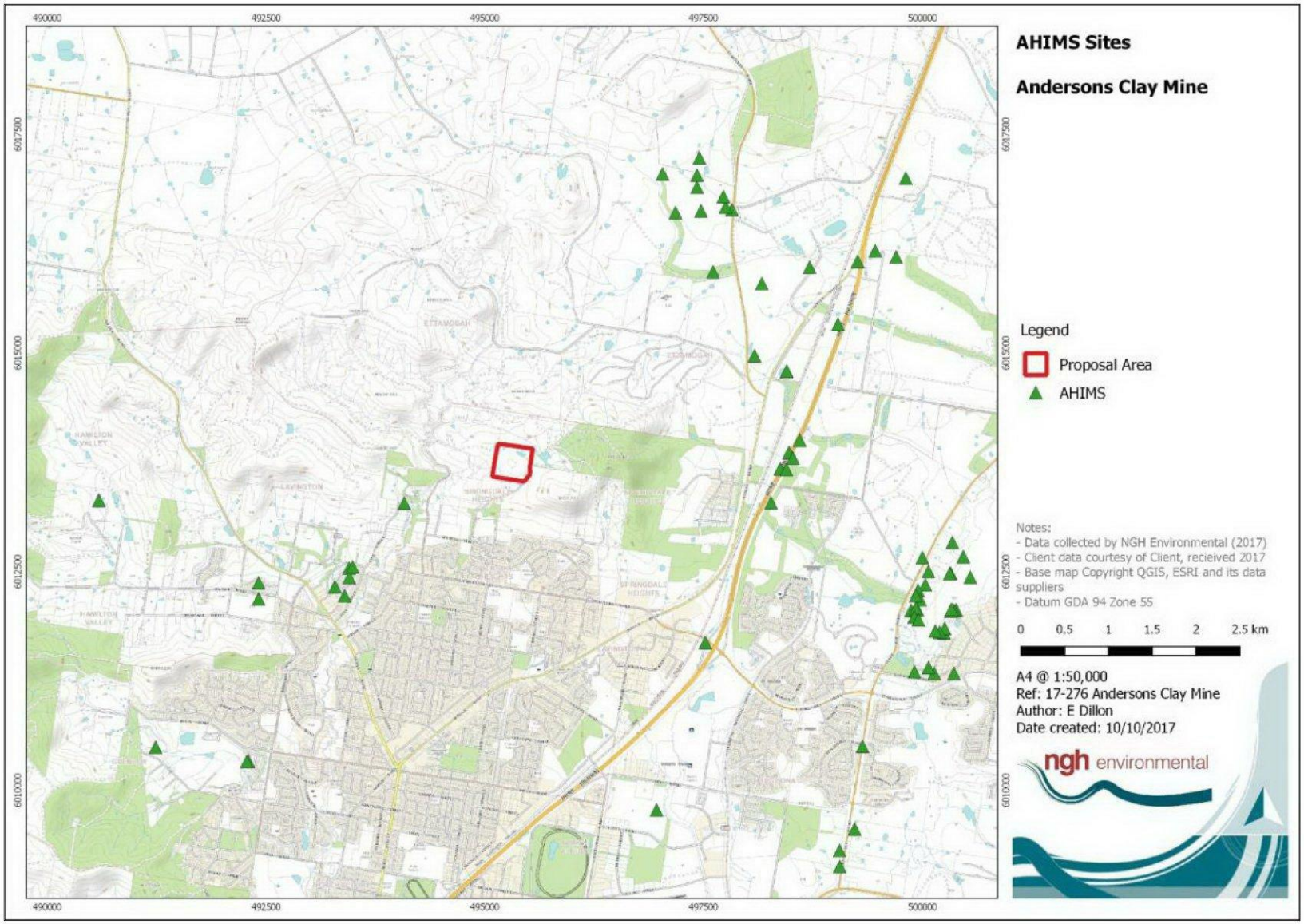


Figure 4. Location of AHIMS sites

3.2.3 Previous archaeological studies

Aboriginal people have occupied what we now know as the Australian continent for at least 40,000 years and perhaps 60,000 years and beyond. There have been no dated excavations in the Deniliquin area, although the archaeological evidence from Lake Mungo, 300 km to the north-west provides ample evidence of Aboriginal occupation dating back 40,000 years (Bowler et al. 2003; Mulvaney & Kamminga 1999; Hiscock 2007).

A number of archaeological surveys have been identified to be within close proximity of the proposed Anderson Clay Mine and are summarised below.

A survey of the Albury area by Crosby (1978) identified that open camp sites and scarred trees are the most common site types in the Albury Region. Crosby (1978) notes that due to the limited range of usable stone outcropping in the region it is unlikely that Aboriginal quarries will occur however, areas where vein quartz occurs should be inspected. Additionally, due to geology and topography of the area and lack of large rock outcrops with shelters suitable for painting or banks suitable for carving it is very unlikely that art sites or ceremonial areas will be identified. Crosby's (1978) survey of six sites returned seven Aboriginal artefacts consisting of six scarred trees and a large volcanic cobble. Of these seven sites three scarred trees and the cobble were identified approximately 1 km to the south west of the Anderson Clay mine along the Bungambrawatha Creek, whose tributaries are directly adjacent to this studies project area.

In 1992 a site survey for a proposed tree plantation approximately 5 km to the north east of the project area was undertaken by Laurajane Smith and Catherine Upcher (1992). The study identified five scarred trees, nine open campsites, one open campsite and scarred tree complex and eleven isolated artefacts. All artefacts recorded, with the exception of a single isolated silcrete artefact, were manufactured on a milky quartz which appears to be the primary raw material type for the Albury area. Both box and river redgum were used for manufacturing wooden artefacts consistent with other studies in the region. This study observed that all open campsites were located within 50 m of creek lines and all but one open camp was located on a creek bank. However, erosion into the creek bank to a depth of <10 cm was needed before archaeological material was exposed. Additionally, Smith and Upcher (1992) noted that despite the presence of erosion scars and recently ploughed paddocks on hill tops and slopes within the project area no open camp sites were identified. Scarred trees however, occurred consistently across all of these landforms.

A survey of development areas in Thurgoona by Kelly (2002) identified a single potential archaeological deposit that was later excavated as part of the Centaur Rd subsurface investigation (Border Archaeology 2006a). 153 artefacts were located during excavation, primarily consisting of quartz debitage. This was similar to survey undertaken of the Hamilton Valley causeway construction site where a single quartz lithic scatter of 12 artefacts was recorded on a river terrace (Border Archaeology 2003).

Survey and subsequent test pitting was undertaken by Border Archaeology (2006b, 2007a) of the Carsten Street Residential Development approximately 2 km to the south west of the Anderson Clay Mine. The original survey identified 3 quartz lithic scatters, one isolated find, one scarred box tree and an area of high archaeological potential. Visibility was however very low and consequently test pitting was recommended.

The 2007 excavations of the Carsten Street Residential Development used a grader to excavate three areas in 10 cm spits down to approximately 20 cm depth. 303 artefacts were recovered from grader scrape 1 of which 86.8% were manufactures from plain quartz and 12.8% were manufactured from crystal quartz. Based upon the authors experience in the Albury region they proposed that "Aboriginal archaeological deposits [are] strongly associated with terrace landform rather than current water course margins" (Border Archaeology 2007a, p.51).

Biosis (2008) undertook site survey of a proposed waste management facility and located a single smoky quartz isolated flake within the valley flat associated with a small creek line. Biosis (2008) assessed creek terraces within the project area as having moderate archaeological sensitivity and valley flats and lower and mid valley slopes as having low archaeological sensitivity.

In 2007 Border Archaeology undertook a survey of the proposed Hume Country Club Estate Residential Development. Eight previously unrecorded sites were identified and consisted primarily of quartz debitage (Border Archaeology 2007b). A previously recorded AHIMS site #60-3-0099 was relocated and was subsequently salvaged by Border Archaeology in 2008. During salvage 65 quartz artefacts were relocated, primarily consisting of debitage and angular fragments (<3 cm) with a small number of cores, flakes and flaked pieces. The site occurred within a heavily disturbed terrace landform (Border Archaeology 2008).

Based on the studies discussed above it is possible to suggest that while Aboriginal sites may be expected through all landscapes there does appear to be a pattern of sites that relate to the presence of potential resources for Aboriginal use. In the Albury area the dominant raw material type is quartz and most scatters recorded consist primarily of debitage and lithic fragments under 3 cm (Border Archaeology 2007a, 2008). These sites tend to be concentrated on raised and level ground associated with a water source and in this region are observable consistently in raised terrace landforms within 50 m of peripheral or seasonal creeks (Border Archaeology 2007a, 2008; Smith & Upcher 1992). Additionally, the presence of scarred trees on box and river red gums are relatively common and are observable along major rivers but also on hilltops and slopes (Smith & Upcher 1992).

Based on site modelling and the prevalence of sites in the surrounding area the site types most likely to be encountered at the Anderson Clay Mine are quartz lithic scatters, isolated artefacts and scarred trees in remnant old growth vegetation bordering the cleared development area.

3.2.4 Summary of Aboriginal land use

The results of previous archaeological surveys in the region show that there are sites and artefacts present throughout the landscape, albeit concentrated closer to water courses. There is a dominance of artefact scatters in the area particularly along water courses. Scarred trees also occur and provide a living link to the past and provide evidence of Aboriginal subsistence activities through the deliberate removal of bark or wood.

In addition, site densities in close proximity to the proposal area appears to be low. This may suggest the seasonal occupation of the area by Aboriginal people though it is more likely that there has been a lack of survey in the area or that land clearing and farming activities have disturbed or removed the cultural material evidence of Aboriginal occupation in the area.

A detailed understanding of Aboriginal land use of the region is lacking, as few in depth studies have been completed and surveys of ridgelines limited. It is possible however, to ascertain that proximity to water sources and raw materials was a key factor in the location of Aboriginal sites. It is also reasonable to expect that Aboriginal people ventured away from these resources to utilise the broader landscape, particularly ridgelines as access ways between regions.

3.2.5 Archaeological Site Location Model

Based on the results of the previous archaeological investigations in the local area, and through extrapolation of sites from surrounding regions it is possible to provide the following model of site location in relation to the proposed Andersons Clay Mine expansion.

Stone artefact scatters – representing camp sites. These can occur across the landscape, usually in association with some form of resource or landscape unit. While it is uncertain if any natural water features once intersected the proposal area given the modification of the landscape there are areas of remnant vegetation that may retain stone artefact scatters. However, due to the level of disturbance in the proposal area large campsites are unlikely to occur.

Burials – are generally found in elevated sandy contexts or in association with rivers and major creeks. No such features exist with the proposal area and therefore such sites are very unlikely to occur.

Scarred Trees – these require the presence of mature trees and are likely to be concentrated along major waterways and around swamps areas. The development area has been cleared, scarred trees are unlikely to be within the development footprint

Hearths/Ovens – are identified by burnt clay used for heat retainers or charcoal. They could occur either independently or in association with other Aboriginal cultural features such as campsites. While it is possible for this feature to occur, such places are not obvious within the proposal area and would likely be disturbed or previously destroyed by clearing and grazing.

Stone resources – are areas where people used natural stone resources as a source material for flaking. This requires geologically suitable material outcropping to be accessible. The proposal area contains no natural outcropping stone therefore such sites are unlikely to occur.

Shell Middens – are the accumulation of shell material disposed of after consumption. Such places are found along the edges of significant waterways, swamps and billabongs. No such natural features occur and therefore this site type is unlikely to exist in the proposal area.

Isolated Artefacts – are present across the entire landscape, in varying densities. As Aboriginal people traversed the landscape for thousands of years, such finds can occur anywhere and indicate the presence of isolated activity, dropped or discarded artefacts from hunting or gathering expeditions or the ephemeral presence of short term camps.

In summary, the topographic elements on the development area lend themselves to scatters of stone artefacts, isolated stone artefacts with scarred trees unlikely due to clearing, but with potential to be observed on the periphery.

3.2.6 Comment on Existing Information

The AHIMS database is a record of those places that have been identified and had site cards submitted to OEH. It is not a comprehensive list of all places in NSW as site identification relies on an area being surveyed and on the submission of site forms to AHIMS. There are likely to be many areas within NSW that have yet to be surveyed and therefore have no sites recorded. However, this does not mean that sites are not present.

The robustness of the AHIMS survey results are therefore considered to be only moderate for the present investigation. There are likely to be many sites that exist that have yet to be identified.

With regard to the limitations of the information available, archaeologists rely on Aboriginal parties to divulge information about places with cultural or spiritual significance in situations where non-archaeological sites may be threatened by development. To date, no such places have been identified within the archaeological reports carried out within the area. No such places have been identified through the consultation process for the Andersons Clay Mine proposal area.

4 ARCHAEOLOGICAL INVESTIGATION RESULTS

4.1 SURVEY STRATEGY

The survey strategy was to cover as much of the ground surface as possible within the proposed mine expansion area and the remaining property. The ground impact within the proposed mine expansion area will be high as complete excavation of the area is anticipated. The surrounding property is expected to be unaffected by the mine expansion.

The survey of the proposed Andersons Clay Mine expansion was undertaken by NGH Environmental Archaeologist Emily Dillon, on the 9th of November 2017.

Notes and photos were taken regarding transect spacing, visibility, landforms and soil types and any possible archaeological features were inspected, assessed and recorded if deemed to be Aboriginal in origin. The survey strategy was comprehensive and the most effective way to identify the presence of Aboriginal cultural heritage within the proposal area.

The proposal area occurs within only the Albury-Oaklands Hills and Foot slopes unit of the Mitchell Landscapes (see Figure 4). Consequently, the resolution of the Mitchell landscapes mapping is not high enough to be used for calculation of the survey transect coverage. The survey was therefore divided into the most obvious landform units, comprising the ridge crest, its associated side slopes and a drainage line.

4.2 SURVEY COVERAGE

The survey was impeded by poor visibility throughout the majority of the proposal area. There were however, some areas of increased visibility associated with erosional exposures especially along tracks and fence lines that contributed to the effectiveness of the visibility and the survey coverage.

Table 2 below shows the calculations of effective survey coverage and Figure 5 shows the division of land units as per the landform mapping across the project area.

Overall, the survey walked approximately 2.315 km of transects and visually inspected over 1.15 hectares, representing 15.9% of the proposal area. However, due to the poor average visibility, the survey effectively examined 1.59% of the total proposal area which equates to 0.12 hectares of a total of 7.28 hectares. The effective survey coverage is low due to the very low visibility which was on average 10%.

As a result of the visibility restrictions no Aboriginal Cultural Heritage was identified however, two areas of Potential Archaeological Deposits (Andersons PAD 1 and Anderson PAD 2) were identified (see Figure 6)

Our assessment of the survey coverage was that with nearly 17% of the project area walked across all landforms the areas where archaeological material is likely to be present have been suitably identified.

Different landforms within the proposal area are expected to have differing levels of archaeological potential based primarily on slope angle and consequently the only areas within the project area that were relatively flat and suitable for occupation were identified as PADs with the remaining areas consisting of slopes of over 15 degrees.

Table 2. Transect information.

Landform	Exposure type	Project Area (m^2)	Transect Length (m)	Transect Width (m)	Surveyed Area (m^2)	Landform surveyed (%)	Average Visibility %	Effective coverage (m^2)	Landform area effectively surveyed (%)	Archaeological Objects
Ridgeline crest	Tracks, erosion	11,836	410	5	2,050	2.82	10	205	1.73%	1 isolated artefact; 1 Potential Archaeological deposits
Ridge slopes	Tracks, erosion, fences, dam construction	49,842	1,515	5	7,575	10.4	10	757.5	1.52	1 Potential Archaeological deposits
Drainage line	Erosion	11,133	390	5	1,950	2.68	10	195	1.75	Nil
TOTAL		72,811	2,315		11,575			1,157.5		

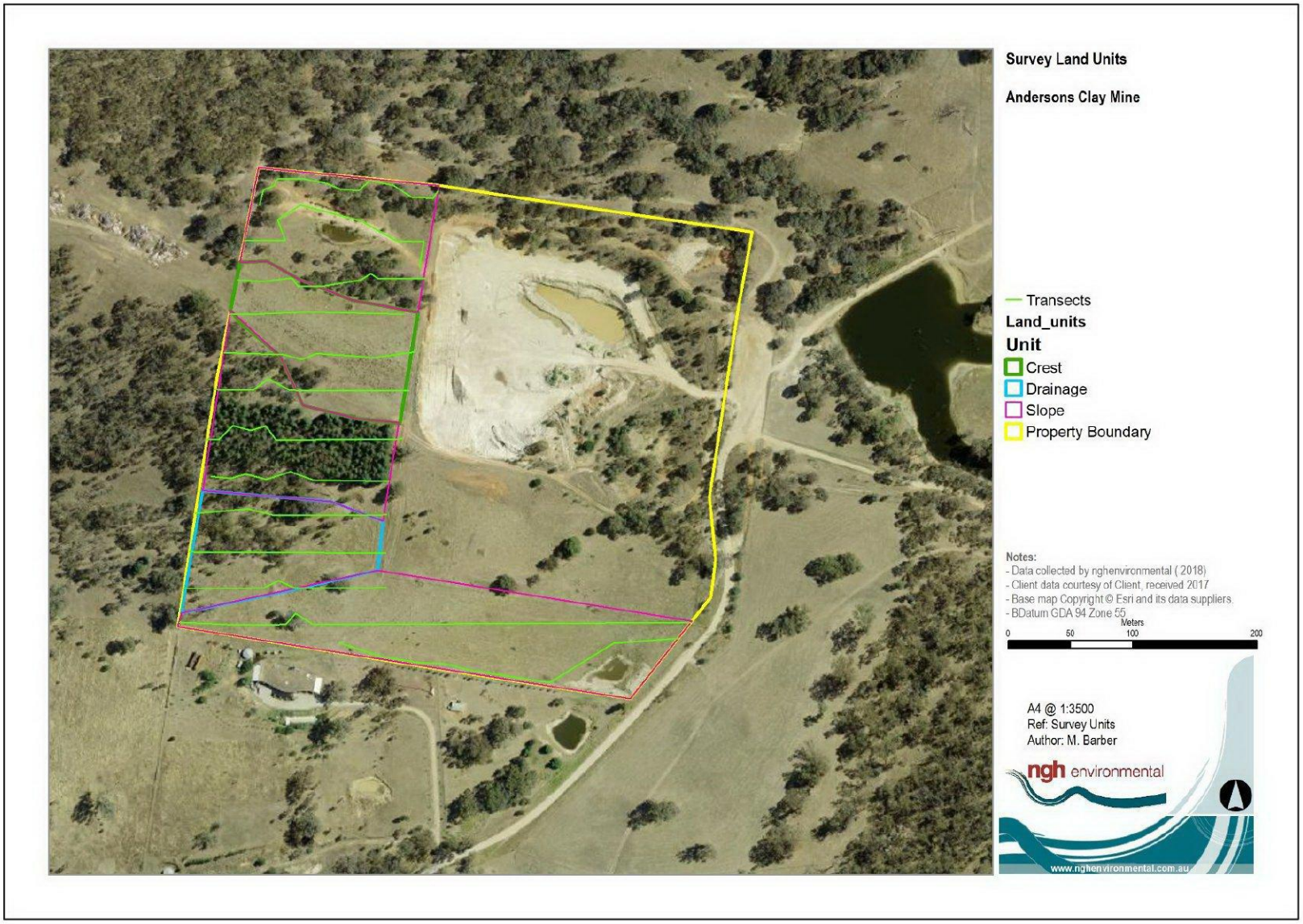


Figure 5. Survey units and transects

4.3 SURVEY RESULTS

As a result of the visibility during survey no archaeological material was identified. Two areas of potential archaeological deposits were however identified (Andersons PAD 1 and Andersons PAD 2).

Andersons PAD 1

This area of archaeological potential designated Andersons PAD 1 and is located in the proposed mine expansion area. The PAD follows the crest of a ridgeline running east west through the project area and covers an area of 12,940 m^2. As the visibility at the time of survey was about 10% due to dense grass cover no Aboriginal cultural material was identified. It is expected however, that there is some depth of deposit at this location as minimal bedrock was observed outcropping along the ridge crest and the view of the ridge from the open cut mine suggests some top soil present. Upon initial inspection, it did not appear that the land surface has been significantly disturbed, although it has subsequently been identified that the area was used as an orchard. Based upon other Aboriginal archaeological investigations undertaken in the Albury area and OEH's landforms of archaeological potential, ridge crests, especially where they are level and accessible, have potential for surficial and/or sub surface archaeological material to be present.

Plate 1. View west along ridgetop PAD 1.

Plate 2. View west along ridgetop PAD into adjacent property

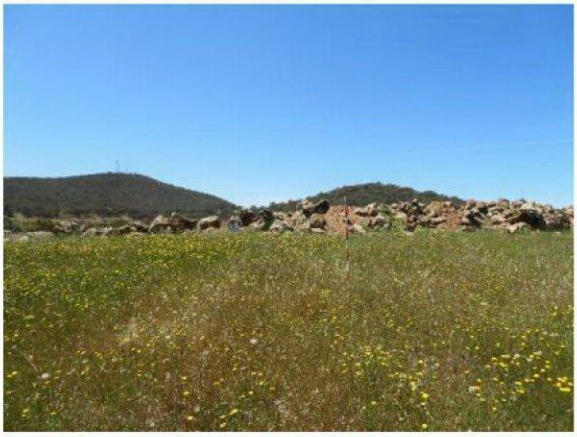


Plate 3. View east of PAD towards edge of existing clay mine (on other side of rock barrier)

Plate 4. Example of visibility within PAD 1

Andersons PAD 2

The second area of archaeological potential, PAD 2, is located in the south of the project area adjacent to the house of the neighbouring property. This PAD is less well defined than PAD 1, however still represents a relatively flat raised area at the intersection of several hills and slopes and is 4176 m^2 in area. There appears

to be some depth of deposit, possibly less than at PAD 1, that has some potential to contain archaeological material. While visibility was at the time of the survey was higher than PAD 1 it was generally still too low to identify the presence of surface artefacts. This PAD is however, outside the proposed mine expansion area and will therefore be avoided.

Plate 5. View south across PAD 2 towards neighbouring property

Plate 6. View west of PAD 2

Plate 7. View north across PAD 2

Plate 8. View East of Pad 2

4.3.1 Survey Summary

The field survey identified two PADs in the subject area, termed Andersons PAD 1 and Andersons PAD 2. Under the current development proposal disturbance to Andersons PAD 1 is unavoidable, and poor surface visibility meant the PAD could not be fully assessed for its potential to contain Aboriginal objects. Accordingly, a program of test excavation was undertaken to test the subsurface archaeological signature of Andersons PAD 1.

Figure 6. Location of PAD 1 and PAD 2 within the proposal area

4.4 TEST EXCAVATION

4.4.1 Methods

The field survey results concluded there were a number of questions regarding the cultural resources of the study area that could not be answered based on the results of field survey, but which would be better able to be resolved using test excavation techniques. Broadly, the aims of the subsurface testing excavation were:

- Identify the presence or absence of Aboriginal cultural material.
- Assess the likely extent and nature of any such cultural material.
- Assess the archaeological significance of any cultural material.
- Provide an opportunity for Aboriginal stakeholders to assess the cultural significance of any material.
- Assess the management requirements for any cultural material that might be affected as the result of the development of the stage 2 phase, including the need for an AHIP.

More specifically, if possible, given the results of the testing, the aims of the investigation would be to:

- Analyse the characteristics of the stone artefact assemblage.
- Identify any activity areas or other cultural features present.

In order to fulfil the aims of the project, the methodology for the subsurface testing will involve the following components.

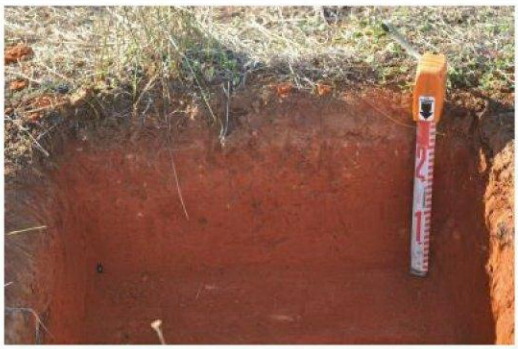
The planned locations of test excavation pits are shown in Figure 7. These locations were selected in order to cover the PAD area with a sample grid that allowed interception of concentrations of stone artefacts while efficiently covering the subject area. Test excavation was structured by way of 0.5 m x 0.5 m test pits placed at 20 m intervals along the transects, the transects being 20m apart. Each pit was excavated to variable depth, but to clay subsoil or bedrock. Excavation proceeded in 'spits', with an initial spit being 50mm deep, and subsequent spits being 100mm deep until a distinct soil change was reached. Excavation was done manually, using shovels, trowels, hand shovels and, where necessary, crow bar. The soil profile of each spit was recorded and photographed. Excavated material was dry sieved using a stationery table sieve with a 5 mm mesh. All residue was sorted on the sieve stand following screening. The location of each test pit was recorded by GPS, and all test pits were backfilled following the completion of excavation.

Figure 7. Planned Test Pit Locations

4.4.2 Test Excavation Results.

While there were 25 test pits proposed for excavation (Figure 7), only 13 were excavated in the test program. At the completion of these test pits enough data had been gathered to conclude that the area of Andersons PAD 1 had very little topsoil deposit in place, although the reason for that could be previous farming practices or a naturally thin profile. NO ABORIGINAL OBJECTS WERE RECOVERED FROM THE EXCAVATED TEST PITS. The test pits excavated are described below.

	**Test Pit 1** Depth: 700 mm Aboriginal Objects: 0 Reddish brown fine brown loose gravelly loam in top 50mm, underlain by reddish brown fine sand. Minor clay content below 450mm. Excaved to depth able to be reached without expanding test pit.
	**Test Pit 2** Depth: 250 mm Aboriginal Objects: 0 50mm of brown humic loam underlain by very compact red/brown sandy silty clay.
	**Test Pit 3** Depth: 250 mm Aboriginal Objects: 0 50mm of brown humic loam underlain by very compact red/brown sandy silty clay.
	**Test Pit 4** Depth: 280 mm Aboriginal Objects: 0 50mm of brown humic loam underlain by very compact red/brown sandy silty clay.

	**Test Pit 5** Depth: 250 mm Aboriginal Objects: 0 50mm of brown humic loam underlain by gravel rich layer, grading to very compact red/brown sandy silty clay.
	**Test Pit 6** Depth: 250 mm Aboriginal Objects: 0 50mm of brown humic loam underlain by very compact red/brown sandy silty clay.
	**Test Pit 7** Depth: 350 mm Aboriginal Objects: 0 50mm of brown humic loam underlain by very compact red/brown sandy silty clay with large gravel inclusions.
	**Test Pit 8** Depth: 250 mm Aboriginal Objects: 0 50mm of brown humic loam underlain by very compact red/brown sandy silty clay.
	**Test Pit 10** Depth: 400 mm Aboriginal Objects: 0 Reddish brown fine brown loose gravelly loam in top 50mm, underlain by undifferentiated reddish brown fine sand. Reddish brown clay at base.

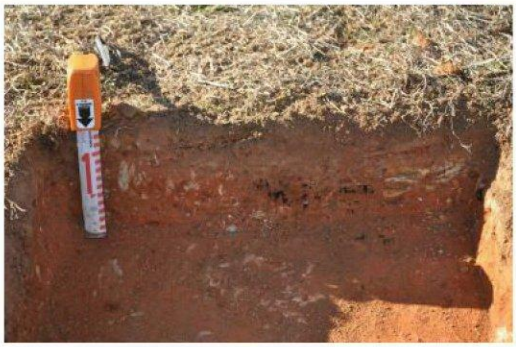
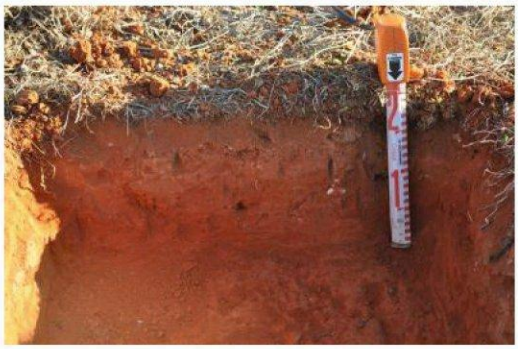
	**Test Pit 14** Depth: 130 mm Aboriginal Objects: 0 50mm of brown humic loam underlain by very compact red/brown sandy silty clay with prolific decomposed metamorphosed shale.
	**Test Pit 17** Depth: 200 mm Aboriginal Objects: 0 50mm of brown humic loam underlain by very compact red/brown sandy silty clay.
	**Test Pit 22** Depth: 250 mm Aboriginal Objects: 0 50mm of brown humic loam underlain by very compact, gravelly red/brown sandy silty clay.
	**Test Pit 24** Depth: 250 mm Aboriginal Objects: 0 100mm of gravelly brown humic loam underlain by very compact red/brown sandy silty clay.

Figure 8. Excavated Test Pit Locations.

Test pits 1 and 10 were situated at the southern boundary of Andersons PAD 1 and the soil profile appeared to be deeper in those pits than any of the others, with the transition to a clay layer beneath a sandy deposit not seen in other test pits. The remainder of the test pits excavated exhibited, in the main, ~50mm of greyish brown humic topsoil with a clear, shallow transition to clay. The lack of topsoil in this location, even in a ridgeline appears to be shallower than expected and may indicate a profile from which the topsoil has been removed, or 'scalped'. The pattern is widespread across the PAD area. It may also be a factor of a naturally thin soil profile in this region but there is no data with which to compare.

When the shallow topsoil was observed as a widespread pattern the excavation team re-examined the subject area in order to re-assess its potential integrity. Evidence of significant disturbance to the study area was found in the form of a soil mound or bund, constructed along the southern margin of the identified PAD (Plate 18). The benched area is ~6m wide and up to ~2m high, and its origin is unknown as the quarry operator has indicated that no topsoil stripping has been undertaken in the area by them. It is possible that the mound was formed through stripping of the topsoil during the orchard phase most likely in order to create a wider flat area at the crest of the ridge. The bench extends into the neighbouring property to the west. The conclusion therefore is that the ridge crest through the two paddocks has been subject to ground disturbance.

The presence of this feature, and the shallow topsoil led to the conclusion that the area of Andersons PAD 1 is in fact highly disturbed and modified, and the likelihood of *in situ* archaeology occurring is very low.

Plate 18. Field workers stand at the top and base of a bench running the length of the southern side of the ridge of Andersons PAD 1. View west.

4.4.3 *Isolated Artefact Andersons PAD 1-1.*

Despite the highly disturbed area one isolated artefact was observed 6 m south west of probe 3 (Figure 8). The artefact was:

White quartz flake 16mm x 19mm x 5mm, focal unifacial platform, feather termination.

Plate 19. Andersons Pad 1-1. View North

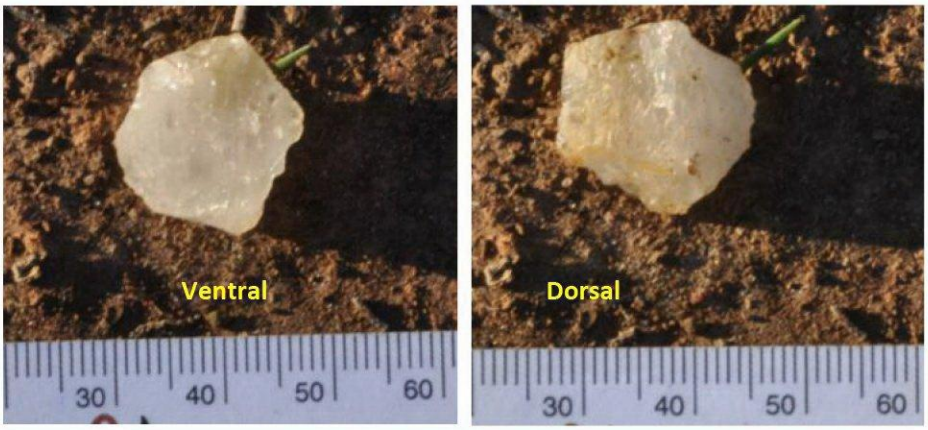


Plate 20. Quartz Flake

The presence of the artefact identifies that the ridge crest area was likely to have been used by Aboriginal people. Although the topsoil and the ridge crest have been disturbed, the artefact identifies that such landforms in the wider area could also contain Aboriginal heritage sites.

4.5 DISCUSSION

Previous archaeological studies in the region were used to inform a site prediction model for the proposed Andersons Clay Mine Property. Based on this model it was predicated that stone artefacts in the form of scatters and isolated finds would be most likely to be found and scarred trees, where old growth trees remain, would be the most probable manifestation of Aboriginal occupation in the area.

Furthermore, the model suggested that while isolated finds would be present as a background scatter across the entire landscape and in varying densities, stone artefact scatters would occur directly associated with a resource or landscape unit, e.g. creek terraces.

Test excavation and additional field assessment showed the topsoil of the area of Andersons PAD 1 has been highly disturbed, and the presence of an earthen mound along the edge of the ridge crest, although its origin is unknown. One isolated artefact was recorded and it is probable that it represents a typical low density scatter in such landforms, which has been disturbed.

5 CULTURAL HERITAGE VALUES AND STATEMENT OF SIGNIFICANCE

The assessment of the significance of Aboriginal archaeological sites is currently undertaken largely with reference to criteria outlined in the ICOMOS Burra Charter (Marquis-Kyle & Walker 1994). Criteria used for assessment are:

- *Social or Cultural Value*: In the context of an Aboriginal heritage assessment, this value refers to the significance placed on a site or place by the local Aboriginal community – either in a contemporary or traditional setting.
- *Scientific Value*: Scientific value is the term employed to describe the potential of a site or place to answer research questions. In making an assessment of Scientific Value issues such as representativeness, rarity and integrity are addressed. All archaeological places possess a degree of scientific value in that they contribute to understanding the distribution of evidence of past activities of people in the landscape. In the case of flaked stone artefact scatters, larger sites or those with more complex assemblages are more likely to be able to address questions about past economy and technology, giving them greater significance than smaller, less complex sites. Sites with stratified and potentially in situ sub-surface deposits, such as those found within rock shelters or depositional open environments, could address questions about the sequence and timing of past Aboriginal activity, and will be more significant than disturbed or deflated sites. Groups or complexes of sites that can be related to each other spatially or through time are generally of higher value than single sites.
- *Aesthetic Value*: Aesthetic values include those related to sensory perception, and are not commonly identified as a principal value contributing to management priorities for Aboriginal archaeological sites, except for art sites.
- *Historic Value*: Historic value refers to a site or place's ability to contribute information on an important historic event, phase or person.
- *Other Values*: The Burra Charter makes allowance for the incorporation of other values into an assessment where such values are not covered by those listed above. Such values might include Educational Value.

All sites or places have some degree of value, but of course, some have more than others. In addition, where a site is deemed to be significant, it may be so on different levels or contexts ranging from local to regional to national, or in very rare cases, international. Further, sites may either be assessed individually, or where they occur in association with other sites the value of the complex should be considered.

Social or cultural value

While the true cultural and social value of Aboriginal sites can only be determined by local Aboriginal people, as a general concept, all sites hold cultural value to the local Aboriginal community. An opportunity to identify cultural and social value was provided to the Aboriginal representatives for this proposal through the fieldwork and draft reporting process. While the true cultural and social value of Aboriginal sites can only be determined by local Aboriginal people, as a general concept, all sites hold cultural value to the local Aboriginal community.

The cultural significance of cultural material is only determined by the local Aboriginal community.

Scientific (archaeological) value.

The research potential of the Aboriginal object located during this assessment is considered to be low. While the presence of the sites can be used to assist in the development of site modelling for the local landscape, its scientific value for further research is limited.

While the artefact itself contributes base technical and location information its lack of temporal context and the absence of information about local resources makes further conclusions about its relationship to traditional land use difficult.

Aesthetic value.

There are no aesthetic values associated with the archaeological object recorded. The modified and heavily disturbed landscape within the development area detracts from any aesthetic setting.

Other Values

There are no other known heritage values associated with the subject area

6 PROPOSED ACTIVITY

6.1 HISTORY AND LANDUSE

It has been noted above that there was a very shallow soil profile across Andersons PAD 1 although a stone artefact was found, indicating the area was likely to have contained Aboriginal activity in the past.

It is also understood that the area of the proposed extension was previously used as an orchard, possibly 30 to 40 years ago. This would have resulted in significant ground disturbance and potentially disturbance of any Aboriginal archaeological material and deposits present (VGT pers comm).

The presence of an earth mound along the southern edge of the ridge and PAD 1 indicates some level of disturbance. However, it is not clear as to how or when this occurred. It is possible that the mound was formed during the period of use as an orchard with soil either imported or moved. Whichever occurred, it is clear that the ridge crest has been subject to ground disturbance, impacting on the potential for *in situ* archaeological material to occur.

6.2 PROPOSED DEVELOPMENT ACTIVITY

The Andersons Clay Mine expansion would involve the following works:

- Extension of existing extraction operations to include the north west corner of the property
- Installation of crushing and screening facilities at the quarry
- Extraction would be undertaken using a combination of dozers, dump trucks and excavators which would rip the shale and push the clay/shale up into one or more internal stockpiles within the mine floor.
- Vegetation clearing

This work will result in the almost total disturbance of the ground surface of Andersons PAD 1, and the location of site Andersons PAD 1-1.

6.3 ASSESSMENT OF HARM

As described in this report, the Aboriginal cultural material recorded in the immediate development area consists of a single isolated artefact. The test excavation recorded no cultural material and a shallow soil profile – it can be concluded that the area identified by Andersons PAD 1 contains no significant archaeological deposit.

The existence of an isolated artefact is consistent with models of site location for the area and the location may contain further residual very sparse isolated artefacts. There can be no confidence that any artefacts that do remain in the PAD area will be *in situ*.

The impact is likely to be most extensive where excavation extends to expand the existing pit, which will involve the removal and stockpiling of topsoil. This is considered a direct impact on the isolated artefact by the development in its present form. Nonetheless, as there is only a single isolated quartz flake and a highly disturbed area, the assessment of harm overall for the proposal is therefore assessed as very low.

Table 3 Identified risk to known sites.

Site name	Site integrity	Type of harm	Degree of harm	Consequence of harm	Recommendation
Andersons PAD 1-1	Poor	Direct	Complete	Complete loss of value	AHIP required

6.4 IMPACTS TO VALUES

The values potentially impacted by the development are any social and cultural values attributed to the proposal area by the local Aboriginal community. The extent to which the loss of the sites or parts of the sites would impact on the community is something the Aboriginal community alone can articulate. The Aboriginal community has identified no intangible cultural values specific to the development area.

The impact to the scientific values of Andersons PAD 1-1 will be high, in that the artefact will be destroyed. It could be considered that the isolated artefact has contributed the extent of its scientific value in the course of this recording and that value has therefore been salvaged during this project. Nonetheless, removal of the artefact, or its breakage would reduce the already low scientific value currently assigned.

No other values have been identified that would be affected by the development proposal

7 AVOIDING OR MITIGATING HARM

7.1 CONSIDERATION OF ESD PRINCIPLES

Consideration of the principles of Ecologically Sustainable Development (ESD) and the use of the precautionary principle was undertaken when assessing the harm to the sites and the potential for mitigating impacts to the sites recorded within the Andersons clay mine proposal area. The main consideration was the cumulative effect of the proposed impact to the sites and the wider archaeological record. The precautionary principle in relation to Aboriginal heritage implies that development proposals should be carefully evaluated to identify possible impacts and assess the risk of potential consequences.

In broad terms, the archaeological material located during this investigation is similar to what has been found previously within the region. Currently there is no clear regional synthesis of the nature, number, extent and content for archaeological sites within the local area. Nevertheless, given the size of the geographical area, it is certain that there would be similar artefacts present within the region.

The result of this Aboriginal heritage assessment has confirmed the proposed model of site location and site distribution, whereby sites could be expected to occur across the landscape and in particular in proximity to a water source, even in disturbed areas.

The implications for ESD principles is that other artefacts are likely to be present in the district.

As noted above, the archaeological values of the Aboriginal objects, considering the scientific, representative and rarity values was deemed to be low. It is believed therefore that the proposed impacts to the sites through the development would not adversely affect the broader archaeological record for the local area or the region.

The principle of inter-generational equity requires the present generation to ensure that the sites and diversity of the archaeological record is maintained or enhanced for the benefit of future generations. NGH therefore believes that the diversity of the archaeological record is not compromised by development of the Andersons Clay Mine proposal.

It is therefore considered, that while the current development proposals will impact one isolated artefact, the overall cumulative impact on the archaeological record for the region will be minimal.

It is argued that the cumulative impacts of the proposal are not enough to reject outright the development proposal.

7.2 CONSIDERATION OF HARM

Avoiding harm to the isolated artefact is not possible given its location on the subject area.

The most likely cause of harm to the artefacts will be through removal of topsoil and overburden to reach the desired geological strata below. Based on the assessment of the artefact it is not considered necessary to prevent development at its location. The site has been shown to be highly disturbed with little remaining scientific value.

A question remains about possible occurrence of stone artefacts within the balance of the development area. It is possible that additional artefacts will be present. Without knowing their exact locations, it is difficult to manage the impacts. The archaeological material identified in the survey, and potentially

present in the balance of the development site is not of sufficient value to reject or amend the development proposal.

Mitigation of harm to cultural heritage sites generally involves some level of detailed recording to preserve the information contained within the site. Mitigation can be in the form of minimising harm, through slight changes in the development plan or through direct management measures of the sites and Aboriginal objects.

It is argued here that mitigation in the form of avoidance is not warranted due to the very low scientific significance attributed to the artefact and the low potential for *in situ* artefacts across the extension area.

8 LEGISLATIVE CONTEXT

Aboriginal heritage is primarily protected under the NPW Act and was subsequently amended in 2010 with the introduction of the *National Parks and Wildlife Amendment (Aboriginal Objects and Places) Regulation 2010*. The aim of the NPW Act includes:

> The conservation of objects, places or features (including biological diversity) of cultural value within the landscape, including but not limited to: places, objects and features of significance to Aboriginal people.

An Aboriginal object is defined as:

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

Part 6 of the NPW Act concerns Aboriginal objects and places and various sections describe the offences, defences and requirements to harm an Aboriginal object or place. The main offences under section 86 of the NPW Act are:

- A person must not harm or desecrate an object that the person knows is an Aboriginal object.
- A person must not harm an Aboriginal object.
- For the purposes of this section, "circumstances of aggravation" are:
    - that the offence was committed in the course of carrying out a commercial activity, or
    - that the offence was the second or subsequent occasion on which the offender was convicted of an offence under this section.
- A person must not harm or desecrate an Aboriginal place.

Under section 87 of the NPW Act, there are specified defences to prosecution including authorisation through an Aboriginal Heritage Impact Permit (AHIP) or through exercising due diligence or compliance through the regulation.

Section 89A of the Act also requires that a person who is aware of an Aboriginal object, must notify the Director-General in a prescribed manner. In effect, this section requires the completion of OEH AHIMS site cards for all sites located during heritage surveys.

Section 90 of the NPW Act deals with the issuing of an AHIP, including that the permit may be subject to certain conditions.

The EP&A Act is legislation for the management of development in NSW. It sets up a planning structure that requires developers (individuals or companies) to consider the environmental impacts of new projects. Under this Act, cultural heritage is considered to be a part of the environment. This Act requires that Aboriginal cultural heritage and the possible impacts to Aboriginal heritage that development may have are formally considered in land-use planning and development approval processes.

9 RECOMMENDATIONS

The recommendations are based on the following information and considerations:

- Results of the archaeological survey;
- Consideration of results from other local archaeological studies;
- Results of consultation with the registered Aboriginal parties;
- Test excavation;
- The assessed significance of the sites;
- Appraisal of the proposed development, and
- Legislative context for the development proposal.

It is recommended that:

1. Prior to commencing construction the proponent must apply for Aboriginal Heritage Impact Permit (AHIP) that covers the development area. The AHIP must be granted and received by the proponent prior to any on ground works commencing.
2. The AHIP application should make allowance for the management of Aboriginal heritage material discovered during construction or ongoing operation of the clay mine.
3. Although very unlikely, if any object is found suspected to be human remains work at the location must cease and the following must be contacted immediately:
    a. NSW Police – Albury Police Station
    b. NSW OEH Environment Line, Phone 131555
    c. The location is to be made secure to prevent unauthorised access. Work on the development project may continue at a suitable distance from the potential human remains – not closer than 100m.
4. Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation. This would include consultation with the registered Aboriginal parties and may include further field survey.
5. PGH, its employees and agents are reminded that it is an offence under the *NSW National Parks and Wildlife Act 1974* to disturb, damage or destroy and Aboriginal object without approval.

10 REFERENCES

AECOM Australia Pty Ltd 2015, *Deniliquin Ethanol Plant Aborigiinal and Historical Heriatge Assessment*, Unpublished report to Dongmun Greentec Pty Ltd.

Bennet, G 1834, *Wanderings in New South Wales, Batavia, Pedir Coast, Singapore, and China* Vol. 1., Richard Bentley, London.

Beveridge, P 1883, *Of the Aborigines inhabiting the great lacustrine and riverine depression of the Lower Murray, Lower Murrumbidgee, Lower Lachlan, and Lower Darling*, Sydney.

Beveridge, P 1889, *The Aborigines of Victoria and Riverina*, M. L. Hutchinson, Melbourne.

Biosis 2008, *Albury Waste Managment Facility- Northern Valley Development: Cultural and Archaeological Heritage Assessment*, Unpublished report to URS Australia.

Border Archaeology 2003, *Archaeological Surface Survey Investigation Report: Hamilton Valley causeway construction*, Unpublished report to Albury Wodonga Development Corporation.

Border Archaeology 2006a, *Centaur Rd Archaeological Subsurface Investigation Report*, Unpublished report to Esler and Associates.

Border Archaeology 2006b, *Carsten St. Archaeological Survey Report*, Unpublished report to Richard Hughes Project Management.

Border Archaeology 2007a, *Carsten St Residential Development Aboriginal Archaeological Excavation/Salvage Report*, Unpublished report to Richard Hughes Project Management.

Border Archaeology 2007b, *The 19th Hole: Hume Country Club Estate Residential Development Archaeological Surface Survey Report*, Unpublished report to Doug Gow & Assoc.

Border Archaeology 2008, *The 19th Hole: Hume Country Club Estate Aboriginal Archaeological Salvage Report*, Unpublished report to Doug Gow & Assoc.

Bowler, JM, Johnston, H, Olley, JM, Prescott, JR, Roberts, RG, Shawcross, W & Spooner, NA 2003, 'New ages for human occupation and climatic change at Lake Mungo, Australia', *Nature*, vol. 421.

Crosby, E 1978, *A Site Survey In The Albury Area*, Unpublished report to NSW NP&WS.

DE&E 2016, 'Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 (Subregions)', retrieved from <http://data.gov.au/dataset/74442a9f-9909-485d-ae3f-8dfa72e4b6b2>.

DECC 2002, *Descriptions for NSW (Mitchell) Landscapes: Based on Descriptions compiled by Dr. Peter Mitchell*, A Report prepared for the Department of Environment and Climate Change.

Dowling, P 1997, *A Great Deal of Sickness: Introduced Diseases Among the Aboriginal People of Colonial Southeast Australia 1788-1900*, Unpublished Doctor of Philosophy Thesis, The Australian National University.

Edmonds, V 1997, *Archaeological survey of a Proposed Gypsum Mine on Binbinette Station, Northwest of Moulamein, Western NSW*, Unpublished report to Northern Gypsum, Kerang.

Egloff, B, Peterson, N & Wesson, SC 2005, *Biamanga and Gulaga: Aboriginal cultural association with Biamanga and Gulaga National Parks*, Office of the Registrar, Aboriginal Land Rights Acts 1983 (NSW).

Eyre, J 1845, *Journals of Expeditions of Discovery Into Central Australia, and Overland from Adelaide to King George's Sound, in the Years: 1840-1*, London.

Fraser, J 1892, *The Aborigines of New South Wales*, Charles Potter, Government Printer, Sydney.

Gilmore, M 1934, *Old Days Old Ways*, Angus & Robertson, Melbourne.

Gott, B 1982, 'Ecology of Root Use by the Aborigines of Southern Australia', *Archaeology in Oceania*, vol. 17, no. 1, pp. 59–67.

Hiscock, P 2007, *Archaeology of ancient Australia*, Routledge.

Horton, D 1994, *The encyclopaedia of Aboriginal Australia: Aboriginal and Torres Strait Islander history, society*

and culture D Horton (ed), Aboriginal Studies Press, Canberra.

Howitt, AW 1904, *The native tribes of south-east Australia*, Macmillan and Company Ltd.

Kabaila, P 1999, *Archaeological Aspects Of Aboriginal Settlement Of The Period 1870-1970 In The Wiradjuri Region*, Unpublished Doctor of Philosophy Thesis, The Australian National University.

Kelly, T 2002, *Archaeological Survey and Review: a survey of development areas in Thurgoona*, Unpublished report to the Albury Wodonga Development Corporation.

Lawrence, RJ 1967, *Aboriginal habitat and economy*, Unpublished Masters Thesis, Department of Geography, The Australian National Universtiy.

Littleton, J & Allen, H 2007, 'Hunter-gatherer burials and the creation of persistent places in southeastern Australia', *Journal of Anthropological Archaeology*, vol. 26, pp. 283–298.

Long, A 2005, *Aboriginal scarred trees in New South Wales : a field manual*, Dept. of Environment and Conservation.

MacDonald, G 1983, *The Concept of Boundaries in Relation to the Wiradjuri People of Inland New South Wales: An assessment of Inter-Group Relationships at the Time of European Conquest*, Report prepared for Wiradjuri Land Council.

Marquis-Kyle, P & Walker, M 1994, *The Illustrated Burra Charter: Making good decisions about the care of important places*, Australian Heritage Commission, Sydney.

Martin, S 2006, *Inscribing the Plains: Constructed, Conceptualised and Socialized Landscapes of the Hay Plain, South Eastern Australia*, Unpublished Doctor of Philosophy Thesis, University of New England.

Martin, S 2010, *Archaeological Research, Characterisation and Predictive Modelling Project*, Unpublished report to the Department of Environment, Climate Change and Water.

Mereweather, J 1859, *Diary of a Working Clergyman in Australia and Tasmania, Kept during the Years 1850- 53*,.

Mitchell, T 1839, *Three Expeditionas into the Interior of Eastern Austrlia*, London.

Mulvaney, DJ & Kamminga, J 1999, *Prehistory of Australia*, Allen & Unwin.

OEH 2010a, *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*,.

OEH 2010b, *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*,.

OEH 2011, *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW*,.

Oxley, J 1820, *Journals of Two Expeditions Into the Interior of New South Wales, undertaken by order of the British Government in the Years 1817-1818*, John Murray, London.

Pearson, M 1981, *Seen through different eyes: changing land use and settlement patterns in the Upper Macquarie River region of NSW from prehistoric times to 1860*, Unpublished Doctor of Philosophy Thesis, Department of Prehistory and Anthropology, The Australian National University.

Smith, L & Upcher, C 1992, *Archaeological Survey for Aboriginal sites of 'Maryvale', Albury NSW*, Unpublished report to Gutteridge Haskins & Davey Pty Ltd.

Sturt, C 1833, *Two expeditions into the interior of Southern Australia during the years 1828, 1829, 1830, and 1831 (2 Volumes)*, Smith, Elder and Co., London.

Tindale, N 1940, *Distribution of Australian aboriginal tribes: a field survey*,.

Tindale, NB 1974, *Aboriginal tribes of Australia: their terrain, environmental controls, distribution, limits, and proper names*, ANU Press, Canberra.

White, I 1986, *Dimensions of Wiradjuri: an ethnohistoric study*, Unpublished B. Litt Thesis, The Australian National University.

APPENDIX B AHIMS SEARCH

Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 17-276 Anderson Clay Mine

Client Service ID : 287062

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
60-3-0030	M11	AGD	55	499810	6017000	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2350
	Contact	Recorders	Laura-Jane Smith					Permits		
61-1-0003	Thurgoona Park;Mitta Junction;	AGD	55	500250	6011800	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	1464,99373
	Contact	Recorders	Ms.E Crosby					Permits		
60-3-0028	M9;	AGD	55	499460	6016170	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2350
	Contact	Recorders	Laura-Jane Smith					Permits		
60-3-0029	M10;	AGD	55	499700	6016100	Open site	Valid	Artefact : -	Open Camp Site	2350
	Contact	Recorders	Laura-Jane Smith					Permits		
60-3-0001	Thurgoona 1;	AGD	55	499056	6009132	Open site	Valid	Artefact : -	Open Camp Site	230,742,1463,102166
	Contact	Recorders	ASRSYS					Permits	1542	
60-3-0002	Thurgoona 2;	AGD	55	499054	6009315	Open site	Valid	Artefact : -	Open Camp Site	230,742,1463,102166
	Contact	Recorders	ASRSYS					Permits	1542	
60-3-0003	Thurgoona 3;	AGD	55	499316	6010506	Open site	Valid	Artefact : -	Open Camp Site	230,742,1463,102166
	Contact	Recorders	ASRSYS					Permits		
60-3-0005	One Tree Hill;TS7;	AGD	55	498711	6015983	Open site	Valid	Artefact : -	Open Camp Site	230
	Contact	Recorders	ASRSYS					Permits		
60-3-0006	One Tree Hill; Ettamogah Sanctuary;T/58;	AGD	55	498449	6014793	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	230
	Contact	Recorders	ASRSYS					Permits		
60-3-0007	One Tree Hill; Ettamogah Sanctuary;T/59;	AGD	55	498449	6014793	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	230
	Contact	Recorders	ASRSYS					Permits		
60-3-0008	One Tree Hill; Ettamogah Sanctuary;TS10;	AGD	55	498449	6014793	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	203,230
	Contact	Recorders	ASRSYS					Permits		
60-3-0009	One Tree Hill;TS6;	AGD	55	498082	6014972	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	203,230

Report generated by AHIMS Web Service on 19/06/2017 for Emily Dillon for the following area at Lat, Long From : -36.0611, 146.8876 - Lat, Long To : -35.9864, 147.0061 with a Buffer of 50 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 77

Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 17-276 Anderson Clay Mine

Client Service ID : 287062

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	ASRSYS					Permits		
60-3-0010	One Tree Hill;TS5;	AGD	55	498165	6015795	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	230
	Contact	Recorders	ASRSYS					Permits		
60-3-0011	One Tree Hill;TS4;	AGD	55	494078	6013285	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	230
	Contact	Recorders	ASRSYS					Permits		
61-1-0103	TS (A1) - Thurgoon Park	AGD	55	500136	6011339	Open site	Valid	Artefact : 1		97601,97602,99373
	Contact	Recorders	Terrence J. Kelly Archaeological Consultant					Permits	1307	
60-3-0069	Little Billabong	AGD	55	498270	6013291	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Archaeological Risk Assessment Services (ARAS),Mr.Giles Hamm					Permits		
61-1-0115	Woolshed Creek 1	AGD	55	500361	6011339	Open site	Valid	Artefact : 41		98394,98789,99373,102166
	Contact	Recorders	Mr.Terence J. Kelly					Permits	1656,1786	
60-3-0070	AWH 1 PAD 10	GDA	55	499260	6016050	Open site	Valid	Artefact : 5		99657
	Contact Colin Clark	Recorders	Mr.Terence J. Kelly					Permits	2246,2334	
60-3-0077	AWH 8 PAD 6	AGD	55	498375	6013678	Open site	Valid	Artefact : 15		
	Contact Searle	Recorders	Mr.Terence J. Kelly,Mr.Stephen Pollock					Permits	2334	
60-3-0078	AWH 9 PAD 7	AGD	55	498476	6013866	Closed site	Valid	Artefact : 26		
	Contact Searle	Recorders	Mr.Terence J. Kelly,Mr.Stephen Pollock					Permits	2334	
60-3-0079	AWH 10 PAD 8	AGD	55	498598	6014004	Open site	Valid	Artefact : 24		99657
	Contact Searle	Recorders	Mr.Terence J. Kelly,Mr.Stephen Pollock					Permits	2334	
60-3-0080	AWH 11 PAD 9	AGD	55	499036	6015329	Open site	Valid	Artefact : 23		99657
	Contact Searle	Recorders	Mr.Terence J. Kelly,Mr.Stephen Pollock					Permits	2334	
60-3-0081	Woolshed Creek Ar2	GDA	55	500000	6012664	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
61-1-0134	Woolshed Creek Ar18	GDA	55	500387	6012066	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
61-1-0135	Woolshed Creek Ar19	GDA	55	500364	6012059	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
61-1-0136	Woodshed Creek Ar20	GDA	55	500324	6012053	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		

Report generated by AHIMS Web Service on 19/06/2017 for Emily Dillon for the following area at Lat, Long From : -36.0611, 146.8876 - Lat, Long To : -35.9864, 147.0061 with a Buffer of 50 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 77

Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 17-276 Anderson Clay Mine

Client Service ID : 287062

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
61-1-0137	Woolshed Creek Ar21	GDA	55	500255	6011854	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
61-1-0138	Woolshed Creek Ar22	GDA	55	500198	6011809	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
61-1-0146	Woolshed Creek Ar31	GDA	55	500548	6012438	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
60-3-0082	Woolshed Creek Ar37	GDA	55	500070	6011406	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
60-3-0083	Eight Mile Creek Ar39	GDA	55	499870	6012059	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
60-3-0084	Eight Mile Creek Ar41	GDA	55	499944	6012065	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
61-1-0151	Eight Mile Creek Ar42	GDA	55	500322	6012484	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
61-1-0152	Eight Mile Creek Ar44	GDA	55	500468	6012673	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
61-1-0153	Eight Mile Creek Ar45	GDA	55	500343	6012835	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
61-1-0154	Eight Mile Creek Ar46	GDA	55	500313	6012477	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
60-3-0085	Eight Mile Creek Ar48	GDA	55	500034	6012353	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
60-3-0086	Eight Mile Creek Ar47	GDA	55	500069	6012505	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
60-3-0087	Eight Mile Creek Ar49	GDA	55	499950	6012288	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
60-3-0088	Eight Mile Creek Ar50	GDA	55	499975	6012181	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits	4077	
60-3-0089	Eight Mile Creek Ar52	GDA	55	499924	6012085	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
60-3-0090	Eight Mile Creek Ar53	GDA	55	499906	6011987	Open site	Valid	Artefact : 2		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
60-3-0093	Mitchell Park Scar Tree1	AGD	55	498521	6013801	Open site	Valid	Modified Tree (Carved or Scarred) : 1		

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Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 17-276 Anderson Clay Mine

Client Service ID : 287062

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
60-3-0076	AWH 7 PAD 4	AGD	55	497519	6011692	Open site	Valid	Artefact : 20		
	Contact	Recorders	Mr.Terence J. Kelly					Permits	2334	
60-3-0091	Eight Mile Creek Ar54	GDA	55	499953	6011954	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
60-3-0097	Centaur Rd	AGD	55	492413	6012374	Open site	Valid	Artefact : 150		100267
	Contact Searle	Recorders	Mr.Stephen Pollock					Permits	2585	
60-3-0098	Carsten St CEPAD1	GDA	55	493285	6012327	Open site	Valid	Potential Archaeological Deposit (PAD) : -		100568
	Contact	Recorders	Mr.Stephen Pollock					Permits	2600,2608,2699	
60-3-0095	HV1	GDA	55	492413	6012190	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact Searle	Recorders	Mr.Stephen Pollock					Permits	2512,2585	
60-3-0096	HV 1	AGD	55	492413	6012190	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Mr.Stephen Pollock					Permits		
61-3-0115	mod tree 1	AGD	55	499226	6009561	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact T Russell	Recorders	Mr.Graham Moore					Permits		
55-6-0066	mod tree 3	AGD	55	497824	6016639	Open site	Deleted	Modified Tree (Carved or Scarred) : 1		
	Contact T Russell	Recorders	Mr.Graham Moore					Permits		
55-6-0064	mungabarina-mm1	AGD	55	497451	6017233	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact Sarah Colley	Recorders	Mr.Michael Mulvaney					Permits		
60-3-0101	CES2 (Albury)	GDA	55	493447	6012542	Open site	Valid	Artefact : -		100568,101135
	Contact Searle	Recorders	Mr.Chris Price					Permits	2699	
60-3-0102	CES3 (Albury)	GDA	55	493396	6012228	Open site	Valid	Artefact : -		100568,101135
	Contact Searle	Recorders	Mr.Chris Price					Permits	2699	
60-3-0103	CES4 (Albury)	GDA	55	493285	6012327	Open site	Valid	Artefact : -		100568,101135

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Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 17-276 Anderson Clay Mine

Client Service ID : 287062

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact Searle	Recorders	Mr.Chris Price					Permits	2699	
60-3-0099	Hume Golf Club	GDA	55	492295	6010334	Open site	Valid	Artefact : 5		100579,102080
	Contact Albury & District LALC	Recorders	Mr.Graham Moore,Mr.Michael Mulvaney					Permits	2753,3242	
60-3-0108	AL01 (Albury)	GDA	55	490588	6013318	Open site	Valid	Artefact : 1		101228,101697
	Contact	Recorders	Mr.Dominic Brady					Permits	3311,3312	
60-3-0106	CEST1 (Albury)	GDA	55	493449	6012436	Open site	Valid	Modified Tree (Carved or Scarred) : 1		101135
	Contact	Recorders	Mr.Chris Price					Permits		
60-3-0107	CES1 (Albury)	GDA	55	493488	6012557	Open site	Valid	Modified Tree (Carved or Scarred) : 1		101135
	Contact	Recorders	Mr.Chris Price					Permits		
60-3-0092	Albury Wodonga Highway 4 and 5	AGD	55	498446	6013670	Open site	Valid	Artefact : -		
	Contact T Russell	Recorders	Parklands - Albury Wodonga					Permits		
60-3-0112	HEAS 1	GDA	55	492278	6010329	Open site	Valid	Artefact : 65		100579,102080
	Contact	Recorders	Mr.Stephen Pollock					Permits	2753,3242	
60-3-0113	AL01	AGD	55	490588	6013318	Open site	Valid	Artefact : 1		101228
	Contact	Recorders	Biosis Pty Ltd - Sydney,Mr.Dominic Brady					Permits		
60-3-0115	PAD THURGOONA	GDA	55	499909	6011355	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Mrs.Rose Overberg					Permits		
60-3-0117	Black Spring Creek AS 1	GDA	55	491236	6010493	Open site	Valid	Artefact : 1		
	Contact	Recorders	Ms.Ashley Edwards,Jo Bell Heritage Services Pty Ltd					Permits		
60-3-0119	TH-15-AS1	GDA	55	496962	6009779	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Mr.Luke Atkinson					Permits	4113	
60-3-0118	Black Springs Creek AS 1	GDA	55	491236	6010493	Open site	Valid	Artefact : 1		
	Contact	Recorders	Ms.Ashley Edwards,Jo Bell Heritage Services Pty Ltd					Permits		
55-6-0103	Nexus AS1	GDA	55	497178	6016606	Open site	Valid	Artefact : 1		
	Contact	Recorders	Biosis Research,Ms.Ashley Edwards					Permits	4118	
55-6-0104	Nexus AS2	GDA	55	497470	6016626	Open site	Valid	Artefact : 1		
	Contact	Recorders	Biosis Research,Ms.Ashley Edwards					Permits	4118	

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 17-276 Anderson Clay Mine

Client Service ID : 287062

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
55-6-0105	Nexus AS3	GDA	55	497753	6016671	Open site	Valid	Artefact : 1		
	Contact	Recorders	Biosis Research,Ms.Ashley Edwards					Permits	4118	
55-6-0106	Nexus AS4	GDA	55	497726	6016789	Open site	Valid	Artefact : 1		
	Contact	Recorders	Biosis Research,Ms.Bridget Grinter					Permits	4118	
55-6-0107	Nexus AS5	GDA	55	497424	6016897	Open site	Valid	Artefact : 1		
	Contact	Recorders	Biosis Research,Ms.Bridget Grinter					Permits	4118	
55-6-0108	Nexus AS6	GDA	55	497424	6017034	Open site	Valid	Artefact : 1		
	Contact	Recorders	Biosis Research,Ms.Bridget Grinter					Permits	4118	
55-6-0109	Nexus AS7	GDA	55	497030	6017049	Open site	Valid	Artefact : 1		
	Contact	Recorders	Biosis Research,Ms.Bridget Grinter					Permits	4118	
60-3-0121	Nexus AS8	GDA	55	497609	6015930	Open site	Valid	Artefact : 1		
	Contact	Recorders	Biosis Research,Ms.Bridget Grinter					Permits	4118	
61-1-0260	TH-AS2-16	GDA	55	500149	6011824	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Mr.Luke Atkinson,AECOM Sydney					Permits	4077	
60-3-0120	TH-AS3-16	GDA	55	499923	6012230	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Mr.Luke Atkinson,AECOM Sydney					Permits	4077	
61-1-0261	TH-AS4-16	GDA	55	500334	6012072	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Mr.Luke Atkinson,AECOM Sydney					Permits	4077	

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APPENDIX C TEST PIT RECORDS

PIT	SPIT	LENGTH	WIDTH	NW	NE	SE	SW	ABORIGINAL ARTEFACTS	MODERN ARTEFACTS	DEPOSIT NOTES
1	1	500	500	50	50	50	50	0	2	reddish brown loose loam, gravelly (15mm dia). Scattered charcoal, 2 beer related euro artefacts.
1	2	500	500	110	110	100	100	0		reddish brown fine sand, aeolian. Compact, minor roots and charcoal. v.minor quartz gravel
1	3	500	500	150	150	150	150	0		reddish brown fine sand, aeolian. Compact, minor roots and charcoal. v.minor quartz gravel
1	4	500	500	200	200	200	200	0		reddish brown fine sand, aeolian. Compact, minor roots and charcoal. v.minor quartz gravel
1	5	500	500	250	250	250	250	0		reddish brown fine sand, aeolian. Compact, minor roots and charcoal. v.minor quartz gravel
1	6	500	500	300	300	300	300	0		reddish brown fine sand, aeolian. Compact, minor roots and charcoal. v.minor quartz gravel
1	7	500	500	350	350	350	350	0		reddish brown fine sand, aeolian. Compact, minor roots and charcoal. v.minor quartz gravel
1	8	500	500	400	400	400	400	0		reddish brown fine sand, aeolian. Minor clay content. Compact, minor roots and charcoal. v.minor gravel
1	9	500	500	450	450	450	450	0		reddish brown fine sand, aeolian. Minor clay content. Compact, minor roots and charcoal. v.minor quartz gravel
1	10	500	500	500	500	500	500	0		reddish brown fine sand, aeolian. Minor clay content. Compact, minor roots and charcoal. v.minor quartz gravel
1	11	500	500	550	550	550	550	0		reddish brown fine sand, aeolian. Minor clay content. Compact, minor roots and charcoal. v.minor quartz gravel
1	12	500	500	600	600	600	600	0		reddish brown fine sand, aeolian. Minor clay content. Compact, minor roots and charcoal. v.minor quartz and mica shale gravel pieces
1	13	500	500	650	650	650	650	0		reddish brown fine sand, aeolian. Minor clay content. Compact, minor roots and charcoal. v.minor quartz and mica shale gravel pieces
1	14	500	500	700	700	700	700	0		reddish brown fine sand, aeolian. Minor clay content. Compact, minor roots and charcoal. v.minor quartz and mica shale gravel pieces
2	1	500	500	50	50	50	50	0		brown humic loam, loose, moderate root content
2	2	500	500	150	150	150	150	0		red brown clayey silty sand. V, compact. Nw corner has disturbance – loam and charcoal
2	3	500	500	250	250	250	250	0		red brown clayey silty sand. V, compact. Nw corner has disturbance – loam and charcoal, lensing out at base of spit
3	1	500	500	50	50	50	50	0		brown humic loam, loose, moderate root content
3	2	500	500	150	150	150	150	0		red brown clayey silty sand. V, compact
3	3	500	500	250	250	250	250	0		red brown clayey silty sand. V, compact
4	1	500	500	50	50	50	50	0		brown humic loam, loose, moderate root content
4	2	500	500	150	150	150	150	0		red brown clayey silty sand. V, compact, minor quartz gravel
4	3	500	500	280	280	280	280	0		red brown clayey silty sand. V, compact, minor quartz gravel
5	1	500	500	50	50	50	50	0		brown humic loam, loose, moderate root content
5	2	500	500	100	100	150	150	0		as above
5	3	500	500	170	170	200	200	0		gravel layer, light brown silty sand among prolific gravel. Probably fill deposit
5	4	500	500	250	250	300	250	0		reddish brown fine sand, aeolian. Compact, minor roots and charcoal. v.minor quartz gravel. Sandy silty clay at base
6	1	500	500	50	50	50	50	0		brown humic loam, loose, moderate root content
6	2	500	500	150	150	150	150	0		red brown clayey silty sand. V, compact, minor quartz gravel
6	3	500	500	250	250	250	250	0		red brown clayey silty sand. V, compact, minor quartz gravel
7	1	500	500	50	50	50	50	0		brown humic loam, loose, moderate root content
7	2	500	500	150	150	150	150	0		red brown clayey silty sand. V, compact, minor quartz gravel
7	3	500	500	250	250	250	250	0		red brown clayey silty sand. V, compact, minor quartz gravel
7	4	500	500	350	350	350	350	0		red brown clayey silty sand. V, compact, minor quartz gravel
8	1	500	500	50	50	50	50	0		brown humic loam, loose, moderate root content
8	2	500	500	150	150	150	150	0		red brown clayey silty sand. V, compact, decomposing mica rich rock at base on southern wall
8	3	500	500	250	250	250	250	0		red brown clayey silty sand. V, compact, decomposing mica rich rock at base on southern wall
10	1	500	500	50	50	50	50	0		reddish brown loose loam, gravelly (15mm dia). Scattered charcoal, 2 beer related euro artefacts.
10	2	500	500	150	150	150	150	0		reddish brown fine sand, aeolian. Compact, minor roots and charcoal. v.minor quartz gravel
10	3	500	500	250	250	250	250	0		reddish brown fine sand, aeolian. Compact, minor roots and charcoal. v.minor quartz gravel
10	4	500	500	350	350	350	350	0		reddish brown fine sand, aeolian. Compact, minor roots and charcoal. v.minor quartz gravel, clay at base
10	5	500	500	400	400	400	400	0		reddish brown fine sand, aeolian. Compact, minor roots and charcoal. v.minor quartz gravel, clay at base
14	1	500	500	50	50	50	50	0		brown humic loam, loose, moderate root content
14	2	500	500	130	130	130	110	0		red brown clayey silty sand. V, compact, prolific decomposing metamorphosed shale.

17	1	500	500	50	50	50	50	0		brown humic loam, loose, moderate root content
17	2	500	500	150	150	150	150	0		red brown clayey silty sand. V, compact, decomposing mica rich rock at base on southern wall
17	3	500	500	200	200	200	200	0		red brown clayey silty sand. V, compact, decomposing mica rich rock at base on southern wall
22	1	500	500	50	50	50	50	0		brown humic loam, loose, moderate root content
22	2	500	500	150	150	150	150	0		red brown clayey silty sand. V, compact, decomposing mica rich rock at base on southern wall
22	3	500	500	200	200	200	200	0		red brown clayey silty sand. V, compact, decomposing mica rich rock at base on southern wall
24	1	500	500	50	50	50	50	0		brown humic loam, loose, moderate root content
24	2	500	500	150	150	150	130	0		red brown clayey silty sand. V, compact, decomposing mica rich rock at base and throughout spit

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