

Appendix 10

Ardmore Park Quarry – Modification 3

Aboriginal Cultural Heritage Field Inspection

prepared by

OzArk Environment & Heritage
Management Pty Ltd

(Total No. of pages including blank pages = 30)

August 2018

This page has intentionally been left blank



View from the proposed extraction area extension towards the existing operations.

ABORIGINAL CULTURAL HERITAGE FIELD INSPECTION

ARDMORE PARK QUARRY

LOT 24 DP1001312

GOULBURN MULWAREE LOCAL GOVERNMENT AREA

AUGUST 2018

Report Prepared by

OzArk Environmental & Heritage Management Pty Ltd

for RW Corkery and Co Pty Limited

on behalf of Multiquip Quarries Pty Limited



**Environmental and
Heritage Management P/L**

OzArk EHM

145 Wingewarra St
(PO Box 2069)
Dubbo NSW 2830

Phone: (02) 6882 0118

Fax: (02) 6882 0630

enquiry@ozarkehm.com.au

www.ozarkehm.com.au

This page has intentionally been left blank.

DOCUMENT CONTROLS

Applicant	Multiquip Quarries Pty Limited		
Client	RW Corkery and Co Pty Limited		
Project No / Purchase Order No			
Document Description	Aboriginal Cultural Heritage Field Inspection. Ardmore Park Quarry. Lot 24 DP1001312		
	Name	Signed	Date
Clients Reviewing Officer			
Clients Representative Managing this Document	OzArk Person(s) Managing this Document		
Location	OzArk Job No.		
Document Status V3.0 FINAL	Date 10 August 2018		
Draft V1.1 Author to Editor OzArk 1 st Internal (Series V1._ = OzArk internal edits)	V1.0: BC author. 30/5/18		
Draft V2.0 Report Draft for release to client (Series V2._ = OzArk and Client edits)	V2.0 BC incorporates client comments 7/6/18 V2.1 SR incorporates further edits 26/6/18 V2.2 BC checks 28/6/18		
FINAL V3._once latest version of draft approved by client	V3.0 BC finalises 10/8/18		
Prepared For	Prepared By		
Alex Irwin Senior Environmental Consultant RW Corkery & Co Pty Limited	Ben Churcher Principal Archaeologist OzArk Environmental & Heritage Management Pty. Limited 145 Wingewarra Street (PO Box 2069) Dubbo NSW 2830 P: 02 6882 0118 F: 02 6882 6030 ben @ozarkeh.com.au		

COPYRIGHT

© OzArk Environmental & Heritage Management Pty Ltd 2018

and © Multiquip Quarries Pty Limited 2018

All intellectual property and copyright reserved.

Apart from any fair dealing for the purpose of private study, research, criticism or review, as permitted under the Copyright Act, 1968, no part of this report may be reproduced, transmitted, stored in a retrieval system or adapted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without written permission.

Enquiries should be addressed to OzArk Environmental & Heritage Management Pty Ltd.

This page has intentionally been left blank.

EXECUTIVE SUMMARY

CEAL, trading as Multiquip Quarries, recently lodged an application to modify operations at the Ardmore Park Quarry. A component of the proposed modification was a 3.5 hectare (ha) extension of the extraction area to better align the extraction area with local topography.

In reviewing the Environmental Assessment associated with this application, the Office of Environment and Heritage (OEH) requested that a qualified archaeological consultant review the Aboriginal heritage assessment. This is to justify the assertion in the Environmental Assessment that the proposed extraction area extension is situated in an area of low archaeological potential, but which was not supported by an archaeological survey report / investigation. A site inspection and assessment of the landform to be affected was completed to satisfy this request.

In addition, the site visit included an inspection of suitable landforms in which to undertake archaeological test excavation as per *Section 4.5* of the *Ardmore Park Quarry, Aboriginal Heritage Management Plan* (AHMP) (Kayandel Archaeological Services 2010). *Section 4.5* of the AHMP provides for the identification of the areas of best preservation within the landforms identified as having higher archaeological potential (as identified as Zone 1 Sandy Deposits in the report: *Cultural Heritage Management Australia. Modified Ardmore Park Quarry Project. Cultural Heritage Assessment* [CHMA 2008]) and implementation of an excavation methodology to:

- determine the presence or absence and extents of archaeological materials;
- confirm the depth of the potential archaeological deposits (if present); and
- determine the nature and significance of any archaeological deposits.

On 26 April 2018 OzArk Principal Archaeologist undertook a site inspection of both the proposed extraction area extension and landforms within Zone 1.

As a result of this inspection, the following conclusions were reached:

- The proposed extraction area extension is within landforms with a low archaeological potential due to:
 - The study area occupies a broad hill that is not unique in the landscape. As such, there is no reason to suspect that the hill within the study area was utilised as a lookout or vantage point any more than any other of the surrounding hills;
 - The soils of the study area appear to be rocky and skeletal which suggest shallow soil depths precluding subsurface archaeological deposits;
 - 0.85ha, or 19% of the total study area has been substantially modified by earthmoving activities which preclude the retention of intact archaeological deposits;

MULTIQUIP QUARRIES

*Ardmore Park Quarry
Appendix 10*

RESPONSE TO SUBMISSIONS

*PA 07_0155 MOD3
Report No. 625/25*

- The study area has been visually inspected twice prior to any disturbance without sites being recorded: once by CHMA in 2008 and secondly by OzArk in 2018.
- Two potential excavation locations in Zone 1 were identified and a preliminary excavation methodology established (see **Section 3**)

CONTENTS

Executive Summary..... iii

1 Introduction..... 1

 1.1 Brief description of the project 1

 1.2 Background 1

 1.3 Study area..... 3

 1.3.1 Proposed extraction area extension study area 3

 1.3.2 Zone 1 study area 6

 1.4 OzArk Involvement 7

 1.4.1 Field Assessment 7

 1.4.2 Reporting..... 7

2 Visual Inspection 8

 2.1 2008 survey..... 8

 2.2 2018 inspection 8

 2.2.1 Proposed extraction area extension study area 8

 2.2.2 Zone 1 study area 11

3 Inspection of excavation locations 13

4 Management of New Discoveries 19

FIGURES

Figure 1-1: Aerial showing the location of the study area.	2
Figure 1-2: Survey transects from the 2008 assessment (CHMA 2008: Figure D).....	4
Figure 1-3: Aerial showing the proposed extraction area extension study area.	5
Figure 1-4: Topography of the proposed extraction area extension study area.	5
Figure 1-5: Disturbances within the proposed extraction area extension study area.	6
Figure 1-6: Topography of the Zone 1 study area.	6
Figure 2-1: Survey track from the 2018 site inspection.....	10
Figure 2-2: Archaeological potential zones as demarcated in CHMA 2008.	11
Figure 3-1: Aerial showing Zone 1 (Sandy Deposits) and the proposed excavation locations. .	15
Figure 3-2: View southwest over Zone 1 with the proposed excavation areas indicated.....	16
Figure 3-3: Proposed excavation locations.....	17

1 INTRODUCTION

1.1 BRIEF DESCRIPTION OF THE PROJECT

OzArk Environmental & Heritage Management Pty Ltd (OzArk) has been engaged by RW Corkery and Co Pty Limited on behalf of CEAL, trading as Multiquip Quarries (the Applicant), to undertake a visual inspection of an area known as the proposed extraction area extension at the Ardmore Park Quarry within Lot 24 DP1001312 (the study area). This site inspection is to confirm a previous archaeological assessment that this area has low archaeological potential.

In addition, the site visit included an inspection of suitable landforms in which to undertake archaeological test excavation as per *Section 4.5* of the *Ardmore Park Quarry, Aboriginal Heritage Management Plan* (AHMP) (Kayandel Archaeological Services 2010). *Section 4.5* of the AHMP provides for the identification of the areas of best preservation within the landforms identified as having higher archaeological potential (as identified as Zone 1 Sandy Deposits in the report: Cultural Heritage Management Australia. *Modified Ardmore Park Quarry Project. Cultural Heritage Assessment* [CHMA 2008]) and implementation of an excavation methodology to:

- determine the presence or absence and extents of archaeological materials;
- confirm the depth of the potential archaeological deposits (if present); and
- determine the nature and significance of any archaeological deposits.

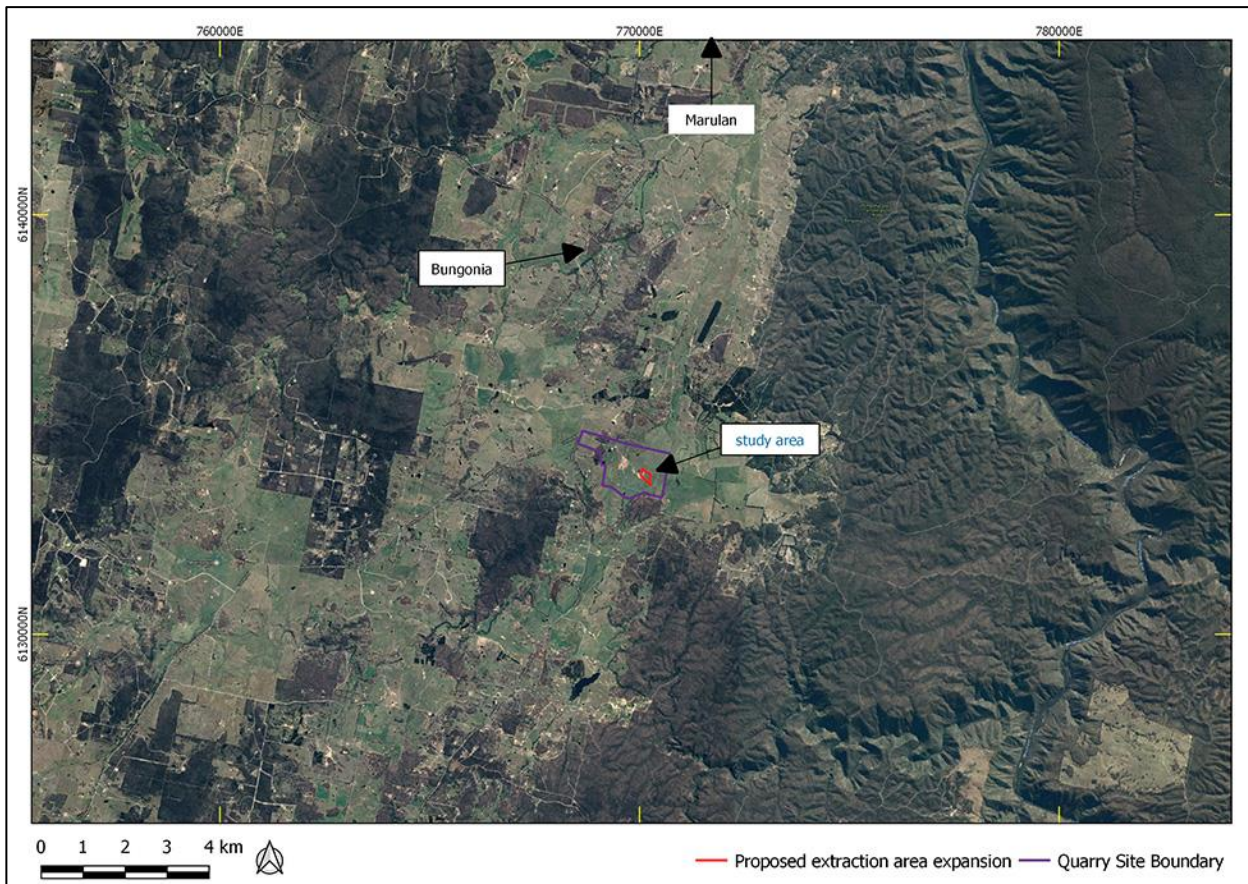
While test excavation was also recommended at Bungonia PAD 1 in the AHMP, this did not form part of the terms of reference for this inspection.

Ardmore Park Quarry is located north of Oallen Ford Road, four kilometres (km) south of the village of Bungonia and 25km southeast of Goulburn in the southern tablelands of New South Wales. The location of the study area is shown on **Figure1-1**.

1.2 BACKGROUND

The Applicant currently operates the Ardmore Park Quarry under Project Approval (PA) 07_0155 issued by the Minister for Planning on 20 September 2009. Since approval was issued, operations at the Quarry have been largely limited to site establishment works and production of materials to support construction works associated with local road upgrades. As the Applicant approaches completion of these construction works, and with the benefit of experience gained through this process, various improvements and modifications to Quarry operations have been identified. The Applicant subsequently lodged an application to modify PA 07_0155 to incorporate these modifications, which included a proposed 3.5 hectare (ha) extension to the extraction area over an area previously included in an archaeological investigation of the Quarry Site and identified as having low archaeological potential (CHMA 2008).

Figure 1-1: Aerial showing the location of the study area.



In reviewing the Environmental Assessment associated with this application, the Office of Environment and Heritage (OEH) has requested that a qualified archaeological consultant review the Aboriginal heritage assessment. This is based on the assertion in the Environmental Assessment that the proposed extraction area extension is situated in an area of low archaeological potential, but which was not supported by an archaeological survey.

The assertion of low archaeological values for the proposed extraction area extension is made in CHMA 2008: 7-36, 7-37 where the area is mapped as 'Zone 2' (waterless terrain). Zone 2 is described as:

Zone 2 Waterless Terrain with Skeletal Soils: Archaeological Potential – Low. This zone may contain small artefact scatters in localised areas and a thin veneer of isolated artefacts. It is unlikely that large sites will be evident or that any sub-surface deposits will be encountered in the thin soils.

CHMA 2008: 7-37.

In connection to the assessment of low archaeological potential, OEH state:

The report states that the proposed extraction area extension has been redesigned to occur in a zone of low archaeological potential and is unlikely to impact on Aboriginal

cultural heritage values. However this statement is not supported by an archaeological survey or investigation. It is therefore not possible to determine its validity.

DOC18/23232-10 MP 07 _0155 MOD 3

However, in *Figure D* of CHMA 2008 (CHMA 2008: 7-26), survey transects are shown to cross the area where the proposed extraction area extension is located (**Figure 1-2** shows the proposed extraction area extension approximately marked by a red ellipse). As such, the CHMA statement of low archaeological potential was backed up by an 'archaeological survey or investigation'.

Notwithstanding the previous assessment, the Applicant applied the precautionary principle and engaged OzArk to inspect the proposed extraction area extension to determine whether the assessment of low archaeological values was valid.

1.3 STUDY AREA

1.3.1 Proposed extraction area extension study area

The study area here refers to the landforms within the proposed extraction area extension (**Figure 1-3**). This is an area of approximately 3.5ha.

The study area occupies a broad hill-top that has been completely cleared of standing timber and currently supports a thick cover of grass and weed species (**Figure 1-4**).

The hill-top in which the study area is located is not a remarkable feature within the broader landscape and is just one of many hills in the undulating landscape.

The underlying geology of the study area consists primarily of basalt and basalt cobbles were noted within the soil across the study area.

While the study area overlooks valleys in which ephemeral waterways are located, there is no waterways in close proximity to the study area.

In the south-western portion of the study area there has been prior disturbance from earthworks and large piles of soil are located within the study area (**Figure 1-5**). The earthmoving disturbances in the southwest of the study area can be seen in the aerial shown on **Figure 1-3**. Elsewhere, disturbances are limited to vegetation clearing and the use of the area over a long period of time for grazing.

Figure 1-2: Survey transects from the 2008 assessment (CHMA 2008: Figure D).

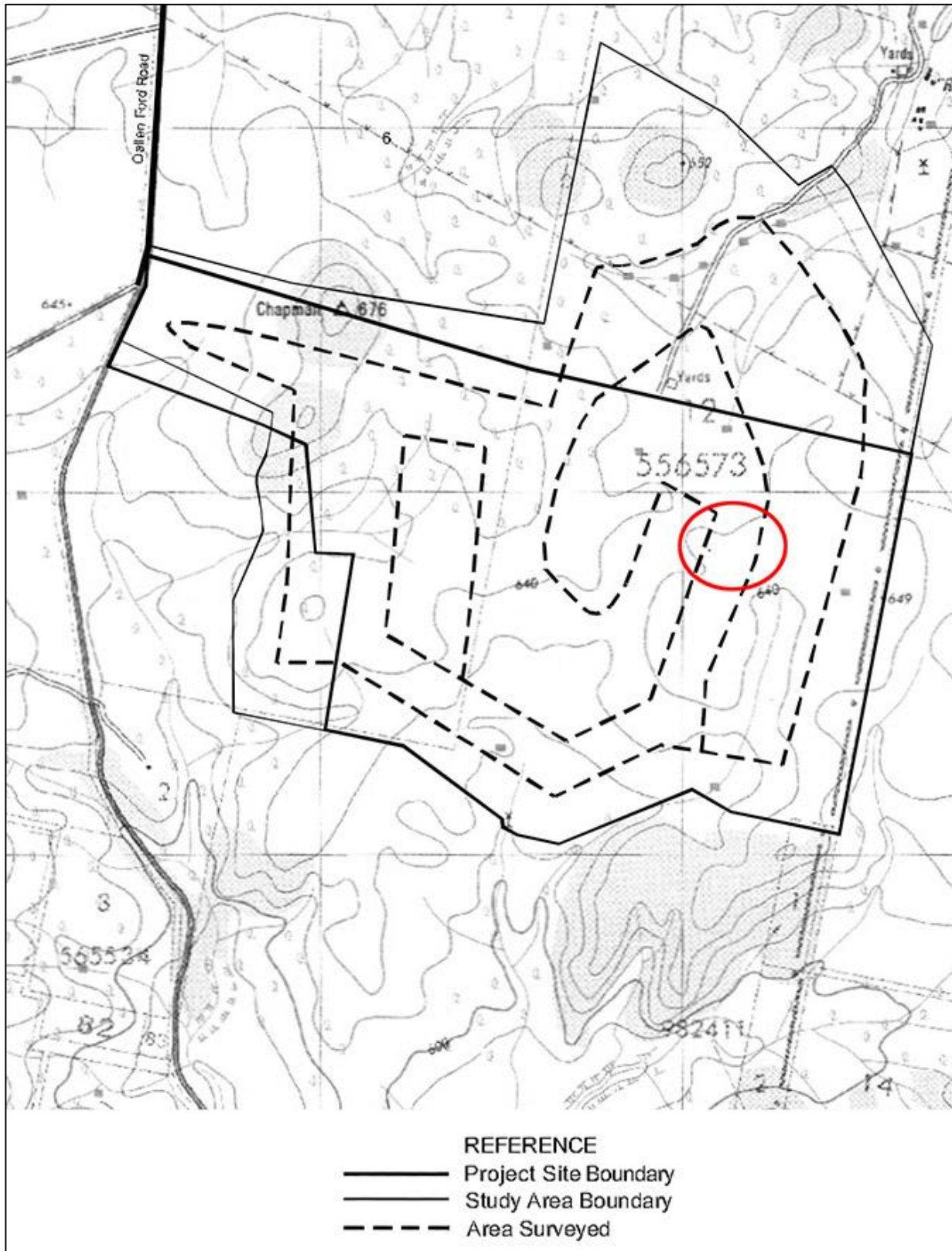


Figure 1-3: Aerial showing the proposed extraction area extension study area.

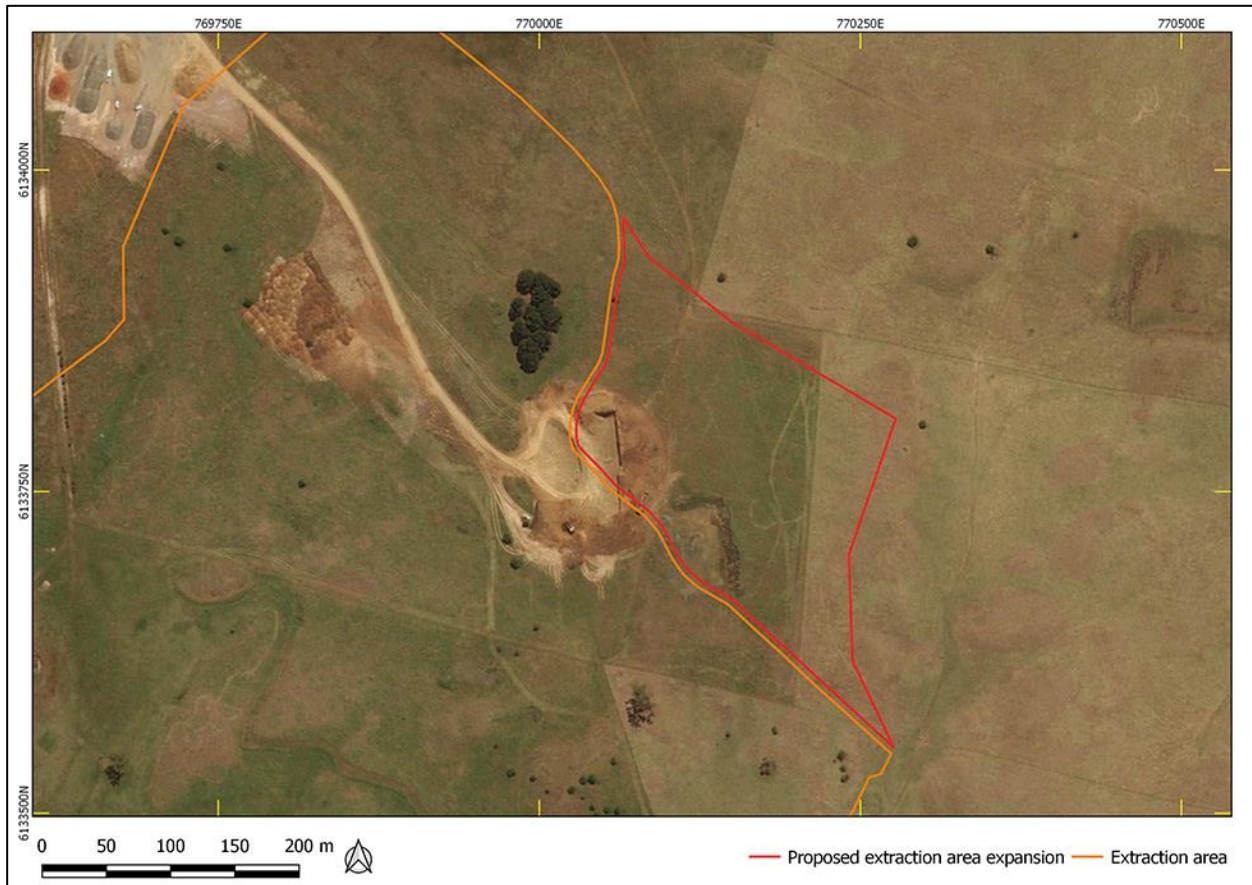


Figure 1-4: Topography of the proposed extraction area extension study area.

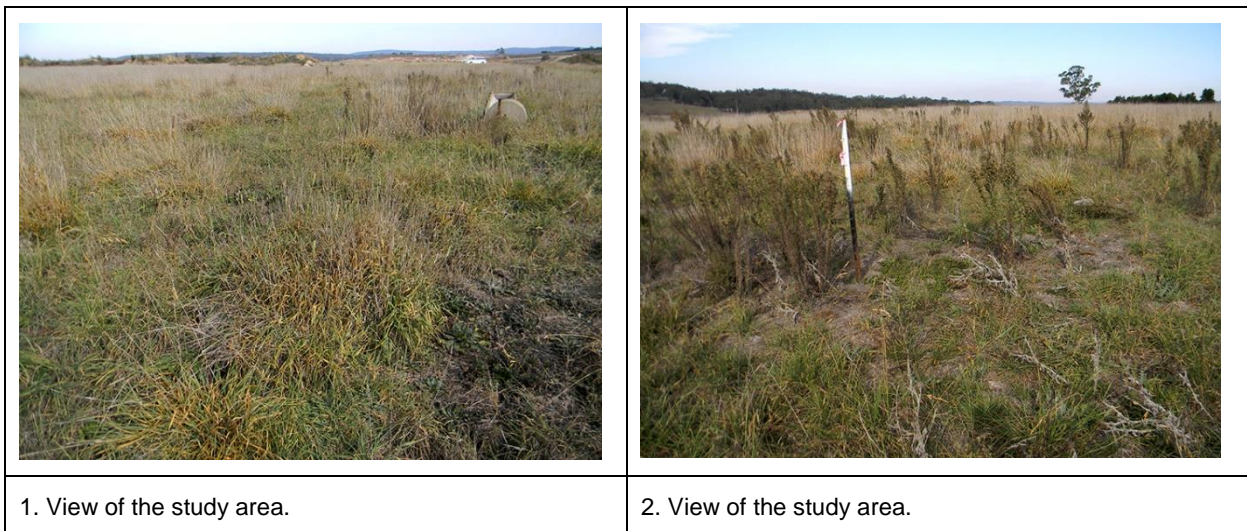
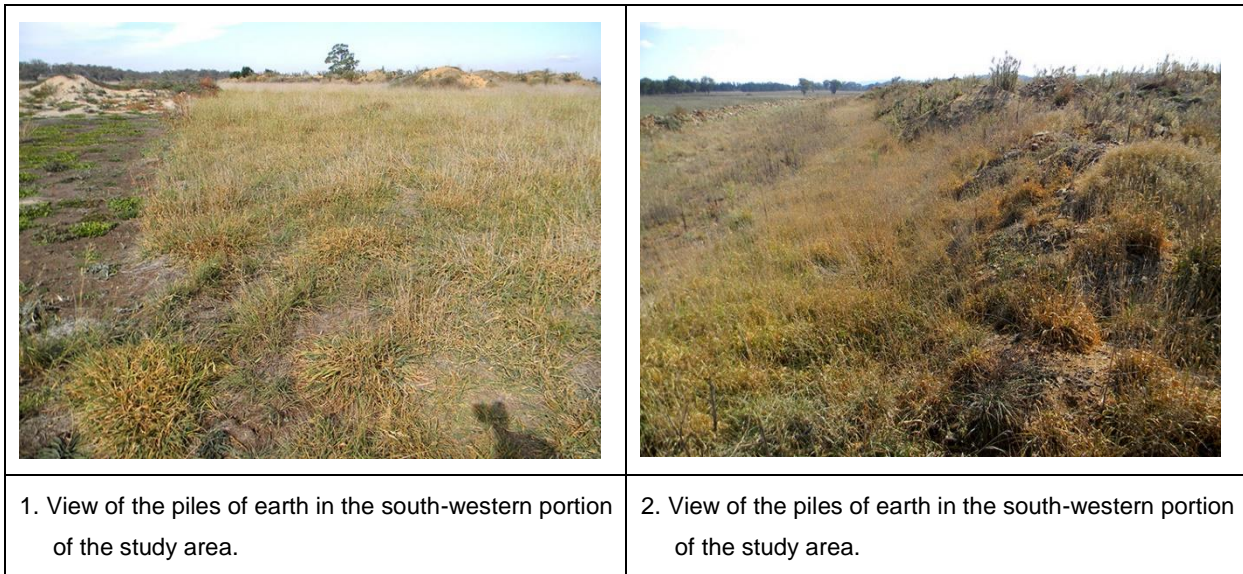


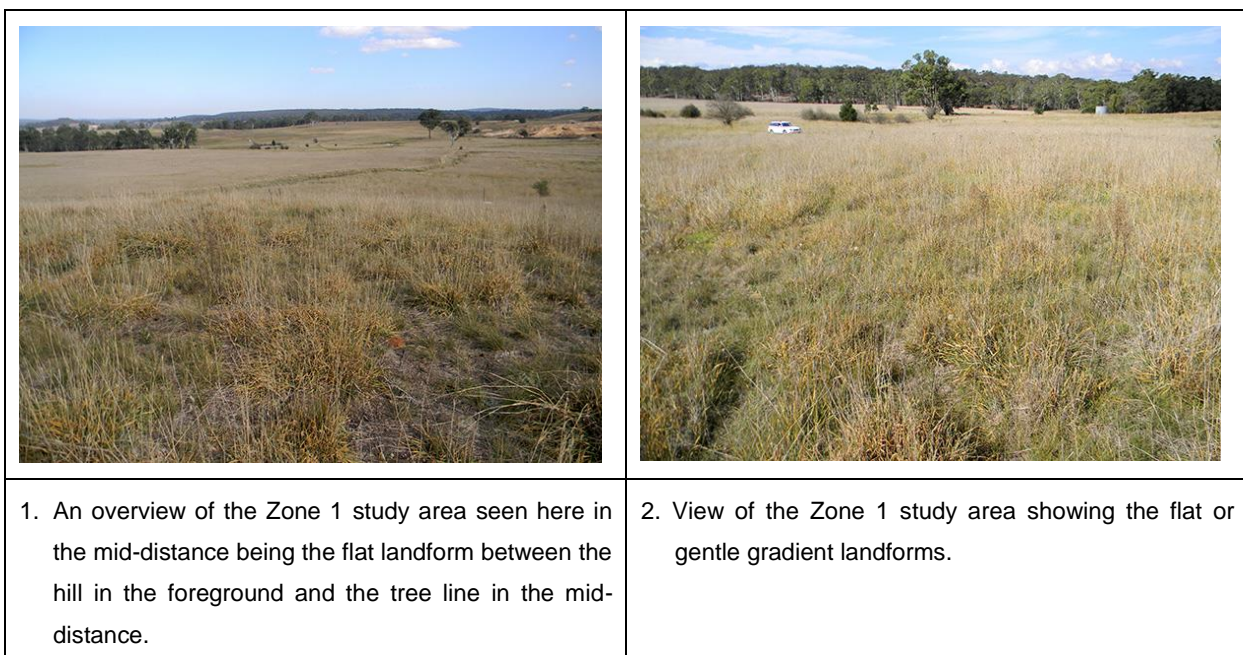
Figure 1-5: Disturbances within the proposed extraction area extension study area.



1.3.2 Zone 1 study area

Zone 1 consists of a large area of flat land bordering an ephemeral waterway that is located adjacent to the extraction area to the southeast (**Figure 1-6**). To the west of this flat land, the topography generally rises in gentle gradients with some localised benches. Outside of the extraction area boundary some exposed sandy areas were noted, but none of these were located within the extraction area footprint.

Figure 1-6: Topography of the Zone 1 study area.



1.4 OZARK INVOLVEMENT

1.4.1 Field Assessment

The fieldwork component of the heritage assessment was undertaken by:

- Fieldwork Director: Ben Churcher (OzArk Principal Archaeologist; BA[Hons], Dip Ed).

The fieldwork took place on 26 April 2018.

1.4.2 Reporting

The reporting component of the heritage assessment was undertaken by:

- Report Author: Ben Churcher.

2 VISUAL INSPECTION

2.1 2008 SURVEY

The CHMA 2008 survey recorded six Aboriginal archaeological sites and one potential archaeological deposit (PAD). The CHMA 2008 sites consist of three artefact scatters (one with a moderate artefact density), three isolated finds, and a PAD alongside Bungonia Creek. The seven CHMA sites are within the easement of the proposed transport route¹.

Of all the sites recorded by CHMA 2008, only one (Bungonia 3) recorded in excess of 10 artefacts. This indicates that sites in the area have the general characteristic of low artefact densities.

Three sites located within the Quarry Site had been recorded previously to the CHMA 2008 survey (ARD1 [51-6-0238], ARD2 [51-6-0239] and A2/VW1 [51-6-0122]). ARD1 and ARD2 each consist of two artefacts located on the side of a low, broad ridge overlooking a tributary of Inverary Creek. A2/VW1 is an isolated find. All sites are located further than 750 metres north of the study area.

CHMA 2008 note that approximately 5% of their Quarry Site Study Area (which includes the current study area) was inspected in some form. This was considered to be an adequate statistically significant sample given the type of survey and the project recommendations. However, despite this survey efficacy no sites were recorded in either the extraction area or the study area.

2.2 2018 INSPECTION

The results of the visual inspection of the proposed extraction area extension study area are detailed in **Section 2.2.1** and the results of the visual inspection of the Zone 1 study area are detailed in **Section 2.2.2**.

2.2.1 Proposed extraction area extension study area

The study area was inspected by OzArk Principal Archaeologist, Ben Churcher, on 26 April 2018. The survey track walked during the assessment is shown on

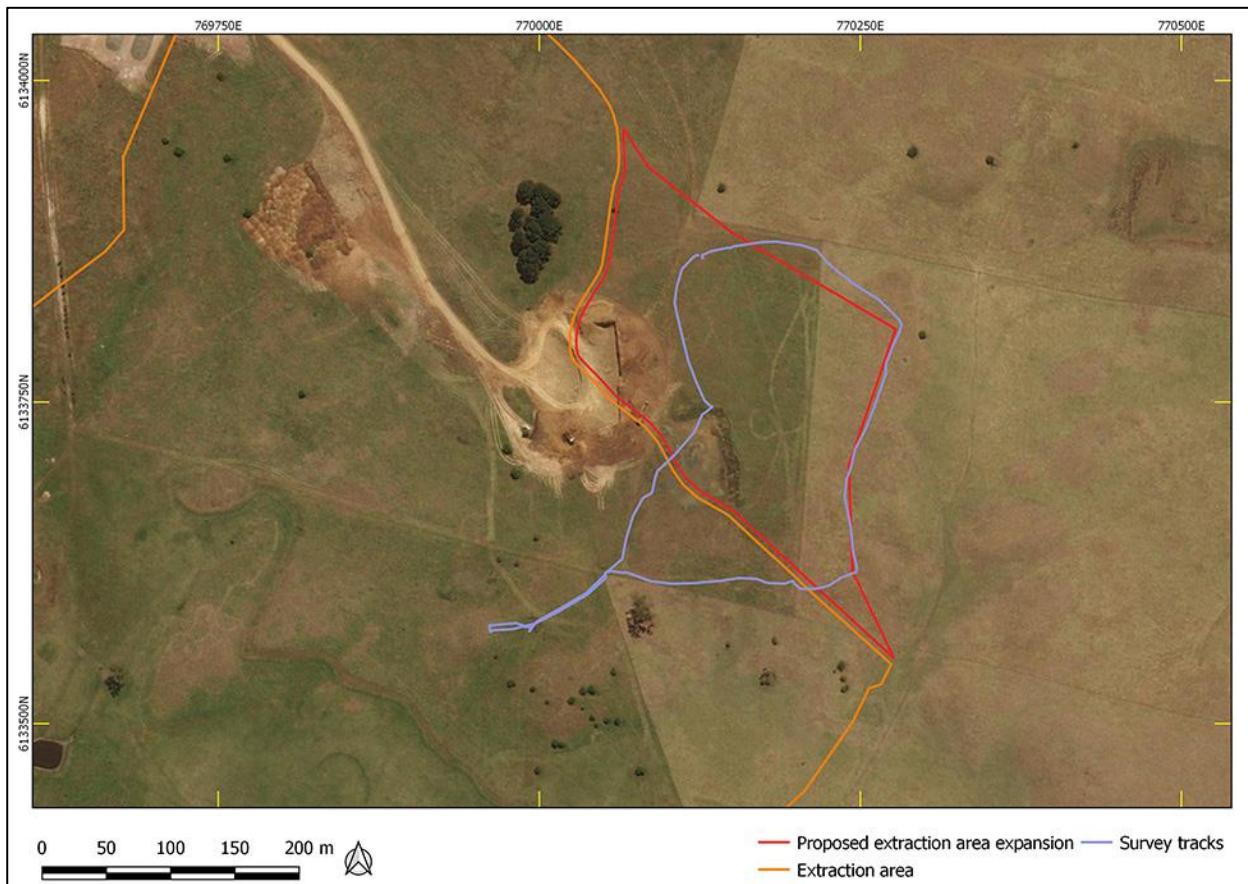
¹ None of the CHMA sites have been registered with AHIMS.

Figure 2-1.

The inspection indicated that the study area has been subject to some previous disturbances in the south-western portions that potentially would have removed or destroyed archaeological deposits had they existed.

The study area afforded very low ground surface visibility; apart from along tracks.

Figure 2-1: Survey track from the 2018 site inspection.



It was assessed that the proposed extraction area extension study area does have low archaeological potential due to the following.

- The study area occupies a broad hill that is not unique in the landscape. As such, there is no reason to suspect that the hill within the study area was utilised as a lookout or vantage point any more than any other of the surrounding hills.
- The soils of the study area appear to be rocky and skeletal which suggest shallow soil depths precluding subsurface archaeological deposits.
- 0.85 hectares, or 19% of the total study area has been the subject of earthmoving activities which preclude the retention of intact archaeological deposits;
- The study area has been visually inspected twice, prior to any disturbances or earthworks, without sites being recorded: once by CHMA in 2008 and secondly by OzArk in 2018.

Conclusion

The results of the visual inspection of the study area indicate that it is unlikely that the area contains intact Aboriginal sites or archaeological deposits.

This observation is supported by the results of the CHMA 2008 survey of the then Project Site that recorded a small number of sites within proximity to water characterised by low artefact densities.

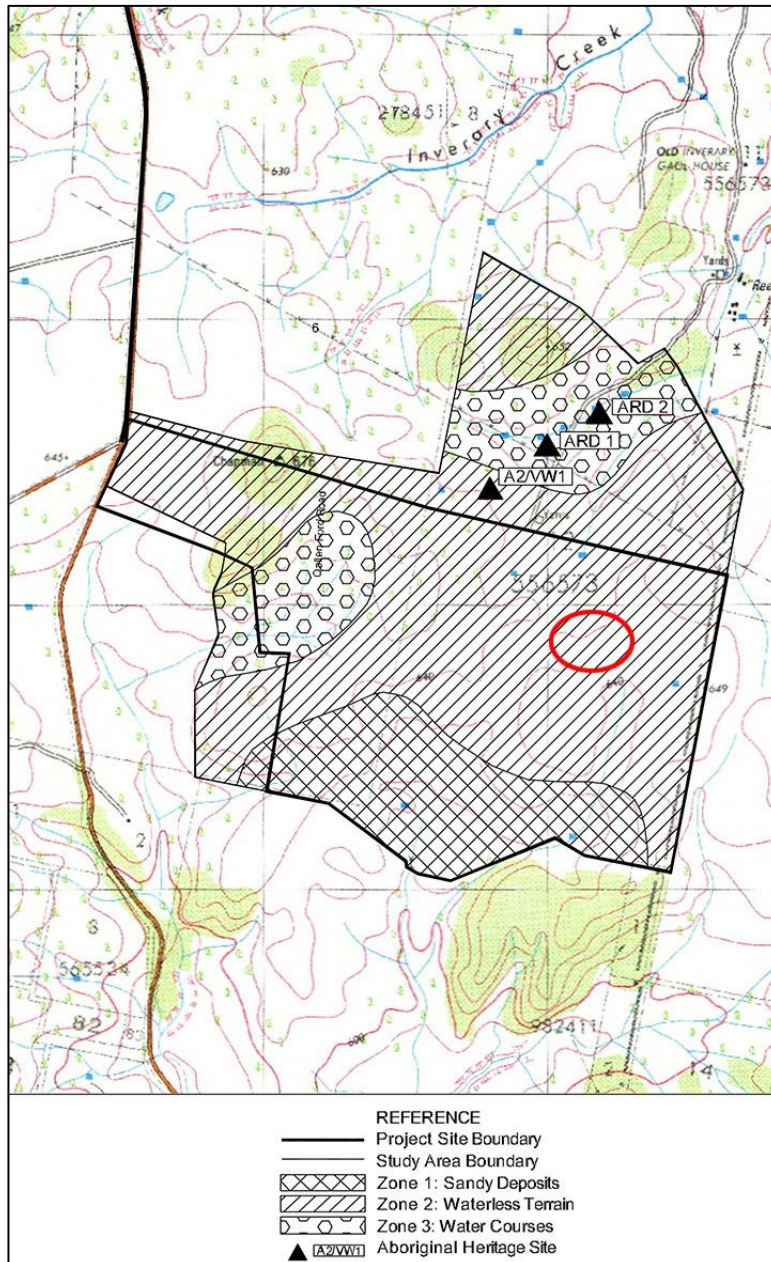
No sites were recorded in the CHMA 2008 designated Zone 2 in which the current study area is located (**Figure 2-2**; the approximate location of the study area is shown by the red ellipse). Even areas such as Zone 1, which would seem to have a higher archaeological potential when compared to Zone 2, due to its proximity to minor creeks and sandy deposits, did not yield any evidence of prior Aboriginal occupation.

This indicates that the landscape generally has a very low density of sites and/or artefacts. When this is coupled with the relatively small size of the study area, the disturbance within the study area and the distance of the study area to any form of waterway, the conclusion is that the study area has a very low likelihood of recording Aboriginal sites.

2.2.2 Zone 1 study area

The results of the visual inspection of the Zone 1 study area is detailed in **Section 3**.

Figure 2-2: Archaeological potential zones as demarcated in CHMA 2008.



3 INSPECTION OF EXCAVATION LOCATIONS

Condition 3(24) of PA 07_0155 requires the AHMP to provide a description of the manual excavation investigations that would be undertaken to determine if archaeological material of significance is present within Bungonia PAD 1 and the landforms identified as having higher archaeological potential (Zones 1 and 3).

The methodology for the excavations is set out in Section 4.5.3 of the AHMP. It should be noted that the use of the term 'test pit' in the AHMP does not equate to the test excavation protocols set out in Section 3.1 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010). To align with current terminology, rather than 'testing', the process should be termed 'limited manual excavation' that will be undertaken post-approval to ensure that archaeological deposits are appropriately managed².

The visual inspection undertaken in 2018 only inspected the landforms within Zone 1 (see **Figure 2-2**).

Regarding investigations at Zone 1, the AHMP states:

1. *CHMA (2008: 57) stated that testing should be isolated small areas of 'the sand body in the south, focusing primarily on the hill slopes'. Prior to any sub surface testing taking place a preliminary surface assessment of the south of the sand body should be conducted to ascertain precise locations for testing and to locate areas of high potential and visible disturbance within areas to be impacted by the development.*
2. *Areas identified by the surface assessment will have between 4 to 6 test pits excavated by hand (if possible) at regular 15 to 30 meter intervals in order to sample an appropriate percentage of area(s) identified.*
3. *Based upon the CHMA (2008) report and the size of the southern portion of Zone 3³ it is anticipated that the excavation of 12 to 24 test pits may be required. This estimate may be revised upon the completion of the surface inspection.*
4. *Should no stratified deposits remain, no archaeological features be identified, or should the soil be of medium to hard plasticity, then machine excavation will be used on the remaining test pits.*

CHMA 2008: 7-22 discuss the importance of the sandy deposits in Zone 1 and it is worth quoting at length:

Perhaps of most interest from an archaeological point of view, is the presence of surface sand deposits in the southern portion of the study area (the southern sand

² As the AHMP was written at the same time as the Code of Practice was published, the methodology in the AHMP refers to a pre-2010 regulatory regime rather than the one in operation today.

³ This is a typographical error in the AHMP: should read Zone 1.

resource). A cursory hand inspection of this sand revealed that it contained small water rolled gravels, typical of an alluvial river deposit. This is unusual given that much of it is located on hill tops, but also given that the sand lies under the basalt. This indicates that the sand is very, very old and would have been deposited long before humans inhabited the continent⁴. The fact that it is exposed on the hills is probably a result of the basalt cap having eroded in these locations. The author has seen similar sand deposits at nearby Butmaroo. At Butmaroo, alluvial sand containing similar river gravels is exposed on a hilltop. It has been argued elsewhere (Packard 1986, Vol. 1, Table 1) that this sand deposit is aeolian, having been blown off Lake George or Lake Bathurst. However, a close inspection of the deposits clearly show that, like the ones in the Study Area, they are alluvial in origin and were probably laid down long ago and then tectonic movements uplifted them.

Interestingly the Butmaroo sand was found to contain relatively recent archaeological deposits associated with occupation in the last 6,000 years. This seems incongruous given the probable age of the alluvial sands at Butmaroo. However, excavations at a similar sand body near Goulburn revealed that artefacts associated with Holocene deposit (approximately 5,000 years and younger) were found in alluvial sand dated by thermoluminescence dating to around 20,000 years (Site G17 – see Paton 1990). Geomorphic investigations at this site revealed that the artefacts had worked their way down into the deposit via pedogenic processes. It is possible that this also occurred at Butmaroo and a similar case may also be present in the exposed southern sand resource of the study area. If this is the case, the area may provide a valuable test case to answer questions about the cultural sequence at Butmaroo and also to help explain the nature of sites in sand deposits.

The visual inspection of Zone 1 in 2018 confirmed that there was little ground surface visibility and in discrete areas, moderate modifications from drainage works during the agricultural use of the property (dams, spillways, contour banking and other excavations).

Zone 1 consists of a large area of flat land and topography that rises in gentle gradients with some localised benches.

On a preliminary level it was thought best to archaeologically examine these two topographic zones: the flat landforms in the very south of the extraction area; and the slope and bench landforms in the south-western portion of the extraction area.

⁴ OzArk was told during the site inspection that the sand is from an ancient bed of the Shoalhaven River.

Figure 3-1 shows an aerial with the proposed excavation locations marked. The southern-most location in the flat landform has been chosen randomly as there are no distinguishing topographic features that could favour one location over another (see **Figure 3-2**, location to left).

Figure 3-1: Aerial showing Zone 1 (Sandy Deposits) and the proposed excavation locations.

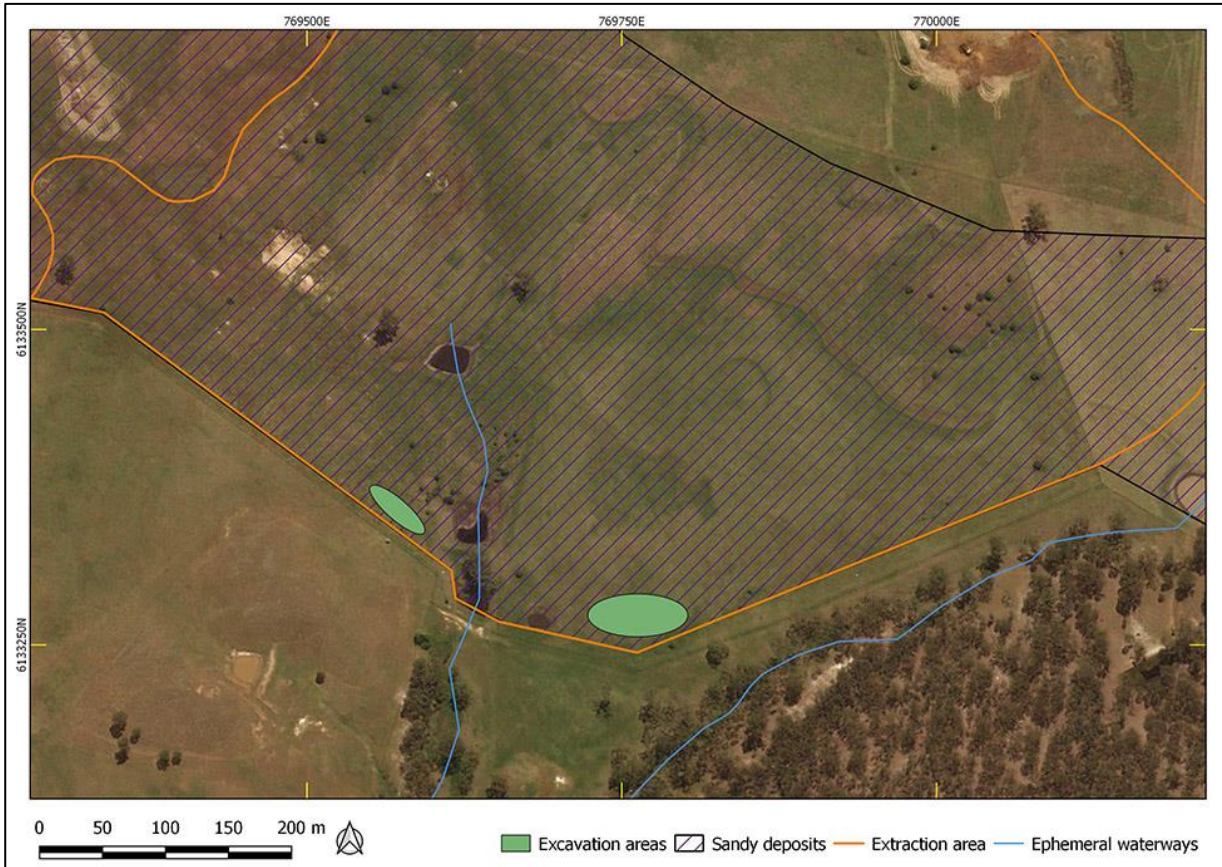
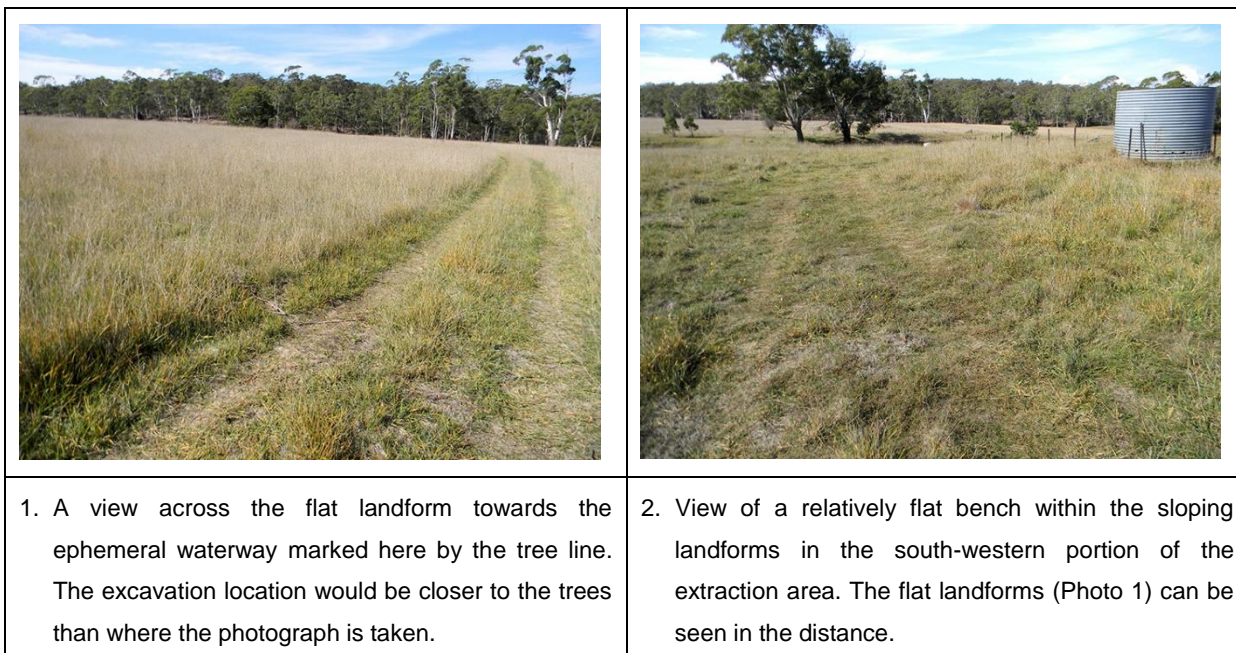


Figure 3-2: View southwest over Zone 1 with the proposed excavation areas indicated.



Instead, the location was chosen due to its relative proximity to ephemeral waterways (**Figure 3-3**, Photo 1). The more westerly location occupies a relatively flat bench in a generally sloping landform and seems to be largely undisturbed (see **Figure 3-2**, location to right and **Figure 3-3**, Photo 2).

Figure 3-3: Proposed excavation locations.



Based on the 2018 examination of Zone 1 it is felt that a two-day excavation program address the question of whether there is any likelihood of archaeological deposits at these locations.

The AHMP states that '12 to 24' excavation squares may be required with the assumption that these are one metre square pits. Further, the AHMP states that these should be spaced 'at regular 15 to 30 metre intervals'.

Given the size of the landform in Zone 1 and the need to gain some spatial coverage in order to have the best opportunity to intersect with sites and/or deposits, OzArk recommends that the excavation squares are 0.5 by 0.5 metres in size and that these squares be spaced 10 metres apart. While the smaller square size has the disadvantage of being awkward to work in at depths approaching one metre, the advantage is that more of the landform is examined and, in this case, this advantage would tend to outweigh the disadvantages. It should also be borne in mind that this is an exploratory investigation. Should there be indications of cultural material at depth, or a high density of cultural material, then OzArk would negotiate with the Applicant about a further stage of excavation that could employ the expanded, stepped-out trench configuration shown on page 17 of the AHMP. However, during the exploratory phase such expansion would not be required.

With the smaller sized pits, OzArk is confident that at least 24 excavation squares could be excavated during the two days of excavation. These would be divided between the two proposed areas with at least 12 pits being excavated at each area (obviously depending on the nature of the deposits that are encountered).

Drilling data obtained in 2004 in this area indicates a sand depth of approximately 15 metres. As such, any excavation methodology, following on from that established in the AHMP, should first employ manual excavation to a depth of around 75-80 centimetres but have the ability to then use mechanical excavation at specific locations to try to determine the nature of deeper deposits i.e. to of depth of around 1.5 to 2 metres. As the sand body pre-dates human occupation in the area, the excavation methodology should be to determine if archaeological deposits exist in the top-most layers of sand as it is not necessary to completely excavate through the sand body.

With this methodology, the two topographic zones will be investigated, and a reasonable horizontal and vertical spatial extent will be examined.

4 MANAGEMENT OF NEW DISCOVERIES

As set out in Section 4.7 of the AHMP, any new discoveries suspected to be of Aboriginal origin should follow the protocol below:

Cultural heritage assessments can be constricted by a number of factors such as surface visibility and survey coverage. Additionally where surface surveys have been augmented by excavations it has been found that surface results can differ significantly from sub-surface remains. Therefore, there is a potential, even when exhaustive survey and excavation has been completed for cultural heritage to remain undiscovered.

If any cultural heritage is located during the completion of the archaeological excavation or during the construction then an assessment of the site's significance should be undertaken and all conservation options explored in detail. In these circumstances a professional archaeologist should be contacted to assess the significance of the site, the local OEH office also has to be contacted. The registered Aboriginal groups should be informed and their views sought in accordance with Management Strategy 1 (Consultation with the Aboriginal Community).

This page has intentionally been left blank