



Moolarben Coal Complex UG4 Ancillary Works Modification

Modification Report

APPENDIX A

ABORIGINAL CULTURAL HERITAGE ASSESSMENT



**Aboriginal Cultural Heritage Assessment
Moolarben Coal Operations UG4 Ancillary Works Modification
Ulan NSW**

Mid-Western Regional Council Local Government Area

Prepared for: Moolarben Coal Operations
27 September 2019



Document control

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Executive summary

Moolarben Coal Operations (MCO) is seeking to modify the Project Approval for Stage 1 of the Moolarben Coal Complex. The proposed modifications to the currently approved operations include (Figure 1 and Figure 2):

- relocation and expansion of dewatering sites and associated infrastructure;
- development of a downcast ventilation shaft for UG4 and associated compound (including service drop holes); and
- development of a Remote Services Infrastructure Area (RSIA) (including service drop holes) above the UG4 mains.

MCO commissioned Niche Environment and Heritage to conduct an Aboriginal Cultural Heritage Assessment (ACHA) for the proposal. The ACHA was conducted in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (Department of Environment, Climate Change and Water [DECCW], 2010a), the *Guide to investigating, assessing and reporting Aboriginal cultural heritage in NSW* (Office of Environment and Heritage [OEH], 2011a) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b).

An archaeological and cultural heritage survey was conducted across the entire subject area footprint on 22 and 23 July 2019. The subject area was subsequently revised to a smaller footprint, and a small part of the revised subject area was moved beyond the survey limits. Other than this there were no constraints to the survey, which documented two new Aboriginal archaeological sites, and provided updated information on three previously known archaeological sites. For the most part the Modification resides in land that has low archaeological potential, with the exception of the Remote Services Infrastructure Area and associated access road crossing on Bora Creek, where there are a number of sites with artefact assemblages that have high potential to provide important information about past Wiradjuri land-use.

It was recommended that heritage sites identified within the Modification footprint would be managed in accordance with the management measures described in MCO's approved Heritage Management Plan, which would be revised to incorporate the additional sites.

Glossary and list of abbreviations

Term or abbreviation	Definition
Aboriginal cultural heritage	The tangible (objects) and intangible (dreaming stories, legends and places) cultural practices and traditions associated with past and present-day Aboriginal communities.
ACHA	Aboriginal Cultural Heritage Assessment
Aboriginal object(s)	The legal definition for material Aboriginal cultural heritage under the NSW <i>National Parks and Wildlife Act 1974</i> .
Aboriginal stakeholders	Members of a local Aboriginal land council, registered holders of Native Title, Aboriginal groups or other Aboriginal people who may have an interest in the Modification.
AHIP	Aboriginal Heritage Impact Permit
Archaeology	The scientific study of material traces of human history, particularly the relics and cultural remains of past human activities
Archaeological deposit	A layer of soil material containing archaeological objects and/or human remains
Archaeological investigation	The process of assessing the archaeological potential of an impact area by a qualified archaeologist.
Archaeological site	An area that contains surface or sub-surface material evidence of past human activity in which material evidence (artefacts) of past activity is preserved
Artefact	An object made by human agency (e.g. stone artefacts).
Assemblage	A group of artefacts found in close association with one another Any group of items designated for analysis that exist in spatial and/or vertical context – without any assumptions of chronological or spatial relatedness
Avoidance	A management strategy which protects Aboriginal sites within an impact area by avoiding them totally in development.
Catchment	The area from which a surface watercourse derives its water.
Code of Practice	<i>Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales</i>
Cumulative impacts	Combination of individual effects of the same kind due to multiple actions from various sources over time.
DECCW	The Department of Conservation, Climate Change and Water, now the Office of Environment and Heritage
DA	Development Application
Drainage	Natural or artificial means for the interception and removal of surface or subsurface water.
EP&A Act	<i>NSW Environmental Planning and Assessment Act 1979</i>
Harm	With regard to Aboriginal objects this has the same meaning as the NSW <i>National Parks and Wildlife Act 1974</i> .
HMP	Heritage Management Plan
Impact	Influence or effect exerted by a project or other activity on the natural, built and community environment.

Term or abbreviation	Definition
Impact area	An area that requires archaeological investigation and management assessment.
In situ	Latin words meaning 'on the spot, undisturbed'.
Isolated artefact / find	A single artefact found in an isolated context.
Landscape character	The aggregate of built, natural and cultural aspects that make up an area and provide a sense of place. Includes all aspects of a tract of land – built, planted and natural topographical and ecological features.
Land unit	An area of common landform, and frequently with common geology, soils and vegetation types, occurring repeatedly at similar points in the landscape over a defined region. It is a constituent part of a land system.
Landform	Any one of the various features that make up the surface of the earth.
LEP	Local Environmental Plan
Methodology	The procedures used to undertake an archaeological investigation.
Mitigation	To address the problem of conflict between land use and site conservation.
NPW Act	National Parks and Wildlife Act 1974
NPW Regulation	National Parks and Wildlife Regulation 2009
OEH	Office of Environment and Heritage
PAD	Potential Archaeological Deposit. A location considered to have a potential for subsurface archaeological material.
RAP	Registered Aboriginal Party
Site recording	The systematic process of collecting archaeological data for an archaeological investigation.
Site	A place where past Aboriginal activity is identifiable.
Spit	A unit of archaeological excavation with an arbitrary assigned measurement of depth and extent.
Survey coverage	A graphic and statistical representation of how much of an impact area was actually surveyed and therefore assessed.

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1. Introduction

1.1 Proponent and Modification background

The Moolarben Coal Complex (MCC) is located approximately 40 kilometres north of Mudgee in the Western Coalfields of New South Wales (NSW) (Figure 1). The Moolarben Coal Complex is located within the Mid-Western Region Local Government Area.

Moolarben Coal Operations Pty Ltd (MCO) is the operator of the MCC on behalf of the Moolarben Joint Venture (Moolarben Coal Mines Pty Ltd, Sojitz Moolarben Resources Pty Ltd and a consortium of Korean power companies). MCO and Moolarben Coal Mines Pty Ltd are wholly owned subsidiaries of Yancoal Australia Limited.

The MCC comprises four approved open cut mining areas (OC1 to OC4), three approved underground mining areas (UG1, UG2 and UG4) and other mining related infrastructure including coal processing and transport facilities.

1.2 Proposed activity

MCO is seeking to modify the Project Approval for Stage 1 of the MCC. The proposed modifications are limited to the currently approved operations at UG4, and include:

- relocation and expansion of dewatering sites and associated infrastructure;
- development of a downcast ventilation shaft for UG4 and associated compound (including service drop holes); and
- development of a Remote Services Infrastructure Area (RSIA) (including service drop holes) above the UG4 mains.

The proposed modification is referred to as the UG4 Ancillary Works Modification, and is illustrated in Figure 2.

1.3 Statutory controls

The management of Aboriginal heritage at the Moolarben Coal Complex is undertaken in accordance with the currently approved Moolarben Coal Complex Heritage Management Plan (MCO 2016).

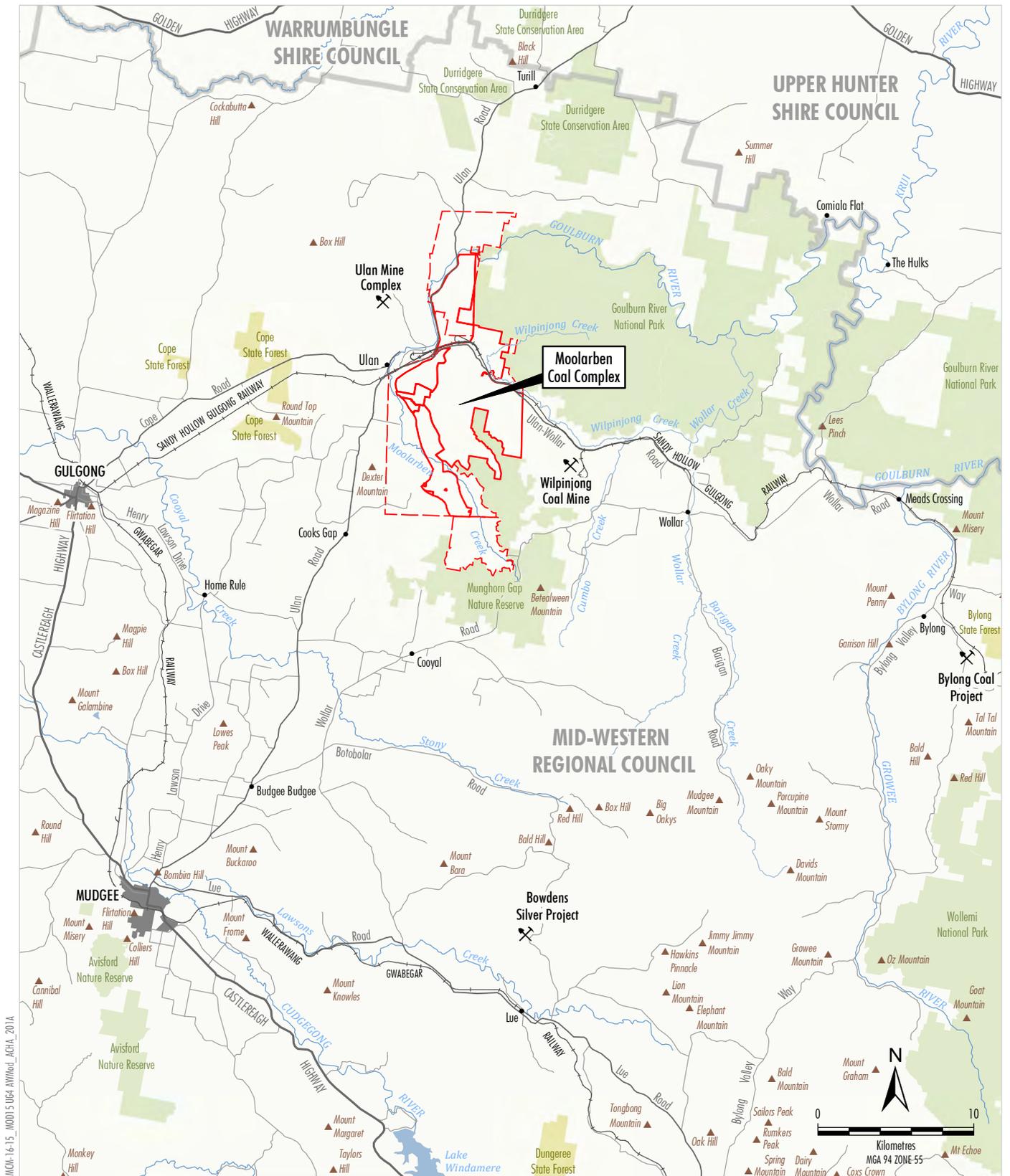
Aboriginal objects are protected under the *National Parks and Wildlife Act 1974* (NSW). The assessment, investigation and reporting on Aboriginal objects and cultural heritage is guided by the National Parks and Wildlife Regulation 2009 which establishes three subordinate regulatory instruments:

1. *Aboriginal cultural heritage consultation requirements for proponents 2010* (Department of Environment, Climate Change and Water [DECCW], 2010a) (hereafter referred to as ‘the Consultation Requirements’)
2. *Guide to investigating, assessing and reporting Aboriginal cultural heritage in NSW* (Office of Environment and Heritage [OEH], 2011a)
3. *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b) (hereafter referred to as ‘the Code of Practice’)

For this modification MCO is relying on existing registrations and ongoing consultation with the RAPs who were involved in the consultation process for the Stage 1 and Stage 2 Project Approvals, noting that this consultation process has been established and conducted in accordance with Item 1 above, and there will be no major departure from the consultation requirements.

This report presents a combined Aboriginal Cultural Heritage Assessment (ACHA) and Archaeological Report (to satisfy the requirements and ensure no major departure from Item 2 and Item 3 respectively).

The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance (Australia ICOMOS, 2013) is a non-statutory instrument that is accepted as presenting the best practice methods for the assessment of cultural heritage values.

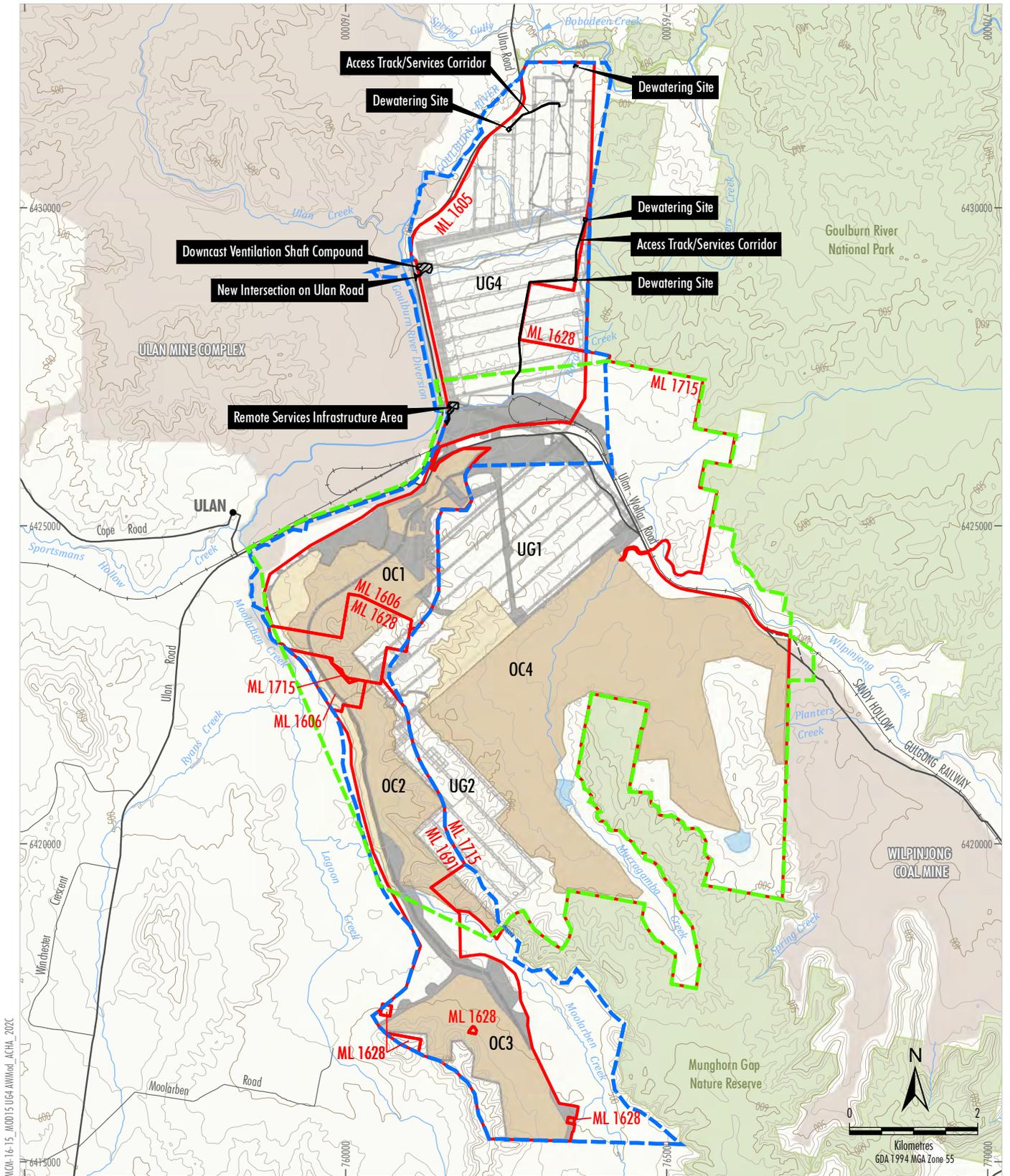


MOOLARBEN COAL

MOOLARBEN COAL COMPLEX

Location of Subject Area
Within Regional Context

Figure 1



MCO-16-15_MDD15 UG4 AWWMod_ACHA_2020

LEGEND

- NSW National Parks and Wildlife Service
- Other Mining Operations
- Mining Lease Boundary
- Existing/Approved Development
- Open Cut Mining Area
- Out-of-pit Emplacement
- Surface Infrastructure Area
- Clean Water Diversion Infrastructure
- Underground Longwall Layout
- Haul Road
- Road Realignment (not yet constructed)
- Approved Stage 1 Project Boundary
- Approved Stage 2 Project Boundary

- UG4 Ancillary Works Modification
- Indicative Surface Infrastructure Area

Source: MCO (2019); NSW Department of Planning, Industry and Environment (2019)


MOOLARBEN COAL
 MOOLARBEN COAL COMPLEX
 Subject Area for the UG4 Modification

Figure 2

2. Consultation with the Aboriginal Community

In administering its statutory functions under Part 6 of the NPW Act, the OEH requires that proponents consult with Aboriginal people about the Aboriginal cultural heritage values (cultural significance) of Aboriginal objects and/or places within any given development area, in accordance with clause 80C of the NPW Regulation and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs) (DECCW 2010a).

Consultation with the Aboriginal community for this ACHA has been undertaken in compliance with the requirements of the following legislative instruments and the following guidelines:

- *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (Department of Environment and Conservation 2005);
- *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010a);
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b);
- *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010c);
- *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011);
- *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia ICOMOS 2013);
- *NSW Minerals Industry Due Diligence Code of Practice for the Protection of Aboriginal Objects* (NSW Minerals Council 2010);
- *Engage Early – Guidance for proponents on best practice Indigenous engagement for environmental assessments under the Environmental Protection and Biodiversity Act, 1999* (EPBC Act) (Commonwealth Government 2016); and
- *NSW National Parks and Wildlife Regulation 2009* (NPW Regulation).

The OEH maintains that the objective of consultation with Aboriginal communities about the cultural heritage values of Aboriginal objects and places is to ensure that Aboriginal people have the opportunity to improve ACHA outcomes by (DECCW 2010a):

- providing relevant information about the cultural significance and values of Aboriginal objects and/or places;
- influencing the design of the method used to assess cultural and scientific significance of Aboriginal objects and/or places;
- actively contributing to the development of cultural heritage management options and recommendations for any Aboriginal objects and/or places within the proposed subject area; and
- commenting on draft assessment reports before they are submitted by the proponent to the OEH.

Consultation in the form outlined in the ACHCRs is a formal requirement where a proponent is aware that their development activity has the potential to harm Aboriginal objects and/or places. The OEH also recommends that these requirements be used when the certainty of harm is not yet established but a proponent has, through some formal development mechanism, been required to undertake a cultural heritage assessment to establish the potential harm their proposal may have on Aboriginal objects and places.

The ACHCRs outline a four-stage consultation process that includes detailed step by step guidance as to the aim of each stage, how it is to proceed and what actions are necessary for it to be successfully completed.

The four stages are:

- Stage 1 – Notification of the Modification proposal and registration of interest.
- Stage 2 – Presentation of information about the proposed Modification.
- Stage 3 – Gathering information about the cultural significance.
- Stage 4 – Review of the draft cultural heritage assessment report.

The document also outlines the roles and responsibilities of the OEH, Aboriginal parties (including Local and State Aboriginal Land Councils) and proponents throughout the consultation process.

To meet the requirements of consultation it is expected that proponents will (DECCW, 2010a):

- bring the Registered Aboriginal Parties (RAPs) or their nominated representatives together and be responsible for ensuring appropriate administration and management of the consultation process;
- consider the cultural perspectives, views, knowledge and advice of the RAPs involved in the consultation process in assessing cultural significance and developing any heritage management outcomes for Aboriginal objects and/or places;
- provide evidence to the OEH of consultation by including information relevant to the cultural perspectives, views, knowledge and advice provided by the RAPs;
- accurately record and clearly articulate all consultation findings in the final cultural heritage assessment report; and
- provide copies of the cultural heritage assessment report to the RAPs who have been consulted.

The consultation process undertaken to seek active involvement from relevant Aboriginal people followed the current NSW framework, namely, the ACHCRs and clause 80C of the NPW Regulation. Section 1.3 of the ACHCRs describes the guiding principles of the document. The principles have been derived directly from the Australian Heritage Commission’s Ask First: A guide to respecting Indigenous heritage places and values (Australian Heritage Commission 2002). Both documents share the aim of creating a system where prior informed advice can be sought from the Aboriginal community.

The following sections outline the process and results of the consultation conducted during the preparation of this ACHA to ascertain and manage the Aboriginal cultural heritage values of the subject area.

2.1 Stage 1 – Notification and Registration

Aboriginal stakeholder groups with an interest in the MCC have previously been identified (in compliance with the ACHCRs) and MCO has maintained ongoing consultation and engagement with these groups since 2004 (see overview in Kuskie 2013a: 70).

For the UG4 Modification, the existing Aboriginal stakeholder groups were contacted and consulted with. These parties are considered to be the RAPs for the UG4 Modification and include the following:

- Mr Craig McConnell;
- Ms Aleisha Lonsdale;
- Ms Warranha Ngumbaay;
- Mudgee Local Aboriginal Land Council;
- Murong Gialinga Aboriginal and Torres Strait Islanders Corporation;
- North-East Wiradjuri Company Ltd; and
- Warrabinga Native Title Claimants Aboriginal Corporation.

In addition to the RAPs listed above one RAP wishes to remain anonymous.

2.2 Stage 2 and Stage 3 – Presentation of Modification Information and Gathering Information about Cultural Significance

2.2.1 Proposed Methodology and Information Session

Information regarding the UG4 Modification ACHA was provided in writing to all RAPs on 3 July 2019. A copy of the Proposed Methodology for the ACHA was provided for review and comment.

A minimum of 28 days was allowed for RAPs to provide input regarding to the following aspects:

- the nature of the Proposed Methodology;
- any Aboriginal objects or places of cultural value within the indicative subject area, or issues of cultural significance;
- any restrictions or protocols considered necessary in relation to any information of sensitivity that may be provided; and
- any other factors considered to be relevant to the heritage assessment.

All RAPs were invited to provide advice on Aboriginal cultural heritage values at all stages during the preparation of the assessment.

Comments were received from two RAPs: Muring Gialinga and one RAP who requested confidentiality. Additional comments were received from two Aboriginal organisations: Ibbai Waggan-Wiradjuri People and one organisation who also requested confidentiality. The commenters (with the exception of Ibbai Waggan-Wiradjuri People) expressed similar concerns, which can be summarised as follows:

- Unsatisfactory engagement by MCO (outside of this Modification ACHA) with the RAP groups;
- Concerns around the effects of underground mining on the water table
- Concerns around the effect of underground mining on surface water including the Goulburn River and its tributaries
- Concerns around the potential effect of underground mining on The Drip – a significant Wiradjuri cultural site on the Goulburn River.

The above concerns were considered when finalising the draft assessment methodology, noting that:

- The Modification does not involve any modifications to the approved underground longwall layout and would not result in any change to assessed and approved impacts of the UG4 mine on the surrounding environment, including groundwater resources; and
- The Dewatering Site (North) is the closest part of the Modification to the Drip. The Drip is located approximately 400 m north-east of Dewatering Site, and at its closest point (horizontally) the Goulburn River Gorge is approximately 250 m from the Dewatering Site (North). It is worth noting also that the dewatering bores will dewater the underground workings of the UG4 mine and are not designed or proposed to actively pump any groundwater from water bearing zones that may exist in the overlying strata.

The methodology and responses are provided in Appendix 1.

2.3 Stage 4 – Review of Draft Report

In accordance with the Consultation Guidelines, a draft of this ACHA was provided to all RAPs listed in Table 2 for review and comment.

2.3.1 Written Submissions Received

Written submissions on the draft ACHA were received from the following RAPs in accordance the ACHRs:

- Mudgee Local Aboriginal Land Council;
- Murong Gialinga Aboriginal and Torres Strait Islander Corporation;
- North-East Wiradjuri Company Ltd; and
- One anonymous RAP.

Further to this, one additional Aboriginal organisation, who wishes to remain anonymous, also provided a submission on the draft ACHA. Copies of the submissions (excluding those kept confidential) are included in this report in Appendix 1. The proponent's consideration and responses to each submission are provided below.

3 September 2019, Mudgee Local Aboriginal Land Council

General concern regarding increased impacts to Aboriginal Cultural Heritage in the Region.

- MCO acknowledges that Aboriginal heritage is of primary interest to the Aboriginal community, and that Aboriginal people have the right to be consulted and involved in relation to the management of their heritage. MCO adheres to the consultation and management practices described in the approved Moolarben Coal Complex Heritage Management Plan.

Concern regarding impacts on Bora Creek area including disturbance of S1MC230.

- Additional detail has been added to Section 11 regarding site S1MC230. It is noted that the site has previously been subject to surface salvage works. Consequently, the Modification would not be the first instance of impact on this site. Notwithstanding, further management of S1MC230 would be undertaken prior to the commencement of works.
- The proposed works will not impact on the Bora Creek Management Area identified and described in Section 3 and Section 5.2.1 of the approved Moolarben Coal Complex Heritage Management Plan.

Concern that not all areas have been surveyed prior to approval being sort.

- As outlined in Section 11.2 of this report, the survey area assessed for this ACHA consisted of 10.8 ha. This was incorporated within the boundaries of the original -and surveyed- footprint except for one route readjustment for an access track/ services corridor, resulting in a small area not being surveyed. Niche determined it was likely to have identical archaeological characteristics as the adjacent subject area that was subject to detailed surveys. Furthermore, this area would be subject to additional surveys prior to the construction of the proposed access track/ services corridor

Concern regarding table 18 and categorisation as ‘partial loss of value’ when sites will be salvaged rather than categorisation as ‘total loss of value’.

- Sites are managed in accordance with the approved Moolarben Coal Complex Heritage Management Plan. The management response will be directly dependent upon the type, condition and significance of the site and may include one or a combination of surface collection, subsurface testing, salvage excavation and/or avoidance. Management procedures are undertaken to record and recover a representative sample of artefacts to avoid a total loss of value.

Concerns regarding the impacts on Groundwater, the Goulburn River Catchment, and the Drip in regard to dewatering.

- The Modification does not involve any modifications to the approved underground longwall layout and would not result in any change to assessed and approved impacts of the UG4 mine on the surrounding environment, including groundwater resources; and
- The Dewatering Site (North) is the closest part of the Modification to the Drip. The Drip is located approximately 400 m north-east of Dewatering Site, and at its closest point (horizontally) the Goulburn River Gorge is approximately 250 m from the Dewatering Site (North). It is worth noting also that the dewatering bores will dewater the underground workings of the UG4 mine and are not designed or proposed to actively pump any groundwater from water bearing zones that may exist in the overlying strata.

Concerns regarding the ongoing management of heritage on site as no annual meeting has taken place.

- As described in Section 2 of the ACHA Mudgee Local Aboriginal Land Council has been consulted as a Registered Aboriginal Party for the Modification. As described in the approved Moolarben Coal Complex Heritage Management Plan, MCO is committed to maintaining ongoing consultation with Aboriginal stakeholders throughout the life of the MCC.

18 September 2019, Murong Gialinga Aboriginal and Torres Strait Islander Corporation

General concern regarding increased impacts to Aboriginal Cultural Heritage in the Region.

- MCO acknowledges that Aboriginal heritage is of primary interest to the Aboriginal community, and that Aboriginal people have the right to be consulted and involved in relation to the management of their heritage. MCO adheres to the consultation and management practices described in the approved Moolarben Coal Complex Heritage Management Plan.

Concern regarding impacts on Bora Creek area including disturbance of S1MC230.

- Additional detail has been added to Section 11 regarding site S1MC230. It is noted that the site has previously been subject to surface salvage works. Consequently, the Modification would not be the first instance of impact on this site. Notwithstanding, further management of S1MC230 would be undertaken prior to the commencement of works.
- The proposed works will not impact on the Bora Creek Management Area identified and described in Section 3 and Section 5.2.1 of the approved Moolarben Coal Complex Heritage Management Plan.

Concern that not all areas have been surveyed prior to approval being sort.

- As outlined in Section 11.2 of this report, the survey area assessed for this ACHA consisted of 10.8 ha. This was incorporated within the boundaries of the original -and surveyed- footprint except for one route readjustment for an access track/ services corridor, resulting in a small area not being surveyed. Niche determined it was likely to have identical archaeological characteristics as the adjacent subject area that was subject to detailed surveys. Furthermore, this area would be subject to additional surveys prior to the construction of the proposed access track/ services corridor

Concern regarding table 18 and categorisation as 'partial loss of value' when sites will be salvaged rather than categorisation as 'total loss of value'.

- Sites are managed in accordance with the approved Moolarben Coal Complex Heritage Management Plan. The management response will be directly dependent upon the type, condition and significance of the site and may include one or a combination of surface collection, subsurface testing, salvage excavation and/or avoidance. Management procedures are undertaken to record and recover a representative sample of artefacts to avoid a total loss of value.

Concerns regarding the impacts on Groundwater, the Goulburn River Catchment, and the Drip in regard to dewatering.

- The Modification does not involve any modifications to the underground longwall layout and would therefore not impact the subsurface water table. The Dewatering Site (North) is the closest part of the Modification to the Drip. The Drip is located approximately 680 m north-east of Dewatering Site, and at its closest point the Goulburn River Gorge is approximately 250 m from the Dewatering Site (North).

Concerns regarding the ongoing management of heritage on site as no annual meeting has taken place.

- As described in Section 2 of the ACHA Murong Gialinga Aboriginal and Torres Strait Islander Corporation has been consulted as a Registered Aboriginal Party for the Modification. As described in the approved Moolarben Coal Complex Heritage Management Plan, MCO is committed to maintaining ongoing consultation with Aboriginal stakeholders throughout the life of the MCC.

23 August 2019, North-East Wiradjuri Company Ltd

Concern regarding the grinding grooves situated in UG4 (S1MC264).

- The Modification would not change the status of this site. As outlined above, sites are managed in accordance with the approved Moolarben Coal Complex Heritage Management Plan. The management response will be directly dependent upon the type, condition and significance of the site and may include one or a combination of surface collection, subsurface testing, salvage excavation and/or avoidance.

24 September 2019, anonymous RAP

One anonymous RAP and one anonymous Aboriginal organisation provided a single submission which has been considered by the proponent. The submission raised similar concerns to the other RAPs with regard to Bora Creek and was otherwise supportive of the approach and recommendations presented in the draft ACHA.

3. Investigators and contributors

Table 1: Contributors, affiliations and contributions

Contributor	Affiliation	Contribution	Qualification
Emma Syme	Moolarben Coal Operations	Cultural Heritage Officer, cultural heritage survey	
Tammy Peterson	Mudgee LALC	RAP, cultural heritage survey	
Larry Flick	Murong Gialinga Aboriginal and Torres Strait Islander Corporation	RAP, cultural heritage survey	
Jamie Reeves	Niche	Archaeologist, Report Writing	BA(Hons)
Clare Anderson	Niche	Internal Q and A	BA (Hons)
Trent Cini	Moolarben Coal Operations	Environment and Community Superintendent	

4. Description of development proposal

4.1 Modification location

The subject area is situated within the Central Tablelands of NSW, approximately 5 km north-east of the township of Ulan, and north of MCC open cut operations in ML 1605 and ML 1628. There are separate components for the subject area for the proposed UG4 Ancillary Works Modification, being (Figure 2):

- Downcast Ventilation Shaft Compound
- Remote Services Infrastructure Area
- Dewatering Sites (North)
- Dewatering Sites and Access Track/ Services Corridor (Saddlers Creek Rd)
- Dewatering Sites and Access Track/ Services Corridor (South)

The subject area is situated on a mixture of woodland, shrubland, existing vehicle tracks and exploration lines, and land that has been cleared for pasture and previously logged. The subject areas, particularly the dewatering sites and attendant access tracks/ services corridor stretch across various landscapes including: flat-topped rocky ridges; moderate and gentle hill slopes; flats and undulating country.

Around the Ulan area the slopes are covered by woodland and shrubland, with some areas having been previously cleared and now containing re-growth vegetation. Footslopes, flats and undulating country has been cleared for pasture and heavily impacted by various agricultural activities as well as logged for timber. Locations surrounding the subject area have been previously subject to systematic Aboriginal heritage survey during previous assessments and management activities conducted by Ulan and MCO.

4.2 Proposed works

The key features associated with the Modification include:

- relocation and expansion of dewatering sites and associated infrastructure;
- development of a downcast ventilation shaft for UG4 and associated compound (including service drop holes); and
- development of a Remote Services Infrastructure Area (RSIA) (including service drop holes) above the UG4 mains.

All the proposed activities have the potential to harm Aboriginal objects that are present at the same location as the activities; either at the ground surface (e.g. stone artefacts and scarred trees), beneath the ground surface (e.g. archaeological deposits) or part of landscape features (e.g. grinding grooves and rockshelters).

5. Previous archaeological work

5.1 Heritage Registers

5.1.1 Aboriginal Heritage Information Management System (AHIMS)

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) was conducted on 12 April 2019 (Search ID #414662) and 6 August 2019 (Search ID#440183). The search areas formed a 3.5 km x 6.8 km rectangle over the subject area.

There has been extensive previous survey around and some survey within the MCC UG4 area (Figure 3). The extensive search returned a total of 154 registered Aboriginal heritage sites within the search area (Figure 4). The raw AHIMS search results are presented in Attachment 1. The AHIMS results are presented and summarised in Table 2, with sites being grouped by the archaeological or cultural heritage features recorded and their context which is recorded as open or closed on the register. Open sites refers to site that have an “open context” (they are in the open), such as stone artefact sites next to creek lines, or scarred trees in a woodland. Closed site refers to sites which are not in the open, and usually this means rockshelters, caves or overhangs where Wiradjuri people may have lived or made art.

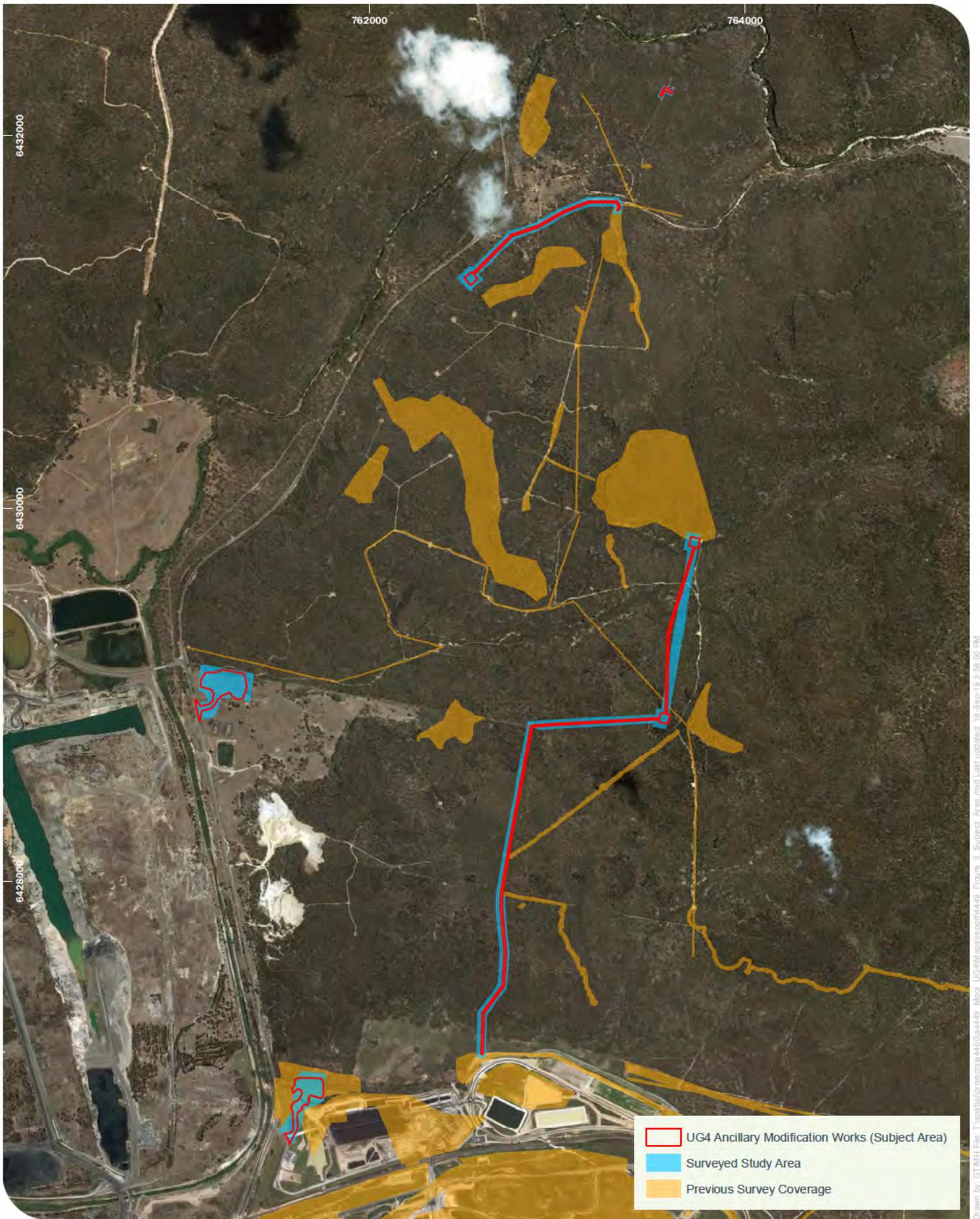
Table 2: AHIMS search results (ID#414662 and ID#440183) summarised by site features

Site Context / Site Features	Frequency	% of all sites
Open Site Context	144	94%
Art (Pigment or Engraved)	1	1%
Artefacts	140	91%
Grinding Grooves	2	1%
Modified Tree	1	1%
Closed Site Context (Rockshelters)	10	6%
Art (Pigment or Engraved)	4	3%
Artefacts	4	3%
Artefact, Art, Grinding Grooves	1	1%
Potential Archaeological Deposit	1	1%
Total:	154	100%

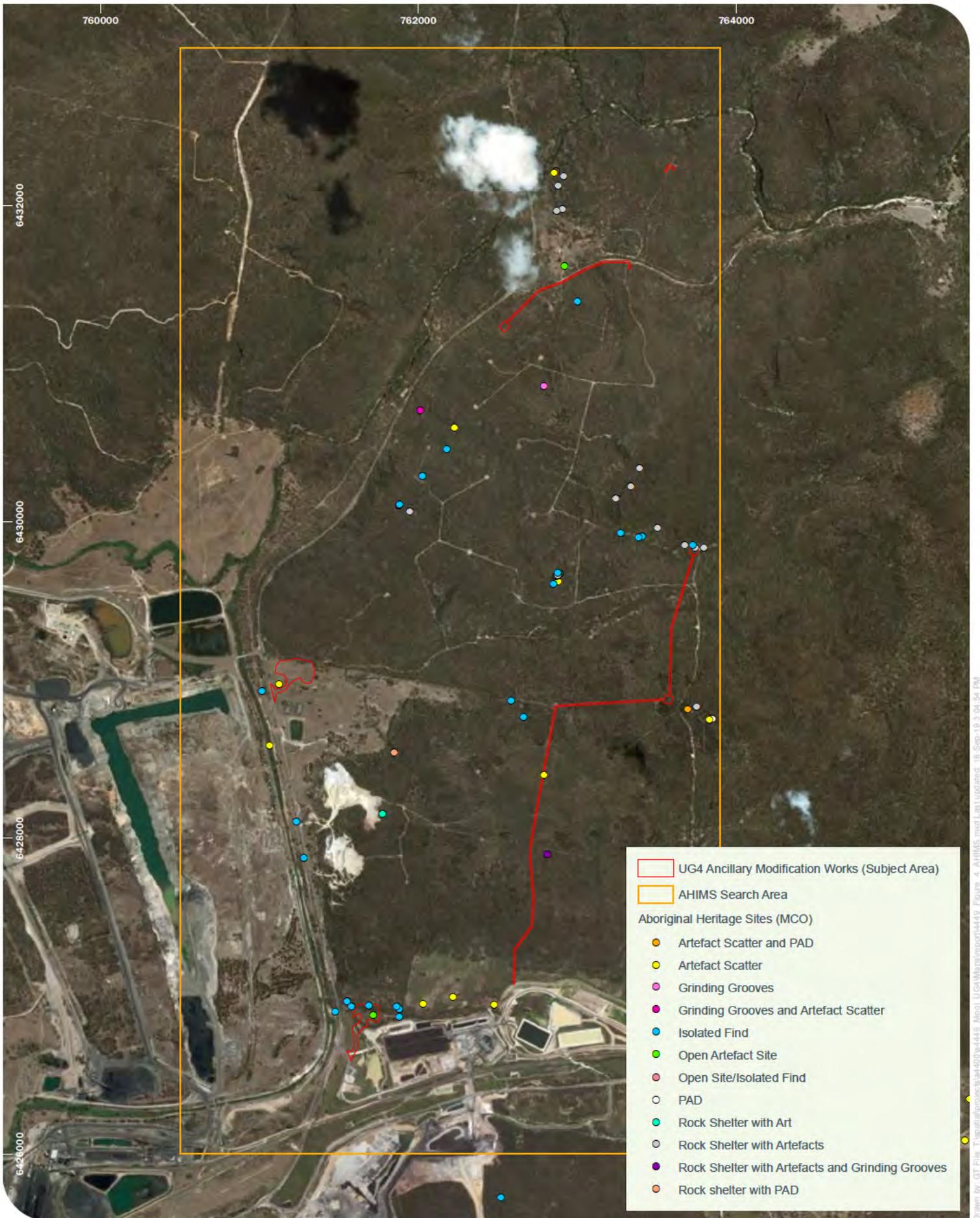
The frequencies of Aboriginal site features in the search results are typical for the Ulan region, and consistent with regional trends identified during previous studies at Moolarben Coal. The high number of open site contexts is a result of the extensive survey work done on hills, footslopes and flats. While there are some examples of closed site context sites in the UG4 area, they are less represented in the locality given there are only limited conditions suitable for rockshelter formations. For the most part, the UG4 area (and the subject area in its entirety) consists of stony slopes and flats, rather than cliffs and escarpments where rockshelters are found.

Stone artefact sites occur across all landforms in the region, but are particularly frequent on lower slopes, foot slopes and flats. Usually they consist of stone artefacts on the ground surface in open areas. Most previously recorded sites in the AHIMS search area are stone artefact sites which is reflective of these landform types accounting for the majority of the AHIMS search area. Open Stone artefact sites in the region can contain anywhere between a single artefact to many hundreds of artefacts. Scarred trees are less represented, which is reflective of past land clearing for agriculture, forestry and mining. Shelter sites

with art and potential archaeological deposits are very frequent in the ridges and steeper country around Ulan, however they are rare in the search area which only covers small areas of steep slope and sandstone cliff country.



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5.1.2 MCO Sites Database

MCO maintains an on-site Aboriginal Heritage Database (the MCO Sites Database). The MCO Sites Database shows strong agreement with the AHIMS results, with 107 sites being present within the search area.

5.1.3 Other registers

Searches of the Australian World Heritage Database, the Commonwealth Heritage List, National Heritage List, State Heritage Register, State Heritage Inventory, the Mid-western Regional Council Local Environmental Plan (LEP) (2018) were conducted on 12 April 2019.

The searches concluded that there are no historical or Aboriginal heritage items listed on these registers within the subject areas and it is unlikely that the subject area falls within the visual catchment of any nearby heritage items. The closest LEP heritage item is the Goulburn River National Park, located adjacent to the Subject areas (Table 3).

Table 3: Listed heritage items in proximity to the subject area

Heritage Register	Items in the subject area	Items nearby to the subject area
Australian World Heritage Database	Nil	Nil
Commonwealth Heritage List	Nil	Nil
National Heritage List	Nil	Nil
State Heritage Register	Nil	Nil
State Heritage Inventory	Nil	Nil
Local Environmental Plan Schedule	Nil	Goulburn River National Park (1994)

There are no works proposed in the Goulburn River National Park, nor are the proposed works within a proximity to the National Park that will adversely affect its heritage or conservation values. In summary there are no listed heritage items within the subject areas.

5.2 Ethnography and History

At the time of first contact, the subject area lay within the land occupied by Wiradjuri speaking people (Tindale 1974, Horton 1994), close to boundaries with the Kamilaroi, Gweagal and Wonnarua speaking peoples. Pearson (1981: 81) hypothesises three possible Wiradjuri speaking clans living at Bathurst, Wellington and Mudgee – Rylstone. The subject area most likely lies within the Mudgee - Rylstone group's area. Based on his review of historical sources, Pearson (1981: 75) suggested that most day to day activities were undertaken by groups of up to 20 individuals who came together into larger groups at certain times of the year to utilise a resource or undertake law or ceremonial activities.

During the 1820s, increasing European settlement along the Cudgegong River and from Mudgee to Wellington would have resulted in increasing upheaval to traditional Aboriginal practices. Hostilities between the local Aboriginal population and non-indigenous settlers peaked between 1824 and 1826 with the advent of martial law by Governor Brisbane and resistance from Windradyne, a Wiradjuri man (Haglund 1999). Settlement increased with the gold rush between the 1850s and 1870s, causing further displacement of the local Aboriginal population.

Today, Wiradjuri people continue to live in the district and maintain an interest in their cultural heritage. The revitalisation of the Wiradjuri language has been taking place over the last 10 years with the publication of *A First Wiradjuri Dictionary* and Wiradjuri being taught at schools and TAFE in Parkes and Forbes (Senior and Rudder 2005).

5.3 Previous heritage and archaeological assessments

5.3.1 Local and Regional assessments

The earliest evidence of Aboriginal occupation in the region was found at Granites 2 Shelter, located approximately 150 km south-west of the subject area, and dates to 7,000 years before present (BP) (Pearson 1981). A number of other archaeological excavations have been undertaken in the nearby area and resulted in dates of occupation in the last 5,000 years (Kuskie 2009).

A number of archaeological models for the distribution of material evidence of Aboriginal use of the landscape have been developed for the region. The purpose of archaeological models is to assist in the prediction of what Aboriginal sites may be present in the landscape and where they might be located.

The first archaeological model of the region was developed by Pearson (1981) through the analysis of sites in the Upper Macquarie. He identified a range of site types typical to the region including open camp sites, scarred trees and grinding grooves, as well as the presence of ceremonial sites and burial sites.

From his data, Pearson (1981) proposed that:

- Most sites would occur between 10 m and 500 m from water, with the largest sites occurring nearest to water.
- Good soil drainage, views over watercourses, level ground with shelter from winds and elevation above cold air were important factors in site location.
- The majority of sites were in places that would originally have been open woodlands with an adequate source of fuel.
- Burials and grinding grooves would be located as close to habitation as possible.
- Grinding grooves required the presence of suitable stone, such as sandstone.
- Burials were most likely to occur where soils were deep enough for internment.
- Ceremonial sites such as earth rings and stone arrangements would be situated away from campsites, potentially in isolated places, on small hills or knolls but also on flat land.
- There was no obvious patterning to the location of scarred and carved trees beyond proximity to water and occupation sites.
- Quarries may occur where suitable sources of stone were present and accessible.
- Camp sites were rarely used by Aboriginal people in the past for longer than three nights and sites with extensive archaeological deposits represented accumulation of material over multiple visits.

This model has since been revised and refined as part of the many archaeological assessments that have been conducted as part of the environmental assessment and approval process for the three mines located within 10 km of the subject area: Ulan Coal Mine, Wilpinjong Coal Mine and the MCC.

Ulan Coal Mine

The Ulan Coal Mine is an open cut and underground coal mine located adjacent to and north-west of the MCC, near the village of Ulan. The Ulan Coal Mine has been operational since the 1920s. Archaeological assessment of the Ulan Coal Mine commenced in the 1980s (Haglund 1980) with 29 assessments occurring over subsequent years (Table 4).

An Aboriginal sites database was developed for the Ulan Coal Mine as part of the environmental assessment process for the Part 3A Approval (Kuskie 2009). Revision 10 of the Ulan Coal Mine Aboriginal Sites Database included 1,274 Aboriginal sites within the Ulan Coal Mine, including 322 rock shelters with

PADs (Table 4). The most frequent Aboriginal site features known within the Ulan Coal Mine were artefact scatters and open sites, rock shelters with PADs and isolated artefacts.

Open camp sites range in size at the Ulan Coal Mine from one stone artefact to 990 stone artefacts (Kuskie 2009: 109). The bulk of open camp sites contain less than 10 artefacts and most sites occur within a 50 square metre (m²) area or less (Kuskie 2009: 109).

Table 4: Summary of Assessments at the Ulan Coal Mine (Source: Kuskie 2018)

Author	Date	Title
Haglund	1980	Preliminary Archaeological Survey of the Coal mining Area at Ulan, NSW
Haglund	1981a	Archaeological Survey and Sampling at the Site of the Ulan Coal Mine, Ulan, NSW
Haglund	1981b	Ulan Coal Mine: Archaeological Investigation in Connection with Proposed Changes in Development Plans
Corkill	1991	Survey for Aboriginal Archaeological Sites at Ulan Colliery, New South Wales: Proposed Overland Conveyor and Creek Site Development
Haglund	1992	Sample Surveys in Relation to Proposed Mine Extension in the Ulan Area, NSW
Haglund	1996a	Salvage Excavation Completed for Ulan Coal Mines Ltd: NPWS Site 36-3-177
Haglund	1996b	Archaeological Inspection and Monitoring of Track and Drill Site East of Ulan Creek
Edgar	1997	Ulan Open Cut Mine: Trench Through Proposed Highwall Zone 3: Aboriginal Heritage Aspects
Haglund	1999a	Addendum to Ulan Coal Mines Second Longwall Project Environmental Statement
Haglund	1999b	Ulan Coal Mines Second Longwall Project Environment Statement: Preliminary Survey for Aboriginal Sites
Haglund	1999c	Ulan Coal Mines Pty Ltd: Archaeological Review and Inspection in Relation to Potential High Wall Mining – Areas West and North-west of Trench A
Haglund	1999d	Report on Aboriginal heritage Studies Relating to SEPP No. 34 Application by Ulan Coal Mine
Therin	2000	Spring Gully 5 Salvage Excavation Usewear and Residue Report
Kuskie	2000	An Assessment of Two Aboriginal Grinding Grooves Sites at Ulan Coal Mine, Central Tablelands, New South Wales
Haglund	2001a	Salvage Excavation Completed for Ulan Coal Mines Ltd: Site SG5 Aboriginal Rock Shelter Site Vol I
Haglund	2001b	Salvage Excavation Completed for Ulan Coal Mines Ltd: Site SG5 Aboriginal Rock Shelter Site Vol III
White	2001a	Salvage Excavation Completed for Ulan Coal Mines Ltd Site SG4 Aboriginal Rock Shelter Vol II
White	2001b	A Comment on the stone artefact assemblage from squares E 7 and E8 at Site SG6, Ulan, NS
Kuskie and Webster	2001	Archaeological Survey of Aboriginal Heritage within Longwall Panels 18-22, Mining Lease 1468 and 1341, Ulan Coal Mine, Central Tablelands, New South Wales, Volumes 1 and 2
Kuskie	2002	An Archaeological Assessment of a Proposed Basalt Quarry within Mining lease 1468, Ulan Coal Mine, Central Tablelands New South Wales
Kuskie and Clarke	2003	Proposed Open Cut Mine extension, Additional Infrastructure and Consolidation Consents at Ulan Coal mine New South Wales: Aboriginal heritage Assessment (Vol. 1)
Kuskie	2004	Proposed Open Cut Mine Extension, Additional Infrastructure and Consolidation Consents at Ulan Coal mine New South Wales: Aboriginal heritage Assessment (Vol. 2)
Kuskie and Clarke	2005a	Proposed Open Cut Mine Extension, Additional Infrastructure at Ulan Coal Mine: Aboriginal heritage Assessment
Kuskie and Clarke	2005b	Archaeological Survey of Aboriginal heritage within SMP Application Area (Longwall Panels 23-25 and W1) of Mining Lease 1468, Ulan Coal Mine, Central Tablelands. Vol A and Vol B
Kuskie and Clarke	2007	Archaeological Survey of Aboriginal Heritage within SMP Application Area (Longwall Panels W2 and W3) of Mining Lease 1468, Ulan Coal Mine, Central Tablelands, New South Wales: Volume A and Volume B
Kuskie	2008	Ulan Coal Mines Limited: Project Waratah: Preliminary Aboriginal Heritage Assessment
Kuskie	2009	Ulan Coal Continued Operations Aboriginal Heritage Impact Assessment

Kuskie	2010a	Ulan Coal Continued Operations Aboriginal Heritage Impact Assessment – Supplementary Report for North 1 panels Project Modification
Kuskie	2012a	Ulan Coal Continued Operations Project: Test excavations of Aboriginal Rock Shelter Sites within the North 1 Panels - Interim Report

Table 5 summarises the archaeological sites that have been previously recorded at Ulan Coal Mine.

Table 5: Summary of Aboriginal sites at the Ulan Coal Mine as of 2009 (Source: Kuskie 2009: 108)

Aboriginal Site Features	Number of Aboriginal Sites
Artefact scatters and Open Sites	521
Isolated Artefacts	291
Grinding Groove	13
Grinding Grooves and Artefact Scatters	4
Ochre Quarry	3
Scarred Trees	8
Scarred Tree with Artefact Scatters	2
Stone Arrangements	6
Waterhole/Well	1
Rock shelter with Artefacts	87
Rock shelter with Grinding Grooves	3
Rock shelter with Grinding Grooves and Artefacts	1
Rock shelter with Art	8
Rock shelter with Art and Artefacts	4
Rock shelter with PADs	322
Total	1,274

The stone artefact assemblage at the Ulan Coal Mine as of 2009 consisted of over 9,000 items (Kuskie 2009: 118). Most artefacts were made from quartz, with tuff and chert being the next most common raw material type. Acidic volcanics, basalt, bone, breccia, chalcedony, flint, granite, ironstone, lithic sandstone, quartzite, rhyolite, sandstone, shell, silcrete, siltstone and petrified wood stone artefacts were also present in small quantities. The bulk of the artefact assemblage comprised complete and broken flakes, angular fragments, cores and core fragments. Retouched and utilised flakes, backed artefacts, hammer stones, anvils and axes were also present.

An analysis of the spatial distribution of Aboriginal sites and artefacts was completed for the archaeological resources at the Ulan Coal Mine. This involved the separation of the landscape into distinct landform and slope classes (Kuskie 2009: 131). Approximately 62% of the Ulan Coal Mine consisted of comparable landforms to the subject area – that is, simple slopes and ridge crests with first order drainage paths (Kuskie 2009: 21).

It was noted that overall, artefacts occurred at a very low mean density across the analysis area (Kuskie 2009: 133) and indicated a background discard. Level to gently inclined terraces had some of the highest densities of artefacts as did level to very gently inclined spur crests, while moderately inclined simple slopes had marginally higher densities of artefacts than gentle simple slopes and flats. This may be the result of the presence of assemblages within rock shelters.

Rock shelters were found to occur on scarps, simple slopes, spur crests and drainage depressions with sandstone rock formation. Artefact densities were found not to increase in density with proximity to water (Kuskie 2009: 135).

As a result of the previous archaeological assessment of the Ulan Coal Mine (Table 4), including spatial analysis of the distribution of sites and a review of the historical sources, an archaeological model was developed and has been refined (Kuskie and Clarke 2005b, 2007, Kuskie 2009). This model has subsequently been applied to the Wilpinjong Coal Mine and the MCC.

The model states that most evidence of occupation will date within the last 5,000 years, though may have extended 30,000 – 40,000 years BP. The model determines three zones of resources: primary resource zones, secondary resource zones and a third zone that encompasses the land beyond primary and secondary resource zones (Kuskie 2009: 22).

Primary resource zones: areas of more abundant and diverse resource rich zones in north-east Wiradjuri territory including the junction of the higher order watercourses such as Goulburn and Talbragar Rivers would most likely be a focus of occupation. These zones may have supported nuclear and extended family base camps, community base camps and congregations of larger groups. This zone may have been subject to longer stays and more frequent occupation than other areas, such as secondary resource zones. The model states that these zones would contain substantially higher counts and densities of artefacts, a greater range of stone materials and artefact types and a higher number of activity areas would be present.

Secondary resource zones: these are areas where resources such as watercourses, swamps and wetlands occur in close proximity to higher order watercourses and associated flats and terraces. Examples of secondary resource zones in the Ulan area include higher order parts of Moolarben Creek. In the model these zones were utilised for regular but sporadic seasonal encampments of small parties, but occupations of the encampments would typically have been for short periods. Compared to the surrounding areas this resource zone will host moderately higher counts and densities of artefacts, a number of activity areas, and a relatively broad range of raw materials and artefact types (but much lesser range than sites in primary resource zones).

Outside primary and secondary zones: occupation is anticipated to be hunter gatherer activities with small parties of men, women or children. Movement across the landscape would be transitory between resource locations and may include special purpose journeys for ceremonial purpose or the procurement of stone. Utilisation of landforms such as simple slopes, ridge crests, spur crests and lower order watercourses would be far less intense than that found in primary and secondary resource zones.

The evidence of this occupation would be low to very low artefact counts and densities, little range in the number of activity areas, and dates of sporadic occupation rather than continuous occupation. Evidence of stone quarries at sources may also be present.

In this model, activities that may have occurred in the landscape include food procurement and processing, food consumption, maintenance and production of tools, the building of shelter, children's play, ceremonial activity, spiritual activity, burials and social and political activity by Aboriginal people.

The bulk of these activities would be supported through the presence of material evidence; in particular through the stone artefact assemblage. For instance, food procurement and processing might be evident through the presence of use-wear residue on stone tools. Ceremonial activities may be evident by the presence of carved trees, bora grounds and stone arrangements.

The archaeological model predicts that most stone artefacts will be made of quartz due to its ease of access and availability in the local landscape. The model hypothesises that the relative intensity of use of each of the materials will be dependent on the proximity of the original source of the stone. Most stone procurement is hypothesised to have occurred during normal daily and seasonal movement without the need for special purpose visits. As a result of the abundance of available local stone, the stone is less likely to exhibit intensive reduction as evidence of conservation of material.

Most stone technology will be basic and non-specific (e.g. complete and broken flakes) with low frequencies of microblade or microlithic technologies, bipolar knapping, backing and use-wear.

Grinding grooves for the sharpening of ground edge axes may occur on exposed sandstone bedrock but are unlikely to occur in high numbers and most likely represent occasional and short term activities rather than special purpose visits.

Wilpinjong Coal Mine

The Wilpinjong Coal Mine is an open cut mine located adjacent to and east of the MCC. The Wilpinjong Coal Mine has been operational since 2006. During this time, 18 Aboriginal archaeological assessments are known to have occurred (Table 6).

In 2005 Navin Officer Heritage Consultants Pty Ltd (Navin Officer) undertook the primary environmental assessment, identifying 224 Aboriginal sites and PADs at the Wilpinjong Coal Mine, and subsequently completed a series of salvage excavations, and surface collections and rock art recording of some shelter sites (Navin Officer 2005, 2006a, 2006b). An Aboriginal and Cultural Heritage Management Plan was developed for the Wilpinjong Coal Mine (WCPL 2008). Between 2006 and 2009, Kayandel Archaeological Services (2006a, 2006b, 2006c, 2006d, 2007a, 2007b, 2007c, 2008a, 2008b, 2009a, 2009b; Boer-Mah 2006) completed a number of surface collections and test excavations. Many of these reports were not available for review at the time of this assessment.

Table 6: Summary of Assessments at the Wilpinjong Coal Mine (Source: Kuskie 2015)

Author	Date	Title
Navin Officer Heritage Consultants Pty Ltd	2005	Wilpinjong Coal Project Appendix F Aboriginal Cultural Heritage Assessment
Boer-Mah	2006	Lithics Report for Surface Salvage and Salvage Excavation at Wilpinjong Mine, N.S.W: June 2006. Prepared for Kayandel Archaeological Services
Navin Officer Heritage Consultants Pty Ltd	2006a	Wilpinjong Coal Project: Archaeological Salvage and Post EIS Investigations
Navin Officer Heritage Consultants Pty Ltd	2006b	Baseline Recording of Three Aboriginal Rock Arts Sites WCP 72, 152 and 163 at Wilpinjong, NSW
Kayandel Archaeological Services	2006a	Aboriginal Heritage Rapid Survey
Kayandel Archaeological Services	2006b	Wilpinjong Coal Project: Aboriginal Heritage Surface Salvage Summary Report. September 2006
Kayandel Archaeological Services	2006c	Proposed Electricity Transmission Line: Ulan Substation to Wilpinjong Coal Project: Aboriginal Cultural Heritage Assessment. March 2006
Kayandel Archaeological Services	2006d	Wilpinjong Coal Project: Aboriginal Cultural Heritage Survey: Supplemental Survey of Escarpment Areas and Report of Findings. November 2006
Kayandel Archaeological Services	2007a	Kayandel Archaeological Services. 2007. Archaeological Survey Report and Mapping for Proposed Borehole Locations: Aboriginal Pedestrian Survey. May 2007. Prepared for Wilpinjong Coal Pty Ltd

Author	Date	Title
Kayandel Archaeological Services	2007b	Wilpinjong Coal Project: Aboriginal Heritage: Surface Salvage of Sites. August 2007. Prepared for Wilpinjong Coal Pty Ltd
Kayandel Archaeological Services	2007c	Wilpinjong Coal Project. Aboriginal Heritage Surface Salvage Summary. Report. September 2007
Kayandel Archaeological Services	2008a	Surface Salvage Report: Wilpinjong Coal Mine, Mudgee: December 2008. Prepared for Wilpinjong Coal Ltd Pty
Kayandel Archaeological Services	2008b	Slate Gully Drillhole Assessments. Report not available for review
Kayandel Archaeological Services	2009a	Test excavations of the Pit 5 Extension. Report not available for review
Kayandel Archaeological Services	2009b	Wintersun Hill / Bald Knobb Test Excavations. Report not available for review
Kuskie	2013b	Wilpinjong Coal Mine, Central Tablelands of New South Wales - Modification: Aboriginal Cultural Heritage Assessment
Brennan	2013	Wilpinjong Coal Mine, Rock Art Conservation and Monitoring Project: Field Inspection Report and Recommendations. Unpublished report to Wilpinjong Pty Ltd
Kuskie	2015a	Wilpinjong Coal Mine, Central Tablelands of New South Wales – Extension Project: Aboriginal Cultural Heritage Assessment.

Subsequently, South East Archaeology undertook a review of archaeological assessments at the Wilpinjong Coal Mine as part of a proposed modification to the Wilpinjong Coal Mine, and provided an updated Aboriginal sites database, an analysis of some stone artefacts recorded during an archaeological survey for the proposed modification and an updated distribution and occupation model (Kuskie 2013a, 2013b).

As of April 2013, the Wilpinjong Coal Mine Aboriginal Sites Database contained 463 Aboriginal sites (Kuskie 2013a, Table 7). Aboriginal site types known to occur at the Wilpinjong Coal Mine include individual stone artefacts, stone artefact scatters, scarred and carved trees, a stone quarry, a ceremonial site, grinding grooves, resources sites such as waterholes and rock shelters with art, stone artefacts, archaeological deposit or PADs. A number of areas of contemporary cultural significance have been identified including Castle Rock and the high density archaeological deposits at Cumbo Creek.

Table 7: Summary of Aboriginal Sites at the Wilpinjong Coal Mine (Source: Kuskie 2013b: 11)

Aboriginal Site Features	Number of Aboriginal Sites
Bora/ceremonial site and carved tree	1
Grinding grooves	2
Grinding Grooves and open artefact site	1
Lithic quarry	1
Non-Aboriginal mounds	1
Open Artefact site	271
PAD	2
Possible cultural value and association	2
Rock shelter with art	4
Rock shelter with art and PAD	2
Rock shelter with artefacts	25
Rock shelter with artefacts and art	1
Rock shelter with artefacts and waterhole/well	1

Rock shelter with PAD	80
Scarred Tree	8
Scarred tree (possible – Aboriginal)	45
Scarred tree (possible – European)	4
Uncertain ¹	2
Waterhole possible	3
Waterhole/well	7
Total	463

¹ This feature description is used in the original source with no further explanation.

The stone artefact assemblage at the Wilpinjong Coal Mine was found to be waterworn and terrestrial quartz dominant. The dominance of quartz is thought to relate to the accessibility of quartz conglomerates in the local geological landscape. Tuff and chert were also present in the stone artefact assemblage and very small frequencies of acidic volcanic stone, jasper, petrified wood, porphyritic rhyolite and quartzite (Kuskie 2013b: 56).

The types of artefacts in the assemblage were also found to be consistent with the Ulan Coal Mine stone artefact assemblage (Kuskie 2013a, 2013b: 58). Complete and broken flakes were the most common artefact types followed by angular fragments, cores and core fragments. Retouched or utilised flakes were also present while backed artefacts such as bondi points and geometric microliths made up a less than 2% of the overall assemblage. A tula slug and hammerstone were also present (Kuskie 2013a, 2013b: 58-59).

The revised archaeological model presented by Kuskie (2013a, 2013b) is consistent with the current models for the archaeological resources at the Ulan Coal Mine.

The most recent comprehensive field survey at the Wilpinjong Coal Mine was undertaken by South East Archaeology between March and June 2014 as part of the Wilpinjong Extension Project (Kuskie 2015a). This survey identified 137 additional sites within the Wilpinjong Extension Project open cut extension and infrastructure areas, comprising:

- 73 rock shelters with PADs;
- 60 open artefact sites;
- two (2) waterholes/wells;
- one (1) rock shelter with artefacts and art; and
- one (1) rock shelter with artefacts and ochre quarry.

Moolarben Coal Complex

Table 8 provides a summary of the archaeological assessments that have been undertaken to date at the MCC.

Table 8: Summary of past Aboriginal archaeological assessments at the Moolarben Coal Complex

Author	Date	Title
Hamm	2006a	Moolarben Coal Project – Aboriginal Cultural Heritage Assessment Report
Hamm	2006b	Responses to Issues Raised in Respect of the Moolarben Coal Project Aboriginal Cultural Heritage Assessment Report
Hamm	2008a	Moolarben Coal Project – Aboriginal Cultural Heritage Assessment Report Stage 2
Hamm	2008b	Aboriginal Heritage Plan for MCP Stage 1 Development Areas: Open Cut 1 and Main Infrastructure Area
Urban Tree Management Australia	2008	Report: Aboriginal Cultural Assessment of Scarred Tree (ref. 36-3-0798: SIMC1) at Ulan, New South Wales for Moolarben Coal Project Stage 1
Hamm	2009a	Aboriginal Cultural Heritage & Archaeological Assessment for Moolarben Coal Project Stage 1 Infrastructure Area & Proposed Water Sharing Pipeline Modification Project in Support of a section 75w (2) Approval
Hamm	2009b	Aboriginal Cultural Heritage & Archaeological Assessment for Moolarben Coal Project Stage 1 Northern Borefield Area
Hamm	2009c	Moolarben Coal Project Executive Summary Report
Coffey Natural Systems	2009	Response to Submissions Report – Part A Moolarben Coal Project – Stage 2
Hamm	2010	Disturbance Report for Moolarben Coal Project Stage 2
Hamm and Foley	2010	Cultural Heritage Management Report on Moolarben Coal Project Stage 1: Open Cut & Main Infrastructure Area
Kuskie	2010	Moolarben Coal Project Stage 2: Aboriginal Heritage Advice on Potential Impact to Aboriginal Sites
AECOM	2011a	Moolarben Preferred Project Report: Aboriginal Archaeological and Cultural Heritage Addendum
AECOM	2011b	Archaeological Collection & Excavation: Northern Borefield, Moolarben Coal Operations, Ulan, NSW
AECOM	2011c	Due Diligence Assessment of Proposed Exploration Drill Sites EL 6288
AECOM	2012	Due Diligence Assessment of Proposed Exploration Drill Sites EL 6288
Hansen Bailey	2012	Moolarben Coal Project Stage 2 Preferred Project Report Response to Submissions
Kuskie	2012a	Moolarben Coal Project Stage 2 – Preliminary Report on Aboriginal Heritage Survey of Geotechnical Investigation Areas
Kuskie	2012b	Moolarben Coal Project Stage 2 – Preliminary Report on Aboriginal Heritage Survey of Proposed Ulan- Wollar Road and Country Energy 66kv Powerline Realignment
Kuskie	2012c	Moolarben Coal Project: Preliminary Aboriginal Heritage Assessment of Proposed Temporary Workers Accommodation Near Ulan, Central Tablelands of New South Wales
Kuskie	2013a	Moolarben Coal Project Stage 1 – Preliminary Report on Aboriginal Heritage Survey of Open Cut 2 Drilling Areas
Kuskie	2013b	Moolarben Coal Project – Stage 1 Optimisation Modification, Near Ulan, Central Tablelands of New South Wales: Aboriginal Cultural Heritage Assessment
Kuskie	2013c	Moolarben Coal Project Stage 2: Aboriginal Heritage Assessment of Proposed Ulan – Wollar Road and Essential Energy Powerline Realignments, Near Ulan Central Tablelands of New South Wales
Niche	2014a	Moolarben Coal Mine OC4 South-West Modification Aboriginal Cultural Heritage Assessment
Niche	2014b	Moolarben Coal Complex UG1 Optimisation Modification Aboriginal Cultural Heritage Assessment
Kuskie	2014a	Moolarben Coal Project, Central Tablelands of New South Wales: Stage 1 – Report on Additional Aboriginal Heritage Survey and Salvage of Proposed Core Shed

Kuskie	2014b	Moolarben Coal Project – Preliminary Report on Aboriginal Heritage Survey of EL7073 Exploration Drilling in September 2014
Kuskie	2014c	Moolarben Coal Project Stage 2 – Preliminary Report on Aboriginal Heritage Survey of Underground 1 Drilling Areas in October 2014
AECOM	2014	Aboriginal archaeological due diligence assessment for Underground 4 (UG4) south drilling works
Kuskie	2015b	Moolarben Coal Project Stage 2 – Preliminary Report on Aboriginal Heritage Survey of Proposed Murrumbidgee Road Realignment February 2015
Kuskie	2015c	Stage 1 Open Cut 2 – Report on additional Aboriginal heritage survey and salvage
AECOM	2015a	Aboriginal archaeological due diligence assessment for six boreholes and associated access tracks in Open Cut 4 (OC4) March 2015
AECOM	2015b	Aboriginal archaeological due diligence assessment for the Southern RIM Area drilling program March 2015
AECOM	2015c	Aboriginal archaeological due diligence assessment for the Northern RIM Area drilling program March 2015
AECOM	2015d	Aboriginal archaeological due diligence assessment for Moolarben Coal Project Stage 1 Modification 9 Project Approval May 2015
AECOM	2015e	Aboriginal archaeological due diligence assessment for the proposed Stage 2 coal conveyor May 2015
AECOM	2015f	Aboriginal archaeological due diligence assessment for Moolarben Coal Project Stage 2 Project Approval May 2015
AECOM	2015g	Assessment of potential Aboriginal rockshelter sites S1MC345 and S1MC352 June 2015
Niche	2015a	Aboriginal Cultural Heritage Assessment - Moolarben Coal Complex UG1 Optimisation Modification June 2015
Niche	2015b	Paleo A, Paleo B, Paleo C, NW01 and NW02 Exploration Boreholes Aboriginal Objects Due Diligence Assessment December 2015
Niche	2016a	Aboriginal Cultural Heritage Conservation Fence Aboriginal Heritage Survey and Assessment March 2016
Niche	2016c	Moolarben Coal Complex- Relocation of Telstra Services Aboriginal heritage pre-surface disturbance survey April 2016
Niche	2016d	Moolarben Coal Complex Longwalls 101 – 103 Aboriginal Heritage Survey Report June 2016
Niche	2016e	Moolarben Coal Complex – Fire Trail Aboriginal objects due diligence assessment June 2016
Niche	2016f	Moolarben Coal Complex – Open Cut 3, Mining Lease Drilling Programme, Aboriginal cultural heritage survey July 2016
Niche	2016g	Moolarben Coal Complex – Open Cut 4 Mining Lease Drilling Programme, Aboriginal cultural heritage survey assessment July 2016
Niche	2016h	Moolarben Coal Complex – Open Cut 3 Exploration Lease Drilling Programme, Aboriginal cultural heritage survey assessment October 2016
Niche	2017a	Moolarben Coal UG1 Longwalls 101-103 Extraction Plan Aboriginal Cultural Heritage Technical Report March 2017
Niche	2017b	OC3 LOX Lines and Access Tracks, Extra Access Lines Aboriginal Heritage Assessment January 2017
Niche	2017d	Moolarben Coal Complex – Open Cut Optimisation Modification, Aboriginal Cultural Heritage Assessment. October 2017

An area of 37 km² was investigated for Aboriginal heritage values in 2008 as part of the Moolarben Coal Project Stage 2 (Hamm 2008a). This assessment work identified 258 new Aboriginal sites: 102 isolated artefacts, 150 artefact scatters, five (5) rock shelters with artefacts, one (1) grinding groove site, 33 PADs and 4,825 stone artefacts. Aboriginal sites were found to concentrate around the central and southern

portion of Murragamba Creek within 100 m of the creek channel, within 100 m of the “Eastern Creek” tributary of Wilpinjong Creek, within 100 m of the headwaters of the Wilpinjong Creek (northern catchment) and the Moolarben Ridge south of Carrs Gap and the Trig station flank of the ridge (Hamm 2008a). Management recommendations included the surface collection of 133 Aboriginal sites, the test excavation and salvage of 34 sites and recording of six (6) sites.

An Aboriginal Heritage Management Plan (AHMP) was developed for the initial Stage 1 works in 2008. In the process of actioning the management and mitigation measures, Hamm and Foley (2010) completed test excavations across the OC1 area and mine infrastructure area. An approximate surface area of 13,700 m² was subject to mechanical exposure (surface scrapes) and 271 m² was excavated by hand/shovel testing, resulting in the recovery of 2,643 artefacts and identification of 35 new open artefact sites (Hamm and Foley 2010).

In 2011, AECOM assessed a revision to the Stage 2 Project. The assessment targeted Stage 2 surface facilities, the southern portion of a proposed modified haul road and the south-eastern boundary of an alternative out of pit emplacement location, two rock shelter sites and the Red Hills and Murragamba Creek Management Areas. No additional sites were identified and an updated impact assessment was completed for the proposed works (AECOM 2011b: 1).

In addition to the above work an additional 16 Aboriginal cultural heritage sites have been documented as the result of various due diligence activities at the MCC.

A revised AHMP was subsequently approved and implemented to include all of the Stage 1 Project areas and replace the earlier AHMP for the OC1 and mine infrastructure area. The revised AHMP contained an updated summary of the Moolarben Coal Mine Aboriginal Sites Database (Kuskie 2013d, 2013a), which at that time contained a total of 531 Aboriginal sites.

Subsequent work including the Moolarben Coal Project Stage 1 Optimisation Modification (Kuskie 2013a), Moolarben Coal Project Stage 2 utilities realignments (Kuskie 2013c), gap surveys of the OC2 area and due diligence assessments for drilling activities has resulted in an additional 72 sites being recorded since January 2013. Niche has carried out an assessment for the UG1 Optimisation Modification in 2015 (Niche 2015a) as well as numerous due diligence assessments and pre-clearance surveys resulting in the identification of more than 200 additional sites. Currently there has been 871 Aboriginal sites identified at the MCC. Open artefact sites (including artefact scatters and isolated finds) are the most frequent site type with occasional grinding groove sites, rock shelters with art, artefacts and/or PADs also being present.

5.3.2 Previous assessments in the subject area

The UG4 mine area has been previously assessed during the following Aboriginal cultural heritage assessments (Figure 3).

Hamm 2006a – Moolarben Stage 1 Aboriginal Cultural Heritage Assessment

This assessment included a sample of areas in the rocky country above the UG4 area, and extensive sampling of the lower slopes and flats where the current MCC Stage 1 open cuts and facilities are located. This assessment included a full survey of the Remote Services Infrastructure Area, but did not overlap elsewhere with other parts of the current subject area. The assessment saw the recording of sites S1MC230 and S1MC278 in the Remote Services Infrastructure Area, which is bisected by Bora Creek.

AECOM 2014 - Aboriginal archaeological due diligence assessment for Underground 4 (UG4) south drilling works

AECOM conducted due diligence assessment for a drilling program in the UG4 area (AECOM 2014). This due diligence assessment overlapped with the UG4 Ancillary Works Modification subject area and resulted in the recording of an open stone artefact site on the vehicle track in the Dewatering Sites and Access Track/ Services Corridor (South) area. This is site number S1MC357 (note that this site was not recorded on AHIMS at the time, but has been recorded on AHIMS as part of this Modification)

Niche 2016 - Moolarben UG4 Exploration Boreholes - Aboriginal Objects Due Diligence Assessment

The Niche (2016) due diligence assessment considered the proposed sites for 8 boreholes and associated access tracks in the UG4 area. The assessment included the partial survey of the Dewatering Sites and Access Track/ Services Corridor (South) area, but did not overlap elsewhere with other parts of the UG4 Ancillary Works Modification subject area. No Aboriginal cultural heritage sites were found in the UG4 Ancillary Works Modification subject area by this due diligence assessment.

Niche 2017 – Moolarben visual screen areas pre-clearance salvage

During pre-clearance surveys under the Stage 1 approval and MCO Heritage Management Plan, Niche discovered an isolated artefact in the Remote Services Infrastructure Area. This site was recorded as S1MC426.

5.3.3 Summary

In summary there has been extensive Aboriginal cultural heritage assessment undertaken adjacent to the subject area, and this has in part overlapped with some parts of the subject area. Because the nature of previous development and the locality of the subject area (mine infrastructure on lower slopes and flats and access tracks and drill sites in woodlands on the ridges) most Aboriginal cultural heritage sites are open stone artefact sites.

There are six known Aboriginal cultural heritage sites within the UG4 Ancillary Works Modification subject area footprint. S1MC278, S1MC230, S1MC426, Ulan ID #86, Ulan ID #87 lie within the Remote Services Infrastructure Area. These sites actually represent multiple recordings of two artefact concentrations: one concentration of artefacts on the flats of Bora Creek (S1MC426, S1MC230, Ulan ID #86, Ulan ID #87); and one concentration on the footslopes just above Bora Creek (S1MC278). There are also many sites recorded surrounding and adjacent to the Remote Services Infrastructure section of the subject area, and these are also multiple recordings of what is best regarded as a continuous distribution of artefacts along Bora Creek, with discontinuities in the distribution of artefacts likely the result of visibility, exposure and previous land disturbance. A single stone artefact site has been recorded within the Dewatering Sites and Access Track/ Services Corridor (South), which is to be used for the UG4 Ancillary Works Modification. The previously recorded sites are all open sites containing stone artefacts, which is typical for the local area.

6. Landscape context

6.1 Preamble

Understanding the past and present environmental contexts of a subject area is requisite in any Aboriginal archaeological and cultural heritage investigation (DECCW, 2010a). This gives an understanding of what activities may have taken place there in the past and the likelihood any trace of them would remain below the surface.

6.2 Topography

The subject area is situated within the Central Tablelands region of NSW, north-east of Ulan, and comprises 5 separate locations that altogether cover approximately a 32 ha total area (Figure 1 and Figure 2). The subject area is comprised of:

- Downcast Ventilation Shaft Compound– cleared (for pasture) alluvial flat and footslope
- Remote Services Infrastructure Area– cleared (for pasture) alluvial flat and footslope
- Dewatering Sites (North) - cleared (vehicle track) and woodland, broad slopes and crests
- Dewatering Sites and Access Track/ Services Corridor (Saddlers Creek Rd) - cleared (vehicle track) and woodland, broad slopes and crests
- Dewatering Sites and Access Track/ Services Corridor (South) - cleared (vehicle track) and woodland, broad slopes and crests

As a rule, the slopes surrounding the subject areas are covered by re-growth woodland and native woodland vegetation, while the flats and undulating landforms have been historically cleared for pasture and heavily impacted by various agricultural activities and the development of mine related infrastructure (Figure 3). Elevations around the subject areas are at approximately 500 m ASL. The area surrounding the subject areas drains to the west into the Goulburn River, which has been diverted adjacent to the subject area. Bora Creek and un-named first and second order drainage lines run west across the area surrounding the subject areas, with a second order drainage line running east-west through the Downcast Ventilation Shaft subject area, and Bora Creek being a major landscape feature of the Remote Services Infrastructure Area.

6.3 Geology

The subject area is situated in the north-western part of the Sydney Basin and is characterised by Late Permian age Illawarra Coal Measures (mudstone, claystone, coal (including the Ulan Seam mined at MCC), torbanite and rhyolitic tuff) which is overlain by the Narrabeen Group (sandstone, conglomeratic sandstone, chert, shale coal and torbanite) (Dubbo 1:250k Geological Series Sheet SI 55-4).

There are no known raw material sources for the manufacture of stone artefacts in the subject area, though the geological formations of Illawarra Coal Measures and Narrabeen Group sandstones are known to have provided exploitable quartz conglomerates across the region. Outcrops and exposures of tuff and cherts within the Illawarra Coal Measures and Narrabeen Group sandstone may also have provided raw materials for the manufacture of stone artefacts.

6.4 Soils and Landforms

There are three soil landscapes as mapped by Murphy and Lawrie (1998). The Downcast Ventilation Shaft, Remote Services Infrastructure Area and part of the Dewatering Sites and Access Track/ Services Corridor (South) are situated on the Ulan soil landscape; the remaining Dewatering Sites and Access Track/ Services Corridor (South), the Dewatering Site (North) and part of the Dewatering Site and Access Track/ Services

Corridor (Saddlers Creek Rd) are situated on the Munghorn Plateau soil landscape; while a small portion of the Dewatering Sites and Access Track/ Services Corridor (Saddlers Creek Rd) is situated on the Lees Pinch soil landscape (Figure 4).

Munghorn Plateau soil landscape is typically characterised by low undulating hills forming plateaux with slopes between 3 and 10%. Like the Lees Pinch Soil Landscape, soils in the Munghorn Plateau Soil Landscape include shallow siliceous sands with yellow earths and yellow podzolic soils. Rock outcrops are often present, but sandstone formations such as overhangs and pagodas are not found in this soil landscape area. Approximately 60 % of the subject area is contained within the Munghorn Plateau soil landscape, with most of the Dewatering Sites and Access Tracks/ Services Corridor located within this soil landscape. The archaeological expectation for this soil landscape is that it may accumulate Aboriginal objects, but these will be sparse outside of rockshelters and in open contexts will not be preserved in situ in the skeletal and mobile siliceous sands which erode readily.

The Ulan soil landscape is typically found in association with low undulating rises and creek flats on slopes between 2 and 10 %. Yellow podzolic soils are present on the lower slopes and drainage lines with yellow and brown earths, earthy sands and occasional occurrences of yellow solodic soils with salt sands. The Ulan Soil Landscape has moderate to high levels of erosion. The Ulan soil landscape accounts for approximately 35 % of the Modification area, with the entirety of the Downcast Ventilation Shaft and Remote Services Infrastructure Area occurring here, and part of the Dewatering Sites and Access Track/ Services Corridor occurring within its bounds. The archaeological expectation of the Ulan soil landscape is that, as a soil landscape associated with alluvial formation processes it has both the attractiveness of a high resource, well-watered and well-drained area for past Wiradjuri land use and the capacity to accumulate Aboriginal objects and bury them in situ, meaning it has good sub-surface archaeological potential.

The Lees Pinch soil landscape is comprised of sandstone plateaux and hillslopes with occasional boulder outcrops. Slope gradients are between 15% and 40% being moderately inclined to steep. The soils are shallow siliceous sands, with the topsoil being loamy sand, subsoil being a clayey sand and then a weathered sandstone 'C' horizon at shallow depth (typically less than 50 cm). Rock outcrops, boulders and sandstone cliffs may be present in some areas. The archaeological expectation for this soil landscape is the same as for the Munghorn Plateau landscape, with the notation that rockshelters are likely to be more common on the steeper slopes of this soil landscape.



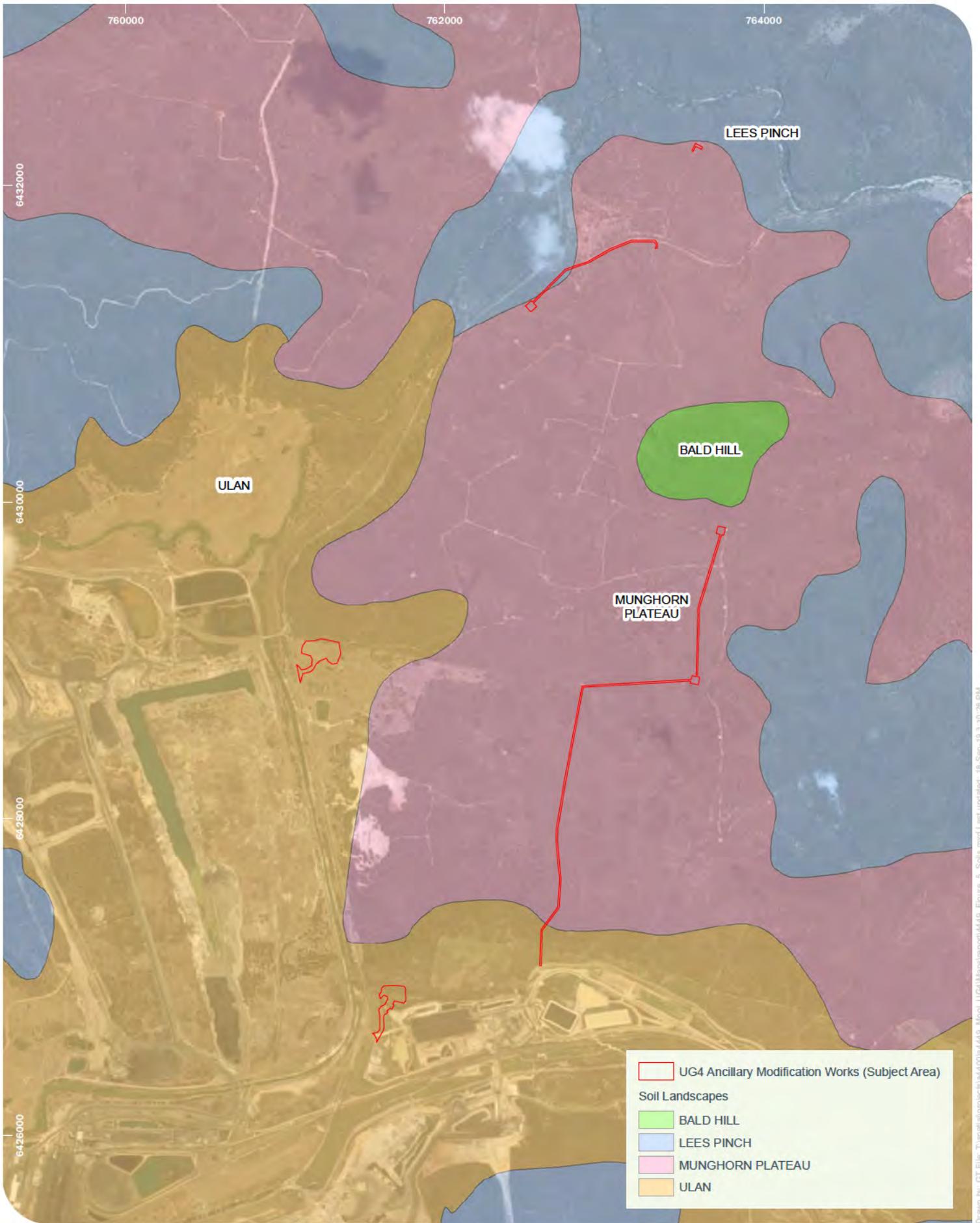
Plate 1: Example of the Ulan soil landscape soil landscape within the subject area



Plate 2: Example of the Munghorn Plateau soil landscape soil landscape within the subject area



Plate 3: Example of the Lees Pinch soil landscape within the subject area



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6.5 Vegetation, ecology and resources

The Wiradjuri people of the Moolarben area would have made extensive and obvious use of the natural resources occurring there. The Moolarben area is located within a particularly biodiverse region, as it incorporates ecological traits and species of both the sandstone environments (woodlands and forests on sandstone ridges and plateau) to the east and the western slopes and plains (red soils, large rivers and pine woodland and forests) to the west. This richness and diversity means the Moolarben area would have been a valuable utilitarian, social and cultural asset for the Wiradjuri. Species of traditional and ongoing interest in the Wiradjuri economy include possums, kangaroos, wallabies, emus, wombats, lizards, snakes, goannas, birds, insects and a range of plant species (Pearson 1981: 335). Many of these resources would have been available in the local landscape of the subject area, and motifs directly or abstractly representing many of these species are found in the Wiradjuri rock art of the Ulan area, speaking to both the social, utilitarian and possibly ceremonial importance of some of these plants and animals.

6.6 Climate

Climate data collected at the Gulgong weather station, approximately 20 km to the west of the subject area, indicates that the subject area is situated in an area with an average rainfall of 630 to 650 millimetres with warm to hot summers and cold winters. Winter frosts occur. Greater variation in seasonal weather may have resulted in more seasonal changes to Aboriginal past land-use; however, to date there is no archaeological evidence of this occurring.

Whilst conditions and temperatures are wide ranging, the conditions in the region of the subject area can be summarised as being moderate, and would have been very suitable for year-round occupation of the region by Wiradjuri people.

6.7 Land use and disturbance

The subject area contains evidence of significant past land use disturbances which likely reduce the potential for any archaeological evidence to survive within the area where this has occurred. High levels of disturbance such as clearing of native vegetation, various levels of farming and agricultural activities, construction of dwellings and associated buildings, logging and the development of three major coal mines and associated infrastructure have had a significant impact on the original soil profile and environment of parts of the subject area.

The overall landscape context of the subject area provides a picture of a mostly disturbed landscape on the flats and footslopes that has been subject to disturbance caused by clearing of native vegetation, general agricultural practices and the construction of buildings. The northern woodland sections of the subject area, have seen some forestry and pockets of intensive clearing but overall have less disturbance. Even in areas subject to previous land clearing, particularly in alluvial landforms and flats there still remains a moderate potential for the retention and preservation of sub-surface archaeological deposits.

7. Regional character

The subject area sits in the far north-eastern area of the Wiradjuri Nation, who's land extended across an extensive portion of NSW incorporating the Lachlan, Macquarie and Murrumbidgee Rivers and taking in the woodlands of the Riverina, the western slopes and plains including Griffith and Wagga Wagga and as far west as Mossgiel, south to the Murray River, east to the Great Diving Range and north to Dubbo and Mudgee. The area around Mudgee is a region of high biodiversity, incorporating aspects of both the Wollemi forests to the east, and the red-soil slopes and plains woodlands to the west.

The Ulan area has been the subject of intensive archaeological and cultural heritage assessment over the last 20 years, driven mostly by the development of the Ulan, Moolarben and Wilpinjong Coal mines. The archaeological record, therefore, is reasonably well understood, and the archaeological expectations of proposed subject areas can be readily and confidently characterised based on the extensive previous findings. The landscape around the subject area is characterised by plains and low-rolling hills, surrounded by sandstone hills, crests and ridges. Generally, the lower lying plains and gentle slopes have been cleared for agriculture while the crests and ridges remain covered with partial modified woodlands. Sites containing stone artefacts are the most common type of site known in the region. While these may occur anywhere, stone artefacts will be concentrated in areas such as alluvial landforms and rockshelters, and sometimes can form extensive, high artefact density sites with both surface and sub-surface artefacts. Rockshelter sites are a very common site type in the sandstone hills and ranges, occurring where there are cliffs, scarps or large boulder falls that form shelters. The rockshelter sites contain either individual features or a combination of features including: archaeological artefacts and deposit; pigment rock-art; axe grinding grooves; grinding slabs. Less common site types include scarred trees and axe grinding grooves, which occur in creek beds and sometimes in rockshelters.

Kuskie (2009) has posited a model of past Wiradjuri land-use which uses the concept of "resource zones" to interpret past use of the landscape. In this model higher value resource zones see the focus of more activity – both utilitarian, social and ceremonial – given these higher value zones are interpreted to have the capacity to sustain larger numbers of people for longer periods of time. Primary resource zones, which are the most valuable and most likely to have been used more extensively by Wiradjuri people in the past and therefore will have a more frequent and dense archaeological record, occur around major waterways and landscape features. Secondary resource zones occur around slightly smaller landscape features and waterways, usually in combination with each other and everything else in between these areas is a separate resource zone. For the most part the subject area occurs outside primary and secondary resource zones, although the proximity of the confluence of Bora Creek and the Goulburn River can be argued to represent an area of secondary resource zone in the subject area.

In summary the Mudgee-Gulgong-Ulan area is an environmentally rich and diverse part of the Wiradjuri's territory, and would have been an asset from both a utilitarian, social and ceremonial point of view in that it could sustain large gatherings of people year-round. The area surrounding the subject area has been demonstrated to contain frequent material traces of past Wiradjuri land-use including stone artefacts, rockshelters, grinding grooves, scarred trees and rock art.

8. Predictions

As described above, in some cases there is overlap between the subject area for the Modification and those areas that were subject to previous systematic survey for earlier development approvals at the MCC.

Open stone artefact sites are by far the most common type of Aboriginal cultural heritage site documented by extensive previous survey in and around the subject area. Landscape based sites such as rockshelters and grinding grooves are well documented in the broader region, but the subject area and its immediate surrounds contain very few suitable landforms for these site types to occur. Extensive clearing of flats and footslopes means scarred trees are relatively rare in the broader region and local context. The subject area is situated on flats and simple slopes, with the distance from water varying between 10 m and 3 km.

During previous survey works, six Aboriginal heritage sites (open sites with stone artefacts) were identified within the subject area. At Bora Creek five separate recordings, and many more adjacent to the subject area, represent multiple recordings of a continuous distribution of artefacts across the flats and footslopes of this area. A single open site with stone artefacts was recorded previously within the slopes of the plateau in the Dewatering Sites and Access Track/ Services Corridor (South) part of the subject area.

In the woodlands on the undulating plateau country that comprises most of the subject area it is anticipated that open stone artefact sites will be present, though these sites will not contain large numbers of artefacts and will be difficult to detect given the lack of archaeological visibility and exposure in the woodland environments. Archaeological visibility and exposure will be better on tracks and in previously disturbed areas, which will provide an opportunity to discover the low-density distribution of stone artefacts in an open context.

On the foot slopes and flats it is anticipated, as demonstrated by the distribution and site type of known sites, that there will be open sites containing stone artefacts, often in high densities. These sites may generally occur anywhere within this terrain, but may be more frequently encountered in favourable occupation areas such as creek lines. This is an established fact in the area of Bora Creek near its confluence with the Goulburn River.

In accordance with the current predictive model for the MCC, the majority of the subject area would be considered as being outside a primary or secondary resource zone. The exception to this is the Remote Services Infrastructure Area, which straddles Bora Creek in a secondary resource zone (being a drainage line near the confluence with a large river – the Goulburn River prior to diversion). Based on the model presented in Section 4.3, past Wiradjuri land use and occupation of this general area would have involved regular but sporadic seasonal encampments of small parties, with occupations of typically short periods. Therefore, compared to the surrounding areas this resource zone will host moderately higher counts and densities of artefacts, a number of activity areas, and a relatively broad range of raw materials and artefact types.

For the woodlands and plateau slopes, which are “outside primary and secondary” resource zone, the occupation will most likely represent transient movement through the landscape for activities such as hunting or gathering, and this would be reflected in low counts and densities of Aboriginal sites and artefacts. Any artefacts contained within the rock shelters will most likely be made of locally obtained quartz with infrequent artefacts of tuff or chert. Types of artefacts will most likely be complete or broken flakes with infrequent occurrences of other technologies such as retouched flakes, backed artefacts and other stone tool technologies.

Considering the archaeological context, the following predictive statements for the subject area are made:

- Closed sites (such as rock shelters with the potential for art, artefacts and/or PADs) have low likelihood to occur in the subject area (note, they are known to occur in areas adjacent to the subject area).
- Grinding grooves are typically found on sedimentary rock surfaces such as sandstone and have a low likelihood to occur within the subject area, as there are few suitable rock surfaces that exist in context of permanent and/or semi-permanent water.
- Culturally modified trees may occur where mature age trees are present; but are unlikely to occur in the subject area due to the levels of past vegetation clearance.
- Stone arrangements are very rare but do occur in the wider region. There is a very low likelihood of these occurring in the subject area due to the level of surface disturbance from past land use, and undifferentiated nature of the plateau woodlands.
- Burials are rare but do occur in the wider region and are associated with sandy soils and rockshelters, there is a very low likelihood that burials occur within the subject area.
- There are no known ceremonial sites in the subject area and they are unlikely to occur as they have not been identified during previous Aboriginal community consultation for the MCC.
- Open sites containing stone artefacts are documented within the subject area, and are highly likely to occur in other parts of the subject area where they are not documented. In the woodlands plateau contexts these will be low density concentrations of artefacts, in the footslopes and flats, especially near Bora Creek, these will be medium to high density concentrations. The detection of stone artefacts in an open context will be highly dependent on archaeological visibility and exposure.

9. Sampling strategy

A Proposed Methodology for the assessment was provided to the RAPs on 3 July 2019. A copy of the Proposed Methodology is provided in Appendix 5. The survey methodology was developed in accordance with Section 5.3 of the HMP.

The Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010b) requires a stratified and weighted sample of the landscapes to be assessed based on their occurrence in an impact or disturbance footprint, and the anticipated Aboriginal cultural heritage potential within those landforms.

Due to the relatively small and accessible size of the subject area, a detailed landscape or landform sampling strategy was not applied. Rather, the approach taken was to use a high intensity transect survey across the majority of the subject area, including all those landforms that occur within them.

For stone artefacts a sampling strategy was not used, with all visible artefacts at a location being recorded.

10. Field methods

10.1 Field methods

The following methods were used to conduct an archaeological survey of the subject area:

- A sampling strategy aiming for survey of the entire Modification footprint;
- Pedestrian survey of the Modification footprint with survey participants no more than 10 m apart for undisturbed areas, and no more than 5 m apart for areas of good exposure (e.g. 2 surveyors would inspect a single land vehicle track) (Plate 4, Plate 5);
- Close inspection of all ground surface exposures;
- Close inspection of any rock formations;
- Intensive and slow inspection when artefacts were discovered.

Survey units were recorded in accordance with the *Code of practice for the archaeological investigation of Aboriginal objects in NSW* (DECCW 2010), with regularly spaced survey transects walked each part of the subject area and survey conditions (exposure and visibility), environmental conditions and landform information recorded for each survey unit. Survey unit boundaries were defined by a combination of the subject area boundary and boundaries in environment and/or landform (each landform sampled was accorded a separate survey unit). All stone artefacts were recorded individually with basic morphological, technological and metric attributes recorded.

Navigation around the survey area was conducted using real-time GPS on a smart-phone and the surveyed area and findings were recorded using a non-differential GPS. Photographs were taken using a smart phone.



Plate 4: Survey in the Remote Facilities Infrastructure Area



Plate 5: Survey in the Proposed Dewatering Site and Access Track/ Services Corridor (South)

11. Results

11.1 Archaeological and cultural heritage survey

The archaeological survey was conducted on Monday 22 July and Tuesday 23 July 2019. The survey components and personnel are summarised in Table 9: Summary of archaeological survey activities. The survey was conducted in fine weather conditions with no constraints to access any of the subject area.

Table 9: Summary of archaeological survey activities

subject area	Date Surveyed	Personnel
Remote Services Infrastructure Area	22 July 2019	Tammy Peterson (Mudgee LALC)
Downcast Ventilation Shaft Compound	22 July 2019	Larry Flick (MGATSIC)
Dewatering Site (North)	22 July 2019	Emma Syme (MCO) Jamie Reeves (Niche)
Dewatering Site and Access Track/ Services Corridor (Saddlers Creek Rd) (Part)	22 July 2019	
Dewatering Site and Access Track/ Services Corridor (Saddlers Creek Rd) (Part)	23 July 2019	Tammy Peterson (Mudgee LALC) Larry Flick (MGATSIC)
Dewatering Site and Access Track/ Services Corridor (South)	23 July 2019	Emma Syme (MCO) Jamie Reeves (Niche)

11.2 Summary of survey coverage

The archaeological and cultural heritage survey was conducted over the subject area which was a larger area than the final Modification footprint. The subject area included the full extent of the Modification footprint, except for one route readjustment for an access track/ services corridor on the North Dewatering Site and Access Track/ Services Corridor. This resulted in a small area of the Modification footprint which fell outside of the surveyed area. This area was not surveyed (Figure 6), however it was determined to be likely to have an identical archaeological character as the adjacent subject area that was subject to detailed surveys. In addition, this area would be subject to additional surveys prior to the construction of the proposed access track/ services corridor.

The survey coverage results are summarised in Table 10.

Table 10: Summary of survey results

Survey Unit	Landform	Survey Unit Area	Visibility	Exposure	Effective Coverage Area (ha)	Effective Coverage Area %
*0	Crest	0.47	0%	0%	0.00	0%
1	Flat	0.55	50%	60%	0.16	30%
2	Flat	0.20	70%	40%	0.06	28%
3	Flat	0.56	40%	40%	0.09	16%
4	Lower Slope	1.02	40%	30%	0.12	12%
5	Mid Slope	0.55	10%	20%	0.01	2%
6	Lower Slope	2.11	20%	30%	0.13	6%
7	Flat	0.62	20%	30%	0.04	6%
8	Lower Slope	1.19	20%	10%	0.02	2%
9	Crest	0.82	20%	10%	0.02	2%
10	Crest	0.35	30%	10%	0.01	3%
11	Upper Slope	0.20	30%	20%	0.01	6%
12	Lower Slope	0.15	20%	20%	0.01	4%
13	Flat	0.05	50%	40%	0.01	20%
14	Crest	1.39	5%	10%	0.01	1%
15	Open Depression	0.49	5%	10%	0.00	1%
16	Crest	0.11	30%	30%	0.01	9%
		10.82			0.71	

* Not surveyed due to design change after survey

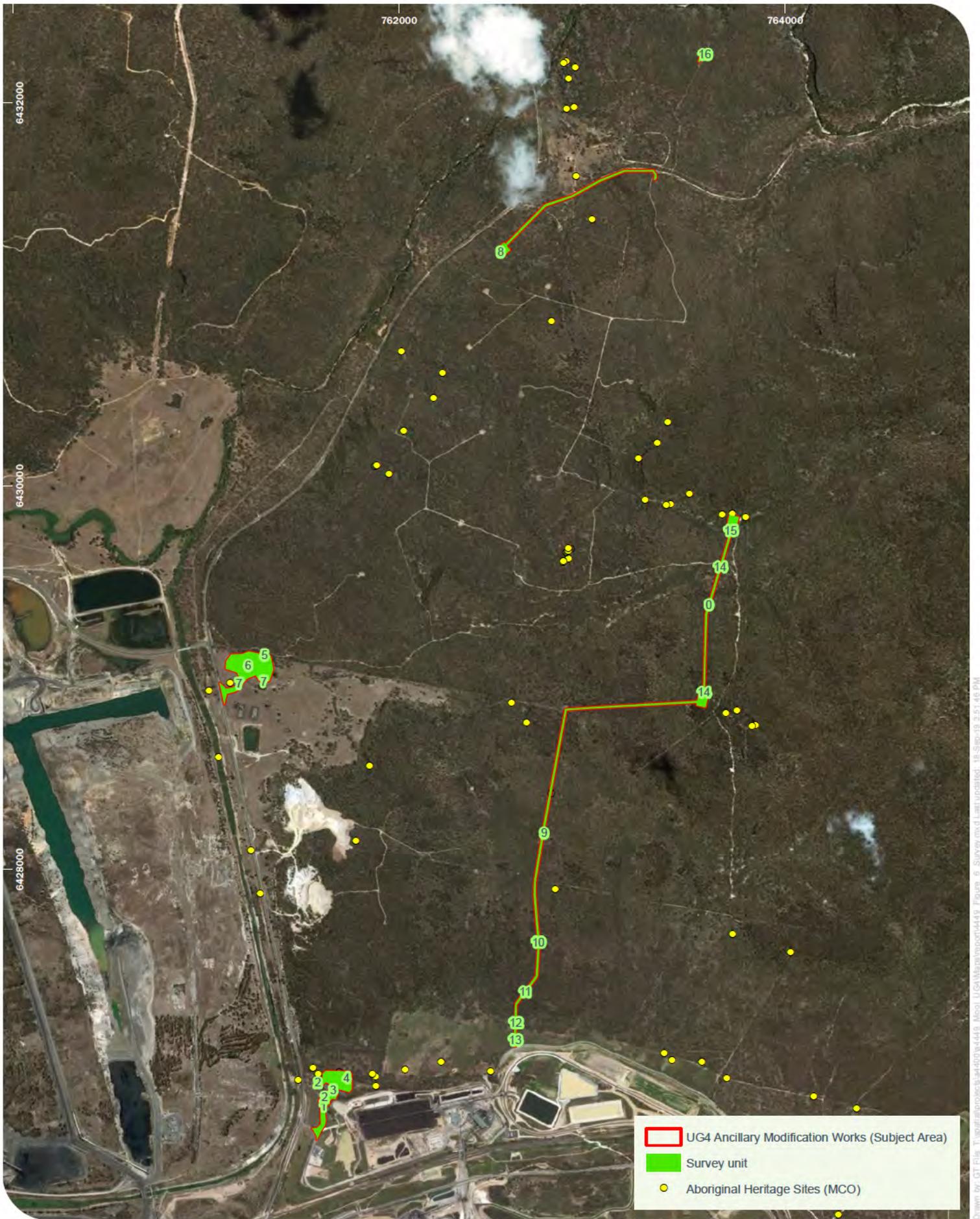
As noted above the archaeological and cultural heritage survey aimed for a 100% coverage of the proposed Modification footprint, however minor change to the final proposed disturbance footprint resulted in a small area of proposed access track/ services corridor not being surveyed. Excepting this, the survey achieved an almost 100 % sample of the affected areas of the landforms inspected, as summarised in Table 11. Table 11: Landform summary – sampled areas.

Table 11: Landform summary – sampled areas

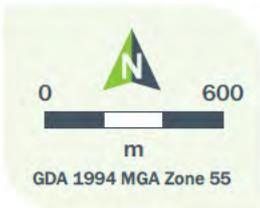
Landform	Survey Unit Area (ha)	Effective Coverage Area (ha)	% of landform effectively surveyed	Number of sites	Number of artefacts
Crest	3.13	0.04	1.39%	1	1
Flat	1.98	0.36	18.09%	1	25
Lower Slope	4.47	0.28	6.23%	2	6
Mid Slope	0.55	0.01	2.00%	-	-
Open Depression	0.49	<0.01	0.50%	-	-
Upper Slope	0.20	0.01	6.00%	-	-
Total:	10.82	0.71	6.52%	4	32

The survey sampling strategy was constructed around total survey of the proposed Modification footprint, rather than a sampling strategy to sample and characterise a broader landscape. Therefore, the survey achieved reasonable to high coverage of all landforms sampled, notwithstanding the usual constraints on exposure and visibility described above.

Wiradjuri cultural heritage sites were discovered on three different landforms, including isolated artefacts, and this suggests that despite sometimes low exposure and visibility the survey was effective in detecting past traces of Wiradjuri land-use.



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 Niche Proj. #: 4449
 Client: Moolarben Coal

Results - Survey coverage
 Moolarben UG4 Ancillary Works Modification

Figure 6

As summarised in Table 11 the survey covered a range of landforms from slopes, depressions and broad crests on higher country, to slopes and flats in lower areas. The survey ranged across several different contexts including:

- Unmodified woodlands;
- Cleared areas of pasture;
- Cleared areas with partially regrown woodland; and,
- Vehicle tracks and roads (which sometimes included crushed rock dressing).

The conditions encountered during the survey were variable, but generally archaeological visibility and exposure were poor except in areas where there was previous ground disturbance such as cleared or modified areas where exposure was patchy and vehicle tracks which provided linear sections of good exposure. Typical examples of conditions relating to the effectiveness of the survey are presented in Plate 6, Plate 7, Plate 8 and Plate 9.



Plate 6: Unmodified Woodlands in Survey Unit 14



Plate 7: Cleared area used for pasture in Survey Unit 6



Plate 8: Partially cleared woodland with patchy exposure in Survey Unit 1 (Bora Creek)



Plate 9: Vehicle track in Survey Unit 9

11.3 Summary of survey finds

The survey of the UG4 Ancillary Works Modification resulted in the recording of four Wiradjuri archaeological cultural heritage sites in the subject area. In two cases the sites have been previously recorded, while in the other two cases the sites are new recordings (Figure 7). In addition, it is known that a fifth site (S1MC357) is located along the proposed access track/services corridor as recorded by AECOM (2010). This site was not found or re-recorded during the recent surveys.

Table 12 summarises the survey finds.

Table 12: Table of survey findings

Site number	Context	Features	Feature Count	Survey Unit	Landform
S1MC-460	Open	Stone artefact	1	Survey Unit 16	Crest
S1MC-461	Open	Stone artefact	1	Survey Unit 8	Lower slope
*S1MC-278	Open	Stone artefacts	5	Survey Unit 4	Lower slope
*S1MC-230	Open	Stone artefacts	22	Survey Unit 2-3	Flat

* Denotes previously recorded site

The sites are typical of the type and contents of sites previously recorded in similar landforms at and around MCC. Site descriptions are provided below.

S1MC460

This is an isolated artefact located on the disturbed edge of a previous drill site, in otherwise undisturbed woodland on the broad crests characteristic of this location within the UG4 area. The artefact was a complete quartz flake. Located on the shallow sandy soils of the Munghorn Plateau soil landscape there is no sub-surface potential at this location.



Plate 10: Location of S1MC-460



Plate 11: Artefact at S1MC-460

S1MC461

This is an isolated artefact located on a turn-out of Saddlers Creek Road. The area is quite disturbed from road maintenance and vehicle activity. The artefact was a unidirectional tuff core, which had been heavily worked. A previously recorded site (S1MC-432) is located across the road, less than 100 m away. The site is located on shallow sandy soils and there is low sub-surface potential. It is likely this artefact is associated with past Wiradjuri land-use at S1MC-432, which is located in flat area and on less sandy soils.



Plate 12: Location of S1MC-461 (S1MC-432 is in the far right distance)



Plate 13: Artefact at S1MC-461

S1MC278

S1MC-278 was an isolated find, assessed to be of low significance. The current survey identified five more artefacts in this location, comprising two cores and three flakes. The site is located within the woodland on a gentle slope in an area of disturbance (probably from forestry activities) that has left patchy exposure, remnants of transient vehicle tracks and hummocks of soil. The soils at this location, are a sandy grey loam, however there is no evidence to suggest that there would be sub-surface potential on a slope like this one.



Plate 14: Location of S1MC-278



Plate 15: Artefact at S1MC-278

S1MC230

S1MC-230 was an artefact scatter that was previously assessed as being of high significance. The scatter covers an extensive area (previous recordings within 50m of the artefacts recorded in July 2019 include S1MC230, S1MC424, Ulan ID#86 and Ulan ID#87, previously recorded sites S1MC426, S1MC425 and S1MC244 are between 50 m and 100 m distant) along both sides of Bora Creek, and has been partially impacted by previous development of MCC facilities managed under the existing Stage 1 Approval and the Moolarben Coal Operations Heritage Management Plan. An additional 25 artefacts were recorded at S1MC-230 during the current assessment. The artefacts included flakes and cores, with the technological characteristics of these suggesting that the area was previously used by Wiradjuri people as a blade

manufacturing work shop. The site is located immediately adjacent to Bora Creek, which splits into two steep sided incised channels at this location. The alluvium associated with Bora Creek is interpreted to have high sub-surface potential in the stable sandy soils that are present. The surface of this area has been previously cleared and disturbed by development works and partial tree clearing, and the channels of Bora Creek have been diverted and rock-armoured in some places.



Plate 16: Location of S1MC-230



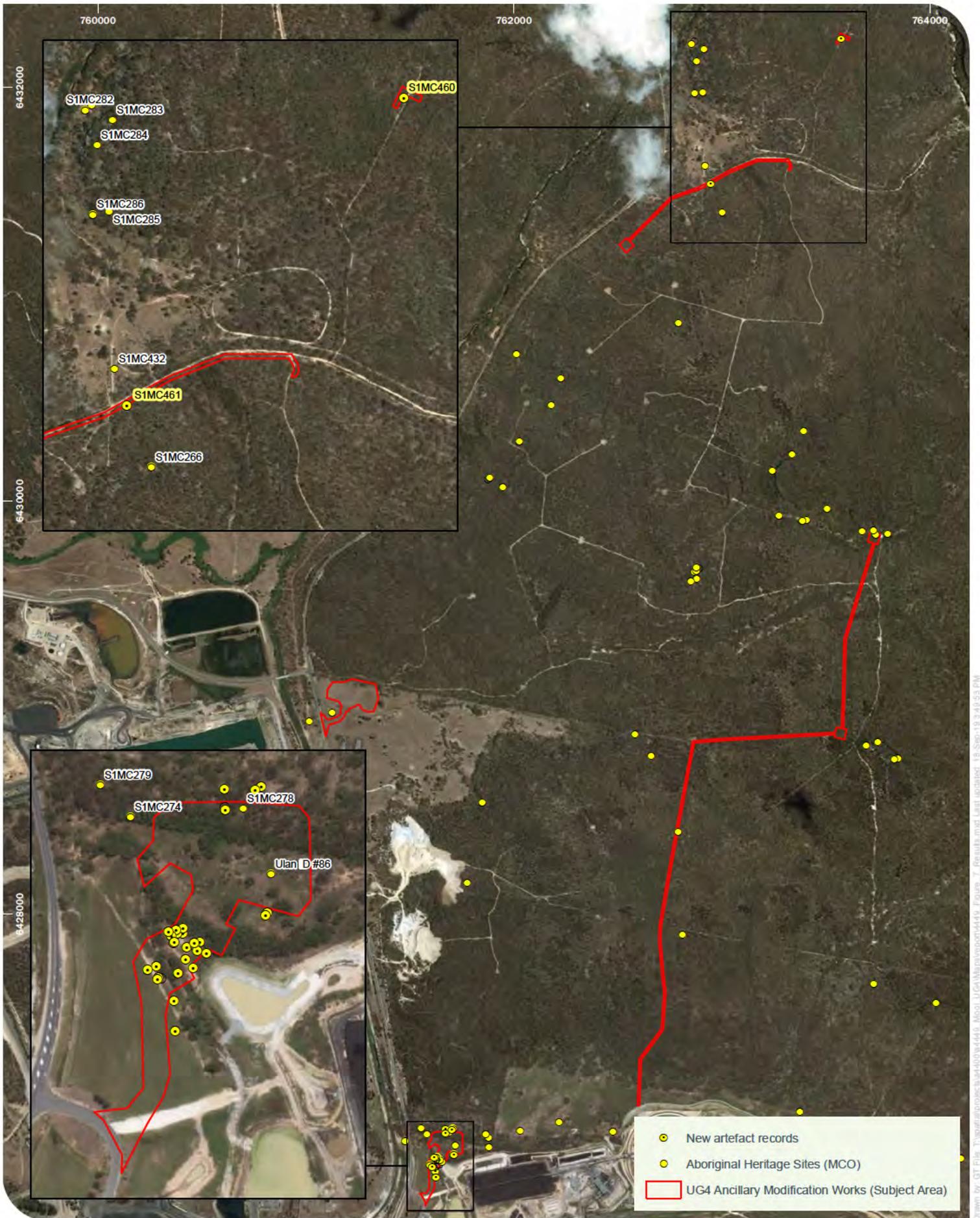
Plate 17: Artefact at S1MC-230

In summary the survey has resulted in the confirmation of the presence of known sites in some areas of the subject area – particularly around Bora Creek – and confirmed the presence of sites, usually as isolated artefacts, in other areas of the subject area in open contexts. The site was subject to surface salvage in 2010 (Hamm, 2010). Notwithstanding, further management will be required to be undertaken in accordance with the Heritage Management Plan in respect to the 25 artefacts located in the recent surveys.

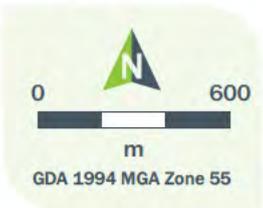
The survey results support the predictive statements that were presented above in Section 7, in particular:

Open sites containing stone artefacts are documented within the subject area, and are highly likely to occur in other parts of the subject area where they are not documented. In the woodlands plateaux contexts these will be low density concentrations of artefacts, in the footslopes and flats, especially near Bora Creek, these will be medium to high density concentrations. The detection of stone artefacts in an open context will be highly dependent on archaeological visibility and exposure.

The close agreement between the predictive statements and the survey results is not surprising given the extensive amount of archaeological work conducted at MCC and in surrounding areas over the last two decades.



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 Niche Proj. #: 4449
 Client: Moolarben Coal

Results - Cultural heritage sites
Moolarben UG4 Ancillary Works Modification

Figure 7

Map data source: Esri, DigitalGlobe, GeoEye, Earthstar OpenStreetMap contributors, CNRVI, Swire, Bing, AeroGRID, IGN, and the GIS User Community

12. Analysis and discussion

Section 4 presented a Wiradjuri settlement history of the Ulan area which was constructed using resource zones as a determining factor in the type of settlement and activities past Wiradjuri land-use would have involved, and the nature of the archaeological traces this settlement and land-use would leave behind. The model is presented in summary in Table 13.

Table 13: Summary of Kuskie’s (2009) settlement model for the Ulan area

<p>Primary resource zones</p>	<p>Areas of more abundant and diverse resource rich zones in north-east Wiradjuri territory including the junction of the higher order watercourses such as Goulburn and Talbragar Rivers would most likely be a focus of occupation. These zones may have supported nuclear and extended family base camps, community base camps and congregations of larger groups. This zone may have been subject to longer stays and more frequent occupation than other areas, such as secondary resource zones. The model states that these zones would contain substantially higher counts and densities of artefacts, a greater range of stone materials and artefact types and a higher number of activity areas would be present.</p>
<p>Secondary resource zones</p>	<p>These are areas where resources such as watercourses, swamps and wetlands occur in close proximity of higher order watercourses and associated flats and terraces. Examples of secondary resource zones in the Ulan area include higher order parts of Moolarben Creek. In the model these zones were utilised for regular but sporadic seasonal encampments of small parties, but occupations of the encampments would typically have been for short periods. Compared to the surrounding areas this resource zone will host moderately higher counts and densities of artefacts, a number of activity areas, and a relatively broad range of raw materials and artefact types (but much lesser range than sites in primary resource zones).</p>
<p>Outside primary and secondary zones</p>	<p>Occupation is anticipated to be hunter gatherer activities with small parties of men, women or children. Movement across the landscape would be transitory between resource locations and may include special purpose journeys for ceremonial purpose or the procurement of stone. Utilisation of landforms such as simple slopes, ridge crests, spur crests and lower order watercourses would be far less intense than that found in primary and secondary resource zones.</p>

Regionally the subject area is unremarkable in as much as it does not contain any primary resource zones, and therefore is not likely to contain the very high frequencies and densities of Wiradjuri archaeological sites that are anticipated by the model in Primary resource zones.

The subject area does contain what may be considered a Secondary resource zone in the area of Bora Creek and its immediate surrounds. The archaeological record around Bora Creek is highly suggestive of sporadic but regular settlement. This is evidenced by the continuous distribution of artefacts through this area (which has resulted in the recording and re-recording of many sites in a comparatively small area). The likely presence of a blade workshop at S1MC-230 represents a distinctive “activity area” within this broader suite of sites. Without doubt the frequency and density of sites and artefacts at Bora Creek is a physical expression of what the model postulates, and accords well with the observation that the survey of the subject area found a total of 32 artefacts and 30 of these were located within the secondary resource zone. This is also the only area within the subject area that has sub-surface archaeological potential.

For the most part the subject area is located in what is clumsily described as Outside primary and secondary resource zones. The expectation here is that there will be low frequencies and densities of sites and artefacts, and the main use of this outside resource zone would have been for travel between other areas. The utilisation of available landscape features and resources in this area is anticipated to not be

intensive at all. This is reflected in the survey results, which found only 2 isolated artefacts in the outside resource zone within the subject area.

In summary, the Wiradjuri settlement history of the subject area would have involved a range of activities being undertaken around the Bora Creek locality. This location would have been regularly visited and revisited by Wiradjuri people with small parties staying in the area for short periods of time. During this time a range of activities would have been taking place. Aside from the utilitarian business of being comfortable and fed, exactly what activities would have taken place here would be dependent on the time of year, the current circumstances at the time, and any other social or cultural activities taking place. It does appear that the Bora Creek area, with a relatively high number of cores but an absence of tools, and distinctive blade technology, in the assemblage recorded by the current survey was a focus for the manufacture of small blades (sometimes called “microblades”) and is interpreted to be a blade workshop, with sub-surface potential.

13. Scientific values and significance assessment

13.1 Assessment framework

The Burra Charter (Australia ICOMOS 2013) defines the basic principles and procedures to be observed in the conservation of important places. It provides the primary framework within which decisions about the management of heritage sites in Australia should be made.

The NSW Aboriginal cultural heritage regulatory framework supports the significance assessment of Aboriginal archaeological sites and provides guidelines for this ACHA within the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011). The *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011) outlines two main themes in the overall Aboriginal cultural heritage significance assessment process, namely, the identification of the cultural/social significance of Aboriginal objects and/or places to Aboriginal people and the identification of the scientific (archaeological) significance to the scientific/research community. These themes encapsulate those aspects of the Burra Charter that are of particular relevance to Aboriginal objects and places.

13.1.1 Cultural significance

The Burra Charter defines cultural significance as being derived from the following values: aesthetic value, historic value, scientific value and social value however, more precise categories may be developed as an understanding of a particular place or site increases (Table 14).

Table 14: Values from which cultural significance is derived

Value type	Description
Aesthetic Value	Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the place and its use.
Historic Value	Historic value 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 setting are substantially intact, than where it has been changed or evidence does not survive. However, some events or association may be so important that the place retains significance regardless of subsequent treatment
Scientific Value	The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality or representativeness (conservation value), and on the degree to which the place may contribute further substantial information.
Social Value	Social or cultural value refers to the spiritual, traditional, historical or contemporary associations and attachments the place or area has for Aboriginal people. Social or cultural value is how people express their connection with a place and the meaning that place has for them. Places of social or cultural value have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods or events. Communities and individuals can experience a sense of loss should a place of social or cultural value be damaged or destroyed.

13.1.2 Scientific significance

The Guidelines specify that information about scientific values will be gathered through archaeological investigation carried out according to the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b). The *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) itself does not specify criteria for assessment of Aboriginal objects, but rather suggests to “identify the archaeological values and assess their significance.” The assessment must be supportable and the assessment criteria must reflect best practice assessment processes as set out in the Burra Charter. The scientific values described in the Burra Charter were considered further by the then NSW National Parks and Wildlife Service in their *Aboriginal Cultural Heritage Standards and Guidelines Kit* (DEC 1997). In lieu of specific criteria, the advice from the *Aboriginal Cultural Heritage Standards and Guidelines Kit* (DEC 1997) is summarised and paraphrased below to provide guidance to the assessment of scientific values.

Table 15: Criteria for assessing scientific value

Scientific value	Description
Research potential	It is the potential to elucidate past behaviour which gives significance under this criterion rather than the potential to yield collections of artefacts. Matters considered under this criterion include the intactness of a site, the potential for the site to build a chronology and the connectedness of the site to other sites in the archaeological landscape.
Representativeness	As a criterion, representativeness is only meaningful in relation to a conservation objective. Presumably all sites are representative of those in their class or they would not be in that class. What is at issue is the extent to which a class of sites is conserved and whether the particular site being assessed should be conserved in order to ensure that we retain a representative sample of the archaeological record as a whole. The conservation objective which underwrites the ‘representativeness’ criteria is that such a sample should be conserved.
Rarity	This criterion cannot easily be separated from that of representativeness. If a site is ‘distinctive’ then by definition, it will be part of the variability which a representative sample would represent. The criteria might best be approached as one which exists within the criteria of representativeness, giving a particular weighting to certain classes of site. The main requirement for being able to assess rarity is to determine what is common and what is unusual in the archaeological record, but also the way that archaeology confers prestige on certain sites because of their ability to provide certain information. Items may be common, uncommon or rare. The criterion of rarity may be assessed at a range of levels including local, regional, state, national, and global.
Educational potential	This criterion relates to the ability of the cultural heritage item or place to inform and/or educate people about one or other aspects of the past. It incorporates notions of intactness, relevance, interpretative value and accessibility. Where archaeologists or others carrying out cultural heritage assessments are promoting/advocating the educational value of a cultural heritage item or place it is imperative that public input and support for this value is achieved and sought. Without public input and support the educative value of the items/places is likely to not ever be fully realised.
Aesthetics	In relation to heritage places, aesthetic significance is generally taken to mean the visual beauty of the place. Aesthetic value is not inherent in a place but arises in the sensory response people have to it. The guidelines provide no expectation for archaeologists to consider aesthetic values, it is often the case that the aesthetics including the physical setting of an archaeological site or a landscape contributes to its cultural heritage significance. Examples of archaeological sites that may have high aesthetic values include rock art sites or sites located in environments that evoke strong sensory responses.

13.1.2.1 Grading scientific values

The following gradations, where a site or zone satisfies at least one criterion, have been applied to provide a measure of the values/significance for Aboriginal objects identified within the subject area, and to provide an overall assessment of the significance of each of the zones used that define the subject area.

Table 16: Criteria for grading significance

Gradation	Description
Low	The site or object contains only a single or limited number of features, and has no potential to meaningfully inform our understanding of the past beyond what it contributes through its current recording (i.e. no or low research potential). The site or object is a representative but unexceptional example of the most common class of sites or objects in the region. Many more similar examples can be confidently predicted to occur within the subject area, and in the region.
Moderate	The site or object derives value because it contains features, both archaeological and contextual, which through further investigation may contribute to our understanding of the local past. These features include, but are not limited to: the relationship with landscape features or other Aboriginal archaeological sites or areas of identified heritage importance; diagnostic archaeological or landscape features that inform a chronology; and a relatively large assemblage of stone artefacts. The presence of a diverse artefact and feature assemblage, and connectedness with landscape features and other notable sites provide relatively higher representative and rarity values than sites of low significance.
High	The site or object has value because it contains archaeological and/or contextual features which through further investigation may significantly contribute to our understanding of the past, both locally and on a regional scale. These features include, but are not limited to: Aboriginal ancestral remains; the site's relationship with landscape features or other Aboriginal archaeological sites or areas of identified heritage importance; diagnostic archaeological or landscape features that inform a chronology; and a very large assemblage of stone artefacts associated with other features such as oven remains or shell midden. Such sites will be relatively rare, and will be representative of a limited number of similar sites that make up this class; hence they derive high representative and rarity values.

13.2 Significance assessment

Table 17 provides an assessment of significance and summarises identified heritage values for individual Aboriginal sites within the subject area.

Table 17: Significance assessment for sites within the subject area

Value	Value Statement
S1MC-460 (36-3-3470)	Assessed significance: LOW
Research potential	Isolated artefacts have low research potential beyond their recognition and recording
Representativeness	The site has no notably demonstrative characteristics of its class or category
Rarity	The site is not rare, artefacts are the most frequent site locally and regionally
Educational potential	The site has limited ability to communicate information
Aesthetics	The site is in an unremarkable and disturbed context (Saddlers Creek Rd)
S1MC-461 (36-3-3471)	Assessed significance: LOW
Research potential	Isolated artefacts have low research potential beyond their recognition and recording
Representativeness	The site has no notably demonstrative characteristics of its class or category
Rarity	The site is not rare, artefacts are the most frequent site locally and regionally
Educational potential	The site has limited ability to communicate information
Aesthetics	The site is in an unremarkable and disturbed context (former drill site edge)
S1MC-357 (36-3-tba)	Assessed significance: LOW (not previously assessed)
Research potential	Isolated artefacts have low research potential beyond their recognition and recording
Representativeness	The site has no notably demonstrative characteristics of its class or category
Rarity	The site is not rare, artefacts are the most frequent site locally and regionally
Educational potential	The site has limited ability to communicate information
Aesthetics	The site is in an unremarkable and disturbed context (partially cleared woodland)
S1MC-278 (36-3-1093)	Assessed significance: LOW (confirmed)
Research potential	Low density artefact concentrations have low research potential beyond their recognition and recording
Representativeness	The site has no notably demonstrative characteristics of its class or category
Rarity	The site is not rare, artefacts are the most frequent site locally and regionally
Educational potential	The site has limited ability to communicate information
Aesthetics	The site is in an unremarkable and disturbed context (partially cleared woodland)
S1MC-230 (36-3-1377)	Assessed significance: HIGH (confirmed) (previously salvaged)
Research potential	High. Potential to inform on the production and use of blades, the potential to understand the use of technologies and raw materials through time due to the potential for sub-surface deposits and dating samples.
Representativeness	The site may contain demonstrative characteristics of blade manufacture
Rarity	Stone artefact sites are not rare, however a site such as this with evidence of secondary manufacture of artefacts and the potential to also provide chronological information provides some value under this criterion
Educational potential	The site has some ability to communicate information about Wiradjuri stone artefact technologies
Aesthetics	The site is in an unremarkable and disturbed context (partially cleared woodland)

13.3 Statement of significance

Statements of significance for the subject area are presented below. These statements of significance have been prepared in consideration of comments received from the RAPs during the consultation process, including those comments relating to the cultural significance of all sites and the interrelationships between the cultural and spiritual values with the natural landscape.

13.3.1 Social Value

The subject area holds social value to the Wiradjuri community through its associations with past Wiradjuri times and lives which are now preserved as archaeological sites within the subject area.

13.3.2 Aesthetic Value

The subject area has no identified aesthetic value.

13.3.3 Historical Value

The subject area has no identified historical values.

13.3.4 Scientific (Archaeological) Value

The subject area holds some scientific (archaeological) value. This value is focussed at Bora Creek where a high frequency and density of artefacts, with sub-surface potential are present.

13.4 Summary

The Moolarben UG4 Ancillary Works Modification subject area is located across a series of locally typical landforms, and many parts of the subject area have been subject to previous disturbance. Woodland, pasture and vehicle tracks characterise the subject area. The subject area contains five known Wiradjuri cultural heritage sites and is surrounded by many hundreds more sites in the local area. Four of the sites in the subject area are of low significance, and one is of high scientific significance. Overall the subject area has low cultural heritage value, the exception is the Bora Creek area which is of high value due to the high number of sites, high number and diversity of artefacts present, and sub-surface potential there.

14. Impact assessment

14.1 Potential for harm

The Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011) requires that both direct and indirect harm to Aboriginal objects and Aboriginal places be considered. Generally direct harm refers to occasions where an activity physically impacts a site or objects and therefore affects the heritage values possessed by the site or objects. Indirect harm is usually taken to mean harm stemming from secondary consequences of the activity and may affect sites or objects as an indirect consequence of the activity. Examples of such indirect harm are increased visitors to a site, or increased erosion in an area as a result of an activity.

The impact assessment is summarised in Table 18, where consequence of harm is assessed as a “Partial loss of value” because it is anticipated that the sites will be managed (collected and catalogued) under the Moolarben Coal Operations Heritage Management Plan, thus salvaging some heritage value and resulting in a partial loss of value.

Table 18: Impact assessment summary

Site name and AHIMS ID#	Type of harm	Degree of harm	Consequence of harm
S1MC-460 (36-3-3470)	Direct	Total	Partial loss of value
S1MC-461 (36-3-3471)	Direct	Total	Partial loss of value
S1MC-357 (36-3-tba)	Direct	Total	Partial loss of value
S1MC-278 (36-3-1093)	Direct	Total	Partial loss of value
S1MC-230 (36-3-1377)	Direct	Total	Partial loss of value

The Dewatering Site and Access Track/ Services Corridor (North) sits in close proximity to the rockshelter sites S1MC-289, S1MC-290, S1MC-294 and the open artefact site S1MC-291. The area of the Dewatering Site has been previously disturbed without deleterious effects to these sites and it is expected there will be no harm from the UG4 Ancillary Works Modification to these sites, given their situation as rockshelters at the base of a cliff-line.

The Downcast Ventilation Shaft subject area sits in close proximity to the artefact site Evaporation Pond 2, however this site will not be directly impacted by the proposed works.

15. Management and mitigation measures

15.1 Conservation Principles and Management Framework

The two founding principles behind the Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011:12) are ecologically sustainable development and intergenerational equity. These principles hold that “the present generation should make every effort to ensure the health, diversity and productivity of the environment – which includes cultural heritage – is available for the benefit of future generations”.

The strong emphasis, as in the Burra Charter, is to quantify and understand the heritage values of a place, a site, or an object and exhaust avenues of avoiding harm to those values. If harm cannot be avoided, then there must be consideration and implementation of strategies to minimise harm (OEH 2011:13).

It follows that the hierarchy for consideration in regard to management strategies available for surface stone artefacts and subsurface stone artefacts and areas of archaeological potential, fall into four general categories, in order of preference from a conservation perspective:

- avoidance and in-situ conservation;
- partial avoidance and partial in-situ conservation (includes partial harm);
- harm caused with mitigating circumstances such as collection or salvage; and
- unmitigated harm.

The four general categories (described above) have been considered in the following subsections with regard to both direct impacts (e.g. surface disturbance) and indirect impacts (e.g. monitoring activities).

The management and mitigation measures have been prepared in consideration of comments received from the RAPs during the consultation process. These comments include those related to cultural considerations surrounding salvage works and the handling of artefactual materials, as well as the cultural significance of all sites. All comments received from the RAPs are considered in Section 4.

15.2 Designing to avoid harm

The Modification design has been continually refined to minimise impacts and risk of impacts to cultural heritage sites.

15.3 Justifying harm

It should be noted that all Aboriginal sites are considered to have high cultural value to the Registered Aboriginal Parties.

The Modification is required for the optimisation of the currently approved UG4 underground mine area. The likely harm to Wiradjuri cultural heritage from the proposed works is assessed, for the most part to be low, and the harm therefore justified by the relative necessity of the Modification.

15.4 Mitigating harm

Management measures are warranted to mitigate the loss of values to the sites that would result from the proposed activity in the subject area. Management and mitigation measures are also needed to ensure continued compliance with the HMP and Project Approval.

For the UG4 Ancillary Works Modification, harm should be mitigated using the principles established and outlined in the Moolarben Coal Heritage Management Plan. In summary this would see a process of:

collection of artefacts prior to impact at sites of low significance; and, collection, initial test-excavation and salvage excavation (if warranted) at sites of high significance and sub-surface potential.

16. Conclusions and recommendations

Based on community consultation with the RAPs for the Modification, and with the completion of this ACHA by Niche, the following recommendations have been made (Table 19):

Table 19: Recommendations

Recommendations	
	Mitigation through salvage in accordance with the Moolarben HMP
1.	Harm to the site S1MC-230 cannot be avoided (however the footprint of harm has been reduced during the detailed design phase of the Modification). S1MC-230 is a site of high scientific (archaeological) significance with the potential for sub-surface archaeological deposits to be present which has been previously subject to surface salvage works. Further management will need to occur in the form of a staged excavation in accordance with Section 5.6 of the Moolarben HMP subsequent to any Modification approval and prior to any activities.
2.	Sites S1MC-278, S1MC-460, S1MC-461 and S1MC357 will be harmed by the Modification and surface salvage procedures as described in Section 5.5 of the Moolarben HMP must be conducted here prior to any works commencing.
	Avoiding harm to known sites
3.	Sites S1MC-289, S1MC-290, S1MC-291, S1MC-294 and Evaporation Pond 2 are all in close proximity to the proposed works. Where practicable facilities or components should be placed within the footprint to be as far away as possible from these sites. A physical barrier should be erected between these sites and activity areas to ensure no harm associated with the construction of the ancillary works areas.
	General
4.	AHIMS site cards must be submitted for all newly identified Aboriginal sites
5.	AHIMS Site Impact Recording Forms must be submitted for all sites subject to harm
6.	All workers should be inducted into the subject area so they are made aware of their obligations with regard to the protection and conservation of Wiradjuri heritage
7.	In the unlikely event that suspected human remains are encountered during activities the procedure set out in Section 5.11 of the Moolarben HMP must be followed

References

AECOM 2011a. Moolarben Preferred Project Report: Aboriginal Archaeological and Cultural Heritage Addendum. Unpublished report prepared for Moolarben Coal.

AECOM 2011b. Archaeological Collection & Excavation: Northern Borefield, Moolarben Coal Operations, Ulan, NSW. Unpublished report prepared for Moolarben Coal.

AECOM 2011c. Due Diligence Assessment of Proposed Exploration Drill Sites EL6288. Unpublished report prepared for Moolarben Coal.

AECOM 2012. Due Diligence Assessment of Proposed Exploration Drill Sites EL6288. Unpublished report prepared for Moolarben Coal.

AECOM 2014. Aboriginal archaeological due diligence assessment for Underground 4 (UG4) south drilling works. Unpublished report prepared for Moolarben Coal.

Australian Heritage Commission 2002. Ask First: A guide to respecting Indigenous Heritage places and values.

Australian ICOMOS 1999. The Burra Charter: The Australian ICOMOS Charter for Places of Cultural Significance 1999. Australia ICOMOS.

Boer-Mah, T. 2006. Lithics Report for Surface Salvage and Salvage Excavation at Wilpinjong Mine, N.S.W: June 2006. Prepared for Kayandel Archaeological Services.

Brennan, W. 2013. Wilpinjong Coal Mine, Rock Art Conservation and Monitoring Project: Field Inspection Report and Recommendations. Unpublished report o Wilpinjong Coal Pty Ltd.

Bureau of Meteorology 2014. <http://www.bom.gov.au/climate/data/>. Accessed 6 February 2014.

Coffey Natural Systems 2009. Response to Submissions Report - Part A Moolarben Coal Project - Stage 2.

Corkill, T. 1991. Survey for Aboriginal Archaeological Sites at Ulan Colliery, New South Wales: proposed Overland Conveyor and Creek Site Development. Report to Ulan Coal Mines Ltd.

Department of Environment and Conservation (DEC) 1997. Aboriginal Cultural Heritage Standards and Guidelines Kit. National Parks and Wildlife Service, Sydney.

Department of Environment and Conservation (DEC) 2004. Interim Community Consultation Requirements for Applicants.

Department of Environment, Climate Change and Water (DECCW) 2010a. Aboriginal cultural heritage consultation requirements for proponents 2010.

Department of Environment, Climate Change and Water (DECCW) 2010b. Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales.

Edgar, J. 1997. Ulan Open Cut Mine: Trench Through Proposed Highwall Zone 3: Aboriginal Heritage Aspects. Report to Ulan Coal Mines Ltd.

- Haglund, L. 1980. Preliminary Archaeological Survey of the Coal mining Area at Ulan, NSW. Report to Longworth and McKenzie Pty Ltd.
- Haglund, L. 1981a. Archaeological Survey and Sampling at the Site of the Ulan Coal Mine, Ulan, NSW. Report to Longworth and McKenzie Pty Ltd.
- Haglund, L. 1981b. Ulan Coal Mine: Archaeological Investigation in Connection with Proposed Changes in Development Plans. Report to Kinhill Engineers Pty Ltd.
- Haglund, L. 1992. Sample Surveys in Relation to Proposed Mine Extension in the Ulan Area, NSW. Report to Connell Wagner Pty Ltd.
- Haglund, L. 1996a. Salvage Excavation Completed for Ulan Coal Mines Ltd: NPWS Site 36-3-177, Ulan Heritage Identifier 116. Report to Ulan Coal Mines Ltd.
- Haglund, L. 1996b. Archaeological Inspection and Monitoring of Track and Drill Site East of Ulan Creek. Report to Ulan Coal Mines Ltd.
- Haglund, L. 1999a. Addendum to Ulan Coal Mines Second Longwall Project Environmental Statement. Report to Ulan Coal Mines Ltd.
- Haglund, L. 1999b. Ulan Coal Mines Second Longwall Project Environment Statement: Preliminary Survey for Aboriginal Sites. Report to Ulan Coal Mines Ltd.
- Haglund, L. 1999c. Ulan Coal Mines Pty Ltd: Archaeological Review and Inspection in Relation to Potential High Wall Mining – Areas West and North-west of Trench A. Report to Ulan Coal Mines Ltd.
- Haglund, L. 1999d. Report on Aboriginal heritage Studies Relating to SEPP No. 34 Application by Ulan Coal Mine. Report to Ulan Coal Mines Ltd.
- Haglund, L. 2001a. Salvage Excavation Completed for Ulan Coal Mines Ltd: Site SG5 Aboriginal Rock Shelter Site Vol 1. Report to Ulan Coal Mines Ltd.
- Haglund, L. 2001b. Salvage Excavation Completed for Ulan Coal Mines Ltd: Site SG5 Aboriginal Rock Shelter Site Vol III. Report to Ulan Coal Mines Ltd.
- Hamm, G. 2006a. Moolarben Coal Project - Aboriginal Cultural Heritage Assessment Report. Report to Moolarben Coal Mines Pty Ltd.
- Hamm, G. 2006b. Responses to Issues Raised in Respect of the Moolarben Coal Project Aboriginal Cultural Heritage Assessment Report. Report to Moolarben Coal Mines Pty Ltd.
- Hamm, G. 2008a. Moolarben Coal Project - Aboriginal Cultural Heritage Assessment Report Stage 2. Report Prepared for Moolarben Coal Mine.
- Hamm, G. 2008b. Aboriginal Heritage Plan for MCP Stage 1 Development Areas: Open Cut 1 and Main Infrastructure Area. Report Prepared for Moolarben Coal Mine.
- Hamm, G. 2009a. Aboriginal Cultural Heritage & Archaeological Assessment for Moolarben Coal Project Stage 1 Infrastructure Area & Proposed Water Sharing Pipeline Modification Project in Support of a Section 75w (2) Approval.

- Hamm, G. 2009b. Aboriginal Cultural Heritage & Archaeological Assessment for Moolarben Coal Project Stage 1 Northern Borefield Area.
- Hamm, G. 2009c. Moolarben Coal Project Executive Summary Report. Hamm, G. 2010 Disturbance Report for Moolarben Coal Project Stage 2.
- Hamm, G. 2010. Disturbance Report for Moolarben Coal Project Stage 2. Unpublished report to Moolarben Coal Operations Pty Limited.
- Hamm, G and Foley, L. 2010. Cultural Heritage Management Report on Moolarben Coal Project Stage 1: Open Cut 1 & Main Infrastructure Area.
- Hansen Bailey 2012. Moolarben Coal Project Stage 2 Preferred Project Report Response to Submissions.
- Horton, D. 1994. Encyclopaedia of Aboriginal Australia. Aboriginal Studies Press, Canberra.
- Kayandel Archaeological Services 2006a. Aboriginal Heritage Rapid Survey.
- Kayandel Archaeological Services 2006b. Wilpinjong Coal Project: Aboriginal Heritage Surface Salvage Summary Report. September 2006. Report to Wilpinjong Coal Pty Ltd.
- Kayandel Archaeological Services 2006c. Proposed Electricity Transmission Line: Ulan Substation to Wilpinjong Coal Project: Aboriginal Cultural Heritage Assessment. March 2006. Report to Wilpinjong Coal Pty Ltd.
- Kayandel Archaeological Services 2006d. Wilpinjong Coal Project: Aboriginal Cultural Heritage Survey: Supplemental Survey of Escarpment Areas and Report of Findings. November 2006. Report to Wilpinjong Coal Pty Ltd.
- Kayandel Archaeological Services 2007a. Archaeological Survey Report and Mapping for Proposed Borehole Locations: Aboriginal Pedestrian Survey. May 2007. Prepared for Wilpinjong Coal Pty Ltd.
- Kayandel Archaeological Services. 2007b. Wilpinjong Coal Project: Aboriginal Heritage: Surface Salvage of Sites. August 2007. Prepared for Wilpinjong Coal Pty Ltd.
- Kayandel Archaeological Services. 2007c. Wilpinjong Coal Project. Aboriginal Heritage Surface Salvage Summary .Report. September 2007.
- Kayandel Archaeological Services 2008a. Surface Salvage Report: Wilpinjong Coal Mine, Mudgee: December 2008.Prepared for Wilpinjong Coal Ltd Pty.
- Kayandel Archaeological Services 2008b. Slate Gully Drillhole Assessments. Report not available for review.
- Kayandel Archaeological Services 2009a. Test excavations of the Pit 5 Extension. Report not available for review.
- Kayandel Archaeological Services 2009b. Wintersun Hill/Bald Knobb Test Excavations. Report not available for review.
- Kuskie, P. 2000. An Assessment of Two Aboriginal Grinding Grooves Sites at Ulan Coal Mine, Central Tablelands, New South Wales. Report to Ulan Coal Mines Ltd.

- Kuskie, P. 2002. An Archaeological Assessment of a Proposed Basalt Quarry within Mining lease 1468, Ulan Coal Mine, Central Tablelands New South Wales. Report to Ulan Coal Mines Ltd.
- Kuskie, P. 2004. Proposed Open Cut Mine Extension, Additional Infrastructure and Consolidation Consents at Ulan Coal mine New South Wales: Aboriginal heritage Assessment (Vol. 2). Report to Ulan Coal Mines Ltd.
- Kuskie, P. 2008. Ulan Coal Mines Limited: Project Waratah: Preliminary Aboriginal Heritage Assessment. Report to Ulan Coal Mines Ltd.
- Kuskie, P. 2009. Ulan Coal Continued Operations: Aboriginal Heritage Assessment Volumes A and B. Report to Ulan Coal Mines Ltd.
- Kuskie, P. 2010a. Ulan Coal Continued Operations Aboriginal Heritage Impact Assessment – Supplementary Report for North 1 panels Project Modification. Report to Umwelt on behalf of Ulan Coal Mines Ltd.
- Kuskie, P. 2010b. Moolarben Coal Project Stage 2: Aboriginal Heritage Advice on Potential Impacts to Aboriginal Sites. Report to Moolarben Coal.
- Kuskie, P. 2012a. Ulan Coal Continued Operations Project: Test Excavations of Aboriginal Rock Shelter Sites within the North 1 Panels – Interim Report. Report to Ulan Coal Mines Ltd.
- Kuskie, P. 2012b. Moolarben Coal Project Stage 2 - Preliminary Report on Aboriginal Heritage Survey of Geotechnical Investigation Areas. Report to Ulan Coal Mines Ltd.
- Kuskie, P. 2012c. Moolarben Coal Project Stage 2 - Preliminary Report on Aboriginal Heritage Survey of Proposed Ulan - Wollar Road and Country Energy 66 kV Powerline Realignment.
- Kuskie, P. 2012d. Moolarben Coal Project: Preliminary Aboriginal Heritage Assessment of Proposed Temporary Workers Accommodation near Ulan, Central Tablelands of New South Wales.
- Kuskie, P. 2013a. Moolarben Coal Project – Stage 1 Optimisation Modification, Near Ulan, Central Tablelands of New South Wales: Aboriginal Cultural Heritage Assessment. Report to Moolarben Coal.
- Kuskie, P. 2013b. Wilpinjong Coal mine, Central Tablelands of new South Wales – Modification Aboriginal Cultural Heritage Assessment.
- Kuskie, P. 2013c. Aboriginal Heritage Management Plan Stage 1. Version 2. Report to Moolarben Coal.
- Kuskie, P. 2013d. Moolarben Coal Project Stage 1 – Preliminary Report on Aboriginal Heritage Survey of Open Cut 2 Drilling Areas. Report to Moolarben Coal.
- Kuskie, P. 2013e. Moolarben Coal Project Stage 2: Aboriginal Heritage Assessment of Proposed Ulan – Wollar Road and Essential Energy Powerline Realignments, Near Ulan, Central Tablelands of New South Wales. Report to Moolarben Coal.
- Kuskie, P. 2015. Wilpinjong Coal Mine, Central Tablelands of New South Wales – Extension Project: Aboriginal Cultural Heritage Assessment. Unpublished report prepared for Wilpinjong Mine.
- Kuskie, P. 2018. Ulan Coal Mines Limited, Central Tablelands of New South Wales: Modification 4 - Aboriginal Cultural Heritage Assessment. Unpublished report prepared for Ulan Coal Mines.

Kuskie, P. and Clarke 2003. Proposed Open Cut Mine Extension, Additional Infrastructure and Consolidation Consents at Ulan Coal mine New South Wales: Aboriginal heritage Assessment (Vol. 1). Report to Ulan Coal Mines Ltd.

Kuskie, P. and Clarke 2005a. Proposed Open Cut Mine Extension, Additional Infrastructure at Ulan Coal Mine: Aboriginal heritage Assessment. Report to Ulan Coal Mines Ltd.

Kuskie, P. and Clarke 2005b. Archaeological Survey of Aboriginal heritage within SMP Application Area (Longwall Panels 23-25 and W1) of Mining Lease 1468, Ulan Coal Mine, Central Tablelands. Vol A and Vol B. Report to Ulan Coal Mines Ltd.

Kuskie, P. and Clarke 2007. Archaeological Survey of Aboriginal Heritage within SMP Application Area (Longwall Panels W2 and W3) of Mining Lease 1468, Ulan Coal Mine, Central Tablelands, New South Wales: Volume A and Volume B. Report to Ulan Coal Mines Ltd.

Kuskie and Webster 2001. Archaeological Survey of Aboriginal Heritage within Longwall Panels 18-22, Mining Lease 1468 and 1341, Ulan Coal Mine, Central Tablelands, New South Wales, Volumes 1 and 2.

Moolarben Coal Operations Pty Ltd 2013. Aboriginal Heritage Management Plan Stage 1. Version 2. May 2013.

MSEC 2015. Revised Predictions of Subsidence Parameters and Revised Assessments of Subsidence Impacts resulting from the Proposed UG1 Mine Layout Optimisation Modification. Unpublished report prepared for Moolarben Coal.

Murphy, B.W. and Lawrie J.M., 1998, Soil Landscapes of the Dubbo 1:250,000 Sheet, NSW Department of Land and Water Conservation, Sydney.

Navin Officer Heritage Consultants Pty Ltd 2005. Wilpinjong Coal Project Appendix F Aboriginal Cultural Heritage Assessment. A report prepared for Wilpinjong Coal Pty Limited.

Navin Officer Heritage Consultants Pty Ltd 2006a. Wilpinjong Coal Project: Archaeological Salvage and Post EIS Investigations.

Navin Officer Heritage Consultants Pty Ltd 2006b. Baseline Recording of Three Aboriginal Rock Arts Sites WCP 72, 152 and 163 at Wilpinjong, NSW.

Niche 2014. Moolarben Coal Mine OC4 South-West Modification Aboriginal Cultural Heritage Assessment. Unpublished report prepared for Moolarben Coal.

Niche 2015a. Aboriginal Cultural Heritage Assessment - Moolarben Coal Complex UG1 Optimisation Modification June 2015. Unpublished report prepared for Moolarben Coal.

Niche 2015b. Paleo A, Paleo B, Paleo C, NW01 and NW02 Exploration Boreholes. Aboriginal Objects Due Diligence Assessment December 2015. Unpublished report prepared for Moolarben Coal.

Niche 2016a. Aboriginal Cultural Heritage Conservation Fence Aboriginal Heritage Survey and Assessment March 2016. Unpublished report prepared for Moolarben Coal.

Niche 2016b. Dun Dun East Biodiversity Offset Area, Hargraves, NSW Aboriginal Cultural Heritage Values Assessment. Unpublished report prepared for Moolarben Coal.

- Niche 2016c. Moolarben Coal Complex- Relocation of Telstra Services Aboriginal heritage pre-surface disturbance survey April 2016. Unpublished report prepared for Moolarben Coal.
- Niche 2016d. Moolarben Coal Complex Longwalls 101 – 103 Aboriginal Heritage Survey Report June 2016. Unpublished report prepared for Moolarben Coal.
- Niche 2016e. Moolarben Coal Complex – Fire Trail Aboriginal objects due diligence assessment June 2016. Unpublished report prepared for Moolarben Coal.
- Niche 2016f. Moolarben Coal Complex – Open Cut 3, Mining Lease Drilling Programme, Aboriginal cultural heritage survey July 2016. Unpublished report prepared for Moolarben Coal.
- Niche 2016g. Moolarben Coal Complex – Open Cut 4 Mining Lease Drilling Programme, Aboriginal cultural heritage survey assessment July 2016. Unpublished report prepared for Moolarben Coal.
- Niche 2016h. Moolarben Coal Complex – Open Cut 3 Exploration Lease Drilling Programme, Aboriginal cultural heritage survey assessment October 2016. Unpublished report prepared for Moolarben Coal.
- Niche 2017a. Moolarben Coal UG1 Longwalls 101-103 Extraction Plan Aboriginal Cultural Heritage Technical Report March 2017. Unpublished report prepared for Moolarben Coal.
- Niche 2017b. OC3 LOX Lines and Access Tracks, Extra Access Lines Aboriginal Heritage Assessment January 2017. Unpublished report prepared for Moolarben Coal.
- Niche 2017c. Moolarben Coal Complex – Underground 3 (UG3), Exploration Drilling Programme, Aboriginal cultural heritage due diligence survey February 2017. Unpublished report prepared for Moolarben Coal.
- Office of Environment and Heritage (OEH) 2011. Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW.
- Pearson, M. 1981. Seen Through Different Eyes: Changing Land Use and Settlement Patterns in the Upper Macquarie River Region of NSW from Prehistoric Times to 1860. Ph.D. Thesis, Department of Prehistory and Anthropology, Australian National University, Canberra.
- Senior and Rudder 2005. A First Wiradjuri Dictionary.
- Therin 2000. Spring Gully 5 Salvage Excavation Usewear and Residue Report.
- Tindale, N. 1974. Aboriginal Tribes of Australia. ANU Press, Canberra.
- Urban Tree Management Australia 2008. Report: Arboricultural Assessment of Scarred Tree ref. (36-3-0798: S1MC1) at Ulan, New South Wales for Moolarben Coal Project Stage 1.
- White, E. 2001a. Salvage Excavation Completed for Ulan Coal Mines Lt Site SG4 Aboriginal Rock Shelter Vol II.
- White, E. 2001b. A Comment on the stone artefact assemblage from squares E 7 and E8 at Site SG6, Ulan, NSW.
- Wilpinjong Coal Pty Ltd (WCPL) 2008. Wilpinjong Coal Mine Aboriginal Cultural Heritage Management Plan and North-Eastern Wiradjuri Cultural Heritage Management Plan.

Appendix 1 – Correspondence

3 July 2019

Aleisha Lonsdale
PO Box 1098
MUDGEE NSW 2850

Dear Aleisha

RE: MOOLARBEN COAL COMPLEX UG4 ANCILLARY WORKS MODIFICATION – ABORIGINAL CULTURAL HERITAGE ASSESSMENT

Moolarben Coal Operations Pty Ltd (MCO) is seeking to modify Stage 1 of the Moolarben Coal Complex to allow for the construction of ancillary infrastructure required for the operation of UG4. This will require an Aboriginal Cultural Heritage Assessment to be undertaken for additional surface disturbance areas.

As part of this process, MCO is seeking to engage with Aboriginal community stakeholders as part of the preparation for lodgement of a modification request under section 4.55 of the NSW *Environmental Planning and Assessment Act, 1979* herein referred to as the UG4 Ancillary Works Modification (the Modification).

Due to your previous involvement and/or interest in Aboriginal heritage at the Moolarben Coal Complex, you have been automatically registered for the consultation process associated with the Modification. You do not need to contact MCO to register for the Modification.

Proposed Methodology

Please find enclosed for your review, a copy of the Proposed Methodology for the Aboriginal Cultural Heritage Assessment for the Modification, including a description of the Modification.

In accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (New South Wales [NSW] Department of Environment, Climate Change and Water, 2010) issued by the NSW Office of Environment and Heritage, we have provided the Proposed Methodology for your review and feedback.

Your feedback may include the identification of issues or areas of cultural significance that may be used to affect, inform or refine the Proposed Methodology.

If you wish to provide input on the following components of the Proposed Methodology, please make a written submission to MCO by **5.00pm 31 July 2019** (via the contact details provided at the end of this letter):

- The nature of the Proposed Methodology.
- Any Aboriginal objects or places of cultural value within the investigation area, or issues of cultural significance, that you are aware of.
- Any restrictions or protocols you may consider necessary in relation to any information of sensitivity that you may provide.
- Any other factors you consider to be relevant to the heritage assessment.

All comments received will be taken into consideration as the Methodology is finalised.

Contact Details

If you have any queries regarding the Modification, or to provide any feedback with respect to the Proposed Methodology, could you please direct all correspondence to MCO via the following contact details:

Trent Cini
Environment and Community Superintendent
Moolarben Coal Operations Pty Ltd
Locked Bag 2003, Mudgee NSW 2850
Phone: (02) 6376 1436
Email: trent.cini@yancoal.com.au

Please do not hesitate to contact the undersigned should you wish to discuss further.

Yours sincerely

MOOLARBEN COAL OPERATIONS PTY LTD



Trent Cini
Environment and Community Superintendent

3 July 2019

Murong Gialinga Aboriginal and Torres Strait Islanders Corporation
Larry and Debbie Foley
PO Box 1097
MUDGEE NSW 2850

Dear Larry and Debbie

RE: MOOLARBEN COAL COMPLEX UG4 ANCILLARY WORKS MODIFICATION – ABORIGINAL CULTURAL HERITAGE ASSESSMENT

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Yours sincerely

MOOLARBEN COAL OPERATIONS PTY LTD



Trent Cini
Environment and Community Superintendent

3 July 2019

Mudgee Local Aboriginal Land Council
Tony Lonsdale
PO Box 1098
MUDGEE NSW 2850

Dear Tony

RE: MOOLARBEN COAL COMPLEX UG4 ANCILLARY WORKS MODIFICATION – ABORIGINAL CULTURAL HERITAGE ASSESSMENT

Moolarben Coal Operations Pty Ltd (MCO) is seeking to modify Stage 1 of the Moolarben Coal Complex to allow for the construction of ancillary infrastructure required for the operation of UG4. This will require an Aboriginal Cultural Heritage Assessment to be undertaken for additional surface disturbance areas.

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Yours sincerely

MOOLARBEN COAL OPERATIONS PTY LTD



Trent Cini
Environment and Community Superintendent

3 July 2019

Craig McConnell
13 Guntawang Rd
GALAMBINE NSW 2850

Dear Craig

RE: MOOLARBEN COAL COMPLEX UG4 ANCILLARY WORKS MODIFICATION – ABORIGINAL CULTURAL HERITAGE ASSESSMENT

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Yours sincerely

MOOLARBEN COAL OPERATIONS PTY LTD



Trent Cini
Environment and Community Superintendent

3 July 2019

Warranha Ngumbaay
PO Box 1098
MUDGEE NSW 2850

Dear Warranha Ngumbaay

RE: MOOLARBEN COAL COMPLEX UG4 ANCILLARY WORKS MODIFICATION – ABORIGINAL CULTURAL HERITAGE ASSESSMENT

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Yours sincerely

MOOLARBEN COAL OPERATIONS PTY LTD



Trent Cini
Environment and Community Superintendent

3 July 2019

North-East Wiradjuri Company Ltd
[REDACTED] Peter O'Mara
PO Box 29
KANDOS NSW 2848

Dear [REDACTED] Peter

RE: MOOLARBEN COAL COMPLEX UG4 ANCILLARY WORKS MODIFICATION – ABORIGINAL CULTURAL HERITAGE ASSESSMENT

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- Any restrictions or protocols you may consider necessary in relation to any information of sensitivity that you may provide.
- Any other factors you consider to be relevant to the heritage assessment.

All comments received will be taken into consideration as the Methodology is finalised.

Contact Details

If you have any queries regarding the Modification, or to provide any feedback with respect to the Proposed Methodology, could you please direct all correspondence to MCO via the following contact details:

Trent Cini
Environment and Community Superintendent
Moolarben Coal Operations Pty Ltd
Locked Bag 2003, Mudgee NSW 2850
Phone: (02) 6376 1436
Email: trent.cini@yancoal.com.au

Please do not hesitate to contact the undersigned should you wish to discuss further.

Yours sincerely

MOOLARBEN COAL OPERATIONS PTY LTD



Trent Cini
Environment and Community Superintendent

3 July 2019

Warrabinga Native Title Claimants Aboriginal Corporation
Lance Syme
PO Box 282
MUDGEE NSW 2850

Dear Lance

RE: MOOLARBEN COAL COMPLEX UG4 ANCILLARY WORKS MODIFICATION – ABORIGINAL CULTURAL HERITAGE ASSESSMENT

Moolarben Coal Operations Pty Ltd (MCO) is seeking to modify Stage 1 of the Moolarben Coal Complex to allow for the construction of ancillary infrastructure required for the operation of UG4. This will require an Aboriginal Cultural Heritage Assessment to be undertaken for additional surface disturbance areas.

As part of this process, MCO is seeking to engage with Aboriginal community stakeholders as part of the preparation for lodgement of a modification request under section 4.55 of the NSW *Environmental Planning and Assessment Act, 1979* herein referred to as the UG4 Ancillary Works Modification (the Modification).

Due to your previous involvement and/or interest in Aboriginal heritage at the Moolarben Coal Complex, you have been automatically registered for the consultation process associated with the Modification. You do not need to contact MCO to register for the Modification.

Proposed Methodology

Please find enclosed for your review, a copy of the Proposed Methodology for the Aboriginal Cultural Heritage Assessment for the Modification, including a description of the Modification.

In accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (New South Wales [NSW] Department of Environment, Climate Change and Water, 2010) issued by the NSW Office of Environment and Heritage, we have provided the Proposed Methodology for your review and feedback.

Your feedback may include the identification of issues or areas of cultural significance that may be used to affect, inform or refine the Proposed Methodology.

If you wish to provide input on the following components of the Proposed Methodology, please make a written submission to MCO by **5.00pm 31 July 2019** (via the contact details provided at the end of this letter):

- The nature of the Proposed Methodology.
- Any Aboriginal objects or places of cultural value within the investigation area, or issues of cultural significance, that you are aware of.
- Any restrictions or protocols you may consider necessary in relation to any information of sensitivity that you may provide.
- Any other factors you consider to be relevant to the heritage assessment.

All comments received will be taken into consideration as the Methodology is finalised.

Contact Details

If you have any queries regarding the Modification, or to provide any feedback with respect to the Proposed Methodology, could you please direct all correspondence to MCO via the following contact details:

Trent Cini
Environment and Community Superintendent
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Please do not hesitate to contact the undersigned should you wish to discuss further.

Yours sincerely

MOOLARBEN COAL OPERATIONS PTY LTD



Trent Cini
Environment and Community Superintendent

PROPOSED METHODOLOGY FOR THE MOOLARBEN COAL COMPLEX UG4 ANCILLARY WORKS MODIFICATION ABORIGINAL CULTURAL HERITAGE ASSESSMENT

3 July 2019

INTRODUCTION

The Moolarben Coal Complex is located approximately 40 kilometres north of Mudgee in the Western Coalfield of New South Wales (NSW) (Figure 1) in the Mid Western Regional Local Government Area.

Moolarben Coal Operations Pty Ltd (MCO) is the operator of the Moolarben Coal Complex on behalf of the Moolarben Joint Venture (Moolarben Coal Mines Pty Ltd, Sojitz Moolarben Resources Pty Ltd and a consortium of Korean power companies). MCO and Moolarben Coal Mines Pty Ltd are wholly owned subsidiaries of Yancoal Australia Limited.

The Moolarben Coal Complex comprises four approved open cut mining areas (OC1 to OC4), three approved underground mining areas (UG1, UG2 and UG4) and other mining related infrastructure (including coal processing and transport facilities).

Mining operations at the Moolarben Coal Complex are currently approved until 31 December 2038 and would continue to be carried out in accordance with NSW Project Approval (05_0117) (Moolarben Coal Project Stage 1) as modified and NSW Project Approval (08_0135) (Moolarben Coal Project Stage 2) as modified. Stages 1 and 2 of the Moolarben Coal Complex were declared State Significant Development under the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act) on 28 June 2019.

The management of Aboriginal heritage at the Moolarben Coal Complex is undertaken in accordance with the *Moolarben Coal Complex Heritage Management Plan* (dated November 2017).

MCO is seeking to modify the Stage 1 Project Approval (05_0117) (the UG4 Ancillary Works Modification [the Modification]) to allow changes to the currently approved operations (Figure 2).

Of relevance to the Aboriginal Cultural Heritage Assessment, the Modification would involve (but is not limited to) the following activities:

- additional dewatering bore sites (in addition to the approved northern borefield) and associated infrastructure (e.g. access tracks, powerline, water pipelines, etc.);
- new remote services infrastructure area;
- new internal road crossing of Bora Creek to provide access to the remote services infrastructure area;
- new downcast ventilation shaft compound and associated infrastructure (e.g. access track, ballast drop hole, storage sheds, water tanks, etc.);
- new site access to the ventilation shaft compound via Ulan Road; and
- other minor ancillary infrastructure.

The Modification would require a modification to the Stage 1 Moolarben Coal Project Approval (05_0117) under section 4.55 of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act).

Moolarben Coal is seeking to engage with Aboriginal community stakeholders as part of the preparation for lodgement of a modification request under section 4.55 of the EP&A Act. The Modification request is referred to as the Modification.

The areas of land that the above activities relate to are indicatively shown on Figure 2 (at the back of this document). Of note is that portions of these areas have previously been surveyed for disturbance and the management of Aboriginal heritage in these areas is guided by the approved *Moolarben Coal Complex Heritage Management Plan* (dated November 2017).

A Statement of Environmental Effects would be prepared for the Modification and it is expected to include the following key specialist assessments:

- Aboriginal Cultural Heritage Assessment.
- Biodiversity Assessment.
- Surface Water Assessment.
- Road Transport Assessment.
- Noise Review.
- Air Quality Review.

The Proposed Methodology for the Aboriginal Cultural Heritage Assessment of the Modification is outlined below. MCO invites Registered Aboriginal Parties (RAPs) to provide comments (either verbally or in writing) on the Proposed Methodology.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

Various Aboriginal cultural heritage survey and assessments have previously been undertaken at the Moolarben Coal Complex, including (but not limited to):

- *Moolarben Coal Project Aboriginal Cultural Heritage Assessment Report* (Archaeological Risk Assessment Services Pty Ltd, 2006).
- *Moolarben Coal Project Aboriginal Cultural Heritage Assessment Report Stage 2* (Archaeological Risk Assessment Services Pty Ltd, 2008).
- *Moolarben Coal Project – Stage 1 Optimisation Modification, Near Ulan, Central Tablelands of New South Wales: Aboriginal Cultural Heritage Assessment* (South East Archaeology, 2013).
- *Moolarben Preferred Project Report: Aboriginal Archaeological and Cultural Heritage Addendum* (AECOM, 2011).
- *Moolarben Coal Mine OC4 South-West Modification Aboriginal Cultural Heritage Assessment* (Niche Environment and Heritage, 2014a).
- *Moolarben Coal Complex UG1 Optimisation Modification Aboriginal Cultural Heritage Assessment* (Niche Environment and Heritage, 2014b).
- *Moolarben Coal Complex Open Cut Optimisation Modification Aboriginal Cultural Heritage Assessment* (Niche Environment and Heritage, 2017).
- Various campaigns of pre-clearance salvage.
- Various campaigns of test pit investigations and monitoring.
- Various campaigns of additional survey work.

Based on the results of these previous investigations, Figure 2 presents the locations of Aboriginal heritage sites within and in immediate proximity to the Study Area. Seven Aboriginal heritage sites are located within the indicative Study Area for the Modification, comprising:

- six open artefact sites; and
- one rock shelter site.

PROPOSED METHODOLOGY

The Proposed Methodology for the Modification Aboriginal Cultural Heritage Assessment is as follows:

- Provision of existing information on Aboriginal heritage sites within the Study Area and surrounds.
- Representative field survey of the Study Area (in areas where sufficient survey coverage has not already been obtained). The involvement of RAPs in fieldwork would be guided by Section 5.1.4 of the *Moolarben Coal Complex Heritage Management Plan* (dated November 2017).
- Conduct an archaeological assessment (including an archaeological significance assessment) of any known or potential Aboriginal heritage sites identified within the Study Area (which may include the use of existing information).
- A request by MCO to RAPs for comments regarding the cultural significance of Aboriginal heritage sites and/or areas within the Study Area.
- In consultation with the RAPs, identification of recommended management and mitigation measures for Aboriginal heritage sites/areas within the Study Area.
- Provide a copy of the draft Aboriginal Cultural Heritage Assessment to the RAPs for their review and feedback.
- Documentation of feedback received as part of the cultural assessment from RAPs for presentation in the final Aboriginal Cultural Heritage Assessment report (subject to the sensitivity of the information provided).

In accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (NSW Department of Environment, Climate Change and Water, 2010), MCO requests that RAPs provide, where relevant, during the conduct of the Aboriginal Cultural Heritage Assessment, cultural information regarding:

- whether there are any Aboriginal sites/objects of cultural value to Aboriginal people in the Study Area or surrounds; and
- whether there are any places of cultural value to Aboriginal people in the Study Area or surrounds.

This may include places of social, spiritual and cultural value, historic places with cultural significance, and potential places/areas of historic, social, spiritual and/or cultural significance.

SENSITIVE CULTURAL INFORMATION – MANAGEMENT PROTOCOL

In the event that a RAP has sensitive or restricted public access information, it is proposed that MCO would manage this information (if provided by the Aboriginal community) in accordance with a sensitive cultural information management protocol.

It is anticipated that the protocol would include making note of and managing the material in accordance with the following key limitations/requirements as advised by the relevant RAP at the time of the information being provided:

- any restrictions on access to the material;
- any restrictions on communication of the material;
- any restrictions on the location/storage of the material;
- any cultural recommendations on handling the material;
- any contextual information;
- any names and contact details of persons authorised by the relevant Aboriginal party to make decisions concerning the Aboriginal material and the degree of authorisation;
- any details of any consent given in accordance with customary law;
- the level of confidentiality to be accorded to the material; and
- any access and use by the RAPs, of the cultural information in the material.

All RAPs should be aware of the mandatory NSW Office of Environment and Heritage requirement that all feedback provided must be documented in the final Aboriginal Cultural Heritage Assessment report, including copies of any submissions received and the proponents response to the issues raised.

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

Following consultation on the Proposed Methodology and the undertaking of any required field components, a draft Aboriginal Cultural Heritage Assessment report will be prepared. The draft Aboriginal Cultural Heritage Assessment report will be provided to RAPs for comment and will include:

- Details of the sites/objects and/or places and their precise locations within the Study Area and an assessment of potential impacts from the Modification.
- Detailed records of the consultation conducted with RAPs and how any comments received throughout the assessment process were considered.
- Management and mitigation recommendations drawing on information provided by RAPs and the results of the Aboriginal Cultural Heritage Assessment.

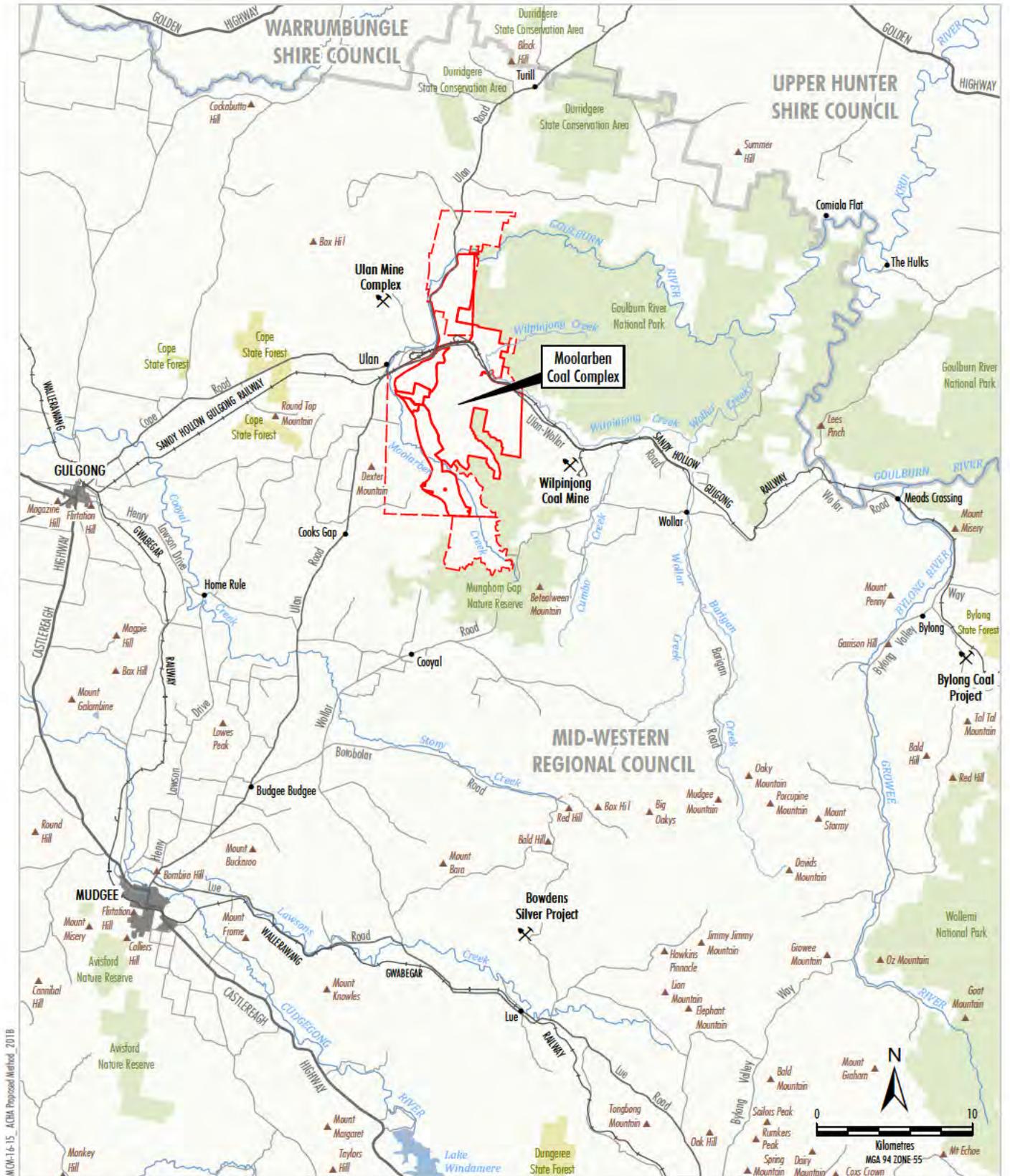
CRITICAL TIMELINES

Critical timelines for the Modification Aboriginal Cultural Heritage Assessment are outlined below:

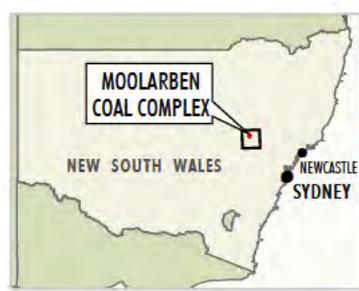
1. Collation of culturally significant information – ongoing throughout process until the end of the draft Aboriginal Cultural Heritage Assessment review period.
2. Provision of comments on the Proposed Methodology to MCO – 31 July 2019.
3. Field survey –10 July 2019.
4. Provision of a draft Aboriginal Cultural Heritage Assessment (including proposed management and mitigation measures) to RAPs for review and comment – early August 2019.
5. Provision of comments from RAPs on draft Aboriginal Cultural Heritage Assessment to MCO – early September 2019.
6. Finalise Aboriginal Cultural Heritage Assessment in consideration of comments received – late September 2019.

REFERENCES

- Aboriginal Risk Assessment Services Pty Ltd (2006) *Moolarben Coal Project Aboriginal Cultural Heritage Assessment Report*. Report prepared for Moolarben Coal Mines Pty Limited.
- Aboriginal Risk Assessment Services Pty Ltd (2008) *Moolarben Coal Project Aboriginal Cultural Heritage Assessment Report Stage 2*. Report prepared for Moolarben Coal Mines Pty Limited.
- AECOM (2011) *Moolarben Preferred Project Report: Aboriginal Archaeological and Cultural Heritage Addendum*. Report prepared for Hansen Bailey.
- Department of Environment, Climate Change and Water (2010) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*.
- Niche Environment and Heritage (2014a) *Moolarben Coal Mine OC4 South-West Modification Aboriginal Cultural Heritage Assessment*.
- Niche Environment and Heritage (2014b) *Moolarben Coal Complex UG1 Optimisation Modification Aboriginal Cultural Heritage Assessment*.
- Niche Environment and Heritage (2017) *Moolarben Coal Complex Open Cut Optimisation Modification Aboriginal Cultural Heritage Assessment*.
- South East Archaeology (2013) *Moolarben Coal Project – State 1 Optimisation Modification, Near Ulan, Central Tablelands of New South Wales: Aboriginal Cultural Heritage Assessment*. Report prepared for Moolarben Coal Pty Limited.



AWM-16-15 - ACBA Proposed Method, 2018

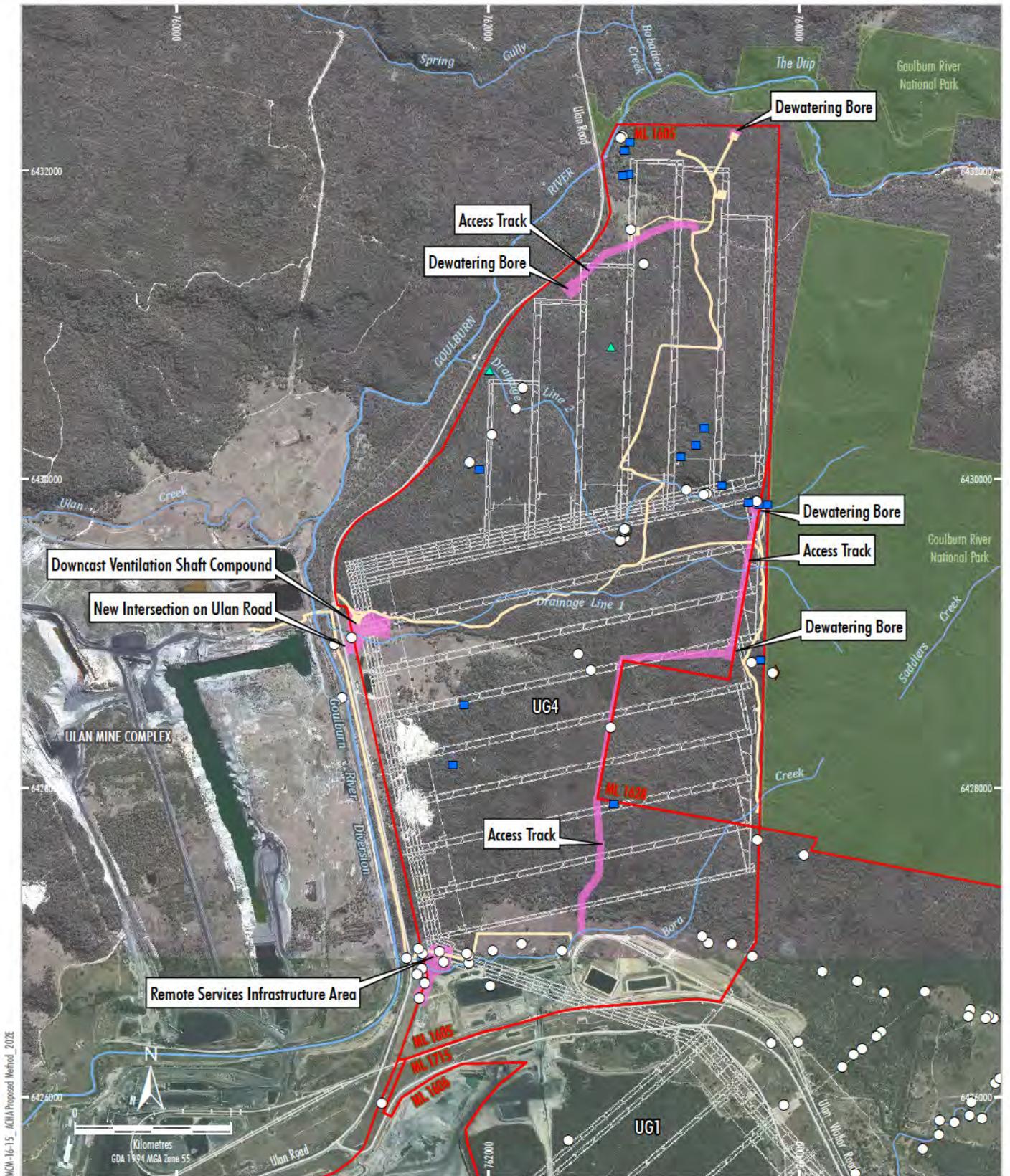


- LEGEND**
- State Forest
 - NSW National Parks and Wildlife Service
 - Local Government Boundary
 - Exploration Licence Boundary
 - Mining Lease Boundary
 - Mining Operation

Source: NSW Land & Property Information (2017); NSW Department of Industry (2019); Office of Environment and Heritage NSW (2019)


MOOLARBEN COAL
 MOOLARBEN COAL COMPLEX
 Regional Location

Figure 1



MCM-16-15_ACHA Proposed Method_202E

- LEGEND**
- Mining Lease Boundary
 - Existing/Approved Development
 - Underground Longwall Layout
 - Pipeline and Borefield Infrastructure
 - UG4 Ancillary Works Modification
 - Study Area

- Aboriginal Heritage Sites**
- Open Artefact Scatter with or without PAD
 - Grinding Grooves with or without Artefact Scatter
 - Rockshelter with or without Art, Grinding Grooves, Artefacts or PAD
 - Potential Archaeological Deposit (PAD)

Source: MCO (2019); NSW Dept of Industry (2019); NSW Land & Property Information (2017); Office of Environment and Heritage NSW (2019); Orthophoto Mosaic: MCO (April 2016 - May 2012)


MOOLARBEN COAL
MOOLARBEN COAL COMPLEX
UG4 Modification
Aboriginal Heritage Sites

Figure 2

Received via e-mail

To Mr T Cini

Murong Gialinga are replying to the Moolarben Coal Complex UG4 Ancillary Works Modification after reading and discussing this with Murong Gilingas community we have these concerns as follows . We do not approve of mining . We need to have Quarterly meetings to be kept up to date on what is happening at Moolarben .This modification will affect the sub surface water table of the project and surrounding areas which include the Goulburn River and ancillary waterways. . The Drip which is very important to our people the local Wiradjuri people past /present also non Aboriginal people could be adversely affected due to vibration and subsidence and irreparable damage. Our Cultural landscape has been changed and can never be the same as no amount of re vegetation can help the destruction that has and will continue to occurred.

Regards

Debbie Foley on behalf of Murong Gialinga



14th August 2019

Mr. TRENT CINI

ENVIRONMENT & COMMUNITY SUPERINTENDENT

MOOLARBEN COAL OPERATIONS

MOOLARBEN COAL COMPLEX UG4 ANCILLARY WORKS MODIFICATION & ALL FUTURE APPLICATIONS

Ibbai Waggan-Wiradjuri People Approvals & Negotiations

Introduction

We write to provide the following information surrounding our Indigenous society. We are an Indigenous group which have had and will continue to have a presence and an influence within your operational area and wish to pursue an ongoing working relationship with your organisation.

We are identified as the Ibbai Waggan-Wiradjuri People being Original Owners of Ngurangbang (Country) within the Wiradjuri Nation. Our status has been affirmed by the testing of our family group genealogy and continued connection to our land.

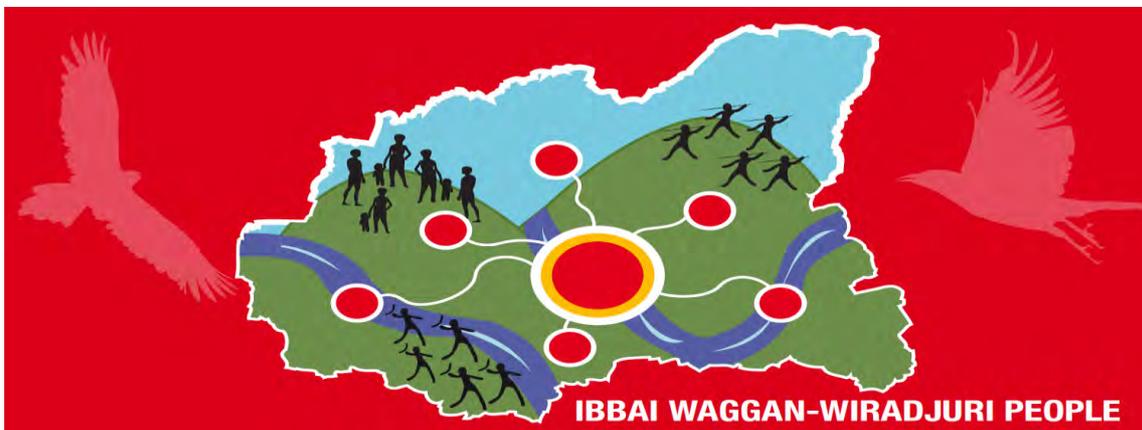
Our genealogy originates from the following Indigenous Apical Ancestors and encompasses a myriad of preceding family ancestors through Main & Kinship;

Woowah Charlotte
Goongalbool Jemmy
John Stewart
Ellen Plummer

Through statements recorded in historical records and actions taken by our ancestors Ibbai Waggan-Wiradjuri People Claim “Exclusive Possession” over our Main & Kinship Tribal Ngurangbang.

We know our history and family apical status entitles our group to exercise this “Right” on activities within our tribal boundary. As such, the Ibbai Waggan-Wiradjuri People claim this right, to be a party of any agreement made on our Ngurangbang, which is retrospective to pre-European settlement.

Based on current arrangements, Ibbai Waggan-Wiradjuri People have been denied access to our Cultural Sensitive sites and excluded from any rightful benefits to support projects to assist the Ibbai Waggan-Wiradjuri People.



Ibbai Waggan-Wiradjuri People have continual unbroken Exclusive Possession & continual unbroken Physical Connection through Main & Kinship of many families within our Tribal Lands > 40000 years pre-European settlement 1788 to present day. Our Exclusive Possession covers all aspects of Ibbai Waggan-Wiradjuri from Knowledge of Culture, Lore, Customs, beliefs and a duty to shield Ibbai Waggan-Wiradjuri Tribal Ngurangbang. We know this and always have through oral stories handed down through our kinship structures.

Whilst Indigenous history is typically handed down orally, we also have the references of our Ibbai Waggan Wiradjuri historical connection records within over 735 pages of first hand documented events within European manuscripts recording daily information, based on factual detail.

These historical connection records bear witness to our existence, occupation and daily recordings of events relevant to our descendants. They commenced soon after the establishment of a colony within the Molong, Wellington & Mudgee areas and are available in the public domain.

Extracts from Historical Connection Records

Watson's Diary

17 October 1835

As declared by Gungin our Tribal Ancestor

What do you want here? What do you come here for? Why do you not go to your own country?

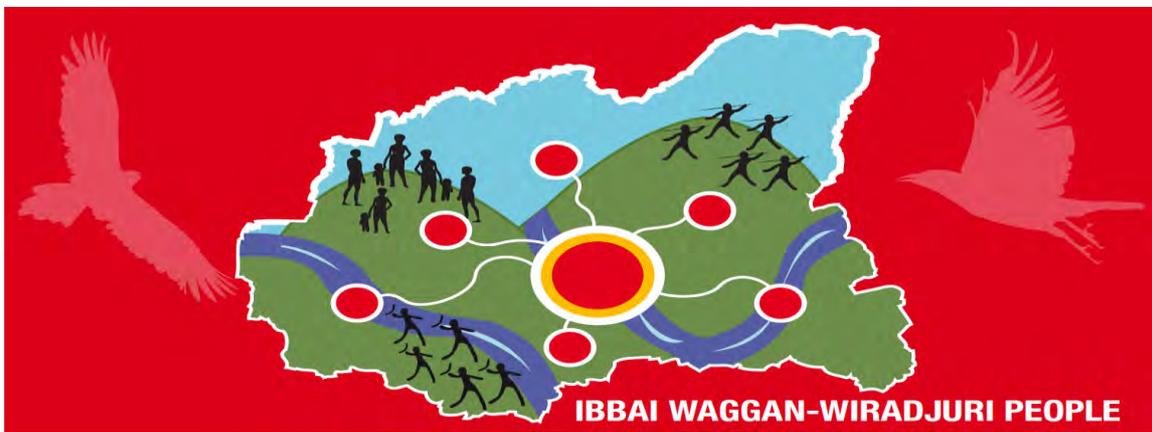
16 November 1836

One apparently full of self importance, had much to say respecting his having been at Bathurst, how Englishmen did when men were brought before a magistrate, how the land "all about" belonged to the natives, and that I was not to mind. I had already learnt that many of these were wild natives, and had come from a distance of 100 miles.

Ibbai Waggan-Wiradjuri People have commissioned a number of studies based on the Wiradjuri Nation, lore, custom and connections to Ngurangbang through our genealogy and Apical ancestors.

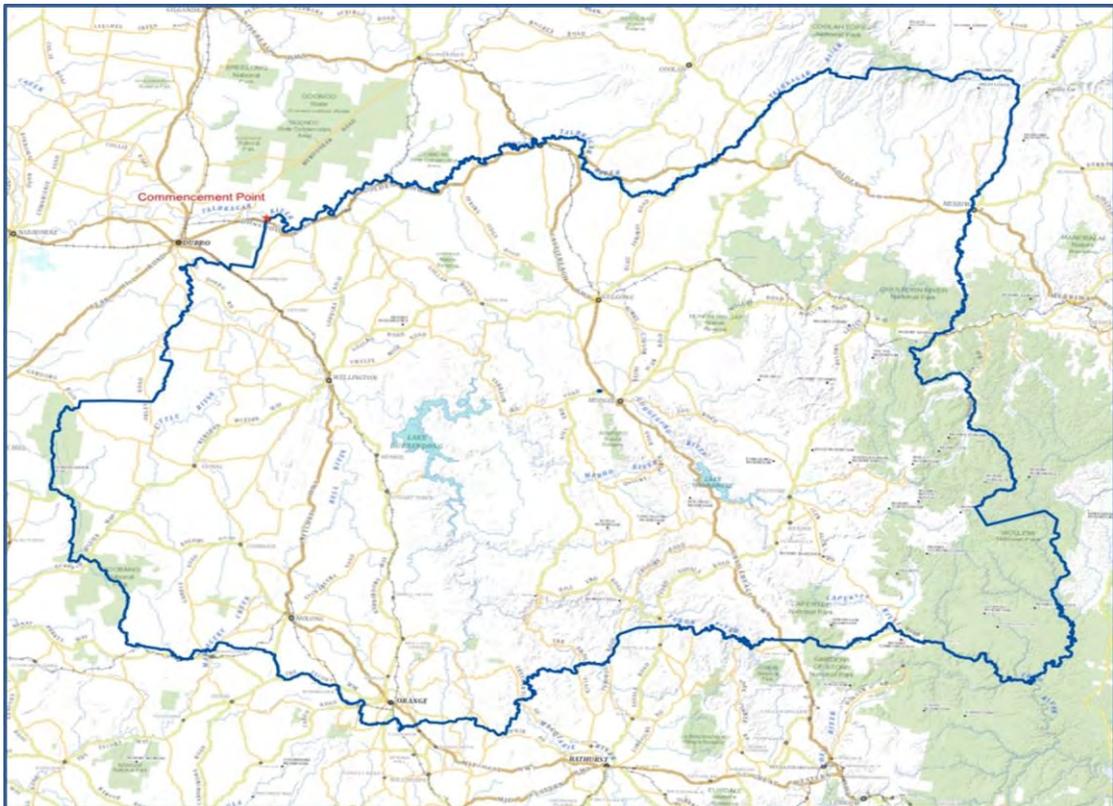
Ibbai Waggan-Wiradjuri People Claim Sovereignty & Proprietary Regional Territorial Rights over Ngurangbang

- Ibbai Waggan-Wiradjuri People have not ceded country
- Ibbai Waggan-Wiradjuri People have its own Lore that stands today over any other
- Ibbai Waggan-Wiradjuri People do not acknowledge the European Federal, State Laws. The current Acts & Policies have not worked for our people
- Ibbai Waggan Proprietary Regional Territorial Ngurangbang Ruling Body, to govern in its Sovereignty & Proprietary Regional Territorial Right for the respect of the First Nations Culture, lore, economic, social & educational advancement, to freely determine our political status, freely pursue our economic social & Culture development, & all decision making within our Ngurangbang

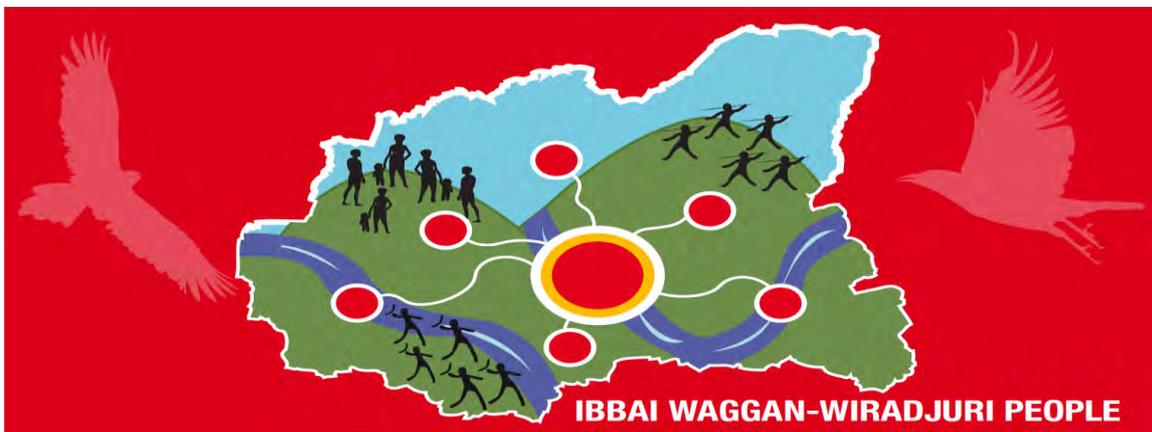


- Ibbai Waggan-Wiradjuri People will work closely with the current Midwestern & Orange councils to approve all projects, to reform changes to current Tax, Royalty Payments, Application Approvals, any Agreements & all decision making within our Ngurangbang

Ibbai Waggan-Wiradjuri People Proprietary Regional Territorial Boundary



We trust our short introduction & Rights, is both informative and beneficial to assist your organisation to identify our group and kinship identity. We believe this will be beneficial to all concerned to initiate a high level of dialogue and contact. We would welcome any questions you may have relevant to our beneficial relationship.



Our Senior Elders look forward to positive talks in the near future and out of respect to them would appreciate any written submissions from your organisation.

Aunty Joyce Williams Senior Elder Ibbai Waggan & all of Wiradjuri Nation
Aunty Violet Carr Senior Elder Ibbai Waggan & all of Wiradjuri Nation
Wayne Alfred Carr Senior Elder Ibbai Waggan-Wiradjuri
Stephen Parkes Elder Ibbai Waggan-Wiradjuri

For the Ibbai Waggan-Wiradjuri People

6 September 2019

Ibbai Waggan-Wiradjuri People

Via email: ibbaiwaggan@gmail.com

Attention: The Ibbai Waggan Wiradjuri People

Dear Ibbai Waggan Wiradjuri People,

RE: MOOLARBEN COAL COMPLEX - UG4 ANCILLARY WORKS MODIFICATION

Moolarben Coal Operations (MCO) would like to thank you for your letter dated 14 August 2019.

MCO acknowledges the Ibbai Waggan-Wiradjuri People's introduction and looks forward to future communication.

If you have any queries, or would like to arrange a meeting to discuss please don't hesitate to contact me on (02) 6376 1436 or at trent.cini@yancoal.com.au.

Yours sincerely

Trent Cini
Environmental & Community Superintendent
Moolarben Coal Operations Pty Ltd

Comments received via e-mail from **North-East Wiradjuri Company Ltd**

23 August 2019

My biggest concern are the 88 plus grinding grooves situated in situ UG4.

They need to be protected at all costs.

Regards



**Murong Gialinga Aboriginal and Torres Strait
Islander Corporation**

C/O PO Box 1097

Mudgee NSW 2850

Ph.: 02 63720859

Email: muronggialinga@hotmail.com

Proud of our Culture

Trent Cini

**Moolarben Coal Operations Pty Ltd
Locked Bag 2003
Mudgee 2859 N S W**

Dear Trent,

Murong Gialinga Aboriginal & Torres Strait Islander Corporation would like to thank you for the draft Moolarben UG4 Aboriginal Cultural Heritage Assessment Report.

After discussing we have the following comments /concerns.

- Whilst the report doesn't consider all of the Aboriginal Cultural Heritage is to be of high scientific or cultural significance we consider all of our culture highly important .

- Our community are very concerned about the increasing impacts on Aboriginal Cultural Heritage in our region from the numerous mining projects which have and continue destroyed our cultural heritage.

This modification will add more Aboriginal cultural heritage sites to the ever growing list of those destroyed by mining in our region .We find it very disturbing that one site that is considered of highly scientific value is to be destroyed .When these culturally places are destroyed they are gone for good .

We would recommend that Moolarben make /take all efforts finding an alternative location for the Remote Service Infrastructure to avoid impacts on Site S1MC-230-..

We also recommend that there to be no further works on infrastructure established in the Bora Creek Management area. This area should be avoided due to the Highly cultural and scientific significance.

- We recommend that all areas which will be impacted by the proposed modifications and associated works- including during their construction and operation (such as the water pipeline and any ancillary developments , access roads etc) should be thoroughly surveyed to establish the possibility of Aboriginal Cultural Heritage materials prior to this application for approval of any modifications to the Project Approval for stage 1 of the Moolarben . Coal complex. If these areas are not surveyed, then the actual impact on Aboriginal Cultural Heritage from the project may be underestimated. Before any approval, development or disturbance along the Dewatering Bore and Access track (South) the unsurveyed area of the access track must be surveyed.

We recommend that a fully detailed Aboriginal Cultural Heritage assessment be carried out in all areas which will be impacted by the proposed modifications both during construction and operation of the mine or ancillary infrastructure prior to approval being sought for the modification so that decision are made with the full information present.

- Further to the previous comment we recommend that there is any areas that have not been surveyed as part of the biodiversity assessments which will be impacted during construction or operation of the mine infrastructure as part of the modification then these assessments need to be conducted and included in reports before to the modification Approval being sought. Once again, we feel that informed decision making is essential in the approval process.

. Murong Gialinga strongly disagree with the impact assessment as summarised in Table 18, which states where consequence of harm is assessed as a "partial loss of value" as it anticipated that the sites will be managed (collected and catalogued) under the Moolarben Coal operation Heritage Management Plan, thus salvaging some heritage value and resulting in a partial loss of value .Table 18 itself states that the type of harm is direct and the degree of harm is Total. Even if cultural heritage objects are salvaged and placed in a keeping place, we do not consider the total destruction of those sites will no longer exist-the cultural integrity of those places are destroyed. The impact of the modification on these sites needs to be clearly stated.

. With any management plans for Aboriginal Cultural Heritage there needs to be and make allowances for Aboriginal Cultural Protocols and Practices to be observed-particular in relation to any on country works, additional surveying and salvage works.

.We are greatly concerned about the impacts of the modifications on the groundwater and the Goulburn River Catchment that may be associated with the dewatering bore sites and infrastructure .There needs to be a lot more investigation to ensure that these works will not impact upon the integrity and security of the groundwater system.

We are very worried about the impacts to the environmental and cultural values of "The Drip" which may result from any impacts to the groundwater and Goulburn River Catchment from the works associated with the modifications. This place is culturally significant to the local Wiradjuri people past/present and is particular significance to the local Wiradjuri women.

- We have concerns about the ongoing management of the Aboriginal Cultural Heritage onsite .We do not feel there is consultation with most of the Registered Aboriginal Parties as Murong Gialinga has not had a meeting with Moolarben for well over a year Murong Gialinga have asked for a meeting but to no avail we ask why this is inconsistent with the Heritage Management plan which requires annual meetings as a minimum. . Other mining companies maintain this practice in accordance with their HMPs as part of their approvals. We do not see why moolarben cannot do the same.

In terms of the specific Recommendations 1-8 we have the following comments.

1/For the reason discussed above we strongly disagree with Recommendation1regarding the mitigation

By salvage for site S1MC-230.We feel that mitigation through design needs to be investigated as a first opinion due to the scientific and cultural values of the site.

2/As with recommendation 1 we feel that wherever possible the impact to sites S1MC-278, S1MC-433 and S1MC-434 needs to be avoided through design in terms of the relocation of the Remote Services Infrastructure Area.

3/If our recommendations/concerns are not taken up and destruction of Sites S1MC-278 S1MC-433 S1MC-230 is approved we agree that the process as described in Section 5.5 of the Moolarben HMP must be subsequent to any Modification approval and prior to any activities.

4/We request that an Independent groundwater study is done pre-Modification approval.

5/In terms of recommendation 4 we feel that surveying along the Dewatering Bore Access Track (south) the unsurveyed area of the access track must be done before approval for modification being sought and all the results be included in this report so(if any new sites are identified).

5/ Murong Gialinga agree with the recommendations 3,5,6,7, and 8.

6/Murong Gialinga reserve the right to make further comments on the full statement of Environment effects with all environmental reports

Murong Gialinga feels this process can be just for show and our comments/concerns fall on deaf ears so we hope we this time we will be taken seriously, and our concerns/ recommendations be considered.

Murong Gialinga would like to thank you once again for the opportunity to comment on thre draft report and look forward to working with Moolarben in the future.

If you need to contact us for any queries, please contact us on 0263720859

Kind Regards
Debbie Foley
On behalf of
Murong Gialinga



MUDGEE
LOCAL ABORIGINAL LAND COUNCIL

Trent Cini
Moolarben Coal Operations Pty Ltd
Locked Bag 2003
Mudgee NSW 2850

03/09/19

RE: Moolarben UG4 Aboriginal Cultural Heritage Assessment – Draft Report.

Dear Trent,

On behalf of the Mudgee LALC I would like to thank you for the draft Moolarben UG4 Aboriginal Cultural Heritage Assessment report.

After consideration we have the following comments.

- Whilst the report doesn't consider all of the Aboriginal Cultural Heritage to be of high scientific or cultural significance we consider all of our Cultural Heritage to be important.
- We are very concerned about the cumulative impacts on Aboriginal Cultural Heritage in our region from the multiple mining projects which have destroyed and displaced our cultural heritage. This modification will add more Aboriginal cultural heritage sites to the list of those destroyed by mining within our region – despite the fact that one of those sites has been considered to be of high scientific value. Once these places are destroyed they are gone for good. As such we recommend that all efforts should be made to avoid impacts on Site S1MC-230– namely finding an alternative location for the Remote Services Infrastructure. Further to this we recommend that any there be no further works or infrastructure established in the Bora Creek Management Area. This area should be avoided due to the cultural and scientific significance.
- We believe that all areas which will be impacted by the proposed modifications and associated works – including during their construction and operation (such as the water pipeline and any ancillary developments, access roads etc) should be surveyed to ascertain the presence of any Aboriginal Cultural Heritage materials prior to the application for approval of any modifications to the Project Approval for Stage 1 of the Moolarben Coal Complex. If areas are not surveyed then the actual impact on Aboriginal Cultural Heritage from the project may be underestimated. Prior to any approval, development or disturbance along the Dewatering Bore and Access Track (South) the unsurveyed area of the access track must be surveyed.

Mudgee Local Aboriginal Land Council
PO Box 1098, Mudgee NSW 2850
Ph: 0263723511 Fax: 0263723522
Email: mudgeelalc@bigpond.com
ABN: 54 927 738 589

We request that a detailed Aboriginal Cultural Heritage assessment be carried out all areas which will be impacted by the proposed modifications both during construction and operation of the mine or ancillary infrastructure prior to approval being sought for the modification so that decisions are made with all information present.

- Further to the previous point we feel that if there are any areas which have not been surveyed as part of the biodiversity assessments which will be impacted during construction or operation of the mine infrastructure as part of the modifications then these assessments need to be conducted and included in reports prior to the modification approval being sought. Again we feel that informed decision making is essential in the approval process.
- We strongly disagree with the impact assessment as summarised in Table 18, which states *where consequence of harm is assessed as a "Partial loss of value" because it is anticipated that the sites will be managed (collected and catalogued) under the Moolarben Coal Operations Heritage Management Plan, thus salvaging some heritage value and resulting in a partial loss of value.* Table 18 itself states that the type of harm is direct and the degree of harm is total. Even if cultural heritage objects are salvaged and placed in a keeping place we do not consider the total destruction of those sites to be a partial loss of value. The site and the cultural landscape associated with that site will no longer exist – the cultural integrity of those places will be destroyed. The impact of the modification on these sites needs to be clearly stated.
- Any management plans for Aboriginal Cultural Heritage need to make allowances for Aboriginal Cultural Protocols and Practices to be observed – particularly in relation to any on-country works, additional surveying and salvage works.
- We are extremely concerned about the impacts of the modifications on the groundwater and the Goulburn River Catchment that may be associated with the dewatering bore sites and infrastructure. There needs to be more investigation to ensure that these works will not impact upon the integrity and security of the groundwater system.
- We are extremely concerned about the impacts to the environmental and cultural values of the "The Drip" which may result from any impacts to the groundwater and Goulburn River Catchment from the works associated with the modifications. This place is culturally significant for the local Aboriginal community and is of particular significance to our women. We have concerns about the dewatering bore and its proximity to the Goulburn River and the Drip and believe that a study of the groundwater needs to be conducted prior to approvals to determine what the potential impacts will be.
- We have concerns about the ongoing management of the Aboriginal Cultural Heritage onsite. We do not feel that there is adequate consultation with all of the Registered Aboriginal Parties - despite requests from RAP's. From our understanding this is inconsistent with the Heritage Management Plan which requires annual meetings as a minimum. Other mining companies maintain this practice in accordance with their HMPs as part of their approvals and we see no reason why Moolarben cannot do the same.

In terms of the specific Recommendations 1-8 in the draft report we have the following comments:

1. For the reasons discussed above we disagree with Recommendation 1 regarding the mitigation by salvage for site S1MC-230. We feel that Mitigation through design needs to be investigated as a first option due to the scientific and cultural values of the site.

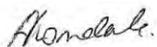
2. As with recommendation 1 we feel that wherever possible the impact to Sites S1MC-278, S1MC-433 and S1MC-434 need to be avoided through design in terms of the relocation of the Remote Services Infrastructure Area.
3. In the event that our recommendations are not taken up and destruction of Sites S1MC-278, S1MC-433, S1MC-434 and S1MC-230 is approved we agree that the process as described in Section 5.5 of the Moolarben HMP must be conducted, subsequent to any Modification approval and prior to any activities.
4. In terms of recommendation 4 we feel that the surveying along the Dewatering Bore and Access Track (South) the unsurveyed area of the access track must occur prior to approval for modification being sought and the results included in this report (if any new sites are identified).
5. We agree with recommendations 3, 5, 6, 7 and 8.

At times we feel like this process can be tokenistic and that our comments fall on deaf ears so we hope that the time is taken to seriously consider our recommendations.

Again we thank you for the opportunity to comment on the draft report and look forward to working with you in the future.

If you have any queries please do not hesitate to our office.

Regards



Aleshia Lonsdale
Chairperson

Appendix 2 - AHIMS extensive search results

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-3-0039	Ulan	AGD	55	760828	6427722	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	361
	Contact									
	Recorders			Ms.Laila Haglund						
	Permits									
36-3-0042	Ulan Creek Site 2	AGD	55	762944	6428010	Closed site	Valid	Artefact : -, Art (Pigment or Engraved) : -, Grinding Groove : -	Axe Grinding Groove,Shelter with Art,Shelter with Deposit	361
	Contact									
	Recorders			Ms.Laila Haglund						
	Permits									
36-3-0059	Ulan Creek Site 17	AGD	55	760781	6428914	Open site	Valid	Artefact : -, Modified Tree (Carved or Scarred) : -	Open Camp Site,Scarred Tree	361
	Contact									
	Recorders			Ms.Laila Haglund						
	Permits									
36-3-0061	Ulan Creek Site 19	AGD	55	760878	6426622	Open site	Valid	Artefact : -	Open Camp Site	361,1299
	Contact									
	Recorders			Ms.Laila Haglund						
	Permits									
36-3-0063	Ulan Creek Site 21	AGD	55	761207	6428074	Open site	Valid	Artefact : -	Open Camp Site	361,1299
	Contact									
	Recorders			Ms.Laila Haglund						
	Permits									
36-3-0068	Bobadeen;	AGD	55	761661	6427966	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	1299
	Contact									
	Recorders			K Shanahan						
	Permits									
36-3-1042	S1MC226	AGD	55	761726	6426232	Open site	Valid	Artefact : 1		
	Contact									
	Recorders			Mr.Giles Hamm						3439
	Permits									
36-3-1043	S1MC227	AGD	55	761825	6426206	Open site	Valid	Artefact : 1		
	Contact									
	Recorders			Mr.Giles Hamm						3439
	Permits									
36-3-1044	S1MC228	AGD	55	762428	6426370	Open site	Valid	Artefact : 1		
	Contact									
	Recorders			Mr.Giles Hamm						3439
	Permits									
36-3-1045	S1MC229	AGD	55	762430	6426375	Open site	Valid	Artefact : 1		
	Contact									
	Recorders			Mr.Giles Hamm						3439
	Permits									
36-3-1046	S1MC230	AGD	55	761640	6426786	Open site	Valid	Artefact : 1		
	Contact									
	Recorders			Mr.Giles Hamm						3439
	Permits									
36-3-1047	S1MC231	AGD	55	761907	6426804	Open site	Valid	Artefact : 1		
	Contact									
	Recorders			Mr.Giles Hamm						3439
	Permits									
36-3-1048	S1MC232	AGD	55	761926	6426825	Open site	Valid	Artefact : 1		
	Contact									
	Recorders			Mr.Giles Hamm						3439
	Permits									
36-3-1049	S1MC233	AGD	55	761954	6426840	Open site	Valid	Artefact : 1		
	Contact									
	Recorders			Mr.Giles Hamm						3439
	Permits									
36-3-1050	S1MC234	AGD	55	761990	6426858	Open site	Valid	Artefact : 1		

Report generated by AHIMS Web Service on 12/04/2019 for Jamie Reeves for the following area at Datum :GDA, Zone : 55, Eastings : 760500 - 763900, Northings : 6426200 - 6430000 with a Buffer of 0 meters. Additional Info : ACHA for SSD Modification. Number of Aboriginal sites and Aboriginal objects found is 107

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders						Permits		
36-3-1051	S1MC235	AGD	55	762126	6426823	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1052	S1MC236	AGD	55	762199	6426811	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1053	S1MC237	AGD	55	762202	6426805	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1054	S1MC238	AGD	55	762211	6426803	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1055	S1MC239	AGD	55	762220	6426805	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1056	S1MC240	AGD	55	762231	6426802	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1057	S1MC241	AGD	55	762272	6426800	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1058	S1MC242	AGD	55	762291	6426801	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1060	S1MC244	AGD	55	762395	6426732	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1061	S1MC245	AGD	55	761552	6426828	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1062	S1MC246	AGD	55	761820	6426775	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1063	S1MC247	AGD	55	761831	6426745	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1064	S1MC248	AGD	55	761863	6426758	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1065	S1MC249	AGD	55	761863	6426771	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1066	S1MC250	AGD	55	761860	6426773	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1067	S1MC252	AGD	55	761867	6426779	Open site	Valid	Artefact : 1		3439
	Contact	Recorders						Permits		3439
36-3-1068	S1MC253	AGD	55	761870	6426772	Open site	Valid	Artefact : 1		3439

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders		Mr.Giles Hamm				Permits	3439	
36-3-1071	S1MC256	AGD	55	762878	6429620	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1072	S1MC257	AGD	55	762850	6429600	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1073	S1MC258	AGD	55	762865	6429652	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1074	S1MC259	AGD	55	762889	6429671	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1075	S1MC260	AGD	55	762849	6429605	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1076	S1MC261	AGD	55	762876	6429660	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1077	S1MC262	AGD	55	762876	6429676	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1086	S1MC271	AGD	55	763749	6428829	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1088	S1MC273	AGD	55	762660	6428640	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1089	S1MC274	AGD	55	761580	6426932	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1090	S1MC275	AGD	55	761878	6426869	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1091	S1MC276	AGD	55	761877	6426917	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1092	S1MC277	AGD	55	761862	6426931	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1093	S1MC278	AGD	55	761688	6426940	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1094	S1MC279	AGD	55	761551	6426963	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-3-1113	S1MC244A	AGD	55	761552	6426828	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm				Permits	3439	
36-3-1137	S1MC310	GDA	55	761014	6428930	Open site	Valid	Artefact : 1		101600

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1138	S1MC311	GDA	55	761232	6428099	Open site	Valid	Artefact : 1	3439	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1139	S1MC312	GDA	55	761279	6427873	Open site	Valid	Artefact : 1	3439	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1140	S1MC303	GDA	55	762029	6426950	Open site	Valid	Artefact : 1	3439	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1141	S1MC304	GDA	55	762216	6426991	Open site	Valid	Artefact : 1	3439	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1142	S1MC305	GDA	55	762474	6426945	Open site	Valid	Artefact : 1	3439	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1143	S1MC306	GDA	55	762426	6426370	Open site	Valid	Artefact : 1	3439	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1146	S1MC309	GDA	55	761931	6429034	Open site	Valid	Artefact : 1	3439	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1147	S1MC310a	GDA	55	761821	6429070	Open site	Valid	Artefact : 1	3439	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-2790	S1MC396	GDA	55	763700	6426207	Open site	Valid	Artefact : -	3439	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1148	S1MC311a	GDA	55	761748	6429079	Open site	Valid	Artefact : 1	3439	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1149	S1MC312a	GDA	55	761120	6429161	Open site	Valid	Artefact : 1	3439	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1150	S2MC1	GDA	55	763454	6426266	Open site	Valid	Artefact : 1	3439	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-2603	S2MC263	GDA	55	763818	6426350	Open site	Valid	Artefact : 1	3439	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-3304	S1MC356b	GDA	55	762581	6428868	Open site	Valid	Artefact : -	3583	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-3305	S1MC358b	GDA	55	761846	6428539	Closed site	Valid	Habitation Structure : -, Potential Archaeological Deposit (PAD) : -	3583	101600
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-0353	Evaporation Pond 2	AGD	55	761010	6428790	Open site	Valid	Artefact : 2		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	T Russell						Permits		
36-3-1407	S1MC313	GDA	55	762188	6429182	Open site	Valid	Art (Pigment or Engraved) : 2		
	Contact							Permits	3439	
36-3-1408	S1MC314	GDA	55	761819	6429071	Open site	Valid	Artefact : 2		
	Contact							Permits		
36-3-1409	S1MC315	GDA	55	761959	6429047	Open site	Valid	Artefact : 1		
	Contact							Permits	3439	
36-3-1410	S1MC316	GDA	55	762039	6429072	Open site	Valid	Artefact : 2		
	Contact							Permits	3439	
36-3-1411	S1MC317	GDA	55	762078	6429120	Open site	Valid	Artefact : 1		
	Contact							Permits	3439	
36-3-1412	S1MC318	GDA	55	762107	6429141	Open site	Valid	Artefact : 1		
	Contact							Permits	3439	
36-3-1413	S1MC319	GDA	55	761634	6429082	Open site	Valid	Artefact : 1		
	Contact							Permits	3439	
36-3-1414	S1MC320	GDA	55	761047	6429251	Open site	Valid	Artefact : 1		
	Contact							Permits	3439	
36-3-1415	S1MC321	GDA	55	763728	6427662	Open site	Valid	Artefact : 1		
	Contact							Permits	3439	
36-3-1416	S1MC322	GDA	55	763693	6428813	Open site	Valid	Artefact : 3		
	Contact							Permits		
36-3-1201	S2MC56	GDA	55	763691	6426485	Open site	Valid	Artefact : 110		101603
	Contact							Permits		
36-3-1210	S2MC63	GDA	55	763818	6426350	Open site	Valid	Artefact : 28		101603
	Contact							Permits		
36-3-1401	S2M257	GDA	55	763698	6426910	Open site	Valid	Artefact : 2		101603
	Contact							Permits		
36-3-1402	S2MC257	GDA	55	763567	6426991	Open site	Valid	Artefact : 1		101603
	Contact							Permits		
36-3-1403	S2MC258	GDA	55	763414	6427000	Open site	Valid	Artefact : 9		101603
	Contact							Permits		
36-3-1404	S2MC259	GDA	55	763374	6427039	Open site	Valid	Artefact : 1		101603
	Contact							Permits		
36-3-1406	S2MC261	GDA	55	763640	6426505	Open site	Valid	Grinding Groove : 92		101603

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1432	Identifier 1	GDA	55	761272	6427235	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1433	Identifier 2	GDA	55	761121	6427218	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1434	Identifier 3	GDA	55	760665	6426887	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1435	Identifier 4	GDA	55	760625	6426927	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1436	Identifier 5	GDA	55	760695	6426926	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1437	Identifier 6	GDA	55	760668	6427046	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1438	Identifier 7	GDA	55	761191	6427737	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1439	Identifier 8	GDA	55	761141	6427748	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1440	Identifier 9	GDA	55	761162	6427777	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1441	Identifier 10	GDA	55	760764	6427895	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1442	Identifier 11	GDA	55	760864	6427903	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1443	Identifier 12	GDA	55	760813	6427844	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1444	Identifier 13	GDA	55	760919	6428162	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1445	Identifier 14	GDA	55	760960	6428242	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1446	Identifier 15, F10	GDA	55	760983	6428391	Open site	Destroyed	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1447	Identifier 17	GDA	55	760995	6428491	Open site	Valid	Artefact : -		
	Contact	Recorders		Ms.Laila Haglund						Permits
36-3-1450	Ulan ID#20 (Identifier 20;XRD)	GDA	55	760504	6429551	Open site	Valid	Artefact : -		102138

Report generated by AHIMS Web Service on 12/04/2019 for Jamie Reeves for the following area at Datum :GDA, Zone : 55, Eastings : 760500 - 763900, Northings : 6426200 - 6430000 with a Buffer of 0 meters. Additional Info : ACHA for SSD Modification. Number of Aboriginal sites and Aboriginal objects found is 107

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1478	Ulan ID#85 (Identifier 85)	GDA	55	762012	6426721	Open site	Valid	Artefact : -		102138
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1479	Ulan ID86# (Identifier 86)	GDA	55	761715	6426877	Open site	Valid	Artefact : -		102138
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1480	Ulan ID87 (Identifier 87)	GDA	55	761593	6426739	Open site	Valid	Artefact : -		102138
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-1481	Identifier 88	GDA	55	761476	6426901	Open site	Destroyed	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-2786	Ulan ID #1537	GDA	55	760656	6429647	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-3123	S1MC 426	GDA	55	761559	6426641	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-3124	S1MC 425	GDA	55	761556	6426768	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		
36-3-3125	S1MC 424	GDA	55	761575	6426859	Open site	Valid	Artefact : -		
	<u>Contact</u>	<u>Recorders</u>						<u>Permits</u>		

Report generated by AHIMS Web Service on 12/04/2019 for Jamie Reeves for the following area at Datum :GDA, Zone : 55, Eastings : 760500 - 763900, Northings : 6426200 - 6430000 with a Buffer of 0 meters. Additional Info : ACHA for SSD Modification. Number of Aboriginal sites and Aboriginal objects found is 107

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-3-0043	Ulan Creek Site 1	AGD	55	760839	6430468	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	361
	Contact							Permits	31	
36-3-0045	Ulan Creek Site 23	AGD	55	760849	6430742	Closed site	Valid	Artefact : -	Shelter with Deposit	361
	Contact							Permits		
36-3-0051	Ulan Creek Site 9	AGD	55	761204	6430454	Closed site	Valid	Artefact : -	Shelter with Deposit	361
	Contact							Permits		
36-3-0069	Ulan Creek Site 22	AGD	55	760849	6430742	Closed site	Valid	Artefact : -	Shelter with Deposit	379
	Contact							Permits		
36-3-0070	Ulan Creek Site 23	AGD	55	760849	6430742	Closed site	Valid	Artefact : -	Shelter with Deposit	379
	Contact							Permits		
36-3-0007	Curra Creek;Goulburn River;	AGD	55	762836	6432499	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact							Permits		
36-3-0008	Curra Creek;Goulburn River;	AGD	55	762677	6430674	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	1299
	Contact							Permits		
36-3-0009	Curra Creek;Goulburn River;.	AGD	55	763659	6432468	Closed site	Not a Site	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact							Permits		
36-3-1069	S1MC254	AGD	55	763332	6431357	Open site	Valid	Artefact : 1		
	Contact							Permits		
36-3-1070	S1MC255	AGD	55	763334	6431358	Open site	Valid	Artefact : 1		
	Contact							Permits	3439	
36-3-1078	S1MC263	AGD	55	762177	6430458	Open site	Valid	Artefact : 1		
	Contact							Permits		
36-3-1079	S1MC264	AGD	55	762010	6430705	Open site	Valid	Artefact : 1		
	Contact							Permits		
36-3-1080	S1MC265	AGD	55	762224	6430592	Open site	Valid	Artefact : 1		
	Contact							Permits		
36-3-1081	S1MC266	AGD	55	763000	6431393	Open site	Valid	Artefact : 1		
	Contact							Permits		
36-3-1082	S1MC267	AGD	55	761945	6430063	Open site	Valid	Artefact : 1		
	Contact							Permits		

Report generated by AHIMS Web Service on 06/08/2019 for Jamie Reeves for the following area at Datum :GDA, Zone : 55, Eastings : 760500 - 763900, Northings : 6430000 - 6433000 with a Buffer of 0 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 47

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-3-1083	S1MC268	AGD	55	761875	6430102	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1084	S1MC269	AGD	55	761882	6430110	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1085	S1MC270	AGD	55	762024	6430287	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1095	S1MC281	AGD	55	762865	6432219	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1096	S1MC282	AGD	55	762851	6432207	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1097	S1MC283	AGD	55	762912	6432185	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1098	S1MC284	AGD	55	762877	6432127	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1099	S1MC285	AGD	55	762905	6431976	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1100	S1MC286	AGD	55	762868	6431969	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1101	S1MC287	AGD	55	763240	6430143	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1102	S1MC288	AGD	55	763336	6430223	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1104	S1MC290	AGD	55	763739	6429835	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1105	S1MC291	AGD	55	763726	6429853	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1106	S1MC292	AGD	55	763406	6429904	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1107	S1MC293	AGD	55	763385	6429901	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1108	S1MC294	AGD	55	763673	6429849	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits
36-3-1109	S1MC295	AGD	55	763273	6429928	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Giles Hamm						Permits

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-3-1110	S1MC296	AGD	55	763503	6429961	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles Hamm					Permits		
36-3-1111	S1MC297	AGD	55	763420	6430329	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles Hamm					Permits		
36-3-2597	S1MC324	AGD	55	763245	6432104	Open site	Valid	Artefact : 1		
	Contact	Recorders	Archaeological Risk Assessment Services (ARAS)					Permits	3439	
36-3-0182	Spring Gully;	AGD	55	761360	6432500	Open site	Valid	Artefact : -, Water Hole : -	Open Camp Site,Water Hole/Well	
	Contact	Recorders	Bill Elwood					Permits		
36-3-1417	S1MC323	GDA	55	763211	6432118	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Giles Hamm					Permits	3439	
36-3-1600	Ulan ID#326 (AD4/A)	GDA	55	760693	6430314	Open site	Valid	Artefact : -		102138
	Contact	Recorders	South East Archaeology					Permits		
36-3-1601	Ulan ID#327 (AD4/B)	GDA	55	760743	6430334	Open site	Valid	Artefact : -		102138
	Contact	Recorders	South East Archaeology					Permits		
36-3-1602	Ulan ID#328 (AD4/C)	GDA	55	760673	6430334	Open site	Valid	Artefact : -		102138
	Contact	Recorders	South East Archaeology					Permits		
36-3-2783	Ulan ID #1533	GDA	55	761059	6432889	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Peter Kuskie					Permits		
36-3-2784	Ulan ID #1534	GDA	55	760915	6432592	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Peter Kuskie					Permits		
36-3-2785	Ulan ID #1535	GDA	55	760752	6430714	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Peter Kuskie					Permits		
36-3-2766	ULAN ID# 1538	GDA	55	760782	6430998	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Peter Kuskie,South East Archaeology					Permits		
36-3-2770	ULAN ID# 1542	GDA	55	760831	6431086	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Peter Kuskie,South East Archaeology					Permits		
36-3-3236	S1MC432	GDA	55	762917	6431617	Open site	Valid	Artefact : -		
	Contact	Recorders	Niche Environment and Heritage,Mr.Balazs Hansel					Permits		
36-3-3228	Liverpool Range TL LU2/L1	GDA	55	761702	6430532	Open site	Valid	Artefact : -		
	Contact	Recorders	Doctor.Julie Dibden,NSW Archaeology Pty Ltd					Permits		

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Contact Us

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Newcastle
Mudgee
Port Macquarie
Brisbane
Cairns



Our services

Ecology and biodiversity

Terrestrial
Freshwater
Marine and coastal
Research and monitoring
Wildlife Schools and training

Heritage management

Aboriginal heritage
Historical heritage
Conservation management
Community consultation
Archaeological, built and landscape values

Environmental management and approvals

Impact assessments
Development and activity approvals
Rehabilitation
Stakeholder consultation and facilitation
Project management

Environmental offsetting

Offset strategy and assessment (NSW, QLD, Commonwealth)
Accredited BAM assessors (NSW)
Biodiversity Stewardship Site Agreements (NSW)
Offset site establishment and management
Offset brokerage
Advanced Offset establishment (QLD)