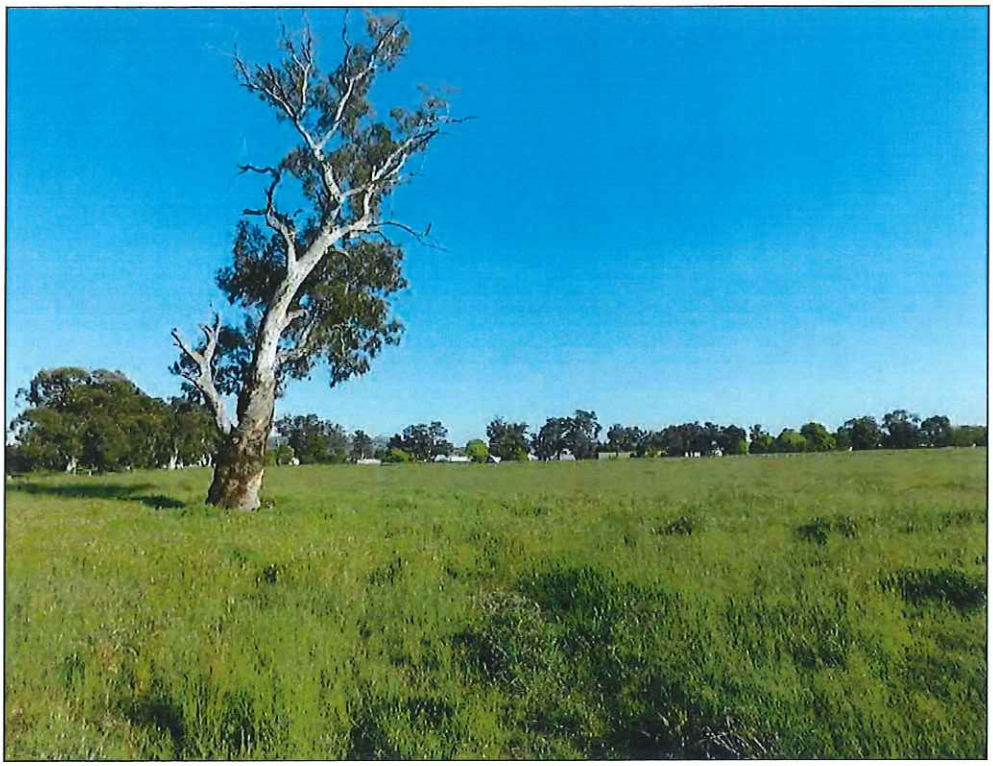

View across the central portion of the study area.

ABORIGINAL ARCHAEOLOGICAL IMPACT ASSESSMENT

COOTAMUNDRA SOLAR FARM

COOTAMUNDRA-GUNDAGAI LOCAL GOVERNMENT AREA, NSW

JANUARY 2022

Report prepared by

OzArk Environment & Heritage

for Flow Power (Utilacor Pty Ltd)

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DOCUMENT CONTROLS

Proponent	Flow Power (Utilacor Pty Ltd)
Client	Flow Power (Utilacor Pty Ltd)
Document Description	Aboriginal Archaeological Impact Assessment: Cootamundra Solar Farm
File Location	OzArk Job No.
OzArk EHM Data\Clients\Flow Power\Cootamundra Solar Farm\AAIA	3185

Document Status: V3.1 FINAL	Date: 18 January 2022
Draft V1: OzArk internal edits	V1.0 YK prepares draft 03/12/21
Draft V2: OzArk and client edits	V2.0 BC edit 17/12/21
Final V3: Final document	V3.0 BC finalises with client comments 11/1/22 V3.1 BC amends final with client comments 18/1/22
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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.

EXECUTIVE SUMMARY

OzArk Environment & Heritage (OzArk) has been engaged by Flow Power (the proponent) to complete an *Aboriginal Archaeological Impact Assessment* of an area located at the corner of Cowcumbla Street and Lloyd Conkey Avenue, Cootamundra which has the potential to be impacted by the proposed Cootamundra Solar Farm (the proposal).

The field survey was undertaken by OzArk Principal Archaeologist, Ben Churcher, on Friday 22 October 2021. The fieldwork was assisted by Vaiola Ingram representing Bidya Marra Consultancy.

The survey recorded three Aboriginal sites and three discreet areas of Sensitive Archaeological Landforms (SALs). All these recordings are closely associated with Muttama Creek.

The three recorded sites are within the study area but are located outside of the impact footprint where impacts associated with the proposal could occur. The proponent elected to decrease the size of the proposal's impact footprint to avoid the identified SALs. As these areas are now avoided by the proposal, test excavation to investigate the nature of any archaeological deposits at these areas was not warranted.

The tangible Aboriginal cultural values of the study area are limited to one low-density artefact scatter and two isolated finds associated with Muttama Creek. There may be places with intangible cultural significance within the study area, although no specific locations have so far been identified by the Aboriginal community except for the general significance of all waterways such as Muttama Creek.

It is assessed that the proposal will not harm significant Aboriginal cultural heritage values and that there will be no diminution of intergenerational equity should the proposal proceed.

Recommendations concerning Aboriginal cultural values within the study area are as follows:

1. The sites recorded within the study area (50-6-0275, 50-6-0276, and 50-6-0277) must not be harmed without the authority of an AHIP.
2. The Sensitive Archaeological Landforms (SALs) identified in this study must be avoided during construction of the proposal. Management recommendations to ensure that the SALs are avoided is provided in **Sections 8.4** and **8.5.2**.
3. If Aboriginal objects are noted during the construction or operation of the proposal, the *Unanticipated Finds Protocol* (**Appendix 2**) should be followed.
4. If human skeletal material is noted during the construction or operation of the proposal, the *Unanticipated Skeletal Remains Protocol* (**Appendix 3**) should be followed.
5. Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts (**Appendix 4**).

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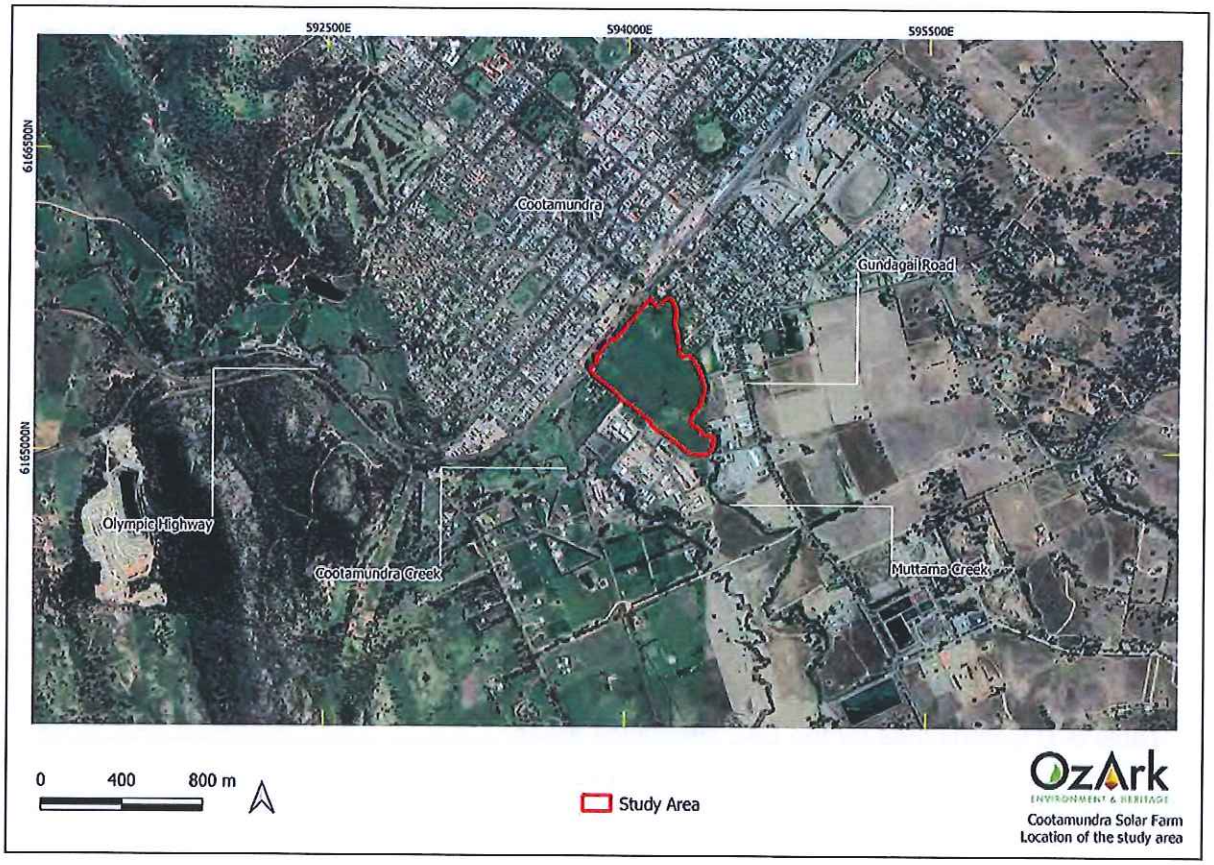
1 INTRODUCTION

1.1 DESCRIPTION OF THE PROPOSAL

OzArk Environment & Heritage (OzArk) has been engaged by Flow Power (the proponent) to complete an *Aboriginal Archaeological Impact Assessment* of an area located at the corner of Cowcumbla Street and Lloyd Conkey Avenue, Cootamundra which has the potential to be impacted by the proposed Cootamundra Solar Farm (the proposal). The proposal is in the Cootamundra-Gundagai Regional Local Government Area (LGA) (**Figure 1-1**).

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



1.2 PROPOSED WORK

The proponent is proposing to construct a five megawatt solar farm at Cootamundra, NSW. The proposal consists of solar generation equipment and associated infrastructure, located on land zoned for industrial purposes. The proposal will connect into the Essential Energy network. The total survey area is approximately 17 hectares (ha) with a maximum potential disturbance footprint of 15.5 ha (**Figure 1-2**).

Figure 1-2: Proposed work showing impact footprint.

1.3 STUDY AREA

The study area is located on vacant land on the corner of Cowcumbla Street and Lloyd Conkey Avenue, Cootamundra. Muttama Creek is located along the north-eastern boundary of the study area.

Within the study area is the survey area. The survey area (17 ha) describes the area where impacts associated with the proposal were planned at the time of the survey. To conserve potential Aboriginal cultural heritage noted during the survey, the impact footprint was decreased by the proponent to 15.5 ha. The survey area investigated includes the current maximum potential impact footprint (**Figure 1-3**).

The study area consists of cleared grassed paddocks with a few scattered trees. The paddocks are currently used for low level grazing, although it is likely the area has also been cultivated in the past based on historical imagery, however, there is no evidence of this activity currently visible in the study area.

The survey area consists of two landform types. Most of the survey area consists of flat or gently sloping land slightly elevated above surrounding landforms and Muttama Creek. In the southeast of the survey area is a low-lying landform that was boggy at the time of the survey. This landform

extends beyond the survey area towards Muttama Creek. The two landform units are shown on **Figure 1-4**.

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

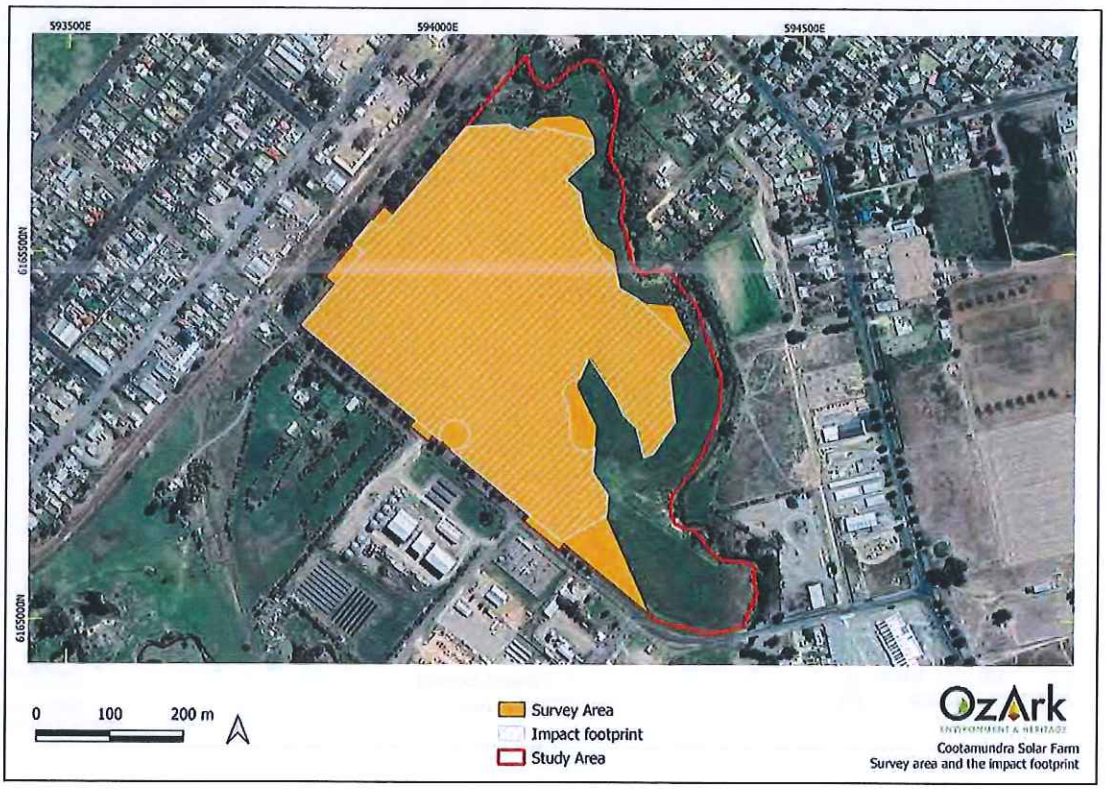
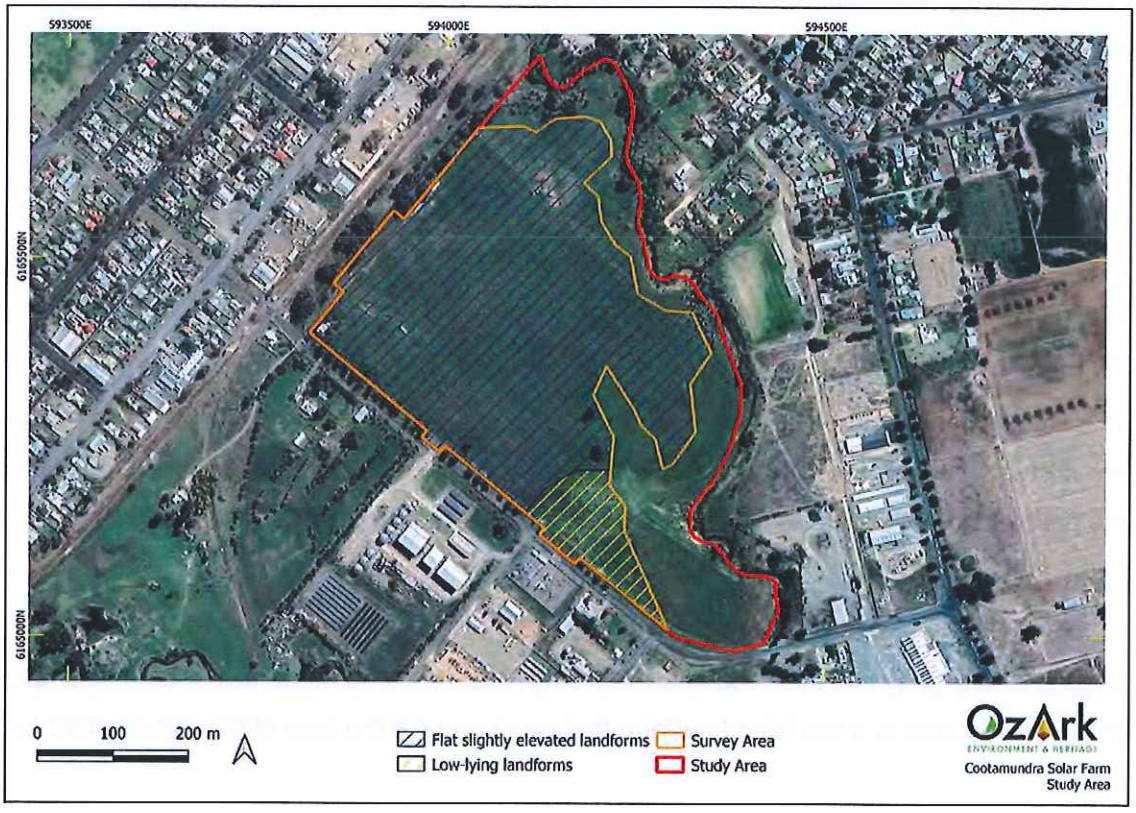


Figure 1-4: Aerial showing the landform units within the survey area.



1.4 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.

1.4.1 Commonwealth legislation

1.4.1.1 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 an impact on one of the matters of national environment significance listed by the Act. Ministerial approval is required under the EPBC Act for proposals involving significant impacts to national/commonwealth heritage places.

1.4.1.2 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 proposal

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

1.4.2 State legislation

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

This Act established 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 Minister responsible for the Act is the Minister for Planning and Public Spaces.

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

Applicability to the proposal

The current proposal will be assessed under Part 4 of the EP&A Act as a regionally significant development.

As the proposal will be assessed under Part 4 of the EP&A Act, and as a regionally significant development, any harm to Aboriginal objects must have prior approval in the form of an Aboriginal Heritage Impact Permit (AHIP) under Section 90 of the *National Parks and Wildlife Act 1974* (NPW Act).

1.4.2.2 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 Planning, Industry and Environment (DPIE) of the location of an Aboriginal object. Identified Aboriginal items and sites are registered on Aboriginal Heritage Information Management System (AHIMS) that is administered by Heritage NSW.

Applicability to the proposal

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

The Secretary of DPIE will be notified of the location of any Aboriginal object recorded because of the survey by registering it on the AHIMS register.

2 THE ARCHAEOLOGICAL ASSESSMENT

2.1 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).

Field assessment and reporting followed the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (the Guide; OEH 2011).

2.2 PURPOSE AND OBJECTIVES

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

The current assessment will apply the Code of Practice in the completion of the Aboriginal cultural heritage assessment to meet the following objectives:

Objective One: Undertake background research on the study area to formulate a predicative model for site location within the study 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: Assess the likely impacts of the proposed work to Aboriginal cultural heritage values and provide management recommendations.

2.3 DATE OF ARCHAEOLOGICAL ASSESSMENT

The field survey was undertaken by OzArk on Friday 22 October 2021.

2.4 OZARK INVOLVEMENT

2.4.1 Field survey

The fieldwork survey was undertaken by:

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

2.4.2 Reporting

The reporting component of the heritage assessment was undertaken by:

- Report author: Ben Churcher
- Contributor: Yekun Zhang (OzArk Archaeologist, B Arts Archaeology & Anthropology, M.Sc Archaeological Science, PhD Archaeology)
- Reviewer: Dr Jodie Benton (OzArk Director, PhD Archaeology).

2.5 ABORIGINAL COMMUNITY INVOLVEMENT

The fieldwork for the proposal was assisted by Vaiola Ingram representing Bidya Marra Consultancy.

2.6 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 2-1** tabulates the compliance of this report with the requirements established by the Code of Practice.

Table 2-1: 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 4.2, 4.3** and **4.3.2**
Requirement 1b	Review AHIMS searches	**Section 4.3.1**
Requirement 2	Review the landscape context	**Section 3**
Requirement 3	Summarise and discuss the local and regional character of Aboriginal land use and its material traces	**Section**
Requirement 4a	Develop predictive model	**Section 4.4**
Requirement 4b	Present predictive model results	**Section 4.4.3**
Requirement 5a	Archaeological survey sampling strategy	**Section 5.1**
Requirement 5b	Archaeological survey requirements	This Requirement was fulfilled during the undertaking of the survey
Requirement 5c	Archaeological survey units	**Section 3.1.1**
Requirement 6	Site definition	**Section 4.4.1**
Requirement 7a	Site recording information to be recorded	**Section 5.4**
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 5.1**
Requirement 10	Analyse survey coverage	**Section 5.3**
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	Due to project redesign by the proponent, no test excavation took place as part of this assessment.
Requirements 15–17	Test excavation	No applicable

3 LANDSCAPE CONTEXT

An understanding of the environmental context of a study 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.

3.1 TOPOGRAPHY

The study area is in the NSW South Western Slopes bioregion (NPWS 2003). The region of the study area comprises narrow alluvial plains, terraces, and current floodplains with slopes <1%. Elevation in the region ranges from 240–260 metres (m) near the locality of Muttama to the south of Cootamundra to 315–340 m north of Cootamundra, with local relief <9 m.

3.1.1 Survey units

Based on the topography of the study 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 is generally between 322 and 328 m above sea level. Based on the preliminary landform mapping within the survey area, the survey area is classified into two survey units (**Figure 1-4**):

- Survey Unit 1: Flat to gently sloping landforms slightly elevated above Muttama Creek and surrounding landforms. Survey unit 1 occupies approximately 15.5 ha of the 17 ha survey area that was assessed during the field survey
- Survey Unit 2: Low-lying landforms comprising of alluvial soils prone to water logging. Survey unit 2 occupies approximately 1.5 ha of the 17 ha survey area.

Figure 3-1 shows views of the two survey units within the survey area.

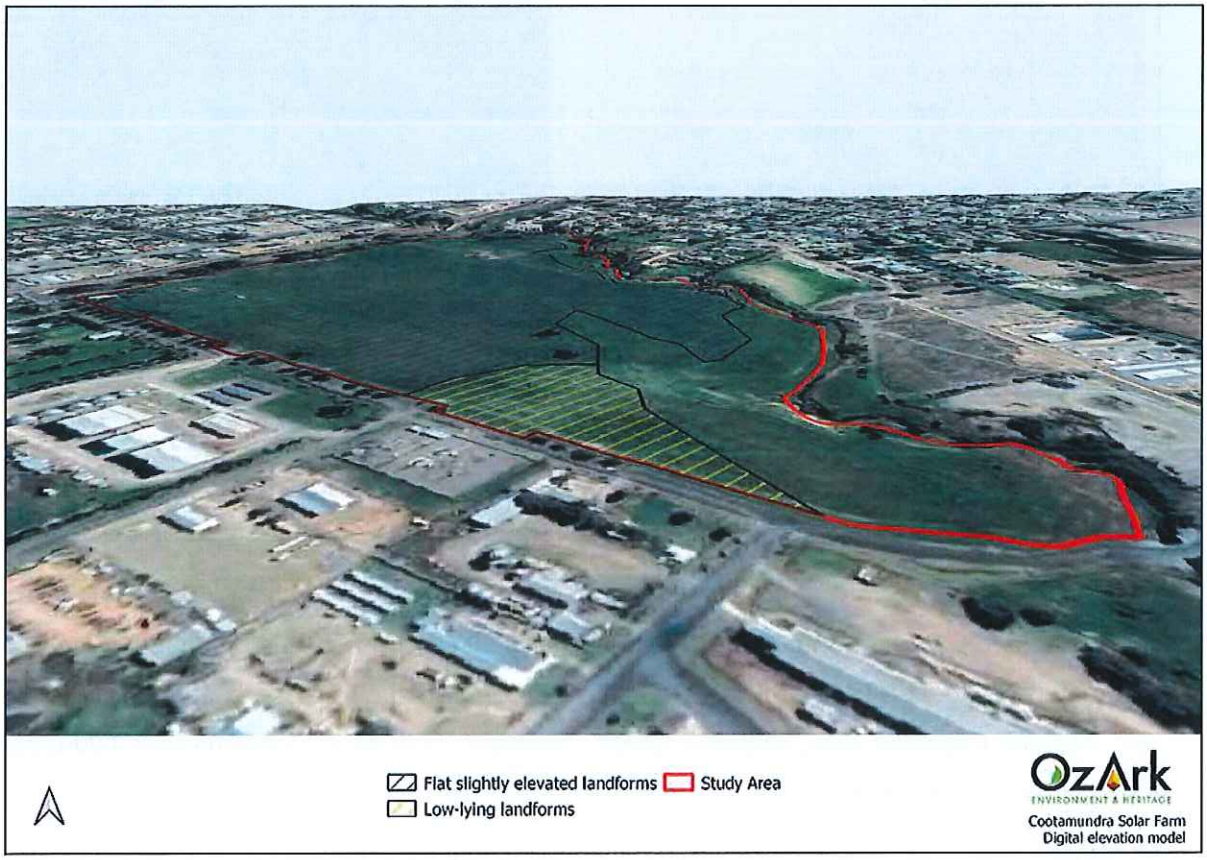
A digital elevation model (DEM) of the study area (**Figure 3-2**) shows that there is very little change in elevation between the two survey units with Survey Unit 2 only being slightly lower than Survey Unit 1.

Figure 3-1: Survey units of the survey area.

1. View of a flat landform of Survey Unit 1 within the survey area.

2. View of the boggy nature of Survey Unit 2 in the southeast of the survey area.

Figure 3-2: DEM of the study area showing the survey units.



3.2 GEOLOGY AND SOILS

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).

Soils within the region of the study area have formed on recent Quaternary alluvium. Parent materials consist of gravel, sand, silt, and clay deposits. These soils are considered to have low erodibility and erosion hazard generally, but moderate to high erodibility and erosion hazard for dispersible subsoils, thin sandy horizons, and locally sodic topsoils.

In the study area, soil profiles were afforded by the banks of Muttama Creek that is moderately incised (**Figure 3-3**). These profiles show a very thin A1 horizon only a few centimetres thick. A sandy alluvial A2 horizon extends down to a depth of approximately 20 centimetres (cm) above the sandy clay B Horizon. The dominant features of these profiles are their alluvial nature and the dominance of finely sorted silts and clays with very few cobbles or gravels.

Figure 3-3: Soil profiles in the study area.

1. View of a soil profile within the study area near Muttama Creek.

2. View of the incised channel for Muttama Creek and adjacent soil profile within the study area.

3.3 HYDROLOGY

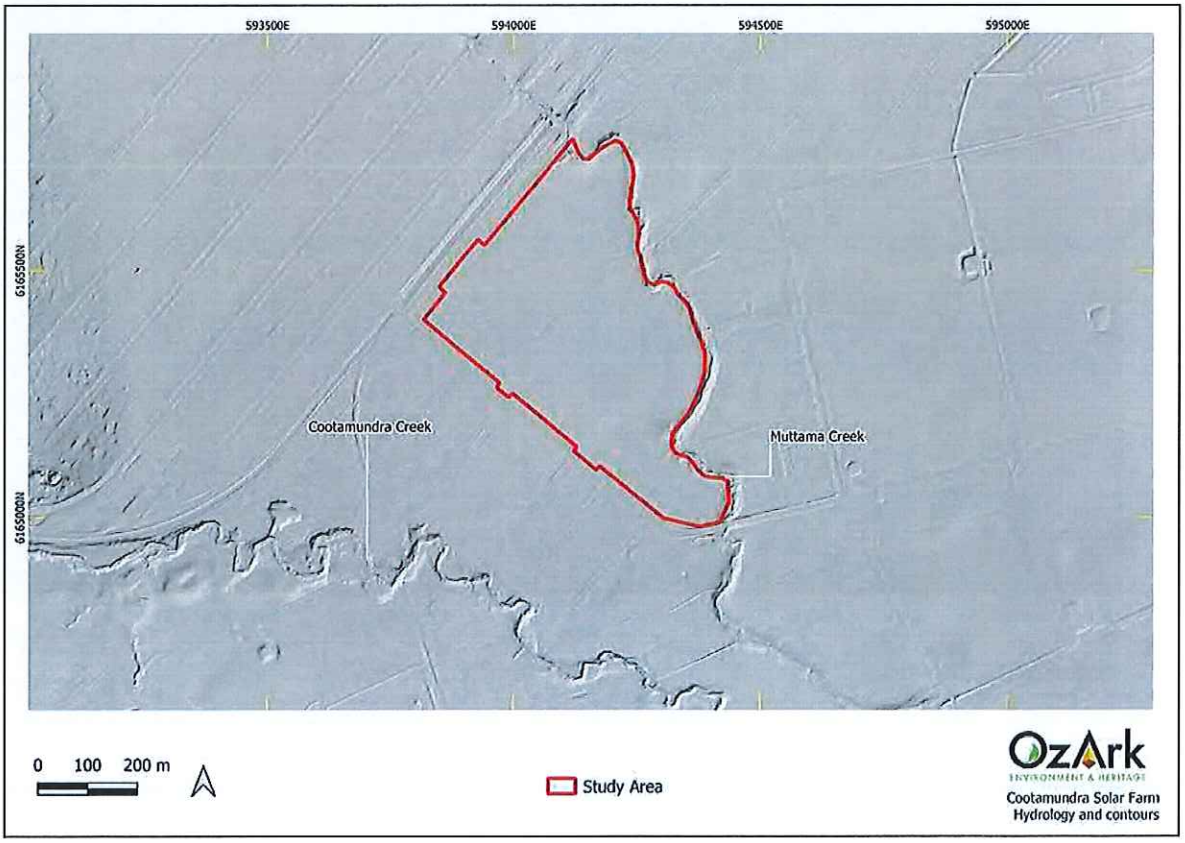
Hydrological features in the vicinity the study area are limited to Muttama Creek which runs from northwest to southeast along the eastern boundary of the study area, as well as Cootamundra Creek which is located approximately 300 m south of the study area (**Figure 3-4**).

The stream channel of Muttama Creek near the study area is less deeply incised than Cootamundra Creek (**Figure 3-5**). Cootamundra Creek also shows more extensive gully erosion and channel migration than Muttama Creek. However, both creek systems lack hydrological features such as terraces.

Muttama Creek is semi-permanent as it has a large catchment, although it could possibly run dry during prolonged dry periods. Formerly, prior to colonial modification of the landscape, the creek systems may have had a chain of ponds morphology where water would be retained in the landscape for longer than is the case with the current incised channels.

Figure 3-4: The study area in relation to nearby waterways.

Figure 3-5: DEM showing topography of local hydrology.



3.4 VEGETATION

The study area would have been formerly dominated by Eucalypt woodlands. However, most of the vegetation has been extensively cleared for agricultural development and only remnant communities remain along road and fence reserves. River red gum occur along creek lines in the region and Blakely's red gum and yellow box occur on surrounding plains. The understorey consists of tussock grasses and forbs.

The study area has been extensively cleared and is today dominated by grasses and weeds.

3.5 LAND USE HISTORY AND EXISTING LEVELS OF DISTURBANCE

The study area is currently used for sheep and cattle grazing on improved pastures. Cereal and fodder crops are also grown in the district, and it is likely that the study area has been cultivated at some time in the past although visual evidence of this is lacking. However, aerial imagery from 1978 shows cultivation across most of the study area, possibly for fodder crops (**Figure 3-6**). The 1978 aerial shows that the cultivation was confined to Survey Unit 1 landforms and that the low-lying landforms of Survey Unit 2 were not used for cultivation but have traditionally been used for grazing.

Figure 3-6: Aerial image of the study area in 1978.

3.6 CONCLUSION

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

- Topography and hydrology: the flat landforms which dominate the study area would have been hospitable to Aboriginal people, however, apart from Muttama Creek, there are few landforms within the study area which would have encouraged long-term Aboriginal occupation of the landscape.

- Geology and soils: landforms which typically comprise outcropping rock, i.e., hills, are not present within the study area, and therefore sources of stone procurement for tool manufacture will not be present. Soils present on the flats within the study area are likely to have been affected by water erosion and are poor draining. The erosional qualities of the soils present will lower the likelihood for the presence for *in situ* archaeological deposits. Furthermore, the long-term cultivation and grazing land use within the study area would have further promoted soil erosion and loss, potentially disturbing Aboriginal sites.

- Vegetation: the study area would have once supported an open woodland which would have provided some resources for Aboriginal subsistence in the past. However, resources likely to have supported a large population of people would have been present closer to the banks of more permanent water sources. The broad-scale vegetation clearance which has taken place across the study area for agricultural purposes reduces the likelihood that any culturally modified trees remain present, however, should mature native vegetation remain, particularly along Muttama Creek, culturally modified trees may be present.

- Land use: ground surface disturbances such as vegetation clearance, cultivation, and grazing exist throughout the study area. These activities may have displaced Aboriginal objects and are likely to have reduced the potential for subsurface archaeological material. Initial vegetation clearing would also have significantly reduced the likelihood of culturally modified trees remaining. However, disturbance at a given location does not necessarily mean that there will be no cultural material present, as often a disturbed context will reveal objects which may have previously been subsurface.

4 ARCHAEOLOGICAL CONTEXT

4.1 ETHNO-HISTORIC SOURCES OF REGIONAL ABORIGINAL CULTURE

The study area is within the territory of the Wiradjuri tribal and linguistic group (Tindale 1974) and the name Cootamundra is thought to of derived from the Aboriginal name for Turtle known as "*guudhamang*".

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.

The Wiradjuri is one of the largest language groups within New South Wales, extending across the districts of Condobolin, Booligal, Carrathool, Wagga Wagga, Cootamundra, Cowra, Parkes, Trundle, Boorowa, Wellington, Mudgee, Bathurst, Mossgiel, Hay, Albury, and Tumbarumba (Tindale 1974). While the area had a single language, various dialects were found throughout the region most notably in Albury and Bathurst. The study area is located near the southeast boundary of the Wiradjuri territory, next to the Ngunnawal territory.

It is important to recognise the use and meaning of the term 'tribe' and the designation of lines on a map as 'tribal boundaries' as being controversial issues (Bowdler 1983: 22). There is no doubt that there were distinctive groups, which can be defined by their linguistic traits, but the designation of lines on a map as boundaries, although useful, must also be accepted as problematic. Unlike Tindale's map, the map (from NSW NPWS) reproduced in Bowdler (1983: 17, Figure 2) shows a more general relationship of the language groups known to exist in NSW.

Prior to colonial settlement, the eastern margins of the Murrumbidgee River basin supported woodland and forest habitats that provided home to a wide range of exploitable resources for the Aboriginal population. These resources included possums, which provided a ready source of meat and fur for cloaks (Kabaila 1998: 12). Also used were vegetables including the roots of daisy yams (Myrrnong), the tubers of lilies and orchids, stands of bracken fern, and Kurrajong roots. The frequent floods of the Murrumbidgee provided the local Aboriginal population with an abundance of resources: as the flood waters receded, they left the drying pools stocked with freshwater mussels, yabbies, fish, and waterfowl as well as aquatic plants (Kabaila 1998: 12).

In the local area, the catastrophic impact of colonial settlement on the local Aboriginal people is exemplified by the Cootamundra Domestic Training Home for Aboriginal Girls (also known as Bimbadeen), that is located northeast of Cootamundra. The centre was operated and run by the New South Wales Aborigines Welfare Board from between 1911 to 1968 to provide training to girls 'forcibly' taken from their families under the *Aborigines Protection Act* (1909). These girls were a part of the Stolen Generations, and were not allowed any contact with their families, being trained to work as domestic servants.

Girls were sent to this college to the age of 14, and then they were sent out to work. Many of these young girls became pregnant while in domestic service, only to have their children in turn removed and brought back to the same college at Bimbadeen.

The building that housed these girls was later taken over by the Aboriginal Evangelical Fellowship as a Christian vocational, cultural, and agricultural training centre which was then called Bimbadeen College. The centre/college was added to the New South Wales Heritage Register on 17 February 2012.

4.2 REGIONAL ARCHAEOLOGICAL CONTEXT

Aboriginal people have occupied the Australian continent for at least 50,000 years and perhaps beyond (O'Connell et al. 2018). There have been no known dated excavations in the Cootamundra area, although the archaeological evidence from Lake Mungo in western NSW provides ample evidence of Aboriginal occupation dating back 40,00 years (Mulvaney and Kamminga 1999).

No regional synthesis of the archaeology has been completed for the Cootamundra area. The following are summaries of those archaeological survey reports, primarily driven by development and infrastructure requirements, that have been completed in the region.

Witter carried out a survey for a gas pipeline between Wagga Wagga and Young to the south of the study area in 1980. He recorded 14 artefact scatters, 21 isolated finds, a possible rock well, and a modified tree. Most of the sites identified by Witter occurred in association with creeks or water courses within a range of landforms including flats, slopes, and spurs. Witter recommended the excavation of some of these sites if they were unable to be avoided. One of these sites, artefact scatter BY/4, was salvaged by Kelly later that same year recording 319 surface artefacts and excavating an additional 48 artefacts (as cited in KNC 2008: 4).

A 1983 study by Witter and Hughes (as cited in AECOM 2010: 67) of a proposed transmission line near Murrumburrah (approximately 30 km northeast of the study area) recorded 18 Aboriginal sites. This consisted of 13 isolated finds, four artefact scatters and one scarred tree. Witter and Hughes suggested that site patterning in the region is dominated by sites clustered along the valleys of water courses with the open undulating plateau containing significantly lower densities of sites.

An archaeological survey of the Ulandra Nature Reserve, approximately 17 km southwest of the study area was undertaken in 1985 by Paton and Hughes (as cited in AECOM 2010: 67). The survey identified seven artefact scatters and 15 isolated finds. The scatters consisted mostly of quartz with some silcrete, basalt, and quartzite ranged in artefact density from between nine and 67 artefacts. All sites were located on low rises associated with creek lines. Paton and Hughes

suggested that landforms associated with wide low relief valleys had the highest archaeological potential.

4.3 LOCAL ARCHAEOLOGICAL CONTEXT

4.3.1 Desktop database searches conducted

A desktop search was conducted on the following databases to identify any previously recorded heritage within the study area. The results of this search are summarised in **Table 4-1** and presented in detail in **Table 4-2**.

Table 4-1: Aboriginal cultural heritage: desktop-database search results.

Name of Database Searched	Date of Search	Type of Search	Comment
Commonwealth Heritage Listings	08/12/2021	Cootamundra-Gundagai LGA	No places listed on either the National or Commonwealth heritage lists are located within the study area
National Native Title Claims Search	08/12/2021	NSW	No Native Title Claims cover the study area.
AHIMS	08/12/2021	10 x 10 km centred on the study area	46 AHIMS sites within the search area.
Local Environmental Plan (LEP)	08/12/2021	Cootamundra LEP of 2013	None of the Aboriginal places noted occur within the study area.

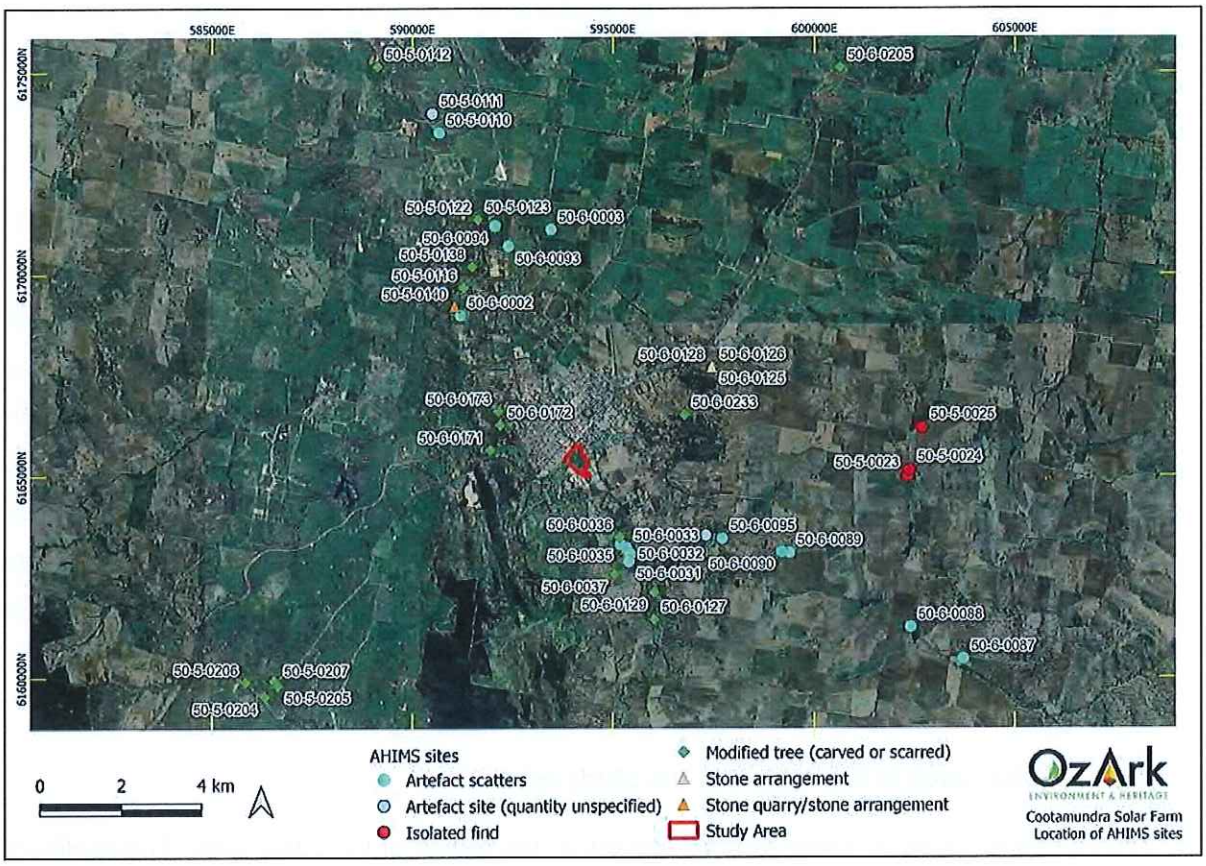
A search of the AHIMS database returned 46 records for Aboriginal heritage sites within a 10 km search area centred on the study area (GDA Zone 55 Eastings: 584145–604145, Northings: 6155377–6175377; without buffer). **Figure 4-1** shows the location of the AHIMS sites that have been recorded near the study area. Of the previous recorded sites, the dominant site types are modified trees and artefact sites, which comprise 50% and 36.9% of all recorded sites, respectively. Four isolated find sites, one stone arrangement, and one stone quarry with stone arrangements are also recorded in the designated search area.

There are no AHIMS sites registered within or directly adjacent to the study area.

Table 4-2: Site types and frequencies of AHIMS sites near the study area.

Site Type	Number	% Frequency
Modified tree (carved or scarred)	23	50%
Artefact scatters	14	30.4%
Isolated find	4	8.7%
Artefact site (quantity unspecified)	3	6.5%
Stone arrangement	1	2.2%
Stone quarry/stone arrangement	1	2.2%
Total	**46**	**100%**

Figure 4-1: Previously recorded sites within a 10 km search area centred on the study area.



4.3.2 Previous studies in or near the study area

A subsurface investigation was undertaken by Barber in 1997 adjacent to the Muttama Creek just south of Cootamundra. (This investigation resulted in the cluster of sites seen on **Figure 4-1** to the south of the study area on Muttama Creek.) A total of 61 test probes were excavated with only 24 test pits containing artefacts. Sixty-nine artefacts in total were recovered and 45% of the assemblage originated from a single test pit, E8. The overwhelming majority of artefacts (92.8%) were manufactured from quartz with lesser numbers of fine grained siliceous and volcanic raw materials present. The nature of the quartz assemblage suggested that bipolar flaking techniques were predominantly used, and the high density of artefacts found in test pit E8 suggested a knapping event. Barber (1997) suggests that the generally flat topography of the area prevented the concentration of the archaeological record to a topographic feature however, a significant background scatter of artefacts including single knapping events such as located in E8 are present in the landscape (Barber 1997).

4.4 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.

4.4.1 Site types in the region of the study area

The site types listed in **Table 4-3** are present in the region of the study area. The likelihood of these sites being present in the study area is discussed in **Section 4.4.3**.

Table 4-3: Site types recorded in the region of the study 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 metres (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

Site type	Site description
	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. As the interpretation of modified trees can be difficult, assessment against accepted criteria is important.
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.
Stone arrangements	Stone arrangements are places where Aboriginal people have positioned stones deliberately to form shapes or patterns. The purpose of these arrangements is unknown because their traditional use ceased when colonial settlement disrupted Aboriginal society. They were probably related to ceremonial activities. Stone arrangements occur where there are plenty of boulders, such as volcanic areas, and where the land could support large bands of people. Surviving stone arrangements are rare in NSW, and most are in the New England Tableland region of the state. Care needs to be taken with identifying stone arrangements as clusters of stones can also be created by farmers clearing fields of stones.

4.4.2 Landform modelling of archaeological potential

The archaeological studies undertaken within the vicinity of the study area provide information to obtain an understanding of the nature and distribution of archaeological sites in the area. Although there is some conjecture about the relationship between stream order, site numbers and densities, the general pattern is that most sites are present close to watercourses, in landforms that associated with wide low relief valleys, flats, gentle slopes, and spurs, but not necessarily on an alluvial flat.

The preservation of archaeological site and deposits is dependent on past land use. The study area and adjacent land has been mainly used for agricultural purposes. These activities involve ploughing the ground surface, or the constant trampling of hoofed livestock, which significantly shuffles or compact the ground surface, ultimately accelerating soil loss. Cropping and the use of ploughing affects the integrity of archaeological Aboriginal sites, in particular open camp sites, especially if such sites have potential for subsurface deposits. However, ploughing will usually affect the top 20 to 50 cm of the topsoil, and so there is the potential for intact subsurface deposits below the plough-zone.

The clearing of vegetation inside the study area is widespread, despite some remnant trees remaining. This is likely to have had an impact on any modified trees that may have been present.

Though no previous assessments have been undertaken within the study area, the results of previous assessments in the vicinity indicate that sites are expected to be recorded within landforms near a watercourse, in this case Muttama Creek.

4.4.3 Conclusion

Based on knowledge of the environmental contexts of the study 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 study area to contain Aboriginal objects (**Table 4-4**), and what types of sites may be present within the study area (**Table 4-5**).

Table 4-4: Likelihood of landforms within the study area to contain Aboriginal objects.

Survey Unit	Landform type	Likelihood to contain Aboriginal objects
1	Flat slightly elevated landforms	These landforms are formed by alluvial deposition from Muttama Creek and were originally an aggrading environment that would have been impacted by flooding and channel migration. Following colonial settlement, these landforms have been used for cultivation and grazing turning the landforms into a degrading landform where thin topsoils are evident. While these landforms would have provided resources to encourage Aboriginal occupation and use in the past, their geomorphic nature makes them poor preservers of archaeological deposits and any objects in such landforms are likely to be in a secondary context.
2	Low-lying landforms	The low-lying nature of these landforms make them poor camping locations and it is not expected that in situ Aboriginal sites will be commonly recorded in Survey Unit 2. It is noted that Survey Unit 2 has less disturbance than Survey Unit 1 as the area was apparently never cultivated. Therefore, should Aboriginal sites be recorded in this landform, there is increased opportunity for them to be in a primary depositional context.

Table 4-5: Likelihood of certain site types being present in the study area.

Site type	Likelihood of being present in the study 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 study area.
Open artefact scatters	As most of the study area is near the Muttama Creek, this site type is possible although the moderate degree of disturbance in the study area will probably mean that the scatter has become displaced. It is likely that any sites associated with such landforms are likely to have a low artefact density and a low complexity of tool types as the sites are either one-off events or only infrequently used. This patterning was confirmed by the results of Barber (1997) excavating similar landforms near Muttama Creek and recording a low density of artefacts apart from one concentration interpreted as a knapping event.
Culturally modified trees	Due to the near-total clearance of trees from within the study area, this site type is predicted to be very rare. Culturally modified trees may be identified should remnant mature trees present within the study area, especially near Muttama Creek.
Quarry sites	This site type is unlikely be recorded within the study area as the alluvial nature of the landforms suggests that rock outcrops will not be present.
Stone arrangements	This site type is unlikely be recorded within the study area due to the nature of past land use (particularly cropping) that would remove such sites.

Near the study area, 50% of the previously recorded sites are comprised of modified trees and artefact sites comprise 36.9% of regional site types. The predominant raw material recorded is quartz; however, a range of other materials including fine grained siliceous and volcanic raw materials are also present. No previously recorded sites are known to exist within the study area, and like the regional pattern, the closest site types to the study area are modified trees and artefact sites.

Based on the distribution of previously recorded site types and the nature of past land use in the study area, the most likely site type to be identified within the study area are stone artefact sites. Should open artefact scatters be present, they are likely to have been disturbed by historic land use practices. Modified trees, has they been present in the study area, have likely been removed by past land clearing.

4.5 RESEARCH QUESTIONS

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

- What resources were available to the Aboriginal people using the land within the study area (food, stone, and water) and what resources were transported to the area?
- How do the raw materials recorded within the study area compare to those in recorded in the surrounding region?
- Establish how the findings within the study area (if any) accord with the regional archaeological context examined in **Section 4.2**.

5 RESULTS OF ABORIGINAL ARCHAEOLOGICAL ASSESSMENT

5.1 SAMPLING STRATEGY AND FIELD METHODS

Standard archaeological field survey and recording methods were employed in this study (Burke & 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 study area are known. Therefore, the aims of the survey were to:

- Conduct pedestrian transects across all landforms in the study area so that their archaeological potential could be determined
- Evaluate whether the predictive model set out in **Section 4.4** is valid
- Determine if any portions of the study area require test excavation to understand the archaeological potential at a particular location.

Figure 5-1 shows the survey tracks of the OzArk archaeologist during the survey. There was an Aboriginal site officer undertaking the survey with the archaeologist, so the actual area of survey coverage was greater than is indicated on this figure.

Figure 5-1: Pedestrian coverage of the study area.

5.2 SURVEY CONSTRAINTS

There were no physical impediments to the survey which consists of agricultural paddocks across a flat plain. However, ground surface visibility (GSV) was greatly reduced to thick grass cover following a substantial wet period (**Figure 5-2**).

Figure 5-2: Examples of GSV in the survey area.

1. View of the thick grass reducing GSV to zero over much of the survey area.

2. View of an isolated area of exposure around a gate.

5.3 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 5-1 calculates the effective survey coverage within the study area. In general, **Table 5-1** 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 Survey Unit 1 only 0.4% of the ground surface could be seen due to the thick grass cover. The amount of visible ground increased in Survey Unit 2 as there was a greater incidence of tracks and gates in this area that afforded views of the ground surface. Visibility within Survey Unit 2 was also hampered by thick grass cover.

Table 5-1: 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)
1	Flat elevated	155000	80	5	620	0.4
2	Low-lying	15000	60	15	3210	21.4

5.4 ABORIGINAL SITES RECORDED

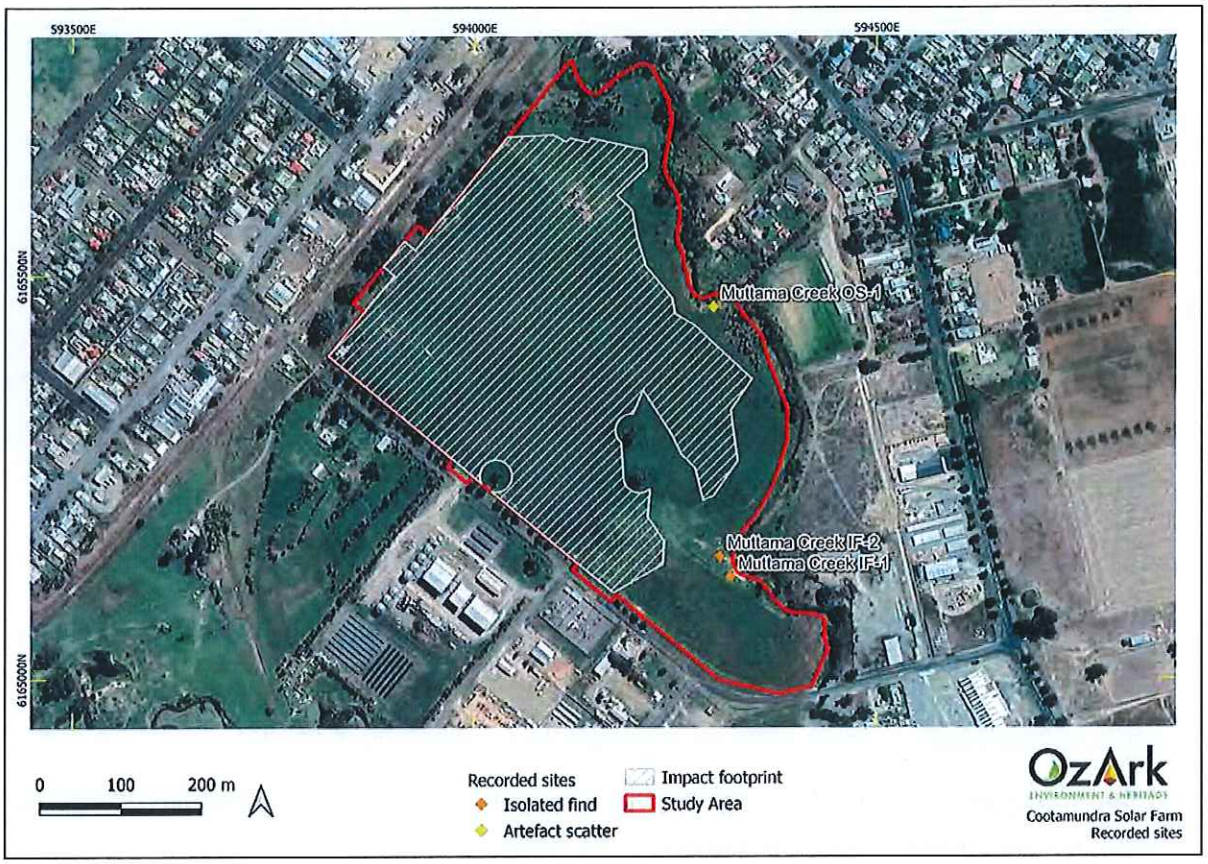
Table 5-2 summarises the Aboriginal cultural heritage sites recorded during the survey. All sites were recorded outside the survey area near Muttama Creek. These landforms, while part of the study area, will not be impacted by the proposal.

Further details on each site follows and the location of the sites is shown on **Figure 5-3**. This figure also shows the impact footprint and demonstrates that all sites will be avoided by the proposal.

Table 5-2: 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
50-6-0275	Muttama Creek IF-1	Isolated find	594318	6165126	Similar to Survey Unit 2
50-6-0276	Muttama Creek IF-2	Isolated find	594305	6165151	Similar to Survey Unit 2
50-6-0277	Muttama Creek OS-1	Artefact scatter	594297	6165461	Similar to Survey Unit 1

Figure 5-3: Aerial showing the location of recorded sites.



Muttama Creek IF-1 (50-6-0275)

Site type: Isolated find

GPS coordinates: GDA Zone 55, Easting 594318, Northing 6165126

Location of site: Muttama Creek IF-1 is located on the banks of the Muttama Creek, 140 m north of Cowcumbla Street. The site is in Lot 1 DP783927.

Description of site: Muttama Creek IF-1 is a single quartz flake located within flat alluvium landform on the banks of the Muttama Creek (**Table 5-3** and **Figure 5-4**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site is a combination of scattered trees and cleared paddocks with dense grass cover. The GSE at the time of recording was moderate (50%) with a GSV of 80% within these exposures. Identified disturbances include water erosion and stock trampling.

Potential for the presence of further subsurface archaeological deposits at Muttama Creek IF-1 was assessed as negligible.

Table 5-3: Muttama Creek IF-1 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Quartz	Complete	Tertiary	26x16x6

Figure 5-4: Muttama Creek IF-1. View of site and the recorded artefact.

1. View of Muttama Creek IF-1 (at the location of the bag) facing northwest.

2. View of Muttama Creek IF-1 quartz flake.

Muttama Creek IF-2 (50-6-0276)

Site type: Isolated find

GPS coordinates: GDA Zone 55, Easting 594305, Northing 6165151

Location of site: Muttama Creek IF-2 is located on the banks of the Muttama Creek, 160 m north of Cowcumbla Street. The site is in Lot 1 DP783927.

Description of site: Muttama Creek IF-2 is a single dark chert core located within flat alluvium landform on the banks of the Muttama Creek (**Table 5-4** and **Figure 5-5**). The extent of the site is defined by a 5 m buffer around the artefact. Surrounding vegetation at the site is cleared paddocks with dense grass cover. The GSE at the time of recording was moderate (40%) with a GSV of 90% within those exposures. Identified disturbances include water erosion and stock trampling.

Potential for the presence of further subsurface archaeological deposits at Muttama Creek IF-2 was assessed as negligible.

Table 5-4: Muttama Creek IF-2 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Core	Chert	Complete	Secondary	Max 30 mm

Figure 5-5: Muttama Creek IF-2. View of site and the recorded artefact.

1. View of Muttama Creek IF-2 (at the location of the bag) facing southeast.

2. View of Muttama Creek IF-2 (at the location of the bag) facing northwest.

3. View of Muttama Creek IF-2 chert core.

4. View of Muttama Creek IF-2 chert core.

Muttama Creek OS-1 (50-6-0277)

Site type: Artefact scatter

GPS coordinates: GDA Zone 55, Easting 594297, Northing 6165461

Location of site: Muttama Creek OS-1 is located on the banks of the Muttama Creek, approximately 500 m east of the intersection of Lloyd Conkey Avenue and Cowcumbla Street. The site is in Lot 14 DP753601.

Description of site: Muttama Creek OS-1 is low-density artefact scatter comprising of five quartz flakes that is located within flat alluvium landform on the banks of the Muttama Creek (**Table 5-5** and **Figure 5-6**). The 10 m (east–west) by 5 m (north–south) extent of the site was defined by the area of exposure. Surrounding vegetation is cleared paddocks with dense grass cover and scattered trees. The GSE at the time of recording was moderate (30%) with a GSV of 50% within these exposures. Identified disturbances were dominated by water erosion and stock trampling.

Potential for the presence of further subsurface archaeological deposits at Muttama Creek OS-1 was assessed as low.

Table 5-5: Muttama Creek OS-1 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Quartz	Complete	Tertiary	19x14x7
Flake	Quartz	Complete	Tertiary	18x12x5
Flake	Quartz	Complete	Tertiary	19x14x4
Flake	Quartz	Complete	Tertiary	10x7x4

Figure 5-6: Muttama Creek OS-1. View of site and details of recorded artefacts.

1. View of Muttama Creek OS-1 (at the location of the bag) facing east.

2. View of Muttama Creek OS-1 (at the location of the bag) facing west.

3. View of Muttama Creek OS-1 quartz flakes.

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5.5 SENSITIVE ARCHAEOLOGICAL LANDFORMS

During the survey, three discrete areas were identified as being Sensitive Archaeological Landforms (SALs) although low GSV prevented a comprehensive examination of the ground surface. These SALs were defined within the survey area although they extend beyond the survey

area towards Muttama Creek. All SALs are associated with Survey Unit 1 and consist of elevated, flat areas of land near Muttama Creek.

The SALs within the survey area are shown on **Figure 5-7**.

Figure 5-7: Location of SALs within the survey area.

5.6 ABORIGINAL COMMUNITY COMMENTS ON THE SURVEY

Vaiola Ingram representing Bidya Marra Consultancy who assisted with the survey did not identify any specific cultural values within the study area. Mr Ingram did express the importance of Muttama Creek to his ancestors and regarded the recorded artefacts as culturally significant.

5.7 SUMMARY OF SURVEY RESULTS

The survey recorded three Aboriginal sites and three discreet areas of SAL. All these recordings are closely associated with Muttama Creek.

The three recorded sites are within the study area but are located outside of the impact footprint where impacts associated with the proposal could occur.

5.7.1 Discussion

The predictions based on the landform modelling and the regional archaeological context for the study area concluded that archaeological sites are likely to be recorded within reasonable

proximity to a watercourse, and that stone artefact sites were the most likely site type to be identified (**Section 4.4**). The results of the current study conform to the predictive model with two isolated finds and one artefact scatter being identified (**Section 5.4**). Modified trees were predicted to have a low likelihood of occurring due to the historic disturbance associated with vegetation clearance in the study area, which is borne out by the results of the assessment.

The identification of artefact sites on the banks of the Muttama Creek is consistent with the findings in the region of the study area.

The three artefact sites recorded along the creek highlight that watercourses such as Muttama Creek once possessed resources that attracted Aboriginal occupation or were used as transit pathways. However, the semi-permanent nature of the Muttama Creek was unlikely to provide resources to support a large population of people and so the area was probably used infrequently or for short-term stays.

In addition, the high level of ground surface disturbance across the study area from activities such as vegetation clearing, cropping, and grazing would have impacted the integrity of any archaeological deposits. It is noted that all recorded sites are in the bank areas of Muttama Creek where impacts from cropping would not have occurred. Nonetheless, these landforms have been heavily impacted by water erosion and stock trampling.

The results of the field survey concluded that the survey area holds little potential for the existence of any undetected Aboriginal sites due to the nature of the landform present and the high levels of past disturbance. The exception to this is in the small areas of SAL where the landform suggests that subsurface archaeological deposits may be present.

5.7.2 Responses to the research questions

In **Section 4.5** several research questions were advanced to guide the survey of the study area. Following the survey, responses to these research questions are set out below.

- What resources were available to the Aboriginal people using the land within the study area (food, stone, and water) and what resources were transported to the area?
    - No specific food resource locations were noted, and water resources were limited to Muttama Creek. At the time of the survey, water was flowing in the creek following prolonged rainfall in recent months. No outcropping rock materials were identified within the study area. Therefore, the implication is that all the raw material used in the manufacturing of the artefacts at recorded sites was transported into the area.
- How do the raw materials recorded within the study area compare to those in recorded in the surrounding region?
    - Most artefacts (five out of six) at the recorded sites are manufactured from quartz, except for the artefact at Muttama Creek IF-2 that is manufactured from chert.

Quartz is recorded as being a relatively common material in the region for manufacturing stone tools (Barber 1997; KNC 2008).

- Establish how the findings within the study area (if any) accord with the regional archaeological context examined in **Section 4.2**.
    - The findings of the study area accord with the regional archaeological context. Previous assessments indicated that landforms such as flat and slope landforms within the reasonable proximity to a watercourse are likely to record archaeological sites. The identification of three artefact sites near Muttama Creek is consistent with the findings of previous assessments (Witter 1980).

6 SIGNIFICANCE ASSESSMENT

6.1 INTRODUCTION TO SIGNIFICANCE ASSESSMENT

6.1.1 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.

6.1.1.1 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.

6.1.1.2 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.

6.1.1.3 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).

6.1.1.4 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.

6.2 ASSESSED SIGNIFICANCE OF THE RECORDED SITES

Table 6-1 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

Vaiola Ingram representing Bidya Marra Consultancy who assisted with the survey regarded the recorded artefacts as culturally significant.

Archaeological/Scientific Value

The recorded sites are in landforms heavily impacted by water erosion and stock trampling and are therefore in poor condition. All sites represent low-density artefact sites that are relatively common in the region and all sites recorded unremarkable artefact types manufactured from commonly utilised stone sources, primarily quartz. As such, all sites have a low potential to add to our knowledge about past Aboriginal settlement and use of the wider region.

All sites are therefore assessed as having low scientific values.

Aesthetic Value

All recorded sites are in poor condition and have unremarkable manifestations consisting of objects that would be difficult for the layperson to appreciate.

All sites are therefore assessed as having low aesthetic values.

Historic Value

None of the sites have a historic association with known Aboriginal people or events and therefore have no historic significance.

Table 6-1: Aboriginal cultural heritage: significance assessment.

AHIMS Id	Site Name	Social or Cultural Value	Archaeological / Scientific Value	Aesthetic Value	Historic Value
50-6-0275	Muttama Creek IF-1	High	Low	Low	None
50-6-0276	Muttama Creek IF-2	High	Low	Low	None
50-6-0277	Muttama Creek OS-1	High	Low	Low	None

6.2.1 Statement of significance

The tangible Aboriginal cultural values of the study area are limited to one low-density artefact scatter and two isolated finds associated with Muttama Creek.

The low scientific value of the recorded sites within the study area is due to the sites' low potential to provide further information on the traditional Aboriginal use of the region. The remainder of the study area has very low scientific value as it is located further away from optimal occupation locations, such as along reliable water sources, or landforms which provide shelter. Further, historic aerials of the study area show that most of the survey area, particularly within Survey Unit 1, has been subjected to long-term cultivation which has probably removed or dispersed Aboriginal sites had they been present in this area.

There may be places with intangible cultural significance within the study area, although no specific locations have so far been identified by the Aboriginal community except for the general significance of all waterways such as Muttama Creek.

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

7 ASSESSING HARM

7.1 AVOIDING AND MINIMISING HARM

7.1.1 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, proposals should be amended to reduce the extent and severity of impacts to significant Aboriginal objects and places using reasonable and feasible measures.

7.1.2 Opportunities to conserve Aboriginal cultural heritage values

The proponent elected to decrease the size of the proposal's impact footprint to avoid the identified SALs. As these areas are now avoided by the proposal, test excavation to investigate the nature of any archaeological deposits at these areas was not warranted.

All recorded sites are outside of the impact footprint and will not be harmed by the proposal.

7.2 LIKELY IMPACTS TO ABORIGINAL HERITAGE FROM THE PROPOSAL

Table 7-1 presents a summary of potential impacts to Aboriginal cultural heritage associated with the proposal.

Table 7-1: 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)
50-6-0275	Muttama Creek IF-1	None	None	No loss of value
50-6-0276	Muttama Creek IF-2	None	None	No loss of value
50-6-0277	Muttama Creek OS-1	None	None	No loss of value

7.3 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.

7.3.1 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 proposal.

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

7.3.2 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 proposal 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.

7.3.3 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 proposals

- Development needs are to be considered in applying environmental objectives.

7.3.4 Applicability to the proposal

There is no impact to Aboriginal objects as no Aboriginal objects were recorded within the impact footprint, and no intangible heritage values have been identified within the study area. The results of the surface survey indicate that significant Aboriginal cultural heritage values will not be harmed within the study area.

Table 7-2 examines the application of ESD principles to the proposal.

Table 7-2: Application of ESD principles to the proposal.

ESD principle	Response
Avoiding and minimising harm	**Section 7.1** sets out mechanisms by which to avoid and minimise harm. The proponent elected to decrease the size of the proposal's impact footprint to avoid the identified SALs. All recorded sites are outside of the impact footprint and will not be harmed by the proposal.
The integration principle	The proposal presents a strong case for the broader environmental benefits arising from the environmentally responsible development of a solar farm. The environmental consequences of the proposal 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 areas.
The intergenerational equity principle	It is assessed that the proposal will not harm significant Aboriginal cultural heritage values and that there will be no diminution of intergenerational equity should the proposal proceed.

8 MANAGEMENT OF ABORIGINAL CULTURAL HERITAGE SITES

8.1 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 proposal. **Section 6.2** and **Section 7.2** describe, respectively, the significance / potential of the recorded sites and the likely impacts of the proposal. 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 proposal 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 AHIP must be sought from Heritage NSW. Whether the AHIP is consented will depend on many factors including the site's assessed significance. An *Aboriginal Cultural Heritage Assessment Report* (ACHAR) will be required to accompany the AHIP application and normally the management recommendations contained in the ACHAR become conditions of the AHIP. Aboriginal community will need to be consulted following the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010b). The AHIP conditions will often stipulate that the Aboriginal community should be involved in any salvage activities and will dictate the fate of any salvaged Aboriginal objects.

8.2 MANAGEMENT AND MITIGATION OF RECORDED ABORIGINAL SITES

8.3 RECORDED SITE AVOIDANCE

The three sites recorded during the survey should be marked on construction plans with a suitable curtilage (5 m minimum) marked as a no-go area. Every effort will be made to conserve these sites in the landscape and their location needs to be considered should the proposal wish to undertake any activity near the sites, including environmental works such as erosion control or the establishment of a planted riparian zone.

8.4 SAL AVOIDANCE

The proposed impact footprint closely abuts the SALs. To prevent inadvertent impact to these areas the SALs should be temporarily fenced during construction. Any fencing may be removed at the completion of construction.

Construction plans should note these locations and all ground disturbing impacts in these areas should be avoided.

8.5 ABORIGINAL CULTURAL HERITAGE AVOIDANCE

Figure 8-1 to **Figure 8-3** map the areas that will require to be avoided during the construction of the proposal and generally during the operation of the proposal,

8.5.1 Known Aboriginal sites

All impacts, both ground disturbing and activities such as driving over the areas should be avoided both during construction and operation of the proposal.

8.5.2 SALs

In the case of the SALs, temporary fencing will conserve the SALs in the landscape during the construction of the proposal. During the operation of the proposal the temporary fencing may be removed and surface activities, such as grass slashing or driving over these areas at times when bogging is not an issue, is permissible. Ground disturbing impacts in these areas, such a tree planting, should consider the possibility of impact to subsurface archaeological deposits.

Table 8-1 provides the coordinates that should be temporarily fenced during construction to avoid inadvertent impact to the SALs. The Point ID identification matches that shown on **Figure 8-1** and **Figure 8-2**.

Table 8-1: Coordinates for the SAL avoidance areas.

Point ID	GDA Zone 55 East	GDA Zone 55 North
1	594130	6165675
2	594142	6165684
3	594182	6165687
4	594200	6165680
5	594215	6165656
6	594216	6165514
7	594221	6165517
8	594242	6165501
9	594246	6165478
10	594284	6165429
11	594323	6165428
12	594349	6165375
13	594346	6165373

Figure 8-1: Avoidance areas in the northeast of the study area.

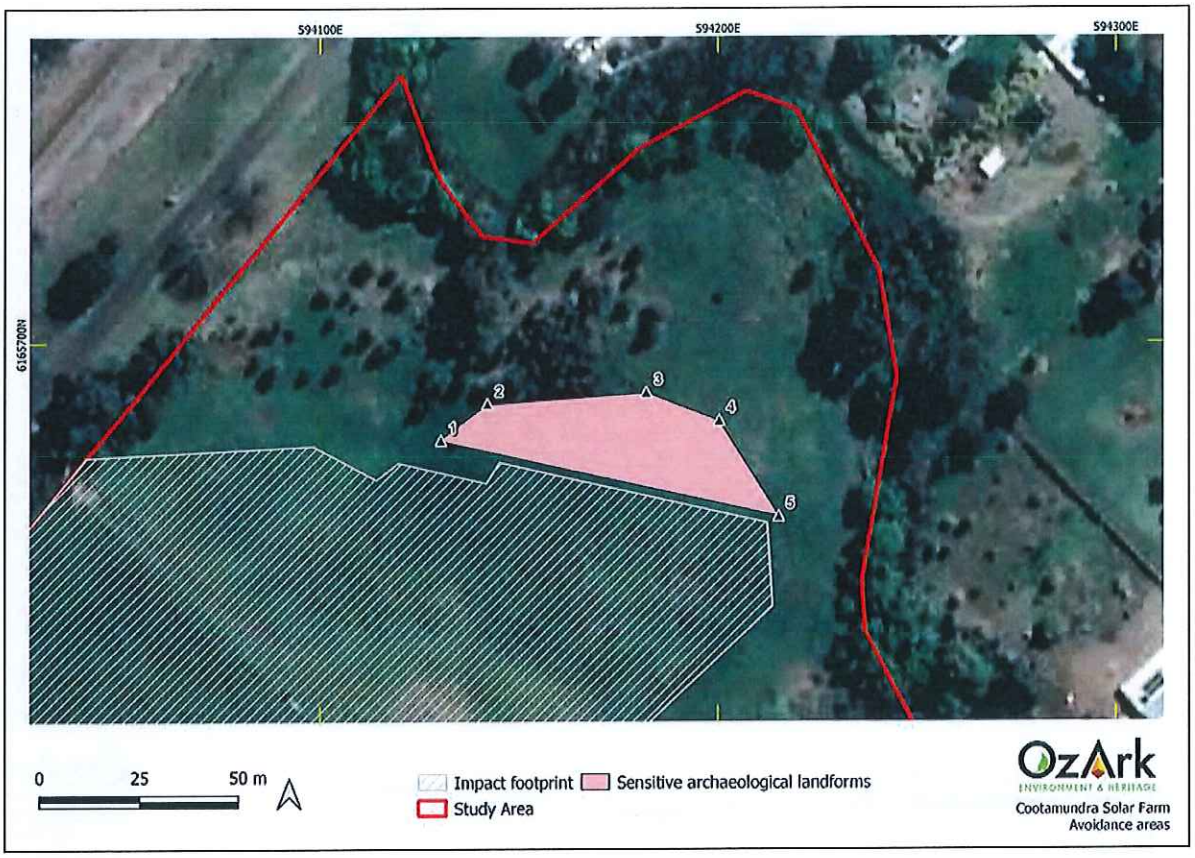


Figure 8-2: Avoidance areas in the east–centre of the study area.

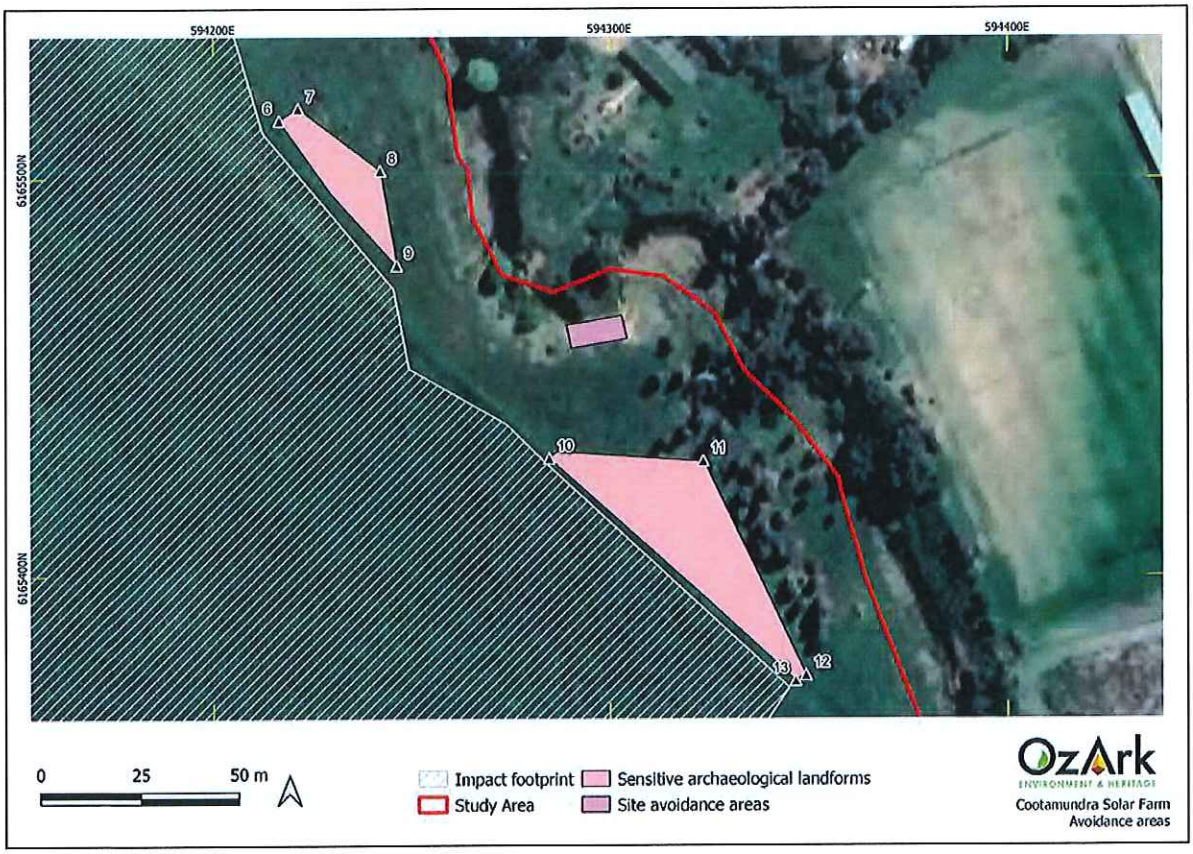
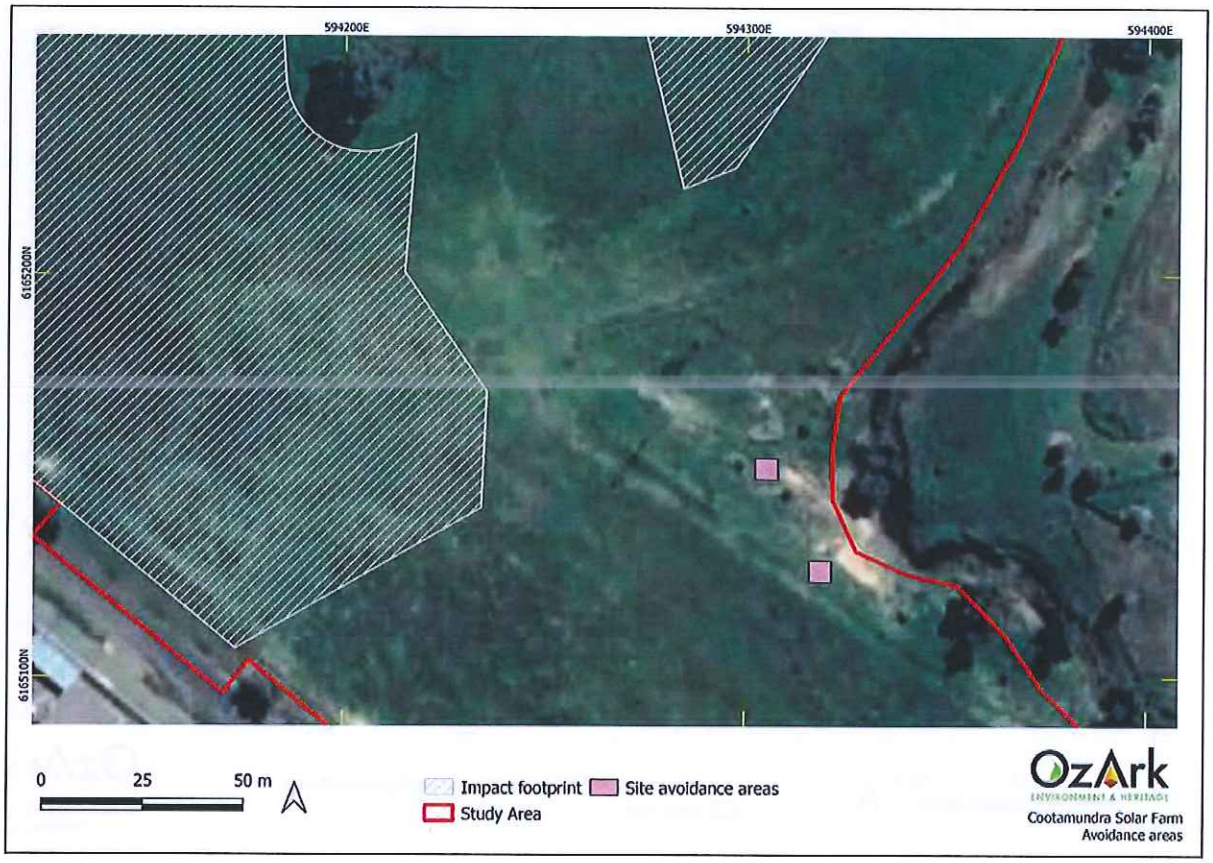


Figure 8-3: Avoidance areas in the southeast of the study area.



9 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 three 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 AHIP
- The findings of the current investigations undertaken within the study area
- The interests of the Aboriginal community.

Recommendations concerning Aboriginal cultural values within the study area are as follows:

1. The sites recorded within the study area (50-6-0275, 50-6-0276, and 50-6-0277) must not be harmed without the authority of an AHIP.
2. The Sensitive Archaeological Landforms (SALs) identified in this study must be avoided during construction of the proposal. Management recommendations to ensure that the SALs are avoided is provided in **Sections 8.4**. and **8.5.2**.
3. If Aboriginal objects are noted during the construction or operation of the proposal, the *Unanticipated Finds Protocol* (**Appendix 2**) should be followed.
4. If human skeletal material is noted during the construction or operation of the proposal, the *Unanticipated Skeletal Remains Protocol* (**Appendix 3**) should be followed.
5. Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts (**Appendix 4**).

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APPENDIX 1: AHIMS SEARCHES

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

Your Ref/PO Number : 3185
Client Service ID : 645960

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
50-5-0023	Kirush 1;	AGD	55	602330	6164990	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	Mr Peter Kuskie					Permits		
50-6-0088	Cowangs to Bauloora 6 (CB6)	GDA	55	602407	6161248	Open site	Valid	Artefact : 4		102171
	Contact	Recorders	Mrs Nicola Hayes					Permits	3378	
50-5-0207	Cungegang TSR Scar Tree 3	GDA	55	586612	6159873	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Peter Ingram					Permits		
50-5-0138	HOGMANS TANK TSR	GDA	55	591498	6170191	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Colin Lock					Permits		
50-6-0125	Shaftsbury Scar Tree 2	GDA	55	597488	6167716	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Colin Lock					Permits		
50-6-0126	Shaftsbury 3 Scar Tree	GDA	55	597488	6167703	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Colin Lock					Permits		
50-6-0090	Cowangs to Bauloora 8 (CB8)	GDA	55	599203	6163115	Open site	Valid	Artefact : 9		102171
	Contact	Recorders	Mrs Nicola Hayes					Permits	3378	
50-6-0035	Muttama Creek 1F	AGD	55	595210	6163350	Open site	Valid	Artefact : -	Isolated Find	3428
	Contact	Recorders	Mr.Mathew Barber					Permits		
50-5-0203	Cungegong TSR Scar Tree 1	GDA	55	586317	6159535	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Peter Ingram					Permits		
50-6-0094	Cowangs to Bauloora 12 (CB12)	GDA	55	592064	6171205	Open site	Valid	Artefact : 2		102171
	Contact	Recorders	Mrs Nicola Hayes					Permits	3378	
50-6-0172	Cootamundra Gap TSR Scar Tree 2	GDA	55	592191	6166264	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Peter Ingram					Permits		
50-5-0142	BOUNDARY TSR COOLAMON	GDA	55	589138	6175150	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Colin Lock					Permits		
50-6-0128	Shafsbury 1 Rock scatter	GDA	55	597167	6167701	Open site	Valid	Stone Arrangement :		
	Contact	Recorders	Mr.Colin Lock					Permits		

Report generated by AHIMS Web Service on 08/12/2021 for Yekun Zhang for the following area at Datum :GDA, Zone : 55, Eastings : 584145.0 - 604145.0, Northings : 6155377.0 - 6175377.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 46

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Extensive search - Site list report

Your Ref/PO Number : 3185
Client Service ID : 645960

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
50-6-0089	Cowangs to Bauloora 7 (CB7)	GDA	55	599392	6163097	Open site	Valid	Artefact : 3		102171
	Contact	Recorders	Mrs Nicola Hayes					Permits	3378	
50-5-0208	Cungegang TSR Scar Tree 4	GDA	55	586555	6159934	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Peter Ingram					Permits		
50-5-0116	APA-ST5-11	GDA	55	591285	6169670	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Luke Kirkwood					Permits		
50-5-0124	Wamoon 1	GDA	55	591643	6171363	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr Mark Saddler					Permits		
50-6-0171	Cootamundra Gap TSR Scar Tree 3	GDA	55	591952	6165639	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Peter Ingram					Permits		
50-6-0173	Cootamundra Gap TSR Scar Tree 1	GDA	55	592156	6166605	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Peter Ingram					Permits		
50-6-0007	Cowangs to Bauloora 5 (CB5)	GDA	55	603715	6160459	Open site	Valid	Artefact : 29		102171
	Contact	Recorders	Mrs Nicola Hayes					Permits	3378,3461	
50-6-0036	Muttama Creek 5	AGD	55	595180	6163480	Open site	Valid	Modified Tree (Carved or Scarred) :	Scarred Tree	3428
	Contact	Recorders	Mr Matthew Barber					Permits		
50-6-0033	Muttama Creek 3	AGD	55	595350	6163210	Open site	Valid	Artefact : -	Open Camp Site	3428
	Contact	Recorders	Mr.Matthew Barber					Permits		
50-6-0129	Boundary TSR Canoe tree 1	GDA	55	596036	6162109	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Colin Lock					Permits		
50-6-0127	Cootamundra 3 Mile TRS Canoe Tree 2	GDA	55	596032	6161441	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Colin Lock					Permits		
50-5-0206	Cunjegong Creek Scar Tree 1	GDA	55	585836	6159899	Open site	Valid	Modified Tree (Carved or Scarred) :		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 3185
Client Service ID : 645960

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
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50-5-0205	Cungegong TSR Scar Tree 2	GDA	55	586645	6159809	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Ingram					Permits		
50-6-0233	Cootamundra 3	GDA	55	596789	6166516	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	NSW Trade and Investment - Crown Lands - Wagga Wagga,Mr.Tom Breed					Permits		
50-6-0092	Cowangs to Bauloora 10 (CB10)	GDA	55	597321	6163528	Open site	Valid	Artefact : 1		102171
	Contact	Recorders	Mrs.Nicola Hayes					Permits	3378	
50-6-0203	Old Gundagai Road Scar Tree 1	GDA	55	599682	6150718	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Ingram					Permits		
50-6-0205	Erlingtons TSR Scar Tree 1	GDA	55	600639	6175111	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Peter Ingram					Permits		
50-6-0032	Muttama Creek 2	AGD	55	595440	6163060	Open site	Valid	Artefact : -	Open Camp Site	3428
	Contact	Recorders	Mr.Matthew Barber					Permits		
50-6-0093	Cowangs to Bauloora 11 (CB11)	GDA	55	592394	6170702	Open site	Valid	Artefact : 5		102171
	Contact	Recorders	Mrs.Nicola Hayes					Permits	3378	
50-5-0110	Cowangs to Bauloora 13 (CB13)	GDA	55	590673	6173512	Open site	Valid	Artefact : 2		102171
	Contact	Recorders	Mrs.Nicola Hayes					Permits	3378	
50-6-0003	Muttama Creek BY 11	AGD	55	593466	6171116	Open site	Valid	Artefact : -	Open Camp Site	738,102549
	Contact	Recorders	ASRSYS					Permits		
50-5-0024	Kilrush 2;	AGD	55	602370	6165140	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	Mr.Peter Kuskie					Permits		
50-5-0111	Cowangs to Bauloora 14 (CB14)	GDA	55	590498	6173977	Open site	Valid	Artefact : 1		102171
	Contact	Recorders	Mrs.Nicola Hayes					Permits	3378	
50-5-0025	Kilrush 3;	AGD	55	602690	6166190	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	Mr.Peter Kuskie					Permits		
50-6-0031	Muttama Creek 1	AGD	55	595410	6162880	Open site	Valid	Artefact : -	Open Camp Site	3428
	Contact	Recorders	Mr.Matthew Barber					Permits		
50-5-0140	Hugmans Tank TSR 2 rock scatter	GDA	55	591056	6169208	Open site	Valid	Artefact : -, Stone Arrangement : -, Stone Quarry : -		
	Contact	Recorders	Mr.Colin Luck,Mr.Colin Luck					Permits		

Report generated by AHIMS Web Service on 08/12/2021 for Yekun Zhang for the following area at Datum :GDA, Zone : 55, Eastings : 584145.0 - 604145.0, Northings : 6155377.0 - 6175377.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 46

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Extensive search - Site list report

Your Ref/PO Number : 3185
Client Service ID : 645960

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
50-6-0002	Cootamundra BY 10	AGD	55	591203	6168991	Open site	Valid	Artefact : -	Open Camp Site	738,102549
	Contact	Recorders	ASRSYS					Permits		
50-5-0122	Coota Stock Ring 1	GDA	55	591612	6171358	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Mark Saddler					Permits		
50-6-0091	Cowangs to Bauloora 9 (CB9)	GDA	55	597729	6163447	Open site	Valid	Artefact : 2		102171
	Contact	Recorders	Mrs.Nicola Hayes					Permits	3378,3461	
50-6-0095	Cowangs to Bauloora 15 (CB15)	GDA	55	597729	6163447	Open site	Valid	Artefact : 1		102171
	Contact	Recorders	Mrs.Nicola Hayes					Permits	3378,3461	
50-6-0037	Muttama Creek 6	AGD	55	595050	6162550	Open site	Valid	Modified Tree (Carved or Scarred) :	Scarred Tree	3428
	Contact	Recorders	Mr.Matthew Barber					Permits		
50-6-0034	Muttama Creek 4	AGD	55	595200	6163300	Open site	Valid	Artefact : -	Open Camp Site	3428
	Contact	Recorders	Mr.Matthew Barber					Permits		
50-5-0123	Coota Stock Ring 2	GDA	55	591643	6171363	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Mark Saddler					Permits		

** 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 on 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 08/12/2021 for Yekun Zhang for the following area at Datum :GDA, Zone : 55, Eastings : 584145.0 - 604145.0, Northings : 6155377.0 - 6175377.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 46

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

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APPENDIX 2: ABORIGINAL HERITAGE: UNANTICIPATED FINDS PROTOCOL

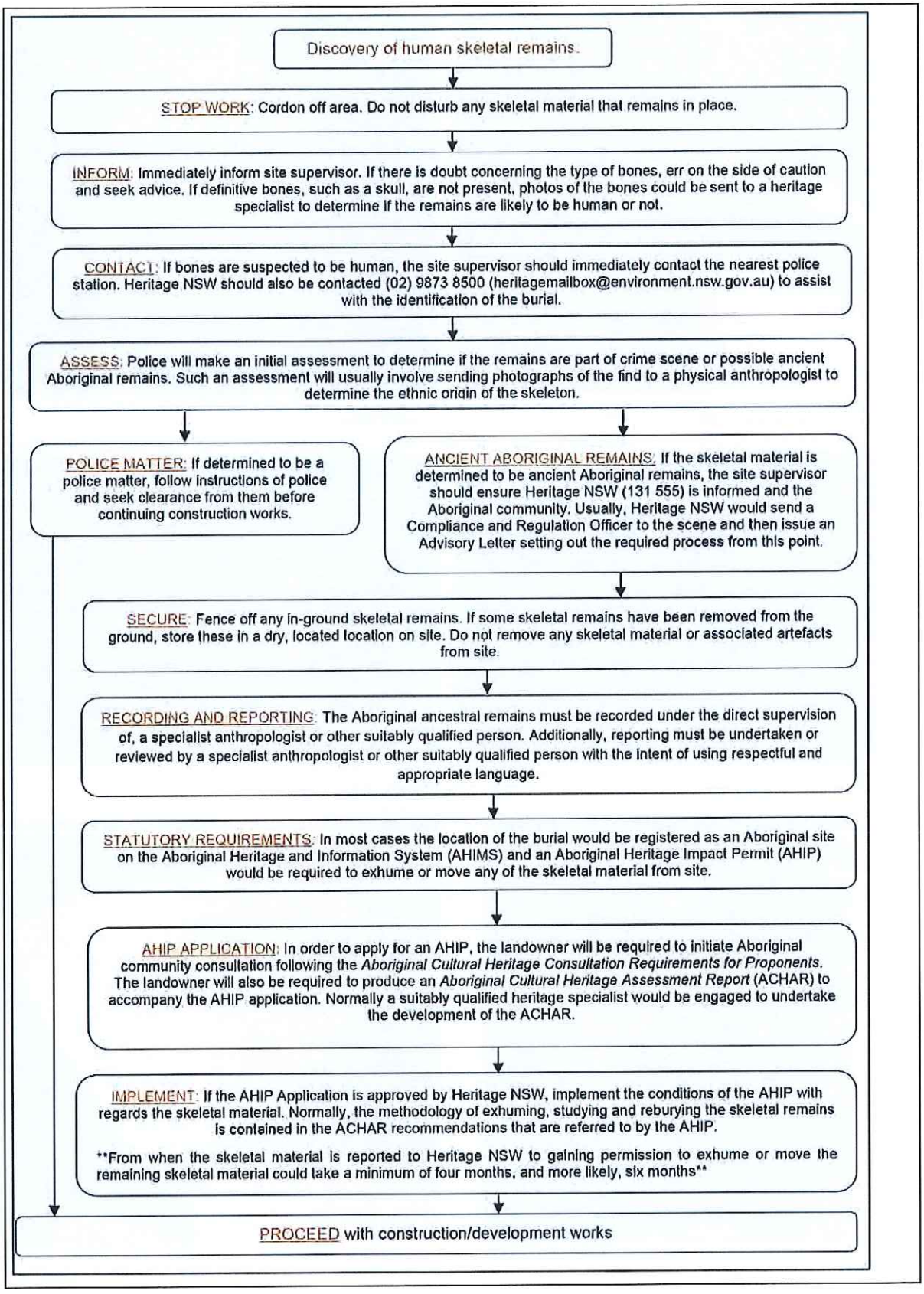
An Aboriginal artefact is anything which is the result of past Aboriginal activity. This includes stone (artefacts, rock engravings etc.), plant (culturally scarred trees) and animal (if showing signs of modification; i.e. smoothing, use). Human bone (skeletal) remains may also be uncovered while onsite.

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 Aboriginal Heritage Impact Permit).

APPENDIX 3: UNANTICIPATED SKELETAL REMAINS PROTOCOL



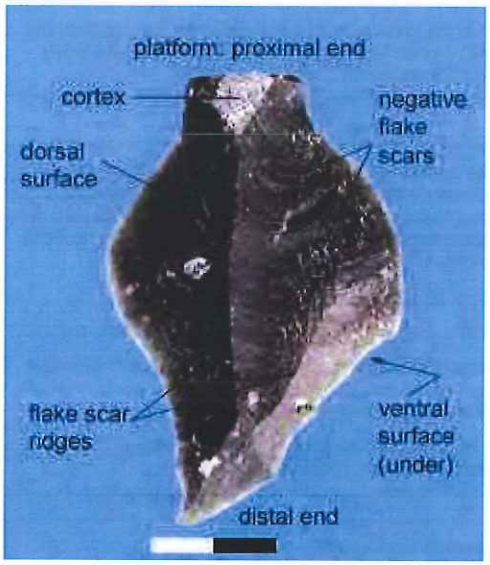
APPENDIX 4: ABORIGINAL HERITAGE: ARTEFACT IDENTIFICATION

A retouched silcrete flake

A quartz flake

Microliths (scale = 1 cm)

Volcanic flakes



Flake characteristics (scale = 1 cm)

A mudstone/tuff core from which flakes have been removed