APPENDIX

B

Revised Aboriginal Cultural Heritage Assessment Report (ACHAR)

View along Brown Creek.

REVISED ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

BIRRIWA SOLAR AND BATTERY PROJECT

MID-WESTERN REGIONAL LOCAL GOVERNMENT AREA

JANUARY 2023

Report prepared by

OzArk Environment & Heritage

for ACEN Australia Pty Ltd

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Heritage NSW

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT COVER SHEET

Report Title	Aboriginal Cultural Heritage Assessment Report: Birriwa Solar and Battery Project, Mid-Western Regional Local Government Area.
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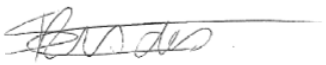

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DOCUMENT CONTROLS

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Document Description	*Revised Aboriginal Cultural Heritage Assessment Report: Birriwa Solar and Battery Project, Mid-Western Regional Local Government Area.*
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Acknowledgement

OzArk acknowledge the traditional custodians of the area on which this assessment took place and pay respect to their beliefs, cultural heritage, and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

ABBREVIATIONS AND GLOSSARY

ACHAR	Aboriginal Cultural Heritage Assessment Report. As set out in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*, all developments where harm to Aboriginal objects is likely must be assessed in an ACHAR.
ACHCRs	*Aboriginal Cultural Heritage Consultation Requirements for Proponents.* Guidelines for conducting Aboriginal community consultation for developments where harm to Aboriginal objects is likely.
ACHMP	Aboriginal Cultural Heritage Management Plan
AHIMS	Aboriginal Heritage Information Management System. Administered by Department of Premier and Cabinet, AHIMS is the central register of all Aboriginal sites within NSW.
AHIP	Aboriginal Heritage Impact Permit. Issued by Heritage NSW to allow harm to Aboriginal objects.
ASIRF	Aboriginal Site Impact Recording Form
BP	Years before present
Code of Practice	*Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* under Part 6 NPW Act. Issued by DECCW in 2010, the Code of Practice is a set of guidelines that allows limited test excavation without the need to apply for an AHIP.
DPE	NSW Department of Planning and Environment
EIS	Environmental Impact Statement. A required document for major projects documenting all potential impacts to the environment, including heritage, that may arise due to the development.
GSE	Ground surface exposure. A measure of factors that may reveal surface artefacts such as erosion scalds.
GSV	Ground surface visibility. A measure of factors that may obscure the detection of surface artefacts such as leaf litter.
Heritage NSW	Government department tasked with ensuring compliance with the NPW Act. Heritage NSW is advised by the Aboriginal Cultural Heritage Advisory Committee (ACHAC).
NPW Act	*National Parks and Wildlife Act 1974*. Primary legislation governing Aboriginal cultural heritage within NSW.

PAD	Potential archaeological deposit. Indicates that a particular location has potential to contain subsurface archaeological deposits, although no Aboriginal objects are visible.
RAP	Registered Aboriginal Party. An individual or group who have indicated through the ACHCR process that they wish to be consulted regarding the project.
SEARs	Secretary's Environmental Assessment Requirements issued by DPE.

EXECUTIVE SUMMARY

OzArk Environment & Heritage (OzArk) has been engaged by ACEN Australia Pty Ltd operating as ACEN Australia (ACEN, the proponent) formerly operating as UPC\AC Renewables Australia to prepare an *Aboriginal Cultural Heritage Assessment Report* (ACHAR) for the proposed Birriwa Solar and Battery Project (the project).

The purpose of the assessment is to form part of an *Environmental Impact Statement* (EIS) being prepared by EMM Consulting Pty Ltd to accompany an application for State significant development consent under Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* for the project.

This ACHAR has been undertaken in accordance with the Secretary's Environmental Assessment Requirements (SEARs), the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*, and the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (the Code of Practice). The Aboriginal cultural heritage assessment of the project has followed the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (the ACHCRs).

Desktop database searches completed prior to the field survey showed that no sites listed on the Aboriginal Heritage Information Management System (AHIMS) database are located within the survey area.

Assessment of the survey area took place with the assistance of representatives from four Registered Aboriginal Parties (RAPs). The fieldwork component of this assessment was undertaken from 8–10 November 2021 (3 days); 17–18 January 2022 (2 days); 14–15 March 2022 (2 days) and 22 March 2022 (1 day).

The survey resulted in eight Aboriginal sites being recorded (White Creek OS-1, Mangarlowe OS-1 and OS-2, Mangarlowe IF-1 and IF-2, Roxanna OS-1, Winora OS-1, and Barneys Reef Road ST-1). Site types include one scarred tree; two isolated finds; four artefact scatters, and one artefact scatter with potential archaeological deposit (PAD).

Of the eight recorded sites, only five are located within the survey area. Sites Mangarlowe OS-2 and Winora OS-1 were recorded during the survey of two connection options which are no longer part of this project, and Roxanna OS-1 was identified approximately eight metres outside of the survey area. While these sites are not located within the survey area, the site details are provided within this ACHAR to ensure they are appropriately documented.

Given the nature of the landforms of the survey area being generally undifferentiated and with widespread disturbances, no landforms were considered to have potential of subsurface archaeological deposits of conservation value; except for the area of PAD associated with White

Creek OS-1. This area of PAD will not be impacted by the project, as such, test excavation within the survey area was not warranted.

The undertaking of the impact assessment concluded that all known sites will not be harmed by the project, except for 36-2-0518 (Mangarlowe IF-2) that may be harmed by the project.

Recommendations concerning Aboriginal cultural heritage within the survey area are as follows:

1. Following granting of development consent for the project, the proponent will be required to develop an *Aboriginal Cultural Heritage Management Plan* (ACHMP) as per the Conditions of Approval. The ACHMP must be developed in consultation with the RAPs and the Department of Planning and Environment (DPE) (with input from Heritage NSW). The ACHMP would include an unanticipated finds protocol, unanticipated skeletal remains protocol and heritage inductions and long-term management of the Aboriginal site being impacted. The ACHMP must be approved by the DPE prior to construction activities occurring within the project area.
2. Aboriginal site 36-2-0518 (Mangarlowe IF-2), located within the development footprint of the project, should be salvaged via surface collection in accordance with the management strategies set out in **Section 9.2.1** and the ACHMP.
    a. The recommended methodology for the salvage will include the measures outlined in **Section 9.2.1**.
    b. The salvage works will include the mapping, analysis, and collection of the surface artefact at the affected site. Results will be included in a brief report to preserve the data in a useable form and an Aboriginal Site Impact Recording Form (ASIRF) will be submitted to AHIMS.
3. The proponent has undertaken to avoid harm to the remaining recorded sites through a considered design the project components. Stone artefact sites (isolated finds, artefact scatters and PADs) should be protected during the construction and operation of the project through permanent fencing. Temporary fencing should be erected around scarred tree 36-2-0516 Barneys Reef Road ST-1 during upgrades to Barneys Reef Road. The location of the sites will be shown on all appropriate plans to ensure that they are not inadvertently harmed.
4. All land-disturbing activities must be confined to within the project's development footprint and access road upgrades. Should the parameters of the proposed work extend beyond this, then further archaeological assessment will be required.

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FIGURES

TABLES

1 INTRODUCTION

1.1 DESCRIPTION OF THE PROJECT

OzArk Environment & Heritage (OzArk) has been engaged by ACEN Australia Pty Ltd (ACEN) formerly operating as UPC\AC Renewables Australia (UPC\AC) to prepare an *Aboriginal Cultural Heritage Assessment Report* (ACHAR) for the proposed Birriwa Solar and Battery Project (the project).

The project is in the locality of Birriwa, approximately 15 kilometres (km) southwest of the township of Dunedoo, in the Central West of New South Wales (NSW) (**Figure 1-1**). The project is in the Mid-Western Regional Council Local Government Area (LGA) on land zoned RU1 – Primary Production under the *Mid-Western Regional Local Environmental Plan 2012* (LEP).

The purpose of the assessment is to form part of an Environmental Impact Statement (EIS) being prepared by EMM Consulting Pty Ltd to accompany an application for state significant development (SSD) consent under Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* for the project.

1.2 BACKGROUND

The survey area includes two potential connection options that are not included in the current SSD application.

These connection options were surveyed in February 2022, and two Aboriginal sites (Mangarlowe OS-2 and Winora OS-1) were identified within these corridors. To ensure the sites have been adequately recorded, the site details have been retained in **Section 6.4**, however the connection options are not addressed within this report.

1.3 PROPOSED WORK

The project includes a large scale solar photovoltaic generation facility along with battery storage and associated infrastructure. The solar component of the project will have an indicative capacity of around 600 megawatts (MW) and include either a centralised or a DC-coupled battery energy storage system of up to 1,000 MW for 1 hour.

Key project components within the development footprint (**Figure 1-2**), will include the following:

- The development of separate arrays of photovoltaic modules (solar panels) within the project area
- Power conversion units comprising of three main components including inverters, transformers, and a ringmain unit
- A centralised battery energy storage system (BESS) of up to 600 MW for 2 hours, which will comprise of batteries, inverters, transformers, heating ventilation air conditioning and fire protection

- A substation allowing connection to the proposed CWO REZ transmission link
- Supporting infrastructure including:
    - Staff office, operations and control room, meeting facilities, amenities and carparking
    - A temperature-controlled spare parts storage facility
    - Supervisory control and data acquisition facilities
    - A workshop and associated infrastructure
    - A network of new internal roads to facilitate access within the project area to allow for construction and ongoing maintenance
    - Fencing and landscaping.
- Safe construction and operation access via designated routes on the local road network, including an upgrade to parts of Barneys Reef Road and parts of Birriwa Bus Route South to facilitate access to the development footprint
- Dedicated public road crossings to facilitate access between the solar project premises where relevant
- Decommissioning of project infrastructure at the end of its operational life.

1.4 PROJECT AREA

The project area is the land that is the subject of the development application. It covers approximately 1,298 hectares (ha) (**Figure 1-3**) of land across multiple lots, or portions thereof including:

Lot 1 DP750755	Lot 12 DP750755	Lot 16 DP750755	Lot 30 DP750755	Lot 31 DP750755
Lot 32 DP750755	Lot 34 DP750755	Lot 36 DP750755	Lot 37 DP750755	Lot 39 DP750755
Lot 43 DP750755	Lot 45 DP750755	Lot 47 DP750755	Lot 48 DP750755	Lot 54 DP750755
Lot 70 DP750755	Lot 82 DP750755	Lot 1 DP1004819		

The development footprint associated with the project is within the project area, covering approximately 1,140 ha (**Figure 1-2**), and encompasses all areas that will potentially be disturbed, including the operational components of the project such as the PV modules, power conversion units and BESS.

The project area will be accessed from the Castlereagh Highway via Barneys Reef Road and then Birriwa Bus Route South (**Figure 1-3**). As such, the project also requires an upgrade to parts of Barneys Reef Road and parts of Birriwa Bus Route South to facilitate site access, as shown in **Figure 1-2**. These portions of Barneys Reef Road and parts of Birriwa Route South extend outside of the project area but are included as part of the overall survey area and have been considered in this assessment (**Section 1.5**).

The project area consists of flat to gently undulating slopes with the highest point being the south-eastern most boundary of the project area, with an elevation of 600 metres (m) which descends towards the north and west.

The project area has been disturbed by past land clearing for agricultural purposes and is now generally dominated by exotic pasture with isolated areas of native vegetation, mostly located along drainage lines and road easements. Livestock grazing and cultivation are the current primary land uses of the project area.

1.5 SURVEY AREA

The survey area includes the entirety of the project area, as well as the portions of Barneys Reef Road and parts of Birriwa Route South which may require upgrades as part of the project (**Figure 1-3**).

Archaeological survey undertaken for this assessment was undertaken across the survey area shown in **Figure 1-3**.

Figure 1-1: Map showing the location of the project.

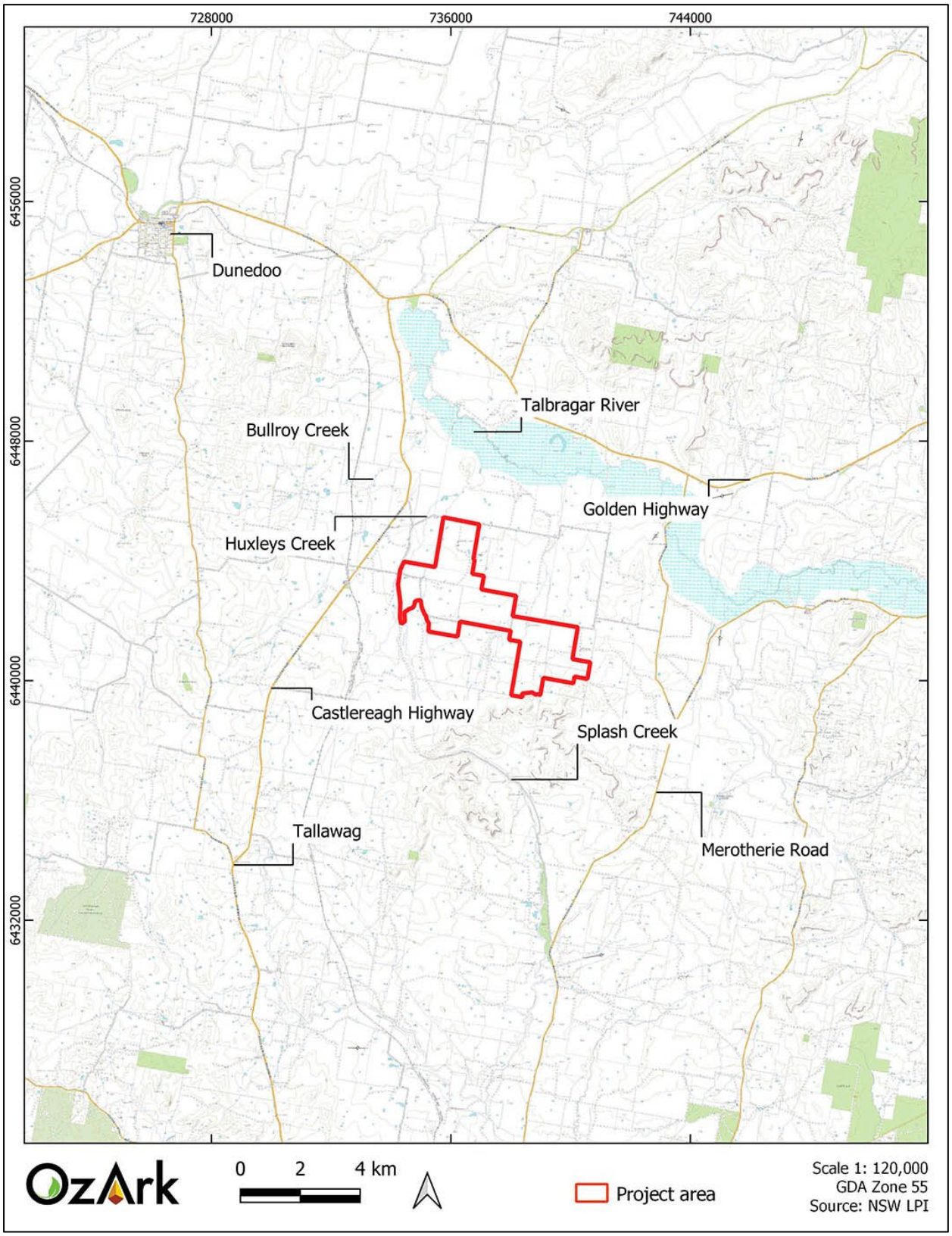


Figure 1-2: Development footprint within the project area.

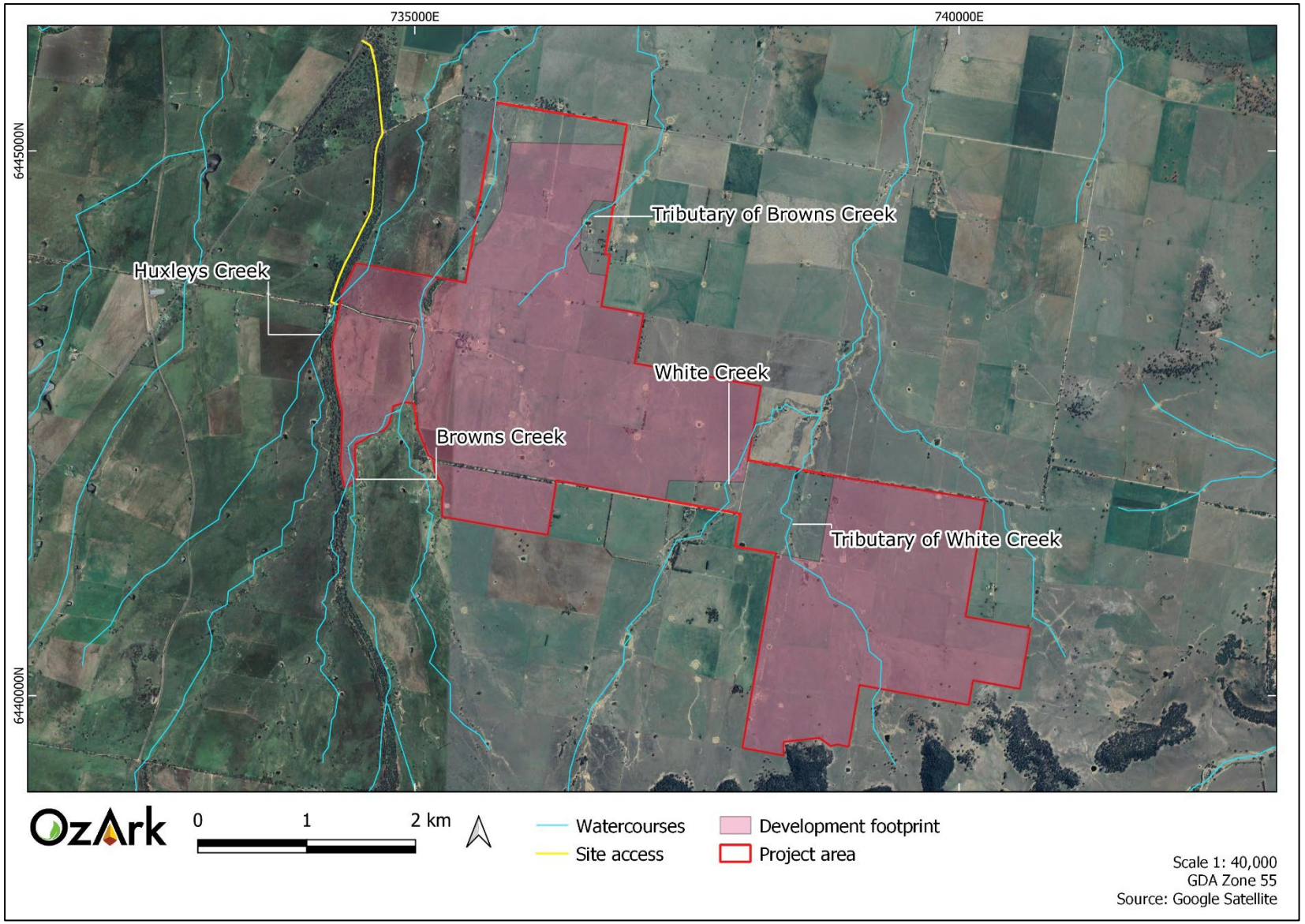
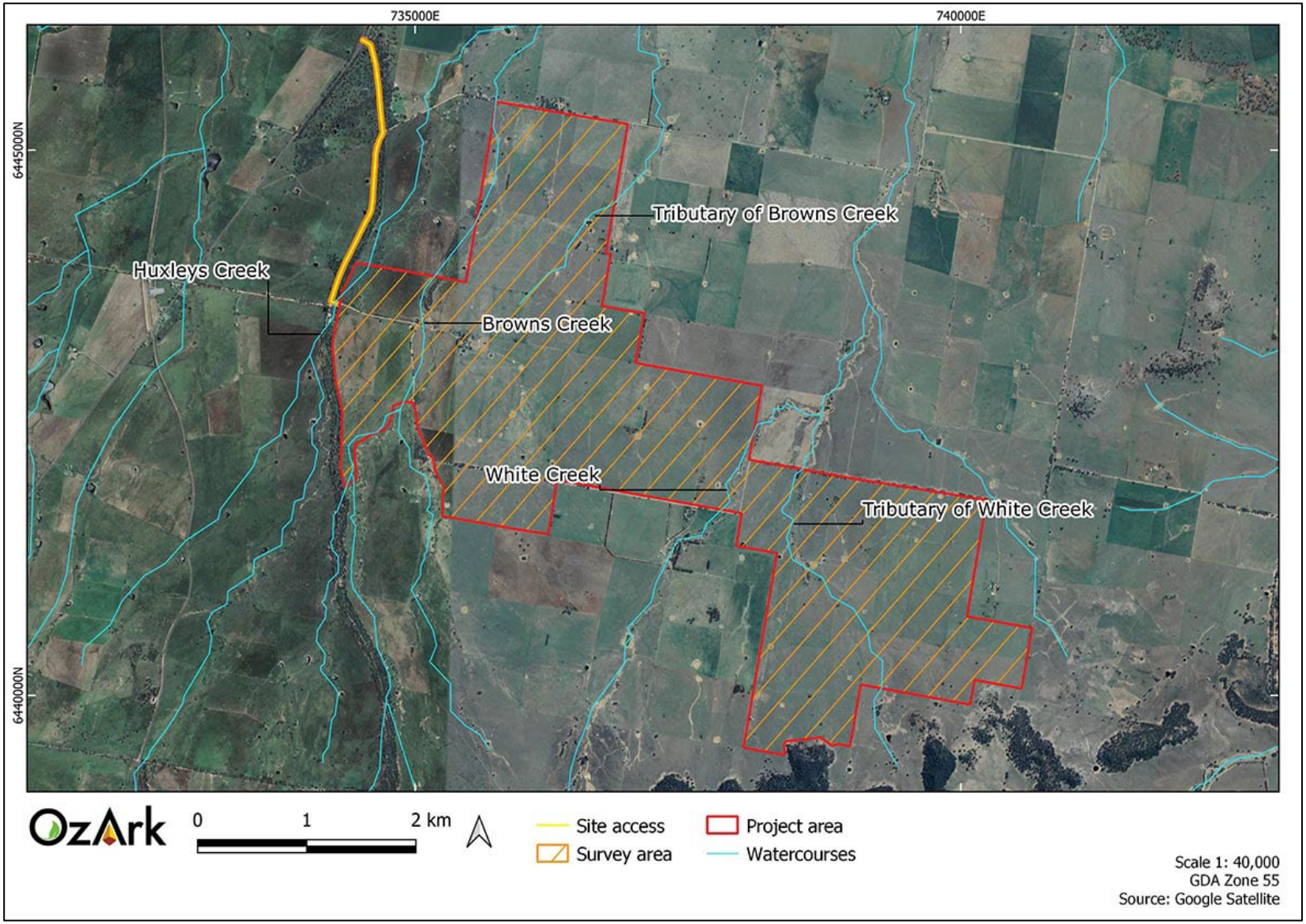


Figure 1-3: Aerial showing the project area and the survey area.



2 THE ABORIGINAL CULTURAL HERITAGE ASSESSMENT

2.1 RELEVANT LEGISLATION

Cultural heritage is managed by several state and national Acts. Baseline principles for the conservation of heritage places and relics can be found in the *Burra Charter* (Burra Charter 2013). The *Burra Charter* has become the standard of best practice in the conservation of heritage places in Australia, and heritage organisations and local government authorities have incorporated the inherent principles and logic into guidelines and other conservation planning documents. The *Burra Charter* generally advocates a cautious approach to changing places of heritage significance. This conservative notion embodies the basic premise behind legislation designed to protect our heritage, which operates primarily at a state level.

Several Acts of parliament provide for the protection of heritage at various levels of government.

2.1.1 Commonwealth legislation

2.1.1.1 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act, administered by the Commonwealth Department of Agriculture, Water and the Environment, provides a framework to protect nationally significant flora, fauna, ecological communities, and heritage places. The EPBC Act establishes both a National Heritage List and Commonwealth Heritage List of protected places. These lists may include Aboriginal cultural sites or sites in which Aboriginal people have interests. The assessment and permitting processes of the EPBC Act are triggered when a proposed activity or development could potentially have a significant impact on one of the matters of national environmental significance listed under the Act. Ministerial approval is required under the EPBC Act for projects involving significant impacts to national/commonwealth heritage places.

2.1.1.2 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* is aimed at the protection from injury and desecration of areas and objects that are of significance to Aboriginal Australians. This legislation has usually been invoked in emergency and conflicted situations.

Applicability to the project

It is noted there are no Commonwealth or National heritage listed places within the survey area, and as such, the heritage provisions of the EPBC Act and other Commonwealth Acts do not apply.

2.1.2 State legislation

2.1.2.1 Environmental Planning and Assessment Act 1979 (EP&A Act)

This Act establishes requirements relating to land use and planning. The main parts of the EP&A Act that relate to development assessment and approval are Part 4 (development assessment) and Part 5 (environmental assessment). The purpose of the Part 5 assessment system is to ensure public authorities fully consider environmental issues before they undertake or approve activities that do not require development consent from a council or the Minister. The government department responsible for administering the EP&A Act is the Department of Planning and Environment (DPE).

The EP&A Act currently provides the primary legislative basis for planning and environmental assessment in NSW. The objects of the EP&A Act include encouragement of:

- The proper management, development, and conservation of natural resources
- The provision and coordination of the orderly and economic use and development of land
- Protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats
- Ecologically sustainable development.

The objects also provide for increased opportunity for public involvement and participation in environmental planning and assessment.

The EP&A Act includes provisions to ensure that the potential environmental impacts of a development or activity are rigorously assessed and considered in the decision-making process.

The framework governing environmental and heritage assessment in NSW is contained within the following parts of the EP&A Act:

- Part 4: Local government development assessments, including heritage. May include schedules of heritage items
    - Division 4.7: Approvals process for State significant development.

Applicability to the project

The project is SSD under the *State Environmental Planning Policy (Planning Systems) 2021* and therefore, a development application for the project is required to be submitted under Part 4, Division 4.1 of the EP&A Act. As the project is SSD, if approved, Section 4.41 of the EP&A Act would apply and therefore an Aboriginal Heritage Impact Permit (AHIP) under section 90 of the *National Parks and Wildlife Act 1974* (NPW Act) to harm Aboriginal objects would not be required. Instead, all management related to Aboriginal cultural heritage within the survey area would be

governed by the policies within an approved *Aboriginal Cultural Heritage Management Plan* (ACHMP).

2.1.2.2 National Parks and Wildlife Act 1974 (NPW Act)

The NPW Act provides for the protection of Aboriginal objects (sites, objects, and cultural material) and Aboriginal places. Under the Act (Part 6), an Aboriginal object is defined as any deposit, object, or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises NSW, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction and includes Aboriginal remains.

An Aboriginal place is defined under the NPW Act as an area which has been declared by the Minister administering the Act as a place of special significance for Aboriginal culture. It may or may not contain physical Aboriginal objects.

It is an offence under Section 86 of the NPW Act to 'harm or desecrate an object the person knows is an Aboriginal object'. It is also a strict liability offence to 'harm an Aboriginal object' or to 'harm or desecrate an Aboriginal place', whether knowingly or unknowingly. Section 87 of the Act provides a series of defences against the offences listed in Section 86, such as:

- The harm was authorised by and conducted in accordance with the requirements of an AHIP under Section 90 of the Act
- The defendant exercised 'due diligence' to determine whether the action would harm an Aboriginal object
- The harm to the Aboriginal object occurred during the undertaking of a 'low impact activity' (as defined in the regulations).

Under Section 89A of the Act, it is a requirement to notify the Secretary of the Department of Premier and Cabinet of the location of an Aboriginal object. Identified Aboriginal items and sites are registered on the Aboriginal Heritage Information Management System (AHIMS) that is administered by Heritage NSW.

Applicability to the project

Any Aboriginal sites within the survey area are afforded legislative protection under the NPW Act.

The location of all Aboriginal objects will be notified to the Secretary of the Department of Premier and Cabinet under Section 89A of the Act. Any new site recordings will be registered on AHIMS that is administered by Heritage NSW.

2.1.2.3 *Secretary's Environmental Assessment Requirements*

To inform the SEARs, Heritage NSW provided input regarding Aboriginal cultural heritage. Heritage NSW input is set out in **Table 2-2** along with a concordance of where Heritage NSW requirements are addressed in this ACHAR.

The SEARs were received on 5 November 2021.

Table 2-1 addresses the general requirements relating to Aboriginal cultural heritage in the SEARs for the project.

Table 2-1: SEARs General Requirements.

General requirement	Where addressed in the ACHAR
An assessment of the impact to Aboriginal and historic heritage (cultural and archaeological) in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010).	An extensive pedestrian survey has been undertaken across the survey area as reported in this ACHAR. All assessment has followed the applicable codes and guidelines. This ACHAR does not assess historic heritage values except if they were applicable to the Aboriginal community. Historic heritage has been addressed in "*Historic Heritage Assessment Report: Birriwa Solar Farm and Battery Project, Mid-Western Regional Local Government Area"* (Ozark 2022) which forms part of the EIS.
Evidence of consultation with Aboriginal communities in determining and assessing impacts, developing options and selecting options and mitigation measures (including the final proposed measures), having regard to the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010).	**Section 3**

Table 2-2 addresses Heritage NSW's requirements in the SEARs for the project.

Table 2-2: Assessment recommendations from Heritage NSW for the project.

Heritage NSW requirement	Where addressed in the ACHAR
The EIS must identify and describe the Aboriginal cultural heritage values that exist across the whole area that will be affected by the development and document these in an Aboriginal Cultural Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation. The identification of cultural heritage values must be conducted in accordance with the Code of Practice for Archaeological Investigation in NSW (DECCW 2010), and be guided by the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales (OEH 2011).	This ACHAR contains the results of the Aboriginal archaeological survey undertaken for the project. It also assesses the cultural, scientific, aesthetic, and historic values scientific present within the survey area.
Consultation with Aboriginal people must be undertaken and documented in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHAR.	This requirement has been followed for the project and is documented in **Section 3** of this ACHAR.
Impacts on Aboriginal cultural heritage values are to be assessed and documented in the ACHAR. The ACHAR must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the EIS must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to Heritage NSW.	Avoidance measures are discussed in **Section 8.1**. Impacts to Aboriginal cultural heritage within the survey area are discussed in **Section 8.12**. Management of Aboriginal cultural heritage within the survey area are discussed in **Section 9**.
The assessment of Aboriginal cultural heritage values must include a surface survey undertaken by a qualified archaeologist. The result of the surface survey is to inform the need for targeted test excavation to better assess the integrity, extent, distribution, nature and overall significance of the archaeological record. The results of surface surveys and test excavations are to be documented in the ACHAR.	The results of the surface survey are documented in **Section 6**. Test excavation was not deemed warranted at any location within the survey area.

The ACHAR must outline procedures to be followed if Aboriginal objects are found at any stage of the life of the project to formulate appropriate measures to manage unforeseen impacts.	Procedures related to any unanticipated Aboriginal objects found within the survey area are outlined in **Section 9.3**.
The ACHAR must outline procedures to be followed in the event Aboriginal burials or skeletal material is uncovered during construction to formulate appropriate measures to manage the impacts to this material.	A procedure for the discovery of skeletal material is outlined in **Section 9.4**.

2.2 ASSESSMENT APPROACH

The archaeological assessment followed the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010).

The Aboriginal cultural heritage assessment followed the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (the Guide; OEH 2011) and the *Aboriginal cultural heritage consultation requirements for proponents* (ACHCRs) (DECCW 2010b).

2.3 PURPOSE AND OBJECTIVES

The purpose of this study is to identify and assess heritage constraints relevant to the project.

The study will apply the Code of Practice, the Guide, and the ACHCRs in the completion of the Aboriginal cultural heritage assessment to meet the following objectives:

Objective One: Undertake background research on the survey area to formulate a predicative model for site location within the survey area

Objective Two: Identify and record Aboriginal cultural heritage values within the survey areas. This includes intangible cultural values, Aboriginal objects, and any landforms likely to contain further archaeological deposits

Objective Three: To assess the significance of any recorded Aboriginal cultural values, Aboriginal objects, or sites in consultation with Registered Aboriginal Parties (RAPs)

Objective Four: Assess the likely impacts of the proposed work to Aboriginal cultural heritage values and provide management recommendations.

2.4 REPORT COMPLIANCE WITH THE CODE OF PRACTICE

The Code of Practice establishes requirements that should be followed by all archaeological investigations where harm to Aboriginal objects may be possible. **Table 2-3** tabulates the compliance of this report with the requirements established by the Code of Practice.

Table 2-3: Report compliance with the Code of Practice.

Code of Practice Requirement	Context of the Requirement	Concordance in this report
Requirement 1a	Review previous archaeological work	**Section 5**
Requirement 1b	Review AHIMS searches	**Section 5.3.1**
Requirement 2	Review the landscape context	**Section 4**

Code of Practice Requirement	Context of the Requirement	Concordance in this report
Requirement 3	Summarise and discuss the local and regional character of Aboriginal land use and its material traces	**Section 5**
Requirement 4a	Develop predictive model	**Section 5.5**
Requirement 4b	Present predictive model results	**Section 5.5.3**
Requirement 5a	Archaeological survey sampling strategy	**Section 6.1**
Requirement 5b	Archaeological survey requirements	This Requirement was fulfilled during the undertaking of the survey
Requirement 5c	Archaeological survey units	**Section 6.3**
Requirement 6	Site definition	**Section 6.4**
Requirement 7a	Site recording information to be recorded	All sites were recorded in accordance with this Requirement.
Requirement 7b	Site recording: scales for photography	All artefact photographs employed a centimetre scale bar.
Requirement 8a	Geospatial information	All artefact locations were logged using a non-differential handheld GPS.
Requirement 8b	Datum and grid coordinates	All coordinates are provided in GDA Zone 55.
Requirement 9	Record survey coverage data	**Section 6.1 and 6.3**
Requirement 10	Analyse survey coverage	**Section 6.3**
Requirement 11	Archaeological Report content and format	This report adheres to this Requirement.
Requirement 12	Records	OzArk undertakes to maintain all survey records for at least five years.
Requirement 13a	Notifying Heritage NSW of breaches	Not applicable
Requirement 13b	Providing Heritage NSW with information	Not applicable
Requirement 14	Test excavation which is not excluded from the definition of harm	Test excavation did not take place.
Requirement 15a	Consultation regarding test excavation	Not applicable
Requirement 15b	Developing a test excavation sampling strategy	Not applicable
Requirement 15c	Providing Heritage NSW with notification of the test excavation	Not applicable
Requirement 16a	Test excavation that can be carried out in accordance with the Code of Practice	Not applicable
Requirement 16b	Objects recovered during test excavations	Not applicable
Requirement 17	When to stop test excavations	Not applicable

2.5 DATE OF ARCHAEOLOGICAL ASSESSMENT

The field survey was undertaken by OzArk over the following periods:

- 8–10 November 2021 (3 days)
- 17–18 January 2022 (2 days)
- 14–15 March 2022 (2 days)
- 22 March 2022 (1 day).

2.6 OZARK INVOLVEMENT

2.6.1 Field survey

The fieldwork survey was undertaken by:

- Fieldwork Director: Stephanie Rusden (OzArk Senior Archaeologist, BS University of Wollongong, BA University of New England)
- Archaeologist: Harrison Rochford (B. Liberal Studies [Hons], M. Phil. [Arts and Social Science])
- Archaeologist: Barry Kerton (OzArk Project Archaeologist, BA, BSc and MA [advanced] Australian National University)
- Archaeologist: Yekun Zhang (OzArk Archaeologist, B Arts Archaeology & Anthropology, M.Sc Archaeological Science, PhD Archaeology).

2.6.2 Reporting

The reporting component of the heritage assessment was undertaken by:

- Report author: Stephanie Rusden
- Contributor: Yekun Zhang
- Reviewer: Ben Churcher (Principal Archaeologist, OzArk, BA[Hons], Dip Ed).

3 ABORIGINAL COMMUNITY CONSULTATION

3.1 INTRODUCTION TO CULTURAL VALUES

No matter who you are, we all have culture. Each person's culture is important; it's part of what makes us who we are.

Many Aboriginal people in Australia have a unique view of the world that's distinct from the mainstream. Land, family, law, ceremony, and language are five key interconnected elements of Aboriginal culture. For example, families are connected to the land through the kinship system, and this connection to land comes with specific roles and responsibilities which are enshrined in the law and observed through ceremony. In this way, the five elements combine to create a way of seeing and being in the world that is distinctly Aboriginal.

Aboriginal and Torres Strait Islander peoples are connected to Country through lines of descent (paternal and maternal), as well as clan and language groups. Territory is defined by spiritual as well as physical links. Landforms have deep meaning, recorded in art, stories, songs, and dance. Songlines or Dreaming Tracks as well as kinship structures link Aboriginal peoples to the territories of other groups. In the past, these links were also used for trade.

Living on this land for more than 50,000 years, Aboriginal and Torres Strait Islanders established effective ways to use and sustain resources. One important aspect is the right of certain people to control the use of resources in a particular area, as well as cultural and spiritual values like totemism that were fundamental in resource management. There was a wide range of traditional methods for gathering food including fish traps, subsistence agriculture, hunting and harvesting a wide range of natural fruits and vegetables. Some groups of people would stay in one place, while others moved around the land according to the seasons, to ensure sustainable and rich food supplies, and to fulfil their spiritual and cultural obligations.

In much of eastern Australia, Aboriginal communities live their lives like most Australians without resorting to tribal lore. However, in certain crucial areas, particularly associated with family, leadership roles and caring for Country, Aboriginal lore continues, even in the most urbanised communities.

3.2 ABORIGINAL COMMUNITY CONSULTATION

A major aim of this assessment is to identify any cultural values within the landscape in which the project is located so that those values can be recognised and incorporated into the project's management recommendations.

The Aboriginal cultural heritage assessment of the project has followed the ACHCRs (DECCW 2010b). A log and copies of correspondence with Aboriginal community stakeholders is presented in **Appendix 1**.

The ACHCRs include four main stages, and these will be detailed in the following sections.

3.2.1 ACHCRs Stage 1

The aim of Stage 1 is to identify the RAPs who wish to be consulted about the project.

An advertisement was placed in the *Mudgee Guardian* on 3 September 2021 to solicit expressions of interest (**Appendix 1 Figure 2**).

A letter seeking information from various agencies was sent on 17 August 2021 (**Appendix 1 Figure 3**). These agencies were: Office of the Registrar, *Aboriginal Land Rights Act 1983*; Heritage NSW; National Native Title Tribunal; National Native Title Services Corporation Ltd (NTSCORP); Mudgee Local Aboriginal Land Council (LALC), Mid-Western Regional Council, and the Mudgee Local Land Services.

On 25 August 2021, letters were sent to individuals and groups whose contact details had been provided by the government agencies (**Appendix 1 Figure 4**).

By the closing date for registration concerning this project, nine groups or individuals registered to be consulted as RAPs:

- Paul Brydon
- Woka Aboriginal Corporation
- Mudgee LALC
- Murong Gialinga Aboriginal & Torres Strait Islander Corporation
- Warrabinga Native Title Claimants Aboriginal Corporation
- Wellington Valley Wiradjuri Aboriginal Corporation (WVWAC)
- Stakeholder 1 (see note below)
- North-Eastern Wiradjuri
- Gallanggabang Aboriginal Corporation

Note: An individual or group who did not wish to be identified in the public documents is referred to as ‘Stakeholder 1’.

3.2.2 ACHCRs Stages 2 and 3

The aim of Stages 2 and 3 is to provide information about the project to the RAPs and to acquire information regarding Aboriginal cultural values associated with the project either through consultation and/or field work. Often these two stages are run together, and the detailed project information is provided in the assessment methodology that is issued to all RAPs for their consideration.

On 1 October 2021, all RAPs were sent information about the project and a draft of the assessment methodology (**Appendix 1 Figure 5** and **Appendix 2**).

RAPs were provided the stipulated 28 days in which to review and comment on these documents as per Stage 3 of the ACHCRs. The closing date for comment was 29 October 2021.

The following response was received from WVWAC on 27 October 2021 (**Appendix 1 Figure 6**):

> *WVWAC members have reviewed the Birriwa Solar Farm Methodology and agree with the document in principal. We however would like increased coverage if possible over the sample areas indicated in the Methodology, if exposures or possible cultural sensitivity areas are identified by Field Officers present.*

OzArk replied on 28 October 2021 and noted that spacing between surveyors would be decreased if areas of exposure were present.

No other responses were received from the RAPs.

3.2.3 ACHCRs Stage 4

Stage 4 involves the production of a draft ACHAR that is issued to all RAPs for their consideration. The ACHAR documents the results of the assessment, outline opportunities for the conservation of Aboriginal cultural values, and suggest recommendations for the management of Aboriginal objects should impacts to these objects be unavoidable.

A copy of the draft ACHAR was distributed to all RAPs for review on 29 April 2022 with a 28-day review period closing 27 May 2022 (**Appendix 1 Figure 7**).

WVWAC provided feedback on the draft ACHAR on 12 May 2022 and a second response on 26 May 2022 (**Appendix 1 Figure 8**). OzArk provided responses to WVWAC on 26 and 30 May 2022. The feedback and responses are provided in full in **Appendix 1 Figure 8** and summarised in **Table 3-1**.

A response was received from Stakeholder 1 on 20 May 2022 noting that they agree with the draft ACHAR (**Appendix 1 Figure 8**).

No other responses were received from the RAPs.

Table 3-1: Stage 4 comments from WVWAC and OzArk responses.

WVWAC comment	OzArk response
Section 7.2 Assessed Significance of the Recorded Sites Each site has a High Social or Cultural Value. Anthropologically these artefacts have a Moderate Academic Value in mapping and understanding Social and Cultural use of the varying materials and site locations selected, from being opportunistic to defined by patterns of seasonal and or generational use and compared to the wider landscape and the other known sites within a 50km radius gives us a greater Anthropological View and information to the Clan use	OzArk thanks Wellington Valley Wiradjuri Aboriginal Corporation (WVWAC) for the information provided relating to the cultural, aesthetic and historic values of the recorded Aboriginal sites, the overall project area and surrounding landforms (i.e. Barneys Reef). These values will be incorporated into Section 7.2 of the ACHAR.

WVWAC comment	OzArk response
of land and their relationships with surrounding Clan and Nations. There is no historically important person or event from a European perspective, however there is Clan and cultural connections, Lore, Song lines and the Dreamtime all associated with the Project Area. Through Wiradjuri eyes the Historic Value is High.	
Section 9.2.2 Long-term management of Aboriginal objects WVWAC Members and knowledge Holders formally request that the artefacts be re buried on site in an area close to where it originated where there will be no future impacts or ground disturbances. We also request that the reburial site is culturally cleansed by smoking ceremony along with the artefact/s to be reburied.	WVWAC's preference for the reburial of artefacts and a smoking ceremony will be included in the ACHAR regarding the long-term management of the Aboriginal objects. The protocols for the long-term management will form part of the *Aboriginal Cultural Heritage Management Plan* (ACHMP).
Section 9.2.3 Fencing WVWAC Members and knowledge Holders formally request that all RAP's be involved in the fencing of the cultural sites to ensure the site locations are adequate and reassure the community the areas are protected.	OzArk notes the request for the Aboriginal groups to be involved in the fencing of the Aboriginal sites. OzArk will supply the proponent with this request so that it can be taken into consideration when the ACHMP is being prepared.
Section 9.4 Unanticipated Skeletal Remains Protocol WVWAC Elders, Knowledge Holders and Members agree that this needs to be developed with RAP's and that the table on page 72 is a starting point and there is no mention of consultation with Aboriginal Community at any point in the table. Follow up comment WVWAC and wider Aboriginal Community believe that Aboriginal Stakeholders should be advised and involved at the time any remains are found as a stakeholder to be present and ensure that if in case the remains are of Aboriginal Origin that the correct procedures are followed.	The human skeletal remains protocol provided in Figure 9-1 of the ACHAR does note that the Aboriginal community will be informed if skeletal remains are encountered. This will place once police have confirmed that they are ancient Aboriginal remains. Follow up response As it is a police matter there would not be an opportunity to inform the local Aboriginal community until the police and their own independent anthropologist have completed their investigations and made their conclusions. There would be no involvement from archaeologists such as ourselves in these investigations. it would not be until the police and their forensic anthropologists have confirmed that remains are ancient ancestral remains that the local Aboriginal community would be informed. Depending on their investigations this could still happen relatively early in the discovery of the remains. All management regarding the remains would all be completed in full consultation with the local Aboriginal community.
Section 10 Recommendations WVWAC Elders, Knowledge Holders and Members agree to the recommendations as written in this section. WVWAC Elders, Knowledge Holders and Members also formally request that due to low surface visibility throughout large sections of the survey areas, that RAP's identify areas to be re-surveyed prior to any ground disturbance if conditions have changes to ensure no surface artefact sites were missed due to long thick grass in excess of 90-100cm in height over large portions of the surveyed project area as discussed relating to project constraints and survey coverage on pp. 42-43 and 58.	The aim of any archaeological survey is not to locate each artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within a project area are known. As noted in Section 6.3 of the ACHAR, OzArk relied on an examination of the archaeological potential of the landforms due to the low GSV and concluded that they have low archaeological potential, excluding the landform at White Creek OS-1. Resurveying these landforms would not change this conclusion. It is OzArk's understanding that GSV across the project area (and most of NSW) is not likely to improve in the near future given the substantial amount of rainfall that much of the state has experienced since early 2020.

3.3 ABORIGINAL COMMUNITY INVOLVEMENT IN THE ASSESSMENT

Table 3-2 provides a log of the RAPs and their representatives who participated in the fieldwork.

Table 3-2: Log of RAP involvement in the field survey.

Individual/group	Name	Day of participation							
		08/11/21	09/11/21	10/11/21	17/01/22	18/01/22	14/03/22	15/03/22	22/03/22
Mudgee LALC	James Williams	X	X	X					X
Murong Gialinga Aboriginal & Torres Strait Islander Corporation	Steve (George) Flick	X	X	X			X	X	X
Warrabinga Native Title Claimants Aboriginal Corporation	Tyron Pennell	X	X	X					
WVWAC	Brenda Waters			X	X	X	X	X	

3.4 CULTURAL VALUES IDENTIFIED THROUGHOUT THE ACHCR PROCESS

WVWAC noted the following in ACHCR process with regards to cultural values associated with the project area and surrounds:

- All Aboriginal objects are culturally significant to Wiradjuri people
- Mapping of Aboriginal objects can allow for greater understanding of social and cultural use of the land i.e. seasonal and / or generational use and provides insight into interactions between surrounding Clan and Nations.
- Barneys Reef is a culturally important location and is close by as with several other natural features relating to the Dreamtime, only Traditional Owner Clan Descendants hold this knowledge
- Clan and cultural connections, Lore, Song lines and the Dreamtime are all associated with the project area.

4 LANDSCAPE CONTEXT

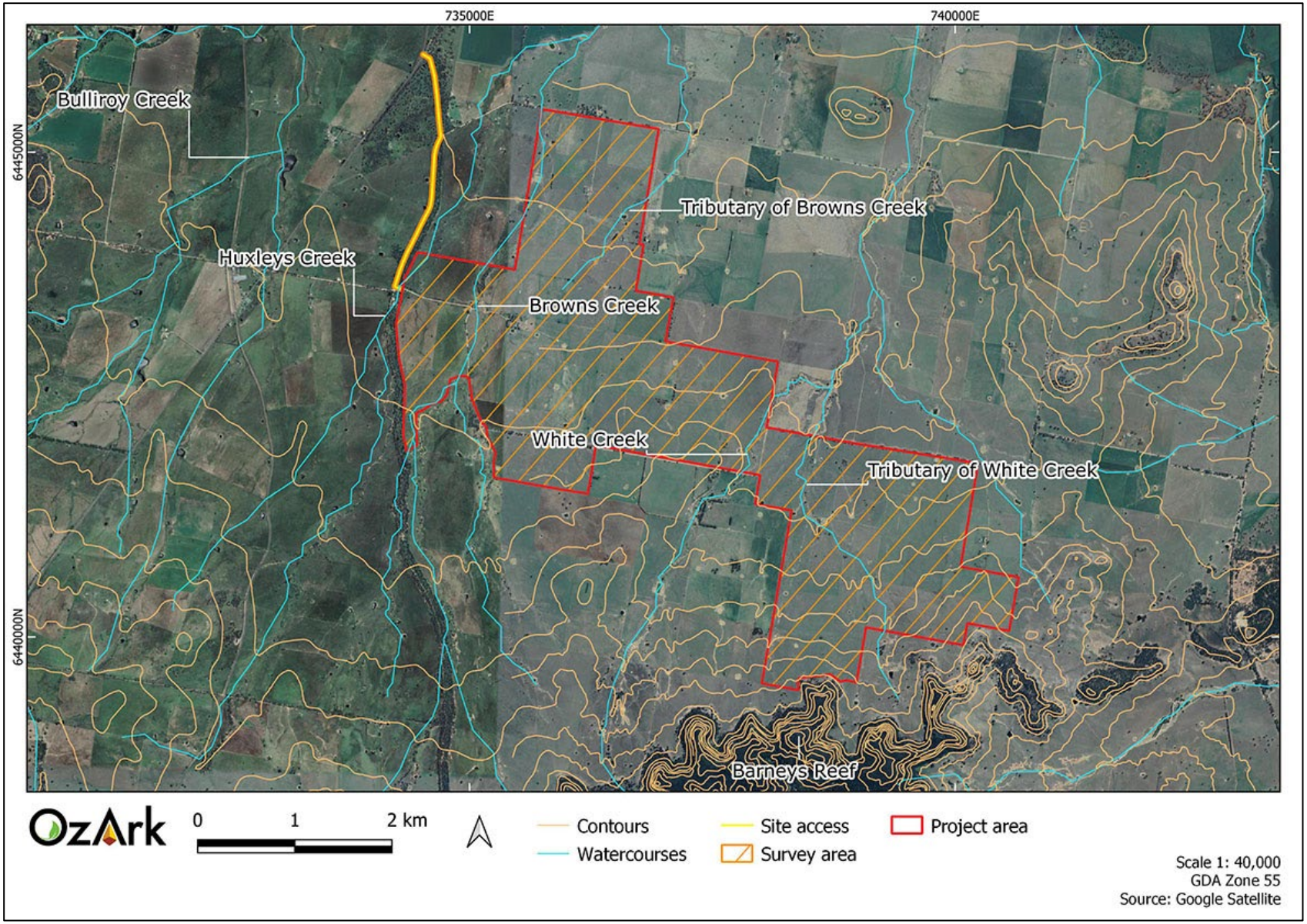
An understanding of the environmental context of a survey area is requisite in any Aboriginal archaeological investigation (DECCW 2010). It is a particularly important consideration in the development and implementation of survey strategies for the detection of archaeological sites. In addition, natural geomorphic processes of erosion and/or deposition, as well as human-activated landscape processes, influence the degree to which the remains of material culture are retained in the landscape as archaeological sites; and the degree to which they are preserved, revealed and/or conserved in present environmental settings.

4.1 TOPOGRAPHY

The survey area is located at the eastern edge of the NSW South Western Slopes bioregion, specifically, the Inland Slopes sub-bioregion. The South Western Slopes bioregion extends from Albury in the south to Dunedoo. Most of the survey area is within the Talbragar–Upper Macquarie Terrace Sands and Gravels as characterised by Mitchell (2002). This landscape type is characterised by sandy quaternary alluvial sediments on floodplains and terraces of the Talbragar River, with a general elevation between 350–500 m (Mitchell 2002: 99).

The topography of the survey area and the site access is primarily gentle slopes or flats. The highest point of the survey area is along the southern-most boundary with an elevation of 600 m which descends towards the north (**Figure 4-1**).

Figure 4-1: Topography and drainage of the survey area.



4.1.1 Survey units

Based on the topography of the survey area, survey units were identified to capture the major topographical features of the survey area. The designation of survey units will allow a comparison of the archaeological potential of each major topographical feature within the survey area to understand whether certain landform types are more likely to contain Aboriginal objects than others.

The survey area can be characterised by three main survey units (**Table 4-1** and **Figure 4-3**). **Table 4-1** shows that most of the survey area is comprised of gentle slope landforms.

Table 4-1: Survey units of the survey area.

Survey unit	Survey Unit description	Survey unit area (ha)
Survey Unit 1: Drainages	Banks and elevated terraces adjacent to drainage lines or watercourses.	368
Survey Unit 2: Flats	Flat plains surrounding the drainage lines and watercourses.	362
Survey Unit 3: Gentle slopes	Characterised by sloping landforms with gentle gradients. These landforms are slightly elevated.	585
	Total	1325

Figure 4-2: Aerial of the survey area showing the location of survey units.

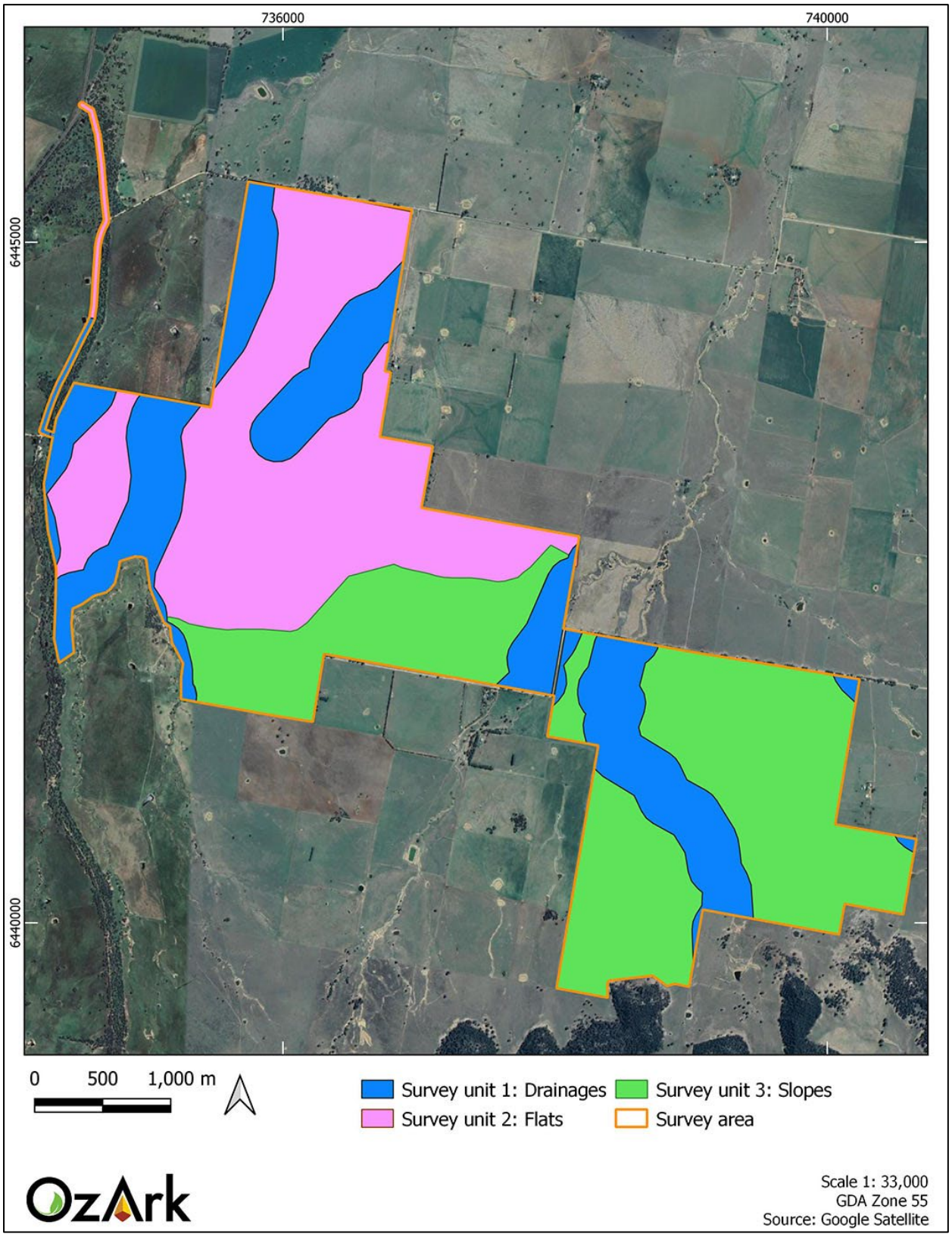


Figure 4-3: Examples of the survey units throughout the survey area.

1. Survey Unit 1: View south along White Creek in the central portion of the survey area.

2. Survey Unit 1: View north along Brown Creek in the southwest of the survey area.

3. Survey Unit 2: View south along the vegetated corridors Barneys Reef Road within the survey area.

4. Survey Unit 2: View north along a cleared, flat plain in the northeast of the survey area.

5. Survey Unit 3: View east upslope across a gentle slope in the southeast of the survey area.

6. Survey Unit 3: View northeast downslope across a cleared paddock in the southeast of the survey area.

4.2 GEOLOGY AND SOILS

The geology of the survey area is predominately undulating hills and low hills with granite outcropping as tors and sloping pavements, which features Gulgong Granite, biotite granite, adamellite, and granodiorite (Murphy and Lawrie 1998).

Soil analysis has important ramifications for archaeological research through the potential impact of different soils on human activity (such as agricultural exploitation) and the impact of the soils on archaeological evidence (such as post-depositional movement).

The soils inside the survey area consists primarily of siliceous sands, in particular the Home Rule soil type. The Home Rule soil type is characterised by low fertility and water holding capacity. Surface soils tend to be acidic, and prone to seasonal waterlogging. The Siliceous Sands Home Rule topsoil ranges between 10–35 centimetres (cm) in depth and tends to be loose brown to dark brown loamy sandy with small quartz and felspar gravels present. The subsoil tends to be a bright brown to red-brown loose clayey-sand, with small quartz and felspar gravels. These types of soil are prone to erosion, especially if no surface cover is present. Furthermore, drainage depressions are highly susceptible to gully erosion due to water runoff (Murphy and Lawrie 1998).

4.3 HYDROLOGY

The Talbragar River is the closest permanent watercourse and is located approximately 3 km north of the survey area. Several creeks intersect through the survey area in a general north–south direction and flow into the Talbragar River. These include Huxleys Creek, Browns Creek, and a tributary of Browns Creek in the western half of the survey area, and White Creek and a tributary of White Creek in the eastern half of the survey area (**Figure 4-1**).

4.4 VEGETATION

Most of the vegetation inside the survey area is classified as non-native. There is a small section along the western-most boundary which is classified as derived grasslands (OEH 2017). Examination of the aerial imagery (**Figure 1-3**) shows that most of the survey area has been cleared, though some small stands of trees and paddock trees remain scattered throughout it while the road corridors of Barneys Reef Road and Birriwa Bus Route South are densely vegetated.

4.5 LAND USE HISTORY AND EXISTING LEVELS OF DISTURBANCE

The level to which an archaeological record remains intact is heavily affected by the levels of disturbance in a given area. Disturbance can be from natural activity, such as the erosion of a landform over time, or through human activity, such as the ploughing of fields or clearing of land. Disturbance of the archaeological record can also be either direct, such as via land clearance, or indirect, such as the increased erosion of the landscape due to the removal of vegetation.

The project area is used primarily for grazing and cultivation. Other disturbances inside the project area appear to be limited to construction of dwellings and agricultural infrastructure, fence lines, dams and contour banks, and unsealed tracks. An aerial from 1964 which covers most of the project area shows there has been little change in terms of land use over the past 57 years (**Figure 4-4**).

Impacts associated with the land use activities across the project area to the archaeological landscape are summarised below:

- Vegetation clearance: the survey area has been subject to significant levels of vegetation removal. Culturally modified trees may have been removed during the land clearance phase in the survey area, thereby distorting the archaeological landscape by removing this site type.
- Cultivation: most of the survey area has been subjected to repeated cultivation. Repeated cultivation since the commencement of colonial settlement will have altered soil profiles and potentially disturbed the integrity of sites and any potential subsurface archaeological deposits. Cultivation acts to redistribute artefacts both horizontally and vertically within the soil profile and ultimately destroys the integrity of artefact assemblages within the top 20 to 25 centimetres (cm) of the soil profile. Research into the impacts on archaeological sites because of agricultural practices, termed plough zone archaeology, has demonstrated that artefacts can move in excess of 8 m per season of cultivation (Frink 1984; Gaynor 2001).
- Grazing: The survey area has been used historically and is currently used for low-intensity livestock grazing. The presence of hoofed livestock is likely to have resulted in trampling and compaction of the ground surface which accelerates soil loss.
- Farm infrastructure, dwellings and remediation works: The survey area has an overall low level of disturbance generated by the construction of dams, contour banks, agricultural buildings, and fencing. Earthworks associated with contour banking and dams can reveal lithic artefacts which may have been otherwise concealed by low ground surface visibility (GSV).
- Transport: Barneys Reef Road is included within the survey area and Birriwa Bus Route South Newell Highway traverses the central portion of the survey area. A limited number of farm tracks also intersect the project area. In the case of unsealed tracks, this disturbance tends to provide exposures, thus enabling the identification of otherwise obscured artefacts. In terms of graded or sealed roads, archaeological sites will have been removed or displaced along their alignments however, mature native trees often remain intact along the road corridors.

Figure 4-4: 1964 aerial with overlay of project area (source: SS 2021).

4.6 CONCLUSION

The review of the environmental and landscape factors associated with the survey area allows the following conclusions to be drawn in terms past Aboriginal occupation:

- Topography and hydrology: the gentle slope and flat landforms which dominate the survey area would have been hospitable to Aboriginal people, however, relative to surrounding landscapes it does not contain features such as a permanent water supply (the Talbragar River) or shelter that are most likely to encourage substantial Aboriginal occupation of the landscape. As such, the size and density of sites located within the survey area are likely to be smaller and sparser than those to the north of the survey area which are in closer proximity to the Talbragar River and to the south around the main escarpment of Barneys Reef.

- Geology and soils: landforms which typically comprise outcropping rock, i.e., hills, are limited within the survey area, and therefore sources of stone procurement for tool manufacture are unlikely to be present. Soils present on the gentle slopes inside the survey area are likely to have been affected by water erosion and are poor draining. The erosional qualities of the soils present will have had an effect on the likelihood for *in situ* archaeological deposits being present. Furthermore, the widespread and comprehensive use of most of the survey area for cultivation would have further promoted soil erosion and loss.

- Vegetation: the broad-scale vegetation clearance which has taken place across the survey area for agricultural purposes reduces the likelihood that any culturally modified trees remain present, however, should mature native vegetation remain, particularly along creeks within the survey area, culturally modified trees may be present.

- Land use: activities such as vegetation clearance, cultivation, and grazing are the dominant types of disturbance to have taken place across the survey area. These activities are likely to have displaced Aboriginal objects or sites or removed them entirely i.e. modified trees. Further, cultivation reduces the potential for intact subsurface archaeological material to remain. In areas where farming and agriculture is less intensive, Aboriginal objects are likely to be in a secondary context due to erosion exacerbated by land use activities.

5 ARCHAEOLOGICAL CONTEXT

5.1 ETHNO-HISTORIC SOURCES OF REGIONAL ABORIGINAL CULTURE

At the time of European settlement, the survey area was situated within the territory of people belonging to the *Wiradjuri* tribal and linguistic group (Tindale 1974). The Wiradjuri tribal area is situated within the Murray Darling Basin and extends across three general physiographic regions: the highlands or central tablelands in the east, the riverine plains in the west, and the transitional western slopes zone in-between (Navin Officer 2005: 48). The survey area is at the north-eastern extent of Wiradjuri territory.

The Wiradjuri is one of the largest language groups within New South Wales extending across the districts of Mudgee, Bathurst, Dubbo, Parkes, West Wyalong, Forbes, Orange, Junee, Cowra, Young, Holbrook, Wagga Wagga, Narrandera, Griffith, and Mossgiel (Tindale 1974). While the area was noted to have a single basic language, various dialects could be found throughout the region (Tindale 2000). The survey area is located within the central tablelands and on the eastern margin of the Wiradjuri territory.

'Wiradjuri' means '*people of three rivers*', the three rivers being the Macquarie (*Wambuul*), Murrumbidgee, and Lachlan Rivers (Sahukar et al 2003: 121). These rivers represented the Wiradjuri people's livelihood and supplied consistent and abundant resources. The Wiradjuri people generally moved in smaller groups along river flats, open land, and waterways.

Oral tradition records the presence of over 20 clans within the broader Bathurst–Mudgee region, organised according to matrilineal descent (Navin Officer 2005: 48). Clans were made up of several fairly independent groups, of up to 20 members, in friendly contact with each other, moving separately for much of the year over a shared territory (Pearson 1981; Haglund 1985).

The Wiradjuri social organisation underpinned kinship systems based on totem names and associations. This system governed and controlled marriage and determined ceremonial kinship obligations. Individual identity and clan affiliations were expressed partly through elaborate carvings on wooden implements and on skin cloaks (White 1986).

Rivers and lagoons formed the basis of Wiradjuri lifestyle, supplying shellfish, fish (cod, perch and catfish) as well as yabbies, shrimp, and turtles (Garnsey 1942 and Pearson 1981). Kangaroo and emu meat, fruit and nuts, yam daisies, wattle seeds and orchid tubers supplemented the riverine diet.

5.2 REGIONAL ARCHAEOLOGICAL CONTEXT

The Aboriginal occupation of Australia begins prior to 40,000 BP (years before present) and possibly earlier than 50,000 BP. Dates exceeding 20,000 years occur in almost all parts of Australia resulting in the expectation that most areas should have a Pleistocene (>12,000 BP) occupational signature. However, such dates remain relatively rare due to a range of factors, both

behavioural and post-depositional. These factors include a possible low density of occupation in the Pleistocene period and poor preservation of archaeological materials (particularly dateable organic materials). Within the Wiradjuri region, the presence of Aboriginal people in the Darling Basin has been dated to 40,000 years ago (Hope 1981 as cited in Haglund 1985). A spread east into the mountains is thought to have occurred between 14,000 to 12,000 years ago.

There are several broad scale regional archaeological studies which either cover the survey area itself, are in general proximity to it or have been completed across landform types similar to those found within the survey area. These studies have been summarised below.

PhD thesis – changing land use and settlement patterns in the upper Macquarie River region of NSW from prehistoric times to 1860 (Pearson 1981)

Pearson's work was primarily in the Upper Macquarie region, which reflects topographic similarities to the current survey area. Pearson divided the archaeological sites he recorded into two main categories: occupation sites and non-occupation sites (including grinding grooves, scarred or carved trees, ceremonial and burial sites). Analysis of site locations produced a site prediction model with occupation occurring in areas with access to water, good drainage, level ground, adequate fuel and appropriate localised weather patterns for summer or winter occupation. Occupation sites were most frequently found on low ridge tops, creek banks, gently undulating hills, and river flats and usually in open woodland vegetation (Pearson 1981: 101). The location of non-occupation sites was dependent upon a variety of factors relating to site function. For instance, grinding grooves were found where appropriate sandstone outcropping occurred, as close to occupation sites as possible. The location of scarred trees displayed no obvious patterning, other than proximity to watercourses where camps were more frequently located. Pearson suggested that these patterns would differ on the drier plains to the west, towards Dubbo and beyond, where dependence upon larger, more permanent water supplies was greater.

An assessment of Aboriginal sites in the Dubbo City Area (Koettig 1985)

In 1985, the survey by Koettig investigated the evidence of Aboriginal occupation within 5 km of Dubbo's city limits. The investigation concluded that sites exist throughout all environmental landscapes surveyed. Artefact scatters, scarred trees and grinding grooves were the most frequently occurring site types; and site location and size were determined by various environmental and social factors. Of the environmental factors, proximity to water, geological formation and availability of food resources were the most important. As such, Koettig's site prediction model suggested that: all site types would occur along watercourses; stone arrangements would occur most frequently on knolls or prominent landscape features; larger campsites would occur most frequently along permanent watercourses, near springs or wetlands; small campsites could occur anywhere; scarred trees could occur anywhere, but particularly in

remnant native woodland communities; campsites would be smaller and more sporadic near the headwaters of creeks; grinding grooves could occur where appropriate sandstone existed; quarries could occur wherever there were suitable stone sources; and shell middens could occur only along the Macquarie River.

Assessment of the prehistoric heritage in the Mudgee Shire (Haglund 1985)

Haglund (1985) conducted a study into the prehistoric heritage in the Mudgee Shire and noted that prior to colonial settlement small groups of approximately twenty Aboriginal people acted independently but engaged in friendly contact. These groups moved after variable intervals, often over a short distance or within the same area, to obtain and use different resources.

Early British explorers and settlers noted considerable variation in the numbers of Aboriginal people that would gather for food procurement activities during different seasons of the year. This seasonality was most obvious in the case of gatherings along major rivers, and it has been suggested that during dry periods the water holes remaining in the major rivers would become focal points for the usually scattered groups (Haglund 1985: 5).

Concerning the Mudgee/Gulgong area, Haglund (1985: 3) notes that the distribution of known sites cannot be seen as accurately reflecting past Aboriginal land use or site location patterns because of site loss since colonial settlement. Those sites known to exist, however, do fit within the general pattern for the various resource zones discerned by Pearson (1981).

Regional cultural heritage study: Brigalow Belt South Bioregion (Purcell 2002)

Purcell (2002) conducted a broad regional cultural heritage study of the Brigalow Belt South Bioregion in NSW. This bioregion extends from Dubbo north to Moree. Over the course of the study Purcell recorded 110 oral history interviews, located 1,110 Aboriginal sites, documented 60 traditionally used plant species and mapped landforms that have Aboriginal cultural heritage values. Of the 1,110 Aboriginal sites recorded during this assessment 893 existed on the site register prior to the study.

The field survey portion of Purcell's study primarily targeted government owned land such as state forests and a landform mapping project was undertaken to assist with the development of a predictive model for Aboriginal site distribution across the bioregion. Water localities were noted to be the major contributing element influencing the distribution of sites among landforms with sites expected to be concentrated near water localities. The landform types were classified into four key groups as shown in **Table 5-1** below. The study indicated that Aboriginal sites have been recorded more frequently on high contour and alluvial landforms. Most of the sites recorded were within 100-400 m of water.

Table 5-1: Breakdown of landforms mapped by Purcell (2002) in the Brigalow Belt South Bioregion.

Landforms	Description	Likelihood of Aboriginal sites
Alluvial	Low lying areas associated with a variety of water features including rivers, creeks, channels, billabongs, swamps and lakes. Landforms include alluvial fans, alluvial terrace, alluvium, channel, floodplain, flood channel, gilgai, wetland/swamp and palaeochannels.	Aboriginal sites occur frequently
Deep stable sand	Landform types include yellow sand sheets and sand monkey. Water is scare.	Aboriginal sites occur less frequently
Terrace group	Landform types consist of terrace with scalds, terrace with overland flow, terrace and clay pans. Each variety of terrace adjoins a landform associated with an alluvium landform.	Areas where terrace ad floodplains overlap will have a high potential for sites
Higher contour	Landforms that are elevated and consist of rocky ground, rocky ravines, colluvial slope, soil mantled slope, bench, and talus.	High frequency of sites when associated with alluvial landforms or creek lines

Aboriginal heritage study: Dubbo Local Government Area (OzArk 2006)

An assessment of Aboriginal heritage resources within the then Dubbo LGA to assist Dubbo City Council (now amalgamated into the Dubbo Regional Council) with planning was undertaken by OzArk (2006). This study aimed to consolidate previous surveys and assessments of Aboriginal heritage; set a baseline for further study; and survey areas zoned for future expansion. Approximately 1120 ha of land was surveyed within five areas surrounding the city of Dubbo. During the survey, 26 new Aboriginal sites were recorded, and eight out of 12 previously recorded sites were relocated. Several the newly recorded site types were similar to those found in previous studies. No new grinding groove sites were recorded, which was understandable given that this site type comprised only 3.6% of previously located sites within the former Dubbo LGA. Scarred tree distribution adhered to the predictive model, exclusively following waterways, and fence-lines, although this probably reflected land clearing practices more than Aboriginal site patterning. Isolated finds and open sites followed a similar pattern, largely limited to watercourse edges, and elevated terraces within 500 m of the Macquarie River and other permanent to semi-permanent waterways. No significant patterning emerged in terms of site size or quality, perhaps because surface manifestations of artefacts often do not adequately reflect site size or complexity.

Predictive model for Aboriginal site locations: the Central West Local Land Services area (OzArk 2016)

In 2016 OzArk established a predictive model for Aboriginal site locations within Travelling Stock Reserves across the Central West Local Land Services area. The landscape in the area were divided into the following types: Channel and Floodplains, Alluvial Plains, Slopes, Uplands and Downs. Observations about the location and site types recorded to date within these landforms were compiled by OzArk and it was noted that:

- A high number of sites were recorded in Slope landscapes. This was perhaps biased by the fact that Dubbo is located within this landscape type and the highest number of sites in the area have been recorded to date in and around Dubbo

- The highest concentration of sites was within Channel and Floodplain landscapes
- Alluvial Plains landscapes had the third highest concentration of sites
- Relatively small numbers of sites were recorded in Uplands landscapes
- A moderate number of sites were recorded in Downs landscapes.

The area investigated by OzArk was also divided into two stream orders with major and minor waters noted to have sensitivity with a 200 m buffer added to either side of major waters and a 100 m buffer added either side of minor waterways. The field investigation of 32 Travelling Stock Reserve areas within the area was used to test the predictive model. A total of 59 sites were recorded which included 26 modified trees, 22 artefact scatters and 11 isolated finds. Most of the recorded sites were in Channel and Floodplain landscapes with lower numbers recorded on Slopes, Alluvial Plains and Down landscapes. OzArk concluded that the most archaeologically sensitive landscape in the Central West Local Land Services area was Channels and Floodplain landscapes. Additionally, OzArk noted that 63% of the sites recorded were within the buffers of major and minor waterways.

5.3 LOCAL ARCHAEOLOGICAL CONTEXT

5.3.1 Desktop database searches conducted

A desktop search was conducted on the following databases to identify any previously recorded heritage within the survey area. The results of this search are summarised in **Table 5-2** and presented in detail in **Appendix 3**.

Table 5-2: Aboriginal cultural heritage: desktop-database search results.

Name of Database Searched	Date of Search	Type of Search	Comment
Commonwealth Heritage List	01/12/2021	Mid-Western Regional and Warrumbungle Shire LGA	No places listed on either the National or Commonwealth heritage lists are located within the survey area.
National Native Title Claims Search	01/12/2021	NSW	One Native Title Claim covers the survey area: Warrabinga-Wiradjuri #7 (NC2018/002, NSD857/2017).
AHIMS	01/09/2021[1]	10 x 10 km centred on the survey area	86 sites within the search area.
LEP	01/12/2021	Mid-Western Regional LEP 2012 and Warrumbungle LEP 2013	None of the Aboriginal places noted occur near the survey area.

A search of the Heritage NSW administered AHIMS database on 1 September 2021 returned 86 results for Aboriginal sites within a 10 km radius of the survey area (GDA Zone 56 Eastings:

[1] An updated AHIMS was completed on 8 January 2023 over the same area as the 1 September 2021 search (**Appendix 3**). This search results returned 94 sites. The additional eight sites are all those recorded as part of this assessment (**Section 6.4**).

724281–750769; Northings: 6429390– 6455408 with no buffer) (see **Table 5-3** for site types and frequencies).

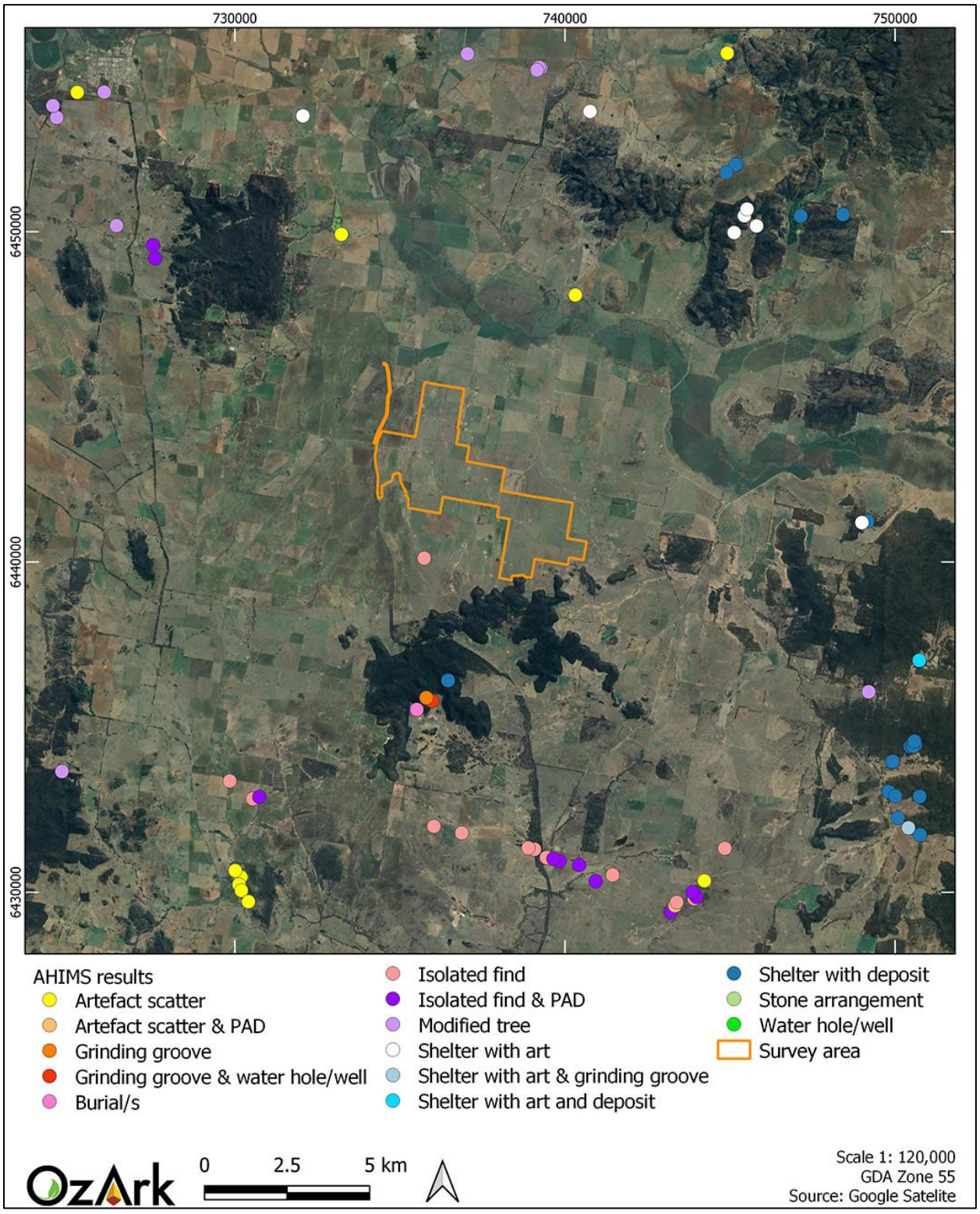
The most frequently recorded site types are rock shelters with deposit which contribute 29.1% of the site types in the vicinity of the survey area. Other frequent site types are isolated finds (16.3%), artefact scatters (11.6%), isolated finds and potential archaeological deposit (PAD) (11.6%), and modified trees (11.6%). Shelters with art (8.1%), axe grinding grooves (2.3%) and burial/s (2.3%) are also present, as well as less represented site types which only have single recording in the vicinity of the survey area (**Table 5-3**).

Site types which include shelters are in the mountainous ranges to the northeast, southeast and south of the survey area. Open artefact sites (such as scatters, isolated finds, and PADs) tend to be near recorded along watercourses, particularly named creek lines. Modified trees also tend to be located near watercourses. Recorded grinding grooves tend to be located near watercourses and on the edges of mountainous areas where suitable materials are more commonly found. **Figure 5-1** shows the location of previously recorded sites in the vicinity of the survey area.

Table 5-3: Types and frequencies of AHIMS sites within a 10 km radius of the survey area.

Site Type	Number	% Frequency
Shelter with deposit	25	29.1
Isolated find	14	16.3
Artefact scatter	10	11.6
Isolated find and PAD	10	11.6
Modified tree	10	11.6
Shelter with art	7	8.1
Axe grinding groove	2	2.3
Burial/s	2	2.3
Artefact scatter and PAD	1	1.2
Axe grinding groove and water hole/well	1	1.2
Shelter with art and axe grinding grooves	1	1.2
Shelter with art and deposit	1	1.2
Stone arrangement	1	1.2
Water hole/well	1	1.2
Total	**86**	**100**

Figure 5-1: Location of previously recorded AHIMS sites within a 10 km radius of the survey area.



5.3.2 Previous studies near the survey area

Ulan Coal Mine

Numerous studies undertaken over the past 25 years for the Ulan Coal Mine, located approximately 21 km southeast of the survey area, have recorded hundreds of Aboriginal sites. Haglund completed many of the heritage assessments at Ulan Coal Mine prior to the year 2000 and South East Archaeology has undertaken numerous investigations at Ulan since that date.

As expected, the variety of landforms present within the Ulan assessment area resulted in all site types being recorded because of these studies (including more unusual sites such as ochre quarries and a utilised rock pool); although, it was noted that in general, the landscapes were highly disturbed because of agricultural activities (clearing, ploughing, grazing) and erosional processes. Overall, quartz appears to be the predominant raw material recorded at Ulan, although significant quantities of chert are also present (Kuskie and Webster 2002; Corkill 1991; Haglund 1996). A summary of findings from the numerous assessments are detailed below.

Pre-2000 archaeological investigations

The most salient results of Haglund's early investigations are presented below:

- Survey in 1980 resulted in the identification of six sites and numerous isolated finds. Surface visibility was high at the time of Haglund's 1980 survey due to a recent drought
- During surveys in 1981, Haglund recorded 12 artefact scatters, seven rockshelters with PAD, one rock shelter with art, one rock shelter with art and PAD, one grinding groove site and 13 scarred trees (three of which were not considered to be the result of Aboriginal activity)
- The salvage excavation of the shelter site ID# 116 (36-3-0177) included 20 square metres (m^2) being excavated. This comprised 14 m^2 within and just in front of the shelter, 2 m^2 just below this, and 4 m^2 on more level parts of the adjacent slope. A total of 391 lithic artefacts and 374 flaking debris items smaller than five millimetres (mm) in length were recovered from the excavation. Haglund noted that given a volume of deposit of 8.2 cubic metres (m^3) (or 5–6 m^3 excluding major rocks) was excavated, the quantity of artefacts recovered was relatively low
- The SG5 (Spring Gully 5) rock shelter site (ID# 132) subject to an extensive salvage excavation in 1998. Site SG5 is in a sandstone rock formation bordering Spring Gully (approximately 170 m distant), a higher order but ephemeral tributary of the Goulburn River. Initially, three grinding stones and an estimated 100+ artefacts were noted, at the dripline. A total of 37 m^2 was subject to salvage excavation, comprising 32 m^2 within or marginally in front of the shelter and 5 m^2 on the adjacent slope (referred to as "Area II"). The main floor area of the shelter was almost totally excavated (referred to as "Area I"), and a smaller chamber partially excavated ("Area III"). Several charcoal samples were retrieved and subject to radiocarbon dating. Three samples were relatively recent (approximately 400 years BP) and several were older, with one dating to more than 4,000 BP

- During surveys in 1999 by Haglund, 59 shelters with PAD were recorded and at least seven shelters with rock art were also recorded. Five rockshelters were associated with grinding grooves, both portable and permanent. Sixteen artefact scatters were located on crests, simple slopes and valley floors, and a grinding groove site was recorded on a flat with exposed sandstone, leading Haglund to comment that "*the general landscape contained evidence of past Aboriginal presence*". Due to the amount of Aboriginal heritage evidence in the survey area, Haglund concluded that the activity represented was that of intense occupation over a long period of time.

Post-2000 investigations

Kuskie and Webster undertook a comprehensive survey of 498 ha of land associated with longwall panels 18–22 in ML1468. The survey identified 58 Aboriginal sites, inclduing 56 artefact scatters, one rock shelter with PAD and one ochre quarry. In addition, six PADs were also identified. Artefacts were identified at a very low mean density of 0.0025 artefacts per square metre. A total of 117 stone artefacts were recorded in detail. The lithic item assemblage was dominated by quartz (79%), with six other stone materials occurring in much lower frequencies. The evidence indicated that Aboriginal utilisation of the panels 18–22 study area was of a very low intensity and was probably infrequent and involved low numbers of people. Kuskie and Webster concluded that occupation was more likely to have been focused in surrounding areas where major watercourses and/or rockshelters suitable for habitation are located.

Kuskie and Clarke undertook a comprehensive survey of 840 ha of land across longwall panels 23–26 and W1 in 2005. The survey resulted in the identification of 65 Aboriginal sites, comprising 52 artefact scatters; seven rockshelters with artefacts; three grinding groove and artefact scatter; two grinding groove sites without associated artefacts and one scarred tree. Artefacts were identified at a very low mean density of 0.0057 artefacts per square metre. A total of 421 stone artefacts were recorded in detail. This evidence indicated that Aboriginal utilisation of the longwall panels 23–26 and W1 area was generally of a low intensity and was probably infrequent and involved low numbers of people. Kuskie and Clarke concluded that occupation of the area may largely have involved occasional and short-duration visits by small parties of hunters and/or gatherers for food procurement or transitory movement through the landscape.

Kuskie and Clarke undertook a comprehensive survey of 351 ha of land for longwall panels W2 and W3. In total, 28 Aboriginal sites were recorded, including 22 artefact scatters (incorporating 'isolated artefacts'), two rockshelters with grinding grooves and artefacts, two rockshelters with grinding grooves, and two rockshelters with artefacts. In addition, 13 rockshelters with PADs were recorded. These totals include several previously recorded sites and exclude several sites located adjacent to the area. Artefacts occurred at a very low mean density of 0.0022 artefacts per square metre of effective survey coverage (accounting for visibility), across the sampled area.

South East Archaeology (2009) completed the assessment for the Ulan Coal Continued Operations Project. The survey involved inspection of 1,888 environmentally discrete survey

areas that sampled a total area of about 4,785 ha. In total, this investigation, along with previous assessments, recorded 709 Aboriginal heritage sites in the Ulan mine lease area boundary, as well as 296 rockshelters with PADs. These sites comprise 558 open artefact sites, nine open grinding groove sites, 128 rockshelters with artefacts, art and/or grinding grooves, five scarred trees, five stone arrangements, two ochre quarries, a waterhole/well and a combined groove and artefact scatter site. A detailed occupation model for the Ulan locality and a predictive model of site location were devised and reassessed during the project. Overall, artefacts occur at a very low mean density of 0.0176 per square metre of effective survey coverage within the analysis area. The spatial distribution and nature of evidence is largely consistent with background discard, interspersed by occasional focalised areas of higher artefact density where activities or repeated activities occurred. This evidence indicates that Aboriginal utilisation of the 2008 study area was generally of a low intensity. In large part this probably relates to the limited presence of higher order watercourses within the analysis area (being situated on and around the crest of the Great Divide).

Kuskie (2010) completed the assessment for Modification 1 to the Ulan Coal Continued Operations. Survey was completed across 236 ha of land and fifty Aboriginal sites and/or PADs were noted across the assessment area comprising two artefact scatters; five isolated finds; nine rockshelters with artefacts; one rock shelter with grinding grooves and artefacts; one rock shelter with art; and 32 rockshelters with PADs.

A field survey sampling 123 ha that had not been subject to heritage survey to current standards was undertaken by Kuskie (2015) for the Ulan Continued Operations Modification 3. The survey resulted in the recording of an additional 22 Aboriginal sites, comprising 13 artefact scatters, seven isolated finds and two rockshelters with artefacts, along with five rockshelters with PADs.

A field survey sampling 98.7 ha of land was undertaken by Kuskie (2018). An additional 22.8 ha of adjacent land was also surveyed. The survey resulted in the recording of an additional 14 Aboriginal sites, comprising nine artefact scatters and five isolated finds.

Dubbo to Tamworth Gas Pipeline (Jo McDonald Cultural Heritage Management Pty Ltd [JMCHM] 1998)

In 1998, JMCHM conducted a major linear survey for the Dubbo to Tamworth gas pipeline. Archaeological survey was conducted along a 300 km pipeline construction corridor which at its closest is located 10 km north of the survey area. During the survey, a total of 98 Aboriginal sites were recorded including 57 artefact sites (open campsites and isolated finds), 36 modified trees, four rockshelters, and one axe grinding groove. Site types identified during the survey located closest along the sections closest to the survey area include scarred trees and artefact scatters.

Site distribution demonstrated a strong correlation with watercourses with 26% of sites situated less than 50 m from the closest water source and 24% between 100–200 m from the closest

water source. The grinding groove site identified was also found in association with first order watercourses, but other site types were not strongly associated with a particular part of the landscape.

Wollar – Wellington 330 kV Electricity Transmission Line (OzArk 2005)

OzArk (2005) undertook an assessment of a proposed 330 kV electricity transmission line (ETL) between Wollar and Wellington. The area assessed for the ETL is approximately 13.5 km southeast of the survey area. During the assessment, 28 Aboriginal sites were recorded which consisted of 10 artefact scatters, nine artefact scatters with PAD, seven isolated finds and two PADs. Most sites recorded during this assessment were within 200 m of water, either on the valley slopes or the valley floors (terraces / banks of watercourses).

Cobbora Coal Project (EMM Consulting 2012)

In 2012, EMM Consulting conducted an Aboriginal cultural heritage assessment for the Cobbora Coal Project, located approximately 23 km west of the survey area. The study area was comprised of sandstone ridges with scree slope edges and rock outcrops from the Dunedoo formation, valley floors, and undulating grounds. Nearby waterways included Sandy Creek, the Cudgegong River, and the Talbragar River.

A total of 229 Aboriginal sites were recorded during the survey. Overall, artefact scatters (n=164) were the most frequent site type recorded, followed by scarred trees (n=25), grinding grooves (n=18), hearths (n=15), and rock shelters with either PAD or artefacts (n=7). Quartz was the predominant material recorded for stone artefacts. To a much lesser degree, stone artefacts manufactured from volcanic materials, silcrete, quartzite, chert, calcedony, mudstone, and sandstone were also recorded.

A series of 1 m by 2 m test pits were mechanically excavated during the 2009–2010 fieldwork. Artefacts were recovered from three pits within the recorded site boundaries. The results of the subsurface testing demonstrated that artefacts are present in the topsoil in association with a minor tributary watercourse inside the Cobbora Coal Project area, as well as near the confluence of Sandy Creek and Laheys Creek.

Most of the sites recorded were in landforms associated with valley floors and watercourses and 100 of the sites occurred within 300 m of Sandy or Laheys Creeks. Many of the extensive artefact assemblages were recorded along Mebul Creek near the Cudgegong River, while many of the low-density artefact sites were recorded on undulating ground between the Talbragar and Cudgegong River catchments. Many isolated finds were also recorded along unnamed second and third order creeks despite apparent disturbances. It was concluded that the more sensitive landforms were situated in areas that were associated, or at least near, major watercourses (named rivers and creeks) with flowing tributaries along valley floors.

Beryl Solar Farm (NGH Environmental 2017)

An Aboriginal cultural heritage assessment for the Beryl Solar Farm, 35 km south of the survey area, was conducted by NGH Environmental in 2017. The Beryl Solar Farm project area consisted of 332 ha of low undulating slopes surrounding two ephemeral drainage channels. Five sites were identified during the survey, three of which were located close to Wialdra Creek near the Castlereagh River.

The assessment concluded that the survey results were consistent with the model predicting site location close to waterways, and that there was negligible potential for intact subsurface deposits with high densities of objects or cultural materials. The survey did record uncommon site types, including an axe blank and a ground-edge axe, despite the small number of identified sites.

Stubbo Solar Farm (OzArk 2020 and 2021)

OzArk conducted an archaeological assessment for the Stubbo Solar Farm located 8 km southeast of the survey area. The assessment resulted in 23 Aboriginal sites being recorded, and two previously recorded AHIMS sites located. The 25 Aboriginal sites inside the area consist of nine isolated finds, three isolated finds with PADs, two artefact scatters, nine artefact scatters with PADs, one PAD, and one modified tree.

The assessment concluded:

- In total, 309 stone artefacts were recorded during the survey. The predominant material for stone artefacts was quartz (n=246, 79.6%), followed by chert (n=22, 7.1%), mudstone (n=16, 5.2%), and volcanics (n=13, 4.2%). Also present though in much lower quantities were silcrete, petrified wood, greywacke, and chalcedony
- The most frequent type of stone artefact is flakes (n=240, 79.6%), shatter (n=36, 11.7%), cores (n=12, 3.9%), blades (n=9, 2.9%) and backed blades (n=5, 1.6%). Also present in the overall assemblage are end scrapers (n=2), flaked pieces (n=2), ground edge hatchet heads (n=2), and a microlith (n=1)
- Most sites were recorded in the ‘drainage’ landforms along Stubbo Creek or the two main tributaries northwest and southwest of Stubbo Creek
- The larger and higher-density sites are located at the confluence of Stubbo Creek and the two tributaries or further southwest along Stubbo Creek after the confluence
- The artefact sites (scatters and isolated finds) are located predominantly in erosion scalds on the edges of elevated terraces, indicating there is potential for subsurface archaeological deposits where the terrace still has topsoil and A-horizon soils present.

The assessment also concluded that the highest areas of archaeological sensitivity remained along the main watercourses (Stubbo Creek and its tributaries), which would have provided at least a semi-permanent source of water in the area. The remainder of the Stubbo Solar Farm assessment area, especially the higher to mid slopes have a much lesser degree of archaeological sensitivity. The ridgelines and crests of the low-lying rolling hills were also less

sensitive for archaeological sites than the landforms immediately adjacent to the main watercourses.

An addendum assessment for the external access tracks to Stubbo Solar Farm was undertaken by OzArk in 2021. The addendum assessment covered two eastern access easements, one western access easement and the extent of the Blue Spring Road between its intersection with Cope Road to where the eastern access easements intersect with the road. No Aboriginal sites were recorded during the addendum assessment.

Dunedoo Solar Farm (NGH Environmental 2020)

In 2020, NGH Environmental conducted archaeological investigations for the Dunedoo Solar Farm, located approximately 15 km northwest of the project area. During the investigations 26 Aboriginal sites were identified, consisting of 14 artefact scatters, nine isolated finds, and three areas of PAD. Sites were primarily recorded across the alluvial flats.

Due to the results of the survey, test excavations were conducted. Of the 75 test pits excavated across the PADs, only 13 recorded subsurface deposits. A total of five artefacts were recovered from three of the 43 test pits located across the flat plains in the western paddock; 35 artefacts were recovered from seven of the 28 test pits located across the terrace above the floodplain of the Talbragar River in the eastern paddock and a total of 45 artefacts were recovered from two of the five test pits excavated within the substation area located on a terrace adjacent to the Talbragar River.

Artefacts from the survey and test excavation were predominantly manufactured from quartz with a lesser number of chert, tuff, quartzite, fine grained siliceous, and basalt artefacts.

Tallawang Solar Farm (Umwelt [Australia] Pty Ltd)

In 2022, Umwelt (Australia) Pty Ltd (Umwelt) conducted archaeological investigations for the Tallawang Solar Farm, located approximately 13 km south of the survey area. Landforms across the assessment area include low inclination slopes bordering minor drainage lines. The ETL associated with the assessment includes slopes and edges of spur/crests extending from Barneys Reef and crosses Tallawang Creek and associated drainage lines.

Thirty-one Aboriginal sites were identified during the survey, including nine areas of PAD (six with associated surface artefacts), 12 artefact scatters and 10 isolated finds. Of the nine PADs recorded, three were assessed as having low-moderate archaeological potential; three with moderate archaeological potential and the remaining three were assessed as having moderate to high archaeological potential.

Isolated finds and artefact scatters were primarily identified across the low inclination slopes and areas adjacent to the drainage lines. PADs were typically identified across the more undulating

landforms along the ETL, primarily along Tallawang Creek and drainage lines, localised benches mid-slope and foothills.

5.4 ARCHAEOLOGICAL CONTEXT: CONCLUSION

The archaeological investigations surrounding the survey area as summarised in **Section 5.2** and **5.3** indicate that:

- Though shelters are one of the most prevalent site types in the general region, these tend to be located near mountainous areas where the necessary geological formations (i.e. sandstone overhangs) are present. These suitable landform types are not present within the survey area
- Site frequency and density are dependent on their location in the landscape and nearby resources. This theme is consistent throughout NSW and is influenced by a range of factors, the most relevant of which is the existing level of disturbance
- The highest concentration of stone artefact sites (isolated finds and artefact scatters) is found within 200 m of permanent watercourses, 100 m from semi-permanent watercourses and 30 m of drainage lines. Surface manifestations are often recorded in associated with PAD, although the integrity of PADs is often low due to existing levels of disturbance
- Further from water, sites are generally recorded along ecotone boundaries, for example, where mountainous areas join the plains
- The AHIMS data does not provide an accurate representation of past settlement strategies as most recordings are either ad hoc or because of development driven studies
- A reasonable number of modified trees are recorded across landforms surrounding the survey area despite large scale vegetation clearance across the region associated with agricultural practices
- Quartz is the predominant material for stone artefacts in the area, although volcanic materials, silcrete, quartzite, mudstone, chert, and chalcedony could also be present
- Artefact assemblages recorded in the region consist largely of unmodified flakes with few formal tools.

5.5 PREDICTIVE MODEL FOR SITE LOCATION

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and the permanence and/or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including plant and animal foods, stone and ochre resources and rock shelters, as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently, sites tend to be found along permanent and ephemeral water sources, along access or trade routes, or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally, it is the more durable materials such as stone artefacts, stone hearths, shells, and some bones that remain preserved in the current landscape. Even these, however, may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport, both over short- and long-time scales, or (b) the historical impacts associated with the introduction of European farming practices including grazing and cropping, land degradation, and farm related infrastructure. Scarred trees, due to their nature, may survive for up to several hundred years but rarely beyond.

5.5.1 Site types in the region of the survey area

The site types listed in **Table 5-4** are present in the region of the survey area. The likelihood of these sites being present in the survey area is discussed in **Section 5.5.3**.

Table 5-4: Site types recorded in the region of the survey area.

Site type	Site description
Isolated finds	May be indicative of random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or subsurface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.
Open artefact scatters	Artefact scatters are defined as two or more artefacts, not located within a rock shelter, and located no more than 50 m away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short- or long-term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of a background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'. Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources. Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.
Culturally modified trees	Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels, and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed because of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently, the distinction between European and Aboriginal scarred trees may not be clear.
Quarry sites	Typically consist of exposures of stone material where evidence for human collection, extraction and/or preliminary processing has survived. Typically, these involve the extraction of siliceous or fine grained igneous and meta-sedimentary rock types for the manufacture of artefacts. The presence of quarry/extraction sites is dependent on the availability of suitable rock formations.

Site type	Site description
Grinding grooves	Grinding grooves are the remnants of ground edge hatchet manufacture and sometimes from food preparation. The site is most likely to occur on flat outcrops of coarse-grained sandstone in the vicinity of water sources, however, grinding grooves have also been recorded on fine-grained granite and quartzite outcrops.
Rockshelters and art sites	Utilised in the past for both habitation and ceremonial purposes. The term 'rock shelter site' refers to rock shelters/rock overhangs that contain evidence such as stone artefacts and/or bones and/or plant remains (from meals eaten at the site) and/or hearths (fireplaces). Most rock shelter sites are secular in nature, however, those that also contain rock art or engravings are often believed to be non-secular in nature. The term 'rock art site' generally refers to Aboriginal ochre paintings or ochre or charcoal drawings located on a rock slab (generally in a sheltered place like the floor of a cave or rock shelter), boulder, cliff-face, cave or rock shelter wall or roof, or wall of a rock overhang. Most rock art sites are found in locations that are sheltered from the elements. This observation, however, is probably biased to some extent, as rock art would not preserve well in open positions. Rock art sites are generally believed to be non-secular in nature.
Rock engravings or petroglyphs	A type of Aboriginal art that are often located on high vantage points along ridge lines at the headwaters of creeks but can be located on any suitable fine-grained stone surface. Examination into the rock engraving process notes that it presumably first included sketching the outline of the motif; then a series of holes was drilled along the line, using a pointed stone or shell. Finally, the holes were joined by rubbing a sharp stone along the line.
PAD	Any location where the potential for subsurface archaeological material is moderate or high, relative to the surrounding study area landscape. The potential for subsurface material to be present is assessed using criteria developed from the results of previous surveys and excavations relevant to the region.
Hearths/ovens	Features used by Aboriginal people for the preparation of food and would generally be in the vicinity of available resources, such as water sources to procure fish and shellfish, and on elevated ground to avoid impact from environmental threats.
Burials	Generally found in soft sediments such as aeolian sand, alluvial silts, and rock shelter deposits. In valley floor and plains contexts, burials may occur in locally elevated topographies rather than poorly drained sedimentary contexts. Burials are also known to have occurred on rocky hilltops in some limited areas. Burials are generally only visible where there has been some disturbance of sub-surface sediments or where some erosional process has exposed them.
Bora/Ceremonial sites	Places which have ceremonial or spiritual connections. Ceremonial sites may comprise of natural landscapes or have archaeological material. Bora sites are ceremonial sites which consist of a cleared area and earthen rings.

5.5.2 Landform modelling of archaeological potential

A consideration of the landforms within the survey area enables a prediction regarding the type and distribution of sites to be made (see **Section 4.1.1** for details of landforms within the survey area).

In the region, artefact sites and scarred trees will almost exclusively only be recorded on flats and gently undulating landforms, generally within 30 m of semi-permanent creeks and drainage lines, while rockshelters are the most likely site to be recorded on slopes greater than 10 degrees where ridges or crests are present, however, this landform type is not present within the survey area.

As most of the survey area consists of gentle slopes and flat plains adjacent to creeks and drainage lines, previous findings indicate that low-density artefact scatters would be the most common site type to be present.

The clearing of vegetation inside the survey area is widespread and typical of a highly modified agricultural landscape. Remnant trees remain throughout the survey area in areas such as along fence lines, property boundaries, road corridors and near waterways. The extent of vegetation clearance across the study area increases the likelihood that any modified trees have been

removed. However, should mature native vegetation remain, particularly along creeks within the survey area, culturally modified trees may be present.

Most of the survey area has been subject to cropping and/or grazing. Cropping involves ploughing the ground surface, which ultimately affects the integrity of archaeological Aboriginal sites, in particular open camp sites, within the 'plough zone' by moving deposits both horizontally and vertically. The grazing of hoofed livestock significantly shuffles or compacts the ground surface.

The directs impacts to the ground surface through vegetation clearance, cropping and grazing ultimately results in indirect impacts to Aboriginal sites as they ultimately accelerate soil loss. Based on the direct and indirect impacts which have affected the survey area, sites such as artefact scatters or isolated finds present within the survey area are likely to be in a secondary context and not associated with intact subsurface deposits.

5.5.3 Conclusion

Based on knowledge of the environmental contexts of the survey area and a desktop review of the known local and regional archaeological record, the following predictions are made concerning the probability of landforms within the survey area to contain Aboriginal objects (**Table 5-5**), and what types of sites may be present within the survey area (**Table 5-6**).

Table 5-5: Likelihood of landforms within the survey area to contain Aboriginal objects.

Survey Unit	Landform type	Likelihood to contain Aboriginal objects
1	Drainages	Archaeological studies in the region indicate that banks and elevated terraces adjacent to drainage lines or watercourses were favoured occupation locations and therefore have high potential for occupation sites to be present. Due to the presence of semi-permanent creeks across the survey area, low-density artefact scatters are the most likely site type to be recorded. Previous studies in the district also indicate that these landforms may contain intact deposits however as most of these landforms have been impacted by erosion and cultivation these sites may be dispersed and intact deposits would only be present if deposits are deep.
2	Flats	Flat landforms were favoured occupation locations when in proximity to permanent and semi-permanent water sources. However, the flat landforms characterised in this survey unit include areas over 200 m from water sources. Due to this distant and the uniformity of this landform there are no distinct resources which would have encouraged occupation. Past studies show that isolated finds and low-density artefact scatters may still be present in the landforms however they are generally in a secondary context from agricultural practices.
3	Gentle slopes	Slopes are a degrading landform, especially in the survey area where vegetation removal has accelerated soil loss. Given the slopes in the survey area consist of gentle gradients they are still suitable for occupation and often favoured as they are more elevated, however, when distant to water they are less likely to have been occupied.

Table 5-6: Likelihood of certain site types being present in the survey area.

Site type	Likelihood of being present in the survey area
Isolated finds	As isolated finds can occur anywhere, particularly within disturbed contexts, it is predicted that this site type could be recorded within the survey area.
Open artefact scatters	Stone artefact distributions of variable artefact densities are some of the most common Aboriginal object found within the region. A general correlation between landform and the nature of the evidence of past Aboriginal occupation is evident. Higher artefact density sites are located on elevated landforms adjacent to waterways. The survey area contains three named creeks and two unnamed tributaries. As OzArk (2020) showed, the perennial nature of watercourses in the general region does not impede the recording of artefacts and PADs near watercourses.

Site type	Likelihood of being present in the survey area
Culturally modified trees	While most of the survey area has been cleared for grazing and farming activities, sections of mature aged vegetation are scattered throughout the survey area and the corridors of Barneys Reef Road are densely vegetated. As such, there is potential to identify this site type within the survey area if trees of an appropriate age are present. Several modified trees have been recorded within 10 km of the survey area and an additional 25 known modified trees are present within 25 km of the survey area which raises the likelihood of this site type being present.
Quarry sites	No quarry sites have been recorded in the surrounding landforms and areas with potential for outcropping rock are limited in the survey area. As such, it is unlikely this site type would be recorded.
Burials	While this site type is rare there is the possibility of it being present. However, the widespread disturbance from agricultural land use across the survey area may have disturbed this type of site.
Hearths/ovens	While several hearths have been recorded approximately 25 km west of the survey area, this site type is not predicted to remain intact within the survey area based on previous levels of disturbance.
PAD	Numerous PADs have been recorded across the region, largely in association with surface manifestations along watercourses. This raises the possibility that the survey area contains PADs, especially associated with drainage landforms.
Bora/Ceremonial sites	The distribution of ceremonial sites and Bora grounds across the landscape is somewhat unpredictable as the choice of their location appears to be based on spiritual reasons rather than simply landscape features and resources. As site types such as modified trees and art sites have been recorded in the district, their presence in the survey area cannot be discounted. Overall, this site type is a rare site type with a low likelihood of being present and remaining extant. These sites are generally identified through consultation with the RAPs.
Rock shelters	Rock shelters have been recorded in the wider region. However, based on preliminary landform analysis of the survey area (see **Section 5.5.2**) it is unlikely suitable landforms for large rock outcrops or overhangs are present within the survey area. Therefore, rock shelters will not be recorded.

5.6 RESEARCH QUESTIONS

Several research questions can meaningfully be applied to the investigation of the survey area. These research questions include:

- How do the raw materials and artefact types recorded within the survey area compare with those recorded in the surrounding region?
- What tasks were Aboriginal people undertaking at the sites?
- Do the findings within the survey area (if any) accord with the regional archaeological context examined in **Section 5.2** and support the predictive model set out in **Section 5.5**?

6 RESULTS OF ABORIGINAL ARCHAEOLOGICAL ASSESSMENT

6.1 SAMPLING STRATEGY AND FIELD METHODS

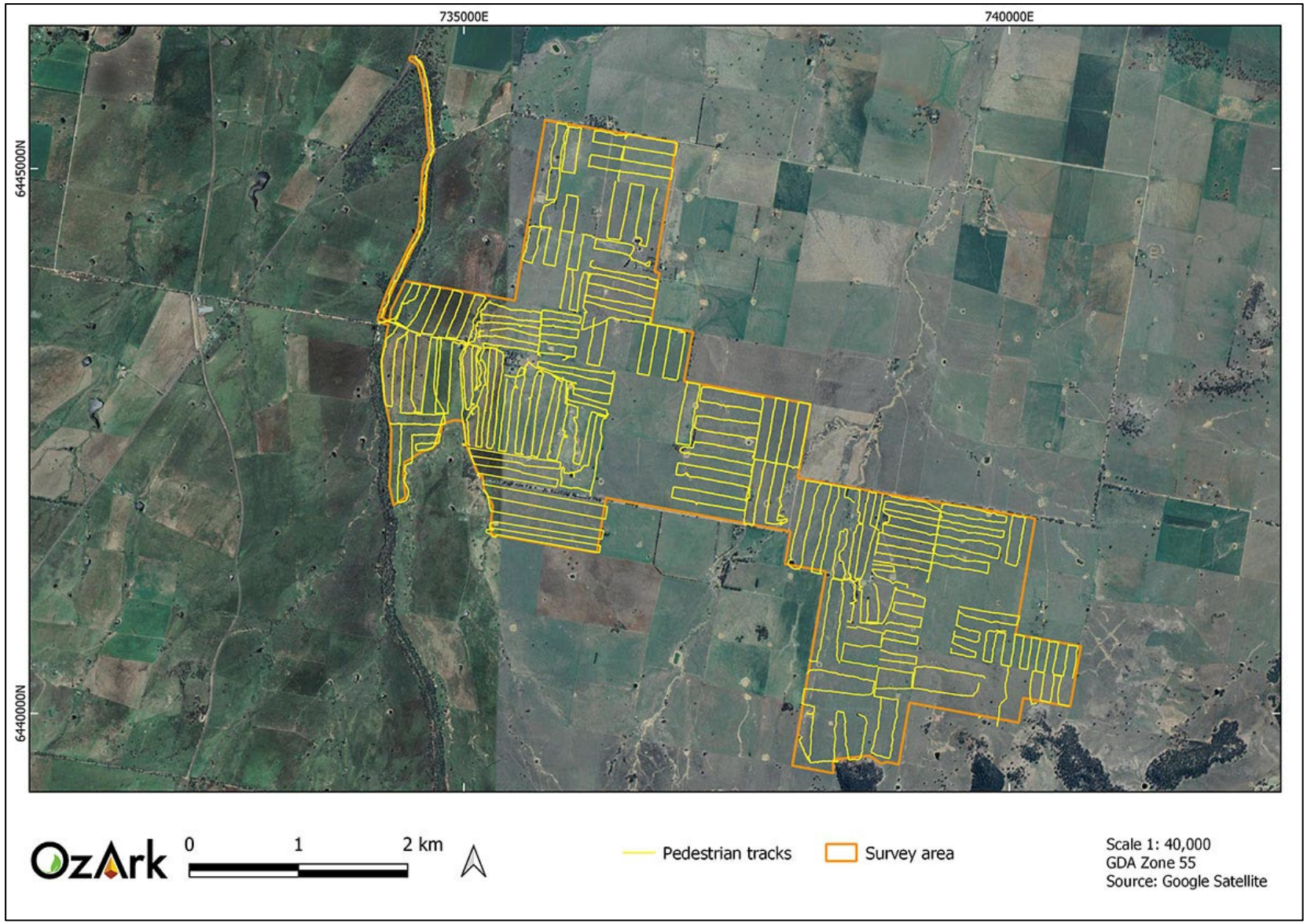
The archaeological methods utilised in the Aboriginal archaeological assessment followed the Code of Practice. Standard archaeological field survey and recording methods were employed (Burke and Smith 2004).

It should be noted that the aim of any archaeological survey is not to locate each artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within the survey area are known. Therefore, the aims of the survey were to:

- Conduct pedestrian transects to sample across all landforms in the survey area so that their archaeological potential could be determined
- Evaluate whether the predictive model set out in **Section 5.5** is valid and answer the research questions in **Section 5.6**
- Determine if any portions of the survey area require test excavation to understand the archaeological potential at a particular location.

Figure 6-1 shows the survey tracks of the OzArk archaeologists during the survey. As well as the archaeologists, there were up to two Aboriginal site officers undertaking the survey on each day, so the actual area of survey coverage was greater than is indicated on this figure.

Figure 6-1: Pedestrian coverage of the survey area.



6.2 PROJECT CONSTRAINTS

The greatest constraint during the fieldwork was very limited areas of exposure, as this was an issue across all survey units (**Section 6.3**). The dense ground cover could be explained by the large amount of rainfall that the region has experienced since early 2020 which has exacerbated weed and grass growth.

6.3 EFFECTIVE SURVEY COVERAGE

Two of the key factors influencing the effectiveness of archaeological survey are GSV and ground surface exposure (GSE). These factors are quantified to ensure that the survey data provides adequate evidence for the evaluation of the archaeological materials across the landscape. For the purposes of the current assessment, these terms are used in accordance with the definitions provided in the Code of Practice.

GSV is defined as:

> *… the amount of bare ground (or visibility) on the exposures which might reveal artefacts or other archaeological materials. It is important to note that visibility, on its own, is not a reliable indicator of the detectability of buried archaeological material. Things like vegetation, plant or leaf litter, loose sand, stone ground or introduced materials will affect the visibility. Put another way, visibility refers to 'what conceals'* (DECCW 2010: 39).

GSE is defined as:

> *… different to visibility because it estimates the area with a likelihood of revealing buried artefacts or deposits rather than just being an observation of the amount of bare ground. It is the percentage of land for which erosion and exposure was sufficient to reveal archaeological evidence on the surface of the ground. Put another way, exposure refers to 'what reveals'* (DECCW 2010: 37).

Table 6-1 calculates the effective survey coverage within the survey area. In general, **Table 6-1** presents an approximation of the amount of ground surface able to be seen at any location within specific landform units. For example, at any one location within the drainage landforms of the survey area approximately 16% of the ground surface could be seen. Exposures in these landforms were generally confined to the immediate edges of the drainage lines where levels of erosion were greatest. The amount of visible ground decreased significantly across the remainder of Survey Unit 1 and the remaining survey units across the survey area due to very thick ground cover. Exposures in these landforms were generally confined to the areas of disturbances due to agricultural practices, i.e. contouring, vehicle tracks, dams and fences.

Table 6-1: Effective survey coverage within the survey area.

Survey Unit	Landform	Survey Unit Area (sq m)	Visibility %	Exposure %	Effective Coverage Area (sq m) (= Survey Unit Area x Visibility % x Exposure %)	Effective Coverage % (= Effective Coverage Area / Survey Unit Area x 100)
Survey Unit 1	Drainages	3,680,000	80	20	588,800	16%
Survey Unit 2	Flats	3,620,000	60	<5	108,600	3%
Survey Unit 3	Gentle slopes	5,850,000	60	<5	175,500	3%

Table 6-2 demonstrates that the low survey efficacy across all survey units could have contributed to the low number of Aboriginal objects recorded. The only recordings were predominately in Survey Unit 1 which was predicted to be the most favourable landform to record sites (**Section 5.5.3**). The types of sites recorded also confirm the predicative model being low density artefact sites.

In general, to offset the lack of visibility, the assessment relied on an examination of the archaeological potential of the landforms present. Although Surveys Units 2–3 have a low archaeological potential, they were nevertheless extensively surveyed (**Figure 6-1**) and the assessment concluded that the low survey efficacy Surveys Units 2–3 did not prevent the archaeological potential of these landforms being understood.

Table 6-2: Effective survey coverage and incidences of site recording.

Landform	Landform area (sq m)	Area Effectively Surveyed (sq m) (= Effective Coverage Area)	% of Landform Effectively Surveyed (= Area Effectively Surveyed / Landform x 100)	Number of Sites	Number of Artefacts or Features
Drainages	3,680,000	588,800	16%	5	17
Flats	3,620,000	108,600	3%	1	1
Gentle slopes	5,850,000	175,500	3%	1	3

6.4 ABORIGINAL SITES RECORDED

Table 6-3 summarises the Aboriginal cultural heritage sites recorded during the survey and **Figure 6-2** shows the location of the recorded sites.

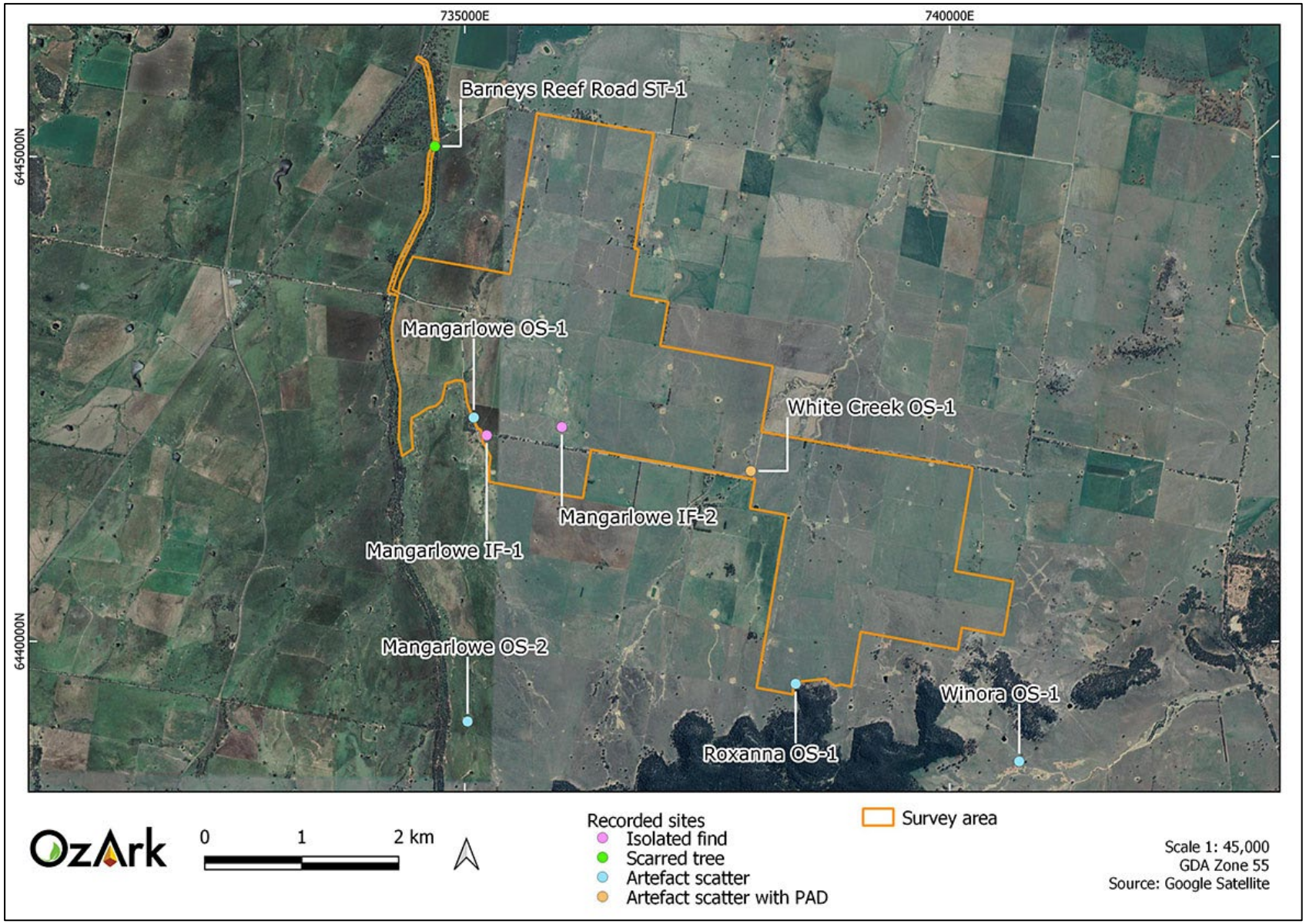
It should be noted that three of the sites listed in **Table 6-3** are not located within the survey area. Sites Mangarlowe OS-2 and Winora OS-1 were recorded during the survey of two connection options which are not included in this SSD application (**Section 1.2**), and Roxanna OS-1 was identified approximately 8 m outside the survey area. While these sites are not located within the survey area, the sites details are provided below to ensure they are appropriately documented.

Further details on each site follows.

Table 6-3: Aboriginal cultural heritage sites recorded during the survey.

AHIMS ID	Site name	Site type	Coordinates (GDA Zone 55) East	Coordinates (GDA Zone 55) North	Survey Unit
36-3-3836	White Creek OS-1	Artefact scatter with PAD	737950	6441755	1
36-2-0519	Mangarlowe OS-1	Artefact scatter	735095	6442310	1
36-2-0520	Mangarlowe OS-2	Artefact scatter	735028	6439173	1
36-3-3835	Roxanna OS-1	Artefact scatter	738413	738413	3
36-3-3834	Winora OS-1	Artefact scatter	740718	6438760	1
36-2-0517	Mangarlowe IF-1	Isolated find	735227	6442124	2
36-2-0518	Mangarlowe IF-2	Isolated find	736001	6442213	1
36-2-0516	Barneys Reef Road ST-1	Scarred tree	734691	6445104	1

Figure 6-2: Location of newly recorded Aboriginal sites.



White Creek OS-1

Site type: Artefact scatter with PAD

GPS coordinates: GDA Zone 55 737950E 6441755E

Location of site: Located to the east of White Creek within Lot 30 DP750755, approximately 85 m directly north and 35 m west of Birriwa Bus Route South (**Figure 6-3**); 430 m northeast of the Hayfield homestead and 6.5 km directly east of the Castlereagh Highway.

Description of site: White Creek OS-1 is located on the elevated, flat bank of White Creek within a cleared paddock currently used for grazing. Six artefacts were recorded along the immediate bank of the creek which is highly eroded (**Table 6-4** and **Figure 6-4**). The artefacts are all manufactured from quartz and include complete and broken flakes. Based on the landform type and proximity to White Creek, the site is considered to be associated with PAD. The PAD excludes the eroded banks of the creek and is bounded to the north by an area which has been heavily disturbed by wombat burrows. Aerial imagery confirms that the area delineated as PAD has been subject to ploughing in the past and therefore, is not considered to be associated with intact deposits within the top 20–25 cm. Soils at the site are likely to be much deeper based on the profile provided by the wombat burrows, and as such, intact deposits may be present beneath the plough zone.

Figure 6-3: White Creek OS-1 location.

Table 6-4: White Creek OS-1 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Quartz	Complete	Tertiary	22x13x7
Flake	Quartz	Proximal fragment	Tertiary	10x12x4
Flake	Quartz	Complete	Tertiary	15x20x5
Flake	Quartz	Medial fragment	Tertiary	11x13x5
Flake	Quartz	Medial fragment	Tertiary	13x12x4
Flake	Quartz	Complete	Tertiary	12x15x4

Figure 6-4: White Creek OS-1. View of site and selection of recorded artefacts.

1. View south along the eastern bank of White Creek at the location of White Creek OS-1.

2. White Creek OS-1 artefacts: quartz flakes.

Mangarlowe OS-1

Site type: Artefact scatter

GPS coordinates: GDA Zone 55 735095E 6442310N

Location of site: Located on the Mangarlowe property within Lot 36 DP750755, approximately 10 m directly east of Birriwa Bus Route South (**Figure 6-5**); 388 m east of Browns Creek and 3.5 km directly east of the Castlereagh Highway.

Description of site: Mangarlowe OS-1 is a low-density artefact scatter consisting of a tuff and a quartz flake (**Table 6-5** and **Figure 6-6**). Both artefacts are at a tertiary stage of reduction. The site is located within a cleared, cultivated paddock and therefore are in a secondary context. Soils consist of light yellow, sandy soils. The GSE at the time of recording was low (50%).

Mangarlowe OS-1 is not considered to be associated with subsurface archaeological deposits as it is located within a secondary context.

Figure 6-5: Mangarlowe OS-1 and IF-1 location.

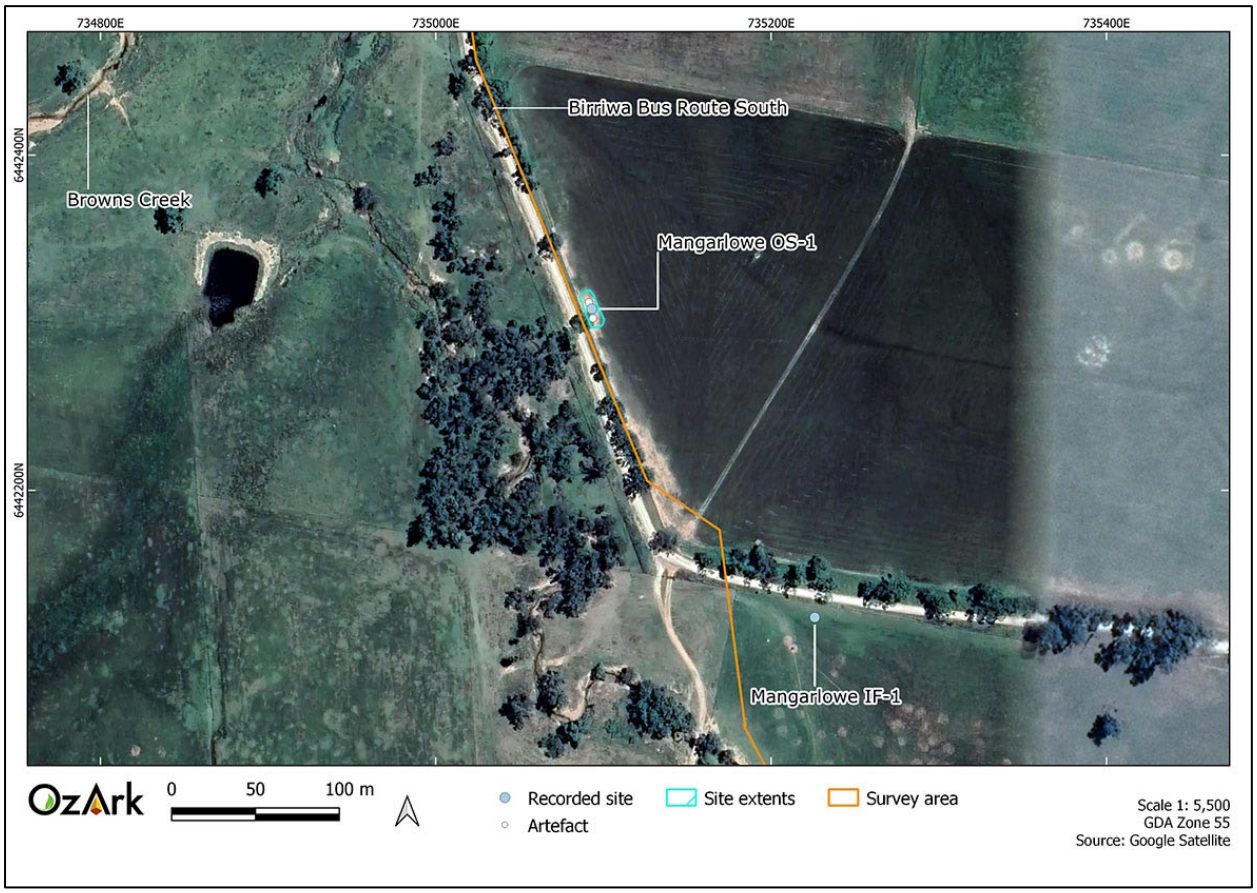
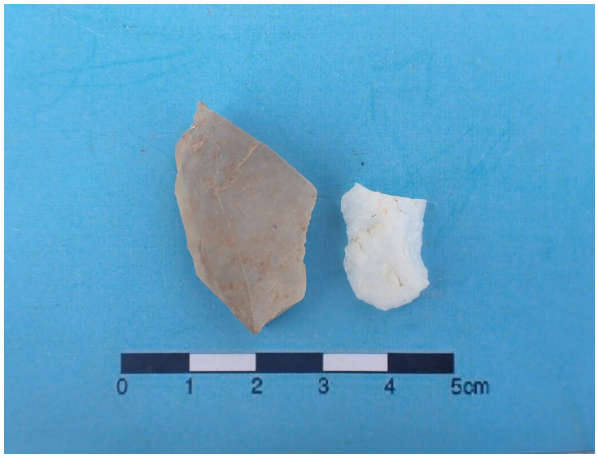


Table 6-5: Mangarlowe OS-1 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Tuff	Complete	Tertiary	35x20x7
Flake	Quartz	Complete	Tertiary	20x15x5

Figure 6-6: Mangarlowe OS-1. View of site and recorded artefacts.

1. View southwest to Mangarlowe OS-1 along the fence line bordering Birriwa Bus Route South.



2. Mangarlowe OS-1 artefacts: a tuff and a quartz flake.

Mangarlowe OS-2

Site type: Artefact scatter

GPS coordinates: GDA Zone 55 735028E 6439173N

Location of site: Located on the Mangarlowe property within Lot 71 DP750755, 316 m directly east of Browns Creek (**Figure 6-7**); 1.6 km north of Slapdash Creek and 2.9 km directly south of Birriwa Bus Route South.

Description of site: Mangarlowe OS-1 is a low-density artefact scatter consisting of five artefacts located along the eastern side of a drainage line of Brown Creek. Artefacts are predominately quartz, with mudstone and silcrete also present (**Table 6-6** and **Figure 6-8**). All recorded artefacts are at a tertiary stage of reduction. The site is located within a cleared, cultivated paddock and areas which have been eroded, therefore they are in a secondary context. Soils consist of light yellow, sandy soils. The GSE at the time of recording was moderate (50%) along the immediate bank of the drainage line.

Mangarlowe OS-2 is not considered to be associated with subsurface archaeological deposits as it is located within a secondary context.

Figure 6-7: Mangarlowe OS-2 location.

Table 6-6: Mangarlowe OS-2 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Quartz	Complete	Tertiary	19x12x5
Flake	Quartz	Distal fragment	Tertiary	9x12x3
Flake	Quartz	Complete	Tertiary	15x22x11
Flake	Silcrete	Proximal fragment	Tertiary	20x22x5
Flaked piece	Mudstone	N/A	Tertiary	49 mm (maximum size)

Figure 6-8: Mangarlowe OS-2. View of site and selection of recorded artefacts.

1. South southeast towards Mangarlowe OS-2 showing areas of erosion along the drainage line and Barneys Reef in the background.

2. Mangarlowe OS-2 artefacts: a mudstone flaked piece and quartz flakes.

Roxanna OS-1

Site type: Artefact scatter

GPS coordinates: GDA Zone 55 738413E 738413N

Location of site: Located on the Roxanna property within Lot 47 DP750755 (**Figure 6-9**), approximately 5 km south of Birriwa Bus Route South and 3.6 km directly east of Barneys reef Road and 4.8 km directly west of Merotherie Road.

Description of site: Roxanna OS-1 is a low-density artefact scatter consisting of three quartz artefacts (**Table 6-7** and **Figure 6-10**). Two artefacts are complete flakes, and one is a distal fragment. All artefacts are at a tertiary stage of reduction. The site is located on a gentle slope at the edge of a densely vegetated area and cleared, cultivated paddocks. Soils consist of light yellow, sandy soils. The GSE at the time of recording was moderate (50%).

Roxanna OS-1 is not considered to be associated with subsurface archaeological deposits as the site has been heavily impacted by erosion.

Figure 6-9: Roxanna OS-1 location.

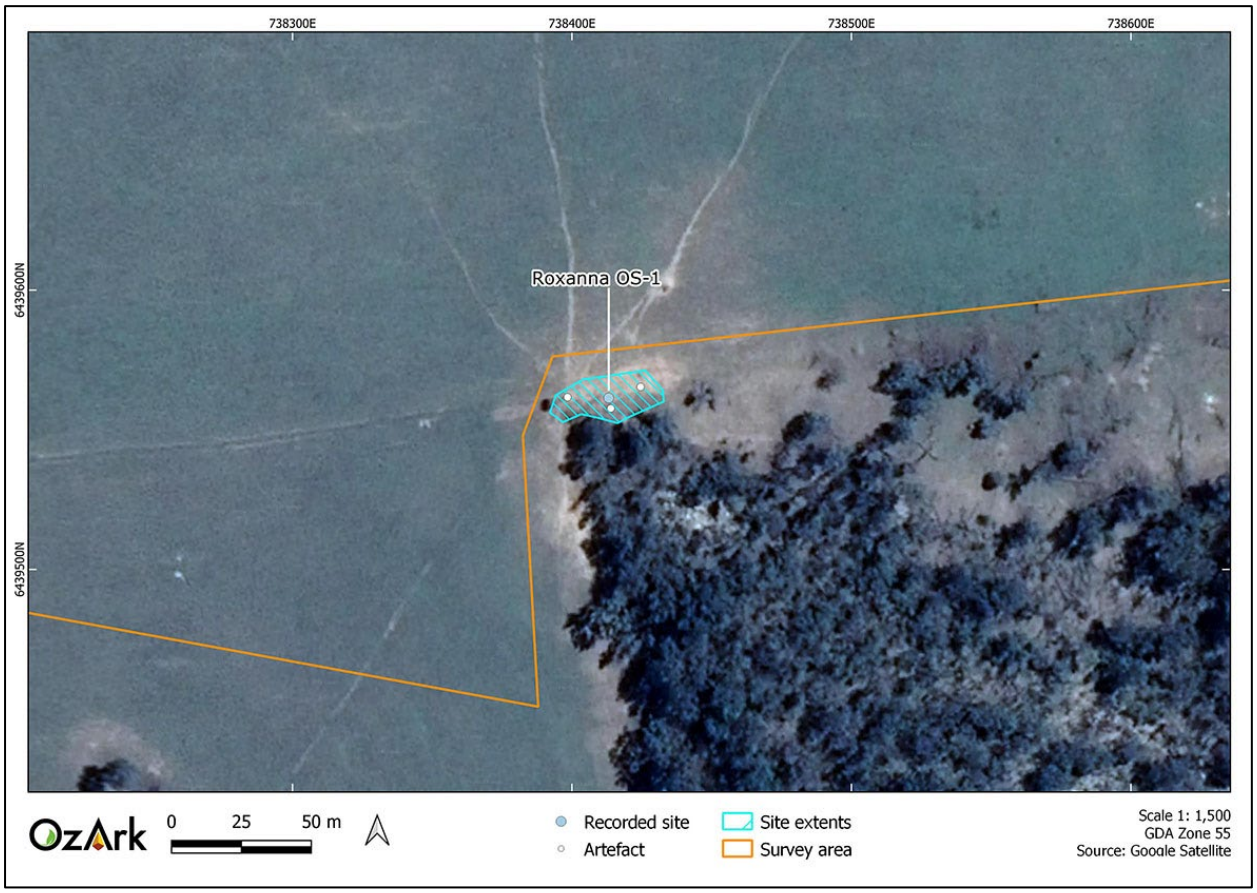
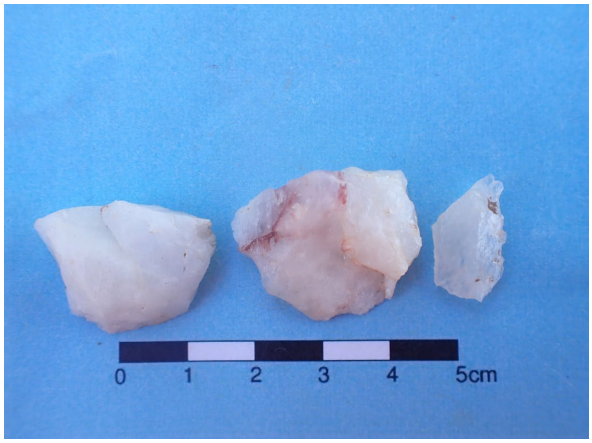


Table 6-7: Roxanna OS-1 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Quartz	Complete	Tertiary	22x20x9
Flake	Quartz	Complete	Tertiary	25x15x8
Flake	Quartz	Distal fragment	Tertiary	10x19x3

Figure 6-10: Roxanna OS-1. View of site and recorded artefacts.

1. View west to Roxana OS-1 in a large area of exposure



2. Roxanna OS-1 artefacts: quartz flakes.

Winora OS-1

Site type: Artefact scatter

GPS coordinates: GDA Zone 55 738413E 738413N

Location of site: Located on the Winora property within Lot 53 DP750755 (**Figure 6-11**), approximately 2.7 km directly west of the Merotherie Road and 2.9 km south of Birriwa Bus Route South and 5.0 km east of Barneys Reef Road.

Description of site: Winora OS-1 is a low-density artefact scatter consisting of flakes manufactured from silcrete, basalt and quartzite (**Table 6-8** and **Figure 6-12**). Two artefacts are at a secondary stage of reduction. The site is located within a cleared, cultivated paddock and therefore are in a secondary context. Soils consist of light yellow, sandy soils. The GSE at the time of recording was low (40%).

Winora OS-1 is not considered to be associated with subsurface archaeological deposits as it is located within a secondary context.

Figure 6-11: Winora OS-1 location.

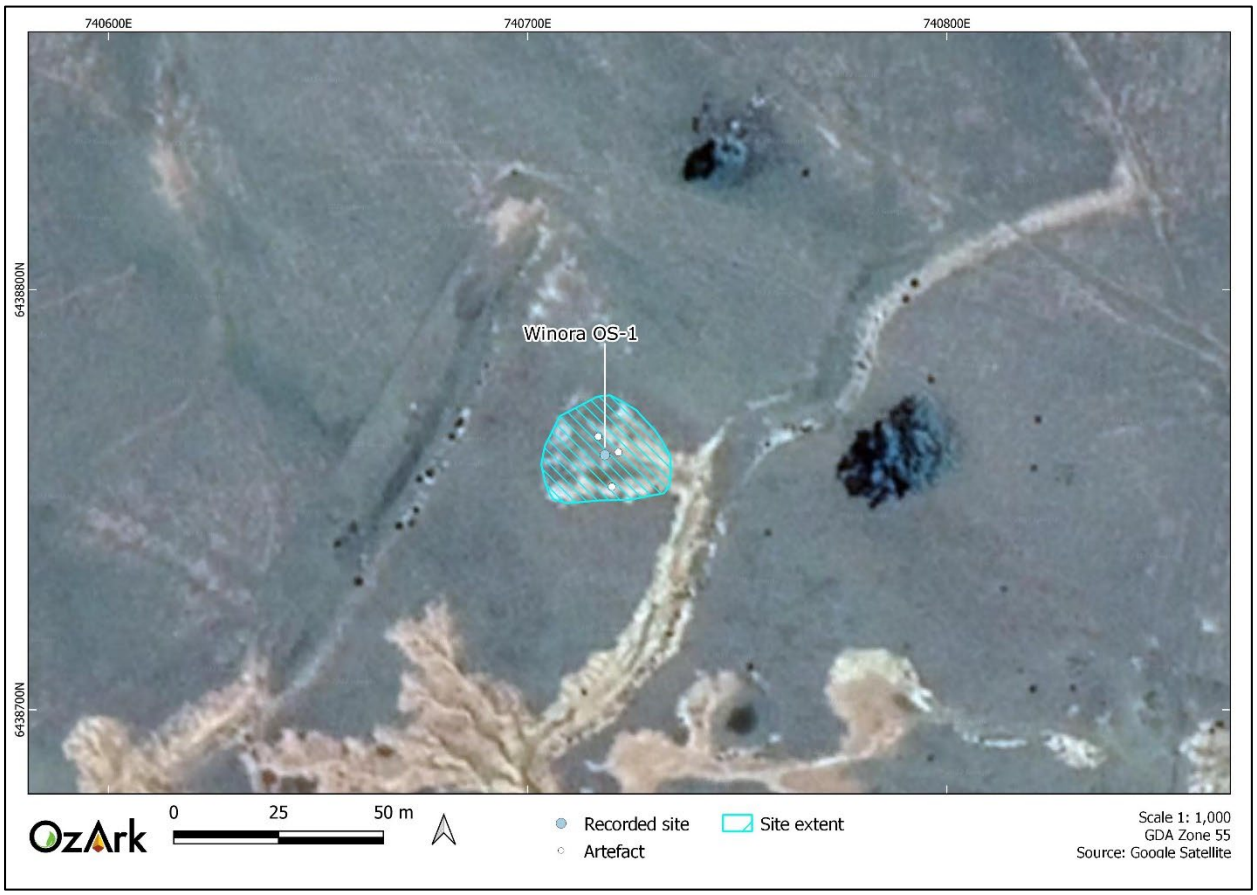


Table 6-8: Winora OS-1 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Basalt	Complete	Tertiary	41x25x8
Flake	Silcrete	Proximal fragment	Secondary	35x37x10
Flake	Quartzite	Complete	Secondary	35x20x5

Figure 6-12: Winora OS-1. View of site and recorded artefacts.

1. View west to Winora OS-1 at an area of erosion, showing Barneys Reef in the background.

2. Winora OS-1 artefacts: a quartzite, basalt and silcrete flake.

Mangarlowe IF-1

Site type: Isolated find

GPS coordinates: GDA Zone 55 735227E 6442124N

Location of site: Located on the Mangarlowe property within Lot 37 DP750755, approximately 13 m directly south of Birriwa Bus Route South (**Figure 6-5**); 720 m east of Browns Creek and 3.5 km directly east of the Castlereagh Highway.

Description of site: Mangarlowe IF-1 is a single, broken flake manufactured from a volcanic tuff (**Table 6-9** and **Figure 6-13**). The blade is at a tertiary stage of reduction and is located within a cleared, cultivated paddock. Soils consist of light yellow, sandy soils. The GSE at the time of recording was low (20%).

Mangarlowe IF-1 is not considered to be associated with subsurface archaeological deposits as it is located within a secondary context.

Table 6-9: Mangarlowe IF-1 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Volcanic	Medial fragment	Tertiary	37x19x6

Figure 6-13: Mangarlowe IF-1. View of site and recorded artefact.

1. View northeast to Mangarlowe IF-1 showing Birriwa Bus Route South in the background.

2. Mangarlowe IF-1 artefact: a volcanic flake.

Mangarlowe IF-2

Site type: Isolated find

GPS coordinates: GDA Zone 55 736001E 6445104N

Location of site: Located on the Mangarlowe property within Lot 16 DP750755, approximately 195 m directly north of Birriwa Bus Route South (**Figure 6-14**) and 4.2 km directly east of the Castlereagh Highway. The site is located along the north dam wall which has been constructed along a drainage line of Browns Creek. The site is 1.4 km directly east of Browns Creek itself.

Description of site: Mangarlowe IF-1 is a single, complete flake manufactured from a volcanic tuff (**Table 6-10** and **Figure 6-15**). The blade is at a tertiary stage of reduction and located within a cleared, cultivated paddock and has been impacted by the construction of a dam. Soils consist of light yellow, sandy soils. The GSE at the time of recording was moderate (60%).

Mangarlowe IF-2 is not considered to be associated with subsurface archaeological deposits as it is located within a secondary context.

Table 6-10: Mangarlowe IF-2 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Volcanic	Complete	Tertiary	27x25x5

Figure 6-14: Mangarlowe IF-2 location.

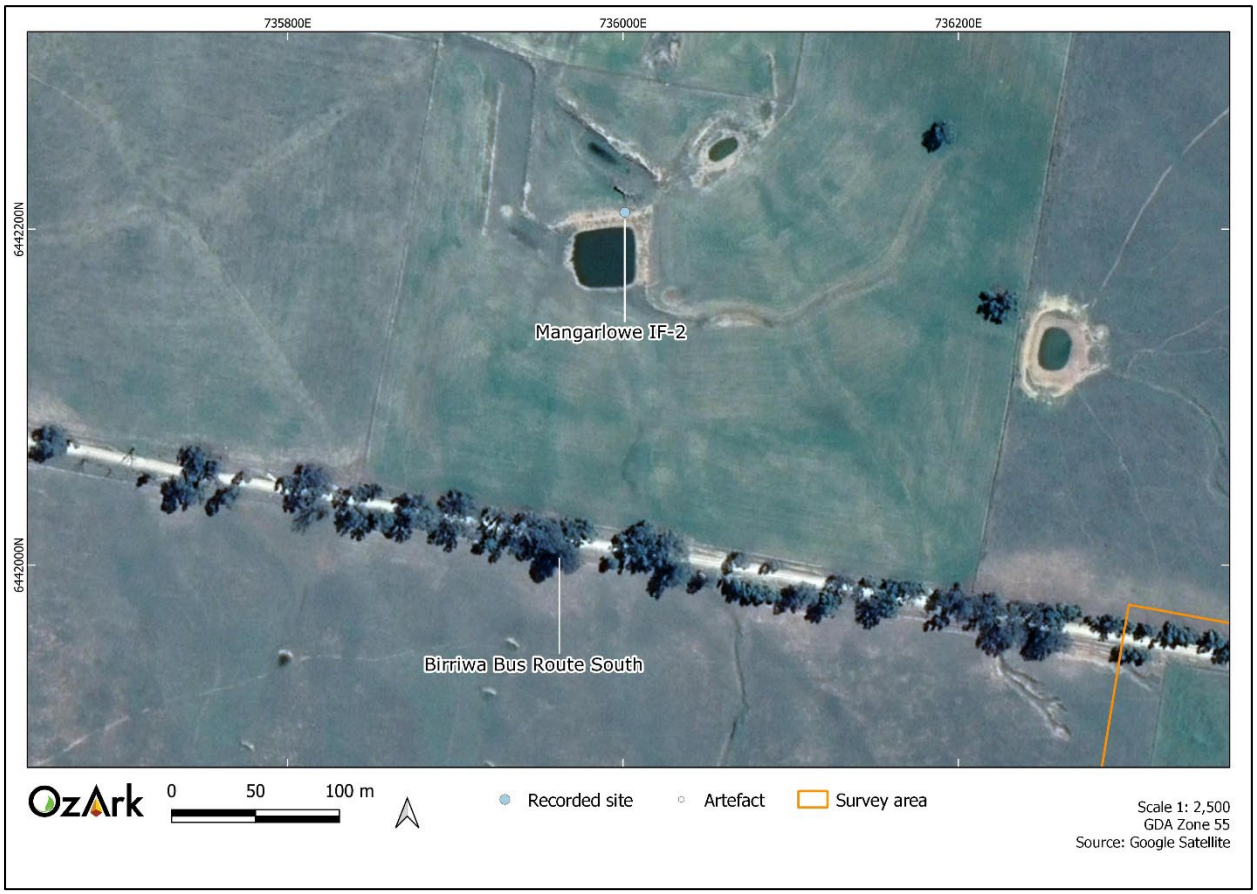


Figure 6-15: Mangarlowe IF-2. View of site and recorded artefact.

1. View west towards Mangarlowe IF-2 located on the northern dam wall.

2. Mangarlowe IF-2 artefact: a volcanic flake.

Barneys Reef Road ST-1

Site type: Scarred tree

GPS coordinates: GDA Zone 55 734691E 6445104N

Location of site: Located approximately 60 m southwest of the intersection of Barneys Reef Road and Birriwa Bus Route North (**Figure 6-16**); 390 m directly west of Huxleys Creek and 780 m directly east of the Castlereagh Highway.

Description of site: Barneys Reef Road ST-1 scar tree located on a flat, low-lying landform. Barneys Reef Road ST-1 comprises one oval scar on a live tree with an epicormic shoot at the base (**Table 6-11**; **Figure 6-17** and **Figure 6-18**). No tool marks are visible. The tree and the scar are in good condition and have not been impacted by any works associated with the use or construction of Birriwa Bus Route North.

Figure 6-16: Barneys Reef Road ST-1 location.

Table 6-11: Barneys Reef Road ST-1 attributes.

Type of tree	**Gum**
Condition of tree (good, fair, dead)	Good
Circumference (m)	3 m
Scar Length (cm)	66 cm
Scar Width (cm)	24 cm

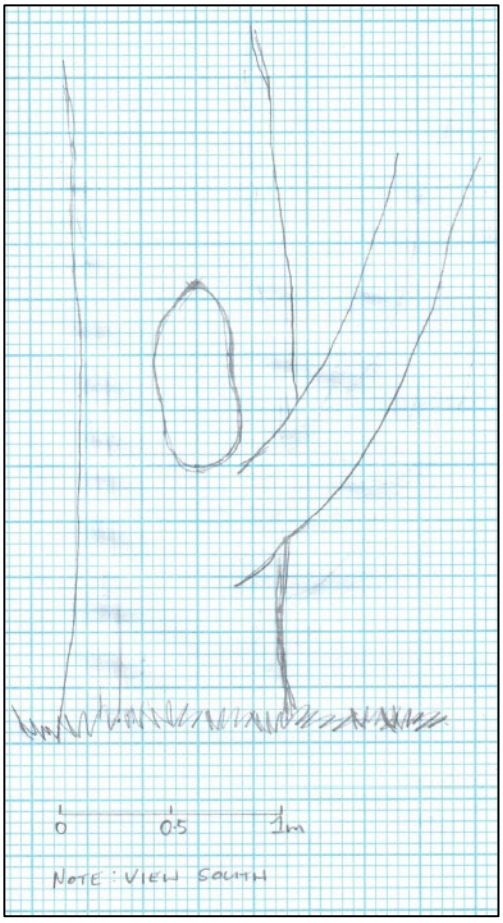
Scar Depth (cm)	5 cm
Overgrowth (cm)	10 cm
Scar shape (Elongated, oval, irregular)	Oval
Orientation (direction of scar is facing)	North
Condition of scar (good, fair, poor)	Good
Associated with artefacts/PAD	No

Figure 6-17: Barneys Reef Road ST-1. View of the scarred tree.

1. View south towards Birriwa Bus Route ST-1.

2. Close up view of the scar.

Figure 6-18: Sketch of Barneys Reef Road ST-1 scar.



6.5 ABORIGINAL COMMUNITY COMMENTS ON THE SURVEY

No specific comments relating to the survey methodology, or the landforms being surveyed, were raised by the RAPs during the survey. No cultural values relating to the survey area were identified to OzArk.

6.6 TEST EXCAVATION

A major aim of this assessment was to determine whether any portions of the survey area require test excavation to understand the archaeological potential at a particular location (**Section 6.1**). The examination of the landforms was considered to be prudent for this investigation given the low GSV across the survey area (**Section 6.2** and **6.3**).

At a desktop level, the archaeological potential of the landforms present was considered greatest across Survey Unit 1 which includes a 200 m buffer on the drainage lines and watercourses including Huxleys, Browns and White Creeks. This determination was based on the results of previous archaeological assessments completed across the region which indicate that artefacts scatters, isolated finds and PADs have been commonly recorded within 100 m of similar semi-permanent watercourses but are more commonly found along the immediate banks and/or terraces associated with these watercourses (**Section 5**). These site types have also been recorded along drainage lines, but previous investigations show they are typically found within 30 m of drainages given they are less reliable sources of water.

While previous archaeological assessments in the surrounding area indicate an increased likelihood of PADs being present in association with surface manifestations within the survey area based on watercourses being present, the results of the field survey conclude that the general site integrity is low for the recorded isolated finds and artefact scatters. The determination that none of the recorded sites, excluding White Creek-OS1, are associated with PAD was based on the observation that all recorded sites are in secondary contexts having been moved by the repeated, extensive ploughing undertaken across the survey area and other disturbances including the construction of dams, access tracks, erosion and construction of fences (**Section 4.5**).

With regards the remaining areas within Survey Unit 1, no areas of PAD were identified during the survey, except for the slightly elevated area along White Creek associated with White Creek OS-1. The lack of PAD recordings across Survey Unit 1 is based on several factors. With regards to Huxley Creek and the northern portion of Browns Creek, considerable water pooling was present at distances up to approximately 100 m from the creek lines during the survey indicating that they are poorly draining landforms and would not have been favourable locations of camping. Further south along Browns Creek, the soils transition into a coarse, sandy well-draining soil however most of this section of the creek models as an area of ‘higher flood hazard’ which has exacerbated erosion along the banks of the creek and caused sections to become highly incised

thereby removing large sections of the creek bank. The landforms along this section of Browns Creek and also flat and differentiated and therefore there are no specific areas along this section of the creek that indicate they would have been more favourable for occupation, particularly given a lack of tangible evidence within the areas of erosion. Landforms adjacent to White Creek are also heavily eroded with the watercourse becoming highly incised. Part of the creek has also been impacted by the construction of a dam. The landform on the western side of the creek is sloping while the landform to the east is generally flat, with a gentle rise to the south where the area of PAD associated with White Creek OS-1 has been recorded.

Landforms within Survey Unit 1 have also been impacted by cultivation. As noted in **Section 4.2**, cultivation redistributes artefacts both horizontally and vertically within the soil profile and ultimately destroys the integrity of artefact assemblages within the top 20 to 25 cm of the soil profile; and can move artefacts in excess of 8 m per season of cultivation (Frink 1984; Gaynor 2001). As such, any archaeological deposits within the top 25 cm of a soil profile have no integrity and therefore limited to no conservation value. Soil deposits across the survey area have potential to be greater than 25 cm, and this was evidenced near White Creek OS-1 (see site description in **Section 6.4**). However, it is considered unlikely that deposits present at greater depths will have conservation value.

For the reasons detailed above, only one PAD has been identified within the survey area. While the watercourses would have been utilised at times when they held water there is little reason to consider, particularly given the lack of tangible evidence, significant levels of post contact disturbance and land erosion, that they would represent or contain deposits of conservation value. Instead, they are more likely to comprise a typical ‘background scatter’ of artefacts which retain little integrity.

As White Creek OS-1 (an artefact scatter with PAD) is being avoided by the project (**Section 8.2**) and no additional locations were identified within the development footprint of the project that suggest subsurface archaeological deposits of conservation value are present (**Section 8.2**), it is considered that test excavation is not unwarranted.

6.7 SUMMARY OF SURVEY RESULTS

The survey for the project resulted in eight Aboriginal sites being recorded (White Creek OS-1, Mangarlowe OS-1 and OS-2, Mangarlowe IF-1 and IF-2, Roxanna OS-1, Winora OS-1, and Barneys Reef Road ST-1). Site types include one scarred tree; two isolated finds; four artefact scatters, and one artefact scatter with PAD. Of these sites, only five (White Creek OS 1, Mangarlowe OS-1, Mangarlowe IF-1 and IF-2 and Barneys Reef Road ST-1) are located within the survey area.

Results from the current survey are:

- The dominant site type recorded is low-density stone artefact sites; while one scarred tree was also recorded
- The dominant raw material within the survey area is quartz, with small quantities of basalt, quartzite, silcrete, mudstone and volcanic materials
- All newly recorded sites are within 200 m of ephemeral watercourses except for Roxanna OS-1 and Barneys Reef Road ST-1
- Artefacts predominately consist of unmodified flakes.

6.8 DISCUSSION

The regional studies and predictive model suggested that artefact scatters and isolated finds would be the most common site types to be recorded, with scarred trees as a possibility, should mature trees be present. This is supported by the survey results which recorded isolated finds, artefact scatters, and a scarred tree.

In **Section 6.3**, it was noted that low GSV due to an extended period of high rainfall causing high, dense ground cover influenced the survey. While the low GSV may have obscured surface artefacts, it is considered that a representative sample of the survey area was achieved through transects conducted around the cleared perimeters of paddocks and through the paddocks under crops in their early stages. Rather than low GSV hampering the detection of sites it is considered more likely that most landforms of the survey area would have only supported sporadic or short-term visitation due to past high levels of disturbance, and the relatively undifferentiated nature of the landforms. GSV was highest across Survey Unit 1 which was considered to have the greatest potential for sites to be recorded. Despite larges areas of exposure being present, few sites were identified and the archaeological potential along most of the drainages was considered low as they were low-lying and poorly draining.

The stone artefact sites recorded during the survey are representative of sites recorded in the region. In terms of site size, artefact density, raw materials, and artefact types these complement the archaeological context highlighted in **Section 5.2** and **5.3**. Regional studies show that most sites will include quartz and that most artefacts recorded were unmodified flakes. The most frequent type of artefact recorded during the survey was quartz, with most flakes being complete but showing no signs of retouch or use wear. Further, all artefact scatters were of low-density with the highest number of artefacts recorded at a site (White Creek OS-1) being six artefacts.

In the past, sites such as isolated finds and artefact scatters would not have been rare and on a state-wide scale, low density artefact scatters and isolated finds would remain the most common site type recorded. Although the sites recorded during this assessment are in no way remarkable, their presence alone, in albeit a much-modified landscape, remains a memory of the past in a landscape that is fast changing (or has changed). The results of the survey conclude that the

general site integrity is low. As noted, the survey area has been subject to wide range of past and current land uses including cultivation, grazing and erosion.

6.8.1 Responses to the research questions

In **Section 5.6** several research questions were advanced to guide the survey of the survey area. Following the survey, responses to these research questions are set out below.

- How do the raw materials and artefact types recorded within the survey area compare to those recorded in the surrounding region?
    - Regional studies show that most sites will include quartz and chert and that most artefacts recorded were unmodified flakes. The most frequent type of artefact recorded during the survey was quartz flakes, with most flakes being complete but showing no signs of retouch or use wear.
- What tasks were Aboriginal people undertaking at the sites?
    - The recorded stone artefact sites are representative of a 'background scatter' of artefacts that are found in almost all landscapes in Australia and can provide no further information other than the fact that the landforms were used at one time or another by Aboriginal people. The recorded scarred tree is not associated with a broader site complex and does not provide sufficient evidence to understand the purpose of the bark removal that created the scar.
- Do the findings within the survey area (if any) accord with the regional archaeological context examined in **Section 5.2** and support the predictive model set out in **Section 5.5**?
    - The findings of the survey area accord with the regional archaeological context. Previous assessments indicated that the landforms of the survey area have low archaeological potential and the most likely site types to be recorded would be isolated finds, low-density artefact scatters, or scarred trees. Further, regarding the artefacts themselves, the type of artefacts, the raw material they are manufactured from, and the range of tool types does not present a unique or distinguishing paradigm to the archaeological context that has been established in the region.

7 SIGNIFICANCE ASSESSMENT

7.1 INTRODUCTION TO SIGNIFICANCE ASSESSMENT

7.1.1 Identifying cultural significance

The concept of cultural significance is used in Australian heritage practice and legislation to encompass all the cultural values and meanings that might be recognised in a place. The *Burra Charter*'s definition of cultural significance is broad and encompasses places that are significant to Indigenous cultures (Burra Charter 2013).

The *Burra Charter* definition of 'place' is also broad and encompasses Indigenous places of cultural significance. 'Place' includes locations that embody spiritual value (such as Dreaming places, sacred landscapes, and stone arrangements), social and historical value (such as massacre sites), as well as scientific value (such as archaeological sites). In fact, one place may be all these things or may embody all these values at the same time.

In some cases, the find-spot of a single artefact may constitute a 'place'. Equally, a suite of related locations may together comprise a single 'place', such as the many individual elements that make up a Songline. These more complex places are sometimes called a cultural landscape or cultural route.

The Guide (OEH 2011: 8–9) notes that cultural significance is comprised of an assessment of social values, scientific values, aesthetic values, and historic values. These values are described below.

7.1.1.1 Social or cultural value

Social or cultural value refers to the spiritual, traditional, historical, or contemporary associations and attachments the place or area has for Aboriginal people. Social or cultural value is how people express their connection with a place and the meaning that place has for them.

Places of social or cultural value have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods, or events. Communities can experience a sense of loss should a place of social or cultural value be damaged or destroyed.

There is not always consensus about a place's social or cultural value. Because people experience places and events differently, expressions of social or cultural value do vary and, in some instances, will be in direct conflict. When identifying values, it is not necessary to agree with or acknowledge the validity of each other's values, but it is necessary to document the range of values identified.

Social or cultural value can only be identified through consultation with Aboriginal people. This could involve a range of methodologies, such as cultural mapping, oral histories, archival

documentation, and specific information provided by Aboriginal people specifically for the investigation.

Cultural value involves both traditional links with specific areas, as well as an overall concern by Aboriginal people for their sites generally and the continued protection of these. This type of value may not be in accord with interpretations made by the archaeologist: a site may have low archaeological value but high social value, or vice versa.

7.1.1.2 Scientific (archaeological) value

This refers to the importance of a landscape, area, place or object because of its rarity, representativeness, and the extent to which it may contribute to further understanding and information (Burra Charter 2013).

Assessing a site in this context involves placing it into a broader regional framework, as well as assessing the site's individual merits in view of current archaeological discourse. This type of value relates to the ability of a site to answer current research questions and is also based on a site's condition (integrity), content and representativeness.

The overriding aim of cultural heritage management is to preserve a representative sample of the archaeological resource. This will ensure that future research within the discipline can be based on a valid sample of the past. Establishing whether a site can contribute to current research also involves defining 'research potential'. Questions regularly asked when determining significance are: can this site contribute information that no other site can? Is this site representative of other sites in the region?

Information about scientific values will be gathered through any archaeological investigation undertaken. Archaeological investigations must be carried out according to Heritage NSW's Code of Practice (DECCW 2010).

Often scientific values are informed by social values that allow a contemporary understanding of the archaeological data to be understood.

7.1.1.3 Aesthetic value

This refers to the sensory, scenic, architectural, and creative aspects of the place. It is often closely linked with the social values. It may consider form, scale, colour, texture and material of the fabric or landscape, and the smell and sounds associated with the place and its use (Burra Charter 2013).

7.1.1.4 Historic value

Historic value refers to the associations of a place with a historically important person, event, phase, or activity in an Aboriginal community. Historic places do not always have physical

evidence of their historical importance (such as structures, planted vegetation or landscape modifications). They may have 'shared' historic values with other (non-Aboriginal) communities.

Places of post-contact Aboriginal history have generally been poorly recognised in investigations of Aboriginal heritage. Consequently, the Aboriginal involvement and contribution to important regional historical themes is often missing from accepted historical narratives. This means it is often necessary to collect oral histories along with archival or documentary research to gain enough understanding of historic values.

7.2 ASSESSED SIGNIFICANCE OF THE RECORDED SITES

Table 7-1 presents a summary of the significance assessment of Aboriginal cultural heritage sites recorded during this assessment. Further details of each of the assessment criteria are provided below.

Social or Cultural Value

The social and cultural value of Aboriginal sites is generally determined through consultation with Aboriginal people. Generally, the Aboriginal community regard all sites as having high cultural significance. This is due to all sites, even displaced artefact sites, being able to provide a connection to their ancestors, as well as being a tangible reminder of the past Aboriginal occupation of the area.

A copy of the draft ACHAR was sent to all RAPs on 29 April 2022 with a closing date of 27 May 2022 (**Appendix 1 Figure 7**). Comments received from WVWAC highlighted that "*from a Wiradjuri society view for our cultural material each piece, each site has a high social or cultural value"*.

As such, all recorded sites have been assessed as having high social and cultural value.

Archaeological/Scientific Value

The scientific significance of Mangarlowe OS-1 and OS-2, Mangarlowe IF-1 and IF-2, Roxanna OS-1, and Winora OS-1 assessed as low. The sites are assessed as having low scientific/archaeological significance based on the following values:

- Sites tend to represent artefacts in secondary contexts
- Low density of artefacts
- Common artefact types and materials in the region
- No associated archaeological deposits.

Further, these sites have low scientific values because they have little or no research potential and a very limited ability to inform researchers about the nature and extent of Aboriginal occupation in the area.

White Creek OS-1 is representative of artefact sites recorded elsewhere in the region. The site is a low-density scatter with a low complexity of tools and is manufactured from materials which are common in the region. In addition, the site is in a location where disturbances from the area's agricultural land use and/or erosion is prevalent. As the site has been recorded in association with PAD, the research potential is slightly raised, although intact stratified deposits are not expected due to disturbances from ploughing and deep deposits are not expected.

Barneys Reef Road ST-1 has been assessed as having low scientific value due to a lack of unique features such as tool marks and lack of associated archaeological deposits means that the site is unlikely to greatly contribute to our knowledge of past Aboriginal activities or settlement distribution in the region. Further, while it is acknowledged that scarred trees are a non-renewable site type which are decreasing in numbers due to land clearance, it is not considered to be a rare site type in the local area. The AHIMS search in **Section 5.3.1** shows 10 scarred trees have been recorded within 10 km of the survey area. An additional 25 scarred trees are located 24 km west of the survey area, recorded by EMM (2012) for the Cobbora Coal Mine Project (**Section 5.3.2**).

WVWAC note that the Aboriginal objects recorded across the project area provide insight into occupation across the project area and interactions between surrounding clans and Nations.

Aesthetic Value

White Creek OS-1, Mangarlowe OS-1 and OS-2, Mangarlowe IF-1 and IF-2, Roxanna OS-1, and Winora OS-1 have been assessed as having low aesthetic value. The sites do not have significant aesthetic value as the integrity of the sensory landscape has been altered in historic and modern times. Additionally, the artefacts themselves are not remarkable and are located within secondary locations.

Barneys Reef Road ST-1 has been assessed as having low aesthetic value. Despite scars on trees being typically less difficult for the layperson to interpret than stone artefact sites, the scarred tree is in an area which have been disturbed via agriculture and infrastructure (i.e. roads).

WVWAC note that Barney Reef, located to the south of the project area, is a culturally important location and is close by as with several other natural features relating to the Dreamtime. Therefore, WVWAC regard the project area as having moderate aesthetic vales.

Historic Value

The recorded Aboriginal sites do not have any association with important persons, places, or events. Therefore, the sites have no historic values.

WVWAC note that to the local Wiradjuri people, the project area has high historic values as there is clan and cultural connections, lore, song lines and the Dreamtime.

Table 7-1: Aboriginal cultural heritage: significance assessment.

AHIMS ID	Site Name	Social or Cultural Value	Archaeological / Scientific Value	Aesthetic Value	Historic Value
36-3-3836	White Creek OS-1	High	Low-moderate	Low	Nil
36-2-0519	Mangarlowe OS-1	High	Low	Low	Nil
36-2-0520	Mangarlowe OS-2	High	Low	Low	Nil
36-3-3835	Roxanna OS-1	High	Low	Low	Nil
36-3-3834	Winora OS-1	High	Low	Low	Nil
36-2-0517	Mangarlowe IF-1	High	Low	Low	Nil
36-2-0518	Mangarlowe IF-2	High	Low	Low	Nil
36-2-0516	Barneys Reef Road ST-1	High	Low	Low	Nil

7.2.1 Statement of significance

The intangible Aboriginal cultural values across the wider district relate to several important places and themes associated with non-archaeological cultural values. These places mainly relate to spiritual and ceremonial connections across the broader landscape that may encompass areas of culturally significant geographical features, such as Barney Reef.

There may be places with intangible cultural significance within the survey area, although no specific locations have so far been identified by the Aboriginal community. Surrounding areas with intangible cultural values include Barneys Reef.

The scientific value of the sites within the survey area are considered to have low potential to provide further information on the traditional Aboriginal use of the region. The remainder of the survey area has very low scientific value as it is confined to areas away from optimal occupation locations such as along reliable water sources or landforms which provide shelter and the landforms have been heavily disturbed by agricultural activities.

Apart from the general understanding of the aesthetic qualities of the survey area, there are no known places with identified aesthetic values.

8 ASSESSING HARM

8.1 AVOIDING AND MINIMISING HARM

8.1.1 Conserving significant Aboriginal cultural heritage

An object of the NPW Act is the '*conservation of objects places and features… of cultural value within the landscape, including… places, objects and features of significance to Aboriginal people*' (s.2A(1(b)(i)).

As heritage professionals, OzArk, strives for good conservation outcomes. In particular, OzArk is primarily concerned with the conservation and protection of Aboriginal cultural heritage that is of significance to Aboriginal people.

Two primary objectives when managing harm to an Aboriginal object are:

- Impacts to significant Aboriginal objects and places should always be avoided wherever possible
- Where impacts to Aboriginal objects and places cannot be avoided, projects should be amended to reduce the extent and severity of impacts to significant Aboriginal objects and places using reasonable and feasible measures.

8.1.2 Opportunities to conserve Aboriginal cultural heritage values

Based on the outcomes of the field survey, the proponent has designed the development (impact) footprint of the solar panels and associated infrastructure to ensure sites 36-3-3836 (White Creek OS-1 and its associated PAD), 36-2-0519 (Mangarlowe OS-1) and 36-2-0517 (Mangarlowe IF-1) will be avoided by the project.

Site 36-2-0516 (Barneys Reef Road ST-1) can be avoided by any road upgrades required to Barney Reef Road.

Three of the recorded sites, 36-3-3835 (Roxanna OS-1), 36-2-0520 (Mangarlowe OS-2) and 36-3-3834 (Winora OS-1), are located outside of the project area and therefore will not be impacted.

8.2 NO AREAS OF PAD WERE IDENTIFIED ACROSS THE SURVEY AREA, EXCEPT AT WHITE CREEK OS-1, DESPITE THE PRESENCE OF NAMED WATERCOURSES FOR SEVERAL REASONS INCLUDING HIGH LEVELS OF DISTURBANCE (BOTH MAN-MADE AND NATURAL); LACK OF DIFFERENTIATION ACROSS THE LANDFORMS; AND LACK OF TANGIBLE EVIDENCE. (SECTION 6.6). WHILE THIS ASSESSMENT HAS CONCLUDED THAT THE LANDFORMS ACROSS THE SURVEY AREA ADJACENT TO THE WATERCOURSES HAVE LOW ARCHAEOLOGICAL POTENTIAL, A 30 M BUFFER IS BEING APPLIED TO BROWNS AND WHITE CREEKS AS THEY ARE THIRD ORDER STREAMS. DIRECT IMPACTS TO WATERCOURSES WILL THEREFORE BE RESTRICTED TO CREEK CROSSINGS, THE NUMBER OF WHICH HAVE ALSO BEEN REDUCED TO LIMIT IMPACTS TO WATERCOURSES. THE PROPOSED CREEK CROSSINGS ARE LOCATED IN AREAS THAT HAVE BEEN IMPACTED BY DISTURBANCES INCLUDING BY A FARM TRACK, CULTIVATION, CONSTRUCTION OF A DAM AND/OR EROSION. LIKELY IMPACTS TO ABORIGINAL HERITAGE FROM THE PROJECT

Table 8-1 presents a summary of potential impacts to Aboriginal cultural heritage associated with the project. Of the eight Aboriginal sites recorded, one site (36-2-0518 [Mangarlowe IF-2]) will be impacted by the project.

Table 8-1: Aboriginal cultural heritage: impact assessment.

AHIMS ID	Site Name	Type of Harm (Direct/Indirect / None)	Degree of Harm (Total/Partial / None)	Consequence of Harm (Total/Partial/No Loss of Value)
36-3-3836	White Creek OS-1	None	None	No loss of value
36-2-0519	Mangarlowe OS-1	None	None	No loss of value
36-2-0520	Mangarlowe OS-2	None	None	No loss of value
36-3-3835	Roxanna OS-1	None	None	No loss of value
36-3-3834	Winora OS-1	None	None	No loss of value
36-2-0517	Mangarlowe IF-1	None	None	No loss of value
36-2-0518	Mangarlowe IF-2	Direct	Total	Total loss of value
36-2-0516	Barneys Reef Road ST-1	None	None	No loss of value

8.3 ECOLOGICALLY SUSTAINABLE DEVELOPMENT PRINCIPLES

Ecologically sustainable development principles (ESD) (defined in s.6 of the *Protection of the Environment Administration Act 1991*) requires the integration of economic and environmental considerations (including cultural heritage) in the decision-making process. Regarding Aboriginal cultural heritage, ESD can be achieved by applying the principle of intergenerational equity and the precautionary principle.

8.3.1 Intergenerational equity

Intergenerational equity is the principle whereby the present generation should ensure the health, diversity, and productivity of the environment for the benefit of future generations.

In terms of Aboriginal heritage, intergenerational equity can be considered in terms of the cumulative impacts to Aboriginal objects and places in a region. If few Aboriginal objects and places remain in a region (for example, because of impacts under previous permits), fewer opportunities remain for future generations of Aboriginal people to enjoy the cultural benefits of those Aboriginal objects and places.

Information about the integrity, rarity or representativeness of the Aboriginal objects and places proposed to be impacted, and how they illustrate the occupation and use of land by Aboriginal people across the region, will be relevant to the consideration of intergenerational equity and the understanding of the cumulative impacts of the project.

Where there is uncertainty, the precautionary principle should also be followed.

8.3.2 The precautionary principle

The precautionary principle states that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

In relation to Aboriginal cultural heritage values, the precautionary principle should be guided by:

- The project involves a risk of serious or irreversible damage to Aboriginal objects or places or to the value of those objects or places
- There is uncertainty about the Aboriginal cultural heritage values or scientific or archaeological values, including in relation to the integrity, rarity or representativeness of the Aboriginal objects or places proposed to be impacted.

8.3.3 Principle of Integration

The Plan of Implementation of the World Summit on Sustainable Development held in Johannesburg, 2002, noted the need to "*promote the integration of the three components of sustainable development- economic development, social development and environmental protection- as interdependent and mutually reinforcing pillars*".

The principle of integration ensures mutual respect and reciprocity between economic and environmental considerations:

- Environmental considerations are to be integrated into economic and other development plans, programs, and projects
- Development needs are to be considered in applying environmental objectives.

8.3.4 Applicability to the project

The loss of any Aboriginal cultural values, be they physical sites or intangible values, is to be avoided as much as is possible to ensure that the environmental impacts of the project are as

acceptable as is possible. The project generally achieves this as only one site, 36-2-0518 (Mangarlowe IF-2), will be impacted by the project.

The remaining sites will be conserved in the landscape, and the project will adhere to the ESD principles of ensuring that impacts are minimised and that the Aboriginal cultural heritage values within the survey area are maintained.

Table 8-2 examines the application of ESD principles to the project.

Table 8-2: Application of ESD principles to the project.

ESD principle	Response
Avoiding and minimising harm	Of the five sites located within the survey area, only one Aboriginal site (36-2-0518) will be impacted by the project. Site 36-2-0518 (Mangarlowe IF-2) consists of a single artefact located in a disturbed context. Mitigation measures are outlined in **Section 9.2** to minimise harm to the cultural value of the object.
The integration principle	The project presents a strong case for the broader environmental benefits arising from environmentally responsible development. The environmental consequences of the project have been carefully assessed.
The precautionary principle	The Aboriginal cultural heritage investigation has followed the precautionary principle though undertaking a robust Aboriginal cultural heritage assessment to ensure that harm to Aboriginal objects and values is minimised. The survey adopted a precautionary principle when it came to describing and assessing landforms within the survey units.
The intergenerational equity principle	The archaeological measures contained in this ACHAR are designed to mitigate the loss of inter-generational equity as much as possible. The results of the investigation and the undertakings of the proponent have ensured that most of the recorded sites will be preserved and able to be appreciated by future generations.

9 MANAGEMENT OF ABORIGINAL CULTURAL HERITAGE SITES

9.1 GENERAL MANAGEMENT PRINCIPLES

Appropriate management of cultural heritage items is primarily determined based on their assessed significance as well as the likely impacts of the project. **Section 7.2** and **Section 8.2** describe, respectively, the significance / potential of the recorded sites and the likely impacts of the project. The following management options are general principles, in terms of best practice and desired outcomes, rather than mitigation measures against individual site disturbance.

- Avoid impact by altering the project to avoid impact to a recorded Aboriginal site. If this can be done, then a suitable curtilage around the site must be provided to ensure its protection both during the short-term construction phase of development and in the long-term use of the area. If plans are altered, care must be taken to ensure that impacts do not occur to areas not previously assessed.

- If impact is unavoidable then approval to disturb sites under the authority of an ACHMP must be sought from DPE. Normally the management recommendations contained in the ACHAR become policies of the ACHMP. As the Aboriginal community have been provided the opportunity to view the draft ACHAR, the ACHAR must make it clear that a future ACHMP will manage Aboriginal cultural heritage within the survey area so that the Aboriginal community can assess the management recommendations with this knowledge. The ACHMP policies will often stipulate that the Aboriginal community should be involved in any salvage activities and will dictate what the fate of any salvaged Aboriginal objects will be.

9.2 MANAGEMENT AND MITIGATION OF RECORDED ABORIGINAL SITES

9.2.1 Surface collection

As one Aboriginal site (36-2-0518) could be harmed by the project it is recommended that the site be salvaged through the recording and collection of the surface artefact, prior to construction works proceeding. This recommendation is made due to:

- The cultural value of this site and its importance to the Aboriginal community
- The nature of the impacted site (an isolated find)
- Being in landforms with high previous disturbance from a range of factors including erosion and land use practices
- The low archaeological value assigned to the site preclude more intensive archaeological investigations

- Sites such as these have a limited ability to further inform the community about the history and culture of the area. While any potential research questions are limited, some information can nevertheless be gained.

The recommended methodology for the salvage will be finalised after the approvals process as part of the ACHMP, but will include the following measures:

- The visible artefact will be flagged in the field
- The site will be photographed after flagging and before recording
- The following artefact information will be recorded for the artefact:
    - Location
    - Artefact class
    - Artefact type
    - Size
    - Reduction level
    - Raw material
    - Notes.
- The artefact will be photographed
- An Aboriginal Site Impact Recording Form (ASIRF) will be submitted by the archaeologist detailing the salvage process at the site.

9.2.2 Long-term management of Aboriginal objects

The ACHMP would include protocols for the long-term management of the Aboriginal site salvaged for the project, as well as any additional artefacts discovered during construction and operation of the project.

Regarding the stone artefact at 36-2-0518, suitable procedures for the long-term management could include the reburial of the artefact at a location outside of impacts that adheres to Requirement 26 of the Code of Practice, or the removal of the artefact to an agreed place of safe keeping.

Any long-term management of the Aboriginal object will be done in consultation with the RAPs.

9.2.3 Fencing

The proponent has undertaken to avoid harm to all recorded sites (except 36-2-0518) through a considered design of the project components. If harm to these sites within the survey area can be achieved in final project design, they should be protected through the use high-visibility fencing.

A two-metre buffer should be applied around all stone artefact sites (isolated finds, artefact scatters and PADs). Fencing around these site types should be permanent during the construction and operation of the project to ensure they are not inadvertently impacted.

Barneys Reef Road ST-1 (36-2-0516) should be fenced around the dripline of the tree to ensure no works associated with the upgrades to Barneys Reef Road. Once upgrades to Barneys Reef Road have been completed, the fencing should be removed as there is potential that permanent fencing will draw unwanted attention to the tree from the public.

The location of all sites should be shown on all appropriate plans to ensure that they are not inadvertently harmed.

9.3 UNANTICIPATED FINDS PROTOCOL

Should development consent for the project be gained, an ACHMP would be developed in consultation with RAPs and DPE with input from Heritage NSW. The ACHMP will contain procedures should a new discovery of Aboriginal artefacts be made during construction and/or operation of the project. The procedure in **Section 9.3.1** is an example of an unanticipated finds protocol that could be incorporated into the ACHMP.

9.3.1 Unanticipated finds protocol example

An Aboriginal artefact is anything which is the result of past Aboriginal activity. This includes stone (artefacts, rock engravings etc.), plant (culturally scarred trees) and animal (if showing signs of modification; i.e. smoothing, use). Human bone (skeletal) remains may also be uncovered while onsite.

Cultural heritage significance is assessed by the Aboriginal community and is typically based on traditional and contemporary lore, spiritual values, and oral history, and may also consider scientific and educational value.

Protocol to be followed if previously unrecorded or unanticipated Aboriginal object(s) are encountered:

1. If any Aboriginal object is discovered and/or harmed in, or under the land, while undertaking the proposed development activities, the proponent must:
    a. Not further harm the object
    b. Immediately cease all work at the particular location
    c. Secure the area to avoid further harm to the Aboriginal object
    d. Notify Heritage NSW as soon as practical on (02) 9873 8500 (heritagemailbox @environment.nsw.gov.au), providing any details of the Aboriginal object and its location; and

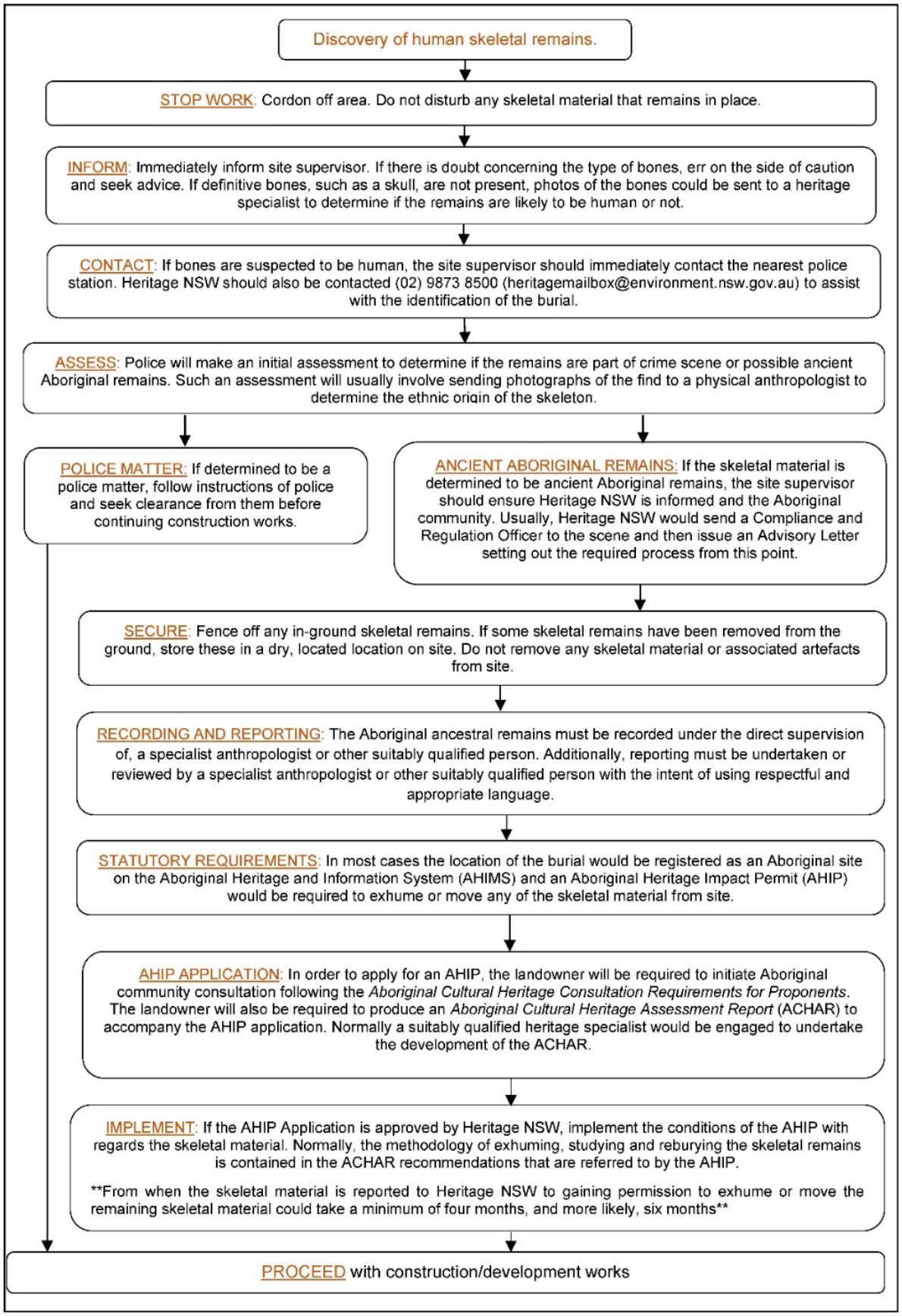
e. Not recommence any work at the particular location unless authorised in writing by Heritage NSW.

2. If Aboriginal burials are unexpectedly encountered during the activity, work must stop immediately, the area secured to prevent unauthorised access and NSW Police and Heritage NSW contacted.
3. Cooperate with the appropriate authorities and relevant Aboriginal community representatives to facilitate:
   a. The recording and assessment of the find(s)
   b. The fulfilment of any legal constraints arising from the find(s), including complying with Heritage NSW directions
   c. The development and implementation of appropriate management strategies, including consultation with stakeholders and the assessment of the significance of the find(s).
4. Where the find(s) are determined to be Aboriginal object(s), recommencement of work in the area of the find(s) can only occur in accordance with any consequential legal requirements and after gaining written approval from Heritage NSW (normally an AHIP or through the procedures of an approved ACHMP).

9.4 UNANTICIPATED SKELETAL REMAINS PROTOCOL

Should development consent for the project be gained, an ACHMP would be developed in consultation with RAPs and DPE. The ACHMP would contain procedures should a new discovery of human skeletal remains be made during construction or operation of the project. A potential flow-chart relating to the discovery of human skeletal remains is shown on **Figure 9-1**.

Figure 9-1: Example of a human skeletal remains procedure.



10 RECOMMENDATIONS

Under Section 89A of the NPW Act it is mandatory that all newly recorded Aboriginal sites be registered with AHIMS. As a professional in the field of cultural heritage management it is the responsibility of OzArk to ensure this process is undertaken.

To this end it is noted that eight Aboriginal sites were recorded during the assessment.

The following recommendations are made based on these impacts and regarding:

- Legal requirements under the terms of the NPW Act whereby it is illegal to damage, deface or destroy an Aboriginal place or object without an approved ACHMP
- The findings of the current investigations undertaken within the survey area
- The interests of the Aboriginal community.

Recommendations concerning Aboriginal cultural heritage within the survey area are as follows:

1. Following granting of development consent for the project, the proponent will be required to develop an ACHMP as per the Conditions of Approval. The ACHMP must be developed in consultation with the RAPs and DPE (with input from Heritage NSW). The ACHMP would include an unanticipated finds protocol, unanticipated skeletal remains protocol and heritage inductions and long-term management of the Aboriginal site being impacted. The ACHMP must be approved by the DPE prior to construction activities occurring within the project area.
2. Aboriginal site 36-2-0518 (Mangarlowe IF-2), located within the development footprint of the project, should be salvaged via surface collection in accordance with the management strategies set out in **Section 9.2.1** following approval of the ACHMP.
    a. The recommended methodology for the salvage will include the measures outlined in **Section 9.2.1**.
    b. The salvage works will include the mapping, analysis, and collection of the surface artefact at the affected site. Results will be included in a brief report to preserve the data in a useable form and an ASIRF will be submitted to AHIMS.
3. The proponent has undertaken to avoid harm to the remaining recorded sites through a considered design the project components. Stone artefact sites (isolated finds, artefact scatters and PADs) should be protected during the construction and operation of the project through permanent fencing. Temporary fencing should be erected around scarred tree 36-2-0516 Barneys Reef Road ST-1 during upgrades to Barneys Reef Road. The location of the sites should be shown on all appropriate plans to ensure that they are not inadvertently harmed.

4. All land-disturbing activities must be confined to within the survey area. Should the parameters of the proposed work extend beyond this, then further archaeological assessment will be required.

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APPENDIX 1: ABORIGINAL COMMUNITY CONSULTATION

Appendix 1 Figure 1: Aboriginal Consultation Log.

Date	Organisation	Comment	Method
13-Aug-21	Mudgee Guardian	Prints Tuesdays & Friday	phone
17-Aug-21	Heritage NSW	Barry Kerton (BK) sent stage1 agency letter requesting potential stakeholders. Closing date 31.8.21	email
17-Aug-21	Mudgee Local Aboriginal Land Council	BK sent stage1 agency letter requesting potential stakeholders. Closing date 31.8.21 - sent to the wrong contact details	email
17-Aug-21	Office of The Registrar, ALRA	BK sent stage1 agency letter requesting potential stakeholders. Closing date 31.8.21	email
17-Aug-21	National Native Title Tribunal	BK sent stage1 agency letter requesting potential stakeholders. Closing date 31.8.21	email
17-Aug-21	NTSCORP	BK sent stage1 agency letter requesting potential stakeholders. Closing date 31.8.21	email
17-Aug-21	Mid-Western Regional Council	BK sent stage1 agency letter requesting potential stakeholders. Closing date 31.8.21	email
17-Aug-21	Local Lands Services Central Tablelands	BK sent stage1 agency letter requesting potential stakeholders. Closing date 31.8.21	email
17-Aug-21	National Native Title Tribunal	BK Received automated message/ response	email
17-Aug-21	Mid-Western Regional Council	BK Received automated message/ response	email
17-Aug-21	Local Lands Services Central Tablelands	BK Received automated message/ response	email
17-Aug-21	Heritage NSW	BK Received automated message/ response	email
18-Aug-21	Mudgee Local Aboriginal Land Council	BK sent stage1 agency letter requesting potential stakeholders. Closing date 31.8.21 - sent to the correct contact details	email
23-Aug-21	Heritage NSW	Sheridan Baker (SB) received email containing RAP letter, turns out it was for Merriwa	email
24-Aug-21	Heritage NSW	SB sends thanks	email
24-Aug-21	Heritage NSW	SB notifies that the wrong RAP letter was attached, asks for correct one	email
25-Aug-21	Heritage NSW	BK and SB received correct RAP letter	email
18-Aug-21	National Native Title Tribunal	BK received notification *Records held by the National Native Title Tribunal as at 18 August 2021 indicate that there is 1 Native Title Determination Applications, Determinations of Native Title, or Indigenous Land Use Agreements over the identified area of the M*id- western regional council. the claim is NC2018/002, belonging to the Warabinga-Wiradjuri #7	email
25-Aug-21	Bill Allen	Brendan Fisher (BF) sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Binjang Wellington Wiradjuri Heritage Survey	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Corroboree Aboriginal Corporation	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Darlina Verrills	BK sent stage 1 community letter closes 10/9/21	postal
25-Aug-21	David Maynard	BF sent stage 1 community letter closes 10/9/21	postal
25-Aug-21	Deborah Foley	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Dhuuluu-Yala Aboriginal Corporation	BF sent stage 1 community letter closes 8/9/21	email

Date	Organisation	Comment	Method
25-Aug-21	Jean Thornton	BK sent stage 1 community letter closes 10/9/21	Postal
25-Aug-21	Jodie Mckinnon	BK sent stage 1 community letter closes 10/9/21	postal
25-Aug-21	Katrina Mckinnon	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Larry Foley	BK sent stage 1 community letter closes 10/9/21	postal
25-Aug-21	Lyn Syme	BK sent stage 1 community letter closes 10/9/21	postal
25-Aug-21	Mingaan Aboriginal Corporation	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	~~Mooka~~	~~BK sent stage 1 community letter~~	RTS
25-Aug-21	Mudgee LALC	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Murong Gialinga Aboriginal & Torres Strait Islander Corporation	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Natasha Rodgers	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	North-Eastern Wiradjuri	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Paul Brydon	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Trevor Robinson	BK sent stage 1 community letter closes 10/9/21	postal
25-Aug-21	Wamarr Cultural Consultants	BK sent stage 1 community letter closes 10/9/21	postal
25-Aug-21	Warrabinga Native Title Claimants Aboriginal Corporation	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Wellington Valley Wiradjuri Aboriginal Corporation	BK sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Wiradjuri Council of Elders	BK sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Wiradjuri Interim Working Party	BK sent stage 1 community letter closes 10/9/21	postal
25-Aug-21	Wiradjuri Traditional Owners Central West Aboriginal Corporation	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Wurrumay Consultants	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Murong Gialinga Aboriginal & Torres Strait Islander Corporation	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Murong Gialinga Aboriginal & Torres Strait Islander Corporation	BF sent stage 1 community letter closes 8/9/21	email
25-Aug-21	Paul Brydon	Paul registered as a RAP	phone
25-Aug-21	Murong Gialinga Aboriginal & Torres Strait Islander Corporation	BF thanked Debbie for EOI and registered the group	email
25-Aug-21	Warrabinga Native Title Claimants Aboriginal Corporation	Jack notified BF that Lance is no longer a member of the group and to contact himself instead - Also registered	email
26-Aug-21	Warrabinga Native Title Claimants Aboriginal Corporation	BF thanked Jack and suggested he contact HNSW to update this change in contact for the group.	email
30-Aug-21	Wellington Valley Wiradjuri Aboriginal Corporation	Brad registered as a RAP and asked to have a copy of the scoping report, if completed	email
30-Aug-21	Wellington Valley Wiradjuri Aboriginal Corporation	BF thanked Brad and said no scoping report has been completed yet	email
02-Sep-21	Woka Aboriginal Corporation	Steven Johnson registered for the project	email
02-Sep-21	Stakeholder 1	Registered for project	email

Date	Organisation	Comment	Method
02-Sep-21	Woka Aboriginal Corporation	BF thanked	email
02-Sep-21	Stakeholder 1	BF thanked	email
10-Sep-21	Wiradjuri Interim Working Party	BK received stage 1 community letter - RTS	postal
10-Sep-21	Trevor Robinson	BK received stage 1 community letter - RTS	postal
30-Sep-21	Heritage NSW	Catherine Burrowes (CB) sent advising RAP's notification email	email
30-Sep-21	Heritage NSW	CB received acknowledgment email	email
30-Sep-21	Mudgee Local Aboriginal Land Council	CB sent advising RAP's notification email	email
1-Oct-21	Mudgee Local Aboriginal Land Council	CB Sent Stage 2 RAP letter with methodology closing date 29/10/21	email
1-Oct-21	Paul Brydon	CB Sent Stage 2 RAP letter with methodology closing date 29/10/21	email
1-Oct-21	Murong Gialinga Aboriginal & Torres Strait Islander Corporation	CB Sent Stage 2 RAP letter with methodology closing date 29/10/21	email
1-Oct-21	Warrabinga Native Title Claimants Aboriginal Corporation	CB Sent Stage 2 RAP letter with methodology closing date 29/10/21	email
1-Oct-21	Wellington Valley Wiradjuri Aboriginal Corporation	CB Sent Stage 2 RAP letter with methodology closing date 29/10/21	email
1-Oct-21	Woka Aboriginal Corporation	CB Sent Stage 2 RAP letter with methodology closing date 29/10/21	email
1-Oct-21	Corroboree Aboriginal Corporation	CB Sent Stage 2 RAP letter with methodology closing date 29/10/21	email
1-Oct-21	Mudgee Local Aboriginal Land Council	CB Sent Stage 2 RAP letter with methodology closing date 29/10/21	email
15-Oct-21	Paul Brydon	CB spoke with Paul asking about attendance at field work. Paul will be unable to attend due to knee replacement.	phone
15-Oct-21	Warrabinga Native Title Claimants Aboriginal Corporation	CB Email response from Simon Blackshield *Dear Catherine, I no longer act for the Warrabinga Applicant. Please remove my contact details from your records. Best regards Simon Blackshield*	email
25-Oct-21	North-Eastern Wiradjuri	BK received phone call from Virginia Doig enquiring about fieldwork dates and project details. BK asked to call back once they could figure details out	phone
25-Oct-21	North-Eastern Wiradjuri	BK called back, providing details, and clearing up confusion as original call was asking about Merriwa, however the group was not on the HNSW list of potential RAPs for Merriwa. They were registered as a RAP. BK also organised to send methodology for comment.	phone
25-Oct-21	North-Eastern Wiradjuri	BK sent draft methodology for comment closing date 29/10/21.	email
27-Oct-21	Wellington Valley Wiradjuri Aboriginal Corporation	CB received email response to methodology	email
28-Oct-21	Wellington Valley Wiradjuri Aboriginal Corporation	Stephanie Rusden (SR) thanked WVWAC for reviewing the methodology and noted that where areas of exposure are present within the proposed survey areas, the survey team will ensure they are appropriately assessed.	email
28-Oct-21	Warrabinga Native Title Claimants Aboriginal Corporation	CB Email reminder for fieldwork	email

Date	Organisation	Comment	Method
28-Oct-21	Wellington Valley Wiradjuri Aboriginal Corporation	Brendan from WVWAC dropped by office to say hi and check details - he might be the site officer for WVWAC	in person
2-Nov-21	Gallanggabang Aboriginal Corporation	BK received a call from Melissa enquiring about a survey for a job in the area, did not know which one, so BK asked to call them back once they could look into the details.	phone
2-Nov-21	Gallanggabang Aboriginal Corporation	BK called back, no answer.	phone
2-Nov-21	Gallanggabang Aboriginal Corporation	BK received a return call from Melissa, BK explained that they would need to get in contact with someone who was in the field and would call back the following day once they heard a response.	phone
3-Nov-21	Gallanggabang Aboriginal Corporation	BK called Melissa back, no answer.	phone
3-Nov-21	Gallanggabang Aboriginal Corporation	BK received return call from Melissa. BK explained fieldwork has been assigned but that Gallanggabang can be registered late. Melissa accepted and gave her email address so that the draft methodology could be sent through.	phone
3-Nov-21	Gallanggabang Aboriginal Corporation	BK sent draft methodology.	email
29-Apr-22	Mudgee Local Aboriginal Land Council	BK sent out stage 4 closing date 27/5/22	email
29-Apr-22	Paul Brydon	BK sent out stage 4 closing date 27/5/22	email
29-Apr-22	Murong Gialinga Aboriginal & Torres Strait Islander Corporation	BK sent out stage 4 closing date 27/5/22	email
29-Apr-22	Warrabinga Native Title Claimants Aboriginal Corporation	BK sent out stage 4 closing date 27/5/22	email
29-Apr-22	Wellington Valley Wiradjuri Aboriginal Corporation	BK sent out stage 4 closing date 27/5/22	email
29-Apr-22	Woka Aboriginal Corporation	BK sent out stage 4 closing date 27/5/22	email
29-Apr-22	Stakeholder 1	BK sent out stage 4 closing date 27/5/22	email
29-Apr-22	North-Eastern Wiradjuri	BK sent out stage 4 closing date 27/5/22	email
29-Apr-22	Gallanggabang Aboriginal Corporation	BK sent out stage 4 closing date 27/5/22	email
12-May-22	Wellington Valley Wiradjuri Aboriginal Corporation	SR received Stage 4 feedback from WVWAC	email
16-May-22	Wellington Valley Wiradjuri Aboriginal Corporation	SR thanked Brad for the feedback and advised a formal response would be sent back	email
16-May-22	Stakeholder 1	BK received message that Stakeholder 1 agrees with the draft ACHAR.	email
26-May-22	Wellington Valley Wiradjuri Aboriginal Corporation	SR sent response to WVWAC feedback	email
26-May-22	Wellington Valley Wiradjuri Aboriginal Corporation	SR received email noting that WVWAC agree with OzArk's response except regarding the skeletal remain protocol	email
30-May-22	Wellington Valley Wiradjuri Aboriginal Corporation	SR responded noting that the skeletal remains protocol is not able to be amended to inform the Aboriginal community earlier	email

Appendix 1 Figure 2: Stage 1 Advertisement placed in the Mudgee Guardian.

14 MUDGEE GUARDIAN Friday, September 3, 2021 mudgeeguardian.com.au

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Death Notices

LAVENDER - ALMA

On Monday, 30th August 2021 peacefully at Gulgong MPS. Late of Yaraandoo St Gulgong and formerly of Laheys Creek.

Dearly beloved wife of Robert (dec). Much loved mother and mother-in-law of Kim (dec) and Karen & Kel. Cherished grandmother and great grandmother to their families.

Aged 82 years

Due to Covid-19 restrictions a private Funeral Service and Cremation has taken place.

EASTAUGH & CARROLL
Funeral Directors Since 1895
John Hopkins and Peter Hannigan
Cnr. Horatio and Lawson Streets, Mudgee
eastaughandcarroll.com.au
Ph: 02 6372 2384 - 24 Hours

RYAN, Athol Augustus

29th August 2021 at Wenonah Lodge. Late of Mayne Street Gulgong. Beloved husband of Helen (dec), much loved father and father-in-law of David (dec), Wendy & Paul. Adored Pop to his grandchildren Damian & Laura, Ryan & Bec and Tahnee-Rae & Matt, great grandchildren Lucy, Oliver, Luna, Quinn & Jasper. Brother to Kevin (dec), Marie (dec), Rita, John, Jean, Colin & Patricia.

Aged 90 years

"I'm good thanks mate
I'm reunited with Mum and David
And in Gods care"

Due to Covid restrictions a **Private Mass** and burial have taken place.

MACQUARIE VALLEY FUNERALS & MONUMENTS
Members of The N.F.D.A. and The F.D.A. of N.S.W. & Monumental Mason's Assoc. of NSW
118 Market Street, Mudgee
Telephone: 6372 2331 All Hours

Funeral Notices

Susan Mary LONERAGAN
10.7.1929 – 30.8.2021

Only child of Dr John Whitton Flynn and Mary Amelia Flynn nee Bridge (both dec). Widow of John R Loneragan. Mother to Sarah, Celia, John and Linda Grandmother to Isabel, Emmaline, Elinor, Oliver, Lee, Jack, Max and Charlie.

Lived a long and full life, dearly loved by her family and friends.

A private family funeral will be held on Tuesday 7th September.

A larger celebration of Sue's life will take place when restrictions ease.

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In Memoriam

In loving memory of
Tamara Kemp
25.7.1928 - 9.9.2006
Until we meet again
Rita, Lydia and Katie

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Del Mudgee/Gulgong.
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Public Notices

Expression of Interest
Cultural Heritage Management

On behalf of UPCVAC Renewables Australia (proponent), OzArk Environment & Heritage has been engaged to seek registration of Aboriginal groups or individuals who are interested in being consulted over an Aboriginal Cultural Heritage Assessment and a potential Aboriginal Heritage Impact Permit application (AHIP) for the proposed Birriwa Solar Farm. The proposed development will be located approximately 20 kilometres south-east of Dunedoo, in the Mid-Western Local Government Area.

This consultation will form part of an Aboriginal Cultural Heritage Assessment Report (ACHAR) and will assist Heritage NSW in their consideration of the project.

If you hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects or places in the proposed study area, please register your interest. Registrations can be made by post: OzArk EHM PO Box 2069 Dubbo NSW 2830; email: sheridan@ozarkehm.com.au; or by phoning OzArk on 02 6882 0118. All submissions should be received no later than **17th September 2021.**

Public Notices

Ulan Community Information Line

If you have a question, to obtain blasting information, provide us with your feedback or to register a complaint, please call us on: 1800 647 630 or please email: Ulancommunity@glencore.com.au

ULAN COAL GLENCORE

ULAN COAL GLENCORE

NOMINATIONS ARE OPEN FOR APPOINTMENT OF COMMUNITY MEMBERS TO THE ULAN COAL MINES COMMUNITY CONSULTATIVE COMMITTEE

Would you like to contribute to your community?

Many State significant projects in NSW have Community Consultative Committees.

These Committees provide a forum for open dialogue between the proponent and representatives of the local community, stakeholder groups and local councils on matters directly relating to the project.

We are looking for a mix of people who live locally or are members of a stakeholder group (eg community, environment, Aboriginal or industry) to join the Ulan Coal Mine Community Consultative Committee.

Your role as a Committee member will be voluntary.

Selection criteria: You will be expected to contribute constructively to Committee discussions, attend up to four meetings per year, and communicate information about our Operations from the Committee to the broader community.

If you would like to apply, please download a copy of the relevant nomination form at https://www.planning.nsw.gov.au/Assess-and-Regulate/Development-Assessment/Community-Consultative-Committees
Interested applicants can also contact our Committee Chairperson, Lisa Andrews at ic.articulatesolutions@gmail.com or by telephoning 0401 609 693.

Applications close on **7 September 2021** and must be sent to the Independent Chairperson of the Community Consultative Committee at Post Office Box 6017, LAKE MUNMORAH NSW 2259.

Positions Vacant

Builders Labourer

Well Established construction company is looking for a Builders Labourer / Leading Hand for Projects in Mudgee
White card essential and Immediate Start
Area: Mudgee
Ph: 0439007691
Email: team@dezign.net.au

GROUND CREW

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adzuna

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RM5539363

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Appendix 1 Figure 3: Stage 1 letter sent to agencies (sample).

OzArk Environment & Heritage
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enquiry@ozarkehm.com.au
www.ozarkehm.com.au
145 Wingewarra St
PO Box 2069
DUBBO NSW 2830

17 August 2021

Heritage NSW
Department of Premier and Cabinet
Locked Bag 5020
Parramatta NSW 2124
heritagemailbox@environment.nsw.gov.au

ABORIGINAL CULTURAL HERITAGE ASSESSMENT AND POTENTIAL AHIP APPLICATION FOR THE PROPOSED BIRRIWA SOLAR FARM, NEAR DUNEDOO.

Dear Sir/Madam,

OzArk Environment & Heritage (OzArk) has been engaged by UPC\AC Renewables Australia (proponent), to undertake Aboriginal community consultation as per the '*Aboriginal cultural heritage consultation requirements for proponents 2010' (the Guidelines)* to inform an Aboriginal Cultural Heritage Assessment Report (ACHAR).

The proponent intends to seek development consent under the *Environmental Planning and Assessment Act 1979* (EP&A Act) to develop the Birriwa Solar Farm, located approximately 20 kilometres (kms) south-east of Dunedoo, Mid-Western Local Government Area. See **Figures 1 & 2**.

Consistent with Section 4.1 of the Guidelines, we are seeking Expressions of Interest from relevant Aboriginal groups and individuals in the area who wish to be consulted in relation to the Project. This consultation is to assist OzArk and the proponent in preparing the ACHAR, and to assist Heritage NSW in their consideration of the project.

If your organisation can recommend and provide contact details for any known Aboriginal groups or individuals with cultural knowledge relevant to determining any impacts to the cultural significance of the project, please advise our office. We would appreciate it if you could provide any feedback regarding these Aboriginal stakeholder groups by responding to this email by **31 August 2021, or sooner if possible.**

Once relevant groups and individuals have been identified, they will form part of the formal consultation process for the project.

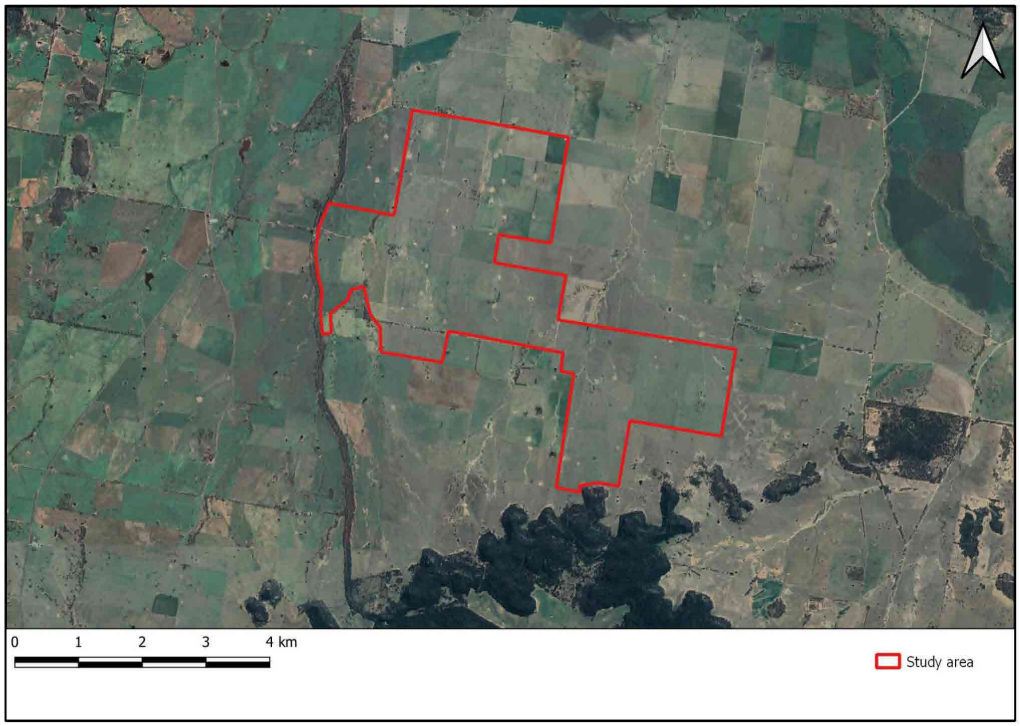
Kind regards,

Sheridan Baker
General Manager

OzArk Environment & Heritage

Figure 1. Location of development

Figure 2. Proposed development area



Appendix 1 Figure 4: Stage 1 Example of letter sent to Aboriginal community groups (sample).

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PO Box 2069
DUBBO NSW 2830

25th August 2021

[redacted]

ABORIGINAL CULTURAL HERITAGE ASSESSMENT AND AHIP APPLICATION FOR THE PROPOSED BIRRIWA SOLAR FARM, BIRRIWA NSW

Dear [redacted]

OzArk Environment & Heritage Pty Ltd (OzArk) is undertaking Aboriginal community consultation as per the *"Aboriginal cultural heritage consultation requirements for proponents 2010"*, on behalf of the proponent; UPC/AC Renewables Australia (UPC Renewables).

UPC Renewables intends to seek development consent under the *Environmental Planning and Assessment Act 1979* (EP&A) to develop the Birriwa Solar Farm, with a site investigation area covering approximately 1500ha (**Figure 1**).

Accordingly, we are seeking Expressions of Interest from relevant Aboriginal groups and individuals in the area, to form a consultation group. This consultation is to assist OzArk and UPC Renewables, in preparation of an Aboriginal Cultural Heritage Assessment Report (ACHAR), including a potential AHIP application, and to assist Heritage NSW in their consideration of the project.

If you hold cultural knowledge relevant to determining the impacts to the cultural significance of this project area, please register your interest by contacting our office. The closing date for expressions of interest is **COB Wednesday 8th September 2021.**

If you wish to register interest it is noteworthy that as per the Heritage NSW guidelines we are required to provide your details to Heritage NSW and the Local Aboriginal Lands Council unless we are advised that you do not wish your details to be released.

Once relevant groups and individuals have been identified, they will form part of the formal consultation process for the project.

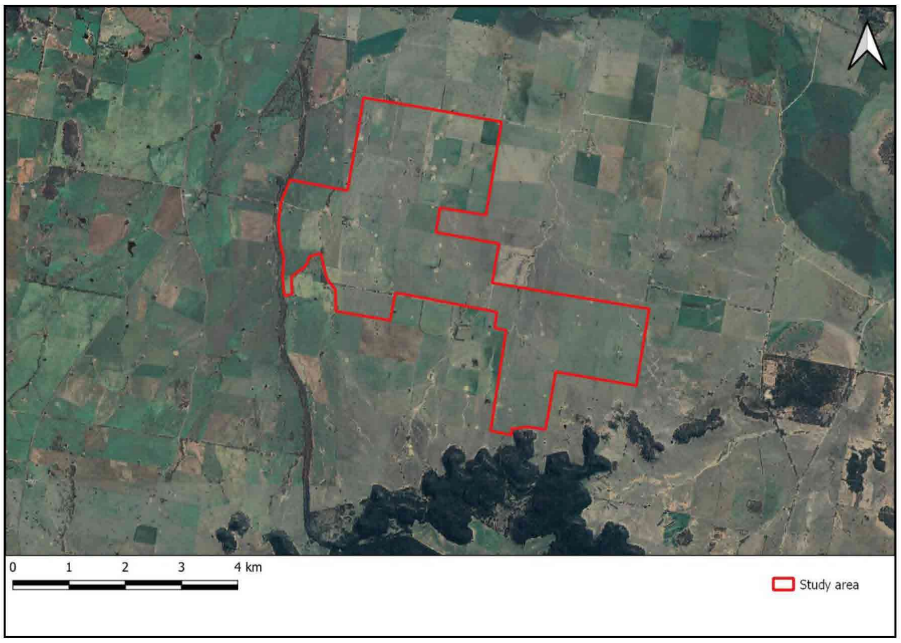
Kind regards,

Brendan Fisher
Project Archaeologist

OzArk Environment & Heritage

Figure 1. Location of development

Figure 2. Proposed development area



Appendix 1 Figure 5: Stage 2/3 cover letter and assessment methodology.

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145 Wingewarra St
PO Box 2069
DUBBO NSW 2830

1 October 2021

Members
[redacted]

ABORIGINAL CULTURAL HERITAGE ASSESSMENT FOR THE BIRRIWA SOLAR FARM

Dear Members,

Thank-you for your registration of interest to become a Registered Aboriginal Party (RAP) to be consulted for the proposed Birriwa Solar Farm Project (the project). OzArk are currently undertaking an *Aboriginal Cultural Heritage Assessment Report* (ACHAR) on behalf of UPC Renewables Australia Pty Ltd operating as UPC\AC Renewables Australia. The project is to be assessed as State Significant Development (SSD) under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of the ACHAR is to determine any impacts the project will have on Aboriginal heritage values present within the project area and to assist in developing/modifying designs in order to minimise the impacts on Aboriginal cultural heritage values.

The following project information and assessment methodology has been provided in accordance with section 4.2 and section 4.3 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a). The aim of this letter is to invite you to comment on the enclosed draft assessment methodology.

In addition to comments on the draft methodology, if you can share any Aboriginal cultural heritage knowledge relevant to the proposed project area, we welcome this input to improve our assessment outcomes and to ensure Aboriginal cultural heritage values are considered. OzArk is required to give you 28 days to supply feedback on the attached documents. This period closes 5pm **on Friday 29th October 2021.**

If you need any help supplying feedback or have any queries in relation to the enclosed information, please do not hesitate to contact our office.

Kind regards,

Catherine Burrowes
Office Manager

Appendix 1 Figure 6: Stage 2/3 RAP feedback and OzArk response.

From: WVWAC Contact Officer <WVWAC@hotmail.com>
Sent: Wednesday, 27 October 2021 7:20 PM
To: Catherine Burrowes <catherine@ozarkehm.com.au>; Jodie Benton <jodie@ozarkehm.com.au>; Stephanie <Stephanie@ozarkehm.com.au>
Subject: Birriwa Solar Farm Methodology

I apologize for the late response, due to various field and other commitments.

WVWAC members have reviewed the Birriwa Solar Farm Methodology and agree with the document in principal. We however would like increased coverage if possible over the sample areas indicated in the Methodology, if exposures or possible cultural sensitivity areas are identified by Field Officers present.

Regards

Bradley R. Bliss J.P.
WVWAC Chairman and Contact Officer
P.O. Box 1583
Orange NSW 2800
Email: WVWAC@hotmail.com
Mobile: 0427321016

RE: Birriwa Solar Farm Methodology

S

Stephanie
To WVWAC Contact Officer; Catherine Burrowes; Jodie Benton

Reply | Reply All | Forward | ...

Wed 27/10/2021 8:44 PM

Hi Brad,

All good. Thanks for taking the time to review the methodology. Where areas of exposure are present within the proposed survey areas, we will ensure they are appropriately surveyed.

Thanks
Steph

Appendix 1 Figure 7: Stage 4 cover letter.

OzArk Environment & Heritage ABN 59 104 582 354
Dubbo T: 02 6882 0118 145 Wingewarra St
Queanbeyan enquiry@ozarkehm.com.au PO Box 2069
Newcastle www.ozarkehm.com.au DUBBO NSW 2830

29 April 2022

Members
Mudgee Local Aboriginal Land Council
PO Box 1098
MUDGEE NSW 2850
mudgeelalc@bigpond.com

ABORIGINAL HERITAGE ASSESSMENT FOR THE BIRRIWA SOLAR FARM AND BATTERY PROJECT

Dear Members,

Thank-you for your continued participation as a Registered Aboriginal Party (RAP) and involvement in the above-mentioned project.

UPC Renewables Australia Pty Ltd operating as UPC\AC Renewables Australia (the Proponent) would like to offer you the opportunity to provide feedback on the draft report that has been undertaken in accordance with stage four (4) of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCR).

As per the ACHCRs we are required to give you twenty-eight (28) days to supply feedback on the attached document. This period closes COB on the **Friday 27th May 2022**. Should our office not be contacted within this time frame, we will presume that you are satisfied with the contents of the report as it stands.

If you need any help supplying feedback or have any queries, please do not hesitate to contact our office.

Kind regards,

Catherine Burrowes
Office Manager/ Community Liaison

Appendix 1 Figure 8: Stage 4 RAP feedback and OzArk response.

WVWAC feedback received 12 May 2022

WELLINGTON VALLEY WIRADJURI
ABORIGINAL CORPORATION

P.O. Box 1583
Orange NSW 2800
ABN: 77 548 143 187
ICN: 7398
WVWAC@hotmail.com

12th May 2022

Stephanie Rusden
OzArk Environment & Heritage
P.O. Box 2069
Dubbo NSW 2830

Re: DRAFT Aboriginal Cultural Heritage Assessment Report: Birriwa Solar Farm and Battery Project, Mid-Western Regional Local Government Area. Dated: April 2022.

Dear Stepanie,

Wellington Valley Wiradjuri Aboriginal Corporation (WVWAC) would like to thank you for your invitation to provide a response for This Aboriginal Cultural Heritage issue relevant to obligations to protect our Heritage within our Traditional Lands. Wellington Valley Wiradjuri represent traditional families with identified apical ancestry pre European occupation with our known Traditional Lands. We know our culture, country and continue with our association with our traditional lands (Ngurangbang).

WVWAC object to any other non-traditional aboriginal organizations or people taking part in site surveys, consultation and assessments within our defined Traditional Lands. These non-traditional people and groups are outsiders under Traditional Lore and have no right to advise on or to be present during consultation or site visits as they do not possess the specific traditional knowledge in relation to these lands or sites. These participants may be indigenous and may live locally within the region however, this still does not give them the right to disregard Traditional Lore and values.

Wellington Valley Wiradjuri Aboriginal Corporation (WVWAC) have through consultation with other Traditional Elders and Traditional Community with cultural knowledge via direct meetings, telephone and video conferencing have the following comments and or recommendations:

Section 7.2 Assessed Significance of the Recorded Sites, pp. 62-63

Table 7-1: Aboriginal cultural heritage: significance assessment.

- From a Wiradjuri Society view for our Cultural Material each piece, each site has a High Social or Cultural Value.
- We Cannot speak to the Archaeological Scientific Value, however Anthropologically these artefacts have a Moderate Academic Value in mapping and understanding Social and Cultural use of the varying materials and site locations selected, from being opportunistic to defined by patterns of seasonal and or generational use and compared to the wider landscape and the other known sites within a 50km radius gives us a greater Anthropological View and information to the Clan use of land and their relationships with surrounding Clan and Nations.
- The Aesthetic Value can remain low when only assessing 20-50m from each site location. Barneys Reef is a Culturally Important location and is close by as with several other natural features relating to the Dreamtime, only Traditional Owner Clan Descendants hold this knowledge. These locations can be identified from this project area and therefore should elevate the Aesthetic Value to Moderate.

- Historic Value, there is no Historically Important person or event from a European perspective, however there is Clan and cultural connections, Lore, Song lines and the Dreamtime all associated with the Project Area. Through Wiradjuri eyes the Historic Value is High.

Section 8.2 Likely Impacts to Aboriginal Heritage From The Project, pp. 65-66

WWAC note that there will only be 1 (one) site impacted and as a consequence there will be a total Loss of Value being 36-2-0518 Mangarlowe IF-2.

8.3.1 Intergenerational Equity, page 66.

Intergenerational equity is the principle whereby the present generation should ensure the health, diversity and productivity of the environment for the benefit of future generations (Commonwealth of Australia, 2002:5).

When assessing likely harm on Aboriginal objects and places, it is important to consider the principles of ecologically sustainable development (ESD), particularly the precautionary principle and the principle of intergenerational equity. Intergenerational equity is:

> "…the principle whereby the present generation should ensure the health, diversity and productivity of the environment for the benefit of future generations.
>
> In terms of Aboriginal heritage, intergenerational equity can be considered in terms of the cumulative impacts to Aboriginal objects and places in a region. If few Aboriginal objects and places remain in a region (for example, because of impacts under previous AHIPs), fewer opportunities remain for future generations of Aboriginal people to enjoy the cultural benefits of those Aboriginal objects and places.
>
> Information about the integrity, rarity or representativeness of the Aboriginal objects and places proposed to be impacted, and how they illustrate the occupation and use of land by Aboriginal people across the region, will be relevant to the consideration of intergenerational equity and the understanding of the cumulative impacts of a proposal. Where there is uncertainty, the precautionary principle should also be followed (DECC 2009: 26)".

- The Project Area contains newly identified archaeological sites and areas of archaeological potential. However, based on the nature of the Project, it is anticipated that impacts to the majority of these sites and areas of potential can be avoided or mitigated to ensure that harm to Aboriginal sites (of both scientific and cultural significance) is minimized, and the cultural values of area are retained while still permitting modern, sustainable land use practices.

- Given the Project Manager has undertaken to avoid the majority of cultural sites and areas of habitat. WWAC Members and knowledge Holders are of the opinion and agree that the Intergenerational Equity loss and impact to cultural sites will be minimized.

Section 9 Management of Aboriginal Cultural Heritage Sites, pp. 68-72

9.2.2 Long-term management of Aboriginal objects, page 69.

- WWAC Members and knowledge Holders formally request that the artefacts be re buried on site in an area close to where it originated where there will be no future impacts or ground disturbances. We also request that the reburial site is culturally cleansed by smoking ceremony along with the artefact/s to be reburied.

9.2.3 Fencing pp. 69-70

WWAC Members and knowledge Holders formally request that all RAP's be involved in the fencing off of the cultural sites to ensure the site locations are adequate and reassure the community the areas are protected.

9.4 Unanticipated Skeletal Remains Protocol pp. 71-72

WWAC Elders, Knowledge Holders and Members agree that this needs to be developed with RAP's and that the table on page 72 is a starting point and there is no mention of consultation with Aboriginal Community at any point in the table.

WELLINGTON VALLEY WIRADJURI
ABORIGINAL CORPORATION

P.O. Box 1583
Orange NSW 2800
ABN: 77 548 143 187
ICN: 7398
WVWAC@hotmail.com

Section 10 Recommendations, page 73.

- WVWAC Elders, Knowledge Holders and Members agree to the recommendations as written in this section.
- WVWAC Elders, Knowledge Holders and Members also formally request that due to low surface visibility throughout large sections of the survey areas, that RAP's identify areas to be re-surveyed prior to any ground disturbance if conditions have changes to ensure no surface artefact sites were missed due to long thick grass in excess of 90-100cm in height over large portions of the surveyed project area as discussed relating to project constraints and survey coverage on pp. 42-43 and 58.

WVWAC look forward to further participating in the above project, sharing our knowledge of county and to ensure our Heritage is protected. We trust our response meets your requirements. Please contact WVWAC Directors should you require our assistance to address any Aboriginal issues to support your future plans.

Regards,

Bradley R. Bliss J.P.
WVWAC CEO and Contact Officer
Senior Aboriginal Cultural Heritage Field Officer
Senior Aboriginal Cultural Mentor and Educator
Traditional Owner Clan Descendant
Mobile: 0427321016

OzArk response to WVWAC sent 26 May 2022

OzArk Environment & Heritage **ABN 59 104 582 354**

Head office: Dubbo
Satellite offices:
Queanbeyan | Wollongong
Newcastle | Brisbane

T: 02 6882 0118
enquiry@ozarkehm.com.au
www.ozarkehm.com.au

145 Wingewarra St
PO Box 2069
DUBBO NSW 2830

26 May 2022

Wellington Valley Wiradjuri Aboriginal Corporation
c/- Brad Bliss
PO Box 1583
Orange NSW 2800
wvwac@hotmail.com

BIRRIWA SOLAR FARM AND BATTERY PROJECT

RESPONSE TO STAGE 4 FEEDBACK

Dear Members,

Thank you for taking the time to review the provided *Aboriginal Cultural Heritage Assessment for the Birriwa Solar Farm and Battery Project* (herein referred to as the ACHAR) and providing your feedback dated 12 May 2022.

Please see below response to your comments, where required:

- OzArk thanks Wellington Valley Wiradjuri Aboriginal Corporation (WVWAC) for the information provided relating to the cultural, aesthetic and historic values of the recorded Aboriginal sites, the overall project area and surrounding landforms (i.e. Barneys Reef). These values will be incorporated into Section 7.2 of the ACHAR.
- WVWAC's preference for the reburial of artefacts and a smoking ceremony will be included in the ACHAR regarding the long-term management of the Aboriginal objects. The protocols for the long-term management will form part of the *Aboriginal Cultural Heritage Management Plan* (ACHMP).
- OzArk notes the request for the Aboriginal groups to be involved in the fencing of the Aboriginal sites. OzArk will supply the proponent with this request so that it can be taken into consideration when the ACHMP is being prepared.
- The human skeletal remains protocol provided in Figure 9-1 of the ACHAR does note that the Aboriginal community will be informed if skeletal remains are encountered. This will place once police have confirmed that they are ancient Aboriginal remains.
- OzArk notes the concerns WVWAC raise regarding the low ground surface visibility (GSV) across large sections of the project area and the request for areas to be re-surveyed prior to construction, if GSV has increased by this time. OzArk does not consider that further survey of the project area is warranted for the following reasons:

- The aim of any archaeological survey is not to locate each artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within a project area are known. As noted in Section 6.3 of the ACHAR, OzArk relied on an examination of the archaeological potential of the landforms due to the low GSV and concluded that they have low archaeological potential, excluding the landform at White Creek OS-1. Resurveying these landforms would not change this conclusion.
- It is OzArk's understanding that GSV across the project area (and most of NSW) is not likely to improve in the near future given the substantial amount of rainfall that much of the state has experienced since early 2020.

If you have any further questions relating to the information provided above, please feel free to contact myself or our office on (02) 6882 0118.

Kind regards,

Stephanie Rusden
Senior Archaeologist
stephanie@ozarkehm.com.au

WVWAC second response received 26 May 2022

RE: Aboriginal Cultural Heritage Assessment for the Birriwa Solar Farm and Battery Project

Reply | Reply All | Forward

WC WVWAC Contact Officer <WVWAC@hotmail.com>
To Stephanie; Jodie Benton
Cc Catherine Burrowes
Thu 26/05/2022 10:55 AM

This sender WVWAC@hotmail.com is from outside your organization.

Follow up. Completed on Monday, 30 May 2022.
You replied to this message on 30/05/2022 9:28 AM.

Hi Stephanie,

Thank you for the reply, WVWAC members anticipated a similar response, we agree with all but 1 point, see below:

"The human skeletal remains protocol provided in Figure 9-1 of the ACHAR does note that the Aboriginal community will be informed if skeletal remains are encountered. This will place once police have confirmed that they are ancient Aboriginal remains".

WVWAC and wider Aboriginal Community believe that Aboriginal Stakeholders should be advised and involved at the time any remains are found as a stakeholder to be present and ensure that if in case the remains are of Aboriginal Origin that the correct procedures are followed. We have no faith in Developer/Police/Archaeologist closed door meetings relating to skeletal remains as we have encountered this previously at Moolarben Coal and Aboriginal Community were shut out, even though other Aboriginal remains were very close by.

Again we do not agree with the process table as presented in the Draft Aboriginal Cultural Heritage Assessment for the Birriwa Solar Farm and Battery Project, as Aboriginal Community need to be notified and Representatives involved at a far earlier time in the process i.e. if an archaeologist is present then Aboriginal Community RAP's are to be present.

Regards,

Bradley R. Bliss J.P.
WVWAC CEO and Contact Officer
Senior Aboriginal Cultural Heritage Field Officer
Senior Aboriginal Cultural Mentor and Educator
Traditional Clan descendant – Project Area
Mobile: 0427321016

OzArk response to WVWAC sent 30 May 2022

RE: Aboriginal Cultural Heritage Assessment for the Birriwa Solar Farm and Battery Project

Reply | Reply All | Forward | ...

Stephanie
To WVWAC Contact Officer
Cc Catherine Burrowes; Jodie Benton

Mon 30/05/2022 9:28 AM

Hi Brad,

Thank you for your email. I understand this is a sensitive topic for WVWAC and the Aboriginal community.

I have had a look through our skeletal remains procedure and Requirement 25 of the Code of Practice to see whether there is any opportunity to inform the Aboriginal community earlier in the process.

As it is a police matter there would not be an opportunity to inform the local Aboriginal community until the police and their own independent anthropologist have completed their investigations and made their conclusions. There would be no involvement from archaeologists such as ourselves in these investigations.

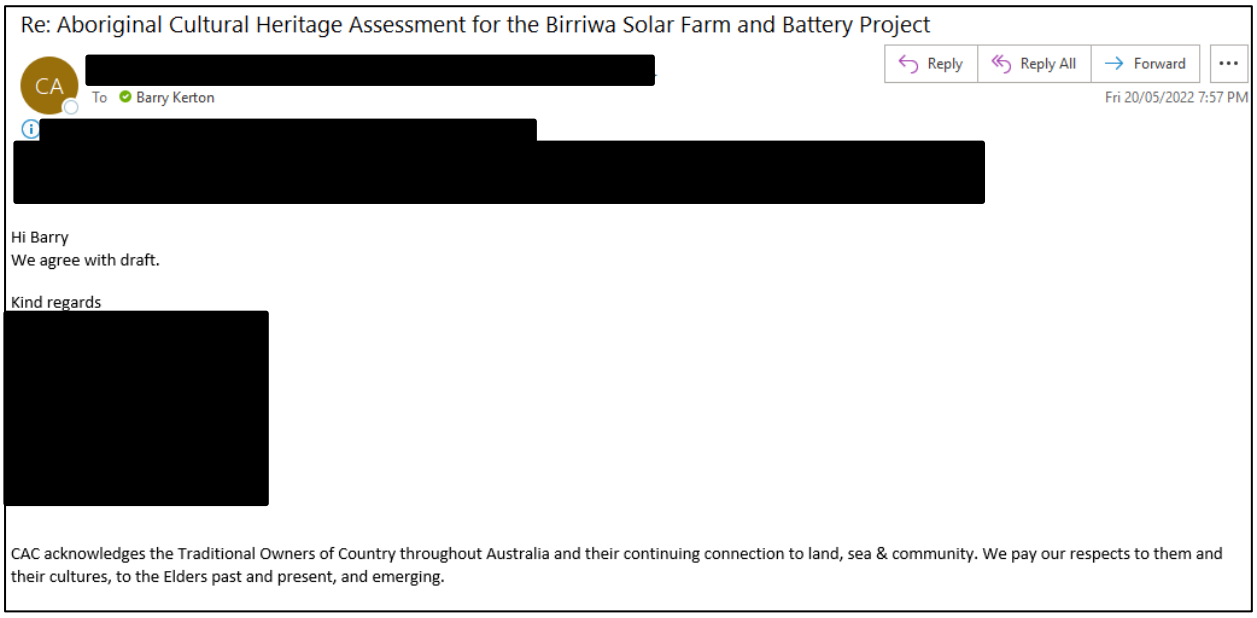
As such, it would not be until the police and their forensic anthropologists have confirmed that remains are ancient ancestral remains that the local Aboriginal community would be informed. Depending on their investigations this could still happen relatively early in the discovery of the remains. All management regarding the remains would all be completed in full consultation with the local Aboriginal community.

Kind regards,

.....

Stephanie Rusden
OzArk Environment & Heritage
Senior Archaeologist
0438 700 041
(02) 6882 0118

Stakeholder 1 feedback received 20 May 2022



Re: Aboriginal Cultural Heritage Assessment for the Birriwa Solar Farm and Battery Project

CA [redacted]

To Barry Kerton

Reply | Reply All | Forward | ...

Fri 20/05/2022 7:57 PM

[redacted]

Hi Barry
We agree with draft.

Kind regards

[redacted]

CAC acknowledges the Traditional Owners of Country throughout Australia and their continuing connection to land, sea & community. We pay our respects to them and their cultures, to the Elders past and present, and emerging.

APPENDIX 2: ASSESSMENT METHODOLOGY

ABORIGINAL CULTURAL HERITAGE ASSESSMENT METHODOLOGY

BIRRIWA SOLAR FARM

MID-WESTERN REGIONAL LOCAL GOVERNMENT AREA, NSW

NOVEMBER 2021

Report prepared by

OzArk Environment & Heritage

for UPC Renewables Australia Pty Ltd

OzArk
Environment & Heritage

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OzArk Environment & Heritage

DOCUMENT CONTROLS

Proponent	UPC Renewables Australia Pty Ltd operating as UPC\AC Renewables Australia (UPC\AC)
Client	
Document Description	*Aboriginal Cultural Heritage Assessment Methodology. Birriwa Solar Farm.*
File Location	OzArk Job No.
D:\OzArk\Projects\August 2021\Birriwa Solar Farm Aug2021\Assessment methodology	3179

Document Status **V3.0 FINAL**	Date 4/11/2021
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Draft V2.0 Report Draft for release to client	V2.0 BC edit 13/9/21 V2.1 SR incorporate comments 29/9/21 V2.2 OzArk to RAPs
FINAL V3.0 = Final report	V3.0 OzArk finalises 4/11/21
Prepared for	Prepared by
Cédric Bergé Project Development Manager UPC\AC Renewables Australia	Dr Alyce Cameron Senior Archaeologist OzArk Environment & Heritage 145 Wingewarra Street (PO Box 2069) Dubbo NSW 2830 P: 02 6882 0118 F: 02 6882 6030 alyce@ozarkehm.com.au

OzArk Environment & Heritage

Acknowledgement

OzArk acknowledge Traditional Owners of the area on which this assessment will take place and pay respect to their beliefs, cultural heritage and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

OzArk Environment & Heritage

CONTENTS

OzArk Environment & Heritage

FIGURES

TABLES

OzArk Environment & Heritage

1 INTRODUCTION

OzArk Environment & Heritage (OzArk) has been engaged by UPC Renewables Australia Pty Ltd operating as UPC\AC Renewables Australia (UPC\AC, the proponent) to prepare an assessment methodology for the proposed Birriwa Solar Farm (the project).

This methodology is in accordance with Stage 3 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs; DECCW 2010b). The project information provided here also complies with Stage 2 of the ACHCRs.

The investigation set out in this methodology aims to identify Aboriginal cultural values, both tangible and intangible, that exist in the project area. The results of this investigation will be presented in an *Aboriginal Cultural Heritage Assessment Report* (ACHAR).

1.1 PROJECT OVERVIEW

The proposed solar farm has a projected capacity of approximately 600MWac of PV, with up to 200MW of battery storage capacity also forming part of the project. UPC\AC are investigating different options to connect to the proposed CWO REZ transmission link (T-Link). These options include establishing a "connection hub" co-located with a future TransGrid substation, either within or outside of the project area, or a stand-alone connection to the proposed T-Link. Other technical options to connect to the existing network would be envisaged if NSW Energy Corporation does not proceed with the proposed transmission link, but these options will not be assessed within the current development application process.

It is understood that the effect of the connection hub would be that the site may include various large electrical plant and equipment such as overhead power lines, transformers, switchgear and batteries, as well as several transmission line easements in and out of the site depending on the final location to be determined during the Environmental Impact Statement (EIS) preparation stage.

1.2 PROJECT AREA

The project is located 20 kilometres (km) southeast of Dunedoo in Central Western NSW (**Figure 1-1**). The project is within the Mid-Western Local Government Area.

The project area covers approximately 1,240 hectares (ha) across five different properties (**Figure 1-2**). In addition to the project area, there are two options for proposed access to the project area being considered and also two transmission line options. Access options and transmission options will be identified during EIS stage, and the preferred option will be assessed in the EIS and in the ACHAR

OzArk Environment & Heritage

The proposed access road options include Barney's Reef Road and the Birriwa Bus Route South from the Castlereagh Hwy (**Figure 1-2**). The transmission line options will each be approximately 3 km in length however the location of these has not yet been finalised.

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Figure 1-1: Location of the project area.

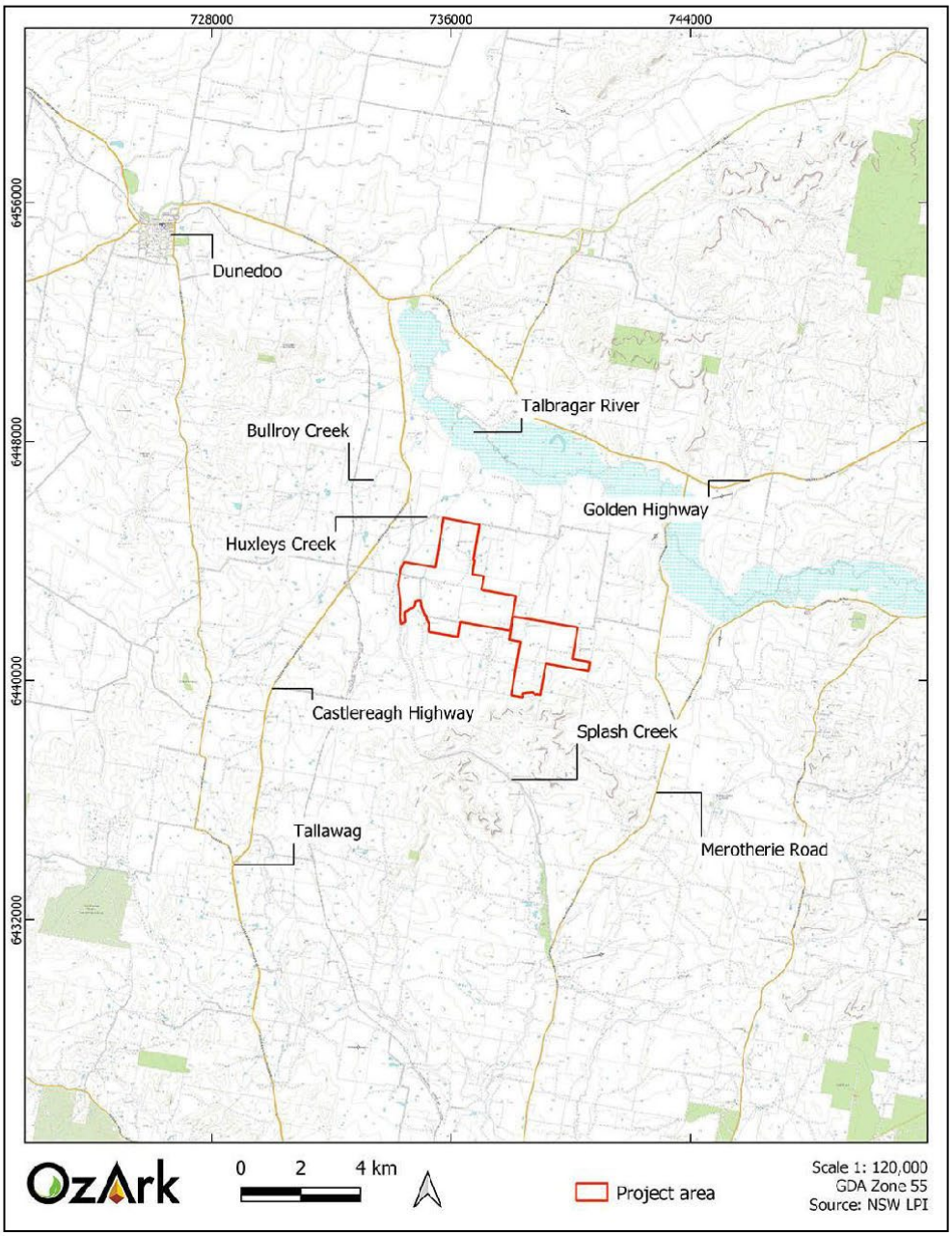

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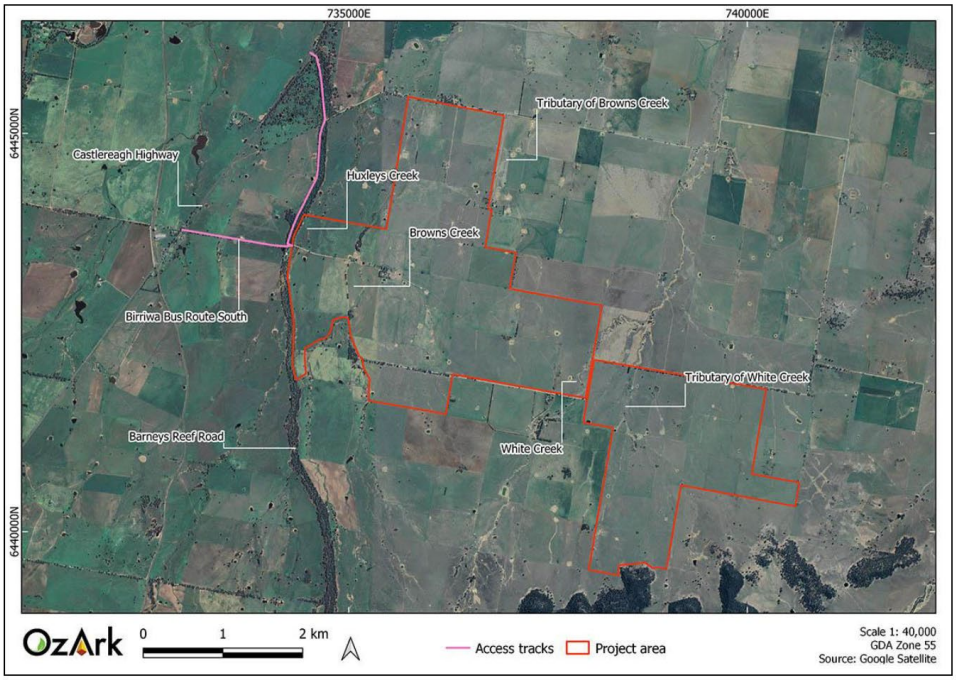
Figure 1-2. Aerial of the project area.



1.3 LANDSCAPE CHARACTERISTICS OF THE PROJECT AREA

The project area is located at the eastern edge of the NSW South Western Slopes bioregion, specifically, the Inland Slopes sub-bioregion. The South Western Slopes bioregion extends from Albury in the south to Dunedoo. Most of the project area is within the Talbragar–Upper Macquarie Terrace Sands and Gravels as characterised by Mitchell (2002). This landscape type is characterised by sandy quaternary alluvial sediments on floodplains and terraces of the Talbragar River, with a general elevation between 350–500 metres (m) (Mitchell 2002: 99). The topography of the project area is primarily gentle slopes or flats, with the highest point being the southern-most boundary of the project area with an elevation of 500 m which descends towards the north (see **Figure 1-3**).

The soils inside the project area consists primarily of Siliceous Sands, in particular the Home Rule soil type. The Home Rule soil type is characterised by low fertility and water holding capacity. Surface soils tend to be acidic, and prone to seasonal waterlogging. The Siliceous Sands Home Rule topsoil ranges between 10–35 centimetres (cm) in depth and tends to be loose brown to dark brown loamy sandy with small quartz and felspar gravels present. The subsoil tends to be a bright brown to red-brown loose clayey-sand, with small quartz and felspar gravels. These types of soil are prone to erosion, especially if no surface cover is present. Furthermore, drainage depressions are highly susceptible to gully erosion due to water runoff (Murphy and Lawrie 1998).

Most of the vegetation inside the project area is classified as non-native. There is a small section along the western-most boundary which is classified as derived grasslands (OEH 2017). Examination of the aerial imagery (see **Figure 1-2**) shows that most of the project area has been cleared, though some small stands of trees and paddock trees remain scattered throughout it while the road corridors of Barneys Reef Road and Birriwa Bus Route South are densely vegetated

The Talbagar River is the closest permanent watercourse and is located approximately 2 km north of the project area. Several creeks intersect through the project area in a general north–south direction and flow into the Talbagar River. These include Huxleys Creek, Browns Creek, and a tributary of Browns Creek in the western half of the project area, and White Creek and a tributary of White Creek in the eastern half of the project area (see **Figure 1-3**).

The project area is used primarily for grazing and cropping purposes. Disturbances inside the project area appear to be limited to construction of homesteads and agriculture infrastructure, fence lines, dams and unsealed tracks. An aerial from 1964 which covers most of the project area shows there has been little change in terms of land use over the past 57 years (**Figure 1-4**).

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Figure 1-3: Topography and drainage of the project area.

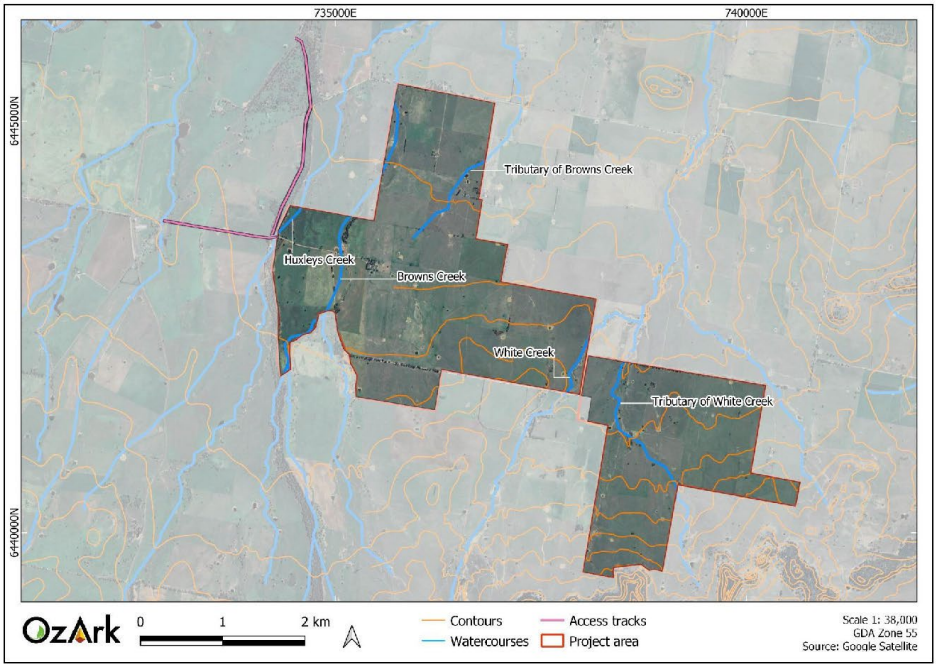

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Figure 1-4: 1964 aerial with overlay of project area (source: SS 2021).

1.4 CONSULTATION ON THIS METHODOLOGY

Consultation for this project has followed the guidelines established in the ACHCRs (DECCW 2010b) whereby an advertisement was placed in the local press and relevant agencies were

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contacted to ascertain if they were aware of groups or individuals who may have cultural knowledge of the region containing the project.

An advertisement was placed in the *Mudgee Guardian* on 3 September 2021 requesting expressions of interest in being consulted about the project. In addition, the following agencies were contacted to identify potential stakeholders for the area: Office of the Registrar, *Aboriginal Land Rights Act 1983*; Heritage NSW; National Native Title Tribunal; National Native Title Services Corporation Ltd (NTSCORP); Mudgee Local Aboriginal Land Council (LALC), Mid-Western Regional Council, and the Mudgee Local Land Services.

As a result, the following individuals/groups registered to be consulted about the project:

- Paul Brydon
- Woka Aboriginal Corporation
- Mudgee LALC
- Murong Gialinga Aboriginal & Torres Strait Islander Corporation
- Warrabinga Native Title Claimants Aboriginal Corporation
- Wellington Valley Wiradjuri Aboriginal Corporation (WVWAC)
- Stakeholder 1
- North-Eastern Wiradjuri
- Gallanggabang Aboriginal Corporation

Those individuals or groups who did not wish to be identified in the public documents are referred to as 'Stakeholder 1', etc.

On 1 October 2021, all RAPs were sent information about the project and a copy of the draft assessment methodology. The closing date for comment was 29 October 2021.

The following response was received from WVWAC on 27 October 2021:

WVWAC members have reviewed the Birriwa Solar Farm Methodology and agree with the document in principal. We however would like increased coverage if possible over the sample areas indicated in the Methodology, if exposures or possible cultural sensitivity areas are identified by Field Officers present.

OzArk noted that spacing between surveyors would be decreased if an area is areas of exposure were present, particularly across sensitive landforms.

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2 CULTURAL VALUES

2.1 INTRODUCTION TO CULTURAL VALUES

No matter who you are, we all have culture. Each person's culture is important; it's part of what makes us who we are.

Many Aboriginal people in Australia have a unique view of the world that's distinct from the mainstream. Land, family, law, ceremony and language are five key interconnected elements of Aboriginal culture. For example, families are connected to the land through the kinship system, and this connection to land comes with specific roles and responsibilities which are enshrined in the law and observed through ceremony. In this way, the five elements combine to create a way of seeing and being in the world that is distinctly Aboriginal.

Fundamentally, culture is living and is not static:

- Culture is acquired - we learn about culture from others in our community, including our parents
- Culture is shared - culture does not exist in a vacuum, it is shared amongst a group of people
- Culture defines core values - because we have been taught our culture and share it with our cultural group, we tend to form the same core values
- Cultures resist change but are not static - culture does and can change, but change is usually slow and gradual.

2.1.1 Connection to Country

Aboriginal and Torres Strait Islander peoples are connected to Country through lines of descent (paternal and maternal), as well as clan and language groups.

Although in the past (and sometimes into the present) there have been conflicts between different tribal groups, these were rarely over land. Aboriginal and Torres Strait Islander people have such a strong sense of belonging to country; they have no desire to own the land of others.

Territory is defined by spiritual as well as physical links. Landforms have deep meaning, recorded in art, stories, songs, and dance. Songlines or Dreaming Tracks as well as kinship structures link Aboriginal peoples to the territories of other groups. In the past, these links were also used for trade.

> *"When we say Country we might mean homeland, or tribal or clan area and in saying so we may mean something more than just a place; somewhere on the map. We are not necessarily referring to place in a geographical sense. But we are talking about the whole of the landscape, not just the places on it."*
>
> Professor Mick Dodson AM, August 2007

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2.1.2 Managing Country

Living on this land for around 50,000 years, Aboriginal and Torres Strait Islanders established effective ways to use and sustain resources. One important aspect is the right of certain people to control the use of resources in a particular area. Aboriginal and Torres Strait Islander people don't see themselves as 'owning' land, animals, plants or nature, but rather belonging with these things as equal parts of creation.

The rights of different groups to live in and manage certain areas of land are clear and recorded through art, stories, songs, and dance.

Deep cultural and spiritual values like totemism have also played an important part in Aboriginal and Torres Strait Islander resource management. Totemism is a belief and value system that connects human beings to other animals, plants and aspects of nature. Groups and individuals are assigned a particular animal that they are related to and must care for. This gives them a profound sense of connection to and responsibility for the natural world.

Aboriginal and Torres Strait Islanders people have a wide range of traditional methods for gathering food including fish traps, subsistence agriculture, hunting and harvesting a wide range of natural fruits and vegetables. Some groups of people would stay in one place, while others moved around the land according to the seasons, to ensure sustainable and rich food supplies, and to fulfil their spiritual and cultural obligations.

Even before 1788 there were complex relationships for long distance trade between Aboriginal and Torres Strait Islander communities especially for coastal shells and stone hatchets. When people from different groups met socially to share resources, for ceremonies or to settle disputes, they brought items to exchange. Items included stones for hatchets, kangaroo skins, timber for spears, ochre or clay for paint and marine shells for decoration. The exchange of objects was not motivated by a desire for wealth accumulation but a social system to build connection between people and groups.

2.1.3 Recognising lore

In much of eastern Australia, Aboriginal communities live their lives like most Australians without resorting to tribal lore. However, in certain crucial areas, particularly associated with family, leadership roles, and caring for Country, Aboriginal lore continues, even in the most urbanised communities.

2.2 IDENTIFYING CULTURAL VALUES

A major aim of this assessment is to identify any cultural values within the landscape in which the project is located so that those values can be recognised and incorporated into the ACHAR's management recommendations.

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Any cultural values relating to the project area will be captured by the OzArk archaeologists (if such information is provided by RAPs during the survey) and included in the ACHAR.

Understanding cultural landscapes can only come from the views of a particular community, in this case, the Aboriginal community. Unless informed, OzArk will not know of the community's feelings towards the cultural landscape in which the project will be located. Should any RAPs have knowledge of cultural values regarding the project area that they wish to share or that may affect the survey methodology set out in **Section 5**, OzArk invites them to contact us so that these values can be recorded and/or responded to in the methodology.

2.2.1 Use of information collected

An ACHAR will be prepared for the project which articulates Aboriginal cultural values and associated conservation methods across the project area, as identified during the consultations. The ACHAR will be circulated to all RAPs for comment as is set out in the ACHCRs. The ACHAR will be available to Heritage NSW for their consideration of the project and the report will be publicly available.

2.2.2 Public / confidential information

Information will be treated in accordance with instructions received by Aboriginal informants. Information described as confidential (culturally sensitive) will not be detailed in the publicly available report. Confidential information should be made available to the proponent, its heritage consultants, and Heritage NSW so that significant cultural values can be conserved. On advice from the provider of the information, a redacted ACHAR would be made available to the wider public where any sensitive cultural information is removed.

2.2.3 Copyright

Information collected for this assessment remains the property of the Aboriginal informants and the author. Without written permission from individual informants and the author information may not be used for purposes other than those outlined above.

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3 ARCHAEOLOGICAL CONTEXT

3.1 ABORIGINAL PEOPLE OF THE PROJECT AREA

At the time of European settlement, the project area was situated within the territory of people belonging to the *Wiradjuri* tribal and linguistic group (Tindale 1974). The Wiradjuri tribal area is situated within the Murray Darling Basin and extends across three general physiographic regions: the highlands or central tablelands in the east, the riverine plains in the west, and the transitional western slopes zone in-between (Navin Officer 2005: 48). The project area is at the north-eastern extent of Wiradjuri territory.

The Wiradjuri is one of the largest language groups within New South Wales extending across the districts of Mudgee, Bathurst, Dubbo, Parkes, West Wyalong, Forbes, Orange, Junee, Cowra, Young, Holbrook, Wagga Wagga, Narrandera, Griffith, and Mossgiel (Tindale, 1974). While the area was noted to have a single basic language, various dialects could be found throughout the region (Tindale 2000). The project area is located within the central tablelands and on the eastern margin of the Wiradjuri territory.

Oral tradition records the presence of over 20 clans within the broader Bathurst–Mudgee region, organised according to matrilineal descent (Navin Officer 2005: 48). Clans were made up of a number of fairly independent groups, of up to 20 members, in friendly contact with each other, moving separately for much of the year over a shared territory (Pearson 1981; Haglund 1985).

Within the Wiradjuri region, the presence of Aboriginal people in the Darling Basin has been dated to 40,000 years ago (Hope 1981 as cited in Haglund 1985). A spread east into the mountains is thought to have occurred between 14,000 to 12,000 years ago.

3.2 REGIONAL ARCHAEOLOGICAL CONTEXT

The Aboriginal occupation of Australia begins prior to 40,000 BP (years before present) and possibly earlier than 50,000 BP. Dates exceeding 20,000 years occur in almost all parts of Australia resulting in the expectation that most areas should have a Pleistocene (>12,000 BP) occupational signature. However, such dates remain relatively rare due to a range of factors, both behavioural and post-depositional. These factors include a possible low density of occupation in the Pleistocene period and poor preservation of archaeological materials (particularly dateable organic materials).

There are a number of broad scale regional archaeological studies which either cover the project area itself or are in general proximity to it. These studies have been summarised below.

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3.2.1 PhD thesis – changing land use and settlement patterns in the upper Macquarie River region of NSW from prehistoric times to 1860 (Pearson 1981)

Pearson's work was primarily in the Upper Macquarie region, which reflects topographic similarities to the current project area. Pearson divided the archaeological sites he recorded into two main categories: occupation sites and non-occupation sites (including grinding grooves, scarred or carved trees, ceremonial and burial sites). Analysis of site locations produced a site prediction model with occupation occurring in areas with access to water, good drainage, level ground, adequate fuel and appropriate localised weather patterns for summer or winter occupation. Occupation sites were most frequently found on low ridge tops, creek banks, gently undulating hills and river flats and usually in open woodland vegetation (Pearson 1981: 101). The location of non-occupation sites was dependent upon a variety of factors relating to site function. For instance, grinding grooves were found where appropriate sandstone outcropping occurred, as close to occupation sites as possible. The location of scarred trees displayed no obvious patterning, other than proximity to watercourses where camps were more frequently located. Pearson suggested that these patterns would differ on the drier plains to the west, towards Dubbo and beyond, where dependence upon larger, more permanent water supplies was greater.

3.2.2 An assessment of Aboriginal sites in the Dubbo City Area (Koettig 1985)

In 1985, the survey by Koettig investigated the evidence of Aboriginal occupation within 5 km of Dubbo's city limits. The investigation concluded that sites exist throughout all environmental landscapes surveyed. Artefact scatters, scarred trees and grinding grooves were the most frequently occurring site types; and site location and size were determined by various environmental and social factors. Of the environmental factors, proximity to water, geological formation and availability of food resources were the most important. As such, Koettig's site prediction model suggested that: all site types would occur along watercourses; stone arrangements would occur most frequently on knolls or prominent landscape features; larger campsites would occur most frequently along permanent watercourses, near springs or wetlands; small campsites could occur anywhere; scarred trees could occur anywhere, but particularly in remnant native woodland communities; campsites would be smaller and more sporadic near the headwaters of creeks; grinding grooves could occur where appropriate sandstone existed; quarries could occur wherever there were suitable stone sources; and shell middens could occur only along the Macquarie River.

3.2.3 Assessment of the prehistoric heritage in the Mudgee Shire (Haglund 1985)

Haglund (1985) conducted a study into the prehistoric heritage in the Mudgee Shire and noted that prior to colonial settlement small groups of approximately twenty Aborigines acted independently but engaged in friendly contact. These groups moved after variable intervals, often over a short distance or within the same area, to obtain and use different resources.

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Early British explorers and settlers noted considerable variation in the numbers of Aboriginal people that would gather for food procurement activities during different seasons of the year. This seasonality was most obvious in the case of gatherings along major rivers, and it has been suggested that during dry periods the water holes remaining in the major rivers would become focal points for the usually scattered groups (Haglund 1985: 5).

Concerning the Mudgee/Gulgong area, Haglund (1985: 3) notes that the distribution of known sites cannot be seen as accurately reflecting past Aboriginal land use or site location patterns because of site loss since colonial settlement. Those sites known to exist, however, do fit within the general pattern for the various resource zones discerned by Koettig (1985) and Pearson (1981).

3.2.4 Aboriginal heritage study: Dubbo local government area (OzArk 2006)

An assessment of Aboriginal heritage resources within the then Dubbo LGA to assist Dubbo City Council (now amalgamated into the Dubbo Regional Council) with planning was undertaken by OzArk (2006). This study aimed to consolidate previous surveys and assessments of Aboriginal heritage; set a baseline for further study; and survey areas zoned for future expansion. Approximately 1120 ha of land was surveyed within five study areas surrounding the city of Dubbo. During the survey, 26 new Aboriginal sites were recorded, and eight out of 12 previously recorded sites were relocated. A number of the newly recorded site types were similar to those found in previous studies. Fewer scarred trees were found than expected, likely due to intensive agricultural practices and associated tree clearance around Dubbo city compared to the broader former Dubbo LGA. No new grinding groove sites were recorded, which was understandable given that this site type comprised only 3.6% of previously located sites within the former Dubbo LGA. Scarred tree distribution adhered to the predictive model, exclusively following waterways and fence-lines, although this probably reflected land clearing practices more than Aboriginal site patterning. Isolated finds and open sites followed a similar pattern, largely limited to watercourse edges and elevated terraces within 500 m of the Macquarie River and other permanent to semi-permanent waterways. No significant patterning emerged in terms of site size or quality, perhaps because surface manifestations of artefacts often do not adequately reflect site size or complexity.

3.3 Local archaeological context

A search of the Heritage NSW administered Aboriginal Heritage Information Management System (AHIMS) database on 1 September 2021 returned 86 results for Aboriginal sites within a 10 km radius of the project area (GDA Zone 56 Eastings: 724281–750769; Northings: 6429390–6455408 with no buffer) (see **Table 3-1** for site types and frequencies).

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The most frequently recorded site types are rock shelters with deposit which contribute 29.1% of the site types in the vicinity of the project area. Other frequent site types are isolated finds (16.3%), artefact scatters (11.6%), isolated finds & PAD (potential archaeological deposit) (11.6%), and modified trees (11.6%). Shelters with art (8.1%), axe grinding grooves (2.3%) and burial/s (2.3%) are also present, as well as less represented site types which only have single recording in the vicinity of the project area (see **Table 3-1**).

Site types which include shelters are located in the mountainous ranges to the northeast, southeast and south of the project area. Open artefact sites (such as scatters, isolated finds and PADs) tend to be located in proximity to a watercourse and recorded outside of the more mountainous areas. Modified trees also tend to be located near watercourses. Recorded grinding grooves tend to be located near a watercourse and on the edges of mountainous areas. **Figure 3-1** shows the location of previously recorded sites in the vicinity of the project area.

Table 3-1: AHIMS site types and frequencies

Site Type	Number	% Frequency
Shelter with deposit	25	29.1
Isolated find	14	16.3
Artefact scatter	10	11.6
Isolated find & PAD	10	11.6
Modified tree	10	11.6
Shelter with art	7	8.1
Axe grinding groove	2	2.3
Burial/s	2	2.3
Artefact scatter & PAD	1	1.2
Axe grinding groove & water hole/well	1	1.2
Shelter with art & axe grinding grooves	1	1.2
Shelter with art and deposit	1	1.2
Stone arrangement	1	1.2
Water hole/well	1	1.2
Total	**86**	**100**

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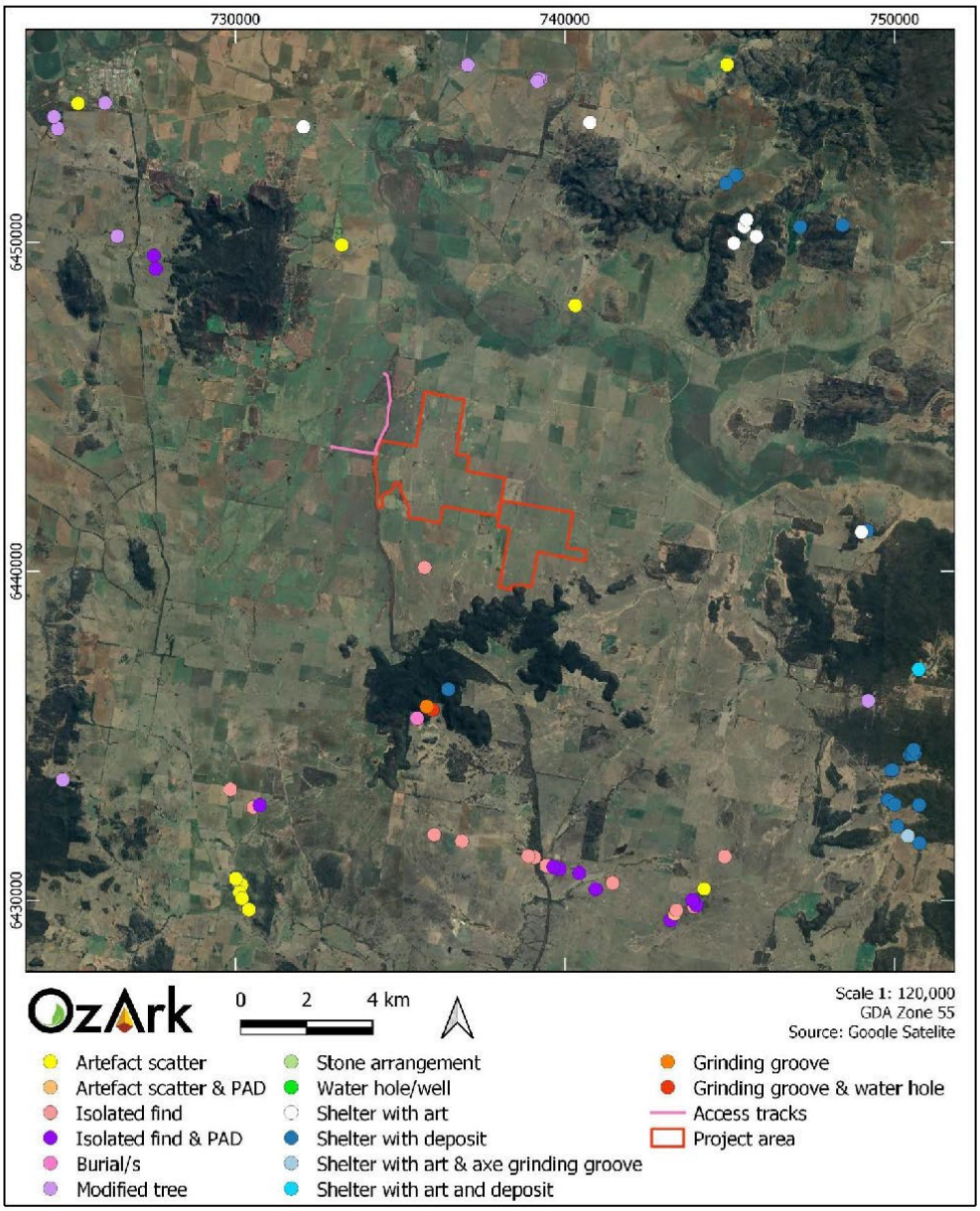
Figure 3-1. AHIMS sites in relation to the project area.



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3.3.1 Archaeological investigations near the project area

3.3.1.1 Ulan Coal Mine (Kuskie and Webster 2002; Corkill 1991; Haglund 1981, 1996, 1999)

Numerous studies undertaken over the past twenty-five years for the Ulan Coal Mine over all portions of their lease areas and have recorded hundreds of Aboriginal sites. Surveys carried out through the 1980s and 1990s by Haglund have been summarised by Kuskie (2000). As expected, the variety of landforms present within the Ulan project area resulted in all site types being recorded as a result of these studies (including more unusual sites such as ochre quarries and a utilised rock pool); although, it was noted that in general, the landscapes were highly disturbed as a result of agricultural activities (clearing, ploughing, grazing) and erosional processes. Overall quartz appears to be the predominant raw material recorded at Ulan, although significant quantities of chert are also present (Kuskie and Webster 2002; Corkill 1991; Haglund 1996).

3.3.1.2 Indigenous and non-Indigenous Heritage Assessment: Wollar – Wellington 330kV Electricity Transmission Line (OzArk 2005)

OzArk (2005) undertook an assessment of a proposed 330kV electricity transmission line (ETL) between Wollar and Wellington. The area assessed for the ETL is approximately 13.5 km southeast of the project area. During the assessment, 28 Aboriginal sites were recorded which consisted of 10 artefact scatters, nine artefact scatters with PAD, seven isolated finds and two PADs. The majority of sites recorded during this assessment were within 200 m of water, either on the valley slopes or the valley floors (terraces / banks of watercourses).

3.3.1.3 Cobbora Coal Project (EMM 2012)

In 2012, EMM conducted an Aboriginal cultural heritage assessment for the Cobbora Coal Project. The proposed Cobbora Coal Mine is located approximately 20 km west and southwest of the project area. The original assessment area for the Cobbora Coal Project also included an approximate 35 km corridor for a pipeline between Tallawang and Ulan, which crossed the northern half of the Stubbo Solar Farm study area. The survey of the pipeline corridor was conducted in 2009–2010 by ERM, though the results of this survey is included in EMM 2012.

Overall, within the Cobbora Coal Project area, artefact scatters were the most frequent site type recorded, followed by scarred trees, grinding grooves, hearths and rock shelters with either PAD or artefacts. Quartz was the predominant material recorded for stone artefacts. To a much lesser degree, stone artefacts manufactured from volcanic materials, silcrete, quartzite, chert, calcedony, mudstone, and sandstone were also recorded.

A series of 1 m by 2 m test pits were mechanically excavated during the 2009–2010 fieldwork. Artefacts were recovered from three pits within the recorded site boundaries. The results of the subsurface testing demonstrated that artefacts are present in the topsoil in association with a

minor tributary watercourse inside the Cobbora Coal Project area, as well as near the confluence of Sandy Creek and Laheys Creek.

The overall assessment concluded that Aboriginal sites, especially artefact scatters, were predominately associated with major watercourses such as Sandy Creek and Laheys Creek and commonly occurred within 200 m of such watercourses. Artefact scatters along minor watercourses and drainage lines tended to be within 30 m of the watercourses.

3.3.1.4 Beryl Solar Farm (NGH Environmental 2017)

An Aboriginal cultural heritage assessment for the Beryl Solar Farm, 35 km south of the project area, was conducted by NGH Environmental in 2017. The Beryl Solar Farm study area consisted of 332 ha of low undulating slopes surrounding two ephemeral drainage channels. Five sites were identified during the survey, three of which were located close to Wialdra Creek near the Castlereagh River.

The assessment concluded that the survey results were consistent with the model predicting site location close to waterways, and that there was negligible potential for intact subsurface deposits with high densities of objects or cultural materials. The low level of topographic variation across the Beryl study area led to a generic predictive model that has limited applicability to the current project area. However, the survey did record uncommon site types, including an axe blank and a ground-edge axe, despite the small number of identified sites.

3.3.1.5 Stubbo Solar Farm (OzArk 2020 and 2021)

OzArk conducted an archaeological assessment for the Stubbo Solar Farm located 8 km southeast of the project area. The assessment resulted in 23 Aboriginal sites being recorded, and two previously recorded AHIMS sites located. The 25 Aboriginal sites inside the study area consist of nine isolated finds, three isolated finds with potential archaeological deposits (PADs), two artefact scatters, nine artefact scatters with PADs, one PAD, and one modified tree.

The assessment concluded:

- In total, 309 stone artefacts were recorded during the survey. The predominate material for stone artefacts was quartz (n=246, 79.6%), followed by chert (n=22, 7.1%), mudstone (n=16, 5.2%), and volcanics (n=13, 4.2%). Also present though in much lower quantities were silcrete, petrified wood, greywacke, and chalcedony
- The most frequent type of stone artefact is flakes (n=240, 79.6%), shatter (n=36, 11.7%), cores (n=12, 3.9%), blades (n=9, 2.9%) and backed blades (n=5, 1.6%). Also present in the overall assemblage are end scrapers (n=2), flaked pieces (n=2), ground edge hatchet heads (n=2), and a microlith (n=1)
- Most sites were recorded in the 'drainage' landforms along Stubbo Creek or the two main tributaries northwest and southwest of Stubbo Creek.

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- The larger and higher-density sites are located at the confluence of Stubbo Creek and the two tributaries or further southwest along Stubbo Creek after the confluence
- The artefact sites (scatters and isolated finds) are located predominately in erosion scalds on the edges of elevated terraces, indicating there is potential for subsurface archaeological deposits where the terrace still has topsoil and A-horizon soils present.

The assessment also concluded that the highest areas of archaeological sensitivity remain to be along the main watercourses (Stubbo Creek and its tributaries), which would have provided at least a semi-permanent source of water in the area. The remainder of the Stubbo Solar Farm assessment area, especially the higher to mid slopes have a much lesser degree of archaeological sensitivity. The ridgelines and crests of the low-lying rolling hills were also less sensitive for archaeological sites than the landforms immediately adjacent to the main watercourses.

An addendum assessment for the external access tracks to Stubbo Solar Farm was undertaken by OzArk in 2021. The addendum assessment covered two eastern access easements, one western access easement and the extent of the Blue Spring Road between its intersection with Cope Road to where the eastern access easements intersect with the road. No Aboriginal sites were recorded during the addendum assessment.

3.4 ARCHAEOLOGICAL CONTEXT: CONCLUSION

The archaeological investigations surrounding the project area as summarised in **Sections 0** and **0** indicate that:

- Though shelters are one of the most prevalent site types in the general region, these tend to be located near mountainous areas
- Stone artefact sites (isolated finds and artefact scatters) are also frequent sites recorded in the area, especially in association with watercourses
- Quartz is the predominant material for stone artefacts in the area, although volcanic materials, silcrete, quartzite, mudstone, chert, and chalcedony could also be present.

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4 PREDICTIVE MODEL

4.1 LANDFORM MODELLING

The topography of the project area is primarily gentle slopes or flats, with the highest point being the southern-most boundary of the project area with an elevation of 500 m which descends towards the north (see **Figure 1-3**). Previous studies in the district (OzArk 2020, 2021) indicate that these gentle slopes or flats are likely to contain intact sites, especially near the watercourses which intersect with the project area.

Preliminary landform mapping within the project area indicates there are three main landform types (**Figure 4-1**):

- drainage lines with a 200 m buffer around them
- gentle to moderate slopes across the southern half of the project area
- flats across the northern half of the project area.

The project area and surrounding land is primarily used for farming and grazing operations. The presence of hoofed livestock is likely to have resulted in trampling and compaction of the ground surface which accelerates soil loss. Erosional process within the project area would be exacerbated by the types of landforms present which have been largely cleared of vegetation.

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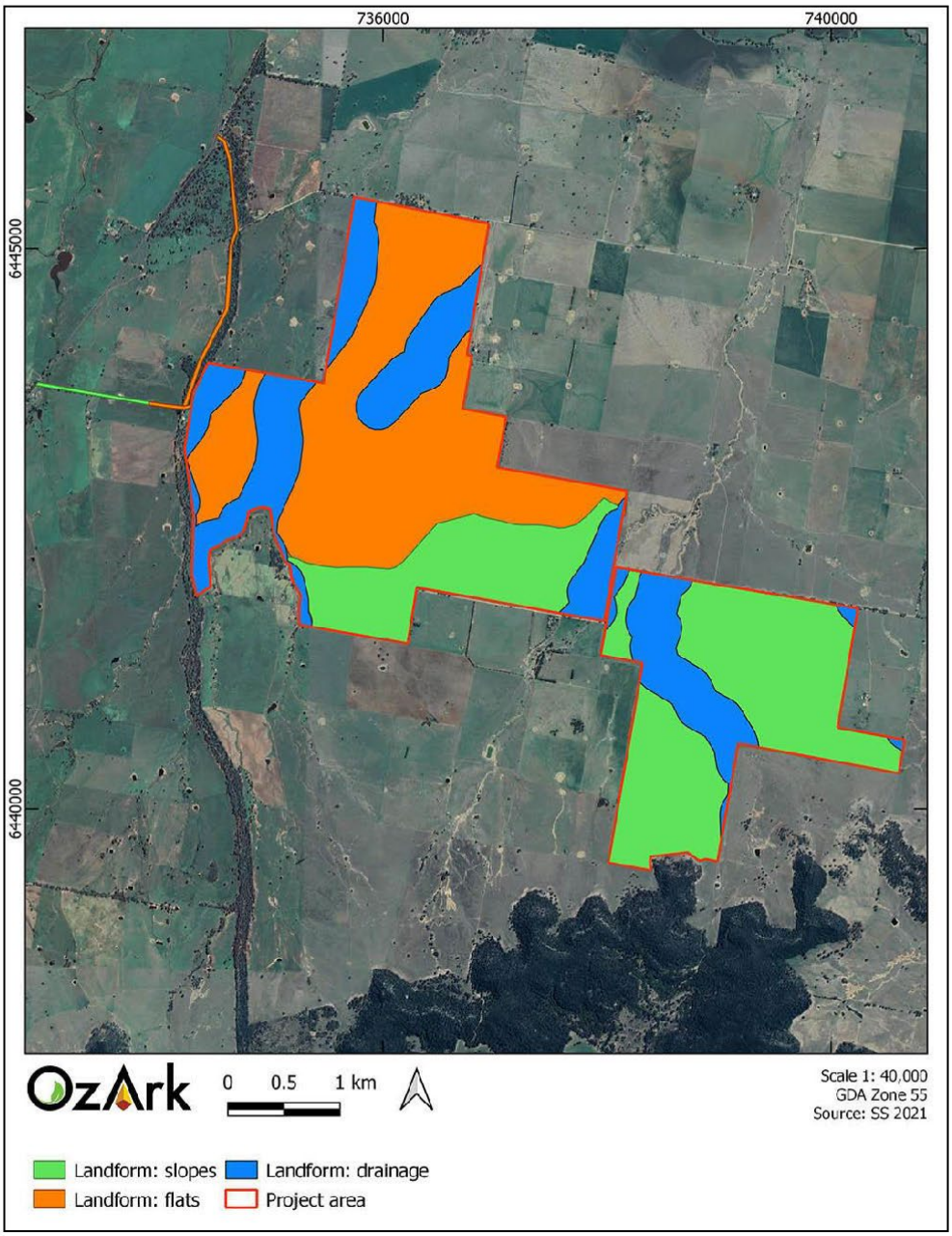
Figure 4-1: Landforms inside the project area.



4.2 PREDICTIVE MODEL FOR THE PROJECT AREA

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and

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the permanence and/or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including: plant and animal foods; stone and ochre resources and rock shelters; as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently, sites tend to be found along permanent and ephemeral water sources, along access or trade routes or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally, it is the more durable materials such as stone artefacts, stone hearths, shell, and some bones that remain preserved in the current landscape. Even these however may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport—both over short- and long-time scales—or (b) the historical impacts associated with the introduction of colonial farming practices. Scarred trees, by their nature, may survive for up to several hundred years but rarely beyond.

The archaeological studies undertaken in the vicinity of the project area provide an insight into the nature and distribution of archaeological sites within the area. However, the location of sites can only reflect what has been identified, usually as a result of infrastructure/development-driven projects, thus presenting the site data as clustered or on linear alignments. Generally, sites have been recorded in proximity to a recognised water source, in locations that have been subject to reduced landform disturbance, and on gentle, elevated landforms. However, landform disturbance may also explain why Aboriginal objects become revealed on the ground surface, such as within modified and disturbed landforms.

Based on knowledge of the environmental contexts of the project area and a desktop review of the known local and regional archaeological record, the following predictions are made concerning the probability of those site types being recorded:

Isolated finds may be indicative of a random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or sub-surface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.

- Applicability to the project area: As isolated finds can occur anywhere, particularly within disturbed contexts, it is predicted that this site type could be recorded within the project area.

Open artefact scatters are here defined as two or more artefacts, not located within a rock shelter, and located no more than 50 m away from any other constituent artefact. This site type may occur

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almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short- or long-term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'.

Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources.

Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.

- Applicability to the project area: Stone artefact distributions of variable artefact densities are some of the most common Aboriginal object found within the region. A general correlation between landform and the nature of the evidence of past Aboriginal occupation is evident. Higher artefact density sites are located on elevated landforms adjacent to waterways. The project area contains three named creeks and two unnamed tributaries. As OzArk 2020 showed, the perennial nature of watercourses in the general region does not impede the recording of artefacts and PADs near watercourses.

Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed as a consequence of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any particular example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently, the distinction between European and Aboriginal scarred trees may not be clear.

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- Applicability to the project area: While most of the study have been cleared for grazing and farming activities, sections of mature aged vegetation are scattered throughout the project area and the corridors of Barneys Reef Road and Birriwa Bus Route South are densely vegetated. As this is one of the more frequently recorded site types in the region, there is potential to identify this site type within the project area as long as trees of an appropriate age are present.

Quarry sites and stone procurement sites typically consist of exposures of stone material where evidence for human collection, extraction and/or preliminary processing has survived. Typically, these involve the extraction of siliceous or fine grained igneous and meta-sedimentary rock types for the manufacture of artefacts. The presence of quarry/extraction sites is dependent on the availability of suitable rock formations.

- Applicability to the project area: This site type could be recorded within the project area should suitable rock outcroppings be available. However, due to the absence of previously recorded quarry sites in the region and inspection of aerial imagery of the landforms within the project area, it is believed this site type is unlikely.

Grinding grooves are most likely to occur on flat outcrops of coarse-grained sandstone in the vicinity of water sources, however, grinding grooves have been recorded on fine-grained granite outcrops.

- Applicability to the project area: Where there is suitable outcropping sandstone rock, there is the possibility for there to be grinding grooves. However, this site type tends to be associated with more mountainous areas in the region, and it is assessed that this site type is unlikely to be recorded within the project area.

Burials are generally found in soft sediments such as aeolian sand, alluvial silts and rock shelter deposits. In valley floor and plains contexts, burials may occur in locally elevated topographies rather than poorly drained sedimentary contexts. Burials are also known to have occurred on rocky hilltops in some limited areas. Burials are generally only visible where there has been some disturbance of sub-surface sediments or where some erosional process has exposed them.

- Applicability to the project area: While this site type is rare there is the possibility of it being present. However, the widespread disturbance from agricultural land use across the project area may have disturbed this type of site.

Bora/Ceremonial sites are places which have ceremonial or spiritual connections. Ceremonial sites may comprise of natural landscapes or have archaeological material. Bora sites are ceremonial sites which consist of a cleared area and earthen rings.

- Applicability to the project area: The distribution of ceremonial sites and Bora grounds across the landscape is somewhat unpredictable as the choice of their location appears to be based on spiritual reasons rather than simply landscape features and resources. As site types such as modified trees and art sites have been recorded in the district, their presence in the project area cannot be discounted.

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Rock shelters were utilised in the past for both habitation and ceremonial purposes. The term 'rock shelter site' refers to rock shelters/rock overhangs that contain evidence such as stone artefacts and/or bones and/or plant remains (from meals eaten at the site) and/or hearths (fireplaces). Most rock shelter sites are secular in nature, however, those that also contain rock art or engravings are often believed to be non-secular in nature. The term 'rock art site' generally refers to Aboriginal ochre paintings or ochre or charcoal drawings located on a rock slab (generally in a sheltered place like the floor of a cave or rock shelter), boulder, cliff-face, cave or rock shelter wall or roof, or wall of a rock overhang. The majority of rock art sites are found in positions that are sheltered from the elements. This observation, however, is probably biased to some extent, as rock art would not preserve well in open positions. Rock art sites are generally believed to be non-secular in nature.

- Applicability to the project area: Rock shelters have been recorded in the wider region. However, based on preliminary landform analysis of the project area (see **Section 4.1**) it is unlikely suitable landforms for large rock outcrops or overhangs are present within the project area. Therefore, rock shelters are unlikely to be recorded within the project area.

4.3 RESEARCH QUESTIONS

A number of research questions can meaningfully be applied to the investigation of the project area. These research questions include:

- What resources were available to the Aboriginal people using the land within the project area (food, stone and water) and what resources were transported to the area?
- What tasks were Aboriginal people undertaking at the sites?
- Is there potential for burials to be present in the landscape?
- Are there outcropping rock materials present suitable for stone tool procurement and manufacture?
- Is there evidence to suggest that Aboriginal people were using the area earlier than the mid to late Holocene? Can dates be obtained for the Aboriginal use of the area?
- Do the findings within the project area (if any) accord with the regional archaeological context examined in **Section 0**?
- Do the survey results support the predictive model set out in **Section 4**?

The survey methodology set out in **Section 5** will be framed to help answer these questions; should sites of sufficient significance be encountered. However, based on the results of previous assessments and past disturbances, it not expected that the land within the project area will contain sites of sufficient significance to help answer those research questions that require a robust data set.

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5 SURVEY METHODOLOGY

5.1 ASSESSMENT APPROACH

The Aboriginal cultural heritage assessment of the project area will follow the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010). The field inspection will follow the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (The Guide, OEH 2011).

Survey for Aboriginal cultural heritage values will concentrate on the project area, the access road options, and the transmission line options.

5.2 SURVEY AIMS

The aim of any archaeological survey is not to locate each artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within the project area are known. Therefore, the aims of the survey will be to:

- Inspect all landform types in the project area so that their archaeological potential can be determined
- Evaluate whether the predictive model set out in **Section 4.2** is valid
- Determine if the research questions set out in **Section 4.3** can be answered
- Determine if any landforms of the project area require test excavation to understand the archaeological potential at a particular location
- Undertake sufficient assessment to satisfy Sections 2.2, 2.4, 2.5, 2.6, and 2.7 in the Guide
- Collect sufficient data so that the results can be presented in an ACHAR as set out in Section 3 in the Guide
- Undertake survey and record keeping satisfying Requirements 1–13 of the Code of Practice.

5.3 SURVEY METHODOLOGY

Standard archaeological field survey and recording methods will be employed in this assessment (Burke & Smith 2004) and will follow the Code of Practice.

As highlighted in **Sections 3** and **4**, greater Aboriginal archaeological potential tends to exist on landforms within 200 m of permanent and ephemeral water sources, along access or trade routes, and areas with suitable flora/fauna and shelter. Archaeological potential is generally reduced on landforms disturbed by erosion and historical impacts (e.g., farming and infrastructure installation). As such, during the field assessment, greater survey effort will be expended on landforms deemed to have greater Aboriginal archaeological potential. 'Full pedestrian survey' refers to systematic transects walked by surveyors spaced approximately 20 m apart throughout

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the landform or area being surveyed, however in areas with high ground surface visibility, spacing could be reduced to 10 m. 'Targeted pedestrian survey' refers to transects walked by surveyors spaced approximately 20 m apart that will not cover the entire area but instead will focus on understanding the archaeological potential of representative landforms within these areas.

As such, the field assessment will include:

- Full pedestrian survey will occur in areas with minimal disturbance and good ground surface visibility within landforms possessing Aboriginal archaeological potential, i.e., areas within 200 m of the watercourses, elevated landforms, and areas with remnant vegetation (**Figure 5-1**)
- Targeted pedestrian survey will occur in all other areas i.e. the sample survey areas: i.e., areas more than 200 m from watercourses; areas with poor ground surface visibility; landforms with low archaeological potential; and areas with significant prior disturbance (**Figure 5-1**)
- All trees deemed to be of sufficient maturity to contain cultural modification will be inspected, as well as any areas with outcropping rock
- Some areas may not be physically surveyed if the RAPs and OzArk staff agree they are too disturbed or possess a very low likelihood of sites.

In the field, OzArk staff will identify, record, and evaluate physical (i.e., archaeological) evidence. Site recording will capture all the information required to complete current AHIMS site recording forms (e.g., site location, site boundary, site plan, representative photographs, artefact recording and feature recording). RAPs will participate in the survey, identifying Aboriginal objects, determining the cultural significance of Aboriginal objects, and identifying cultural places or non-physical site types within the project area. OzArk staff understand that cultural knowledge may not be provided in some instances due to cultural sensitivities (e.g., men's and/or women's places). Under these circumstances, to assess the potential impacts, OzArk staff will need to be told, only in general terms, why a particular place is important, and what the significance of the impact will be. OzArk staff will liaise with RAPs on a case-by-case basis to determine how to record the location in a culturally sensitive manner.

5.4 TEST EXCAVATION

It is possible that the survey may identify landforms where test excavation under the Code of Practice (Requirements 14–17) is required. Should such landforms be identified during the survey, the test excavation methodology will be prepared as a separate document that will be circulated to all RAPs for review and comment.

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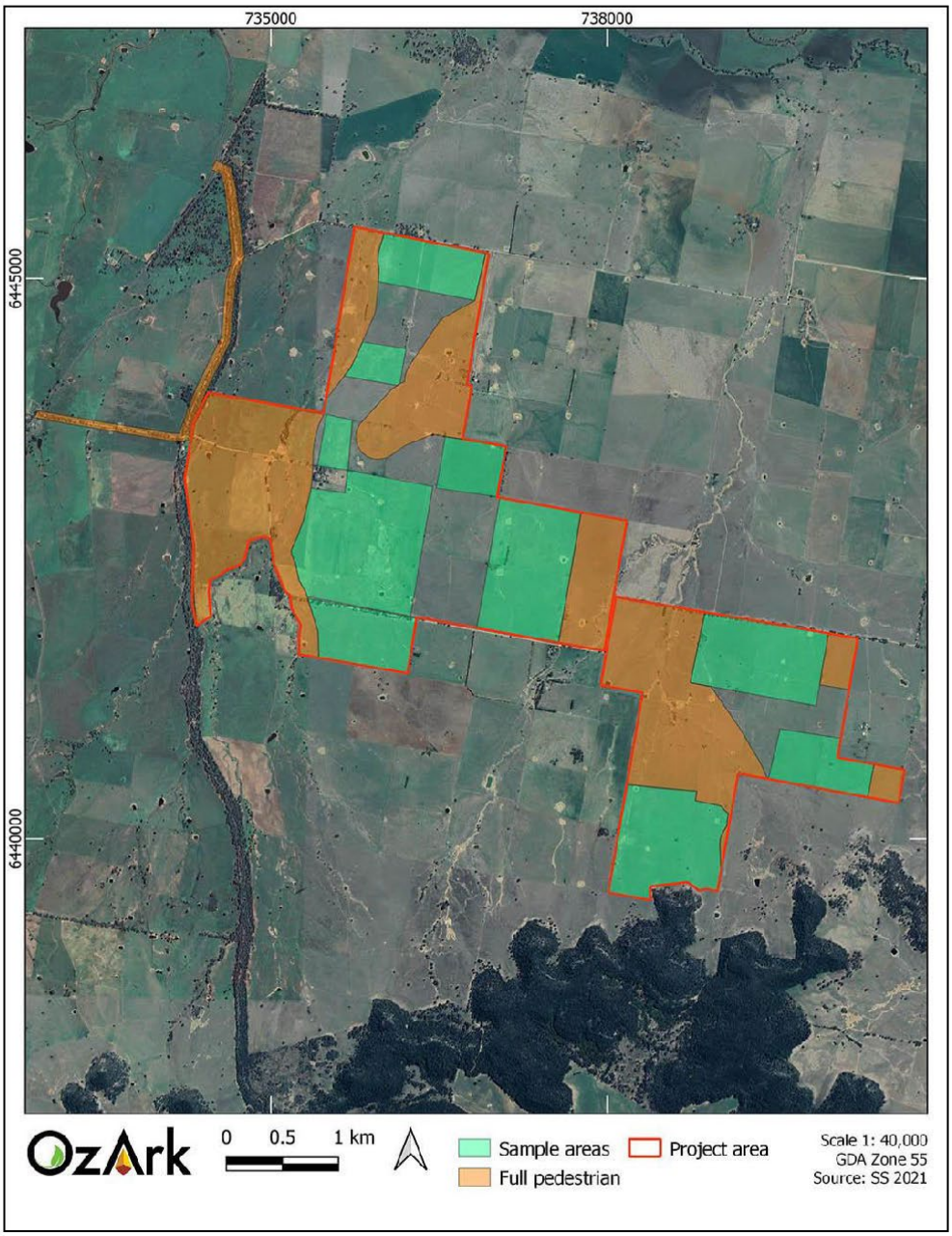
Figure 5-1: Aerial showing the proposed survey areas.



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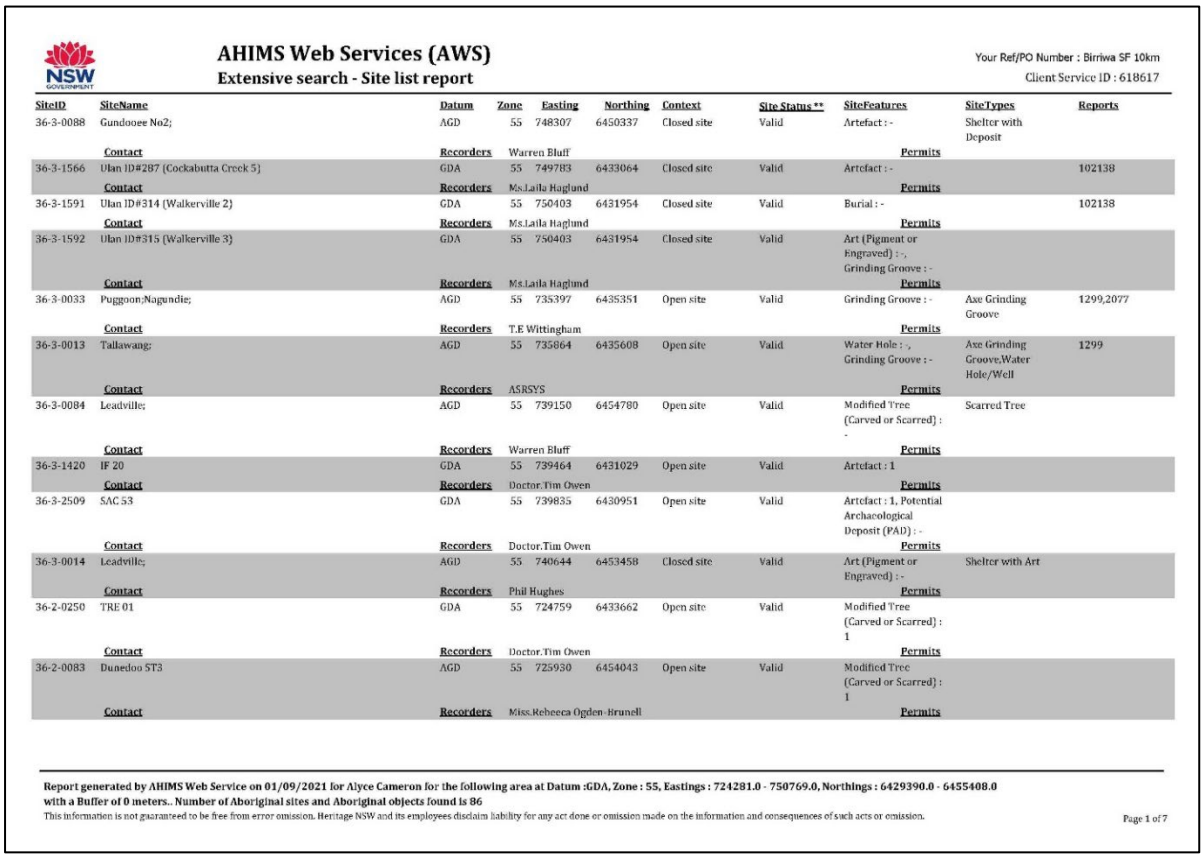
APPENDIX 3: AHIMS SEARCH RESULT

September 2021



AHIMS Web Services (AWS)
Extensive search - Site list report

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Client Service ID : 618617

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36-3-0088	Gundooee No2;	AGD	55	748307	6450337	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
36-3-1566	Ulan ID#287 (Cockabutta Creek 5)	GDA	55	749783	6433064	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-1591	Ulan ID#314 (Walkerville 2)	GDA	55	750403	6431954	Closed site	Valid	Burial : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-1592	Ulan ID#315 (Walkerville 3)	GDA	55	750403	6431954	Closed site	Valid	Art (Pigment or Engraved) : -, Grinding Groove : -		
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-0033	Puggoon;Nagundie;	AGD	55	735397	6435351	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	1299,2077
	Contact	Recorders	T.E Wittingham					Permits		
36-3-0013	Tallawang;	AGD	55	735864	6435608	Open site	Valid	Water Hole : -, Grinding Groove : -	Axe Grinding Groove,Water Hole/Well	1299
	Contact	Recorders	ASRSYS					Permits		
36-3-0084	Leadville;	AGD	55	739150	6454780	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	Recorders	Warren Bluff					Permits		
36-3-1420	IF 20	GDA	55	739464	6431029	Open site	Valid	Artefact : 1		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-3-2509	SAC 53	GDA	55	739835	6430951	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-3-0014	Leadville;	AGD	55	740644	6453458	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	Recorders	Phil Hughes					Permits		
36-2-0250	TRE 01	GDA	55	724759	6433662	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-2-0083	Dunedoo ST3	AGD	55	725930	6454043	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Miss.Rebecca Ogden-Brunell					Permits		

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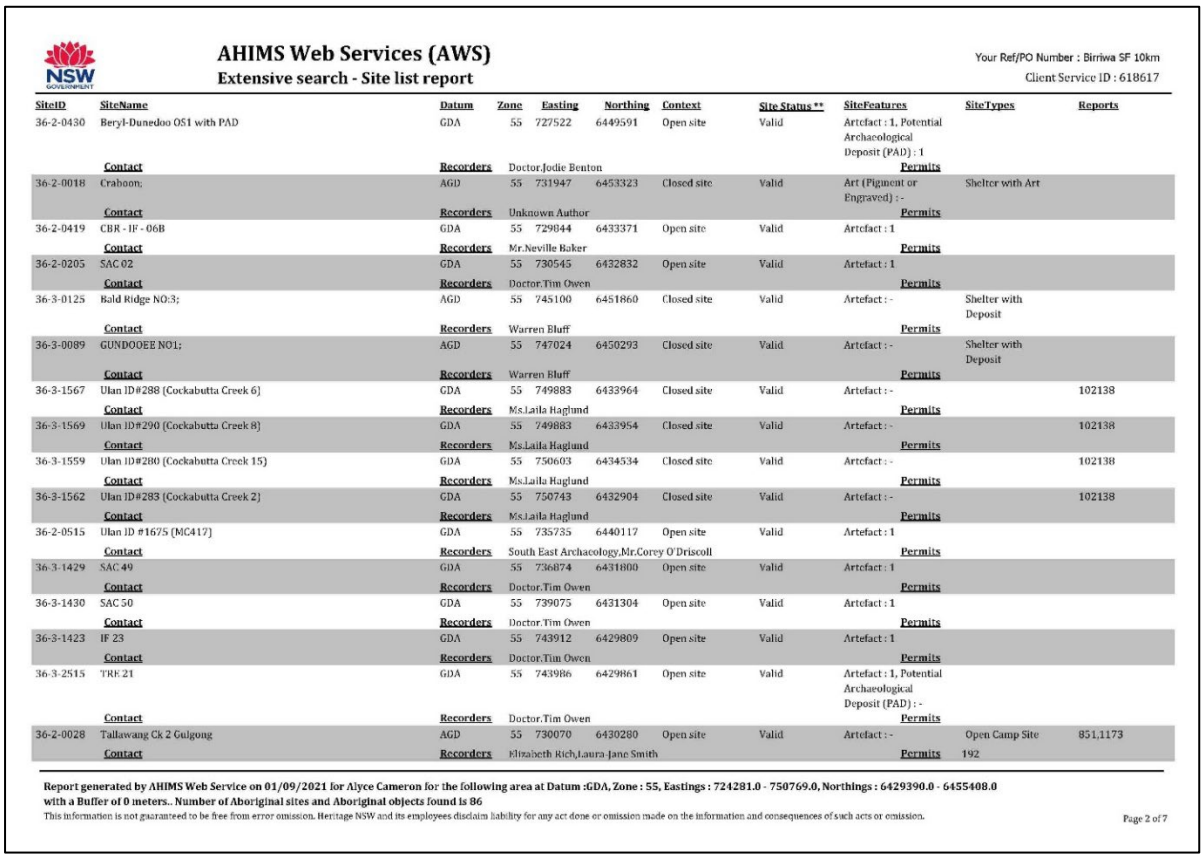

AHIMS Web Services (AWS)
Extensive search - Site list report

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Client Service ID : 618617

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36-2-0430	Beryl-Dunedoo OS1 with PAD	GDA	55	727522	6449591	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Doctor.Jodie Benton					Permits		
36-2-0018	Crahoon;	AGD	55	731947	6453323	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	Recorders	Unknown Author					Permits		
36-2-0419	CBR - IF - 06B	GDA	55	729844	6433371	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Neville Baker					Permits		
36-2-0205	SAC 02	GDA	55	730545	6432832	Open site	Valid	Artefact : 1		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-3-0125	Bald Ridge NO:3;	AGD	55	745100	6451860	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0089	GUNDOOEE NO1;	AGD	55	747024	6450293	Closed site	Valid	Artefact : -	Shelter with Deposit	
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36-3-1567	Ulan ID#288 (Cockabutta Creek 6)	GDA	55	749883	6433964	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-1569	Ulan ID#290 (Cockabutta Creek 8)	GDA	55	749883	6433954	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-1559	Ulan ID#280 (Cockabutta Creek 15)	GDA	55	750603	6434534	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-1562	Ulan ID#283 (Cockabutta Creek 2)	GDA	55	750743	6432904	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-2-0515	Ulan ID #1675 (MC417)	GDA	55	735735	6440117	Open site	Valid	Artefact : 1		
	Contact	Recorders	South East Archaeology,Mr.Corey O'Driscoll					Permits		
36-3-1429	SAC 49	GDA	55	736874	6431800	Open site	Valid	Artefact : 1		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-3-1430	SAC 50	GDA	55	739075	6431304	Open site	Valid	Artefact : 1		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-3-1423	IF 23	GDA	55	743912	6429809	Open site	Valid	Artefact : 1		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-3-2515	TRE 21	GDA	55	743986	6429861	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-2-0028	Tallawang Ck 2 Gulgong	AGD	55	730070	6430280	Open site	Valid	Artefact : -	Open Camp Site	851,1173
	Contact	Recorders	Elizabeth Rich,Laura-Jane Smith					Permits	192	

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AHIMS Web Services (AWS)

Extensive search - Site list report

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Client Service ID : 618617

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36-3-0082	Rock Linden No.1;	AGD	55	745010	6449790	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	1333
	Contact	Recorders	Warren Bluff					Permits		
36-3-0083	Rock Linden No 4;	AGD	55	745320	6450300	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0034	Puggoon;Nagundie;	AGD	55	735397	6435351	Open site	Valid	Water Hole : -	Water Hole/Well	2077
	Contact	Recorders	T.E Wittingham					Permits		
36-3-1419	IF 19	GDA	55	738889	6431346	Open site	Valid	Artefact : 1		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-3-3670	The Pinnacle IF-01	GDA	55	743861	6430006	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management,Doctor.Alyce Cameron					Permits		
36-3-3671	The Pinnacle IF-02	GDA	55	743207	6429405	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management,Doctor.Alyce Cameron					Permits		
36-3-3684	The Pinnacle OS-02	GDA	55	743331	6429599	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management,Doctor.Alyce Cameron					Permits		
36-2-0082	Dunedoo ST2	AGD	55	724488	6453274	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Miss.Rebecca Ogden-Brunell					Permits		
36-2-0012	Dunedoo;	AGD	55	725111	6454034	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	R Hawkins,Hawkins					Permits		
36-2-0027	Tallawang Ck 1 Gunning	AGD	55	729897	6430477	Open site	Valid	Artefact : -	Open Camp Site	851,102800
	Contact	Recorders	Elizabeth Rich,Laura-Jane Smith					Permits		
36-3-0162	Cockabulte (site 4);	AGD	55	749050	6441050	Closed site	Valid	Artefact : -	Shelter with Deposit	1333
	Contact	Recorders	Warren Bluff					Permits		
36-3-1565	Ulan ID#286 (Cockabutta Creek 4)	GDA	55	749813	6433044	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-1570	Ulan ID#291 (Cockabutta Creek 9)	GDA	55	749943	6433954	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-1564	Ulan ID#285 (Cockabutta Creek 3)	GDA	55	750003	6432914	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-1558	Ulan ID#279 (Cockabutta Creek 14)	GDA	55	750583	6434484	Closed site	Valid	Artefact : -		102138

Report generated by AHIMS Web Service on 01/09/2021 for Alyce Cameron for the following area at Datum :GDA, Zone : 55, Eastings : 724281.0 - 750769.0, Northings : 6429390.0 - 6455408.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 86

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Birriwa SF 10km
Client Service ID : 618617

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-1427	IF 27	GDA	55	736030	6432000	Open site	Valid	Artefact : 1		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-3-3674	The Pinnacle IF-05	GDA	55	743383	6429701	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management,Doctor.Alyce Cameron					Permits		
36-3-3683	The Pinnacle OS-01	GDA	55	744221	6430351	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management,Doctor.Alyce Cameron					Permits		
36-3-3428	Wongo Roo Ring 1	GDA	55	749199	6436072	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Mark Saddler					Permits		
36-3-1557	Ulan ID#278 (Cockabutta Creek 13)	GDA	55	750613	6434464	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-2-0500	Craboon-1	GDA	55	733226	6449921	Open site	Valid	Artefact : -		
	Contact	Recorders	RPS Australia East Pty Ltd - Hamilton,Mr.Ben Slack					Permits		
36-3-0035	Puggoon;Nagundie;	AGD	55	735397	6435351	Closed site	Valid	Artefact : -	Shelter with Deposit	2077
	Contact	Recorders	T.E Wittingham					Permits		
36-3-0029	Nagundie, Dubbo	AGD	55	735684	6435706	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	Recorders	Michael Pearson					Permits		
36-3-0032	Puggoon;Nagundie;	AGD	55	736344	6436231	Open site	Valid	Stone Arrangement : -	Stone Arrangement	1299,2077
	Contact	Recorders	T.E Wittingham					Permits		
36-3-0085	Leadville;	AGD	55	739100	6434790	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	Recorders	Warren Bluff					Permits		
36-3-2511	SAC 55	GDA	55	740929	6430339	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-3-1422	IF 22	GDA	55	741443	6430554	Open site	Valid	Artefact : 1		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-3-0126	Bald Ridge No:2;	AGD	55	745050	6451840	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
36-3-1554	Ulan ID#275 (Cockabutta Creek 10)	GDA	55	750463	6434414	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-1555	Ulan ID#276 (Cockabutta Creek 11)	GDA	55	750523	6434424	Closed site	Valid	Artefact : -		102138

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Birriwa SF 10km
Client Service ID : 618617

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-1556	Ulan ID#277 (Cockabutta Creek 12)	GDA	55	750543	6434424	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-1593	Ulan ID#316 (Walkerville 4)	GDA	55	750753	6431744	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-0031	Puggoon;Nagundie;	AGD	55	736344	6436231	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	T.E Wittingham					Permits		
36-3-2510	SAC 54	GDA	55	740431	6430830	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-2-0204	SAC 01	GDA	55	730739	6432890	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-3-0081	Old Castle;	AGD	55	744800	6455220	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Warren Bluff					Permits		
36-3-1590	Ulan ID#313 (Walkerville 1)	GDA	55	750083	6432254	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-1560	Ulan ID#281 (Cockabutta Creek 16)	GDA	55	750583	6434574	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-1552	Ulan ID#273 (Brokenback 13)	GDA	55	750733	6437024	Closed site	Valid	Art (Pigment or Engraved) : -, Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-0036	Puggoon;Nagundie;	AGD	55	735397	6435351	Open site	Valid	Burial : -	Burial/s	1299,2077
	Contact	Recorders	T.E Whittingham					Permits		
36-3-0079	Leadville;	AGD	55	739040	6454710	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0114	Waringle;	AGD	55	740200	6447900	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Warren Bluff					Permits		
36-2-0081	Dunedoo ST1	AGD	55	724373	6453630	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Miss.Rebecca Ogden-Brunell					Permits		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Birriwa SF 10km
Client Service ID : 618617

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
36-2-0089	Dunedoo ST	AGD	55	726301	6450000	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	April Blair					Permits		
36-2-0429	Beryl-Dunedoo OS2 with PAD	GDA	55	727582	6449194	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Doctor.Jodie Benton					Permits		
36-3-0078	Rock linden;	AGD	55	745400	6450500	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0080	Rock Linden No 3;	AGD	55	745690	6449990	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0161	Cockabulte (site 3);	AGD	55	748880	6441010	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	1333
	Contact	Recorders	Warren Bluff					Permits		
36-3-1568	Ulan ID#289 (Cockabutta Creek 7)	GDA	55	749933	6433964	Closed site	Valid	Artefact : -		102138
	Contact	Recorders	Ms.Laila Haglund					Permits		
36-3-0220	DTG/ST23 - Narangarie	AGD	55	736930	6455200	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	Recorders	Mr.Mark Rawson					Permits		
36-3-1431	SAC 51	GDA	55	739436	6431056	Open site	Valid	Artefact : 1		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-3-2508	SAC 52	GDA	55	739649	6431018	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-3-1421	IF 21	GDA	55	741443	6430523	Open site	Valid	Artefact : 1		
	Contact	Recorders	Doctor.Tim Owen					Permits		
36-2-0029	Tallawang Ck 3 Gulgong	AGD	55	730010	6430050	Open site	Valid	Artefact : -	Open Camp Site	851,1173
	Contact	Recorders	Elizabeth Rich,Laura-Jane Smith					Permits	192	
36-2-0030	Tallawang Ck 4 Gulgong	AGD	55	730082	6429871	Open site	Valid	Artefact : -	Open Camp Site	851,102800
	Contact	Recorders	Elizabeth Rich,Laura-Jane Smith					Permits	192	
36-2-0033	Tallawang Ck 7 Gulgong Nungarrin "Nungarrin",	AGD	55	730296	6429535	Open site	Valid	Artefact : -	Open Camp Site	851,1173,102800
	Contact	Recorders	Elizabeth Rich,Laura-Jane Smith					Permits	192	
36-3-0127	Bald Ridge No:1;	AGD	55	744770	6451610	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		

Report generated by AHIMS Web Service on 01/09/2021 for Alyce Cameron for the following area at Datum :GDA, Zone : 55, Eastings : 724281.0 - 750769.0, Northings : 6429390.0 - 6455408.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 86

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Birriwa SF 10km
Client Service ID : 618617

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
36-3-3691	Rosevale IF-01	GDA	55	744841	6431333	Open site	Valid	Artefact : -		

Contact	Recorders	Permits
	OzArk Environmental and Heritage Management,Doctor Alyce Cameron	

** Site Status
Valid - The site has been recorded and accepted onto the system as valid
Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.
Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground
Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 01/09/2021 for Alyce Cameron for the following area at Datum :GDA, Zone : 55, Eastings : 724281.0 - 750769.0, Northings : 6429390.0 - 6455408.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 86

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January 2023

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Birriwa
Client Service ID : 743512

OzArk Environmental and Heritage Management - Dubbo

Date: 08 January 2023

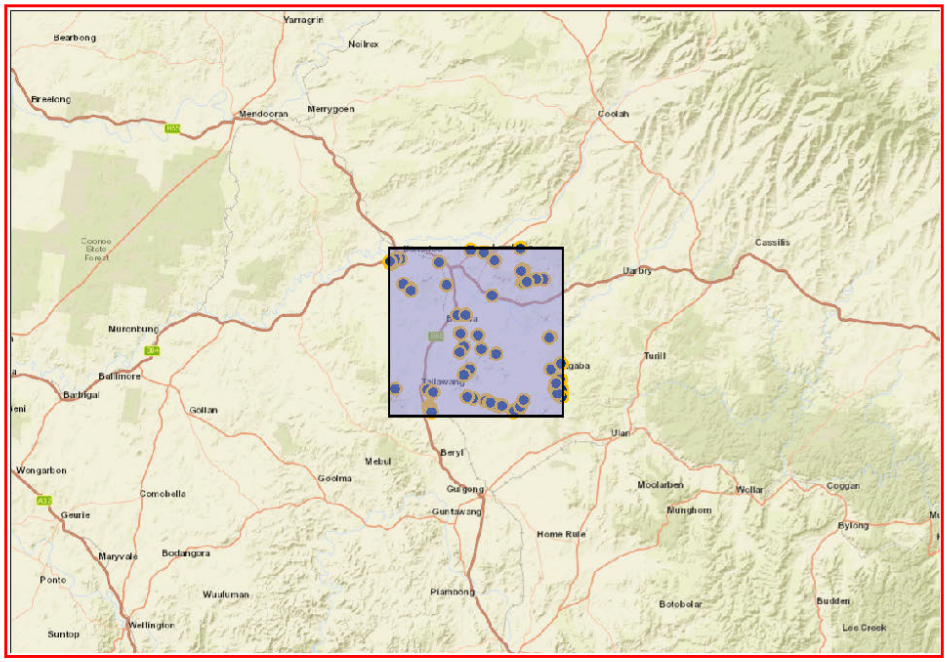
PO Box 2069
Dubbo New South Wales 2830
Attention: Stephanie Rusden

Email: stephanie@ozarkehm.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 55, Eastings : 724281.0 - 750769.0, Northings : 6429390.0 - 6455408.0 with a Buffer of 0 meters, conducted by Stephanie Rusden on 08 January 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

94	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***