Appendix D

Aboriginal cultural heritage assessment report

Hillston Sun Farm

Overland Sun Farming

Hillston sun farming project, NSW

Aboriginal cultural heritage assessment report

DRAFT REPORT

Prepared for Overland Sun Farming Pty Ltd

25 May 2017

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- Overland Sun Farming: John Zammit

Biosis staff involved in this project were:

- Lauren Harley and Sonika Kumar for mapping

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Glossary

ACHAR	Aboriginal Cultural Heritage Assessment Report
AHIMS	Aboriginal Heritage Information Management System
DA	Determining Authority
DECCW	Department of Environment, Climate Change and Water (now OEH)
DP	Deposited Plan
EPA	Environment Planning and Assessment
GDA	Geocentric Datum of Australia
GPS	Global Positioning System
GSV	Ground Surface Visibility
ICOMOS	International Council on Monuments and Sites
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
MGA	Map Grid of Australia
NHL	National Heritage List
NPW Act	National Parks and Wildlife Act
NPWS	National Parks and Wildlife Service
NSW	New South Wales
NTSCORP	Native Title Services Corporation
OEH	NSW Office of Environment and Heritage
PAD	Potential Archaeological Deposit
RAP	Registered Aboriginal Party
REF	Review of Environmental Factors
REP	Regional Environmental Plan
SEPP	State Environmental Planning Policy
NNTT	National Native Title Tribunal
ICOMOS	International Council on Monuments and Sites

Summary

Biosis Pty Ltd was commissioned by Overland Sun Farming Pty Ltd to undertake an Aboriginal Cultural Heritage Assessment (ACHA) of the proposed Hillston Sun Farm, a large-scale solar photovoltaic (PV) generation facility and associated infrastructure (Figure 3), located on Kidman Way approximately 3.5 kilometres south from Hillston

There are 120 Aboriginal cultural heritage sites registered with the Aboriginal Heritage Information Management System (AHIMS) register within a 10 square kilometre radius of the study area; however, none of these site occur within the study area.

A survey of the study area located seven Aboriginal sites, including three scarred trees, one isolated quartz manuport and an artefact scatter. All of these sites are located outside of the development footprint and will not be impacted by the proposed development.

The Department of Planning and Environment is the consent authority and will assess the Environmental Impact Statement (EIS) to determine if the project is likely to have a significant effect on the environment, including Aboriginal cultural heritage.

Consultation

The Aboriginal community was consulted regarding the heritage management of the project throughout its lifespan. Consultation has been undertaken as per the process outlined in the DECCW document, *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements). The appropriate government bodies were notified and advertisements placed in the Hillston Spectator newspaper (16 November 2016), which resulted in the following Aboriginal organisations registering their interest:

- Griffith Local Aboriginal Land Council (GLALC)

A search conducted by the Office of the Registrar, *Aboriginal Land Rights Act 1983* listed no Aboriginal Owners with land within the study area. A search conducted by the National Native Title Tribunal listed no Registered Native Title Claims, Unregistered Claimant Applications or Registered Indigenous Land Use Agreements within the study area.

Upon registration the Aboriginal parties were invited to provide their knowledge on the study area and proposal provided in *Project Methodology Aboriginal Cultural Heritage Assessment: Hillston Solar Farm* .No responses were received from GLALC. . Responses from the Registered Aboriginal Parties (RAPs) are included in Appendix 3.

The registered Aboriginal parties participated in the field survey and provided comment on the study area with regard to the proposal.

As of 19 April 2017 no comments have been received in regards to the level of cultural significance. The results of the consultation process are included in this document.

The recommendations that resulted from the consultation process are provided below.

Management recommendations

Prior to any development impacts occurring within the study area, the following is recommended:

Recommendation 1: Continued consultation with the registered Aboriginal parties

It is recommended that Overland Sun Farming continue to inform the RAPs about the management of Aboriginal cultural heritage sites within the site boundary throughout the construction of the project. This recommendation is in keeping with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a).

Recommendation 2: Sites Hillston 1, 2, 3, 4, and 5 are to be avoided from impact.

The development footprint avoids impact to sites Hillston 1, 2, 3, 4, and 5 so no further investigation is required.

Recommendation 3: Discovery of unanticipated Aboriginal objects

All Aboriginal objects and places are protected under the *National Parks and Wildlife Act 1974*. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage (OEH). Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders to inform options for management of the objects.

Recommendation 4: Discovery of unanticipated historical relics

Relics are historical archaeological resources of local or State significance and are protected in NSW under the *Heritage Act 1977*. Relics cannot be disturbed except with a permit or exception/exemption notification. Should unanticipated relics be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic.

Recommendation 5: Discovery of Aboriginal ancestral remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains
2. Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location
3. Not recommence work at that location unless authorised in writing by OEH.

Recommendation 6: Stop work provision for any potential discovery of human remains

If any suspected human remains are discovered during any activity works, all activity must cease immediately. The remains must be left in place and protected from harm or damage. The following contingency plan describes the immediate actions that must be taken in instances where human remains or suspected human remains are discovered. Any such discovery at the activity area must follow these steps:

1. Discovery: If suspected human remains are discovered all activity must stop to ensure minimal damage is caused to the remains; and the remains must be left in place, and protected from harm or damage.
2. Notification: Once suspected human skeletal remains have been found, the Coroner's Office and the NSW Police must be notified immediately. Following this, and if the human remains are likely to be Aboriginal in origin, the find will be reported to the Aboriginal parties and DECCW NSW. If the find is likely to be non-

Aboriginal in origin and more than 100 years in age, the Heritage Council of NSW will be notified of the find under s.146 of the *Heritage Act 1977*.

1 Introduction

1.1 Project background

Biosis Pty Ltd was commissioned by Overland Sun Farming Pty Ltd to undertake an Aboriginal Cultural Heritage Assessment (ACHA) of a proposed solar energy site at Hillston, NSW (Figure 1). The assessment included a field survey and review of background resources including soil landscapes, geology, hydrology and past reports and site records to inform predictive statements about the likelihood of Aboriginal heritages sites to occur within the study area.

An environmental impact statement (EIS) is a requirement of the approval process. This report details the investigation, consultation and assessment of Aboriginal cultural heritage undertaken for the project and forms part of the EIS.

1.2 Location of the study area

The study area is located within the Carrathool Local Government Area (LGA), Parish of Redbank, County of Nicholson (see Figure 1). The study area incorporates Lots 22, 43, 61, 76, 77, 85, 100 and 101 DP755189. This includes 713 hectares of private land and adjacent road reserves, including 16.7 hectares of road reserve adjacent to the sub-station, located on Kidman Way approximately 3.5 kilometres south from Hillston (Figure 2). The development site encompasses an area of approximately 296 kilometres and is located on the western side of the Kidman Way. The Hillston substation is located adjacent to the north-eastern boundary of the development site.

1.3 Proposed development

The project includes the development, construction and operation of a solar PV electricity generation facility, which comprises the installation of PV solar panels and associated infrastructure on the site.

The electricity and associated environmental products generated from the project will be sold to one or more of a registered energy retailing organisation, large energy users (governmental or private) or to the National Electricity Market that is managed by the Australian Energy Market Operator.

The project will have an estimated capacity in the order of 85MW and comprises the following key components:

- a network of PV solar panel arrays
- electrical collection systems, switchyard and control room
- a management hub, including demountable offices and amenities and equipment sheds
- parking and internal access roads
- easement and connection infrastructure

The development footprint is defined as the land area within the site where project infrastructure will be constructed and operate for the project life. The development footprint encompasses an area of 296 ha, which has been refined through the project design process to avoid environmental constraints (primarily remnant vegetation and Aboriginal heritage) (Figure 3).

1.4 Planning approvals

The project is a State significant development (SSD) under the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP). A development application for the project is required to be submitted under Part 4, Division 4.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The NSW Minister for Planning, or the Minister's delegate, is the consent authority.

Other relevant legislation and planning instruments that will inform the assessment include:

- *National Parks and Wildlife Act* (NPW Act) *1974* (NSW)
- *National Parks and Wildlife Amendment Act 2010* (NSW)
- Carrathool Local Environmental Plan 2012.

This report was prepared in accordance with the requirements of the NSW Department of Planning and Environment. These were set out in the Secretary's Environmental Assessment Requirements (SEARs) for the project, issued on 14 October 2016. The SEARs identify matters which must be addressed in the EIS. The SEARS state that the EIS must address:

- Heritage – including an assessment of the likely Aboriginal and historic heritage (cultural and archaeological) impacts of the development, including adequate consultation with the local Aboriginal community

Further comments from OEH in regards to the SEARS also state that the EIS must:

- Identify and describe the Aboriginal cultural heritage values that exist across the whole area that will be affected by the proposed Hillston Sun Farm and document these in the EIS. This may include the need for surface survey and test excavation. The identification of cultural heritage values should be guided by the Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (DECCW, 2011) and consultation with OEH regional officers.
- Where Aboriginal cultural heritage values are identified, consultation with Aboriginal people must be undertaken and documented in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the EIS.
- Impacts on Aboriginal cultural heritage values are to be assessed and documented in the EIS. The EIS must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the EIS must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to OEH.

1.5 Restricted and confidential information

Appendix 1 in the Archaeological Report contains AHIMS information which is confidential and is not to be made public. This is clearly marked on the title page for the Attachment.

1.6 Aboriginal cultural heritage

1.6.1 General description

According to Allen and O'Connell (2003), Aboriginal people have inhabited the Australian continent for the last 50,000 years, and the NSW area, according to Bowler *et al* (2003), for over 42,000 years. These dates are

subject to continued revision as further evidence of Aboriginal cultural heritage is discovered and as more research of this evidence is conducted.

Without being part of the Aboriginal culture and the productions of this culture it is not possible for non-Aboriginal people to fully understand their meaning to Aboriginal people – only to move closer towards understanding this meaning with the help of the Aboriginal community. Similarly, definitions of Aboriginal culture and cultural heritage without this involvement constitute outsider interpretations.

With this preface Aboriginal cultural heritage broadly refers to things that relate to Aboriginal culture and hold cultural meaning and significance to Aboriginal people (DECCW 2010: 3). There is an understanding in Aboriginal culture that everything is interconnected. In essence Aboriginal cultural heritage can be viewed as potentially encompassing any part of the physical and/or mental landscape, that is, 'Country' (DECCW 2010: iii).

Aboriginal people's interpretation of cultural value is based on their "traditions, observance, lore, customs, beliefs and history" (DECCW 2010: 3). The things associated with Aboriginal cultural heritage are continually / actively being defined by Aboriginal people (DEC 2005: 1; DECCW 2010: 3). These things can be associated with traditional, historical or contemporary Aboriginal culture (DEC 2005: 1, 3; DECCW 2010: 3).

1.6.2 Tangible Aboriginal cultural heritage

Three categories of tangible Aboriginal cultural heritage may be defined:

- Things that have been observably modified by Aboriginal people.
- Things that may have been modified by Aboriginal people but no discernible traces of that activity remain.
- Things never physically modified by Aboriginal people (but associated with Dreamtime Ancestors who shaped those things).

1.6.3 Intangible Aboriginal cultural heritage

Examples of intangible Aboriginal cultural heritage would include memories of stories and 'ways of doing', which would include language and ceremonies (DECCW 2010: 3).

1.6.4 Statutory

Currently Aboriginal cultural heritage, as statutorily defined by the NPW Act, consists of objects and places.

Aboriginal objects are defined as:

> *"any deposit, object or material evidence…relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains"*

Aboriginal places are defined as a place that is or was of special Aboriginal cultural significance. Places are declared under section 84 of the NPW Act.

1.6.5 Values

Aboriginal cultural heritage is broadly valued by Aboriginal people as it is used to define their identity as both individuals and as part of a group (also see DEC 2005: 1, 3; DECCW 2010: iii). More specifically it is used:

- To provide a:
  - "*connection and sense of belonging to Country*" (DECCW 2010: iii)
  - Link between the present and the past (DECCW 2010: iii).

- As a learning tool to teach Aboriginal culture to younger Aboriginal generations and the general public (DECCW 2010: 3).
- As further evidence of Aboriginal occupation prior to European settlement for people who do not understand the magnitude to which Aboriginal people occupied the continent (see also DECCW 2010: 3).

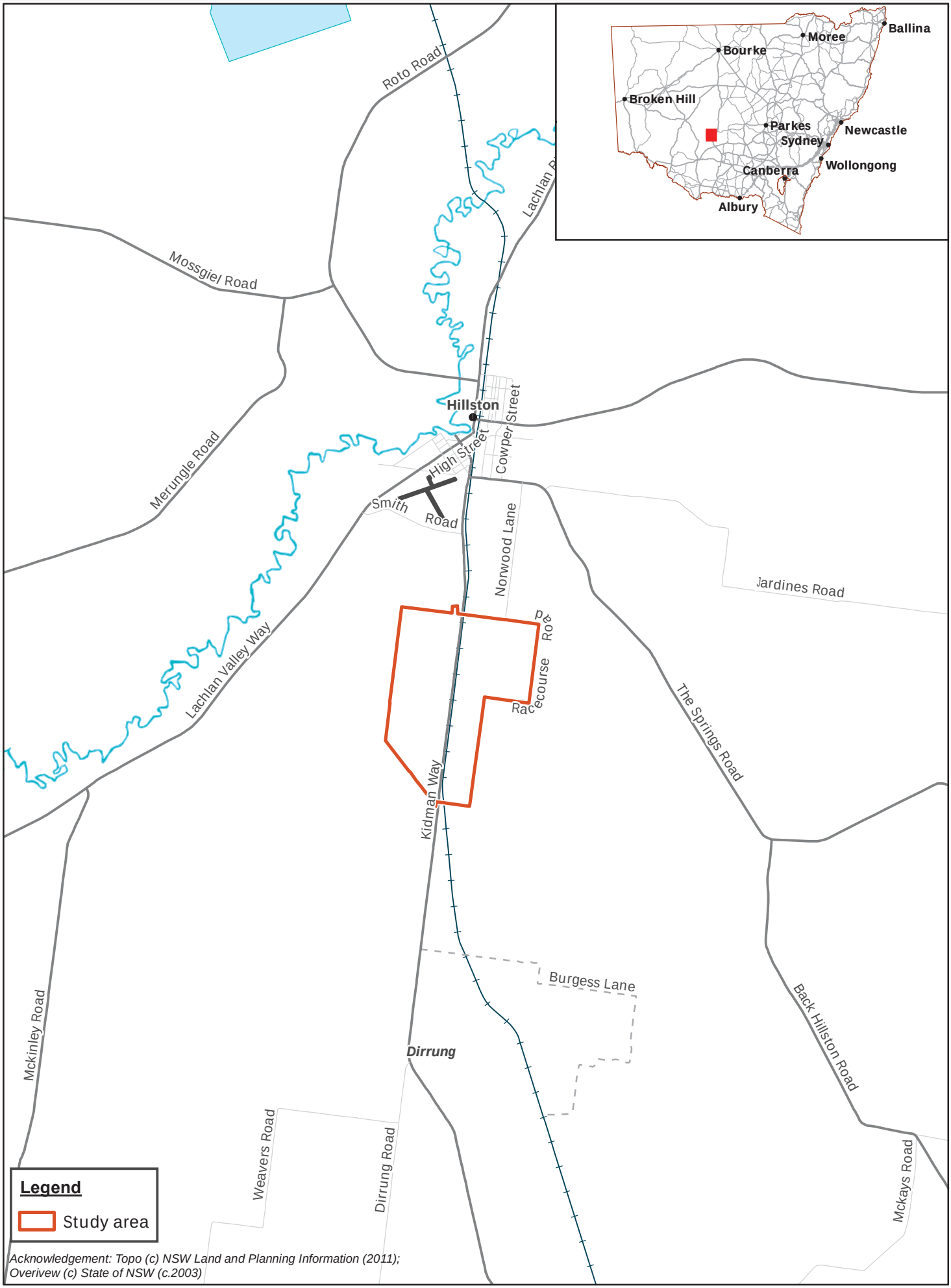


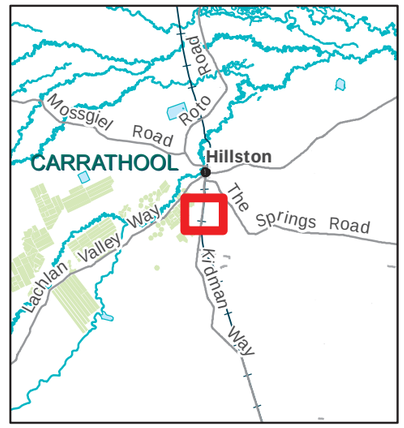
Figure 1: Location of the study area

Biosis Pty Ltd
Ballarat, Brisbane, Canberra, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 23501
Date: 18 April 2017,
Checked by: MS, Drawn by: LH, Last edited by: lharley
Location:P:\23500s\23501\Mapping\

0 1 2 3 4
Kilometers

Scale 1:100,000 @ A4, GDA 1994 MGA Zone 55



Legend

Study area

Figure 2: Overview of the study area

0 160 320 480 640 800

Metres

Scale: 1:16,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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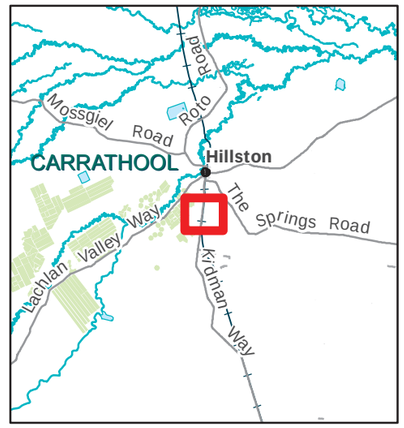
Date: 24 May 2017,
Checked by: MS, Drawn by: LH, Last edited by: lharley
Location:\\bio-data-01\matters$\23500s\23501\Mapping\23501_ACH_F2_StudyArea_201705232

Acknowledgements: Basemap © Land and Property Information 2016; Imagery © Overland Sun Farming, LPI 2012



Legend

- Study area
- Development site

Figure 3: Proposed development

0 160 320 480 640 800

Metres

Scale: 1:16,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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Matter: 23501
Date: 25 May 2017,
Checked by: MS, Drawn by: LH, Last edited by: lharley
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Acknowledgements: Basemap © Land and Property Information 2016; Imagery © Overland Sun Farming, LPI 2012

2 Study area context

This section discusses the site in regards to its landscape, environmental and Aboriginal cultural heritage context. This section should be read in conjunction with the archaeological report attached in Appendix 5.

The study area is located within the Riverina bioregion in central-west NSW (Figure 1). The study area incorporates 713 hectares of private land and adjacent road reserves, including 16.7 hectares of road reserve adjacent to the sub-station, located on Kidman Way approximately 3.5 kilometres south from Hillston (Figure 2). The development site is located on the western side of the Kidman Way and the Hillston substation is located adjacent to the north-eastern boundary of the development site.

2.1 Topography and hydrology

The study area is located in central-west NSW, overlying unconsolidated mud, silt, sand and gravel deposits that are dominantly found in western NSW and may be associated with old river systems and paleo channels. The broader landscape of the Murray Darling Basin formed over 60 million years when the area was covered by an inland sea. At this time marine sands were deposited, these sands are present in the current landscape. Subsequent draining of the sea led to periods of inundation by a giant fresh water lake and periods of deposition of clays and carbonates. The present landscape surface therefore represents the final phase of deposition, the youngest of which is approximately 36,000 years old (Porteners 1993).

The study area is located within the Riverina bioregion. In NSW bioregions are characterised by broad areas which contain natural features and environments that influence the functions of entire ecosystems. The Riverina bioregion is located in south-west New South Wales, extending into central-north Victoria. In total the Riverina bioregion is approximately 9,576,964 hectares, with 74.03 per cent lying within New South Wales (Eardley 1999, NPWS 2003). The Riverina bioregion includes the towns of Hillston, Coleambally, Deniliquin, Leeton, Mossgiel, Hay, Booligal and Wentworth (NPWS 2003).

The Riverina bioregion is dominated by river channels, floodplains, backplains, swamps, lakes and lunettes that are all of Quaternary age. It covers the alluvial fans of the Lachlan River, Murrumbidgee River and the Murray River, west of the Great Dividing Range. The topography of the Riverina bioregion is very similar to the Darling Riverine Plains bioregion, with the landscape being comprised of a series of overlapping, low gradient alluvial fans on the eastern half of the Murray Basin. Each fan differs slightly because of differences in the discharge of the streams (NPWS 2003).

Soil landscapes have distinct morphological and topological characteristics that result in specific archaeological potential. Because they are defined by a combination of soils, topography, vegetation and weathering conditions, soil landscapes are essentially terrain units that provide a useful way to summarise archaeological potential and exposure.

The Lachlan Depression Plains (Ldp) soil landscapes covers the entire study area. The Ldp soil landscape encompasses Hillston and is characterised by alluvial plains consisting of grey and brown cracking and non-cracking clays contrasting with red and brown texture contrast sands (see Table 1).

Table 1 Lachlan Channel and Floodplains/Lachlan Depression Plains soil landscape characteristics (Mitchell 2002, pp. 101-105).

Soil Material	Description
Ldp – Riverina	Quaternary alluvial plains with numerous circular depressions interpreted as high floodplains or low terraces beyond the reach of average floodwaters. Sandy rises and levees trace ancestral streams and stand above the general plain, relief 1 to 3 m. Grey and brown cracking and non-cracking clays often with gilgai on the plains. Sands and red or brown texture contrast soils on the higher ground.

2.2 Landscape resources

The area surrounding the study area today supports natural and modified vegetation communities. The term modified is used to describe land where the original natural vegetation cover has been cleared and replaced with agricultural land uses. The state of vegetation in these modified areas varies considerably from recently cropped areas to remnant and regenerating native vegetation. Although areas of natural vegetation cover the study area, most plant communities have been disturbed or degraded as a result of altered water regimes, physical disturbance from earthworks, livestock and pest animal grazing and weed invasion.

In the past, resources in the vicinity of the study area would have provided adequate sources of nutrition for subsistence activities; however these resources would be largely tied to seasonal variations and the flow of the Lachlan River. In this respect, activities on the Hillston floodplains would resemble that elsewhere in Western New South Wales, with the Lachlan finding parallels in the riverine environments surrounding the Murray and Darling River systems, and the semi-arid plain, with its ancestral lakes being similar to other semi-arid areas such as Willandra.

The activities of the Barkindji linguistic group in the Darling Basin, north-west of the current study area, have been well documented and would parallel the activities of the Wiradjuri group at Hillston. Summer marked the period of highest productivity, with river flow being the strongest at this time. As a result of this, aquatic plants and animals were both abundant and nomadic avian species present to reproduce and feed. Cold conditions in winter coincided with lower flow of the river, leading to a marked decrease in available food resources, with fish and many crustaceans being either absent or in hibernation, and other sources, such as mussels, being present in decreased populations (Allen 1974 p. 311). Although the Murray Darling Basin is a winter-spring dominant system, in contrast to the Darling River which is summer dominant, a similar theory of seasonal use applies to the lower Murray Darling basin. This theory of seasonal use explains the high density of Aboriginal sites located away from the riverine and lacustrine environments in the semi-arid and arid plains.

Although Allen (1974, p. 311) observes that potential sources of food remain relatively stable throughout the year, these sources became more accessible during winter when the plains would become easier to traverse. During summer, high evaporation rates in these areas made water sources scarce, so sources which were generally more stable during winter allowed groups to traverse these arid regions in search of alternative food sources such as red kangaroo. As a result of this, Allen theorised that these groups would have stayed close to large water sources during summer, when sources of food were plentiful, and venturing into the surrounding arid and semi-arid areas in winter when these areas were more accessible, and the chances of obtaining food higher.

Accounts by Mitchell (1835) document the resources utilised by Wiradjuri groups along the Bogan River to the north-east of Hillston. He noted that the principal foods of the various groups included possum, Kangaroo and Emu, as well as fish and fresh water mussels from ponds and water holes (Mitchell 1835). Fish were

caught using moveable dams of long, dry twisted grass that were pushed from one end of a water hole to the other, while fresh water mussels were prised out of the waterhole mud using the toes (Mitchell 1835).

Descriptions are also available on resources available to groups around the Menindee Lakes to the north-west of Hillston as a part of Pardoe's (2003) study, which looked at how these resources and environments were used by groups in the area. Like the current study area and other examples described here, the Menindee Lakes area is characterised by a small number of permanent or semi-permanent water sources, which appear to supply a large portion of the landscape resources available to local groups, and arid or semi-arid plains surrounding these sources.

Pardoe (2003) noted ethnographic descriptions of Aboriginal resource use in the Menindee Lakes area, noting that different observers described drastically different situations there. Where Mitchell described large stretches of water, plentiful in waterfowl and fish (Mitchell 1839), Sturt in Pardoe (2003) described dried up lakes and local populations surviving almost entirely on roots (Sturt 1833). These descriptions give weight to the assertion made by both Pardoe and Allen that Aboriginal groups living in these types of environments would have employed both the riverine and arid/semi-arid environments.

A selection of resources noted in the background research has been compiled into Table 2 to give an indication of the resources available to local Aboriginal groups near Hillston. Notably, the majority of the food sources mentioned in Table 2 are located within or in close proximity to rivers and lakes. This has partially to do with the greater availability of resources in these environments, particularly in the summer months, but it is also tied to early ethnographic observations made by explorers and surveyors such as Oxley, Mitchell and Sturt.

These early explorers predominantly travelled close to the major rivers of the area, such as the Lachlan, Murrumbidgee, and Murray, and as a result of this, their observations mostly came as a result of interactions with Aboriginal groups in these environments. Aboriginal activity is not well documented away from water sources, creating a bias in the information available.

Table 2 Landscape resources available to local Aboriginal groups.

Plant / Animal	Aboriginal use
Bulrush / Cumbungi	Food source, fibres could be used to make twine (Mitchell 1835, Martin 2006, 2010)
Emus / emu eggs	Food source (Allen 1974), bones could be used for tools, the fat for medicine, and feathers as ornaments (Martin 2010)
Fish species	Food source, fat from these animals could also be used in medicine (Martin 2010)
Freshwater snail	Food source (Martin 2010)
Lignum	Food source – fresh shoots could be eaten raw (Martin 2010)
Nardoo	Food source – seeds roasted and turned into dough (Martin 2010)
Native willow	Food source, bark used for tannin, wood used for boomerang making (Martin 2010)
Possum	Food source, skin could also be used to make cloaks (Martin 2010)
Red / grey kangaroo	Food source, also used to make bags to hold seeds or water (Allen 1974), bone was used for bone points, and the teeth for fish hooks (Martin 2010)
River mussel/ Lake mussel	Food source (Martin 2010)
River red-gum	Wood used for boomerangs and other tools, bark used for shields, dishes, and potentially boomerangs. (Martin 2010)
Rush	Used to make nets for hunting (Martin 2010)
Saltbush	Leaves used for medicinal wash, seeds ground and cooked (Martin 2010)
Snakes	Food source (Martin 2010)
Termites, termite larvae, and termite eggs	Food source, termite nests could also be used for a heat retainer (Martin 2010)
Turtles	Food source, fat could also be used in medicine (Martin 2010)
Water ribbon	Food source – roots could be baked, and small fruits eaten (Martin 2006, 2010)
Waterfowl / other aquatic birds	Food source available in summer months in Riverine environments (Allen 1974)
Yabby	Food source (Martin 2010)

2.3 European land use history

The first European to visit the Hillston area was John Oxley in 1817 during his first expedition along the Lachlan River (Oxley, 1820). The area wasn't settled by Europeans until 1839 when William Hovel took up a pastoral run called "Bellingerambil," along the Lachlan River. The town of Hillston developed to serve these surrounding pastoral leases, and this was the primary industry of the area into the 1880s, crops appear to have been grown less frequently and required the development of artificial irrigation channels (*Hillston News*, 1882).

The 1927 parish map shows the study area divided into a number of small lots owned by William Cashmere, E. V. H. Jones and the Australian Joint Stock Bank along Kidman Way and the railway line (Plate 1).

The study area appears to have been given over to agricultural use since the early 20th century when it was divided into a number of smaller properties, it is likely the land was cleared for farming purposes by this time. Kidman Way was tarred in the 1970s, but had been functioning as a major thoroughfare for the region throughout the 20th century. Most recently, the study area has been subject to intensive use for large scale wheat farming, the purpose to which the land it currently given.

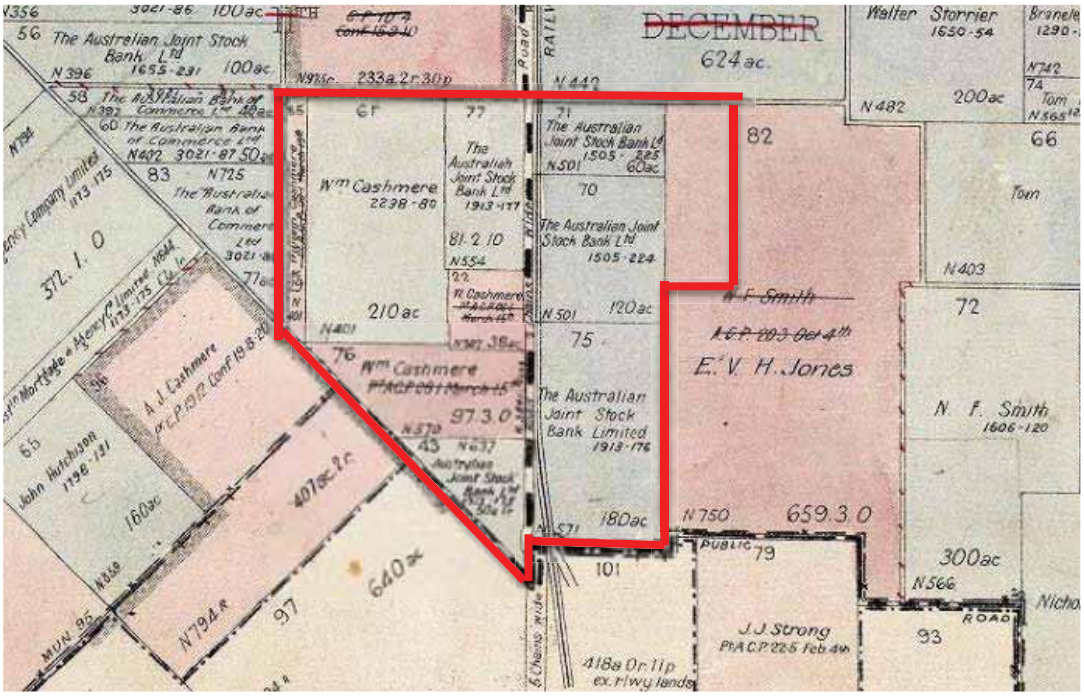


Plate 1 1927 parish map with approximate location of the study area in red (NSW LPI).

3 Aboriginal cultural heritage context

3.1 Ethnohistory

Aboriginal occupation of the region dates back to around 50,000 years ago (Hiscock 2008, p.44).

The study area falls within an area identified by Tindale (1974) as being within the boundaries of the Wiradjuri linguistic group, one of the largest groups within Australia. Although the boundaries of this group vary between maps, the land occupied by the Wiradjuri encompasses an area roughly between Nyngan, Mudgee, Albury and Hay. The closest groups to the study area are identified as the Yitha (Yita Yita) group to the west and the Wongaibon to the north.

The Yitha group are identified around the junction of the Lachlan and the Murrumbidgee, while the Nari are identified around the same area, on the south side of the Lachlan River. The Wiradjuri group is noted as being present along the Murrumbidgee and Lachlan in the vicinity of Hillston (Martin 2006, p. 155).

The first encounter many of these people would have had with Europeans was when Mitchell explored the inner regions of NSW. Mitchell (1835) kept journals of his explorations which detail many observations of Aboriginal people in the region before European settlement of the area. It is through these observations that an insight into the lifeways of Aboriginal people of the Lachlan and the Murrumbidgee Rivers can be imagined (Figure 5).

In reference to features now known as Earth Mounds or Hearths, Mitchell states:

> *'One artificial feature, not observed by me in other places, distinguishes the localities principally frequented by the natives, and consists in the lofty mounds of burnt clay, or ashes used by them in cooking'* (Mitchell 1839).

Mitchell describes the burial practices of Aboriginal people at the junction of the Lachlan and Murrumbidgee Rivers as small huts constructed over tombs. The junction of the Lachlan and Murrumbidgee Rivers is located south-west of the study area; therefore, the following description provides good insight of Aboriginal life within or near to the study area:

> *'Two of the tombs here consisted of huts, very neatly and completely thatched over, the straw or grass being bound down by a well-wrought net. Each hut had a small entrance on the south-west side, and the grave within was covered with dry grass or bedding on which lay however some pieces of wood. There was a third grave with coverings of the same kind, but it was not so neatly finished, nor was it covered with net. There were also graves without any covering; one where it appeared to have been burnt; and two old-looking graves were open, empty, and about three feet deep.'* (Mitchell 1835).

3.2 Aboriginal heritage located in the study area

The archaeological assessment of the study area identified the following Aboriginal sites in the study area:

- Hillston 1 (AHIMS# Pending)
- Hillston 2 (AHIMS# Pending)
- Hillston 3 (AHIMS# Pending)
- Hillston 4 (AHIMS# Pending)
- Hillston 5 (AHIMS# Pending)

The archaeological report attached in Appendix 5 provides details for Aboriginal sites identified during the archaeological assessment and shown on Figure 4. A brief description of each site is provided below.

Hillston 1 (AHIMS# Pending)

Hillston 1 is a modified box tree in the northern portion of the study area measuring 20 metres across and 2.8 metres in circumference bearing a large, east facing oval with no visible axe marks. The tree and scar are in good condition, with the scar located 65 centimetres from the ground and measuring 240 centimetres long by 40 centimetres wide and displaying 10 centimetres of regrowth. The size of the scar indicates it was likely caused by the removal of bark to make a canoe.

Currently, the closest natural water source to Hillston 1 is the Lachlan River, located approximately 3.1 kilometres to the north-west.

Hillston 2 (AHIMS# Pending)

Hillston 2 is a modified box tree in the south west corner of the study area, measuring 25 metres across and 2.72 metres in circumference with a large, east facing oval scar. The scar bears steel axe marks in the centre of the dryface. The tree and scar are in good condition, with the scar located 60 centimetres from the ground and measuring 180 centimetres long by 50 centimetres wide and displaying 30 centimetres of regrowth. An epimorphic stem grows from the base of the scar.

Currently, the closest natural water source to Hillston 2 is the Lachlan River, located approximately 3.6 kilometres to the north-west.

Hillston 3 (AHIMS# Pending)

Hillston 3 was an isolated find, a quartz flaked piece measuring 21 millimetres in length. Quartz does not naturally occur in the Hillston region, and thereby must have been transported into the study area. It was found exposed at the edge of a wheat field. As such, the site is considered to be in poor condition.

Currently, the closest natural water source to Hillston 3 is the Lachlan River, located approximately 3.6 kilometres to the north-west.

Hillston 4 (AHIMS# Pending)

Hillston 4 is an artefact scatter located in an area of exposure on a Lachlan depression plain landform. It consists of three silcrete artefacts. The assemblage is made up of one single platform core fragment and two distal flake fragments. None of these artefacts showed evidence for retouch.

Due to the location of the artefact scatter within an area of disturbance on the edge of a wheat field the condition of Hillston 4 has been assessed as poor.

Currently, the closest natural water source to Hillston 4 is an unnamed non-perennial creek, located approximately 4 kilometres to the north-east. The Lachlan River is the closest permanent water source, lying approximately 4.5 kilometres north-west of the site.

Hillston 5 (AHIMS# Pending)

Hillston 5 is a modified box tree in the northern portion of the study area measuring 20 metres across and 3 metres in circumference bearing a large, east facing oval scar with no visible axe marks. The tree is located approximately 20 metres to the west of Kidman Way. Both tree and scar are in good condition, with the scar located 70 centimetres from the ground and measuring 220 centimetres long by 40 centimetres wide and displaying 20 centimetres of regrowth. The size of the scar suggests it was the result of the removal of bark to create a canoe.

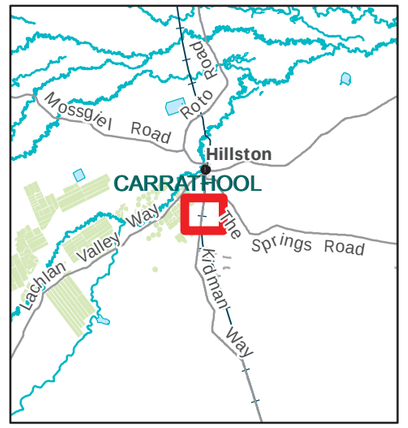
Currently, the closest natural water source to Hillston 5 is an unnamed non-perennial creek, located approximately 3.3 kilometres to the east. The Lachlan River is the closest permanent water source, lying approximately 4 kilometres west of the site.

3.3 Interpretation of past Aboriginal land use

The types and locations of sites newly identified during the survey was largely consistent with the predictive model formulated as part of the archaeological report. The entirety of the study area belonged to the Lachlan Depression Plains landscape and the concentration of sites within the study area was largely consistent with this. Fewer modified trees were identified during the survey than anticipated, and this was likely the result of the extensive land clearing that has taken place within the study area during its agricultural use. The poor condition assessment of the artefact scatter and isolated find is the result of this land use history.

The location of sites within the study area seems to bear little correlation with their relationship to modern water sources. There are no natural drainage or creek lines within the study area and, discounting the large number of irrigation channels, the local area is poor in natural water sources. None of the sites identified were located in close proximity to a source of water. This too is consistent with the predictive model, which saw little correlation between water availability and site location. Interestingly, the size of the scars of Hillston 2 and Hillston 5 suggests the removal of bark to create canoes, which potentially indicates the area was closer to natural waterways in the past than at present. This is likely the result of the extensive irrigation development in the Hillston area affecting the courses of creek lines and springs within the landscape.

The identification of a quartz artefact within the study area is notable, as quartz does not occur naturally within the region and therefore must have been a manuport brought in from elsewhere. The other three artefacts all consist of silcrete, which is common for the Lachlan River. The small size of the artefact assemblage identified during this study likely accounts for the dominance of silcrete, as well as the lack of patterns evident in the types of stone artefacts present in the assemblage. This does not allow for the development of any clear statements on the study area's Aboriginal occupation history on the basis of its lithic assemblage alone, although the low density of artefacts within the study area suggests only sporadic use. No hearths, earth mounds or site types indicated repeated use of the area were identified during the survey.



Legend

- Study area
- Development site

Site Type

- W Modified Tree
- Surface Artefacts

Figure 4: Aboriginal sites in the vicinity of the study area

0 150 300 450 600 750

Metres

Scale: 1:15,394 @ A3

Coordinate System: GDA 1994 MGA Zone 55

biosis

Biosis Pty Ltd

Ballarat, Brisbane, Canberra, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 23501
Date: 25 May 2017,
Checked by: ALA, Drawn by: SSK, Last edited by: lharley
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Acknowledgements: Basemap © Land and Property Information 2016; Imagery © Overland Sun Farming, LPI 2012

4 Aboriginal community consultation

Consultation with the Aboriginal community has been undertaken in compliance with the consultation requirements as detailed below. A consultation log of all communications with RAPs is provided in Appendix 1.

4.1 Stage 1: Notification of project proposal and registration of interest

4.1.1 Identification of relevant Aboriginal stakeholders

In accordance with the consultation guidelines, Biosis Pty Ltd notified the following bodies regarding the Proposal:

- Carrathool Shire Council (CSC)
- NSW Office of Environment and Heritage (OEH)
- NSW Native Title Services Corporation Limited (NTSCORP Limited)
- Office of the Registrar, Aboriginal Land Rights Act 1983 of Aboriginal Owners
- National Native Title Tribunal (NNTT)
- Southern Rivers Local Land Services
- Griffith Local Aboriginal Land Council (GLALC)
- Balranald Local Aboriginal Land Council (BLALC)

A list of known Aboriginal stakeholders in the Hillston area was provided by OEH (a copy of this/these responses are provided in Appendix 2 and include:

- Griffith Local Aboriginal Land Council

A response was also received from BLALC who noted that the Hillston study area was not within their boundaries.

4.1.2 Searches

A search conducted by the Office of the Registrar, Aboriginal Land Rights Act 1983 (NSW) listed no Aboriginal Owners with land within the site boundary. A search conducted by the National Native Title Tribunal listed one Registered Native Title Claim, two Native Title Determination Applications and no Registered Indigenous Land Use Agreements within the study area.

4.1.3 Public notice

In accordance with the consultation guidelines, a public notification was placed in the following newspaper:

- The Hillston Spectator (16 November, 2016)

The advertisement invited Aboriginal people who hold cultural knowledge to register their interest in a process of community consultation to provide assistance in determining the significance of Aboriginal object(s) and/or places in the vicinity of the study area. A copy of the public notice is provided in Appendix 2.

4.1.4 Registration of Aboriginal parties

Aboriginal groups identified in Section 4.1.1 were sent a letter inviting them to register their interest in a process of community consultation to provide assistance in determining the significance of Aboriginal object(s) and/or places in the vicinity of the study area. In response to the letters and public notice, one group registered their interest in the consultation process. . Responses to registration from Aboriginal parties are provided in Appendix 3. A full list of Aboriginal parties who registered for consultation is provided below:

- Griffith Local Aboriginal Land Council

4.2 Stage 2: Presentation of information about the proposed project

On 19 December, 2016 Biosis provided RAPs with details about the proposed development works (project information pack). A copy of the project information pack is provided in Appendix 3.

4.3 Stage 3: Gathering information about cultural significance

4.3.1 Archaeological assessment methodology information pack

On 19 December 2016, Biosis provided each RAP with a copy of the project methodology pack outlining the proposed Aboriginal cultural heritage assessment process and methodology for this project. RAPs were given 28 days to review and prepare feedback on the proposed methodology. A copy of the project methodology pack is provided in Appendix 4.

No comments from RAPs were received at this stage of consultation.

4.3.2 Information gathered during fieldwork

As part of the site survey Biosis collected any cultural information offered by the site representatives. Max Harris attended the site survey and during the survey spoke about sites known nearby which included scar trees and artefact scatters. Specific details and locations were not given.

4.4 Stage 4: Review of draft Aboriginal cultural heritage assessment report

Following completion of the DRAFT Aboriginal cultural heritage assessment report it was provided to RAPs on TBA for review and comment. RAPs were given 28 days to provide comments and X responses were received as detailed below. Comments on the draft report are provided in Appendix 5. To be completed after 28 day comment period.

5 Aboriginal cultural significance assessment

The two main values addressed when assessing the significance of Aboriginal sites are cultural values to the Aboriginal community and archaeological (scientific) values. This report will assess the cultural values of Aboriginal sites in the site. Details of the scientific significance assessment of Aboriginal sites in the site boundary are provided in Appendix 6.

5.1 Introduction to the assessment process

Heritage assessment criteria in NSW fall broadly within the significance values outlined in the *Australia International Council on Monuments and Sites (ICOMOS) Burra Charter* (Australia ICOMOS 1999). This approach to heritage has been adopted by cultural heritage managers and government agencies as the set of guidelines for best practice heritage management in Australia. These values are provided as background and include:

- **Historical significance** (evolution and association) refers to historic values and encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section. A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.
- **Aesthetic significance** (Scenic/architectural qualities, creative accomplishment) refers to the sensory, scenic, architectural and creative aspects of the place. It is often closely linked with social values and may include consideration of form, scale, colour, texture, and material of the fabric or landscape, and the smell and sounds associated with the place and its use.
- **Social significance** (contemporary community esteem) refers to the spiritual, traditional, historical or contemporary associations and attachment that the place or area has for the present-day community. Places of social significance 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 significance be damaged or destroyed. These aspects of heritage significance can only be determined through consultative processes with local communities.
- **Scientific significance** (Archaeological, industrial, educational, research potential and scientific significance values) refers to the importance of a landscape, area, place or object because of its archaeological and/or other technical aspects. Assessment of scientific value is often based on the likely research potential of the area, place or object and will consider the importance of the data involved, its rarity, quality or representativeness, and the degree to which it may contribute further substantial information.

The cultural and archaeological significance of Aboriginal and historic sites and places is assessed on the basis of the significance values outlined above. As well as the ICOMOS Burra Charter significance values guidelines, various government agencies have developed formal criteria and guidelines that have application when assessing the significance of heritage places within NSW. Of primary interest are guidelines prepared by the

Australian Government, the NSW OEH and the Heritage Branch, and the NSW Department of Planning and Environment. The relevant sections of these guidelines are presented below.

These guidelines state that an area may contain evidence and associations which demonstrate one or any combination of the ICOMOS Burra Charter significance values outlined above in reference to Aboriginal heritage. Reference to each of the values should be made when evaluating archaeological and cultural significance for Aboriginal sites and places.

In addition to the previously outlined heritage values, the OEH Guidelines (DECC 2006) also specify the importance of considering cultural landscapes when determining and assessing Aboriginal heritage values. The principle behind a cultural landscape is that 'the significance of individual features is derived from their inter-relatedness within the cultural landscape'. This means that sites or places cannot be 'assessed in isolation' but must be considered as parts of the wider cultural landscape. Hence the site or place will possibly have values derived from its association with other sites and places. By investigating the associations between sites, places, and (for example) natural resources in the cultural landscape the stories behind the features can be told. The context of the cultural landscape can unlock 'better understanding of the cultural meaning and importance' of sites and places.

Although other values may be considered – such as educational or tourism values – the two principal values that are likely to be addressed in a consideration of Aboriginal sites and places are the cultural/social significance to Aboriginal people and their archaeological or scientific significance to archaeologists. The determinations of archaeological and cultural significance for sites and places should then be expressed as statements of significance that preface a concise discussion of the contributing factors to Aboriginal cultural heritage significance.

5.2 Cultural (social significance) values

Cultural or social significance refers to the spiritual, traditional, historical and/or contemporary associations and values attached to a place or objects by Aboriginal people. Aboriginal cultural heritage is broadly valued by Aboriginal people as it is used to define their identity as both individuals and as part of a group (also see DECC 2005: 1, 3; DECCW 2010: iii). More specifically it provides a:

- "*connection and sense of be*longing to Country" (DECCW 2010: iii);
- Link between the present and the past (DEC 2005: 2-3; and DECCW 2010: 3);
- A learning tool to teach Aboriginal culture to younger Aboriginal generations and the general public (DECCW 2010: 3); and,
- further evidence of Aboriginal occupation prior to European settlement for people who do not understand the magnitude to which Aboriginal people occupied the continent (also see DECCW 2010: 1; DECCW 2010: 3).

It is broadly acknowledged that Aboriginal people are the primary determiners of the cultural significance of Aboriginal cultural heritage. During consultation the following information was provided by RAPs in regards to the cultural values of the site.

- *To be completed after 28 day comment period.*

5.3 Historic values

Historic significance refers to associations a place or object may have with a historically important person, event, phase or activity to the Aboriginal and other communities. The study area is not known to have any historic associations.

5.4 Archaeological (scientific significance) values

An archaeological scientific assessment was undertaken for the site and is presented in detail as part of the attached Archaeological Report (Appendix 6). The site survey revealed five Aboriginal heritage sites which included 3 modified trees, one artefact scatter and one isolated find. Each of these site types are considered to have archaeological significance.

5.5 Aesthetic values

The study area has been extensively disturbed and modified but still represents the semi-arid plains around Hillston and the Lachlan River. These extensive plains with stands of black box and grassland, are characteristic of the region. Due to the disturbance within the study area only moderate aesthetic values apply.

5.6 Statement of significance

5.6.1 Statement of significance for Hillston 1

Hillston 1 is a modified box tree measuring 20 metres across and 2.8 metres in circumference bearing a large, east facing oval with no visible axe marks. Scar trees hold high significance to the local Aboriginal community. The scar is in good condition and notable for its size, which suggests it was the result of the creation of a canoe. This site is of moderate scientific significance.

5.6.2 Statement of significance for Hillston 2

Hillston 2 is a modified box tree measuring 25 metres across and 2.72 metres in circumference with a large, east facing oval scar which bears steel axe marks at its centre. Scar trees hold high significance to the local Aboriginal community. The scar is in good condition and is easy identifiable as being made by humans due to the presence of steel axe marks. The site is of moderate scientific significance.

5.6.3 Statement of significance for Hillston 3

Hillston 3 is an isolated find, a quartz flaked piece measuring 21 millimetres in length found exposed at the edge of a ploughed field. While quartz is an unusual raw material for the region, lithic fragments are common to the region and this site has been highly disturbed by ploughing. It has low scientific significance.

5.6.4 Statement of significance for Hillston 4

Hillston 4 is an artefact scatter consisting of three silcrete artefacts located in an area of exposure at the edge of a ploughed field. The assemblage is made up of one single platform core fragment and two distal flake fragments, all of which are common to the region and the site has been subject to extensive disturbance. The site is of low scientific significance.

5.6.5 Statement of significance for Hillston 5

Hillston 5 is a modified box tree measuring 20 metres across and 3 metres in circumference bearing a large, east facing oval scar with no visible axe marks. Scar trees hold high significance to the local Aboriginal

community. The scar is in good condition and notable for its size, which suggests it was the result of the creation of a canoe. This site is of moderate scientific significance

Table 3 Significance assessment criteria

Site name	Criteria	Ranking
Hillston 1	Cultural – unknown	
	Historical – There is no historical association with this site.	Low
	Scientific – Culturally modified scar trees can provide information about peoples movement through the landscape and tools which were being used, especially in the post-contact period. This site is of moderate significance.	Moderate
	Aesthetic – The site is in good condition however not in its natural setting due to ongoing agricultural use of the property.	Moderate
Hillston 2	Cultural – unknown	
	Historical – There is no historical association with this site.	Low
	Scientific – Culturally modified scar trees can provide information about peoples movement through the landscape and tools which were being used, especially in the post-contact period. This site is of moderate significance	Moderate
	Aesthetic – The site is in good condition however not in its natural setting due to ongoing agricultural use of the property.	Low
Hillston 3	Cultural – unknown	
	Historical – There is no historical association with this site.	Low
	Scientific –	Moderate
	Aesthetic – The site is in poor condition and not in its natural setting due to ongoing agricultural use of the property.	Low
Hillston 4	Cultural – unknown	
	Historical – There is no historical association with this site.	Low
	Scientific – Earth mounds have high scientific significance as they can reveal a lot of information about Aboriginal peoples' occupation of an area however this mound is disturbed reducing the significance to moderate.	Moderate
	Aesthetic – The site is in poor condition and not in its natural setting due to ongoing agricultural use of the property.	Low
Hillston 5	Cultural – unknown	
	Historical – There is no historical association with this site.	Low
	Scientific – Culturally modified scar trees can provide information about peoples movement through the landscape and tools which were being used, especially in the post-contact period. This site is	Moderate

Site name	Criteria	Ranking
	of moderate significance	
	Aesthetic – The site is in good condition however not in its natural setting due to ongoing agricultural use of the property.	Low

The significance of sites was assessed in accordance with the following criteria:

- Requirements of the Code (*ICOMOS) Burra Charter*' (Australia ICOMOS 1999).
- Guide to Investigating and reporting on Aboriginal Heritage

Use of these guidelines in combination is widely considered to represent the best practice for assessments of Aboriginal cultural heritage. The identification and assessment of cultural heritage values includes the four values of the Burra Charter: social, historical, scientific and aesthetic values. The resultant statement of significance has been constructed for the site based on the significance ranking criteria assessed in Table 3.

6 Proposed development limitations & mitigation measures

Within the study area, there are five recorded Aboriginal sites. As discussed in Section 5.2, it is expected that the potential of harm to Aboriginal archaeological sites from the project ranges from negligible to low. Strategies to avoid or minimise harm to Aboriginal heritage are discussed below.

A summary of the potential archaeological impact of the proposal on known Aboriginal sites within the site boundary is provided in Table 4.

Table 4 Summary of potential archaeological impacts

AHIMS site no.	Site name	Significance	Type of harm	Degree of harm	Consequence of harm
Pending	Hillston 1	Moderate	None	None	No loss of value
Pending	Hillston 2	Moderate	None	None	No loss of value
Pending	Hillston 3	Low	None	None	No loss of value
Pending	Hillston 4	Low	None	None	No loss of value
Pending	Hillston 5	Moderate	None	None	No loss of value

6.1 Potential risks to Aboriginal cultural heritage

The construction of the project includes disturbance to the ground surface within the development footprint. This construction has the potential to disturb Aboriginal heritage sites; however, through project design, Overland has designed the development footprint to avoid and minimize impacts to Aboriginal heritage sites as far as practicable.

6.2 Management and mitigation measures

Ideally, heritage management involves conservation of sites through the preservation and conservation of fabric and context within a framework of "*doing as much as necessary, as little as possible*" (Marquis-Kyle and Walker 1994: 13). In cases where conservation is not practical, several options for management are available. For sites, management often involves the salvage of features or artefacts, retrieval of information through excavation or collection (especially where impact cannot be avoided) and interpretation.

Overland has designed the development footprint to avoid harm to all 5 Aboriginal heritage sites identified in the study area.

7 Recommendations

The recommendation below responds specifically to the wishes of the registered Aboriginal parties. Recommendations regarding the archaeological value of the site, and the subsequent management of Aboriginal cultural heritage is provided in the archaeological report (Appendix 5).

Recommendation 1: Continued consultation with the registered Aboriginal parties

It is recommended that Overland Sun Farming continue to inform the RAPs about the management of Aboriginal cultural heritage sites within the site boundary throughout the construction of the project. This recommendation is in keeping with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a).

Recommendation 2: Sites Hillston 1, 2, 3, 4, and 5 are to be avoided from impact.

The development footprint avoids impact to sites Hillston 1, 2, 3, 4, and 5 so no further investigation is required.

Recommendation 3: Discovery of unanticipated Aboriginal objects

All Aboriginal objects and places are protected under the *National Parks and Wildlife Act 1974*. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage (OEH). Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders to inform options for management of the objects.

Recommendation 4: Discovery of unanticipated historical relics

Relics are historical archaeological resources of local or State significance and are protected in NSW under the *Heritage Act 1977*. Relics cannot be disturbed except with a permit or exception/exemption notification. Should unanticipated relics be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic.

Recommendation 5: Discovery of Aboriginal ancestral remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains
2. Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location
3. Not recommence work at that location unless authorised in writing by OEH.

Recommendation 6: Stop work provision for any potential discovery of human remains

If any suspected human remains are discovered during any activity works, all activity must cease immediately. The remains must be left in place and protected from harm or damage. The following contingency plan

describes the immediate actions that must be taken in instances where human remains or suspected human remains are discovered. Any such discovery at the activity area must follow these steps:

1. Discovery: If suspected human remains are discovered all activity must stop to ensure minimal damage is caused to the remains; and the remains must be left in place, and protected from harm or damage.
2. Notification: Once suspected human skeletal remains have been found, the Coroner's Office and the NSW Police must be notified immediately. Following this, and if the human remains are likely to be Aboriginal in origin, the find will be reported to the Aboriginal parties and DECCW NSW. If the find is likely to be non-Aboriginal in origin and more than 100 years in age, the Heritage Council of NSW will be notified of the find under s.146 of the *Heritage Act 1977*.

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Appendices

Appendix 1 Consultation log

A1.1 Stage 1 – Notification of project proposal and registration of interest

Step 1- Identification of Aboriginal people/parties with an interest in the proposed study area.

Organisation contacted	Date and type of contact	Date and type of response	Response details
Carrathool Shire Council	14/11/2016 - Email	No response	N/A
Balranald Local Aboriginal Land Council	14/11/2016 - Email	14/11/2016 - Email	Responded that Hillston is not within boundaries of Balranald LALC
Griffith Local Aboriginal Land Council	14/11/2016 - Email	22/11/2017- Phone	Response received. Registered an interest
Office of Environment and Heritage	14/11/2016 - Email	No response	N/A
Office of the Registrar, Aboriginal Land Rights Act 1983	14/11/2016 - Email	16/11/2016 - Email	Response received. Informed Biosis that there are no registered Aboriginal Owners in the project area
Native Title Services Corporation	14/11/2016 - Email	No response	N/A
National Native Title Tribunal	14/11/2016 - Email	16/11/2016 - Email	Response received. Provided native title overlap results within the Carrathool LGA

Step 2- Public advertisement

The public notice was published in the *Hillston Spectator* on the 16/04/2017. A copy of the advertisement is provided in Appendix 2.

Step 3- Registration of interest.

The registration period ran from the 28 November 2016 to the 13 December 2016. Leeway was given to Aboriginal parties/groups who provided responses shortly after the close of this period and they have been registered as Aboriginal parties for consultation.

Organisation contacted	Date and type of contact	Date and type of response	Response details
Griffith Local Aboriginal Land Council	14/11/2016 - Email	22/11/2016- Phone	Response received. Registered an interest

A1.2 Stage 2 – Presentation of information about the proposed project

Step 1- Provision of project information pack.

A copy of the information pack is provided in Appendix 3and a copy of the covering email is provided following.

Organisation contacted	Date and type of contact	Date and type of response	Response details
Griffith LALC	19/12/2016	No response	N/A

A1.3 Stage 3 – Gathering information about cultural significance

Step 1- Provision of project methodology pack and consultation meeting.

A copy of the methodology pack is provided in Appendix 4 and a copy of the covering email is provided following.

Organisation contacted	Date and type of contact	Date and type of response	Response details
Griffith LALC	19/12/2016	No response	N/A

Step 2- Field survey

Organisation contacted	Date and type of contact	Date and type of response	Response details
Griffith LALC	19/12/2016 - email	19/12/2016 - email	Attended site survey

A1.4 Stage 4 – Review of Draft Report (TBC after 28 days period)

Step 1- Provision of draft report for review.

Organisation contacted	Date and type of contact	Date and type of response	Response details

Appendix 2 Stage 1: Notification of project proposal and registration of interest

14 November 2016

Mr Shane Wilson
Director Development Services
Carrathool Shire Council
PO Box 12
Goolgowi NSW 2652

Dear Shane,

RE: Hillston Sun Farm – identification of interested Aboriginal parties

Our Ref: Matter 23501

The Overland Sun Farming Company (Overland) is proposing to develop the Hillston Solar Farm property to provide a solar energy site and associated infrastructure. The study area is within the Carrathool Local Government Area (LGA), Parish of Redbank, County of Nicholson. This area incorporates 682 hectares of private land and adjacent road reserves, including 16.7 hectares of road reserve adjacent to the sub-station, located on Kidman Way, approximately four kilometres south from Hillston.

An Aboriginal Cultural Heritage Assessment will be undertaken as part of an Environmental Impact Statement (EIS)

Biosis Pty Ltd is assisting Overland on consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community for this proposal will follow the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010). The purpose of the Aboriginal community consultation is to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment.

Overland wishes to identify Aboriginal people who may have an interest in the proposed study area and hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or Places in the Hillston area. If you could please provide contact details for any such Aboriginal people or organisations of which you are aware it would be greatly appreciated. Please provide these details by **5pm on 27 November 2016**.

In accordance with the consultation requirements, please note that the relevant Overland contact for this project is:

John Zammit
Overland Sun Farming Company Pty Ltd
L1, 23 Milton Parade
Malvern VIC 3144

All correspondence regarding provision of names and contact details of Aboriginal people who may hold cultural knowledge relevant to the study area should be provided in writing to:

Biosis Pty Ltd
Wollongong Resource Group

8 Tate Street
Wollongong NSW 2500

Phone: 02 4201 1090
Fax: 03 9646 9242

ACN 006 175 097
ABN 65 006 175 097

Email: wollongong@biosis.com.au

biosis.com.au

Amanda Atkinson
Biosis Pty Ltd
8 Tate Street
Wollongong NSW 2500
aatkinson@biosis.com.au

If you have any queries regarding the study area please don't hesitate to contact me on the details below.

Yours sincerely,

Amanda Atkinson
Senior Archaeologist

14 November 2016

Griffith Aboriginal Land Council
PO Box 1424
East Griffith NSW 2680

Dear Sir/Madam,

RE: Hillston Sun Farm – identification of interested Aboriginal parties
Our Ref: Matter 23501

The Overland Sun Farming Company (Overland) is proposing to develop the Hillston Solar Farm property to provide a solar energy site and associated infrastructure. The study area is within the Carrathool Local Government Area (LGA), Parish of Redbank, County of Nicholson. This area incorporates 682 hectares of private land and adjacent road reserves, including 16.7 hectares of road reserve adjacent to the sub-station, located on Kidman Way, approximately four kilometres south from Hillston.

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8 Tate Street
Wollongong NSW 2500
aatkinson@biosis.com.au

If you have any queries regarding the study area please don't hesitate to contact me on the details below.

Yours sincerely,

Amanda Atkinson
Senior Archaeologist

14 November 2016

Mr John Gilding
Regional archaeologist – South-west region
Office of Environment and Heritage
Via email: john.gilding@environment.nsw.gov.au

Dear John,

RE: Hillston Sun Farm – identification of interested Aboriginal parties

Our Ref: Matter 23501

The Overland Sun Farming Company (Overland) is proposing to develop the Hillston Solar Farm property to provide a solar energy site and associated infrastructure. The study area is within the Carrathool Local Government Area (LGA), Parish of Redbank, County of Nicholson. This area incorporates 682 hectares of private land and adjacent road reserves, including 16.7 hectares of road reserve adjacent to the sub-station, located on Kidman Way, approximately four kilometres south from Hillston.

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aatkinson@biosis.com.au

If you have any queries regarding the study area please don't hesitate to contact me on the details below.

Yours sincerely,

Amanda Atkinson
Senior Archaeologist

14 November 2016

Stephen Wright
Office of the Regtistrar Aboriginal Land Rights Act 1983
PO Box 112
Glebe NSW 2037

Dear Stephen,

RE: Hillston Sun Farm – identification of interested Aboriginal parties

Our Ref: Matter 23501

The Overland Sun Farming Company (Overland) is proposing to develop the Hillston Solar Farm property to provide a solar energy site and associated infrastructure. The study area is within the Carrathool Local Government Area (LGA), Parish of Redbank, County of Nicholson. This area incorporates 682 hectares of private land and adjacent road reserves, including 16.7 hectares of road reserve adjacent to the sub-station, located on Kidman Way, approximately four kilometres south from Hillston.

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8 Tate Street
Wollongong NSW 2500
aatkinson@biosis.com.au

If you have any queries regarding the study area please don't hesitate to contact me on the details below.

Yours sincerely,

Amanda Atkinson
Senior Archaeologist

14 November 2016

George Tonna
Land and Notifications Officer
Native Title Services Corporation
PO Box 2105
Strawberry Hills NSW 2012

Dear George,

RE: Hillston Sun Farm – identification of interested Aboriginal parties

Our Ref: Matter 23501

The Overland Sun Farming Company (Overland) is proposing to develop the Hillston Solar Farm property to provide a solar energy site and associated infrastructure. The study area is within the Carrathool Local Government Area (LGA), Parish of Redbank, County of Nicholson. This area incorporates 682 hectares of private land and adjacent road reserves, including 16.7 hectares of road reserve adjacent to the sub-station, located on Kidman Way, approximately four kilometres south from Hillston.

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In accordance with the consultation requirements, please note that the relevant Overland contact for this project is:

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aatkinson@biosis.com.au

If you have any queries regarding the study area please don't hesitate to contact me on the details below.

Yours sincerely,

Amanda Atkinson
Senior Archaeologist

14 November 2016

National Native Title Tribunal
GPO Box 9973
Sydney NSW 2001

Dear Sir/Madam,

RE: Hillston Sun Farm – identification of interested Aboriginal parties

Our Ref: Matter 23501

The Overland Sun Farming Company (Overland) is proposing to develop the Hillston Solar Farm property to provide a solar energy site and associated infrastructure. The study area is within the Carrathool Local Government Area (LGA), Parish of Redbank, County of Nicholson. This area incorporates 682 hectares of private land and adjacent road reserves, including 16.7 hectares of road reserve adjacent to the sub-station, located on Kidman Way, approximately four kilometres south from Hillston.

An Aboriginal Cultural Heritage Assessment will be undertaken as part of an Environmental Impact Statement (EIS)

Biosis Pty Ltd is assisting Overland on consultation with the Aboriginal community and the Aboriginal Cultural Heritage Assessment. Consultation with the Aboriginal community for this proposal will follow the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010). The purpose of the Aboriginal community consultation is to provide sufficient information for the assessment of Aboriginal cultural heritage values and to inform the Aboriginal Cultural Heritage Assessment.

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In accordance with the consultation requirements, please note that the relevant Overland contact for this project is:

John Zammit
Overland Sun Farming Company Pty Ltd
L1, 23 Milton Parade
Malvern VIC 3144

All correspondence regarding provision of names and contact details of Aboriginal people who may hold cultural knowledge relevant to the study area should be provided in writing to:

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If you have any queries regarding the study area please don't hesitate to contact me on the details below.

Yours sincerely,

Amanda Atkinson
Senior Archaeologist

OVERLAND SUN FARMING COMPANY - HILLSTON NOTIFICATION AND REGISTRATION OF ABORIGINAL INTERESTS

Overland Sun Farming Company (Overland) is proposing to develop the solar energy site and associated infrastructure at Hillston NSW. The site is within the Carrathool Local Government Area (LGA) Parish of Redbank, County of Nicholson. The area incorporates 682 hectares of private land and adjacent road reserves, including 16.7 hecatres of road reserve adjacent to the substation, located on Kidman Way approximately four kilometres south from Hillston township.

An Aboriginal cultural Heritage Assessment will be undertaken as part of an Environmental Impact Statement (EIS).

Overland invites Aboriginal people who hold cultural knowledge in determing the significance of Aboriginal objects(s) and/or places in the vicinity of the above area to register their interest in a process of community consulation.

The purpose of the community consultation will be to provide sufficient information for the assessment of Aboriginal cultural heritage values and to assist and inform the Aboriginal Cultural Heritage Assessment.

For more information please contact:
John Zammit
Overland Sun Farming Company Pty Ltd
L1, 23 Milton Parade
Malvern, VIC 3144
Email:john.zammit@overlandsunfarming.com.au

To register in writing please contact:
Amanda Atkinson
Biosis Pty Ltd
8 Tate Street
Wollongong NSW 2500
aatkinson@biosis.com.au

REGISTRATIONS MUST BE RECEIVED BEFORE 5.00pm 30 November 2016

Appendix 3 Stage 2: Presentation of information about the proposed project

Rebecca Morris

From: Rebecca Morris
Sent: Monday, 16 January 2017 2:23 PM
To: 'grifflalc@bigpond.com'
Subject: Hillston Sun Farm Survey
Attachments: 23501.GriffithLALC.Hillston.Project.Information.FIN01.20161219.pdf; 23501.GriffithLALC.Hillston.Methodology.20161219.pdf

Hi Robert,

Please find attached the information pack and methodology for the Hillston Sun Farm. We want to confirm your rates and availability for one day over the 29th or 30th of January.

Kind regards,

Rebecca Morris
Research Assistant - Heritage
Mobile: 0427 458 051
Direct: (02) 9101 8716
Email: rmorris@biosis.com.au

Leaders in Ecology and Heritage Consulting
Unit 14 17-27 Power Avenue Alexandria NSW 2015
ph: (02) 9101 8700 fax: (03) 9646 9242
biosis.com.au

19 December 2016

Robert Carrol

Griffith Local Aboriginal Land Council

PO Box 1424

East Griffith, NSW 2680

Dear Robert,

RE: Project Information Aboriginal Cultural Heritage Assessment: Hillston Solar Farm.

Our Ref: Matter 23501

Thank you for your registration of interest in this project. The following project information has been provided by Biosis on behalf of Overland Sun Farming Company and is in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010b). The aim of this document is to provide the Registered Aboriginal Parties with information about the scope of the proposed project.

Study Areas

The study area is within the Carrathool Local Government Area (LGA), Parish of Redbank, County of Nicholson. This area incorporates 713 hectares of private land and adjacent road reserves, including 16.7 hectares of road reserve adjacent to the sub-station, located on Kidman Way, approximately four kilometres south from Hillston.

Project

Biosis Pty Ltd completed a desktop due diligence assessment of the study area on 7 September 2016. The results of this assessment identified that further assessment of the study area was required due to a high potential for Aboriginal heritage objects to be present.

Biosis has been engaged by Overland Sun Farming Company Pty Ltd (Overland) to undertake an Aboriginal Cultural Heritage Assessment (ACHA) as part of an Environmental Impact Statement (EIS). No Aboriginal Heritage Impact Permit (AHIP) is required for this project as it is being assessed under Part 5.1 of the *Environmental Planning and Assessment Act.*

Biosis Pty Ltd
Wollongong Resource Group

8 Tate Street
Wollongong NSW 2500

Phone: 02 4229 5222
Fax: 03 9646 9242

ACN 006 175 097
ABN 65 006 175 097

Email: wollongong@biosis.com.au

biosis.com.au

Aboriginal Cultural Heritage Assessment Process

The assessment process includes the following tasks:

Background Research

This task will identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment/study area. The following steps will be undertaken:

- A search of the Aboriginal Heritage Information Management System (AHIMS) will be completed to identify registered sites in the vicinity of the assessment/study area. The results of the AHIMS search will be used to obtain relevant site cards and relevant previously completed Aboriginal cultural heritage assessments.
- Review of relevant reports identified through the AHIMS search.
- Review of aerial photographs and other resources to gauge the existing landscape and previous history of land disturbance.
- Review of the historical heritage databases.
- A brief summary of the historical uses of the study areas.

Consultation with the Aboriginal Community

This task will allow the Aboriginal community the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and inputting into management options.

Aboriginal community consultation will be undertaken in accordance with *the Aboriginal cultural heritage consultation requirements for proponents (*2010b), which includes:

- **COMPLETED.** Biosis ascertained the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or Places within the proposed study area.
- **COMPLETED.** Aboriginal stakeholders were provided with notification by email of the proposed project on 2 December 2016 via Biosis and given the opportunity to be involved in consultation.
- This document outlines the details of the proposed project.
- Biosis will provide details of the project methodology for the archaeological assessment and test excavations to the registered parties. The registered Aboriginal parties must be given an opportunity to review and provide feedback to the proponent within a minimum of **28 days** of Biosis providing the methodology document.
- The DRAFT Aboriginal Cultural Heritage Assessment Report (ACHAR) and Archaeological Report (AR) will be provided to all registered Aboriginal parties for comment – the proponent must allow **28 days** for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an Appendix.
- Representatives of the registered Aboriginal parties will be invited to participate in any archaeological excavations which will take place within the study area(s).

Field Survey

An inspection of the assessment area will be undertaken in order to identify any previously unknown Aboriginal objects or Places, should they be present. If identified, these will be recorded to the required standard.

Any known sites identified by the AHIMS search which are within the assessment area will be inspected to determine their current condition. Registered sites in the near vicinity will be visited to ensure they will not be impacted by the proposed works. Areas of potential archaeological deposit (PAD) identified by previous assessments will also be inspected.

This task will assist in the assessment of disturbance and with predictive modelling will define areas of potential archaeological deposit and assessment of whether the proposed works are likely to impact on undiscovered Aboriginal artefacts.

Mapping will be undertaken in ArcGIS and/or MapInfo Professional.

Reporting

A draft ACHAR and AR report will be prepared in accordance with the *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW (*2010a) and will include:

- Background and project description.
- A summary and analysis of the findings including the presence and location of registered or undiscovered Aboriginal artefacts or heritage items within proximity of the study areas.
- A summary of any other relevant studies or surveys which have relevance to the assessment area.
- A summary of the landscape features of the site which may indicate a history of Aboriginal activity.
- A summary of previous land use that may have affected the retention of intact Aboriginal archaeology in the landscape.
- The potential or likelihood for the proposed works to uncover or expose potential undiscovered Aboriginal objects.
- Legislative implications of the proposed works.
- Recommendations and justification for further assessment (if required).
- Mitigation measures (if any) required for the works to proceed.
- Mapping will be carried out to show the location of registered and newly located (if any) Aboriginal sites in relation to the proposed works.

As part of this methodology registered Aboriginal parties will be provided with the draft report for comment and allowed **28 days** for review.

The final report will incorporate all comments.

Project schedule

The schedule and time allocations for the project are summarised below.

Action	Timeframe	Notes
Commencement of Aboriginal community Consultation	Completed	Notices sent to registered Aboriginal stakeholders
Provision of client-reviewed DRAFT Methodology Document to registered Aboriginal stakeholders for review and comment – these methods will form the basis for all archaeological and cultural heritage work.	4 Weeks	**28 days** review time allowed under OEH Aboriginal community consultation guidelines.
Information gathering	Ongoing	Until finalisation of report.
Site inspection with selected representatives of the registered Aboriginal parties	TBC[1]	
Test excavations with selected representatives of the registered Aboriginal parties (only if required)	TBC	Only if required
Review of the draft report	TBC	**28 days** review time allowed under OEH Aboriginal community consultation guidelines.
Final Report	TBC	

[1] TBC = to be confirmed.

Responsibilities and roles

As part of the consultation process registered Aboriginal parties are expected to respond to requests for cultural information and comment on draft reporting, as appropriate in accordance with their role specified in the guidelines (DECCW 2010b).

Biosis and Overland, in accordance with their role under the guidelines, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process.

Each section of the methodology will be undertaken in consultation with the Aboriginal stakeholders. Biosis invites Aboriginal stakeholders to provide culturally appropriate information via mail, email or phone with regards to this project.

Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then the Aboriginal stakeholder should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

If you have any queries regarding the Project or the information in this letter, please don't hesitate to contact me in the office on (02) 4201 1056.

Yours sincerely,

Amanda Atkinson
Senior Archaeologist
0409 199 785
aatkinson@biosis.com.au

References

Department of Environment, Climate Change and Water. 2010a. *Code of practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010*. NSW Department of Environment, Climate Change and Water, Sydney NSW.

Department of Environment, Climate Change and Water. 2010b. *Aboriginal cultural heritage consultation requirements for proponents 2010*. NSW Department of Environment, Climate Change and Water, Sydney NSW.

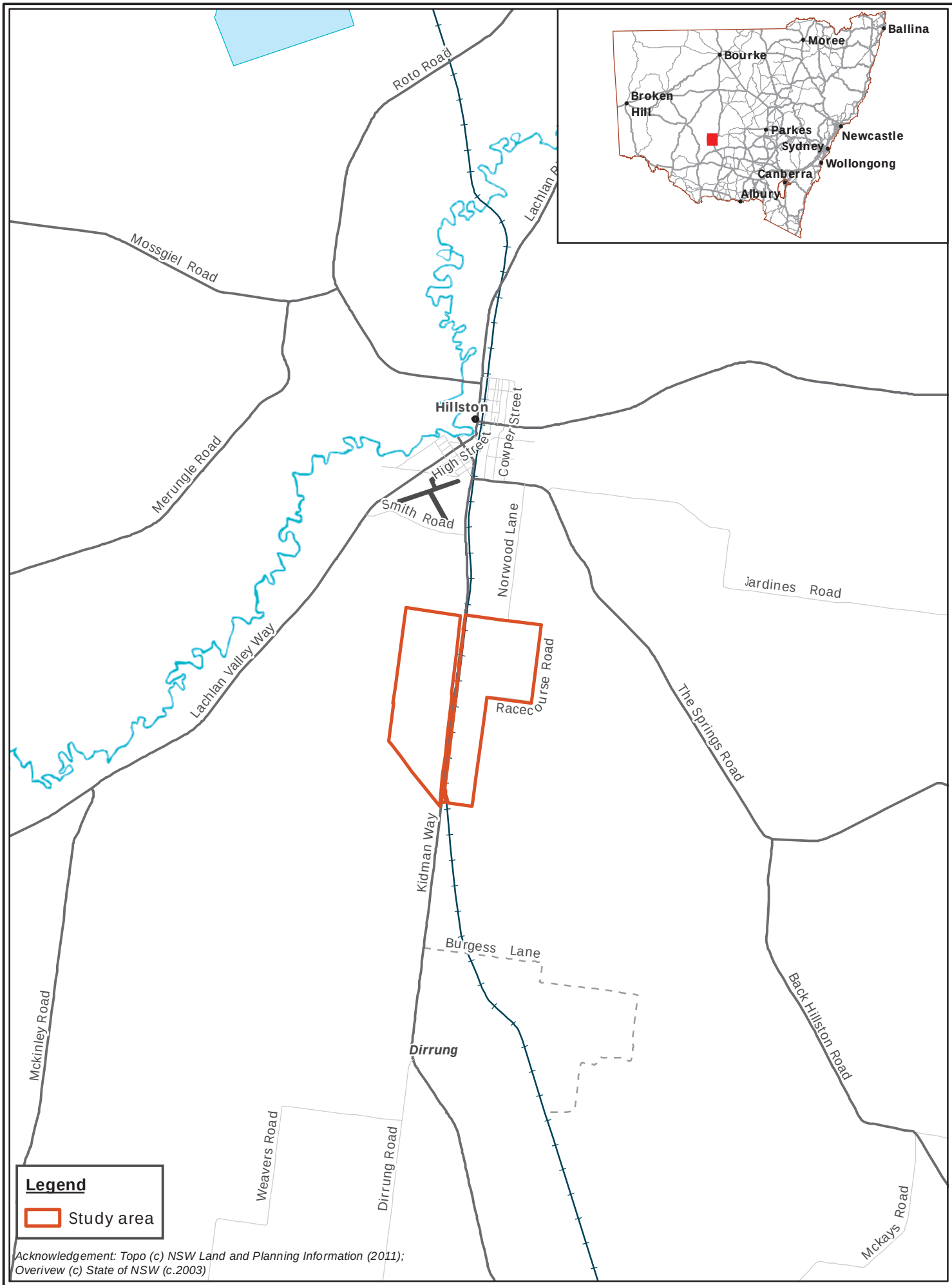
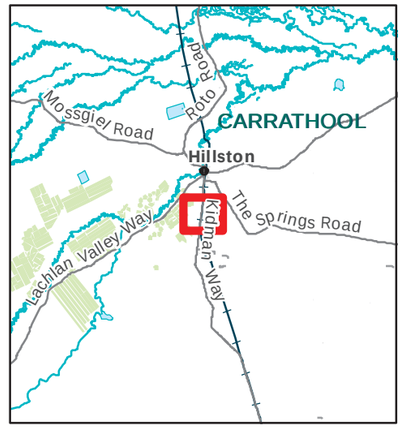


Figure 1: Location of the study area

Biosis Pty Ltd
Ballarat, Brisbane, Canberra, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 23501
Date: 19 December 2016,
Checked by: MS, Drawn by: LH, Last edited by: mlooby
Location:P:\23500s\23501\Mapping\



Legend

Study area

Figure 2: Overview of study area

0 160 320 480 640 800

Metres

Scale: 1:16,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

Biosis Pty Ltd

Ballarat, Brisbane, Canberra, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 23501
Date: 19 December 2016,
Checked by: MS, Drawn by: LH, Last edited by: mlooby
Location:P:\23500s\23501\Mapping
23501_F2_StudyArea

Acknowledgements: Basemap © Land and Property Information 2016

Appendix 4 Stage 3: Gathering information about cultural significance

Rebecca Morris

From: Rebecca Morris
Sent: Monday, 16 January 2017 2:23 PM
To: 'grifflalc@bigpond.com'
Subject: Hillston Sun Farm Survey
Attachments: 23501.GriffithLALC.Hillston.Project.Information.FIN01.20161219.pdf; 23501.GriffithLALC.Hillston.Methodology.20161219.pdf

Hi Robert,

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Kind regards,

Rebecca Morris
Research Assistant - Heritage
Mobile: 0427 458 051
Direct: (02) 9101 8716
Email: rmorris@biosis.com.au

Leaders in Ecology and Heritage Consulting
Unit 14 17-27 Power Avenue Alexandria NSW 2015
ph: (02) 9101 8700 fax: (03) 9646 9242
biosis.com.au

19 December 2016

Robert Carrol

Griffith Local Aboriginal Land Council

PO Box 1424

East Griffith, NSW 2680

Dear Robert,

RE: Project Methodology Aboriginal Cultural Heritage Assessment: Hillston Solar Farm.

Our Ref: Matter 23501

Thank you for your registration of interest in this project. Attached is information about the proposed project and the Aboriginal Cultural Heritage Assessment (ACHA) methodology. This document also includes the methodology for collecting information regarding cultural significance.

In accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a), we are providing the proposed methodology for a survey of the study area for your review and feedback.

It would be appreciated if you would provide feedback on the methodology presented in this letter to Biosis Pty Ltd by **5 pm 16 January 2016** either by email, phone or return mail.

Please address feedback on the methodology to:

Amanda Atkinson
Biosis Pty Ltd
8 Tate Street
Wollongong NSW 2500
aatkinson@biosis.com.au

Please do not hesitate to contact me if you require additional information or have any queries about the methodology or information provided.

Kind regards,

Biosis Pty Ltd
Wollongong Resource Group

8 Tate Street
Wollongong NSW 2500

Phone: 02 4229 5222
Fax: 03 9646 9242

ACN 006 175 097
ABN 65 006 175 097

Email: wollongong@biosis.com.au

biosis.com.au

19 December 2016

Robert Carrol

Griffith Local Aboriginal Land Council

PO Box 1424

East Griffith, NSW 2680

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Our Ref: Matter 23501

Thank you for your registration of interest in this project. Attached is information about the proposed project and the Aboriginal Cultural Heritage Assessment (ACHA) methodology. This document also includes the methodology for collecting information regarding cultural significance.

In accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a), we are providing the proposed methodology for a survey of the study area for your review and feedback.

It would be appreciated if you would provide feedback on the methodology presented in this letter to Biosis Pty Ltd by **5 pm 12 January 2016** either by email, phone or return mail.

Please address feedback on the methodology to:

Amanda Atkinson
Biosis Pty Ltd
8 Tate Street
Wollongong NSW 2500
aatkinson@biosis.com.au

Please do not hesitate to contact me if you require additional information or have any queries about the methodology or information provided.

Kind regards,

Biosis Pty Ltd
Wollongong Resource Group

8 Tate Street
Wollongong NSW 2500

Phone: 02 4229 5222
Fax: 03 9646 9242

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ABN 65 006 175 097

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Amanda Atkinson
Senior Archaeologist
Heritage research assistant

Project Methodology Aboriginal Cultural Heritage Assessment: Hillston Solar Farm.

The following information has been provided by Biosis on behalf of Overland Sun Farming Company and is in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010b). The aim of this document is to provide registered Aboriginal parties with the proposed methodology for the cultural heritage and archaeological assessment.

Biosis Pty Ltd recently completed a desktop due diligence assessment for Aboriginal archaeological heritage for the proposed works. This assessment did not include a site survey and so was not in compliance with the requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010a). The desktop assessment identified a high potential for unrecorded Aboriginal heritage sites to be present in the study area and recommended further assessment.

Accordingly, an Aboriginal Cultural Heritage Assessment will be undertaken that will involve undertaking a site survey and possible test excavations (if required) for the project approvals process through an Environmental Impact Statement (EIS). The methodology is detailed below for both survey and test excavations.

Assessment Methodology

Aims of the Survey

The principle aims of the survey are to:

- Provide RAPs an opportunity to view the study area and to discuss previously identified Aboriginal object(s) and/or place(s) in or within close proximity to the study area.
- To undertake a systematic survey of the study area, while targeting areas with the potential for Aboriginal heritage.
- To inspect listed sites within the study area and to record their current condition.
- Identify and record Aboriginal archaeological sites visible on the ground surface.
- Identify and record areas of Potential Archaeological Deposits (PADs).

Survey Methodology

The survey methods are intended to assess and understand the landforms and to determine whether any archaeological material from Aboriginal occupation or land use exists within the study area. Identification of natural soil deposits within the study area will be undertaken if possible. Photographs and recording techniques will be incorporated into the survey including representative photographs of survey units, landforms, vegetation coverage, ground surface visibility and the recording of soil information for each survey unit. Any Aboriginal objects observed during the survey will be documented and photographed. Since this is purely a survey, no artefacts are to be removed from the site.

Recording during the survey will follow the guidelines of the OEH, in particular The Code (DECCW 2010a).

Specific information that will be recorded during the survey includes:

- Aboriginal objects or sites present in the study area
- Survey coverage

- Survey effectiveness
- Any resources that may have potentially have been exploited by Aboriginal people
- Landforms and general soil information
- Photographs of the site indicating landforms
- Evidence of disturbance
- Aboriginal artefacts, culturally modified trees, shell middens or any other Aboriginal sites.

Distinguishing landform elements and their association with Aboriginal cultural heritage will assist with the identification of site patterning, though with the awareness of the following limitations:

- The degree of ground surface visibility (GSV) and amount of exposed areas can significantly bias the discovery of surface artefacts.
- Cultural material exposed on the surface is not necessarily representative of the potential extent of the site (either horizontally or vertically).

Information about the presence of potentially exploitable resources helps contribute to predictions of the Aboriginal sites that may occur within the study area. Information about GSV, DV and areas of exposures help to provide a general indication of the effectiveness of the survey for identifying Aboriginal cultural heritage exposed to the surface. Observable disturbances are also considered when assessing the integrity of known or potential sites in an area. The location of Aboriginal cultural heritage and points marking the boundary of the landform elements will be recorded using a hand-held Global Positioning System and the Map Grid of Australia (94) coordinate system.

Test excavation methodology (if required)

Aims of the Sub-surface test excavations (if required)

If the survey identifies the need for test excavations the objectives of the subsurface test excavations will be to identify and understand the nature, extent and significance of any archaeological sites located within areas of archaeological potential.

The aims of the testing program will be to:

- Determine whether sub-surface archaeological deposits exist which may be impacted upon by the development
- If so, to determine the extent and nature of such deposits
- Identify if the archaeological material occurs in an intact, undisturbed context, by examining the soil profile and stratigraphy
- Analyse and interpret any archaeological finds (such as stone artefacts, shell midden deposits, etc.) recovered during the testing program
- Inform current knowledge of Aboriginal occupation and land use models of the region
- Provide management and mitigation measures for Aboriginal archaeological objects located during the subsurface testing program.

Test excavation sampling strategy (if required)

If required test excavations across the study area will conform to the following methodology:

- Test excavations will be undertaken in areas as identified having the potential to contain Aboriginal cultural material.
- Area will be systematically gridded at 20 metre intervals to provide test excavation units locations.
- Test excavation units will consist of 50 by 50 centimetre test pits, in order to determine the nature of sub-surface deposit and presence of any possible archaeological deposits.
- Test excavations units must be excavated using hand tools only including spades, handle shovels, and trowels.
- The first test excavation unit will be excavated and documented in 5 centimetres spits. Based on the evidence of the first excavation unit, 10 centimetres spits or sediment profile/stratigraphic excavation (whichever is smaller) will then be implemented.
- All material excavated from the test excavation units must be sieved using nested 5 millimetre aperture wire-mesh sieves.
- Test excavation units must be excavated to at least the base of the identified Aboriginal object-bearing units, and must continue to confirm the soils below are culturally sterile.
- All cultural material will be collected, bagged and clearly labelled. They will be temporarily stored in the Biosis office at 8 Tate Street, Wollongong for analysis.
- For each test pit that is excavated, the following documentation will be taken:
    - Unique test pit identification number
    - GPS coordinate of each test pit
    - Munsell soil colour, texture and pH
    - Amount and location of cultural material within the deposit
    - Nature of disturbance where present
    - Stratigraphy
    - Archaeological features (if present)
    - Photographic records
    - Spit records
- Test excavation units must be backfilled as soon as practicable due to safety issues.

Following test excavation, an Aboriginal Site Recording form must be completed and submitted to the AHIMS Registrar as soon as practicable, for each AHIMS site that has been identified.

Standard protocol for the discovery of any human remains is to be followed in the event that human remains are discovered.

Aboriginal Cultural Heritage Assessment Report

Biosis Pty Ltd will prepare an Archaeological Cultural Heritage Assessment Report (ACHAR) for the proposed development. The main aim of the report is to document the assessment of potential development related impacts to Aboriginal cultural heritage and to formulate strategies to manage these impacts. Reporting will follow the guidelines of the OEH, in particular the *Code of Practice for the Protection of Aboriginal Objects in New South Wales (2010a)* and the Consultation Guidelines 2010.

The report will contain:

- Aboriginal Consultation Process
- Environmental Context
- Aboriginal Archaeological Context
- Survey Results
- Aboriginal Site Significance Assessment
- Impact Assessment
- Management Strategies
- Maps.

The RAPs will be provided with the draft archaeological and cultural heritage report and their comments on report content sought.

Comments on the report's content are to be provided to Biosis by the party's respective nominated spokesperson(s). All comments not provided in writing will be recorded in an informal logbook by Biosis.

These comments and responses to these comments will be documented in the final ACHAR. Overland and Biosis will consider and respond to all comments and will also explain how suggestions concerning management strategies were considered and/or implemented in the finalisation of the EIS (DECCW 2010a, p. 6).

References

Department of Environment, Climate Change and Water. 2010a. *Code of practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010*. NSW Department of Environment, Climate Change and Water, Sydney NSW.

Department of Environment, Climate Change and Water. 2010b. *Aboriginal cultural heritage consultation requirements for proponents 2010*. NSW Department of Environment, Climate Change and Water, Sydney NSW.

Appendix 5 Stage 4: Review of draft cultural heritage assessment report

Appendix 6 Archaeological report

Hillston sun farming project, NSW

Archaeological report

DRAFT REPORT

Prepared for Overland Sun Farming Pty Ltd

24 May 2017

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Document information

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Prepared by:	Amanda Atkinson Rebecca Morris
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LGA:	Carrathool Shire Council

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Version	Internal reviewer	Date issued	Issued by
Draft 01	Asher Ford	22/04/2017	Amanda Atkinson
Draft 02	Asher Ford	24/05/2017	Rebecca Morris
Final 01	To be confirmed	TBC	To be confirmed

Acknowledgements

Biosis gratefully acknowledges the contributions of the following people and organisations (listed alphabetically) in preparing this report:

Registered Aboriginal Parties

- Griffith Local Aboriginal Land Council

Government Departments

- Office of Environment and Heritage
- National Native Title Tribunal

Overland Sun Farming Pty Ltd

- John Zammit

Biosis

- Sonika Kumar (mapping)
- Lauren Harley (mapping)

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Glossary

ACHAR	Aboriginal Cultural Heritage Assessment Report
AHIMS	Aboriginal Heritage Information Management System
Consultation requirements	*Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a)
DA	Determining Authority
DECCW	Department of Environment, Climate Change and Water (now OEH)
DP	Deposited Plan
EPA	Environment Planning and Assessment
GPS	Global Positioning System
GSV	Ground Surface Visibility
ICOMOS	International Council on Monuments and Sites
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
MGA	Map Grid of Australia
NHL	National Heritage List
NPW Act	*National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
NSW	New South Wales
NTSCORP	Native Title Services Corporation
OEH	NSW Office of Environment and Heritage
PAD	Potential Archaeological Deposit
Study area	Located on Kidman Way, approximately 4 km south of Hillston and surrounded by large farming properties
RAP	Registered Aboriginal Party
REF	Review of Environmental Factors
REP	Regional Environmental Plan
SEPP	State Environmental Planning Policy
The code	*Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010)

Summary

Biosis Pty Ltd was commissioned by Overland Sun Farming Pty Ltd to undertake an Aboriginal Cultural Heritage Assessment (ACHA) of the proposed Hillston Sun Farm, a large-scale solar photovoltaic (PV) generation facility and associated infrastructure (Figure 3), located on Kidman Way approximately 3.5 kilometres south from Hillston. This archaeological report forms part of that assessment and is

There are 120 Aboriginal cultural heritage sites registered with the Aboriginal Heritage Information Management System (AHIMS) register within a 10 square kilometre radius of the study area; however, none of these site occur within the study area.

The Department of Planning and Environment is the consent authority and will assess the Environmental Impact Statement (EIS) to determine if the project is likely to have a significant effect on the environment, including Aboriginal cultural heritage.

The Aboriginal community was consulted regarding the heritage management of the project throughout its lifespan. Consultation has been undertaken as per the process outlined in the DECCW document, *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a) (consultation requirements).

The survey was conducted on 29 January 2017. The overall effectiveness of the survey for examining the ground for Aboriginal sites was deemed low. This was attributed to vegetation cover and recent wheat harvesting restricting ground surface visibility combined with a low amount of exposure in the study area.

Five previously unrecorded Aboriginal cultural heritage sites were identified during the field survey, consisting of three scarred trees, one isolated quartz manuport and an artefact scatter. All of these sites are located outside of the development footprint and will not be impacted by the proposed development.

Strategies have been developed based on the archaeological (significance) of cultural heritage relevant to the study area. The strategies also take into consideration:

- Predicted impacts to Aboriginal cultural heritage
- The planning approvals framework
- Current best conservation practice, widely considered to include:
- Ethos of the Australia International Council on Monuments and Sites (ICOMOS) Burra Charter
- The *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*(DECCW 2010) (the code)

The recommendations that resulted from the consultation process are provided below.

Management recommendations

Prior to any development impacts occurring within the project area, the following is recommended:

Recommendation 1: Continued consultation with the registered Aboriginal parties

It is recommended that Overland Sun Farming continue to inform the RAPs about the management of Aboriginal cultural heritage sites within the site boundary throughout the construction of the project. This recommendation is in keeping with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a).

Recommendation 2: Sites Hillston 1, 2, 3, 4, and 5 are to be avoided from impact.

The development footprint avoids impact to sites Hillston 1, 2, 3, 4, and 5 so no further investigation is required.

Recommendation 3: Discovery of unanticipated Aboriginal objects

All Aboriginal objects and places are protected under the *National Parks and Wildlife Act 1974*. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage (OEH). Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders to inform options for management of the objects.

Recommendation 4: Discovery of unanticipated historical relics

Relics are historical archaeological resources of local or State significance and are protected in NSW under the *Heritage Act 1977*. Relics cannot be disturbed except with a permit or exception/exemption notification. Should unanticipated relics be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic.

Recommendation 5: Discovery of Aboriginal ancestral remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains
2. Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location
3. Not recommence work at that location unless authorised in writing by OEH.

Recommendation 6: Stop work provision for any potential discovery of human remains

If any suspected human remains are discovered during any activity works, all activity must cease immediately. The remains must be left in place and protected from harm or damage. The following contingency plan describes the immediate actions that must be taken in instances where human remains or suspected human remains are discovered. Any such discovery at the activity area must follow these steps:

1. Discovery: If suspected human remains are discovered all activity must stop to ensure minimal damage is caused to the remains; and the remains must be left in place, and protected from harm or damage.
2. Notification: Once suspected human skeletal remains have been found, the Coroner's Office and the NSW Police must be notified immediately. Following this, and if the human remains are likely to be Aboriginal in origin, the find will be reported to the Aboriginal parties and DECCW NSW. If the find is likely to be non-Aboriginal in origin and more than 100 years in age, the Heritage Council of NSW will be notified of the find under s.146 of the *Heritage Act 1977*.

1 Introduction

1.1 Project background

Biosis Pty Ltd was commissioned by Overland Sun Farming Pty Ltd to undertake an Aboriginal Cultural Heritage Assessment of a proposed solar energy site at Hillston, NSW (Figure 1). The assessment included a field survey and review of background resources including soil landscapes, geology, hydrology and past reports and site records to inform predictive statements about the likelihood of Aboriginal heritages sites to occur within the study area.

An environmental impact statement (EIS) is a requirement of the approval process. This report details the investigation, consultation and assessment of Aboriginal cultural heritage undertaken for the project and forms part of the EIS.

1.2 Location of the study area

The study area is located within the Carrathool Local Government Area (LGA), Parish of Redbank, County of Nicholson (see Figure 1). The study area incorporates Lots 22, 43, 61, 76, 77, 85, 100 and 101 DP755189. This includes 713 hectares of private land and adjacent road reserves, including 16.7 hectares of road reserve adjacent to the sub-station, located on Kidman Way approximately 3.5 kilometres south from Hillston (Figure 2). The development site encompasses an area of approximately 296 kilometres and is located on the western side of the Kidman Way. The Hillston substation is located adjacent to the north-eastern boundary of the development site.

1.3 Planning approvals

The project is a State significant development (SSD) under the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP). A development application for the project is required to be submitted under Part 4, Division 4.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The NSW Minister for Planning, or the Minister's delegate, is the consent authority.

Other relevant legislation and planning instruments that will inform the assessment include:

- *National Parks and Wildlife Act* (NPW Act) *1974* (NSW)
- *National Parks and Wildlife Amendment Act 2010* (NSW)
- Carrathool Local Environmental Plan 2012.

1.4 Objectives of the investigation

The objectives of the investigation can be summarised as follows:

- To identify and consult with any registered Aboriginal stakeholders and the Griffith Local Aboriginal Land Council.
- To conduct additional background research in order to recognise any identifiable trends in site distribution and location.

- To search statutory and non-statutory registers and planning instruments to identify listed Aboriginal cultural heritage sites within the project area.
- To highlight environmental information considered relevant to past Aboriginal occupation of the locality and associated land use and the identification and integrity/preservation of Aboriginal sites.
- To summarise past Aboriginal occupation in the locality of the project area using ethnohistory and the archaeological record.
- To formulate a model to broadly predict the type and character of Aboriginal sites likely to exist throughout the project area, their location, frequency and integrity.
- To conduct a field survey of the project area to locate unrecorded or previously recorded Aboriginal sites and to further assess the archaeological potential of the project area
- To assess the significance of any known Aboriginal sites in consultation with the Aboriginal community.
- To identify the impacts of the proposed development on any known or potential Aboriginal sites within the project area.
- To recommend strategies for the management of Aboriginal cultural heritage within the context of the proposed development.

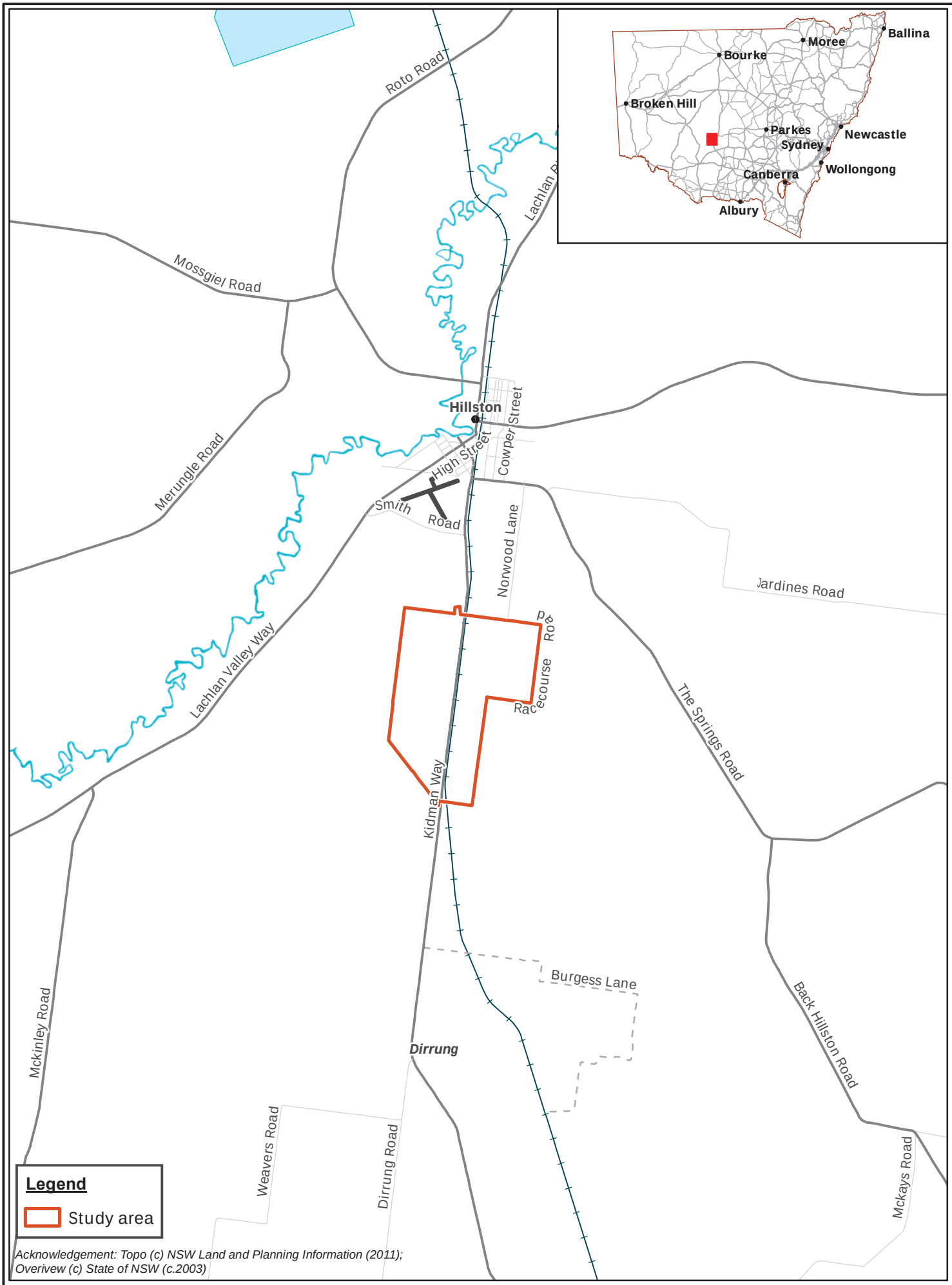
1.5 Investigators and contributors

The roles, previous experience and qualifications of the Biosis project team involved in the preparation of this archaeological report are described below in Table 1.

Table 1

Name and qualifications	Experience summary	Project role
Amanda Atkinson BA (Hons)	Amanda has nine years archaeological consulting experience across south-eastern and western Australia. She is experienced in all aspects of heritage consulting with specialisation in Aboriginal archaeology. Amanda has extensive experience in the successful completion of Aboriginal and historical assessments, archaeological surveys, excavations, permits and management plans. She is accomplished in obtaining approvals under the NSW *National Parks and Wildlife Act 1974* and *NSW Heritage Act 1977*. Amanda has primarily undertaken projects in south-eastern Australia and the Pilbara region of Western Australia and has a detailed understanding of heritage values within the Sydney Basin, Cumberland Plain and Hunter Valley. Amanda specialises in the archaeology of central and far western New South Wales, with particular research interests in the Lachlan River valley.	• Lead cultural heritage advisor • Aboriginal community consultation • Field survey • Development of recommendations • Preparation of the report.

Name and qualifications	Experience summary	Project role
Rebecca Morris BA (Hons)	Rebecca recently graduated from the University of Sydney with First Class Honours in Archaeology and has experience with desktop assessments, archaeological field surveys, aboriginal and historical excavations, and the recording and analysis of cultural material. She also has skills in lithic analysis and project, administrative and client liaison experience. Most recently she has been involved in field survey, salvage and test excavation and archaeological report writing for Western Sydney, the NSW North Coast and the Southern Tablelands.	• Field survey • Preparation of the report



Acknowledgement: Topo (c) NSW Land and Planning Information (2011); Overivew (c) State of NSW (c.2003)

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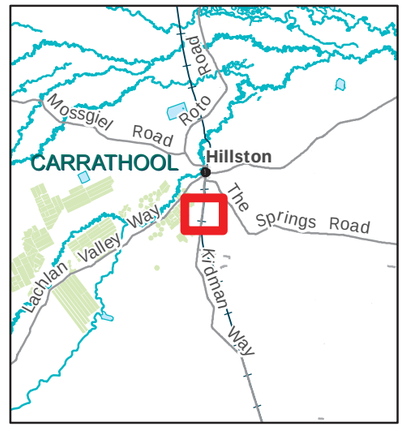
Ballarat, Brisbane, Canberra, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Figure 1: Location of the study area

Matter: 23501
Date: 01 May 2017,
Checked by: MS, Drawn by: LH, Last edited by: lharley
Location:P:\23500s\23501\Mapping\

0 1 2 3 4
Kilometers

Scale 1:100,000 @ A4, GDA 1994 MGA Zone 55



Legend

Study area

Figure 2: Overview of the study area

0 160 320 480 640 800

Metres

Scale: 1:16,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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Date: 25 May 2017,
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Location:\\bio-data-01\matters$\23500s\23501\Mapping\23501_AR_F2_StudyArea_20170523

Acknowledgements: Basemap © Land and Property Information 2016; Imagery © Overland Sun Farming, LPI 2012

2 Proposed development

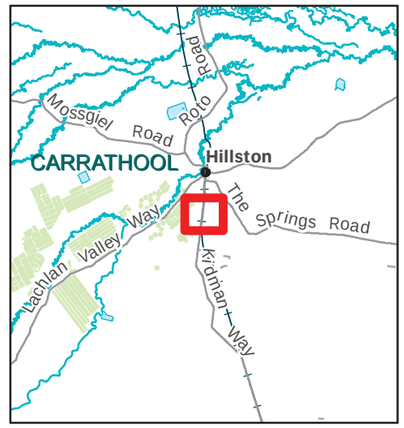
The project includes the development, construction and operation of a solar PV electricity generation facility, which comprises the installation of PV solar panels and associated infrastructure on the site.

The electricity and associated environmental products generated from the project will be sold to one or more of a registered energy retailing organisation, large energy users (governmental or private) or to the National Electricity Market that is managed by the Australian Energy Market Operator.

The project will have an estimated capacity in the order of 85 MW and comprises the following key components:

- a network of PV solar panel arrays
- electrical collection systems, switchyard and control room
- a management hub, including demountable offices and amenities and equipment sheds
- parking and internal access roads
- easement and connection infrastructure

The development footprint is defined as the land area within the site where project infrastructure will be constructed and operate for the project life. The development footprint encompasses an area of 296 ha, which has been refined through the project design process to avoid environmental constraints (primarily remnant vegetation and Aboriginal heritage) (Figure 3).



Legend

- Study area
- Development site

Figure 3: Proposed development

0 160 320 480 640 800

Metres

Scale: 1:16,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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Acknowledgements: Basemap © Land and Property Information 2016; Imagery © Overland Sun Farming, LPI 2012

3 Desktop assessment

A desktop assessment has been undertaken to review existing archaeological studies for the study area and surrounding region. This information has been synthesised to develop an Aboriginal site prediction model for the study area and identify known Aboriginal sites and/or places recorded in the study area. This desktop assessment has been prepared in accordance with requirements 1 to 4 of the Code.

3.1 Landscape context

It is important to consider the local environment of the study area in any heritage assessment. The local environmental characteristics can influence human occupation and associated land use and consequently the distribution and character of cultural material. Environmental characteristics and geomorphological processes can affect the preservation of cultural heritage materials to varying degrees or even destroy them completely. Lastly, landscape features can contribute to the cultural significance that places can have for people.

3.2 Geology, soils and landforms

The study area is located in central-west NSW, overlying unconsolidated mud, silt, sand and gravel deposits that are dominantly found in western NSW and may be associated with old river systems and paleo channels. The broader landscape of the Murray Darling Basin formed over 60 million years when the area was covered by an inland sea. At this time marine sands were deposited, these sands are present in the current landscape. Subsequent draining of the sea led to periods of inundation by a giant fresh water lake and periods of deposition of clays and carbonates. The present landscape surface therefore represents the final phase of deposition, the youngest of which is approximately 36,000 years old (Porteners 1993).

The study area is located within the Riverina bioregion. In NSW bioregions are characterised by broad areas which contain natural features and environments that influence the functions of entire ecosystems. The Riverina bioregion is located in south-west New South Wales, extending into central-north Victoria. In total the Riverina bioregion is approximately 9,576,964 hectares, with 74.03 per cent lying within New South Wales (Eardley 1999, NPWS 2003). The Riverina bioregion includes the towns of Hillston, Coleambally, Deniliquin, Leeton, Mossgiel, Hay, Booligal and Wentworth (NPWS 2003).

The Riverina bioregion is dominated by river channels, floodplains, backplains, swamps, lakes and lunettes that are all of Quaternary age. It covers the alluvial fans of the Lachlan River, Murrumbidgee River and the Murray River, west of the Great Dividing Range. The topography of the Riverina bioregion is very similar to the Darling Riverine Plains bioregion, with the landscape being comprised of a series of overlapping, low gradient alluvial fans on the eastern half of the Murray Basin. Each fan differs slightly because of differences in the discharge of the streams (NPWS 2003).

Soil landscapes have distinct morphological and topological characteristics that result in specific archaeological potential. Because they are defined by a combination of soils, topography, vegetation and weathering conditions, soil landscapes are essentially terrain units that provide a useful way to summarise archaeological potential and exposure.

The Lachlan Depression Plains (Ldp) soil landscapes covers the entire study area. The Ldp soil landscape encompasses Hillston and is characterised by alluvial plains consisting of grey and brown cracking and non-cracking clays contrasting with red and brown texture contrast sands (Table 2).

Table 2 Lachlan Depression Plains (Ldp) soil landscape characteristics (Mitchell 2002, pp. 101-105).

Soil Material	Description
Ldp – Riverina	Quaternary alluvial plains with numerous circular depressions interpreted as high floodplains or low terraces beyond the reach of average floodwaters. Sandy rises and levees trace ancestral streams and stand above the general plain, relief 1 to 3 m. Grey and brown cracking and non-cracking clays often with gilgai on the plains. Sands and red or brown texture contrast soils on the higher ground.

3.3 Flora and fauna

The area surrounding the study area supports natural and modified vegetation communities. The term modified is used to describe land where the original natural vegetation cover has been cleared and replaced with agricultural land uses. The state of vegetation in these modified areas varies considerably from recently cropped areas to remnant and regenerating native vegetation. Although areas of natural vegetation cover the study area, most plant communities have been disturbed or degraded as a result of altered water regimes, physical disturbance from earthworks, livestock and pest animal grazing and weed invasion.

3.4 Resource statement

Resources in the vicinity of the study area would have provided adequate sources of nutrition for subsistence activities; however these resources would be largely tied to seasonal variations and the flow of the Lachlan River. In this respect, activities on the Hillston floodplains would resemble that elsewhere in Western New South Wales, with the Lachlan finding parallels in the riverine environments surrounding the Murray and Darling River systems, and the semi-arid plain, with its ancestral lakes being similar to other semi-arid areas such as Willandra.

The activities of the Barkindji linguistic group in the Darling Basin, north-west of the current study area, have been well documented and would parallel the activities of the Wirajuri group at Hillston. Summer marked the period of highest productivity, with river flow being the strongest at this time. As a result of this, aquatic plants and animals were both abundant and nomadic avian species present to reproduce and feed. Cold conditions in winter coincided with lower flow of the river, leading to a marked decrease in available food resources, with fish and many crustaceans being either absent or in hibernation, and other sources, such as mussels, being present in decreased populations (Allen 1974 p. 311). Although the Murray Darling Basin is a winter-spring dominant system, in contrast to the Darling River which is summer dominant, a similar theory of seasonal use applies to the lower Murray Darling basin. This theory of seasonal use explains the high density of Aboriginal sites located away from the riverine and lacustrine environments in the semi-arid and arid plains.

Although Allen (1974, p. 311) observes that potential sources of food remain relatively stable throughout the year, these sources became more accessible during winter when the plains would become easier to traverse. During summer, high evaporation rates in these areas made water sources scarce, so sources which were generally more stable during winter allowed groups to traverse these arid regions in search of alternative food sources such as red kangaroo. As a result of this, Allen theorised that these groups would have stayed close to large water sources during summer, when sources of food were plentiful, and venturing into the surrounding arid and semi-arid areas in winter when these areas were more accessible, and the chances of obtaining food higher.

Accounts by Mitchell (1835) document the resources utilised by Wirajuri groups along the Bogan River to the north-east of Hilllston. He noted that the principal foods of the various groups included possum, Kangaroo

and Emu, as well as fish and fresh water mussels from ponds and water holes (Mitchell 1835). Fish were caught using moveable dams of long, dry twisted grass that were pushed from one end of a water hole to the other, while fresh water mussels were prised out of the waterhole mud using the toes (Mitchell 1835).

Descriptions are also available on resources available to groups around the Menindee Lakes to the north-west of Hillston as a part of Pardoe's (2003) study, which looked at how these resources and environments were used by groups in the area. Like the current study area and other examples described here, the Menindee Lakes area is characterised by a small number of permanent or semi-permanent water sources, which appear to supply a large portion of the landscape resources available to local groups, and arid or semi-arid plains surrounding these sources.

Pardoe (2003) noted ethnographic descriptions of Aboriginal resource use in the Menindee Lakes area, noting that different observers described drastically different situations there. Where Mitchell described large stretches of water, plentiful in waterfowl and fish (Mitchell 1839), Sturt in Pardoe (2003) described dried up lakes and local populations surviving almost entirely on roots (Sturt 1833). These descriptions give weight to the assertion made by both Pardoe and Allen that Aboriginal groups living in these types of environments would have employed both the riverine and arid/semi-arid environments.

A selection of resources noted in the background research has been compiled into Table 2 to give an indication of the resources available to local Aboriginal groups near Hillston. Notably, the majority of the food sources mentioned in Table 2 are located within or in close proximity to rivers and lakes. This has partially to do with the greater availability of resources in these environments, particularly in the summer months, but it is also tied to early ethnographic observations made by explorers and surveyors such as Oxley, Mitchell and Sturt.

These early explorers predominantly travelled close to the major rivers of the area, such as the Lachlan, Murrumbidgee, and Murray, and as a result of this, their observations mostly came as a result of interactions with Aboriginal groups in these environments. Aboriginal activity is not well documented away from water sources, creating a bias in the information available.

Table 3 Landscape resources available to local Aboriginal groups.

Plant / Animal	Aboriginal use
Bulrush / Cumbungi	Food source, fibres could be used to make twine (Mitchell 1835, Martin 2006, 2010)
Emus / emu eggs	Food source (Allen 1974), bones could be used for tools, the fat for medicine, and feathers as ornaments (Martin 2010)
Fish species	Food source, fat from these animals could also be used in medicine (Martin 2010)
Freshwater snail	Food source (Martin 2010)
Lignum	Food source – fresh shoots could be eaten raw (Martin 2010)
Nardoo	Food source – seeds roasted and turned into dough (Martin 2010)
Native willow	Food source, bark used for tannin, wood used for boomerang making (Martin 2010)
Possum	Food source, skin could also be used to make cloaks (Martin 2010)
Red / grey kangaroo	Food source, also used to make bags to hold seeds or water (Allen 1974), bone was used for bone points, and the teeth for fish hooks (Martin 2010)
River mussel/ Lake mussel	Food source (Martin 2010)
River red-gum	Wood used for boomerangs and other tools, bark used for shields, dishes, and potentially boomerangs. (Martin 2010)
Rush	Used to make nets for hunting (Martin 2010)
Saltbush	Leaves used for medicinal wash, seeds ground and cooked (Martin 2010)
Snakes	Food source (Martin 2010)
Termites, termite larvae, and termite eggs	Food source, termite nests could also be used for a heat retainer (Martin 2010)
Turtles	Food source, fat could also be used in medicine (Martin 2010)
Water ribbon	Food source – roots could be baked, and small fruits eaten (Martin 2006, 2010)
Waterfowl / other aquatic birds	Food source available in summer months in Riverine environments (Allen 1974)
Yabby	Food source (Martin 2010)

3.5 Land use history

The first European to visit the Hillston area was John Oxley in 1817 during his first expedition along the Lachlan River (Oxley, 1820). The area wasn't settled by Europeans until 1839 when William Hovel took up a pastoral run called "Bellingerambil," along the Lachlan River. The town of Hillston developed to serve these surrounding pastoral leases, and this was the primary industry of the area into the 1880s, crops appear to have been grown less frequently and required the development of artificial irrigation chanels (*Hillston News*, 1882).

The 1927 parish map shows the study area divided into a number of small lots owned by William Cashmere, E. V. H. Jones and the Australian Joint Stock Bank along Kidman Way and the railway line (Plate 1). The study area appears to have been given over to agricultural use since the early 20th century when it was divided into a number of smaller properties, it is likely the land was cleared for farming purposes by this time. Kidman Way was tarred in the 1970s, but had been functioning as a major thoroughfare for the region throughout the 20th century. Most recently, the study area has been subject to intensive use for large scale wheat farming, the purpose to which the land it currently given.

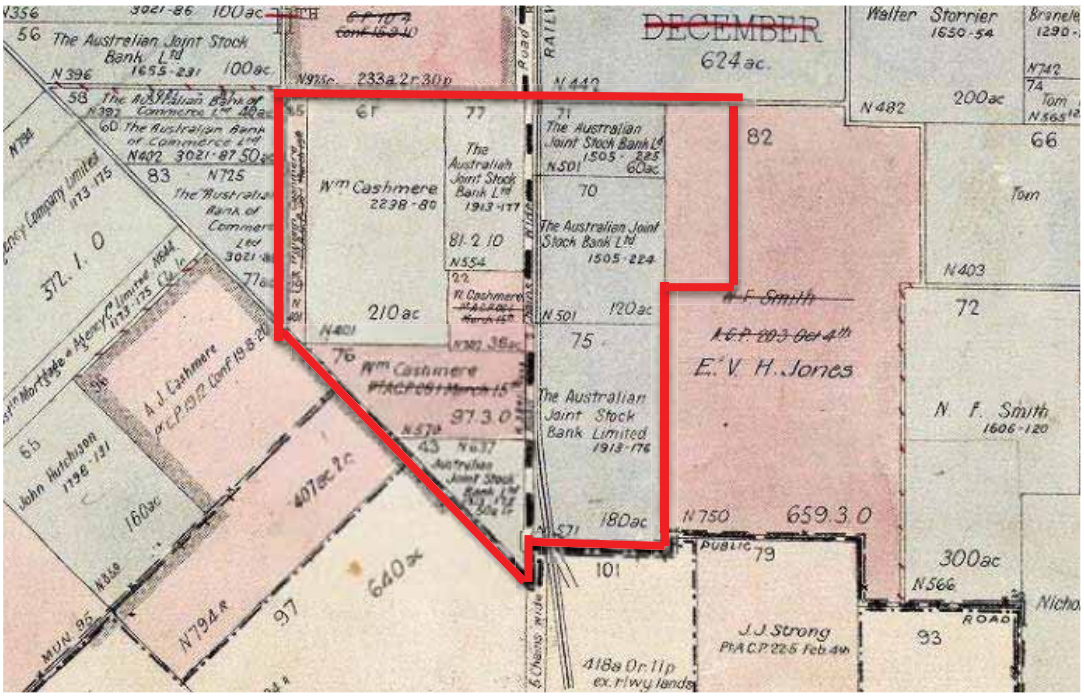
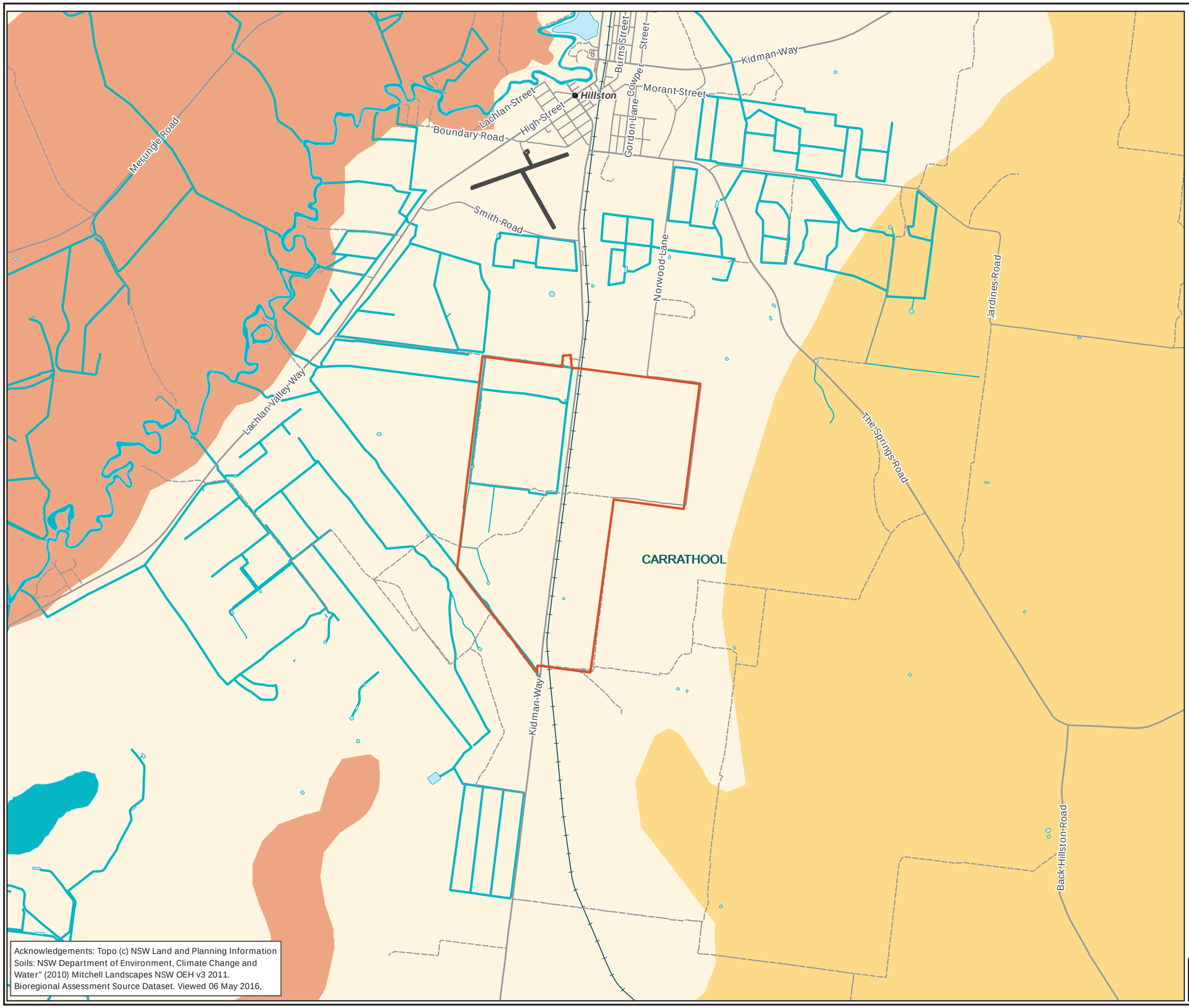


Plate 1 1927 parish map with approximate location of the study area in red (NSW LPI).



Legend

Study area

Soil landscape units (1:250,000)

- Hillston Sandplains
- Lachlan Channels and Floodplains
- Lachlan Depression Plains
- Canal-Drain
- NaturalWatercourse
- NonPerennial
- Perennial

Figure 4: Soil Landscapes

0 500 1,000 1,500 2,000 2,500

Metres

Scale: 1:45,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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Date: 01 May 2017,
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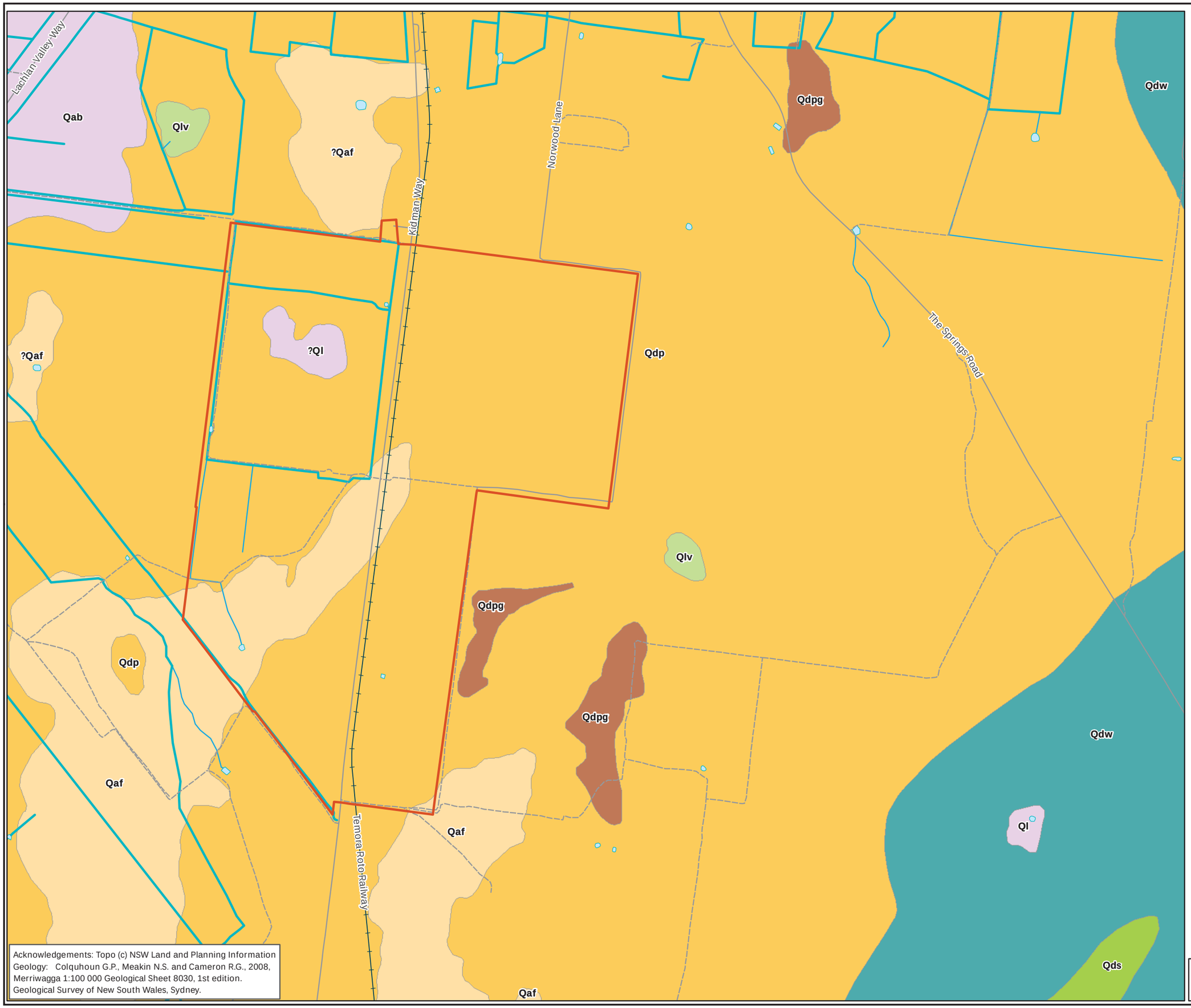

Acknowledgements: Topo (c) NSW Land and Planning Information
Geology: Colquhoun G.P., Meakin N.S. and Cameron R.G., 2008, Merriwagga 1:100 000 Geological Sheet 8030, 1st edition. Geological Survey of New South Wales, Sydney.

Legend

Study area

Hydro Line

- NonPerennial
- Perennial

Hydro Area

- Canal-Drain

Geological Units (1:100,000)

- "The Featureless Sand Plain"
- Woorinen Formation
- alluvial floodbasin & "swamps"
- alluvial floodplain, +/- incipient drain structure.
- dry lake bed vegetated with grasses and scrubs
- gilgaid sand plain
- source-bordering dunes
- undifferentiated lacustrine deposits

Figure 5: Geology/hydrology

0 240 480 720 960 1,200

Metres

Scale: 1:24,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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3.6 Previous archaeological work

A number of Aboriginal cultural heritage investigations have been conducted for the Lachlan River region and surrounding areas of the Riverine Plain region. Models for predicting the location and type of Aboriginal sites with a general applicability to the Riverine Plain region, and thus relevant to the study area, have also been formulated. Several of these have been completed as a part of these investigations and others from cultural heritage investigations for large developments.

Looking at a wider area around the Lachlan River, there are close links between it and other riverine environments within New South Wales, notably the Mungo, Willandra, and Menindee Lake systems, the Murrumbidgee River, and the Murray.

These links become clearer when discussing the work of Allen (1974) and his discussion of the Bagundji (Barkindji) people in the Darling Basin. The links between the riverine and arid/semi-arid environments have clear parallels within the study area, bordered to the north and south of the Lachlan and Murrumbidgee rivers respectively, with a broad semi-arid plain between them.

3.6.1 Regional overview

Biosis (2016) undertook an assessment of a proposed water pipeline between Maude and Hay in NSW. The study area assessed a 65 kilometre pipeline route and located 21 Aboriginal heritage sites which included artefact scatters, hearths, earth mound and midden sites as well as a post contact site. Archaeological test excavation was undertaken at four locations within the study area and the subsurface assessment revealed archaeological deposits dating to 49,200 BP.

Kelton (1998) undertook a survey of a proposed optic fibre cable between Hillston and "Willanthry" station in NSW. The study area assessed a 30 kilometre long cable route and recorded no Aboriginal sites along the immediate survey route, but did record three Aboriginal scarred tree sites within 15 metres of the proposed route.

Witter (2004) undertook a large scale assessment of Aboriginal sites in NSW, looking at regional variation on site types and distributions to develop a better understanding of how sites are preserved, and what natural processes impact on site preservation, with a particular focus on open camp sites. As a part of that study, Witter divided the state in to eight archaeological regions, based on the pre-existing Interim Biogeographic Regionalisation for Australia. The current study area falls under the Riverine Plain Region (Witter 2004, pg. 140).

The Riverine Plain Region is described as an area of alluvial plains cut by the Murray, Murrumbidgee, and Lachlan Rivers. It also contains a network of paleo channels and lake beds, containing deposits dating to the late Holocene and early Pleistocene. Witter (2004) noted that owing to a lack of raw material in the region, stone artefacts are relatively scarce and small, although the presence of hearths can assist in identifying camp sites. Mounds are also a noted feature of this region, particularly on the Hay Plain to the south-east of Hillston, where they reach a larger size than elsewhere, and tend to contain larger numbers of stone artefacts.

Witter (2004) notes that in the past 200 years, a large part of the region had been cultivated, which has led to the destruction of archaeological traces through the flattening of mounds and ploughing of the ground surface. Witter (2004) describes the mound settlements as the most extraordinary features in Australian archaeology, as they suggest the region to be a major population centre of Aboriginal Australia (Witter 2004, p. 142).

It is concluded that although the factors impacting on the preservation of open campsites in NSW vary, there are a number of main ones, including the erosion of soil profiles, hill slope erosion, gullying and rilling, blowouts, and clay pan expansion. He also notes that the introduction of domestic grazing animals has had a

large impact on the archaeological record, as they accelerate the natural factors mentioned above (Witter 2004, p. 146).

Klaver (1987, 1995, 1998) has completed a number of studies focusing on the central Murrumbidgee and surrounds between Narrandera and Hay, which are south-west of the study area and comparable to the landform of the Lachlan River at Hillston. Klaver's work includes large scale survey to identify Aboriginal sites, and the excavation and dating of mound sites. As with Martin (2006, 2010), a major focus of Klaver's work was earth mounds.

The excavations conducted by Klaver identified the mounds as the result of the *in situ* use of baked clay heat retainer ovens. Dates obtained from the Cooey Point Lagoon excavations, around 100 kilometres south of the study area, identify a range of dates between 400 to 2660 years BP. However, Klaver noted that the date of 2660 BP comes from the 'core' of the mound, and that the overlying material was dated to 2000 years later.

Pardoe (1995) attempted to develop a regional model relating biological and cultural change in south-eastern Australia, with a focus on societies in the Murray-Darling River system. The biological discussion undertaken is closely linked with recovered skeletal remains, discussing the gradual changes seen in these remains and their potential links to changes in environment and cultural change. Explanations included a predator-prey model, stating the predator (human) size evolves alongside prey (animal) size, and that with the decrease in prey size after megafaunal extinction, predator size decreased too. A biocultural model is also put forward, relating skull size to various factors including warfare, famine, and disease.

Pardoe (2003) undertook a study of the Menindee Lakes, around 150 – 200 kilometre north-west of the current study area. The study involved an intensive archaeological survey aimed at identifying sites in areas which had been neglected by previous surveys. Pardoe used spatial analysis to identify areas of higher potential, focusing on environmental factors. The study area covered for that project was largely constricted to lake margins, river edges, floodplains, feeder creeks, and lakebeds, generally not extending more than 900 metres away from water sources.

As that study was centred on the Menindee Lakes, a part of it utilised spatial data to determine site distance from water source. It observed that almost all sites were found within 1,500 metres of water, with the average distance being 368 metres from water. The study reported 90 per cent of sites were found within 500 metres of water, and 11 per cent at water's edge. The predominant site types identified by Pardoe were oven (55%), and artefact (15%) sites, although there were a large number of site types identified throughout the course of the survey, with a total of 4,978 sites identified in 2,432 areas.

Fanning and Holdaway (2004) undertook a broad study of factors affecting surface artefact visibility in Western New South Wales. Their area of study took in a portion of 12 Mile Creek in the Sturt National Park, close to the border between NSW, Queensland, and South Australia. Although geographically quite far from the current study area, the site does share a number of environmental characteristics with the current study area, being located in a semi-arid zone with discontinuous vegetation coverage.

The survey covered a variety of geographic units and surface types, seeking to compare exposures and artefact quantities present in each. The study did not find firm evidence to support increased or decreased artefact density in particular areas beyond general trends, for example, that there would be decreased visibility on sand and vegetation covered surfaces. It did note however that narrow survey transect were not ideal, as in many cases artefact visibility is highly dependent on very localised conditions, for example disturbance or visibility in one particular area. It concluded that generally speaking, artefact visibility was highest on erosional surfaces, and lowest on depositional ones, however the impacts of local variation in landscape are significant, and if a survey seeks to study relationships at a landscape level, this variation must be accounted for.

Fanning (1999) conducted a study of recent changes in the arid zone of Western NSW, looking at regional change in the nineteenth and twentieth centuries. Fanning argues that since European settlement of Australia, soil erosion rates have drastically increased, to around 145 times their 'natural' rate (Fanning 1999, p. 191). Fanning concludes that the introduction of domestic grazing animals, along with changes in land use and their associated effects (decreased vegetation cover, tree cutting etc.) has enhanced runoff in the arid zone. This has in turn increased the level of erosiveness this water flow has had on soils.

Atkinson (2011) conducted a site survey and test excavations between Lake Cargelligo and Hillston for the Merri Abba to Lake Cargelligo Emergency bore water pipeline for Lachlan Shire Council. The survey identified five artefact scatters, a scarred tree and an area of PAD. The subsurface excavation recovered a total of 3,882 artefacts.

3.6.2 Local overview

3.6.3 Identified Aboriginal Archaeological Sites – Study area

An extensive search of the AHIMS database was conducted on 26 July 2016 (Client service ID: 235837). The search identified 120 Aboriginal archaeological sites within a 10 x 10 kilometre search area, centred on the township of Hillston and encompassing the study area (Table 4 and Table 5). None of these registered sites are located *within* the study area (Figure). The mapping coordinates recorded for these sites were checked for consistency with their descriptions and location on maps from Aboriginal heritage reports where available. These descriptions and maps were not relied on where notable discrepancies occurred. The full AHIMS extensive search is contained in Appendix 1.

It should be noted that the AHIMS database reflects Aboriginal sites that have been officially recorded and included on the list. Large areas of NSW have not been subject to systematic, archaeological survey; hence AHIMS listings may reflect previous survey patterns and should not be considered a complete list of Aboriginal sites within a given area.

Table 4 AHIMS Search Results

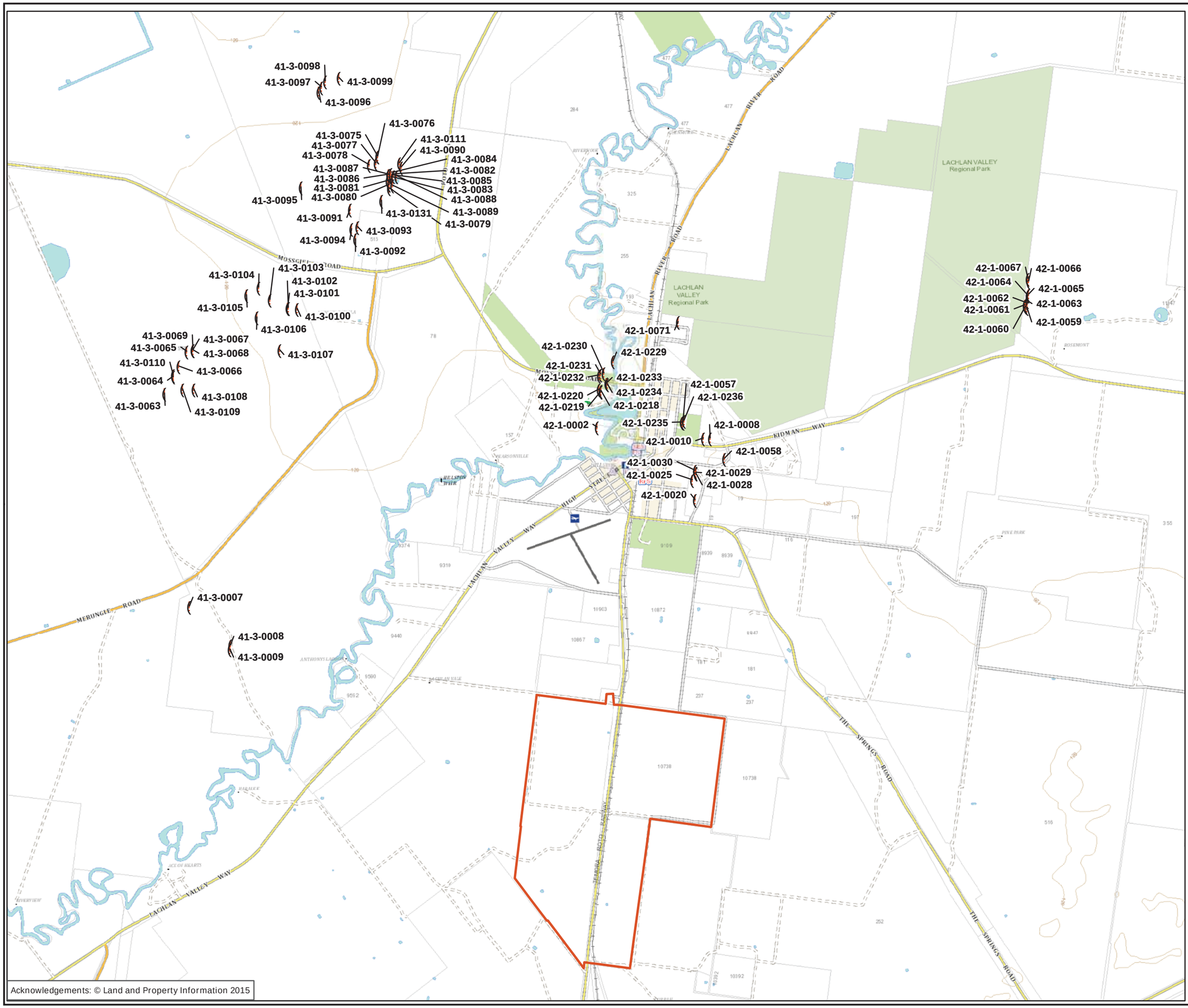
AHIMS Site No	Site Name	Site Type
41-3-0075	MR-ST1	Modified Tree (Carved or Scarred)
41-3-0076	MR-ST2	Modified Tree (Carved or Scarred)
41-3-0077	MR-ST3	Modified Tree (Carved or Scarred)
41-3-0078	MR-ST4	Modified Tree (Carved or Scarred)
41-3-0079	MR-ST6	Modified Tree (Carved or Scarred)
41-3-0080	MR-ST7	Modified Tree (Carved or Scarred)
41-3-0081	MR-ST8	Modified Tree (Carved or Scarred)
41-3-0082	MR-ST9	Modified Tree (Carved or Scarred)
41-3-0083	MR-ST10	Modified Tree (Carved or Scarred)
41-3-0084	MR-ST11	Modified Tree (Carved or Scarred)
41-3-0085	MR-ST12	Modified Tree (Carved or Scarred)
41-3-0086	MR-ST13a	Modified Tree (Carved or Scarred)
41-3-0087	MR-ST13b	Modified Tree (Carved or Scarred)

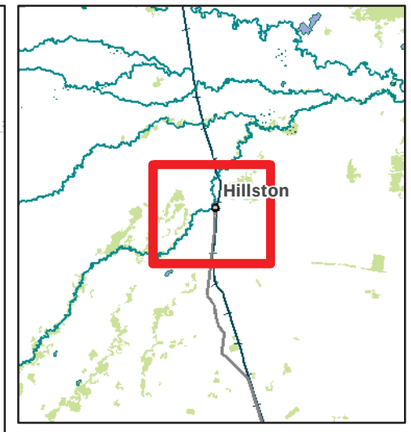
AHIMS Site No	Site Name	Site Type
41-3-0088	MR-ST14	Modified Tree (Carved or Scarred)
41-3-0089	MR-ST15	Modified Tree (Carved or Scarred)
41-3-0090	MR-ST16	Modified Tree (Carved or Scarred)
41-3-0091	MR-ST18	Modified Tree (Carved or Scarred)
41-3-0092	MR-ST19	Modified Tree (Carved or Scarred)
41-3-0093	MR-ST20	Modified Tree (Carved or Scarred)
41-3-0094	MR-ST21	Modified Tree (Carved or Scarred)
41-3-0095	MR-ST22	Modified Tree (Carved or Scarred)
41-3-0096	MR-ST23	Modified Tree (Carved or Scarred)
41-3-0097	MR-ST24	Modified Tree (Carved or Scarred)
41-3-0098	MR-ST25	Modified Tree (Carved or Scarred)
41-3-0099	MR-ST26	Modified Tree (Carved or Scarred)
41-3-0100	MF-ST1	Modified Tree (Carved or Scarred)
41-3-0101	MF-ST2	Modified Tree (Carved or Scarred)
41-3-0102	MF-ST3	Modified Tree (Carved or Scarred)
41-3-0103	MF-ST5	Modified Tree (Carved or Scarred)
42-1-0012	Restriction applied.	
42-1-0013	Restriction applied.	
42-1-0014	Restriction applied.	
42-1-0015	Restriction applied.	
42-1-0016	Restriction applied.	
42-1-0017	Restriction applied.	
42-1-0018	Restriction applied.	
42-1-0019	Restriction applied.	
42-1-0020	HN - ST 10	Modified Tree (Carved or Scarred)
42-1-0021	Restriction applied.	
42-1-0022	Restriction applied.	
42-1-0023	Restriction applied.	
42-1-0024	Restriction applied.	
42-1-0025	HN - ST15	Modified Tree (Carved or Scarred)
42-1-0026	Restriction applied.	
42-1-0027	Restriction applied.	
42-1-0028	HN - ST18	Modified Tree (Carved or Scarred)

AHIMS Site No	Site Name	Site Type
42-1-0029	HN - ST19	Modified Tree (Carved or Scarred)
42-1-0030	HN - ST20	Modified Tree (Carved or Scarred)
42-1-0031	Restriction applied.	
42-1-0032	Restriction applied.	
42-1-0033	Restriction applied.	
42-1-0034	Restriction applied.	
42-1-0035	Restriction applied.	
42-1-0036	Restriction applied.	
42-1-0037	Restriction applied.	
42-1-0038	Restriction applied.	
42-1-0039	Restriction applied.	
42-1-0040	Restriction applied.	
42-1-0041	Restriction applied.	
42-1-0042	Restriction applied.	
42-1-0043	Restriction applied.	
42-1-0044	Restriction applied.	
42-1-0045	Restriction applied.	
42-1-0046	Restriction applied.	
42-1-0047	Restriction applied.	
42-1-0048	Restriction applied.	
42-1-0049	Restriction applied.	
42-1-0050	Restriction applied.	
42-1-0051	Restriction applied.	
42-1-0052	Restriction applied.	
42-1-0053	Restriction applied.	
42-1-0054	Restriction applied.	
42-1-0055	Restriction applied.	
42-1-0056	Restriction applied.	
42-1-0057	Hillston/Cowper St.1	Modified Tree (Carved or Scarred)
41-3-0104	MF-ST6	Modified Tree (Carved or Scarred)
41-3-0105	MF-ST7	Modified Tree (Carved or Scarred)
41-3-0106	MF-ST8	Modified Tree (Carved or Scarred)
41-3-0107	MF-ST9	Modified Tree (Carved or Scarred)

AHIMS Site No	Site Name	Site Type
41-3-0108	MF-ST10	Modified Tree (Carved or Scarred)
41-3-0109	MF-ST11	Modified Tree (Carved or Scarred)
41-3-0110	MF-ST12	Modified Tree (Carved or Scarred)
42-1-0011	Restriction applied.	
41-3-0111	MR-ST 17	Modified Tree (Carved or Scarred)
42-1-0229	Hillston Bridge Scarred Tree Site 4	Modified Tree (Carved or Scarred)
42-1-0230	Hillston Bridge Scarred Tree Site 5	Modified Tree (Carved or Scarred)
42-1-0231	Hillston Bridge Scarred Tree Site 6	Modified Tree (Carved or Scarred)
42-1-0232	Hillston Bridge Scarred Tree Site 7	Modified Tree (Carved or Scarred)
42-1-0233	Hillston Bridge Scarred Tree Site 8	Modified Tree (Carved or Scarred)
42-1-0234	Hillston Bridge Scarred Tree Site 9	Modified Tree (Carved or Scarred)
42-1-0008	H-St=-01	Modified Tree (Carved or Scarred)
42-1-0010	H-ST-02	Modified Tree (Carved or Scarred)
41-3-0063	M-ST-40	Modified Tree (Carved or Scarred)
41-3-0064	M-ST-41	Modified Tree (Carved or Scarred)
41-3-0065	M-ST-42	Modified Tree (Carved or Scarred)
41-3-0066	M-ST-43	Modified Tree (Carved or Scarred)
41-3-0067	M-ST-44	Modified Tree (Carved or Scarred)
41-3-0068	M-ST-45	Modified Tree (Carved or Scarred)
41-3-0069	M-ST-46	Modified Tree (Carved or Scarred)
41-3-0007	Hillston Coolamon; Cowl Cowl;	Modified Tree (Carved or Scarred)
42-1-0219	HB-ST-1 (Hillston)	Modified Tree (Carved or Scarred)
42-1-0220	HB-ST-2 (Hillston)	Modified Tree (Carved or Scarred)
42-1-0218	HB-ST-3 (Hillston)	Modified Tree (Carved or Scarred)
41-3-0131	MR-ST 5	Artefact
41-3-0008	Chief Hunthawang; Bobbys Grave; Cowl Cowl;	Modified Tree (Carved or Scarred), Burial
41-3-0009	Hillston Canoe: TSR 3023;Cowl Cowl;	Modified Tree (Carved or Scarred)
42-1-0002	Multi-Scar Box Tree;T.S.R.2633;Hillston;	Modified Tree (Carved or Scarred)
42-1-0062	Rosemont ST-4	Modified Tree (Carved or Scarred)
42-1-0063	Rosemont ST-5	Modified Tree (Carved or Scarred)
42-1-0064	Rosemont ST-6	Modified Tree (Carved or Scarred)
42-1-0065	Rosemont ST-7	Modified Tree (Carved or Scarred)
42-1-0066	Rosemont ST-8	Modified Tree (Carved or Scarred)

AHIMS Site No	Site Name	Site Type
42-1-0067	Rosemont ST-9	Modified Tree (Carved or Scarred)
42-1-0058	Hillston Carved Tree	Modified Tree (Carved or Scarred)
42-1-0059	Rosemont ST-1	Modified Tree (Carved or Scarred)
42-1-0060	Rosemont ST-2	Modified Tree (Carved or Scarred)
42-1-0061	Rosemont ST-3	Modified Tree (Carved or Scarred)
42-1-0071	HSF- ST1	Modified Tree (Carved or Scarred)
42-1-0235	Hillston Central School 1	Modified Tree (Carved or Scarred)
42-1-0236	Hillston Central School Scar Tree 2	Modified Tree (Carved or Scarred)





Legend

Study area

AHIMS Records

Figure 6: AHIMS sites within vicinity of study area

0 520 1,040 1,560 2,080 2,600

Metres

Scale: 1:52,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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Date: 01 May 2017,
Checked by: lharley, Generated by: lharley
Location:P:\23500s\23501\Mapping
23501_AR_F6_AHIMS_20170418.mxd

4 Predictive model

A model has been formulated to broadly predict the type and character of Aboriginal cultural heritage sites likely to exist throughout the study area and where they are more likely to be located.

This model is based on:

- Local and regional site distribution in relation to landform features identified within the study area.
- Consideration of site type, raw material types and site densities likely to be present within the study area.
- Findings of the ethnohistorical research on the potential for material traces to present within the study area.
- Potential Aboriginal use of natural resources present or once present within the study area.
- Consideration of the temporal and spatial relationships of sites within the study area and surrounding region.

Based on this information, a predictive model has been developed, indicating the site types most likely to be encountered during any survey and subsequent sub-surface investigations across the present study area (Table 10).

4.1 Analysis of Aboriginal occupation

A search of the Aboriginal cultural heritage sites registered within 10 kilometres of the study area indicates that the dominant site type in the Hillston area is culturally modified trees representing 63.3% (n=76). There was also an artefact (n=1) and modified tree/burial (n=1), which represented 0.83% of total sites each. A number of restricted sites were also recorded within the search area totalling 35% (n=42) of sites.

The dominance of modified trees in the results may reflect the individual recording and registration of these site types on the AHIMS database, while other site types such as artefacts and hearths are grouped and recorded as single site complexes. There are a large number of restricted sites in the Hillston area and the exact nature of these sites have not been reproduced at the request of the Aboriginal community. None of these restricted sites are located within or in the immediate vicinity of the study area. Because their exact location or nature is unknown, restricted sites were not included in the predictive model analysis.

Table 5 AHIMS sites within the vicinity of the study area

Site type	Occurrences	Frequency (%)
Artefact	1	0.83
Modified tree (carved or scarred)	76	63.33
Modified tree; burial	1	0.83
Restricted	42	35.00
Total	**120**	**100**

4.1.1 Local soils

Three soil landscapes are present in the vicinity of the study area, two of which are represented in the AHIMS results. Most sites concentrate within the Lachlan Depression Plains, but a large number of sites are also located within the Lachlan Channels and Floodplains soil landscapes (Table 6). No sites are registered within the Hillston Sandplains.

Both Lachlan Channels and Floodplains and Lachlan Depression Plains contain two varieties of sites. Lachlan Channels and Floodplains contain predominately modified trees (n=27) and one burial site (Figure 6). This burial site is associated with a modified tree (AHIMS #41-3-008). The landscape is typified by sandplains, remanent lunettes and slightly higher terraces along the Lachlan River. The soil on lakes and plains consists of grey, red and brown cracking clays with prior streams and lunettes identifiable by loamy red texture-contrast soils and calcerous earths.

51 modified trees and one artefact site are registered within the Lachlan Depression Plains, which are floodplains or low terraces beyond the reach of average floodwaters. These sandy rises and levees run along ancestral streams and stand above the plain to a relief of 1 – 3 metres. The plains are usually identified by grey and brown cracking and non-cracking clays, often with gilgai, while sands and red or brown texture contrast soils mark higher ground. Modified trees are most likely to occur within this landscape and the only artefact site registered in the vicinity of the study area was also located within it.

Table 6 Soil landscapes in the vicinity of the study area

Soil landscape	Site type			
	Artefact	Burial	Modified Tree	Total
Hillston Sandplains	-	-	-	-
Lachlan Channels and Floodplains	-	1	27	28
Lachlan Depression Plains	1	-	51	52

Figure 6 Site types and number of recorded AHIMS sites located within soil landscapes in the local region

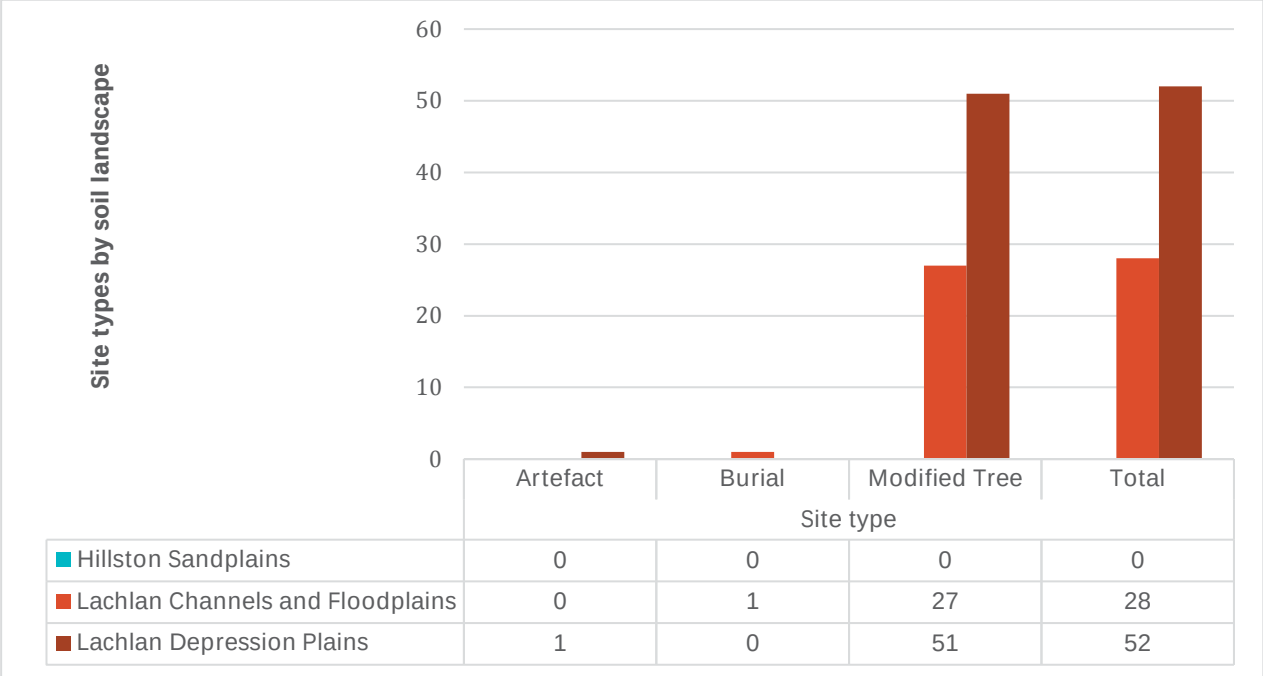


Table 7 shows the number of AHIMS sites identified in each soil landscape compared with the proportion of the search area covered by that landscape. No sites were identified in the Hillston Sandplains landscape, which covered approximately 0.5% of the search area. The frequency of sites within the Lachlan Depression Plains is notably high (65%) given it only makes up 39.16% of the area covered by the AHIMS search. Only 35% of sites were located within the Lachlan Channels and Floodplains landscape despite being the largest in the area, indicating it holds a slightly lower archaeological potential.

Table 7 Search area covered by soil landscapes

Soil Landscape	Area covered (ha)	Area covered (%)	Aboriginal Sites (n)	Frequency (%)
Hillston Sandplains	52.31	0.50	0	0.00
Lachlan Channels and Floodplains	6358.86	60.35	28	35.00
Lachlan Depression Plains	4125.80	39.16	52	65.00
Total	10536.99	100.00	80	100.00

The data provided suggests that based on the proportion of sites in the vicinity sites are likely to be found within the study area, which is entirely located within the Lachlan Depression Plains landscape. Within this soil landscape, the AHIMS results suggest that modified trees are the most likely site types to be identified. The sample size of registered artefact and burials sites is extremely low, making determining any predictive models on this basis alone unreliable.

4.1.2 Local hydrology

The hydrology of the Lachlan River and area surrounding Hillston has been heavily modified by irrigation infrastructure, and this has been taken into account when developing a predictive model for the region.

Where man-made irrigation channels have been labelled as such they have been removed from the model as potential water sources with which Aboriginal sites could be associated.

Within the vicinity of the study area, AHIMS results indicate the vast majority of sites are located in closest proximity to the permanent water source of the Lachlan River. Of the 80 results analysed, only 3 were located closer to an ephemeral water source, all of which were modified trees. A further analysis of this information illustrates the distribution of site types within the landscape seems to bear little relation to their general relationship to modern water sources. The landscape surrounding the study area has been heavily modified by the construction of irrigation channels diverting water from the Lachlan River and impacting on the current location of natural water courses.

Table 8 Summary of the site types and their associated distances to water sources

Site type	Nearest ephemeral water source			Nearest permanent water source		
	Minimum (m)	Maximum (m)	Average (m)	Minimum (m)	Maximum (m)	Average (m)
Artefact	-	-	-	2898.22	2898.22	2898.22
Burial	-	-	-	1183.14	1183.14	1183.14
Modified tree	1133.35	1989.69	1435.36	36.11	5533.43	1792.86

From the data shown all site types are located on average over 1000 metres from either permanent or ephemeral water courses (Table 8). Modified trees occur in closest proximity to water, with ten sites located within 500 metres of water. The highest frequency of sites cluster between 2500 - 3000 metres, and 3000 - 3500 metres, with 15 sites located within each bracket, in total accounting for 37.5% of the sites registered. Again, as only one example of artefact and burial sites were identified in the results, this site type may be underrepresented and the data biased (Table 9 and Figure 7).

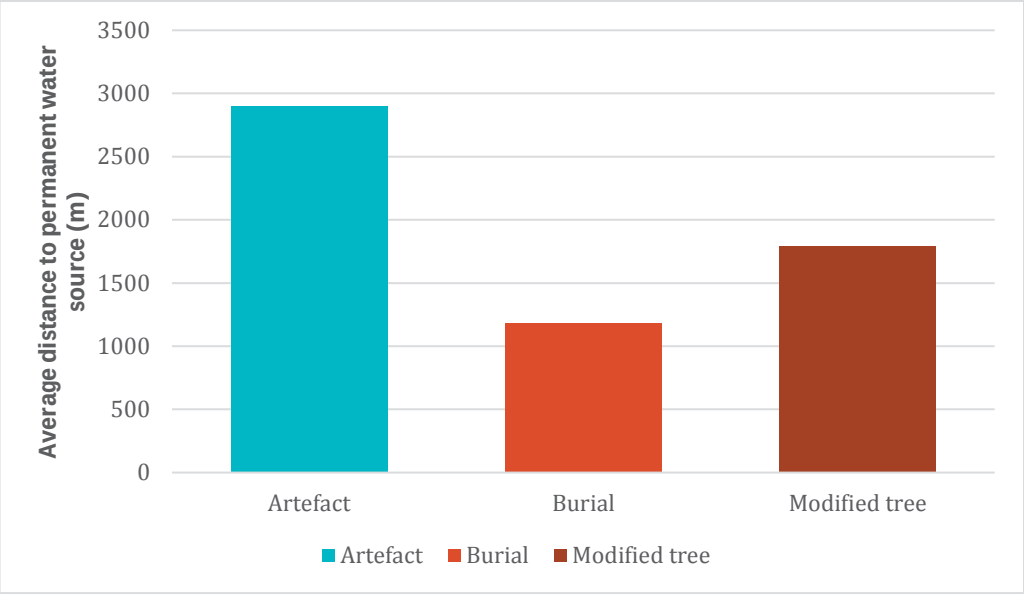
The number of sites generally decreases with distance from water, although it is notable that two modified trees are recorded over 5500 metres from the closest water source. As shown in Table 9, the frequency of sites and site types appears to bear little correlation with the distance of these sites from water. Site frequencies gradually decrease approaching 2000 metres from the closest water source, before increasing markedly from 2500 metres and steadily decreasing again from 4000 metres.

Table 9 Distribution of sites types in relation to water sources

Distance (m)	Site type			
	Artefact	Burial	Modified Tree	Total
0 - 500	-	-	10	10
500 - 1000	-	-	9	9
1000 - 1500	-	1	5	6
1500 - 2000	-	-	1	1
2000 - 2500	-	-	-	-
2500 - 3000	1	-	14	15
3000 - 3500	-	-	15	15

Distance (m)	Site type			
	Artefact	Burial	Modified Tree	Total
3500 - 4000	-	-	11	11
4000 - 4500	-	-	4	4
4500 - 5000	-	-	-	-
5000 - 5500	-	-	7	7
5500 - 6000	-	-	2	2

Figure 7 Recorded AHIMS site types by average distance to permanent water sources



These results show no clear trends regarding site types and their proximity to water. Modified trees do exhibit a slight tendency to be located closer to watercourses than other site types, but this likely reflects the survival of modified trees in areas where water remained available, rather than preferences in selection by Aboriginal groups. A possible explanation for the lack of trends lies in the hydrology of the area, which has been heavily modified by irrigation practices since the 19th century. The low relief of the area also leaves the courses of creek lines more susceptible to change. This suggests that the modern landscape and hydrology mapping does not accurately reflect the availability of water in the past and suitability of the land for sustaining Aboriginal groups.

4.2 Aboriginal site prediction statements

The definitions of potential are described in Table 10. The results of this model will be influenced by previous survey patterns and the limited search area, which does not necessarily provide a representative sample of all site types, landforms, stream orders, geological formations or soil landscapes.

Table 10 Aboriginal site prediction statements

Site type	Site description	Potential
Scarred Trees	Trees with cultural modifications	High: Scarred trees are the most common site type within the vicinity of the study area. Due to extensive vegetation clearance only a small number of mature native trees have survived however these do have potential to be cultural modified.
Earth Mounds	Deposits of baked clay, charcoal, shell and bone which indicate multiple occurrences of occupation. Often contain human remains.	High: Earth mounds are commonly found near the Murray and Murrumbidgee rivers. Earth mounds can be found near the river banks as well as in the hinterland near less permanent water sources.
Hearths	Deposits of baked clay, charcoal, shell and bone which indicate a single use event.	High: Hearths are commonly found near the Murray and Murrumbidgee rivers. Earth mounds can be found near the river banks as well as in the hinterland near less permanent water sources.
Shell Middens	Deposits of shells accumulated over either singular large resource gathering events or over longer periods of time.	Moderate: Shell midden sites have been recorded near to the study area and are common in the riverine and lacustrine environments.
Quarries	Raw stone material procurement sites.	Low: There is no record of any quarries being within or surrounding the study area.
Potential Archaeological Deposits (PADs)	Potential sub surface deposits of cultural material.	Moderate: PADs have been previously recorded in the region across a wide range of landforms. PADs are likely to be present within areas adjacent to water courses or on high points in undisturbed landforms.
Flaked Stone Artefact Scatters and Isolated Artefacts	Artefact scatter sites can range from high-density concentrations of flaked stone and ground stone artefacts to sparse, low-density 'background' scatters and isolated finds.	High: Stone artefact sites have been previously recorded in the region on level, well-drained topographies in close proximity to reliable sources of fresh water. Due to disturbance of the site, the potential for locating stone artefacts is high.
Grinding Grooves	Grooves created in stone platforms through ground stone tool manufacture.	Low: Suitable horizontal sandstone rock outcrops do not occur in the study area.

Site type	Site description	Potential
Burials	Aboriginal burial sites.	Moderate: Aboriginal burial sites are generally situated within deep, soft sediments, caves or hollow trees. Areas of deep sandy deposits will have the potential for Aboriginal burials. The soil profiles associated with the study area are associated with burial sites. Burial sites have been recorded nearby.
Rock shelters with art and / or deposit	Rock shelter sites include rock overhangs, shelters or caves, and generally occur on, or next to, moderate to steeply sloping ground characterised by cliff lines and escarpments. These naturally formed features may contain rock art, stone artefacts or midden deposits and may also be associated with grinding grooves.	Low: The sites will only occur where suitable sandstone exposures or overhangs possessing sufficient sheltered space exist, which are not present in the study area.
Aboriginal Ceremony and Dreaming Sites	Such sites are often intangible places and features and are identified through oral histories, ethnohistoric data, or Aboriginal informants.	Moderate: There are currently no recorded mythological stories for the study area however they are known to occur in the region.
Post-Contact Sites	These are sites relating to the shared history of Aboriginal and non-Aboriginal people of an area and may include places such as missions, massacre sites, post-contact camp sites and buildings associated with post-contact Aboriginal use.	Moderate: There are no post-contact sites previously recorded in the study area however it is possible for post contact sites to occur in the region.
Aboriginal Places	Aboriginal places may not contain any “archaeological” indicators of a site, but are nonetheless important to Aboriginal people. They may be places of cultural, spiritual or historic significance. Often they are places tied to community history and may include natural features (such as swimming and fishing holes), places where Aboriginal political events commenced or particular buildings.	Low: There are currently no recorded Aboriginal historical associations for the study area.

5 Archaeological survey

A field survey of the project area was undertaken on 29 January 2017. The field survey sampling strategy, methodology and a discussion of results are provided below.

5.1 Archaeological survey objectives

The objectives of the survey were to:

- Provide Registered Aboriginal Parties (RAPs) an opportunity to view the project area and to discuss previously identified Aboriginal object(s) and/or place(s) in or within close proximity to the project area.
- To undertake a systematic survey of the project area targeting areas with the potential for Aboriginal heritage.
- Identify and record Aboriginal archaeological sites visible on the ground surface.
- Identify and record areas of potential archaeological deposits (PADs).

5.2 Archaeological survey methodology

The survey methods were intended to assess and understand the landforms and to determine whether any archaeological material from Aboriginal occupation or land use exists within the study Area.

5.2.1 Sampling strategy

The survey effort targeted all landforms within the study area. Particular attention was given to stands of remnant native vegetation with the potential to contain modified trees.

5.2.2 Survey methods

The archaeological survey was conducted by vehicle and on foot with a field team of three members. Recording during the survey followed the archaeological survey requirements of the code and industry best practice methodology. Information that recorded during the survey included:

- Aboriginal objects or sites present in the study area during the survey.
- Survey coverage.
- Any resources that may have potentially have been exploited by Aboriginal people.
- Landform.
- Photographs of the site indicating landform.
- Evidence of disturbance.
- Aboriginal artefacts, culturally modified trees or any other Aboriginal sites.

Where possible, Identification of natural soil deposits within the project area was undertaken. Photographs and recording techniques were incorporated into the survey including representative photographs of survey units, landform, vegetation coverage, ground surface visibility and the recording of soil information for each survey unit were possible. Any potential Aboriginal objects observed during the survey were documented and photographed. The location of Aboriginal cultural heritage and points marking the boundary of the landform

elements were recorded using a hand-held Global Positioning System and the Map Grid of Australia (94) coordinate system.

5.3 Survey constraints

The overall effectiveness of the survey for examining the ground for Aboriginal sites was considered to be low due to poor ground surface visibility (GSV). The study area is comprised of fields of wheat with varying degrees of visibility between 20% to 50% (Plate 2). Opportunities to examine the ground surface primarily occurred along fence lines, dirt tracks and occasional cleared patches within fields (Plate 3). Areas of exposure, within which visibility approached 100%, were targeted for their increased potential to contain visible Aboriginal cultural features. These majority of these exposure had been subject to and were created by substantial disturbance from clearing, ploughing and other farming activities.

Disturbance in the study area is associated with natural and human agents. Natural agents generally affect small areas and include the burrowing and scratching in soil by animals, such as foxes, rabbits and kangaroos, and sometimes exposure from slumping or scouring. The study area has been extensively disturbed by a long history of agricultural use which has seen the majority of the study area cleared and then extensively ploughed for the cultivation of wheat and other crops. Disturbances created by fencing, informal vehicle tracks and graded access roads also occur throughout the study area.

Plate 2 **General GSV within the study area, scale 2 m.**

The ability to see more obtrusive potential cultural heritage features from a distance throughout most of the study area was considered to be high due to the sparse tree cover within cleared fields. This allowed for the easy identification of landforms and areas of exposure within these. Occasional large stands of remnant black box trees are present within the study area, particularly on the western side of Kidman Way. The GSV within these was considered to be zero, due to the dense vegetation cover, and no areas of exposure were identified.

Plate 3 Areas of exposure along access tracks and grasscover within study area. View west, scale 1 m.

5.4 Archaeological survey results

Archaeological survey was conducted in one day with a field team of three members. A total of seven transects were walked across the Lachlan Depression Plain landform with the surveyors walking two metres apart Figure 8). This follows the methodology set out in Burke and Smith (2004: 65) which states that a single person can only effectively visually survey an area of two linear metres. Five Aboriginal sites, one artefact scatter, one isolated find and three modified trees, were identified in the study area. The results from the field survey have been summarised in Table 11 and 12, and are discussed below (Figure 9).

Table 11 Survey coverage

Survey Unit	Landform	Survey unit area (m²)	Visibility (%)	Exposure (%)	Effective coverage area (m²)	Effective coverage (%)
1	Lachlan Depression Plains	117568	0	0	0	0
2	Lachlan Depression Plains	92352	50	20	9235.2	10
3	Lachlan Depression Plains	116194	20	20	4647.76	4
4	Lachlan Depression Plains	91957	20	50	9195.7	10
5	Lachlan Depression Plains	139372	20	20	5574.88	4
6	Lachlan Depression Plains	113689	20	20	4547.56	4
7	Lachlan Depression Plains	43096	0	0	0	0
8	Lachlan Depression Plains	39468	0	0	0	0

Table 12 Landform summary

Landform	Landform area (m²)	Area effectively surveyed (m²)	Landform effectively surveyed (%)	No. of Aboriginal sites	No. of artefacts or features
Lachlan Depression Plains	8326000	33201.1	0.4	5	7

5.4.1 Transect 1

Transect 1 was surveyed on foot and consisted of a remnant stand of black box trees within the Lachlan depression plains landform. Visibility and exposure were both 0% due to the dense grass cover surrounding the base of the trees. All black box trees within this transect were inspected to determine their approximate age and potential to contain cultural modification. Two modified trees, Hillston 1 and Hillston 2, were identified within this transect.

Hillston 1

Hillston 1 is a modified box tree measuring 20 metres across and 2.8 metres in circumference bearing a large, east facing oval with no visible axe marks (Plate 4). The tree and scar are in good condition, with the scar located 65 centimetres from the ground and measuring 240 centimetres long by 40 centimetres wide and displaying 10 centimetres of regrowth. The size of the scar indicates it was likely caused by the removal of bark to make a canoe.

Currently, the closest natural water source to Hillston 1 is the Lachlan River, located approximately 3.1 kilometres to the north-west.

Plate 4 **Hillston 1. View west, scale 2m.**

Hillston 2

Hillston 2 is a modified box tree in the south west corner of the study area identified while driving between transects. It measures 25 metres across and 2.72 metres in circumference with a large, east facing oval scar. The scar bears steel axe marks in the centre of the dryface (Plate 5, Plate 6). The tree and scar are in good condition, with the scar located 60 centimetres from the ground and measuring 180 centimetres long by 50 centimetres wide and displaying 30 centimetres of regrowth. An epimorphic stem grows from the base of the scar.

Currently, the closest natural water source to Hillston 2 is the Lachlan River, located approximately 3.6 kilometres to the north-west.

Plate 5 **Hillston 2. View west, scale 2 m.**

Plate 6 **Detail shot of Hillston 2 steel axe marks, scale 2 m.**

5.4.2 Transect 2

Transect 2 was surveyed on foot and located within a wheat field on cleared Lachlan depression plain. The landform had been subject to extensive disturbance from long term ploughing in its capacity as a wheat field. The recent wheat harvest placed visibility at 50%, with exposure 20% (Plate 7). No large areas of exposure were identified within transect 3.

No Aboriginal objects or sites were identified during this portion of the survey.

5.4.3 Transect 3

Transect 2 was surveyed on foot and located within a wheat field on cleared Lachlan depression plain. The landform had been subject to extensive disturbance from long term ploughing in its capacity as a wheat field. The recent wheat harvest placed visibility at 20%, with exposure 20% (Plate 10). One large area of exposure was identified within this landform and this was targeted during the survey. One site, an isolated find, was located in an area of exposure within transect 2.

Plate 7 Transect 2. View north-east, scale 2 m.

Hillston 3

Hillston 3 was an isolated find, a quartz flaked piece measuring 21 millimetres in length. Quartz does not naturally occur in the Hillston region, and thereby must have been transported into the study area. It was found exposed at the edge of a wheat field (Plate 8). As such, the site is considered to be in poor condition.

Currently, the closest natural water source to Hillston 3 is the Lachlan River, located approximately 3.6 kilometres to the north-west.

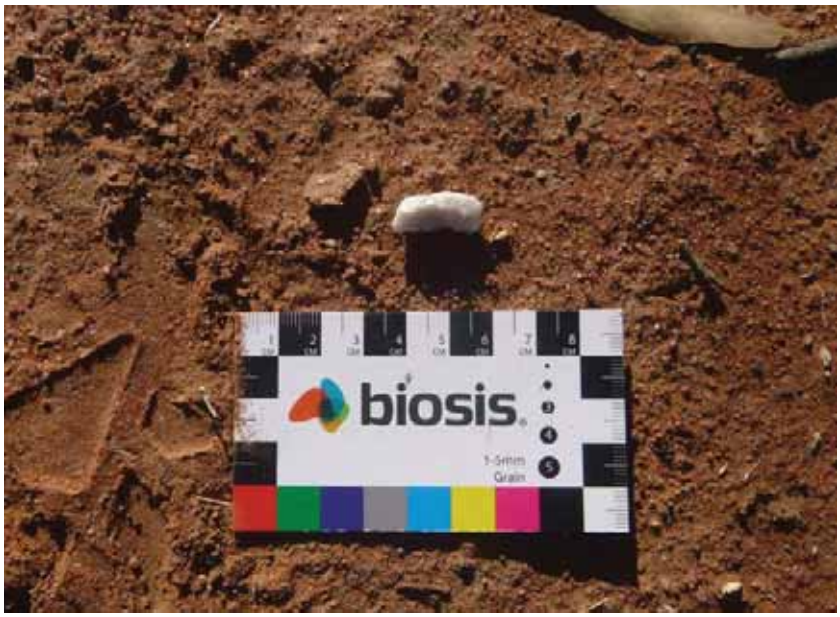


Plate 8 Hillston 3, Artefact 1.

5.4.4 Transect 4

Transect 4 was surveyed on foot and located within a cleared area of Lachlan depression plain in the south western portion of the study area. The recent harvest meant general visibility throughout the transect was 20%, with exposure 50% (Plate 9). Areas of increased exposure and stands of remnant vegetation were targeted during the survey and one site, an artefact scatter, was identified.

Hillston 4

Hillston 4 is an artefact scatter located in an area of exposure on a Lachlan depression plain landform (Plate 9). It consists of three silcrete artefacts, all of which were recorded with the details provided in Table 13. The assemblage is made up of one single platform core fragment and two distal flake fragments. None of these artefacts showed evidence for retouch.

Due to the location of the artefact scatter within an area of disturbance on the edge of a wheat field the condition of Hillston 4 has been assessed as poor.

Currently, the closest natural water source to Hillston 4 is an unnamed non-perennial creek, located approximately 4 kilometres to the north-east. The Lachlan River is the closest permanent water source, lying approximately 4.5 kilometres north-west of the site.

Plate 9 **Transect 4. View west, scale 1m.**

Table 13 Details of artefact assemblage from Hillston 4.

ID	Type	Raw Material	Platform	Platform Length (mm)	Platform Width (mm)	Termination	Retouch	Retouch Location	Length (mm)	Width (mm)	Thickness (mm)	Flake Scars	Tool Type	Weight (g)
2	Single Platform Core Fragment	Silcrete	N/A	N/A	N/A	N/A	N/A	N/A	23	11	7	3, lfs 22 mm	N/A	N/A
3	Distal Flake Fragment	Silcrete	N/A	N/A	N/A	Feather	N/A	N/A	21	22	11	2	N/A	N/A
4	Distal Flake Fragment	Silcrete	N/A	N/A	N/A	Feather	N/A	N/A	9	11	4	2	N/A	N/A

5.4.5 Transect 5

Transect 5 was within a wheat field on cleared Lachlan depression plain and subject to vehicle survey to identify any areas of exposure. The landform had been subject to extensive disturbance from long term ploughing in its capacity as a wheat field. The recent wheat harvest meant visibility was 20%, with exposure 20% (Plate 10). There we no large exposures identified on this landform during the survey.

No Aboriginal objects or sites were identified during this portion of the survey.

Plate 10 Visibility in transect 5, scale 1m.

5.4.6 Transect 6

Transect 6 was located within a wheat field and area of remnant black box on cleared Lachlan depression plain. Transect 6 was subject to vehicle survey to identify any areas of exposure and pedestrian survey within the black box remnant. The landform had been subject to extensive disturbance from long term ploughing in its capacity as a wheat field. The recent wheat harvest meant visibility was 20%, with exposure 20% (Plate 11). There were no large exposures identified on this landform during the survey.

No Aboriginal objects or sites were identified during this portion of the survey.

Plate 11 Visibility in transect 6, scale 2m.

5.4.7 Transect 7

Transect 7 was subject to vehicle survey as it was located along Kidman Way, which cuts longitudinally through the centre of the survey area, and was located within the Lachlan depression plains. General visibility was 10% across this transect with 20% exposure along the edges of the road. The majority of this transect was found to have been subject to extensive disturbance from the construction of the road, train line and associated infrastructure through the study area. All black box trees within this transect, along the eastern edge of Kidman Way, were inspected to determine their approximate age and potential to contain cultural modification.

No Aboriginal objects or sites were identified during this portion of the survey.

5.4.8 Transect 8

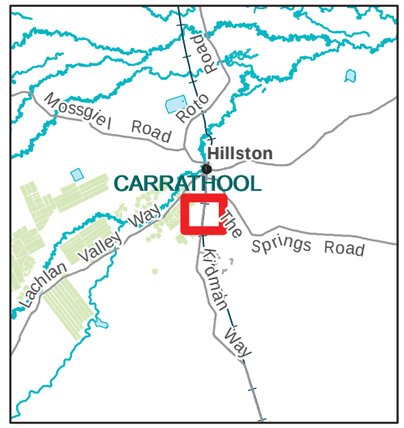
Transect 8 was surveyed on foot and by vehicle and consisted of an area of remnant black box trees and scrub along the western edge of Kidman Way within the Lachlan depression plains. As it borders the road, the eastern edge of the transect was found to be largely disturbed from the construction of the road. A strip of remnant bushland remains, however, running north-south through the centre of the study area (Plate 12). General visibility was 20% across this landform with 10% exposure. All black box trees within this transect, along the eastern edge of Kidman Way, were inspected to determine their approximate age and potential to contain cultural modification. One site, a modified tree, was identified within this transect.

Hillston 5

Hillston 5 is a modified box tree in the northern portion of the study area measuring 20 metres across and 3 metres in circumference bearing a large, east facing oval scar with no visible axe marks (Plate 12). The tree is located approximately 20 metres to the west of Kidman Way. Both tree and scar are in good condition, with the scar located 70 centimetres from the ground and measuring 220 centimetres long by 40 centimetres wide and displaying 20 centimetres of regrowth. The size of the scar suggests it was the result of the removal of bark to create a canoe.

Currently, the closest natural water source to Hillston 5 is an unnamed non-perennial creek, located approximately 3.3 kilometres to the east. The Lachlan River is the closest permanent water source, lying approximately 4 kilometres west of the site.

Plate 12 Hillston 5 View west, scale 2 m



Legend

- Study area
- Survey tracks

Figure 8: Survey tracks

0 160 320 480 640 800

Metres

Scale: 1:15,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

Biosis Pty Ltd

Ballarat, Brisbane, Canberra, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 23501
Date: 25 May 2017,
Checked by: ALA, Drawn by: SSK, Last edited by: lharley
Location:\\bio-data-01\matters$\23500s\23501\Mapping\23501_AR_F8_Survey_tracks_20170523

Acknowledgements: Basemap © Land and Property Information 2016; Imagery © Overland Sun Farming, LPI 2012

5.5 Discussion of archaeological survey results

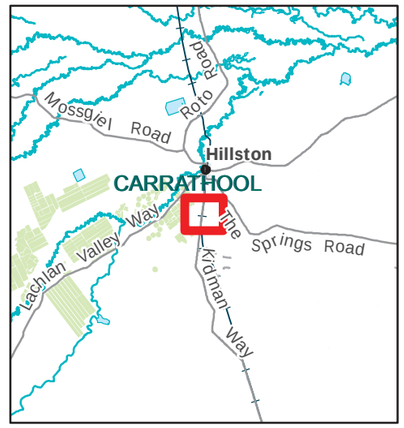
The survey effort identified five previously unrecorded aboriginal sites within the study area, three modified trees, one artefact scatter and one isolated find.

The primary constraint to this survey was the lack of GSV within the study area, except for small areas of exposure created by erosion in clay pans, along vehicle access tracks, and occasional areas within ploughed fields. Where exposures were present they were usually associated with substantial ground disturbance from ploughing or the grading of vehicle tracks.

All sites identified were located within the Lachlan depression plains landform. Both the isolated find and the artefact scatter were located on areas of exposure created by ploughing and were considered to be in poor condition as a result of this. The intensive agricultural use of the study area throughout the 20th century has significantly disturbed the shallow soil profiles within the study area, displacing cultural material.

The three modified trees located within the study area all bore east facing scars. These black box trees were noticeably older than those surrounding them, the majority of which were considered too young to hold cultural modifications. The dominance of the modified trees site type in the Hillston area, the extensive clearing of the study area and the apparent subsequent regrowth of these areas of vegetation indicate the study area likely held more modified trees in the past prior to its initial clearance.

An analysis of these sites is presented in Section 6.



Legend

- Study area
- Development site

Site Type

- Modified Tree
- Surface Artefacts

Figure 9: Result Map

0 150 300 450 600 750

Metres

Scale: 1:15,394 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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Date: 25 May 2017,
Checked by: ALA, Drawn by: SSK, Last edited by: lharley
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6 Analysis and discussion

The types and locations of sites newly identified during the survey was largely consistent with the predictive model discussed in Section 4. The entirety of the study area belonged to the Lachlan Depression Plains landscape and the concentration of sites within the study area was largely consistent with this. Fewer modified trees were identified during the survey than anticipated, and this was likely the result of the extensive land clearing that has taken place within the study area during its agricultural use. The poor condition assessment of the artefact scatter and isolated find is the result of this land use history.

The location of sites within the study area seems to bear little correlation with their relationship to modern water sources. There are no natural drainage or creek lines within the study area and, discounting the large number of irrigation channels, the local area is poor in natural water sources. None of the sites identified were located in close proximity to a source of water. This too is consistent with the predictive model, which saw little correlation between water availability and site location. Interestingly, the size of the scars of Hillston 2 and Hillston 5 suggests the removal of bark to create canoes, which potentially indicates the area was closer to natural waterways in the past than at present. This is likely the result of the extensive irrigation development in the Hillston area affecting the courses of creek lines and springs within the landscape.

The identification of a quartz artefact within the study area is notable, as quartz does not occur naturally within the region and therefore must have been a manuport brought in from elsewhere. The other three artefacts all consist of silcrete, which is common for the Lachlan River. The small size of the artefact assemblage identified during this study likely accounts for the dominance of silcrete, as well as the lack of patterns evident in the types of stone artefacts present in the assemblage. This does not allow for the development of any clear statements on the study area's Aboriginal occupation history on the basis of its lithic assemblage alone, although the low density of artefacts within the study area suggests only sporadic use. No hearths, earth mounds or site types indicated repeated use of the area were identified during the survey.

7 Scientific values and significance assessment

The two main values addressed when assessing the significance of Aboriginal sites are cultural values to the Aboriginal community and archaeological (scientific) values. This report will assess scientific values while the Aboriginal Cultural Heritage Assessment Report will detail the cultural values of Aboriginal sites in the study area.

7.1 Introduction to the assessment process

Heritage assessment criteria in NSW fall broadly within the significance values outlined in the Australia International Council on Monuments and Sites (ICOMOS) Burra Charter (Australia ICOMOS 1999). This approach to heritage has been adopted by cultural heritage managers and government agencies as the set of guidelines for best practice heritage management in Australia. These values are provided as background and include:

- **Historical significance** (evolution and association) refers to historic values and encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section. A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.
- **Aesthetic significance** (Scenic/architectural qualities, creative accomplishment) refers to the sensory, scenic, architectural and creative aspects of the place. It is often closely linked with social values and may include consideration of form, scale, colour, texture, and material of the fabric or landscape, and the smell and sounds associated with the place and its use.
- **Social significance** (contemporary community esteem) refers to the spiritual, traditional, historical or contemporary associations and attachment that the place or area has for the present-day community. Places of social significance 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 significance be damaged or destroyed. These aspects of heritage significance can only be determined through consultative processes with local communities.
- **Scientific significance** (Archaeological, industrial, educational, research potential and scientific significance values) refers to the importance of a landscape, area, place or object because of its archaeological and/or other technical aspects. Assessment of scientific value is often based on the likely research potential of the area, place or object and will consider the importance of the data involved, its rarity, quality or representativeness, and the degree to which it may contribute further substantial information.

The cultural and archaeological significance of Aboriginal and historic sites and places is assessed on the basis of the significance values outlined above. As well as the ICOMOS Burra Charter significance values guidelines, various government agencies have developed formal criteria and guidelines that have application when assessing the significance of heritage places within NSW. Of primary interest are guidelines prepared by the Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA), the OEH and the

Heritage Branch, NSW Department of Planning. The relevant sections of these guidelines are presented below.

These guidelines state that an area may contain evidence and associations which demonstrate one or any combination of the ICOMOS Burra Charter significance values outlined above in reference to Aboriginal heritage. Reference to each of the values should be made when evaluating archaeological and cultural significance for Aboriginal sites and places.

In addition to the previously outlined heritage values, the OEH Guidelines (DECC 2006) also specify the importance of considering cultural landscapes when determining and assessing Aboriginal heritage values. The principle behind a cultural landscape is that 'the significance of individual features is derived from their inter-relatedness within the cultural landscape'. This means that sites or places cannot be 'assessed in isolation' but must be considered as parts of the wider cultural landscape. Hence the site or place will possibly have values derived from its association with other sites and places. By investigating the associations between sites, places, and (for example) natural resources in the cultural landscape the stories behind the features can be told. The context of the cultural landscape can unlock 'better understanding of the cultural meaning and importance' of sites and places.

Although other values may be considered – such as educational or tourism values – the two principal values that are likely to be addressed in a consideration of Aboriginal sites and places are the cultural/social significance to Aboriginal people and their archaeological or scientific significance to archaeologists. The determinations of archaeological and cultural significance for sites and places should then be expressed as statements of significance that preface a concise discussion of the contributing factors to Aboriginal cultural heritage significance.

7.2 Archaeological (scientific significance) values

Archaeological significance (also called scientific significance, as per the ICOMOS Burra Charter) refers to the value of archaeological objects or sites as they relate to research questions that are of importance to the archaeological community, including indigenous communities, heritage managers and academic archaeologists. Generally the value of this type of significance is determined on the basis of the potential for sites and objects to provide information regarding the past life-ways of people (Burke and Smith 2004: 249, NPWS 1997b). For this reason, the NPWS (part of DECC) summarises the situation as 'while various criteria for archaeological significance assessment have been advanced over the years, most of them fall under the heading of archaeological research potential' (NPWS 1997b: 26). The NPWS criteria for archaeological significance assessment are based largely on the ICOMOS Burra Charter.

Research potential

Research potential is assessed by examining site content and site condition. Site content refers to all cultural materials and organic remains associated with human activity at a site. Site content also refers to the site structure – the size of the site, the patterning of cultural materials within the site, the presence of any stratified deposits and the rarity of particular artefact types. As the site contents criterion is not applicable to scarred trees, the assessment of scarred trees is outlined separately below. The site content ratings used for archaeological sites are provided in Table 14. Site condition refers to the degree of disturbance to the contents of a site at the time it was recorded. The site condition ratings used for archaeological sites are provided in Table 15.

Table 14 Site contents ratings used for archaeological sites.

Rating	Description
0	No cultural material remaining.
1	Site contains a small number (e.g. 0–10 artefacts) or limited range of cultural materials with no evident stratification.
2	Site contains a larger number, but limited range of cultural materials; and/or some intact stratified deposit remains; and/or are or unusual example(s) of a particular artefact type.
3	Site contains a large number and diverse range of cultural materials; and/or largely intact stratified deposit; and/or surface spatial patterning of cultural materials that still reflect the way in which the cultural materials were deposited.

Table 15 Site condition ratings used for archaeological sites.

Rating	Description
0	Site destroyed.
1	Site in a deteriorated condition with a high degree of disturbance; lack of stratified deposits; some cultural materials remaining.
2	Site in a fair to good condition, but with some disturbance.
3	Site in an excellent condition with little or no disturbance. For surface artefact scatters this may mean that the spatial patterning of cultural materials still reflects the way in which the cultural materials were laid down.

Pearson and Sullivan note that Aboriginal archaeological sites are generally of high research potential because 'they are the major source of information about Aboriginal prehistory' (1995, p.149). Indeed, the often great time depth of Aboriginal archaeological sites gives them research value from a global perspective, as they are an important record of humanity's history. Research potential can also refer to specific local circumstances in space and time – a site may have particular characteristics (well preserved samples for absolute dating, or a series of refitting artefacts, for example) that mean it can provide information about certain aspects of Aboriginal life in the past that other less or alternatively valuable sites may not (Burke and Smith 2004, p.247-8). When determining research potential value particular emphasis has been placed on the potential for absolute dating of sites.

The following sections provide statements of significance for the Aboriginal archaeological sites recorded during the surface survey for the assessment. The significance of each site follows the assessment process outlined above. This includes a statement of significance based on the categories defined in the Burra Charter. These categories include social, historic, scientific, aesthetic and cultural (in this case archaeological) landscape values. Nomination of the level of value—high, moderate, low or not applicable—for each relevant category is also proposed. Where suitable the determination of cultural (archaeological) landscape value is applied to both individual sites and places (to explore their associations) and also, to the Study Area as a whole. The nomination levels for the archaeological significance of each site are summarised below.

Representativeness

Representativeness refers to the regional distribution of a particular site type. Representativeness is assessed by whether the site is common, occasional, or rare in a given region. Assessments of representativeness are subjectively biased by current knowledge of the distribution and number of archaeological sites in a region. This varies from place to place depending on the extent of archaeological research. Consequently, a site that is assigned low significance values for contents and condition, but a high significance value for representativeness, can only be regarded as significant in terms of knowledge of the regional archaeology. Any such site should be subject to re-assessment as more archaeological research is undertaken.

Assessment of representativeness also takes into account the contents and condition of a site. For example, in any region there may only be a limited number of sites of any type that have suffered minimal disturbance. Such sites would therefore be given a high significance rating for representativeness, although they may occur commonly within the region. The representativeness ratings used for archaeological sites are provided in Table 16.

Table 16 Site representativeness ratings used for archaeological sites

Rating	Description
1	Common occurrence.
2	Occasional occurrence.
3	Rare occurrence.

Overall scientific significance ratings for sites, based on a cumulative score for site contents, site integrity and representativeness are provided in Table 18.

Table 17 Scientific significance ratings used for archaeological sites

Rating	Description
1-3	Low scientific significance.
4-6	Moderate scientific significance.
7-9	High scientific significance.

Each site is given a score on the basis of these criteria – the overall scientific significance is determined by the cumulative score. This scoring procedure has been applied to the Aboriginal archaeological sites identified during the survey. The results are in Table 18.

7.2.1 Statements of archaeological significance

The following archaeological significance assessment is based on Requirement 11 of the Code. Using the assessment criteria detailed in Scientific Values and Significance Assessment, an assessment of significance was determined and a rating for each site was determined. The results of the archaeological significance assessment are given in Table 18 below.

Table 18 Scientific significance assessment of Aboringinal archaeological sites recorded within the study area.

Site Name	Site Content	Site Condition	Representativeness	Scientific Significance
Hillston 1 (AHIMS # Pending)	1	2	1	Moderate
Hillston 2 (AHIMS # Pending)	1	2	1	Moderate
Hillston 3 (AHIMS # Pending)	1	1	1	Low
Hillston 4 (AHIMS # Pending)	1	1	1	Low
Hillston 5 (AHIMS # Pending)	1	2	1	Moderate

Table 19 Statements of scientific significance for archaeological sites recorded within the study area.

Site Name	Statement of Significance
Hillston 1 (AHIMS # Pending)	Hillston 1 is a modified box tree measuring 20 metres across and 2.8 metres in circumference bearing a large, east facing oval with no visible axe marks. Scar trees hold high significance to the local Aboriginal community. The scar is in good condition and notable for its size, which suggests it was the result of the creation of a canoe. This site is of moderate scientific significance.
Hillston 2 (AHIMS # Pending)	Hillston 2 is a modified box tree measuring 25 metres across and 2.72 metres in circumference with a large, east facing oval scar which bears steel axe marks at its centre. Scar trees hold high significance to the local Aboriginal community. The scar is in good condition and is easy identifiable as being made by humans due to the presence of steel axe marks. The site is of moderate scientific significance.
Hillston 3 (AHIMS # Pending)	Hillston 3 is an isolated find, a quartz flaked piece measuring 21 millimetres in length found exposed at the edge of a ploughed field. While quartz is an unusual raw material for the region, lithic fragments are common to the region and this site has been highly disturbed by ploughing. It has low scientific significance.
Hillston 4 (AHIMS # Pending)	Hillston 4 is an artefact scatter consisting of three silcrete artefacts located in an area of exposure at the edge of a ploughed field. The assemblage is made up of one single platform core fragment and two distal flake fragments, all of which are common to the region and the site has been subject to extensive disturbance. The site is of low scientific significance.

Site Name	Statement of Significance
Hillston 5 (AHIMS # Pending)	Hillston 5 is a modified box tree measuring 20 metres across and 3 metres in circumference bearing a large, east facing oval scar with no visible axe marks. Scar trees hold high significance to the local Aboriginal community. The scar is in good condition and notable for its size, which suggests it was the result of the creation of a canoe. This site is of moderate scientific significance.

8 Impact assessment

8.1 Predicted physical impacts

The construction of the project includes disturbance to the ground surface within the development footprint. This construction has the potential to disturb Aboriginal heritage sites; however, through project design, Overland has redesigned the development footprint to avoid and minimize impacts to Aboriginal heritage sites as far as practicable.

A summary of impacts is provided below in Table 20.

Table 20 Summary of potential archaeological impacts

AHIMS Site No.	Site Name	Significance	Type Of Harm	Degree Of Harm	Consequence Of Harm
Pending	Hillston 1	Moderate	None	None	No loss of value
Pending	Hillston 2	Moderate	None	None	No loss of value
Pending	Hillston 3	Low	None	None	No loss of value
Pending	Hillston 4	Low	None	None	No loss of value
Pending	Hillston 5	Moderate	None	None	No loss of value

8.2 Management and mitigation measures

Ideally, heritage management involves conservation of sites through the preservation and conservation of fabric and context within a framework of "*doing as much as necessary, as little as possible*" (Marquis-Kyle and Walker 1994: 13). In cases where conservation is not practical, several options for management are available. For sites, management often involves the salvage of features or artefacts, retrieval of information through excavation or collection (especially where impact cannot be avoided) and interpretation.

Overland has designed the development footprint to avoid harm to all five Aboriginal heritage sites identified in the study area.

9 Recommendations

Strategies have been developed based on the archaeological (significance) of cultural heritage relevant to the project area and influenced by:

- Predicted impacts to Aboriginal cultural heritage;
- The planning approvals framework;
- Current best conservation practise, widely considered to include:
  - Ethos of the Australia ICOMOS Burra Charter and,
  - The Code.

Prior to any impacts occurring within the project area, the following is recommended:

Recommendation 1: Continued consultation with the registered Aboriginal parties

It is recommended that Overland Sun Farming continue to inform the RAPs about the management of Aboriginal cultural heritage sites within the site boundary throughout the construction of the project. This recommendation is in keeping with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a).

Recommendation 2: Sites Hillston 1, 2, 3, 4, and 5 are to be avoided from impact.

The development footprint avoids impact to sites Hillston 1, 2, 3, 4, and 5 so no further investigation is required.

Recommendation 3: Discovery of unanticipated Aboriginal objects

All Aboriginal objects and places are protected under the *National Parks and Wildlife Act 1974*. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage (OEH). Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders to inform options for management of the objects.

Recommendation 4: Discovery of unanticipated historical relics

Relics are historical archaeological resources of local or State significance and are protected in NSW under the *Heritage Act 1977*. Relics cannot be disturbed except with a permit or exception/exemption notification. Should unanticipated relics be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic.

Recommendation 5: Discovery of Aboriginal ancestral remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains

2. Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location
3. Not recommence work at that location unless authorised in writing by OEH.

Recommendation 6: Stop work provision for any potential discovery of human remains

If any suspected human remains are discovered during any activity works, all activity must cease immediately. The remains must be left in place and protected from harm or damage. The following contingency plan describes the immediate actions that must be taken in instances where human remains or suspected human remains are discovered. Any such discovery at the activity area must follow these steps:

1. Discovery: If suspected human remains are discovered all activity must stop to ensure minimal damage is caused to the remains; and the remains must be left in place, and protected from harm or damage.
2. Notification: Once suspected human skeletal remains have been found, the Coroner's Office and the NSW Police must be notified immediately. Following this, and if the human remains are likely to be Aboriginal in origin, the find will be reported to the Aboriginal parties and DECCW NSW. If the find is likely to be non-Aboriginal in origin and more than 100 years in age, the Heritage Council of NSW will be notified of the find under s.146 of the *Heritage Act 1977*.

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Appendices

Appendix 1 AHIMS results

THE FOLLOWING APPENDIX IS NOT TO BE MADE PUBLIC