Baiada Poultry Pty Limited

STATEMENT OF ENVIRONMENTAL EFFECTS

Section 96(2) Modification Application

APPENDIX E –

Archaeological Survey Report
(*Gaynor & Wilson Archaeological Consultants, 1997)*

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PRELIMINARY REPORT

THE ARCHAEOLOGICAL SURVEY OF THE PROPOSED RENDERING SITE ON "OAKBURN" OXLEY HIGHWAY TAMWORTH, N.S.W.

PREPARED FOR
EES PTY LTD
TAMWORTH N.S.W.
ON BEHALF OF
BAIADA POULTRY PTY LTD
CORNER OUT AND BRIDGE STREET
WEST TAMWORTH.

BY
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Summary

The archaeological survey of the proposed rendering site on the property "Oakburn", near Tamworth NSW, was undertaken at the request of EES Pty Ltd, acting on behalf of their clients, Baiada Poultry Pty Ltd. The brief was to conduct an archaeological survey of an area of 16 hectares surrounding the site of the former "Oakburn" homestead, located adjacent to the Oxley Highway and opposite the western perimeter of the Tamworth airport. This survey area falls within the area designated as belonging to the *Gamilaroi* tribal or dialectical group and is within the zone supervised by the Tamworth Local Aboriginal Land Council.

The survey was undertaken on the 28th June 1997 by the authors, and Mr. Allan Kelly, representing the Tamworth Local Aboriginal Land Council and Mr. Adam Heaton, a second year Aboriginal student from the Department of Archaeology and Palaeoanthropology UNE, Armidale. During the survey two isolated Aboriginal stone artefacts were located. The first artefact was a broken retouched flake which had residues present on its surface. This artefact had been manufactured from a white, very fine grained siliceous material. Identification of this raw material was difficult due to the weathered nature of the surface of the artefact, however, it is either a very fine grained quartzite or a silcrete. Either raw material is rare in artefact assemblages from the Tamworth region and must have been imported into this area as they are not locally available.

The second stone artefact was manufactured from andesitic greywacke and was identified as being either an axe or an axe blank. The advanced state of weathering and patination of this artefact made it impossible to tell if it had ever been used, and therefore, the distinction between an axe and axe blank could not be made. Andesitic greywacke is locally available, however, raw material of the quality necessary for axe manufacture is limited in the landscape. It is likely, therefore, that the raw material for this artefact was sourced from the nearby Peel River 5 Aboriginal Axe Quarry. Further analysis of both of these artefacts, under laboratory conditions, will help clarify raw material type and thus, to pinpoint more accurately their sources. Sourcing of the raw material will in turn, provide information in relation to the movement of Aboriginal people and/or raw materials across the landscape prior to European settlement of the survey area.

The following recommendations have met with the approval of Mr. Allan Kelly (Tamworth Local Aboriginal Land Council representative), but have not yet been approved at a general meeting of the committee and members of the Tamworth Local Aboriginal Land Council. Written approval of these recommendations will be necessary prior to this preliminary report being finalised and then forwarded to the National Parks and Wildlife Service.

It is the recommendation of the authors that there is no archaeological reason that the development proposed by Baiada Pty Ltd on the property "Oakburn" should not be allowed to proceed, providing the following conditions are met by the developer:

1) that no works proceed on the proposed development area until the two artefacts located during the survey are collected for analysis and temporary storage at the Department of Archaeology and Palaeoanthropology, UNE Armidale. The artefacts collected will be returned to the Tamworth Local Aboriginal Land Council for display within their "Keeping Place" as soon as its construction is complete. In this regard an application for a "Consent to Collect" the artefacts in the sites known as "Oakburn 1" and "Oakburn 2" must be forwarded by Baiada Pty Ltd to the National Parks and Wildlife Service for their approval;

2) that the developer agrees to meeting the cost of:

a) the artefact collection and the writing of the subsequent report required by the National Parks and Wildlife Service;

b) the cost of residue analysis on the broken retouched flake and thin section analysis of the axe/blank, should laboratory inspection under high powered magnification indicate that these forms of analyses would be successful in furthering our knowledge of past Aboriginal life ways in the Tamworth Region (this will need to take into account the nature of the residue and the degree of weathering of the axe/blank).

3) that a representative of the Tamworth Local Aboriginal Land Council be granted permission to investigate any areas disturbed by earthworks undertaken for the development so that if further artefacts are uncovered they may also be collected.

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1 Introduction

The archaeological survey of a 16 hectare portion of the property "Oakburn", on the Oxley Highway, adjacent to the Tamworth airport, was undertaken at the request of Terry Ellis of EES Pty Ltd, acting on behalf of their clients, Baiada Poultry Pty Ltd of Tamworth. The survey was to record the presence of any sites or relics of Aboriginal, archaeological or historic significance.

1.1 Aboriginal Tribal Area

The survey area falls within the region designated as belonging to the *Gamilaroi* tribal or dialectical group (Tindale 1974), and is within the Land Council Zone of the Tamworth Local Aboriginal Land Council.

1.2 The Archaeological Brief

The archaeological brief was to conduct a survey covering an area of 16 hectares on the property "Oakburn". The survey area included the site of the former homestead (according to local landholders the homestead was demolished around three to five years ago). The area surveyed is located on Portions 42 and 432, Parish of Murroon, County of Parry. The survey was to be undertaken in accordance with National Parks and Wildlife Service guidelines.

1.3 The Location of the Survey Area

The survey area was located approximately 5.25 km west of Tamworth on the right hand side of the Oxley Highway (see Figure 1).

2 The Environmental Context

2.1 Geography

The survey area is situated on a slope which dips gently (<1 degree) to the north. The nearest major watercourse is the Peel River which flows approximately 3 km to the northeast. The major tributary draining the area is Bolton's Creek which runs approximately 500 metres to the west of the survey area (see Figure 1). The property is bounded to the south side by the Oxley Highway.

2.2 Geology and Soils (A glossary of geological terms has been attached as Appendix 1)

The survey area lies at the border of the Upper Devonian Mandowa Mudstone, which contains mudstones (technically it would be more correct to term these siltstones; N. Stephenson pers. comm. 1990, geologist, U.N.E.) and arenites, and the Upper Devonian Keepit Conglomerates, which contain polymictic conglomerates and andesitic greywackes. These geological formations in turn overlie the Upper Devonian Baldwin Formation, which contain argillites and andesitic greywackes. To the north the Baldwin Formation is overlain by Quaternary sediments deposited along the banks and floodplains of the Peel River and its major tributaries (Tamworth 1:250000 Geological Series Sheet SH 56-13, Crook 1960:

189-207, Chappell 1961:63-75, Chappell 1968: 87-102, pers. obs:1993).

Of the stone types which are likely to outcrop in the survey area, only andesitic greywacke is known to have been regularly used for the production of Aboriginal stone implements. Andesitic greywacke is an excellent raw material for the production of stone axes (for more information see Binns and McBryde 1972 and Wilson 1994) and a large percentage of axes produced in the Tamworth Region were manufactured from this raw material. Further to the north-east where the argillites have been contact metamorphosed by heat from the Permian Moonbi Adamellite intrusions these were also used for the production of both axes and for the production of sharp flakes for cutting, scraping, skinning etc (Gaynor and Wilson 1994, 1995b), however, as the argillites present in the area surrounding "Oakburn" have not been subject to contact metamorphism, it is unlikely that they will be suitable for axe or flake manufacture.

The pebble/cobble beds in the Peel River may also have supplied raw materials, such as quartz, chert, cherty argillite and siltstone for flake manufacture, to Aboriginal people using the area of the proposed development prior to European settlement.

During the actual survey of "Oakburn" (see Section 5 below) no rock outcrops were observed, however, loose scree of both andesitic greywacke and argillite were observed both in the paddocks and in piles around trees in the paddocks.

Soils formed from andesitic greywacke and argillite are generally red-brown in colour, not of high fertility have a high clay content and poor permeability. The soils observed during the survey fit this description.

2.3 Vegetation

Species identification for this report was undertaken with the assistance of the following references: **Plants of Western New South Wales** by Cunningham et al:1981, **Weeds** by Auld and Medd 1987, **Eucalypts a Guide** by Brogan 1987, **Field Guide to Eucalypts** by Brooker and Kleinig 1990, **Grasses of Temperate Australia** by Lamp et al 1990 and **What Tree is That?** by Macoboy 1997.

The plant species recorded within the proposed development area are discussed in full within Section 5 (the Survey) of this report. A discussion of how plant species identification has been used to help understand the manner in which the landscape has been modified since European settlement of the area will also follow the discussion of the survey of the "Oakburn" property.

As the survey was broken up into the various paddocks included in the proposed development

area, the plant species present were recorded for each paddock separately. In many cases these were found to be similar but differences did arise due to the introduction of many non-native species in the area surrounding the former homestead site and the associated sheds and yards. As the survey was undertaken at the end of June, after several very heavy frosts, the species recorded will not be representative of the species which may be present in the area during the warmer months of the year. The majority of the weeds and grasses present were dead and retained only their stalks, and those parts of the plants normally used for species identification were no longer present. The living groundcover plants had only just germinated and were too immature to identify to species level on the day of the survey.

A detailed survey of the flora present in the proposed development area will be undertaken at a later date by Mr Paul Broese van Groenou of Arnhem Environmental Impact Assessors.

2.4 Fauna

On the day of the survey absolutely no fauna was recorded within the proposed development area. The day was very cold and windy and not even bird or insect activity was observed. Large amounts of fresh sheep and cattle manure did indicate however, that the area is still being used for the grazing of livestock.

3 Aboriginal Consultation

Mr. Allan Kelly, was the nominated representative of the Tamworth Local Aboriginal Land Council and he accompanied the authors on the survey and was consulted in regard to the recommendations made within this preliminary report. The recommendations within this report will have to be presented to a general meeting of the Tamworth Local Aboriginal Land Council for discussion by its members. This may result in some amendments to the recommendations presented at this time. If this is the case, then the amended recommendations will be those that will appear in the report that will be sent to the National Parks and Wildlife Service.

4 Previous Archaeological Research

4.1 The Aboriginal Axe Quarry on "Daruka" Station Moore Creek

The Aboriginal axe quarry on "Daruka" is listed on the Register of the National Estate and andesitic greywacke axes from this quarry have been recovered from all over the north-west of NSW, reaching as far distant as the Wilcannia Region, 960 kilometres away (Binns and McBryde 1972). During the 1960's and early 1970's research was undertaken at the site by Binns and McBryde (1969 and 1972) and by McBryde (1974). Research pertaining to the quarry site itself was mainly descriptive and no quantitative research was undertaken. Binns' and McBryde's (1974) main interest at that time was in the distribution patterns of axes from this quarry. "Daruka" is located approximately 11 km northeast of "Oakburn".

The most recent Archaeological consultancy in the area of the "Daruka" axe quarry was

by Appleton (1991), who surveyed the lower eastern slopes of Mt. Daruka for a rural subdivision. Appleton recorded "34 artefact locations (1991:17)". These consisted of one scarred tree, ten isolated artefacts, one camp site, nineteen artefact scatters and three knapping floors. Raw material types noted by Appleton (1991:33) were greywacke, mudstone, chert, quartz, chalcedony, jasper, silicified mudstone and silicified greywacke. All of these materials can be sourced locally or from within a few kilometres of "Daruka". The sites containing the artefacts were all located on the lower slopes and along the local creeks.

Wilson (1994) carried out research in the Tamworth Region which concentrated on experimental axe production and use-wear experiments using raw materials sourced from the local area, including that from the "Daruka" axe quarry. Wilson (1994:13-19) found that the andesitic greywacke from the Daruka axe quarry was by far the superior axe raw material available in this area due to its durability (toughness and preservation of a sharp cutting edge).

4.2 The Peel River Sites

All five of these sites were recorded by one of the authors in 1993 (J.W.).

Peel River 1

Situated approximately 6 km north of "Oakburn". Peel River 1 is an open camp site which extends for over 1700 metres along the western side of the Peel River. To date this is the only known site along the Peel River. This site has not been fully investigated as the landowner would not grant permission for research to be undertaken on his property. Preliminary observations by the authors (1992-3) noted that the site contained knapping debris from pebbles derived from the local pebble beaches along the Peel River, as well as andesitic greywacke sourced from a local quarry (Peel River 5) and what appeared to be andesitic greywacke from the "Daruka" quarry. Raw materials present at Peel River 1 included andesitic greywacke, cherty argillite, hornfels, quartz, siltstone and chert.

Peel River 2, 3 and 4

Situated approximately 5.75 km north of "Oakburn". These three sites consist of lithic sandstone boulders with evidence for the grinding of axes. They are located in a ring surrounding a small greywacke axe quarry (Peel River 5).

Peel River 5

Situated approximately 5.75 km north of "Oakburn". Peel River 5 is a small andesitic greywacke quarry. The andesitic greywacke from this quarry has been used for the manufacture of axes as well as the manufacture of cores for the production of flakes. The greywacke is very different to that found at the "Daruka" axe quarry. It is light grey in

colour ("Daruka" is green), coarser in texture and it has much better flaking qualities. This superior flaking quality makes it by comparison an inferior axe material to that from "Daruka".

Peel River 3, 4 and 5 were threatened by destruction by bulldozers in 1994 during the Rural Lands Protection Board rabbit eradication programme. Fortunately one of the landowners objected and the matter was eventually sorted out and the quarry and grinding grooves saved.

4.3 Botanic Gardens (this site was given the *Gamilaroi* name *"Garawul Gurar"*, meaning Long Gully).

This site is approximately 10.25 km east of "Oakburn" and is situated on the northern outskirts of Tamworth. In 1996 the authors located a large artefact scatter between two tributaries of Long Gully, a watercourse which drained the southwestern slope of a hill known locally as Bald Hill. The nature of the assemblage recorded at the site, indicated that cherty argillite and hornfels scree found on the slope, had been used for the manufacture of cores and flakes, that had later been removed from the site. The small cores, retouched and used flakes left at the site, had been sourced from river pebbles (most likely from the Peel River 2000 metres to the south) and it appears that "*Garawul Gurar*" was a stopover place where Aboriginal people replaced exhausted (worn out) artefacts, with those made from material sourced from the present area of the Botanic Gardens. Most of this site will be preserved as part of the Tamworth Botanic Gardens Development which will also include the Tamworth Local Aboriginal Land Council "Keeping Place". Artefacts located at the site had been manufactured from cherty argillite, hornfels, quartz, andesitic greywacke and chalcedony.

4.4 "Marengo"

In 1994, six sites were located during a survey undertaken by the authors, on the property "Marengo" which is situated approximately 10 km ENE of "Oakburn". The sites consisted of one hornfels and one cherty argillite quarry, a large open site (located adjacent and beneath an old European homestead site), two artefact scatters and an isolated artefact. Raw materials observed at "Marengo" included cherty argillite, hornfels, andesitic greywacke, siltstone, quartz, aplite and chert.

4.5 West Tamworth to Carroll Optic Fibre Cable Route

This Telstra line runs both inside (300 metres) and outside the front fence of the "Oakburn" property. The survey of the Optic Fibre Cable Route was carried out by Mr.T. Griffiths and Mr Allan Kelly (Tamworth Local Aboriginal Land Council) in November 1995. In the 54 km length of the route, no Aboriginal relics were sighted (Griffiths 1995)

4.6 Tamworth Sewage Effluent Irrigation Scheme

This survey was carried out by Lovell-Jones and Mr. Allan Kelly (Tamworth Local Aboriginal Land Council) in January 1996. The work was undertaken for the NSW Department of Public Works. Lovell-Jones's survey area overlapped that of the present survey and also included an area adjacent to the Tamworth airport and continued further to the west and south to include a section of Bolton's Creek. It should be noted at this time that the author's were unaware of the previous survey when they undertook their own survey and were still awaiting the results of a National Parks and Wildlife Service search of their "Minark" Aboriginal sites register, which would have indicated the earlier survey.

Lovell-Jones (1996) located five isolated stone artefacts and one site (containing four stone artefacts) during her survey. Lovell-Jones (1996) does not mention the location of the site but Allan Kelly (1997: pers. comm.) from the Tamworth Local Aboriginal Land Council informed the author's that the site was on Bolton's Creek. All four artefacts located in the site on Bolton's Creek were described by Lovell-Jones (1996:29) as "grey silcrete". Captions under photographs of two of the isolated stone artefacts describes them as silcrete and chert flakes respectively (Lovell-Jones 1996:14), however, the report fails to mention what the raw material types were for the other three isolated artefacts.

In her recommendations Lovell-Jones (1996:V) stated that:

> "none of the artefacts or the site we located were uncommon for the Tamworth region. Therefore, none of the artefacts or indeed the site that we found could be described as a significant Aboriginal or archaeological area, place or site."

However, Lovell Jones (1996:V11) did go on to recommend that all the artefacts be collected and deposited with the Tamworth Local Aboriginal Land Council. As this development did not proceed it appears that the artefact collection was not undertaken.

4.7 Discussion--Previous Archaeological Research

From the brief site descriptions given above, it can be ascertained that there are a certain suite of raw materials common to Aboriginal stone artefact assemblages from this area. These include andesitic greywacke, cherty argillite, hornfels, chert, quartz, siltstone and more rarely chalcedony. Silcrete, such as that described by Lovell Jones (1996:29), is not a common raw material located in sites in this area. In fact, to the authors' knowledge the closest site to contain silcrete artefacts was on the property "Sunnyside" at Kootingal (Gaynor and Wilson 1995:42), more than 15 kms to the north-east, and even then, only two artefacts out of more than 600 artefacts were silcrete (the remainder of the artefacts were of those raw materials discussed above). The only areas with suitable geological histories for the formation of silcrete lie to the north in the Armidale area and far to the south in the Hunter Valley. Thus, silcrete in a site in the Tamworth area should be seen to

have archaeological significance, as its presence indicates either the long distance movement of people or of raw material.

4.8 Historical References to the Survey Area.

The earliest parish map of Murroon available from the Department of Land and Water Conservation at Tamworth is dated 26th July 1909. The "Oakburn" area was originally part of the Australian Agricultural Company's "Goonoo Goonoo Station". In 1909, the area was thrown open for settlement purchase by the government of the day. According to the original parish map, Portion 42 was taken up by A.G. Warner on June 11th 1909 (farm 29), and Portion 43, by P.T. Potter on 8th June 1909 (farm 30). The survey area is comprised of part of the most southerly section of these two portions (Portion 43 is now divided into two portions with the Portion adjacent to the highway being Portion 432). The site of the "Oakburn" homestead is in portion 42. It is likely that these portions were cleared for cultivation soon after they were purchased and this indicates a long history of cultivation and thus, of ground disturbance.

5 The Survey

The survey was undertaken on Saturday the 28th June 1997 by the two authors, Mr. Allan Kelly (Tamworth Local Aboriginal Land Council) and Mr. Adam Heaton, a second year Aboriginal student from the Department of Archaeology and Palaeoanthropology, UNE, Armidale. The weather was clear and fine but windy and cold. Light conditions were good.

5.1 The Predictive Model

From the sites known to the authors and discussed above, it could be predicted that the most likely sites to be found would be artefact scatters and/or isolated artefacts. If sites such as these were located, it could be predicted that they would contain artefacts manufactured from andesitic greywacke, cherty argillite, hornfels, quartz and chert. It was also possible that grinding grooves and/or axe quarries may be located within the survey area if suitable outcrops were found to exist. As sites such as scarred or carved trees and art sites were unknown in this general area it was unlikely that they would be found during this survey.

As mentioned above, the survey undertaken by Lovell-Jones (1996), of the same area, was unknown prior to the undertaking of this survey and therefore, her results could not form part of the predictive model. If they had been known, the only change in the predictive model would be that silcrete would have been added to the list of raw materials expected in any assemblages located in the area.

5.2 The Survey Strategy

The entire area of the proposed development was surveyed with the participants walking at five metre intervals. All ant's nests, cattle, sheep and vehicular tracks and eroded and scoured areas were investigated closely as they provided the only areas with excellent visibility. The remainder of the area had poor visibility due to a thick mantle of short,

recently germinated, grass and weeds and in other sections by stands of tall, dead, grasses. The direction in which the participants walked was altered as the day progressed to take advantage of the best light and to avoid shadows. All stone artefacts located were flagged for later artefact analysis, site recording and photographic purposes. All four participants involved in the survey were experienced in stone artefact identification.

5.3 The Paddocks

5.3.1 - Paddock 1 (see Plates 1 and 2)

Paddock 1 was located adjacent to the Oxley Highway on the western side of the development area (see Figure 2). Included within this paddock were a derelict shearing shed, a shed which combined a hay shed, horse stalls and a cow bale; a roundyard and loading ramp, sheep yards and a grain silo. A drainage channel had also been constructed below (north) the yards complex. This channel carried water away from the former homestead. Paddock 1 was flat. (see Plate 1).

The groundcover species in Paddock 1 included wiregrass (most probably *Aristida ramosa*), an occasional barbed-wire grass (*Cymbopogon refractus*) and star thistles (*Centaurea calcitrapa*). Around the sheds and in the sheep yards there were also Bathurst burrs (*Xanthium spinosum*). All of these plants were dead but beneath these many new groundcover species had recently germinated. As most of these were only at the two leaf stage their identification to species level was problematic, but they included dock (*Rumex sp.*) and medics (*Medicago sp.*) and rosettes of variegated thistle (*Silybum marianum*) and saffron thistle (*Carthamus lanatus*).

There were no mid-stratum species observed. The native trees present in the upper stratum consisted of an occasional white box (*Eucalyptus albens*) and wilga (*Geijira parviflora*) and there were also and some very large introduced trees which included peppercorn (*Schinus areira*), locust (*Ceratonia siliqua*) and another very large tree which could not be identified.

The paddock was surveyed in an east/west direction taking advantage of the best light conditions at that time of the morning. Visibility was generally around 5% owing to the fresh green mantle of plants. This green mantle, however, was not sufficient to obscure any stones greater than approximately 2 cm in diameter, so stone artefacts greater than this size would have been sighted owing to the 5 metre grid pattern adopted for the survey. There were only small patches of tall grass in this paddock.

There were a number of bare areas in this paddock that had 100% visibility. These were on tracks or roads, around the sheds and in the sheep and horse yards. The areas around the buildings and yards were very disturbed. Andesitic greywacke scree was visible in this paddock and piled under the trees, suggesting that farmers had removed them from the paddock so that it could be cultivated more effectively. No Aboriginal or historic relics were sighted in this paddock.

5.3.2 Paddock 2 (see Plates 3 and 4)

Paddock 2 was also adjacent to the Oxley Highway and this paddock included the original house yard, two large slabs of cement, the foundations of a house and shed and a well and pump. This area was also flat. According to local farmers (Diane and Devon Drew pers. comm. 1997), the brick homestead was demolished and a large shed removed sometime after 1992. As the antiquity or historic significance of this building was unknown at the time of the survey, the author's spent some time in drawing up a plan of the homestead as reflected by the remains of its foundations, at the completion of the survey (see Figure 3 and Plate 12).

Plant species recorded in the house yard included many introduced garden plants such as jonquils (*Narcissus sp.*) and iris (*Iris sp.*) and ornamental trees such as the Oleander (*Nerium oleander*). A yellow flowering vine (species unknown) grew over the few remnants of the house yard fence and some succulents (possibly aloes) grew nearby. Native trees in around the house yard included wilga, silky oak (*Grevillea robusta*), Casuarina (probably *Casuarina cunninghamiana*) and kurrajong (*Brachychiton populneus*). The kurrajongs were planted in a neat row across the northern side of the house yard. Groundcover species growing in the house yard included couch grass (*Cynodon dactylon*), nettles (*Urtica incisa*) and horehound (*Marrubium vulgare*).

Outside the house yard the groundcover species were the same as those recorded for Paddock 1 with the addition of an occasional soft roly-poly (*Salsola kali*) and an occasional patch of a very tall grass (up to one metre) which had shed all its seed and leaf but appeared to be tall plains grass (*Stipa aristiglumis*). Directly in front of the former house yard a small stand of grey gums (probably *Eucalyptus punctata*) were recorded. These were mainly immature specimens surrounding an occasional mature tree. Isolated kurrajongs, wilgas and white cedars (*Melia azedarach*) were also recorded in this paddock.

The only mid-stratum species noted in Paddock 2 were ornamental trees around the house yard and an African boxthorn (*Lycium ferocissimum*) beneath one of the trees.

This paddock was surveyed in a similar fashion to Paddock 1. The same mantle of new green growth covered much of the ground and there were still many bare patches affording 100% visibility. Soil heaped up along the fencelines in this paddock indicated that the area had been regularly ploughed in the past. This paddock had also been disturbed by the laying of a Telstra cable just inside the boundary fence and running the length the Oxley Highway boundary. It was evident that this line had been laid after cultivation had ceased in this paddock as the soil deposited by prior disc ploughing had been removed from along this fenceline. There was a considerable amount of andesitic greywacke scree present along the southern boundary of this paddock. Visibility in Paddock 2 ranged from 5% in the grass to 100% in eroded and scoured areas (some of which reached a size of 10 metres by 5 metres). Overall visibility averaged around 25%.

5.3.3 Paddock 3 (see Plates 5 and 6)

Paddock 3 ran to the north-east of Paddocks 1 and 2 (see Figure 2). Paddock 3 sloped gently (<1 degree) to the north-east. There were no buildings or remains of buildings observed in this paddock. Paddock 3 contained only one tree. This was a mature white box. There was no mid-stratum present. The groundcover consisted of the same weeds and grasses recorded in Paddock 1 and 2 with the addition of some (dead) chicory plants (*Cichorium intybus*), also an introduced species.

This paddock was traversed in a north-south fashion as light conditions had changed from the first two paddocks. A laneway containing a track with 100% visibility ran along the western boundary of this paddock (see Plate 5). Although trampled hard by stock, it afforded an excellent cross section (with 100% visibility) of the western side of this paddock. A graded track also crossed this paddock from west to east. Visibility was 100% over most of this track, which appears to have been lightly graded for access through both Paddocks 3 and 4.

One stone artefact was discovered in the southwestern corner of this paddock. The artefact was a broken retouched flake, the surface of which was quite patinated making raw material identification difficult. Under magnification (x30) the artefact appears to have been manufactured from a white, extremely fine grained quartzite or silcrete. The artefact also appeared to have some residues on both its ventral and dorsal surfaces (see Plate 9). The area surrounding the artefact was intensively investigated, however, no further artefacts were located.

It is interesting to note that both quartzite and silcrete are very rare raw material types used for stone implement manufacture in this region and therefore, the location of this isolated broken retouched flake is of some archaeological significance.

Visibility in Paddock 3 away from the laneway and grader scrape ranged between 5 to 50% and averaged 25% in the western half of the paddock. Visibility then decreased significantly in the eastern half of the paddock, to range between 2% and 15% and average 5% owing to thick stands of tall grass. As in the earlier paddocks, there were also many areas within the grass totally devoid of vegetation which gave patches of 100% visibility.

5.3.4 Paddock 4 (see Plate 7)

Paddock 4 was the largest paddock surveyed and comprised the south-eastern section of the proposed development area. Paddock 4 sloped gently (<1 degree) to the north-north-east. It showed very definite signs of past cultivation with broadsheet erosion visible in the southwestern corner (see Plate 7). Groundcover varied with patches of bare ground, patches of dense tall grass, and patches with only the green mantle of immature grasses and weeds. Visibility varied throughout this paddock from 0% to 100% and averaged 25%.

An andesitic greywacke stone axe or axe blank was discovered in Paddock 4, approximately 80 metres from the tributary which drains the present site of the airport. This artefact was extremely weathered and highly patinated and it was not possible to discern if it had ever been used as an axe or if it had been lost or discarded prior to being used. It had never been edge-ground. The source of the raw material for this axe was not the "Daruka" quarry at Moore creek, and it is more likely to have been sourced from a smaller quarry such as the Peel River 5 quarry, described earlier. No other Aboriginal artefacts were located in this paddock.

The only trees observed during the survey of this paddock were just outside the survey area proper (to the south-east) and these consisted of one peppercorn tree and two white cedars growing along the tributary. Both of these are introduced species. There were no mid-stratum species present and the groundcover was similar to that in the earlier paddocks with the addition of rat's tail grass (*Sporobolus creber*).

As groundcover had diminished visibility within the survey area to such as degree that it was not really possible to observe the majority of the ground surface, it was decided to increase the area surveyed to include the banks of the tributary which drained the airport. This tributary ran parallel to, and just outside, the northern and eastern margins of the survey area (Paddock 4). Visibility was 100% along the tributary and this degree of visibility often extended more than 20 metres back from the tributary (see Plate 8). It was felt that if sites were to exist in the area that they would most likely be found in association with the tributary system. It was also felt that the proximity of this tributary system to the proposed development area may mean that it could be damaged during the construction of the rendering plant and any water retention dams that may have to be built to retain run-off from the site.

Upon inspection it was found that this tributary system appeared to have been straightened and reformed by earthmoving equipment in the past. The length of the tributary system surveyed was approximately 300 metres. Within this the tributary varied from a single channel approximately 10 metres wide to a braided channel up to 50 metres wide. The O horizon was missing from the majority of the area surveyed. In many places the A horizon was also missing and the B Horizon was visible at the surface. It is probable that this tributary system periodically carries large volumes of water originating from the large expanses of sealed tarmac at the Tamworth airport. These flows it appears have in the past, broken the banks of two dams to the east of the survey area and scoured the banks of the tributary removing the O and A horizon. As could be expected, no artefacts were located along this tributary system and it is suggested that even if they had existed in this area in the past, that they would have been washed away along with the O and A horizons.

5.4 Results of the Survey

Two isolated Aboriginal stone artefacts were located during the survey of "Oakburn". As it is a National Parks and Wildlife Service directive that each isolated stone artefact be

classified as an Aboriginal site if it is at a distance greater than 50 metres from any other Aboriginal artefact, the two artefacts were recorded as separate sites, which were named "Oakburn 1" and "Oakburn 2".

The homestead foundations suggest that the original house was probably reasonably small but had been substantially added to over the years (the original foundation was brick but later additions were concrete footings). As the area was first taken up by settlers in 1909, the homestead could not have been any older than this. The nature of the concrete footings suggest that most of the house was much younger than a 1909 vintage (see Plate 12 and Figure 3). The question of whether or not the house was of historic significance is no longer relevant as it has already been destroyed and the rubble removed from the site.

The sheds and yards are typical of those built post 1920 and are all now in a derelict state. Constructions of a similar nature and in better condition are common on other farms in the district and therefore, these appear not to have any historic significance.

5.4.1 Discussion

It was obvious that most of the native trees had been cleared from the proposed development area. This would appear to indicate that the area was cleared for cultivation. The groundcover species present were those generally associated with disturbed ground and this would also suggest that the area has been subject to cultivation in the past. Other indications of cultivation were the large piles of andesitic greywacke scree around many of the trees, plough damage on rocks left in the paddocks, the soil heaped up along the fencelines, erosion initiated by the method of ploughing the paddock and a cutting point from an old mould board plough. In light of all this evidence it is fairly obvious that the soil has been disturbed at least to the base of the plough zone (approximately 15-30 cms below the surface).

All of the above indicates that any artefacts located during the survey will have been subject to some degree of vertical and horizontal movement from cultivation. This means that both spatial (across the ground surface) and temporal (within the soil profile) patterning has been disrupted. Observations by the authors have shown that during cultivation the horizontal movement of artefacts is limited and though the original pattern of discard will be disturbed, the actual area of discard can still be defined to within a few metres. Unfortunately the vertical movement of the artefacts when subject to cultivation means that it is no longer possible to know if subsurface artefacts have any greater antiquity than surface artefacts and vice-versa. Therefore, it is not possible to know if there are more artefacts below the surface or to suggest any age for those artefacts which were discovered during the survey. The type and degree of weathering of the artefacts does, however, suggest that they have spent some time buried beneath the surface before being returned to the surface by cultivation.

6 Site Recording

6.1 Site Details "Oakburn 1'

Map Reference: Tamworth 1:25000 9035-I-N Second Edition
Grid Reference: E293800 N6560750 Site Type: single artefact
Artefact type : broken retouched flake Raw Material(s): quartzite or silcrete
Landform: gentle slope Resource Zone: Open grassland (old cultivation)
Local Outcrop(s): andesitic greywacke Visibility: 100%
Present Land Use: grazing Geomorphic Processes: erosion
Past Land Use: farming and grazing Nearest permanent water: 625 m Boltons Creek

Comments:
The artefact is the proximal end of a broken retouched flake. The surface of this artefact is quite patinated making identification of the raw material extremely difficult. The raw material is extremely fine grained and creamy white in colour. Under magnification, the raw material appears to be a either a fine grained quartzite or a silcrete. Both of these raw materials are very rare in sites in the Tamworth District. Residues were observed on both the ventral and dorsal surfaces of the artefact.

Technical Details :(a glossary of technical terms has been attached as Appendix 1)
length - 16mm, width - 16 mm, thickness - 6 mm.
Retouched on the left lateral margin. Retouch initiated from the ventral surface. Possible use-wear on the right lateral margin. Platform has three flake scars on its surface indicating the core from which the flake was removed had been rotated. The flake termination is missing due to a transverse snap. There is no cortex remaining on the artefact.

6.2 Site Details "Oakburn 2'

Map Reference: Tamworth 1:25000 9035-I-N Second Edition
Grid Reference:E294200 N6560450 Site Type: isolated artefact
Artefact type(s): axe/axe blank Raw Material(s): andesitic greywacke
Landform: gentle slope Local Outcrop(s): andesitic greywacke
Resource Zone: Open grassland Visibility: 20%
Geomorphic Processes: cultivation Present Land Use: grazing
Past Land Use: farming and grazing Nearest permanent water:1000m Boltons Creek

Comments:
This artefact was highly patinated and extremely weathered with magnesium staining (indicating a lengthy time in contact with the soil). The degree of weathering of the artefact's surface made it impossible to discern if it had ever been used as an axe or if it had been lost or discarded prior to being used. It had never been edge-ground. The axe/blank had been bifacially flaked and was manufactured from a large flake of andesitic greywacke. The poll of the artefact exhibited some evidence of plough damage. The source of the raw material for this axe was not the "Daruka" quarry at Moore creek, and it is more likely to have been

sourced from a smaller quarry such as the "Peel River 5" quarry. Thin section analysis of the artefact will be able to prove if this is the case, providing the artefact is not too weathered. A new method of thin sectioning is now available which removes only a very thin (pencil lead thickness) core from the artefact. The end of the core is then glued back into the artefact so that the thin sectioning is no longer visible.

Technical details of this artefact were :
length - 76 mm, width - 69 mm, thickness - 30 mm.
The width of cutting edge was 61 mms and the width of the poll was also 61 mms. There was no cortex remaining on the artefact.

7 Discussion

7.1 "Oakburn 1"

After consultation with Mr Allan Kelly (Tamworth Local Aboriginal Land Council) it was decided that as the raw material used in the manufacture of the broken retouched flake was rare in the Tamworth region and could be instrumental in helping to trace past movements of Aboriginal people across the landscape, that the artefact should be collected for further analysis (including residue analysis)and then ultimately housed in the Tamworth Local Aboriginal Land Council Keeping Place. As construction of this "Keeping Place" has not yet begun, the artefact would be stored in an area already set aside as a temporary Keeping Place for the Tamworth Local Aboriginal Land Council, at the Department of Archaeology and Palaeoanthropology, UNE, Armidale, until such time as the Tamworth Local Aboriginal Land Council Keeping Place is finished.

7.2 "Oakburn 2"

After consultation with Mr Allan Kelly (Tamworth Local Aboriginal Land Council) it was decided that as this axe/blank could be instrumental in helping to trace past movements of Aboriginal people across the landscape, that the artefact should be collected for further analysis and then ultimately housed in the Tamworth Local Aboriginal Land Council Keeping Place. As construction of this "Keeping Place" has not yet begun, the artefact would be stored in an area already set aside as a temporary Keeping Place for the Tamworth Local Aboriginal Land Council, at the Department of Archaeology and Palaeoanthropology, UNE, Armidale, until such time as the Tamworth Local Aboriginal Land Council Keeping Place is finished.

8 Significance

8.1 Aboriginal Significance

Discussions with Mr. Allan Kelly (to be ratified at the next Tamworth Local Aboriginal Land Council meeting) during the "Oakburn" survey led us to conclude that the two artefacts located during the survey do not have any great Aboriginal significance which could have been derived from their association with any known Aboriginal sites in the area, nor do they constitute sites which could be used for teaching purposes within the Aboriginal community

and therefore, gain Aboriginal significance in this regard. However, both artefacts could be used as teaching tools within the context of the regional perspective which will be a feature of the displays in the Tamworth Aboriginal Land Council Keeping Place and as such, do have sufficient Aboriginal significance to warrant their collection prior to any development going ahead on the property "Oakburn".

8.2 Archaeological Significance

Both of the Aboriginal stone artefacts located during the survey have archaeological significance which is derived from a number of factors. To begin with, the archaeological resource of the area surrounding "Oakburn" is so poorly known, due to an almost total lack of research in the area, that it is not possible to state with any confidence what proportion of the archaeological record that these artefacts may represent. We suspect that they are just a minute sample of what exists on other private properties in the area, but at present these artefacts constitute 18%, or two from a total of 11 artefacts known from the area (nine from the survey of Lovell-Jones 1996). Secondly, both the andesitic greywacke axe and the quartzite/silcrete broken retouched flake may add valuable information to the archaeological record in regard to the movement of people and/or raw materials across the landscape. The flake also has some residues on its surface which may be able to provide information in relation to what the flake was used for and by extrapolation what Aboriginal people were doing when they were in the area now known as the "Oakburn" property. By collecting and analysing these artefacts it may be possible to add significantly to the present archaeological knowledge of the Tamworth Region.

8.3 Educational Significance

When eventually added to the collection displayed at the "Tamworth Local Aboriginal Land Council Keeping Place", the artefacts will add to the store of knowledge on the Aboriginal prehistory of the whole of the Tamworth Region. This kind of information will not only provide a means of teaching future generations of Aboriginal children, it is also of great interest to the general public and helps nurture a greater understanding between the Aboriginal and non-Aboriginal community.

8.4. Historic Significance

The sheds and yards recorded during the survey are in a state of disrepair and typical of many old constructions found on farms around the region. As such they are seen to have low historic significance.

9 Recommendations

It is the recommendation of the authors that there is no archaeological reason that the development proposed by Baiada Pty Ltd on the property "Oakburn" should not be allowed to proceed, providing the following conditions are met by the developer:

1) that no works proceed on the proposed development area until the two artefacts located during the survey are collected for analysis and temporary storage at the Department of Archaeology and Palaeoanthropology, UNE Armidale. The artefacts collected will be returned

to the Tamworth Local Aboriginal Land Council for display within their "Keeping Place" as soon as its construction is complete. In this regard an application for a "Consent to Collect" the artefacts in the sites known as "Oakburn 1" and "Oakburn 2" must be forwarded by Baiada Pty Ltd to the National Parks and Wildlife Service for their approval;

2) that the developer agrees to meeting the cost of:

a) the artefact collection and the writing of the subsequent report required by the National Parks and Wildlife Service;

b) the cost of residue analysis on the broken retouched flake and thin section analysis of the axe/blank, should laboratory inspection under high powered magnification indicate that these forms of analyses would be successful in furthering our knowledge of past Aboriginal life ways in the Tamworth Region (this will need to take into account the nature of the residue and the degree of weathering of the axe/blank).

3) that a representative of the Tamworth Local Aboriginal Land Council be granted permission to investigate any areas disturbed by earthworks undertaken for the development so that if further artefacts are uncovered they may also be collected.

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Appendix 1

A1.1 Glossary of Geological and Technical Terms

Geological terms were adapted from The Penguin Dictionary of Geology (Whitten and Brooks 1988) and those related to artefact analyses and description from Gaynor 1987 and Wilson 1994).

adamellite: a medium to coarse grained igneous rock, occurring like granite, mainly in batholiths.

andesitic greywacke: a greywacke containing fragments of andesite derived from the erosion of an earlier volcanic sequence (see greywacke below).

aplite: a fine-grained, equigranular felsic plutonic rock occurring as dykes and sills in adamellite.

arenite: detrital sedimentary rocks in which particle size ranges from 1/16 mm to 2 mm. more commonly known as sandstone.

argillite: a sedimentary rock, commonly a siltstone or a mudstone, which has lost its ability to cleave along its bedding due to metamorphism. Argillites can have a conchoidal fracture.

axe: an artefact will be classed as an axe if it has been edge-ground to produce a cutting edge and is of a shape suitable for use as a hand held or hafted axe. An artefact will also be classed as an axe if it fulfils the above criteria except for the edge-grinding but displays identifiable use-wear.

axe blank: a piece of stone of a raw material, shape and size suitable for the manufacture of an axe that has undergone some modification other than grinding (flaking, pecking).

bifacial: bifacial flaking refers to the removal of flakes from a single edge but from two opposite directions. Axes often have bifacially flaked cutting edges.

chert: a cryptocrystalline rock which sometimes displays conchoidal fracture and may have either an organic or inorganic origin.

cherty argillite: a very fine grained sedimentary rock which has undergone silicification due to the infilling of its pore spaces by silica. Cherty argillites vary in colour but are generally grey through to a pale green.

contact metamorphism: changes brought about in rocks within the crust of the earth by heat from contact with igneous rocks.

core: a piece of isotropic material from which flakes or pieces have been struck. It may have negative bulbs of percussion or straight shear edges according to the method of reduction. It will always display at least one flake scar.

cortex: the weathered surface of the rock.

distal: in reference to a flake the distal margin is the bottom of the flake or that margin which contains the termination of the flake.

dorsal surface: the dorsal surface of a flake is the surface which once constituted the outside surface of the core (see ventral surface). It may or may not exhibit flake

scars.

equigranular: containing grains of equal size.

flake: A piece of stone detached from a larger mass by the application of force and having a feather, hinge or step termination, plus a bulb of percussion. A platform may be present if the proximal end is unbroken or uncrushed.

flake scar: a concave surface which has resulted from the removal of a flake

greywacke: a very poorly sorted sandstone which has often undergone metamorphism producing a very tough, dark coloured rock.

hornfels: a medium or fine grained equi-granular rock produced by high grade contact metamorphism of a sedimentary or igneous rock. Hornfelses are generally hard, compact, black to grey in colour and may exhibit a range of conchoidal fracture from good to poor. Fresh flakes have a dull lustre and a somewhat porous appearance. The more intractable hornfelses make excellent axe materials.

igneous: a solid crystalline or glassy rock formed by crystallisation from a magma.

intrusion: a body of magma which has forced its way up through the existing rocks.

lateral margin: the lateral margins of a flake are the two edges (right and left) of the flake which join the platform (top) of the flake and the termination (bottom) of the flake.

patinated: the term patinated or patination refers to the weathering skin which forms on the outside of the sttone artefact.

platform: the area on the proximal end of a flake where the force was applied to remove it from the core.

polymictic conglomerate: a conglomerate containing fragments of many rock types.

proximal: the proximal end of a flake is the top part of the flake or that part which contains the platform (where the flake was struck by the hammerstone to remove it from the core).

relic: Aboriginal or historic artefact.

residue: the term residue refers to the remnants of plant or animal material which remain encrusted on the surface of an artefact. Residue analysis can provide information in relation to the use of the artefact.

retouch: retouch refers to the resharpening or blunting of an artefact by the removal of small flakes.

rotation: when the angle on the edge of a core becomes greater than 90 degrees the core may be rotated and a new platform initiated or the core may be discarded and another core utilised. If that particular raw material is in short supply for any reason (distance to quarry, socio-cultural reason for restriction of access) then core rotation will be utilised to increase the use-life of the core. Core rotation can be recognised on flakes by the orientation of the various flake scars on the dorsal surface and/or platform of the flake. Core rotation is a method for the conservation of raw material.

scree: loose rock rubble.

siltstone: very fine-grained sedimentary rock formed by the deposition of silt.

termination: the termination of a flake is that part of the flake which was the last to be

detached from the core. The termination of a flake make take several forms dependant on the amount of force with which it is struck from the core, the direction of that force and the distance from the edge of the core that the hammerstone impacts. The three main termination types are the feather, step and hinge. A feather termination is one in which the flake detaches from the core with a thin sharp end or termination. A stepped termination occurs when the flake detaches from the core with a fracture plane at right angles to the core face. A hinge termination occurs when the flake detaches from the core with a rounded blunt termination.

use-wear: use-wear on an artefact refers to some indication such as, edge chattering, polish or striations which indicate that the artefact has been used to cut, grind, slice or scrape.

ventral surface: the ventral surface of the flake is the surface which was inside the core before it was detached. The ventral surface will not display flake scars unless it has been retouched after being removed from the core. The ventral surface will often, but not always (depending on raw material type), display a rounded protruberance below the platform commonly known as a bulb of percussion or bulb of force.

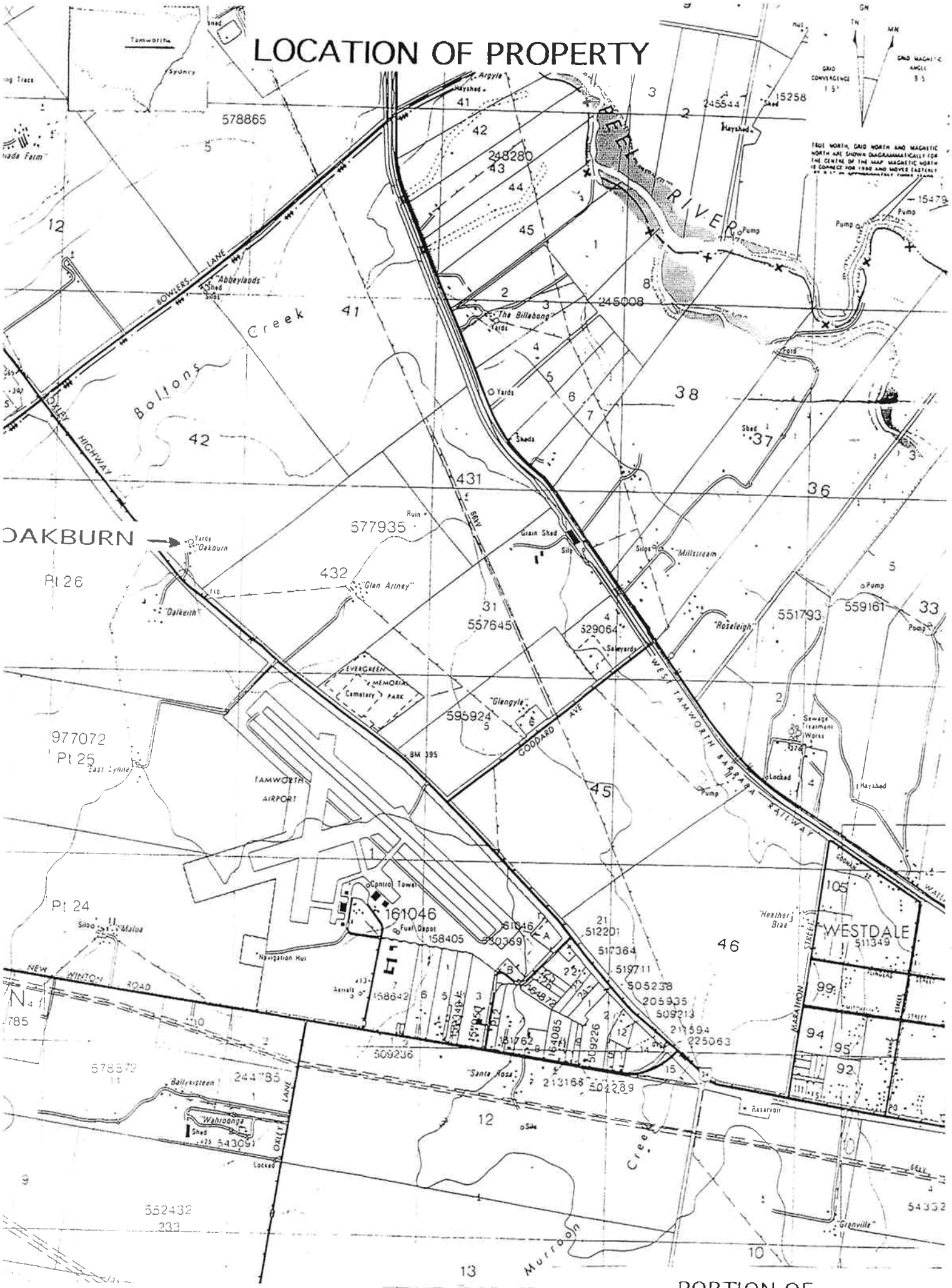

FIGURE 2

PORTION OF

SCALE 1:25 000

CONTOUR INTERVAL 10 METRES

LOCATION OF SURVEY AREA

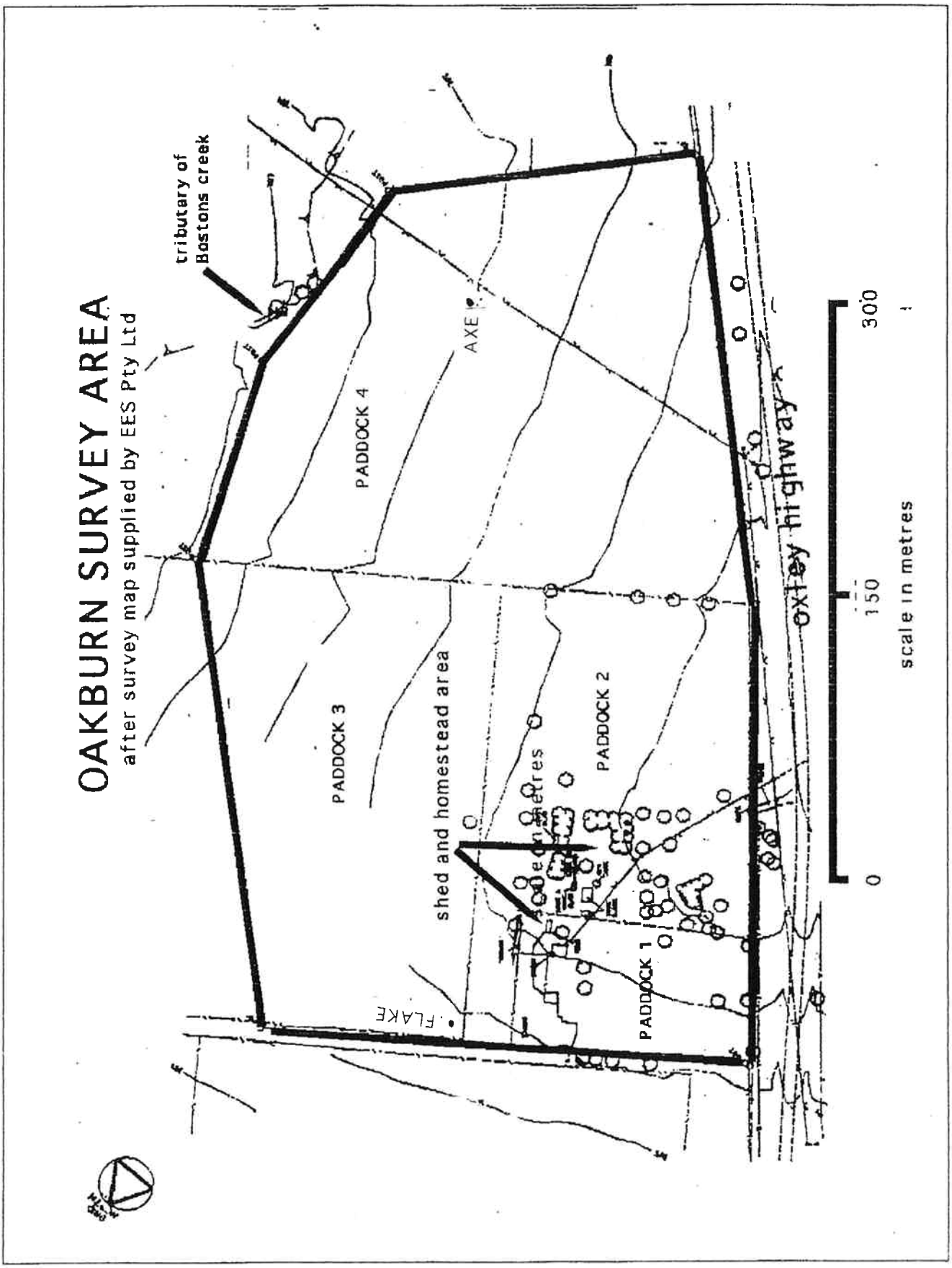

FIGURE 1

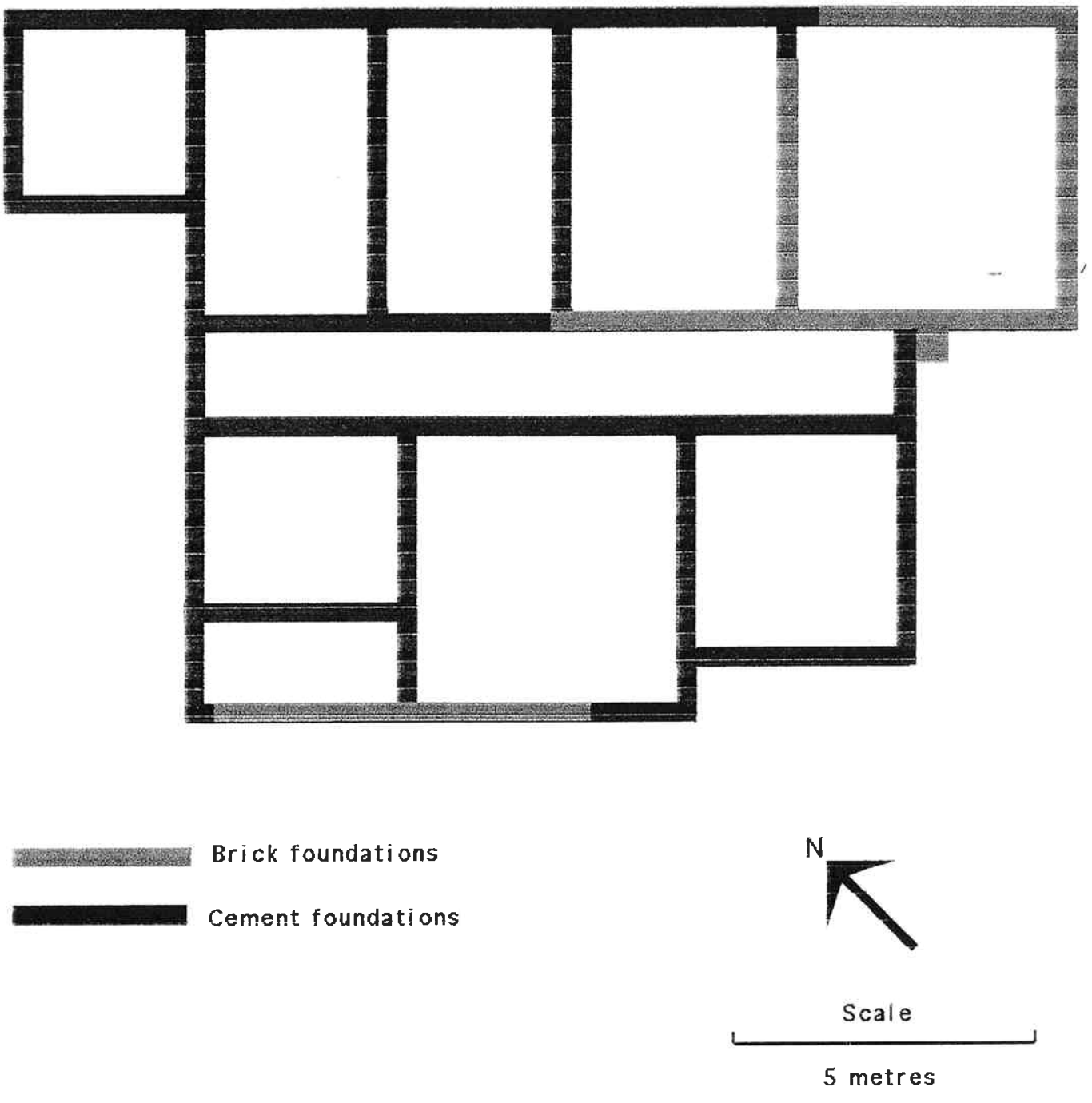

Figure 3 Plan of Former Homestead Site

Plate 1 Paddock 1 from southwest corner with sheds and yards
hills in the background are the Baldwin Formation above Tamworth

Plate 2 Paddock 1 near sheds showing green mantle of immature plants

Plate 3 Paddock 2 from southwest corner looking towards old homestead site near tank

Plate 4 Paddock 2 from southeast corner showing visibility on open grassland

Plate 5 Paddock 3 from northwest corner showing laneway on western boundary with 100% visibility

Plate 6 Paddock 3 from southeast corner showing visibility in open grassland

Plate 7 Paddock 4 from southwest corner showing depression down corner from past erosion of cultivation. Visibility here is typical of this paddock with bare patches (on right), mantle of green immature plants and patches of dead grasses

Plate 8 Scoured banks of the tributary of Boltons creek running across paddock 4 but to the north of the survey area

Plate 9 Broken quartzite flake found in paddock 3

Plate 10 Greywacke axe found in paddock 4

Plate 11 Derelict sheds

Plate 12 Homestead foundations