



Moolarben Coal Complex  
UG1 Optimisation Modification

Environmental Assessment

APPENDIX G

ABORIGINAL CULTURAL  
HERITAGE ASSESSMENT





# ABORIGINAL CULTURAL HERITAGE ASSESSMENT


## Moolarben Coal Complex UG1 Optimisation Modification

June 2015

Local Government Area: Mid-Western Region  
Nearest Town: Ulan  
Consultant Name: Niche Environment and Heritage Pty Ltd  
Authors: Clare Anderson and Jamie Reeves  
Proponent: Moolarben Coal Mines Pty Ltd

## Document Controls

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Cover Photo: Surveying in the proposed remote services facilities area. Source: Niche Environment and Heritage Pty Ltd.

## Summary

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This report presents the results of an Aboriginal cultural heritage and archaeological assessment of the proposed Moolarben Coal Complex UG1 Optimisation Modification (the UG1 Modification) at the Moolarben Coal Complex, near Ulan in New South Wales. The UG1 Modification includes the following components:

- ❑ assessment of three proposed separate surface disturbance areas (totalling approximately 14 hectares [ha]) -
  - i. remote services facilities area;
  - ii. underground run-of-mine (ROM) coal conveyor corridor; and
  - iii. rear air intake shaft and associated ventilation fan.
- ❑ assessment of the surface area associated with subsidence from longwall extraction of the UG1 central mains.
- ❑ assessment of the surface area associated with subsidence from the extension of UG1 longwall panels in the north-east and south-west.

The UG1 Modification falls within hilly terrain comprised of simple slopes, ridge crests and first order drainage paths with low to steep slopes. Below this are the associated footslopes and undulating country that has been cleared for pasture. The area that is the subject of the UG1 Modification has been subject to relatively intensive Aboriginal cultural heritage and archaeological survey in the past. These surveys were for the purposes of assessing the impacts of other previously proposed mine related activities such as subsidence, waste rock emplacements and exploration.

Survey for the UG1 Modification was conducted on 16, 17 and 31 July 2014 by an experienced and qualified archaeologist (Jamie Reeves of Niche Environment and Heritage Pty Ltd) and representatives of Registered Aboriginal Parties (Warrabinga Native Title Claimants Aboriginal Corporation, North East Wiradjuri Company Ltd, Murong Gialinga Aboriginal and Torres Strait Islander Corporation and Mudgee Local Aboriginal Land Council).

The surveys discovered three Aboriginal heritage sites additional to those recorded by previous surveys. Including sites subject to other approved disturbance activities, all the sites documented (relevant to the UG1 Modification) were open sites containing stone artefacts, located in the following components of the subject area:

- ❑ remote services facilities area - 2 sites;
- ❑ underground ROM coal conveyor corridor - 1 site;

- ❑ surface area associated with subsidence from longwall extraction of the UG1 central mains - 3 sites;
- ❑ surface area associated with subsidence from the extension of UG1 longwall panels in the north-east - 5 sites (excluding overlap with the remote services facilities area).

There were no sites recorded within the rear air intake shaft and associated ventilation fan area or the extension of UG1 longwall panels in the south-west.

Open sites are generally not susceptible to harm from ground movements caused by mine subsidence, and are therefore not likely to lose cultural heritage value due to subsidence.

Including sites subject to other approved disturbance activities, the proposed UG1 Modification may harm and/or cause partial or total loss of heritage value to the sites MUG1-Mod 1 and S2MC001 which are situated within the remote service facilities area and CE-15-IF which is situated in the underground ROM coal conveyor corridor. All these sites have been assessed to be of low archaeological significance.

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## 1. Introduction

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The Moolarben Coal Complex is located approximately 40 kilometres (km) north of Mudgee in the Western Coalfields of New South Wales (NSW) in the Mid-Western Regional Council 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.

Stage 1 of the Moolarben Coal Complex (i.e. the Moolarben Coal Project) was approved in 2007 as a Major Project (05\_0117) under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Stage 1 consists of three open cut coal mines (OC1, OC2, OC3), one underground mine (UG4), a coal handling and preparation plant (CHPP), coal stockpiles, a rail loop, rail loader, and office and workshop support facilities. Modifications to the Stage 1 approval include Modifications 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10. An Aboriginal Heritage Management Plan for Stage 1 has been approved and is currently implemented.

MCO is seeking to expand its operations as part of Stage 2 of the Moolarben Coal Project. A Major Project Application (08\_0135) was submitted to the NSW Department of Planning and Infrastructure (now the NSW Department of Planning and Environment [DP&E]) in 2008 and was approved on 30 January 2015. Stage 2 comprises an open cut mine (OC4), two underground mines (UG1 and UG2) and associated infrastructure.

MCO has identified that an opportunity exists to reconfigure the UG1 mine to achieve mining efficiencies and increase underground run-of-mine (ROM) coal production. The UG1 Optimisation Modification (the UG1 Modification) involves (among other aspects) the relocation of main headings, reconfiguration of longwall panels to extract additional coal, construction of additional surface support facilities and increasing the extraction rate of underground ROM coal. The proposed additional disturbance areas associated with the UG1 Modification would require a modification to its Stage 2 Moolarben Coal Project Approval (08\_0135) under Section 75W of the EP&A Act.

Niche Environment and Heritage Pty Ltd (Niche) has been commissioned by MCO to undertake an Aboriginal Cultural Heritage Assessment (ACHA) and archaeological assessment report to inform an Environmental Assessment of the proposed surface disturbance and underground mining extension areas of the UG1 Modification.

This archaeological assessment report has been prepared in accordance with the following guidelines:

- ❑ *Aboriginal cultural heritage consultation requirements for proponents 2010* (ACHCRs) (NSW Department of Environment, Climate Change and Water [DECCW] 2010a);
- ❑ *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b); and
- ❑ *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (NSW Office of Environment and Heritage [OEH] 2011).

The objectives of this report were to assess the proposed additional disturbance areas for Aboriginal heritage values, to identify whether Aboriginal sites, objects or places would be impacted by the proposed works, and provide appropriate mitigation and management recommendations, where required.

## 2. Site Location

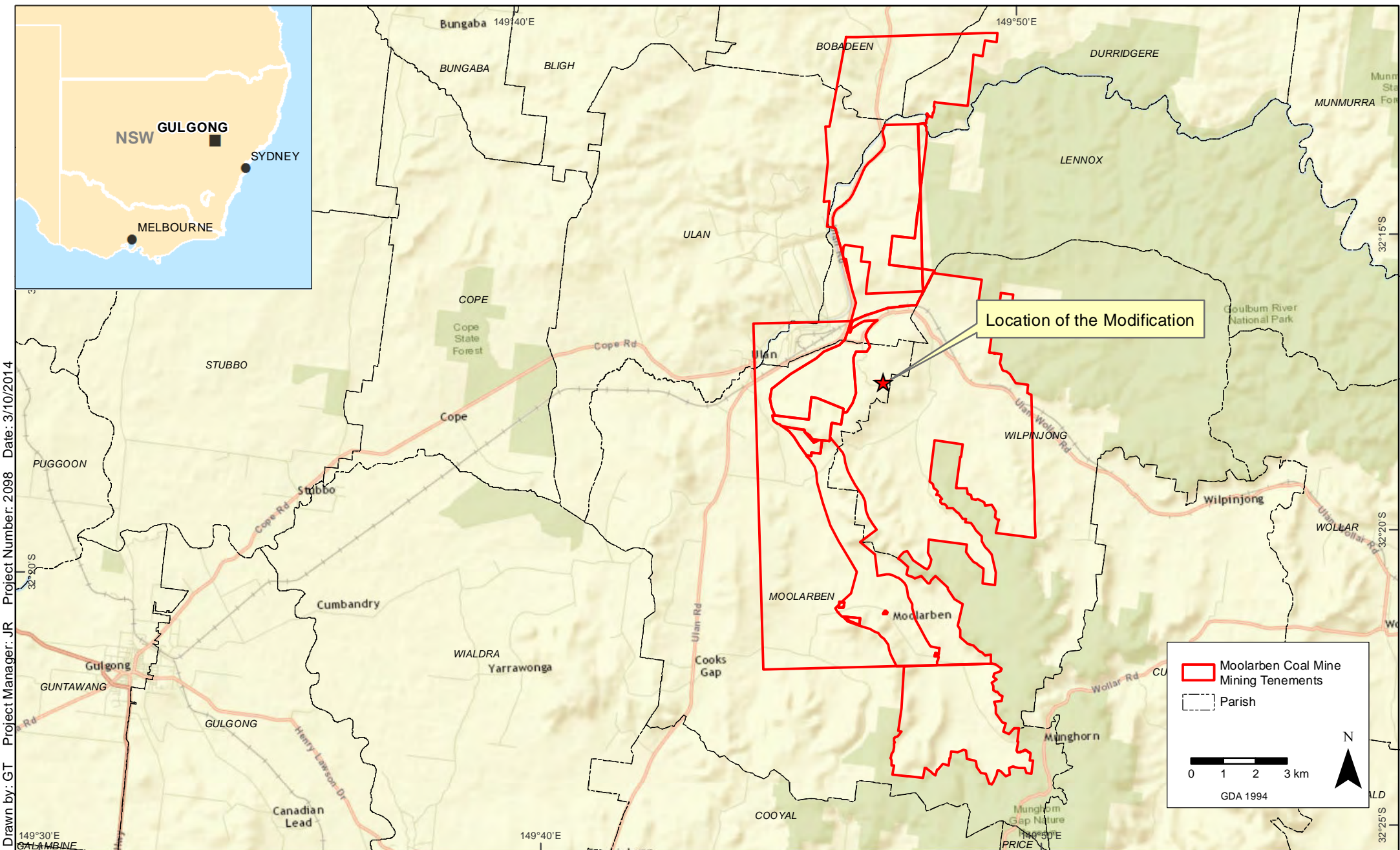
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The study area and the subject area for the UG1 Modification are located within the Moolarben Coal Complex, approximately 40 km north of Mudgee in the Western Coalfields of NSW. The Moolarben Coal Complex is located immediately west of the Wilpinjong Coal Mine and south-east of the Ulan Coal Mine in the locality of Ulan in the Central Tablelands of NSW (Figure 1).

The study area includes all areas which may be subject to potential surface disturbance or subsidence impacts as a result of the UG1 Modification. The study area is presented on Figure 2 and includes the underground workings, overland conveyor and surface infrastructure area proposed as a component of the UG1 Modification.

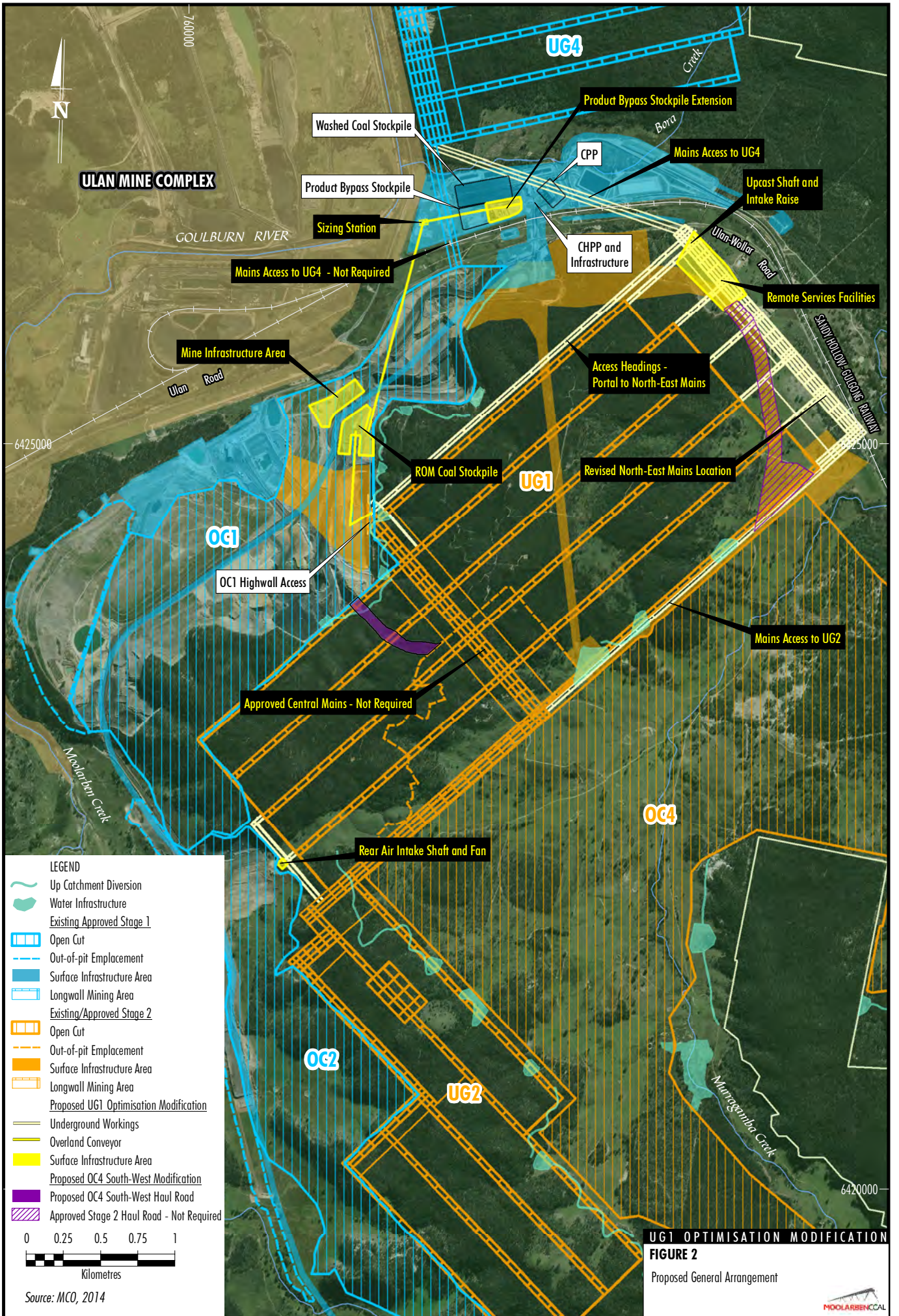
It is noted that portions of the proposed UG1 Modification area are located on land to be impacted by surface disturbance activities associated with the Moolarben Coal Project Stage 2 or on land approved to be impacted as part of the Moolarben Coal Project Stage 1 (Figure 2). These portions include (Figure 2):

- ❑ a product bypass stockpile and sizing station;
- ❑ a mine infrastructure area and ROM coal stockpile;
- ❑ a portion of the proposed remote services facilities area; and
- ❑ the surface area associated with potential subsidence impacts from longwall extraction of the UG1 central mains.



Regional Location  
Moolarben UG1 Optimisation Modification

**FIGURE 1**



**ULAN MINE COMPLEX**

GOLBURN RIVER

Ulan Road

Moolah Creek

Murrumbidgee Creek

STONY HOLLOW GULBURN RAILWAY

**LEGEND**

- Up Catchment Diversion
- Water Infrastructure
- Existing Approved Stage 1**
- Open Cut
- Out-of-pit Emplacement
- Surface Infrastructure Area
- Longwall Mining Area
- Existing/Approved Stage 2**
- Open Cut
- Out-of-pit Emplacement
- Surface Infrastructure Area
- Longwall Mining Area
- Proposed UG1 Optimisation Modification
- Underground Workings
- Overland Conveyor
- Surface Infrastructure Area
- Proposed OC4 South-West Modification
- Proposed OC4 South-West Haul Road
- Approved Stage 2 Haul Road - Not Required

0 0.25 0.5 0.75 1  
Kilometres

Source: MCO, 2014

**UG1 OPTIMISATION MODIFICATION**  
**FIGURE 2**  
 Proposed General Arrangement



On the basis of the above, the subject area for the UG1 Modification refers only to those areas that have the potential to experience additional impacts to those impacts already approved for the Moolarben Coal Project Stage 1 or the Moolarben Coal Project Stage 2. While this assessment considers those potential impacts from the UG1 Modification within the wider study area, the focus of the assessment is on the subject area and those sites which may experience impacts additional to those approved as a component of other applications.

The subject area is therefore defined as comprising the following components, excluding the portions (shown in Figure 2) that are located within the approved Stage 2 and/or the approved Stage 1 footprints (Figure 3):

- ❑ Three separate proposed surface disturbance areas, including:
  - remote services facilities area (approximately 8 hectares [ha]);
  - underground ROM coal conveyor corridor (approximately 6 ha); and
  - rear air intake shaft and associated ventilation fan (approximately 0.02 ha).
- ❑ The surface area associated with subsidence from longwall extraction of the UG1 central mains.
- ❑ The surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east.
- ❑ The surface area associated with subsidence from the extension of the UG1 longwall panels in the south-west.

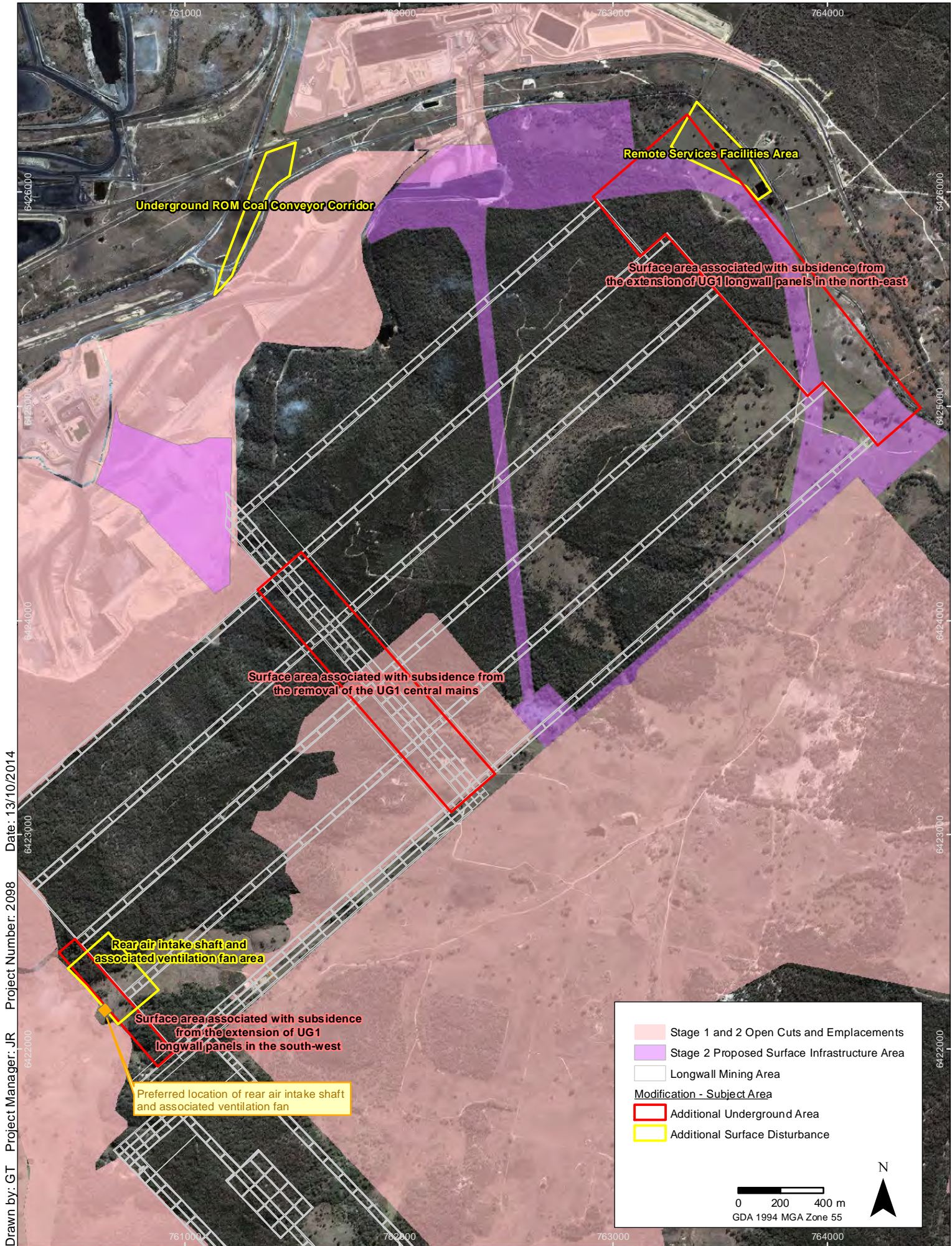
It is also noted that the subject area for the UG1 Modification does not represent the extent of the proposed UG1 Modification workings or disturbance; rather the area provides an indicative survey area for the purpose of this assessment. This is particularly applicable to the underground ROM coal conveyor corridor subject area, which is significantly larger than the proposed disturbance works and represents an area within which the final alignment would be developed.

### 3. Investigators and Contributors

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This investigation was conducted by Jamie Reeves, Archaeologist of Niche. This report was written by Jamie Reeves and Clare Anderson and reviewed by Balazs Hansel (Niche).

Coral Williams (Warrabinga Native Title Claimants Aboriginal Corporation), Robyn Williams, Shaen Morgan (North East Wiradjuri Company Ltd), Shannon Foley (Murong Gialinga Aboriginal and Torres Strait Islander Corporation) Christine Maynard, Tammy Peterson and Larry Foley (Mudgee Local Aboriginal Land Council) participated in the archaeological survey. All of the Registered Aboriginal Parties (RAPs) were consulted and invited to provide advice on Aboriginal cultural heritage values during the assessment, regardless of participation in the archaeological survey work.



Site Map  
Moolarben UG1 Optimisation Modification

**FIGURE 3**

Imagery: (c) YanCoal 2013-08-12

## 4. Description of Development Proposal

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MCO has reviewed the mining sequence and associated infrastructure layout requirements at the Moolarben Coal Complex to achieve mining efficiencies and increase the underground ROM coal production.

The UG1 Modification includes the following key components:

- Recovery of approximately 3.7 million tonnes (Mt) of additional ROM coal over the life of the mine.
- An extension of UG1 longwall panels in the north-east by approximately 150 to 500 metres (m).
- An extension of two UG1 longwall panels in the south-west by approximately 75 m.
- Relocation of the approved UG1 central main headings to the north-east.
- Relocation of underground access to UG2 and UG4.
- Longwall extraction of the portion of coal that forms the approved (central) main headings.
- An increase in the coal seam extraction height by approximately 300 millimetres (mm) to a maximum extraction thickness of 3.5 m.
- An increase to longwall panel void width from approximately 305 to 311 m centres.
- Construction of a ROM coal conveyor and associated transfer points between the UG1 pit top facilities in OC1 and the CHPP to transport underground ROM coal.
- Extension to the underground product coal stockpile in the CHPP area and relocation and expansion of the underground ROM coal stockpile at the UG1 pit top facilities.
- An increase in the maximum underground ROM coal production rate up to 8 million tonnes per annum (Mtpa) from UG1, UG2 and UG4 (combined).
- An increase in the maximum total site ROM coal rate to 21 Mtpa (i.e. 13 Mtpa from open cut operations and 8 Mtpa from underground operations).
- An increase in average daily rail departures.
- Construction of remote services facilities and rear air intake shaft and associated fan above the extended UG1 longwall panels.
- Relocation of the underground Mine Infrastructure Area and site administration offices.



## 5. Aboriginal Community Consultation Process

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In administering its statutory functions under Part 6 of the NSW *National Parks and Wildlife Act, 1974*, 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 NSW *National Parks and Wildlife Regulation, 2009*.

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 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 his/her development activity has the potential to harm Aboriginal objects 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.

Consultation for the UG1 Modification, has been undertaken in accordance with the ACHCRs as these meet the fundamental tenants of the 2004 policy *Interim Community Consultation Requirements for Applicants* (NSW Department of Environment and Conservation [DEC] 2004), while meeting current industry standards for community consultation.

The ACHCRs outline a four stage consultation process that includes detailed step-wise guidance as to the aim of the 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 project proposal and registration of interest.
- Stage 2 - Presentation of information about the proposed project.

- Stage 3 - Gathering information about the cultural significance.
- Stage 4 - Review of 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 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(s) and/or places(s);
- 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 their cultural heritage assessment report to the RAPs who have been consulted.

The consultation process undertaken to seek active involvement from relevant Indigenous people followed the current NSW statutory guideline, namely, the ACHCRs. Section 1.3 of the ACHCRs describes the guiding principles of the document. The principles have been derived directly from the Principles section of 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 free prior informed advice can be sought from the Aboriginal community.

The following outlines the process and results of the consultation conducted during this assessment to ascertain and reflect the Aboriginal cultural heritage values of the subject area.

## The Consultation Process

### Stage 1 - Notifications

This stage of the consultation process is used to identify any Aboriginal people or groups who may have a cultural interest and possess cultural knowledge in the subject area. Aboriginal stakeholder groups with an interest in the Moolarben Coal Complex 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 UG1 Modification, the existing Aboriginal stakeholder groups were contacted and consulted with. These parties are considered to be the RAPs for the UG1 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;
- NC01<sup>1</sup>;
- North-East Wiradjuri Company Ltd; and
- Warrabinga Native Title Claimants Aboriginal Corporation.

A consultation log detailing all Aboriginal community consultation undertaken for the UG1 Modification is provided in Appendix 1. The Proposed Methodology for the assessment and a copy of relevant written correspondence sent to and received from the RAPs is provided in Appendix 2 and Appendix 3, respectively.

### **Stages 2 and 3 - Presentation of Project Information and Gathering Information about Cultural Significance**

#### **Proposed Methodology**

All of the RAPs were provided with a letter on 3 June 2014 outlining information about the UG1 Modification, an invitation to attend an information session on 17 June 2014 and a copy of the Proposed Methodology for an ACHA for their review and comment in accordance with the ACHCRs (DECCW 2010a).

An information session was held on 17 June 2014 at the Moolarben Coal Complex. All RAPs were invited to the information session and representatives from the following RAPs attended:

- Mudgee Local Aboriginal Land Council;
- Murong Gialinga Aboriginal and Torres Strait Islander Corporation;
- NC01; and
- North East Wiradjuri Company Ltd.

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<sup>1</sup> One of the RAPs for the UG1 Modification advised MCO that they did not wish for their name to be made public or be published in any formal documentation. Accordingly, in this report this RAP is referred to as "NC01".

At the information session, MCO representatives provided a presentation on the nature and scale of the proposed UG1 Modification, an overview of the impact assessment process, a discussion of the roles, functions and responsibilities of participants and protocols for the management of any sensitive cultural heritage information. The information session also provided RAPs with an opportunity to raise any cultural issues or comments/perspectives regarding the proposed UG1 Modification or the Proposed Methodology.

The Proposed Methodology for the ACHA was also discussed at the information session, with a minimum of 28 days allowed for RAPs to:

- suggest any protocols to be adopted into the information gathering process and assessment methodology; and
- highlight any other matters such as issues or areas of cultural significance that might affect, inform or refine the methodology.

The period for commenting on the Proposed Methodology was open between 3 June 2014 and 3 July 2014, and the following comments were received from the RAPs:

- North East Wiradjuri Company Ltd - 7 June 2014.
- Warrabinga Native Title Claimants Aboriginal Corporation - 10 June 2014.
- Murong Gialinga Aboriginal and Torres Strait Islander Corporation - 3 July 2014.

The copies of the submissions are included in this report in Appendix 3. Responses to each submission are provided below.

#### Responses to Comments Received on Proposed Methodology

##### North East Wiradjuri Company Ltd

**Comment:** *"We note that MCO had provided the very minimal consultation process and had planned to submit the final draft to the DoP without the RAPS sighting the final document".*

**Response:** Consultation for the ACHA has been undertaken in accordance with the ACHCRs and Clause 80C of the *National Parks and Wildlife Regulation 2009*. The correspondence and comments provided by North East Wiradjuri Company Ltd and other RAPs to date have been included in full in Appendix 3 and considered in detail in this section. All relevant comments received during the draft ACHA review period were considered when the ACHA was finalised, including any necessary updates and/or clarification in the report where required. A copy of the final ACHA report will be made available to all RAPs during the public exhibition period for the Environmental Assessment. During this exhibition period all RAPs will have a further opportunity to review and provide additional comment on the final ACHA report.

**Comment:** *“We do not agree that areas that have been approved and or previously assessed for disturbance should not be revisited for at least a cursory examination to see if circumstances have changed”.*

**Response:** All previously assessed areas have been assessed to levels compliant with, or exceeding, regulatory requirements. The previous systematic survey work has been conducted by experienced archaeologists accompanied by members from the RAPs and has built up a robust record of the Aboriginal heritage that exists in the area. The relevant approved Heritage Management Plan contains provisions for dealing with unexpected finds in these areas during works.

The survey methodology allowed for all previously unsurveyed areas to be surveyed in their entirety. The survey intensity is relatively higher in surface disturbance areas (surveyor spacing of 5 m) compared to surface areas associated with underground mine areas (surveyor spacing of 10 m).

**Comment:** *“[The Proposed Methodology] should be conducted in accordance with the ACHMP”.*

**Response:** There is no conflict between the Proposed Methodology and the currently approved Aboriginal Heritage Management Plan. The current assessment has been designed to complement and inform the preparation of (or revision of) future Heritage Management Plans.

**Comment:** *“We note that unusually in this methodology, the methodology is to be approved 2 weeks after the survey has been conducted.”*

**Response:** Noted. There is no regulatory requirement to conduct the surveys subsequent to the expiry of the Proposed Methodology review period (noting that the Proposed Methodology refers to more than just the archaeological survey, and provides a methodology for the progression of the assessment).

However, based on this comment and discussions at the project information session (17 June 2014), the fieldwork was moved to a starting date of 16 July 2014 to allow the survey to be conducted subsequent to a minimum 28 day review period of the methodology. The deferred survey work allowed all RAPs the opportunity to review and provide feedback on the Proposed Methodology prior to undertaking the survey work.

**Comment:** *“All cultural information is sensitive.*

- *Restrictions on access to the material: Any response to this should be on a case by case basis.*
- *Restrictions on communication of the material: Each RAP will have the right of fair dealing and internal reporting to their organization. No communication of any cultural information or material to any third party.*
- *Any restrictions on the location/storage of the material: All storage of material must be located in the already established Keeping Place.*

- *Any cultural recommendations on handling the material: In accordance with the ACHMP and on a case by case basis.*
- *Any contextual information: On a case by case basis.*
- *Any names and contact details of persons authorized by the relevant RAP to make decisions concerning the Aboriginal material and the degree of authorisation: No individual should have this authorization and the relevant Board of Directors of each RAP would make decisions regarding this.*
- *Any details of any consent given in accordance with customary law: This is the right, the role and the responsibility of the Traditional Owners as established under The Native Title Act.*
- *Level of confidentiality to be accorded to the material: Case by case basis.*
- *Any access and use by the Registered Aboriginal Parties, of the cultural information in the material. Each RAP will have the right of fair dealing and internal reporting to their organization."*

Response: Noted. Notwithstanding protocols already agreed and documented in the approved *Aboriginal Heritage Management Plan Stage 1* (MCO 2013), MCO are open to receiving additional information and requests for the handling of cultural information, and if received would work with the RAPs to develop appropriate procedures.

Comment: *"Field Survey. On inspection of the Study area as noted in Figure 2, 2 days is insufficient to provide a good representative sample within the survey and does not do justice to obtaining cultural material and information from the study area."*

Response: Based on the predictive model and previous survey experience in the area, two days was considered sufficient to achieve the goals of the assessment. Due to inclement weather and the expansion of the survey area associated with the rear air intake shaft and associated ventilation fan, the survey was conducted over a total of three days (Section 11). The survey coverage and results achieved a robust sample of the subject area, and the results were consistent with expectations and the findings of previous assessments (see Section 12). As described in Section 12, all representatives from the RAPs present during the field surveys expressed their satisfaction with the conduct, methods and coverage of the survey.

**Comment:** *“Provision of draft ACHA - Review and Comment. We note the previous attempt by MCO to take review and comments from RAPS without the RAPS being able to see the final version before submission to the Government.”*

**Response:** The comments provided by North East Wiradjuri Company Ltd to date have been included in full in Appendix 3 and considered in this section. Detailed consideration of the comments provided by all RAPS has been undertaken, including updates and/or clarification in the report where required. All relevant comments received during the draft ACHA review period have been considered when the ACHA was finalised, including any necessary updates and/or clarification in the report where required.

A copy of the final ACHA report will be made available to all RAPS during the public exhibition period for the Environmental Assessment. During this exhibition period all RAPS will have the opportunity to review and provide additional comment on the final ACHA report.

**Comment:** *“Provision of Comments. We would expect to see how our comments are incorporated in the final draft before submission to Government.”*

**Response:** The comments provided by North East Wiradjuri Company Ltd to date have been included in full in Appendix 3 and considered in detail in this section. Detailed consideration of the comments provided by all RAPS has been undertaken, including updates and/or clarification in the report where required. These changes will be apparent when the Draft and Final versions of the report are compared. All relevant comments received during the draft ACHA review period have been considered when the ACHA was finalised, including any necessary updates and/or clarification in the report where required. A copy of the final ACHA report will be made available to all RAPS during the public exhibition period for the Environmental Assessment. During this exhibition period all RAPS will have the opportunity to review and provide additional comment on the final ACHA report.

#### Warrabingga Native Title Claimants Aboriginal Corporation

**Comment:** *“We find it’s not appropriate for any survey to take place prior to the Methodology being finalised, therefore we suggest that fieldwork be postponed to the 7th July 2014”.*

**Response:** Noted. As per the above responses, there is no regulatory requirement to conduct the surveys subsequent to the expiry of the Proposed Methodology review period (noting that the Proposed Methodology refers to more than just the archaeological survey, and provides a methodology for the progression of the assessment). However, based on this comment and discussions at the project information session (17 June 2014), the fieldwork was moved to a starting date of 16 July 2014 to allow the survey to be conducted subsequent to a minimum 28 day review period of the methodology. The deferred survey work allowed all RAPS the opportunity to review and provide feedback on the Proposed Methodology prior to undertaking the survey work.

**Comment:** *“We will have a person attending the information session on 17th June but required a copy of the presentation material to be emailed prior to the information day.”*

**Response:** A copy of the Proposed Methodology was provided via e-mail prior to the information session, which was held on 17 June 2014. The information session provided background on the proposed UG1 Modification, and provided also an opportunity for the RAPs to discuss the Proposed Methodology. The information sessions presentation material was made available at the meeting, and a copy was provided to all RAPs after the information session.

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

**Comment:** *“All Aboriginal Reps should have fair / equal say and all comments taken on board not taking into consideration.”*

**Response:** The consultation process is following the current best practice standard of the ACHARs. The ACHCRs allow a structured and equal process to be conducted. In addition, a face-to-face information session was held to provide information regarding the UG1 Modification and to allow all RAPs to provide any comments they may have. The MCO Cultural Heritage Officer is always available for the RAPs to discuss any additional concerns they may have outside of the scope of the UG1 Modification. All comments received from the RAPs will be considered and actioned as appropriate. Please note that as per the ACHCRs, proponents cannot determine who can speak for Country, but can only provide an opportunity for those groups and people who identify themselves as having an interest in or responsibility to Country to have input into the assessment process.

**Comment:** *“All areas to be surveyed 100% in the area.”*

**Response:** Based on the predictive model and previous survey experience in the area, two days was considered sufficient to achieve the goals of the assessment. Due to inclement weather and the expansion of the survey area associated with the rear air intake shaft and associated ventilation fan, the survey was conducted over a total of three days (Section 11). The survey coverage and results achieved a robust sample of the subject area, and the results were consistent with expectations and the findings of previous assessments (see Section 12). As described in Section 12, all representatives from the RAPs present during the field surveys expressed their satisfaction with the conduct, methods and coverage of the survey. The survey methodology allowed for all previously unsurveyed areas to be surveyed in their entirety. The survey intensity is relatively higher in surface disturbance areas (surveyor spacing of 5 m) compared to surface areas associated with underground mine areas (surveyor spacing of 10 m).



## Field Surveys

The survey work for the UG1 Modification was originally scheduled for 18 and 19 June 2014, however, was deferred until after the close of the period for review and comment on the Proposed Methodology, in consideration of feedback provided by the RAPs. The deferred survey work allowed all RAPs the opportunity to review and provide feedback on the Proposed Methodology prior to undertaking the survey work.

Representatives from the following RAPs attended the field survey of the subject area on 16, 17 and 31 July 2014:

- Mudgee Local Aboriginal Land Council;
- Murong Gialinga Aboriginal and Torres Strait Islander Corporation;
- North East Wiradjuri Company Ltd; and
- Warrabinga Native Title Claimants Aboriginal Corporation.

The Proposed Methodology anticipated the survey would take 2 days to complete. An additional day of survey work was conducted on 31 July 2014 because of rain delaying the survey on 16 July 2014, and to allow for a larger area to be surveyed for the rear air intake shaft and associated ventilation fan.

### Stage 4 - Review of Draft Report

A draft of this report (i.e. the draft ACHA) was provided to the RAPs for their review and comment on 14 October 2014 in accordance with the ACHCRs (DECCW 2010a). A minimum of 28 days were provided to each of the RAPs with a request for comments to be provided by 14 November 2014.

On 11 November 2014 Warrabinga Native Title Claimants Aboriginal Corporation advised MCO that they have not received their copy of the draft report, MCO provided an additional copy of the report and correspondence to Warrabinga Native Title Claimants Aboriginal Corporation on 11 November 2014. Following receipt of the additional copy of the draft ACHA Warrabinga Native Title Claimants Aboriginal Corporation requested additional time for review of the draft report. Accordingly MCO extended the period for receiving comments on the draft ACHA for all RAPs.

A copy of the final ACHA report will be made available to all RAPs during the public exhibition period for the Environmental Assessment. During this exhibition period all RAPs will have the opportunity to review and provide additional comment on the final ACHA report.

As at April 2015, written submissions on the draft ACHA had been received from the following RAPs in accordance with the ACHCRs (DECCW 2010a):

- ❑ Ms. Aleisha Lonsdale - 19 November 2014.
- ❑ Ms. Warranha Ngumbaay - 19 November 2014.
- ❑ Mudgee Local Aboriginal Land Council - 19 November 2014.
- ❑ Murong Gialinga Aboriginal and Torres Strait Islander Corporation - 19 November 2014.
- ❑ NC01 - 11 November 2014.
- ❑ Warrabing Native Title Claimants Aboriginal Corporation - 20 November 2014.

Copies of the submissions are included in this report in Appendix 3. Responses to each submission are provided below.

#### Responses to Comments Received on Draft ACHA

##### Ms. Aleisha Lonsdale and Ms. Warranha Ngumbaay

**Comment** (via email): *"..writing to formally advise that myself and Warranha Ngumbaay have reviewed the Draft ACHA for Moolarben UG1 Modification and we are happy with the contents".*

**Response:** Noted.

##### Warrabing Native Title Claimants Aboriginal Corporation

**Comment** (via email): **Difficulty in distinguishing some components of maps.**

**Response:** Noted. The colour schemes and labels on Figures 4 and 5 have been amended in the Final report.

**Comment** (via email): *"...we would like to see the audit trail that led to the decision to use the Moolarben Coal Mine Aboriginal Sites Database site positions over that of the AHIMS site locations."*

**Response:** A review of the site locations within and in proximity to the subject area for the UG1 Modification identified that in the cases where there was disagreement between the Aboriginal Heritage Information Management System (AHIMS) records and those in the Moolarben Coal Mine Aboriginal Sites Database, the Moolarben Coal Mine Aboriginal Sites Database was more accurate (e.g. the coordinates for rock-shelters recorded in the Moolarben Coal Mine Aboriginal Sites Database were located in appropriate topography).

Comment (via email): *“We would like confirmation that updated site cards have been provided to AHIMS”.*

Response: None of the sites where there is disagreement between the AHIMS records and the Moolarben Coal Mine Aboriginal Sites Database are located within the subject area for the UG1 Modification. These sites were not visited during the surveys, and therefore there is no basis on which to supply a definitive amendment request to AHIMS. The location of the sites has only been determined on comparison of the desktop datasets available for the purposes of the current assessment.

Comment (via email): *“Beside the identified differences between the AHIMS sites identified within the Moolarben Coal Mine and Moolarben Coal Mine Aboriginal Sites Database, could you confirm that there were no other differences between the two datasets...”*

Response: No other differences were noted during the assessment between the AHIMS records and the Moolarben Coal Mine Aboriginal Sites Database.

Comment (via email): *“We would appreciate the inclusion of photographs and dimensions of all previously unidentified Aboriginal stone artefacts that were recorded during the course of the surveys in the report.”*

Response: Section 12 of this report includes descriptions of the sites recorded during the surveys for the UG1 Modification. It is noted that neither the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) nor the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011) requires such a level of detail to be provided in the draft ACHA. Consistent with Requirement 18 and Requirement 19 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) photographs and dimensions of sites and artefacts will be included in the AHIMS site cards to be submitted following finalisation of this report. Notwithstanding, we note that a representative of Warrabinga Native Title Claimants Aboriginal Corporation was present at the field surveys, during which the previously unidentified sites were recorded.

Comment (via email): *“We would appreciate confirmation that the AHIMS site cards for the previously unidentified Aboriginal sites have been lodged with AHIMS.”*

Response: The site cards for all sites recorded during the surveys for the UG1 Modification will be lodged with AHIMS upon receipt of all comments from the RAPs and finalisation of this report. This allows an opportunity to record any cultural information provided during the consultation process and review of the draft report on the site cards.

**Comment** (via email): *“We do not feel it is appropriate for a Heritage Consultant to comment on Aboriginal cultural significance without providing justification for their decision.”*

**Response:** Noted. The assessment of significance provided in Section 14 of this report is based on the scientific significance of the sites in accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011). Section 14 provides a description of the cultural values identified for the Moolarben Coal Complex area, noting that no areas of cultural value within the subject area have been identified by the Aboriginal community during the surveys for the UG1 Modification or during previous assessments.

**Mudgee Local Aboriginal Land Council**

**Comment** (via email): *“The Mudgee LALC has reviewed the Draft Aboriginal Cultural Heritage Management Plan (ACHA) re Moolarben UG1 Modification and have no issues with the document.”*

**Response:** Noted.

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

**Comment** (via email): *“...after reading the Aboriginal Cultural Heritage Assessment by Niche we see no problems with the assessment.”*

**Response:** Noted.

**NC01**

NC01 contacted MCO Cultural Heritage Officer Donna Whillock and provided the following comments via telephone.

**Comment** (via phone): NC01 agreed with the findings of the report, however indicated that they were disappointed that they had not been invited out on the field survey as it was within their traditional lands. NC01 thanked MCO for allowing them to participate in the consultation meetings.

**Response:** Noted. Engagement of representatives for archaeological survey was undertaken in accordance with the approved *Aboriginal Heritage Management Plan Stage 1* (MCO 2013). Consultation for the UG1 Modification ACHA has been undertaken in accordance with the ACHCRs.

## 6. Register Searches

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### Commonwealth Registers

#### National Heritage Registers

Under the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* Amendments (No. 88, 2003), two mechanisms have been created for the protection of heritage places of National or Commonwealth significance (<http://www.environment.gov.au/heritage/places/national/index.html>) - the National Heritage List (NHL) and the Commonwealth Heritage List (CHL). The NHL provides protection to places of cultural significance to the nation of Australia, while the CHL comprises natural, Aboriginal and historic heritage places owned and controlled by the Commonwealth. There are no management constraints associated with listing on the Register of the National Estate (RNE) unless the listed place is owned by a Commonwealth agency.

A search of the online Australian Heritage Database, which includes items from the CHL and RNE was conducted on 4 March 2014. Search terms used were: Mid-Western Regional, Ulan and Wollar. No heritage items were identified within or in close proximity to the subject area.

### State Registers

#### Heritage Act Registers

The *State Heritage Register* (SHR) holds items that have been assessed as being of State Significance to NSW. The *State Heritage Inventory* (SHI) contains items that are listed on Local Environmental Plans and/or on a State Government Agency's Section 170 registers (OEH website - [www.heritage.nsw.gov.au/index.html](http://www.heritage.nsw.gov.au/index.html)). An assessment of heritage significance is required for items greater than 50 years in age. Items appearing on either the SHR or SHI have been granted a defined level of statutory protection under NSW legislation.

Searches of the SHR and SHI were completed on the 4 March 2014. No heritage items were listed in the subject area.

#### Environmental Planning and Assessment Act Registers (EP&A Act)

##### Local Environmental Plans

Each Local Government Area is required to create and maintain a Local Environmental Plan that identifies and conserves Aboriginal and Historic heritage items. These items are protected under the EP&A Act and the NSW *Heritage Act 1977*.

A search of the *Mid-Western Regional Local Environmental Plan 2012* was undertaken on the 4 March 2014. There are no Aboriginal heritage items listed in the Local Environmental Plan that are located specifically within the subject area.

## National Parks and Wildlife Act Registers (AHIMS)

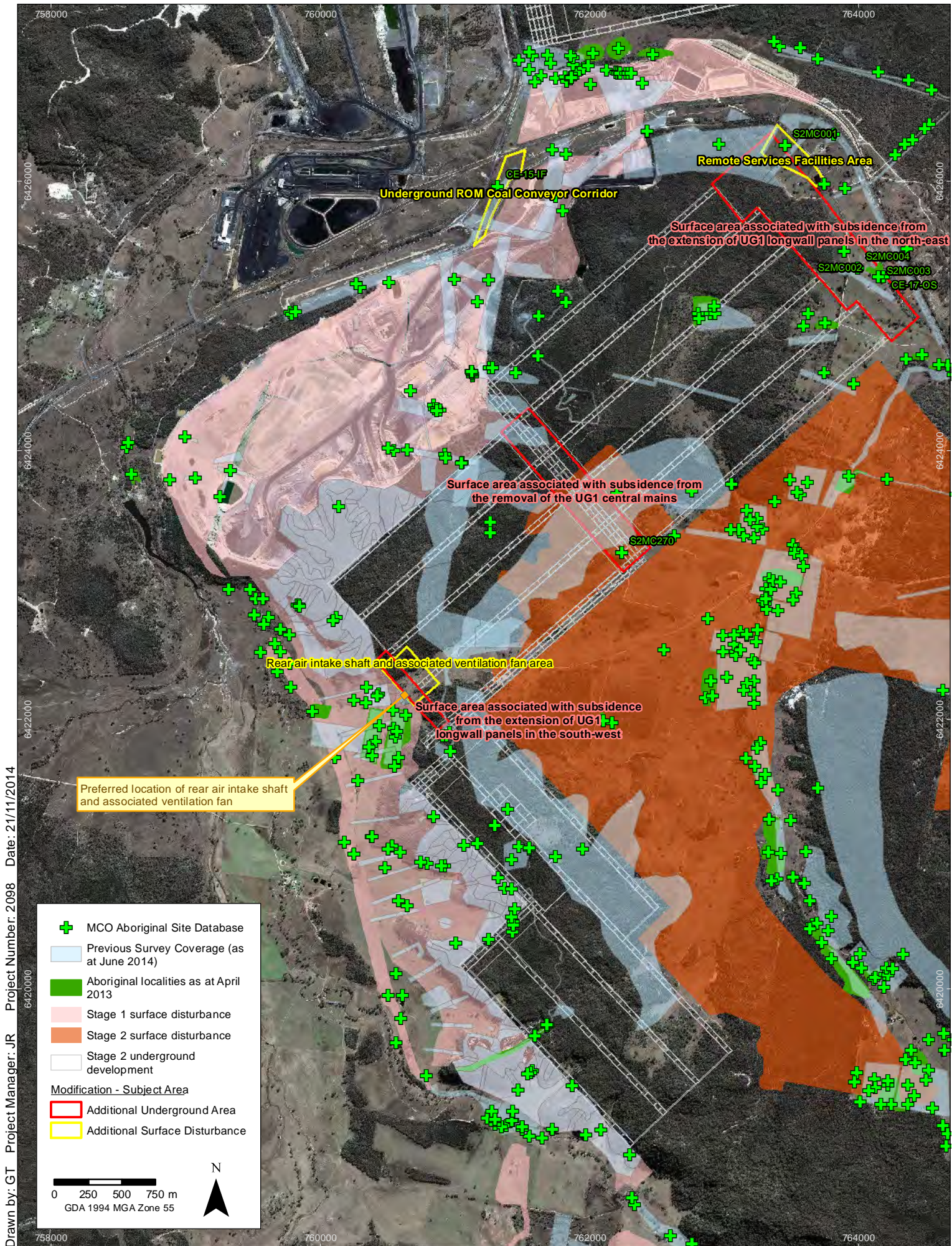
### Aboriginal Heritage Sites in proximity to the UG1 Modification

An extensive search of the AHIMS was conducted on 6 February 2014 and 22 September 2014 (AHIMS ID 124265 and 147385; Appendix 4) for the area surrounding the study area. The search identified a total of 235 Aboriginal sites, including seven sites located within the subject area. More detail on these sites is provided in Section 10. The 235 Aboriginal sites were recorded during the numerous environmental assessments of the Moolarben, Ulan and Wilpinjong Coal Mines between 1980 and 2013, indicating intensive levels of previous archaeological assessment, and form a small fraction of the sites known within a 10 km radius of the subject area. Each of the three mines hold databases of the number and nature of Aboriginal sites in their project boundaries and the extent of previous archaeological survey. At the Moolarben Coal Complex it was noted that in some cases the AHIMS data was not consistent with the database held by MCO, with some sites being located in different positions on AHIMS when compared to the Moolarben Coal Mine Aboriginal Sites Database.

This was concluded to be an error in AHIMS (e.g. due to the incorrect datum being used), and as such the Moolarben Coal Mine Aboriginal Sites Database site positions are presented in Figure 4<sup>2</sup> and used for the basis of this assessment. The distribution and nature of sites in the region are discussed further in Section 9.

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<sup>2</sup> Sites shown on Figure 4 in areas already subject to disturbance have been managed in accordance with the existing approved Aboriginal Heritage Management Plan (or its former revision).



Drawn by: GT Project Manager: JR Date: 21/11/2014 Project Number: 2098

Notice: 2014-04-24. Niche Environment and Heritage Pty Ltd have identified spatial discrepancies, indicative of datum error, between the Moolarben Coal heritage database and AHIMS. These discrepancies are under investigation. The site point data presented here should be interpreted in this regard.

Moolarben Coal Aboriginal Heritage Records  
Moolarben UG1 Optimisation Modification

FIGURE 4

Imagery: (c) YanCoal 2013-08-12



## 7. Landscape Context

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The subject area is situated within the Central Tablelands region of NSW, about 2 km west of the Munghorn Gap Nature Reserve. For the most part the subject area is within a hilly terrain comprised of simple slopes, ridge crests and first order drainage paths with low to steep slopes. Below this are the associated footslopes and flat to undulating country that has been cleared for pasture.

The subject area is situated at the north-western margin of the Sydney Basin and is characterised by Late Permian age Illawarra Coal Measures (mudstone, claystone, coal, torbanite and rhyolitic tuff) which is overlain by the Narrabeen Group (sandstone, conglomeratic sandstone, chert, shale coal and torbanite).

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 exposed veins 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.

There are four soil landscapes within the subject area: the Ulan, Lees Pinch, Munghorn Plateau and Bald Hill Soil Landscapes (Murphy and Lawrie 1998). The summaries below are derived from the Soil Landscape descriptions provided by Murphy and Lawrie (1998).

The lower elevations of the subject area are situated within the Ulan Soil Landscape, which is typically found in association with low undulating rises and creek flats on slopes between 2 and 10 percent (%). 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 had moderate to high levels of erosion. The entire underground ROM coal conveyor corridor, the entire remote services facilities area, the majority of the UG1 longwall extension area and a small part of the UG1 central mains removal area are situated on the Ulan Soil Landscape.

The Lees Pinch Soil Landscape, situated on the lower to mid-slopes of the subject area, is typically found in association with sandstone plateau and hillslopes with boulder debris and rock outcrops with slopes between 15 and 40%. Soils in the landscape are shallow siliceous sands with yellow earths and yellow podzolic soils on the lower slopes. The Lees Pinch Soil Landscape is subject to high levels of downslope erosion. A very small part of the UG1 longwall extension area, approximately half of the UG1 central mains removal area and one-third of the rear air intake shaft and associated ventilation fan area are situated on the Lees Pinch Soil Landscape.



The Bald Hill Soil Landscape occurs on lower and mid-slopes of the subject area where the rear air intake shaft and associated ventilation fan are situated. This landscape is characterised by steep slopes ranging between 10 to 35% gradients and mafic volcanic rocks (basalt and dolerite) which are frequently present in outcrop. The soils are more coherent and fertile than the surrounding siliceous soils however the steep slopes and stony ground result in high levels of mass movement. Approximately two-thirds of the rear air intake shaft and associated ventilation fan area is situated on the Bald Hill Soil Landscape.

The ridgelines within the subject area are dominated by the Munghorn Plateau Soil Landscape which 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. Approximately half of the UG1 central mains removal area is situated on the Munghorn Plateau Soil Landscape.

The geological composition and soil landscapes of the subject area indicate that sandstone boulders, outcrops, shelters and overhangs may be present, particularly in the Lees Pinch and Munghorn Plateau Soil Landscapes. Sandstone features have frequently been utilised in the region by past Aboriginal people and may contain evidence of past Aboriginal occupation in the form of rock art, grinding grooves and archaeological deposits of stone artefacts. Scatters of stone artefacts will most likely occur in association with sandstone features rather than in open, surface or subsurface contexts due to the shallow soils of the subject area and the sloped and erosional nature of the landscape.

Water is considered one of the primary factors in the prediction of the location of Aboriginal sites in the landscape. The subject area falls within the upper reaches of the Murrumbidgee Creek Catchment. There are no permanent water sources within the subject area, with the nearest permanent water sources being the Moolarben and Murrumbidgee Creeks, which are at their closest points approximately 1.3 km west and 200 m south of the closest subject area components respectively. Drainage depressions in proximity to the subject area can be considered first or second order drainage lines and are unlikely to act as temporary sources of potable water (i.e. after rain, water may have temporarily collected in depressions in sandstone outcrops within the subject area).

A number of ecological resources are known to have been exploited by the Wiradjuri (the traditional Aboriginal people of the area) including possums, kangaroos, wallabies, wombats, kangaroo rats, 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.

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 mm, with warm to hot summers and cold winters. Winter frosts occur (Bureau of Meteorology 2014). Greater variation in seasonal weather may have resulted in more seasonal changes to Aboriginal practice, however to date there is no archaeological evidence of this occurring.

## 8. Local Aboriginal History

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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 1999a). 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).

## 9. Previous Archaeological Work

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### Regional Archaeological Studies

Archaeological studies provide material evidence of Aboriginal use of the landscape at times both before and after written history, and complements the oral histories and cultural knowledge held by the Aboriginal community.

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 and 500 m from water, with the largest sites occurring nearest to water.
- ❑ That 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 that 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 Moolarben Coal Complex.

### **Ulan Coal Mine**

The Ulan Coal Mine is an open cut coal mine located adjacent to and north-west of the Moolarben Coal Complex, near the village of Ulan. The Ulan Coal Mine has been operational since the 1920s. In 2009, the Ulan Coal Mine sought a consolidated Part 3A Approval. Archaeological assessment of the Ulan Coal Mine commenced in the 1980s (Haglund 1980) with 29 assessments occurring over subsequent years (Table 1).

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 Potential Archaeological Deposits (PADs) (Table 2). 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 (m<sup>2</sup>) area or less (Kuskie 2009: 109).

Table 1: Summary of Assessments at the Ulan Coal Mine (Kuskie 2013a: 15)

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 Preposed 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	1999b	Ulan Coal Mines Second Longwall Project Environment Statement: Preliminary Survey for Aboriginal Sites
Haglund	1999a	Addendum to Ulan Coal Mines Second Longwall Project Environmental Statement
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 2: Frequency of Aboriginal Sites at the Ulan Coal Mine as of 2009 (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
<b>Total</b>	<b>1,274</b>

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 valley 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 archaeological assessment of the Ulan Coal Mine (Table 1), 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 Moolarben Coal Complex.

The model states that most evidence of occupation will date within the last 5,000 years though may have extended 30 - 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 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).

*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 evidenced 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 usewear 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 usewear.

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 activity 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 Moolarben Coal Complex. The Wilpinjong Coal Mine was approved under Part 3A of the EP&A Act and has been operational since 2006. During this time, 17 Aboriginal archaeological assessments are known to have occurred (Table 3).

In 2005 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 3: Summary of Assessments at the Wilpinjong Coal Mine (Source: Kuskie 2013b)

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
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

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 4). 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 4: 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*	2
Waterhole Possible	3
Waterhole/Well	7
<b>Total</b>	<b>463</b>

\* 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.

## Local Archaeological Assessments

### Moolarben Coal Complex

The subject area is situated within the Moolarben Coal Complex, which is adjacent to the Ulan and Wilpinjong Coal Mines. Between 2006 and 2013, 23 archaeological assessments and management plans were completed for the Moolarben Coal Complex. These are summarised in Table 5.

Table 5: Summary of Past Aboriginal Heritage Investigations at Moolarben Coal Complex (Source: Kuskie 2013c: 12-14)

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. 26-3-0798: 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
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	2010b	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	2012b	Moolarben Coal Project Stage 2 – Preliminary Report on Aboriginal Heritage Survey of Geotechnical Investigation Areas
Kuskie	2012c	Moolarben Coal Project Stage 2 – Preliminary Report on Aboriginal Heritage Survey of Proposed Ulan- Wollar Road and Country Energy 66kv Powerline Realignment
Kuskie	2012d	Moolarben Coal Project: Preliminary Aboriginal Heritage Assessment of Proposed Temporary Workers Accommodation Near Ulan, Central Tablelands of New South Wales
Kuskie	2013c	Aboriginal Heritage Management Plan Stage 1. Version 2
Kuskie	2013d	Moolarben Coal Project – Stage 1 Optimisation Modification, Near Ulan, Central Tablelands of New South Wales: Aboriginal Cultural Heritage Assessment
Kuskie	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

Some of these earlier surveys (Table 5) assessed Aboriginal heritage values in parts of the subject area. Approximately 50% of the surface disturbance area associated with the underground ROM coal conveyor corridor and 40% of the surface area associated with subsidence from longwall extraction of the UG1 central mains have been subject to previous systematic surveys. Additionally a small part (i.e. less than 10%) of the remote services facilities area and the surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east has been previously systematically surveyed. During the previous surveys, a total of eight Aboriginal objects were identified.

In 2006, an Aboriginal Cultural Heritage Assessment for environmental assessment of Stage 1 of the Moolarben Coal Project was undertaken and included an investigation area of 34.8 square kilometres (km<sup>2</sup>) (Hamm 2006a). This area was surveyed using a sampling strategy with effective survey coverage of 1.1%. The assessment identified 222 Aboriginal sites including isolated artefacts, artefact scatters, rock shelters with artefacts/art, a scarred tree and a grinding groove site (Hamm 2006a:4). In addition to this Hamm also identified a number of PADs (Hamm 2006a:72). The assessment noted that concentrations of Aboriginal sites occurred on the Moolarben and Bora Creek alluvial flats and the northern ridges. A series of management and mitigation measures were recommended including the collection of 51 Aboriginal sites, the test excavation and salvage of 43 sites, recording and salvage of three sites and subsidence monitoring and recording of 23 sites.

In response to submissions on the environmental assessment for Stage 1, three cultural landscapes were identified by the RAPs including the Bora Creek alluvial flats, the Goulbourn River and the Drip. Revisions were made to the underground plan to reduce impact to a rock shelter site with art (Hamm 2006b).

An area of 37 km<sup>2</sup> 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, 5 rock shelters with artefacts, one 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 sites.

An Aboriginal Heritage Management Plan 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 m<sup>2</sup> was subject to mechanical exposure (surface scrapes) and 271 m<sup>2</sup> 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 Murrumbidgee 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 Moolarben Coal Complex.

A revised Aboriginal Heritage Management Plan was subsequently approved and implemented to include all of the Stage 1 Project areas and replace the earlier Aboriginal Heritage Management Plan for the OC1 and mine infrastructure area. The revised Aboriginal Heritage Management Plan contained an updated summary of the Moolarben Coal Mine Aboriginal Sites Database (Kuskie 2013c, 2013d, Table 6), which at that time contained a total of 531 Aboriginal sites.

Subsequent work including the Moolarben Coal Project Stage 1 Optimisation Modification (Kuskie 2013d), Moolarben Coal Project Stage 2 utilities realignments (Kuskie 2013e), 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. The Moolarben Coal Mine Aboriginal Sites Database as current at February 2014 is shown in Table 6. Currently there are has been 603 Aboriginal sites identified at the Moolarben Coal Complex. Similar to the Wilpinjong and Ulan Coal Mines, open artefact sites (including artefact scatters and isolated finds) are the most frequent site type with occasional grinding groove sites, ochre quarries, scarred trees and rock shelters with art, artefacts and/or PADs also being present.

Table 6: Summary of Identified Aboriginal Heritage Sites within Stages 1 and 2 of the Moolarben Coal Complex (Source: Moolarben Coal Mine Aboriginal Sites Database as at February 2014)

Aboriginal Site Features	Number of Aboriginal Sites
Artefact Scatter <sup>1</sup>	248
Artefact Scatter and Grinding Grooves	1
Artefact Scatter and PAD	10
Grinding Grooves	2
Grinding Grooves and Artefact Scatter	2
Isolated Find <sup>2</sup>	276
Ochre Quarry	1
PAD	9
Rock Shelter with Art	1
Rock Shelter with Art and Artefacts	1
Rock Shelter with Art and Grinding Grooves	1
Rock Shelter with Artefacts <sup>3</sup>	23
Rock shelter with PAD	26
Scarred Tree	1
Scarred Tree and Artefact Scatter	1
<b>Total</b>	<b>603</b>

<sup>1</sup> Includes sites recorded as "Open Artefact Site" with greater than 1, or an unspecified number of artefacts.

<sup>2</sup> Includes sites recorded as "Open Artefact Site" with 1 artefact.

<sup>3</sup> Includes site recorded as "Artefact Shelter/Scatter."

Overall the existing information presents few identifiable limitations, with extensive assessments having been carried out in the vicinity of the subject area, including some previous assessments which overlap the subject area. It is assumed all available and up-to-date information has been assessed and presented in this report, however minor limitations such as unidentifiable AHIMS errors may exist. It is assumed that all relevant cultural knowledge that may have the potential to be harmed by the proposed UG1 Modification has been provided by the RAPs during the ACHA consultation process.

## 10. Predictive Model

As described in Section 2, in some cases there is overlap between the subject area for the UG1 Modification and those areas subject to previous systematic survey for earlier development approvals at the Moolarben Coal Complex.

During previous survey works a total of eight Aboriginal sites have been identified within the UG1 Modification subject area (Table 7). All of these sites are open sites and contain either individual or low numbers of stone artefacts. All of these sites have been previously assessed as being of low archaeological significance.

Table 7: Known Aboriginal Heritage Sites within the Subject Area

Site Name	AHIMS	Site Type	No. of Artefacts	Significance	Previous Impact	Recorder	UG1 Component
CE-15-IF	36-3-0691	Isolated Find	1	Low	No	Kayandel	Underground ROM coal conveyor corridor
CE-17-OS	36-3-0693	Open Artefact Site	3	Low	No	Kayandel	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east
S2MC001	36-3-1150	Isolated Find	1	Low	Yes	Hamm	Remote services facilities area
S2MC002	36-3-1151	Isolated Find	1	Low	Yes	Hamm	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east
S2MC003	36-3-1152	Open Artefact Site	2	Low	No	Hamm	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east
S2MC004	36-3-1153	Isolated Find	1	Low	Yes	Hamm	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east
S2MC270	Pending	Isolated Find	1	Low	No	Hamm	Surface area associated with subsidence from longwall extraction of the UG1 central mains
S2MC277	Pending	Isolated Find	1	Low	Yes	AECOM	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east

The subject area is situated on simple slopes and steep slopes and ridge crests and first order drainage paths with gently to moderately inclined slopes, and foot slopes and undulating plains. The distance from water is generally greater than 1 km. Sandstone formations are present within the steeper hills. It is therefore anticipated that in the steeper areas, any evidence of Aboriginal occupation is likely to take the form of rock shelters with art, artefacts or PADs.

On the foot slopes and undulating plains it is anticipated, as demonstrated by the distribution and site type of known sites, that there will be open sites containing stone artefacts. These sites may generally occur anywhere within this terrain, but may be more frequently encountered in favourable occupation areas which may often be associated with differentiation in the landscape (e.g. hill crests and flats).

In accordance with the current model for the Moolarben Coal Complex, Wilpinjong Coal Mine and Ulan Coal Mine, this landscape would be considered as being outside a primary or secondary resource zone. The occupation will therefore 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.

## 11. Field Methods

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### Survey Sampling Strategy

Due to the relatively small and accessible size of the subject area, and because the subject area included some areas previously subject to systematic surveys, 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. Because the previous survey efforts have provided adequate samples and coverage, those previously surveyed areas were not systematically re-surveyed during the current assessment (although occasionally these areas were traversed to reach current survey areas).

The approach was discussed with the RAP representatives on-site prior to and during the survey, and it was agreed that the methods employed were appropriate given the previous survey results and the conditions present on site at the time of current survey.

It is noted that given the level of previous assessment and systematic survey within the wider study area, only the subject area was subject to survey for the UG1 Modification.

### Survey Methods

During the 16, 17 and 31 July 2014 survey campaigns, the survey team consisted of between four and six team members including one archaeologist, walking pedestrian transects across the previously unsurveyed portions of the subject area.

For the subject area proposed to be subject to surface disturbance (i.e. the remote services facilities area, the underground ROM coal conveyor corridor and the rear air intake shaft and associated ventilation fan) survey team members were spaced 5 m apart to achieve the maximum possible survey effectiveness.



For the subject area within the proposed underground development areas a less intensive survey was used, with survey team members maintaining 10 m spaces between each other with some flexibility allowed dependant on terrain conditions. This method retains the potential for discovering large sites on the ground surface through inspection of areas of exposure, and allows conspicuous sites such as rock shelters and scarred trees to be readily inspected by the survey team.

During the 16, 17 and 31 July 2014 survey campaigns all areas of relatively higher exposure were inspected for artefacts, and all potential rock shelters and rock formations were inspected for possible art, occupation evidence and grinding grooves.

The location of survey units and archaeological finds were recorded using a hand-held GPS connected to a tablet computer running a real time GIS. The survey data was uploaded directly to a GIS for presentation on maps and figures. All positional recording used Map Grid of Australia coordinates (zone 55) based on the Geocentric Datum of Australia (GDA94). Details such as landform, visibility and exposure for each survey unit were recorded electronically on standard survey unit recording forms on the tablet computer, with transects being determined based on changes in the landform as per the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b). Exposure and visibility were also estimated in accordance with the requirements of the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b). The camera of the tablet computer with 5 mega pixel resolution was used for all photography.

## Methods of Assessing Heritage Significance

Heritage significance was assessed by considering each cultural or archaeological site against the significance criteria set out in the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011).

In all cases the assessment of significance was informed by the Aboriginal community, and this is documented in this report. If any culturally sensitive values were identified they would not be specifically included in the report or made publicly available, but would be documented and lodged with the knowledge holder providing the information.

## 12. Results

The survey was conducted on 16, 17 and 31 July 2014 and covered the majority of the subject area. Three new Aboriginal heritage sites were identified and recorded during the survey. Artefacts were observed at four of the previously recorded Aboriginal heritage sites (S2MC003, CE-17-0S, CE-15-IF and S2MC270), however no artefacts could be seen at the remaining four previously recorded Aboriginal heritage sites (S2MC001, S2MC002, S2MC004 and S2MC277), possibly due to changing exposure and visibility conditions between the original and current survey times.

All areas of exposure and areas of archaeological potential observed within the survey transects - such as sheet washed areas, vehicle tracks, cuttings, rock shelters and overhangs - were inspected by the survey team. Whilst on-site all representatives from the RAPs present expressed their satisfaction with the conduct, methods and coverage of the survey. The survey conditions were considered adequate, with wet weather on 16 July 2014 and fine weather on 17 and 31 July 2014.

The only constraint to the survey was the inability (for safety reasons) to survey closer than 20 m to the open cut high wall, which is adjacent to the rear air intake shaft and associated ventilation fan survey area. This constraint was not considered to be detrimental to the survey's adequacy or effectiveness as the area was previously surveyed prior to the OC1 development (Figure 4). A summary table of the coverage of the current survey is outlined below in Table 8, and a summary of the landform areas is provided in Table 9. The survey results are displayed in Figure 5 and discussed in this section.

Table 8: Survey Coverage Data

Subject Area	Survey Unit	Landform	Survey Unit Area (m <sup>2</sup> )	Visibility (%)	Exposure (%)	Effective Coverage (m <sup>2</sup> )	Effective Coverage (%)
Remote services facilities area	1	Lower slopes	94,172	5	20	942	1.00
Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east	2	Lower slopes	113,927	40	40	18,228	16.00
	3	Flats	194,266	10	30	5,828	3.00
	5	Simple slopes	358,489	30	30	32,264	9.00
Underground ROM coal conveyor corridor	4	Flats	33,548	5	5	84	0.25
Surface area associated with subsidence from longwall extraction of the UG1 central mains	6	Simple slopes	188,622	20	40	15,090	8.00
	7	Lower slopes	36,193	10	40	1,448	4.00
Rear air intake shaft and associated ventilation fan and extension of the UG1 panels in the south-east	8	Ridge crests and steep slopes	36,956	60	30	6,652	18.00
	9	Ridge crests and steep slopes	42,079	10	20	842	2.00
<i>Totals:</i>	-	-	<i>1,098,252</i>	-	-	<i>81,378</i>	<i>7.41</i>

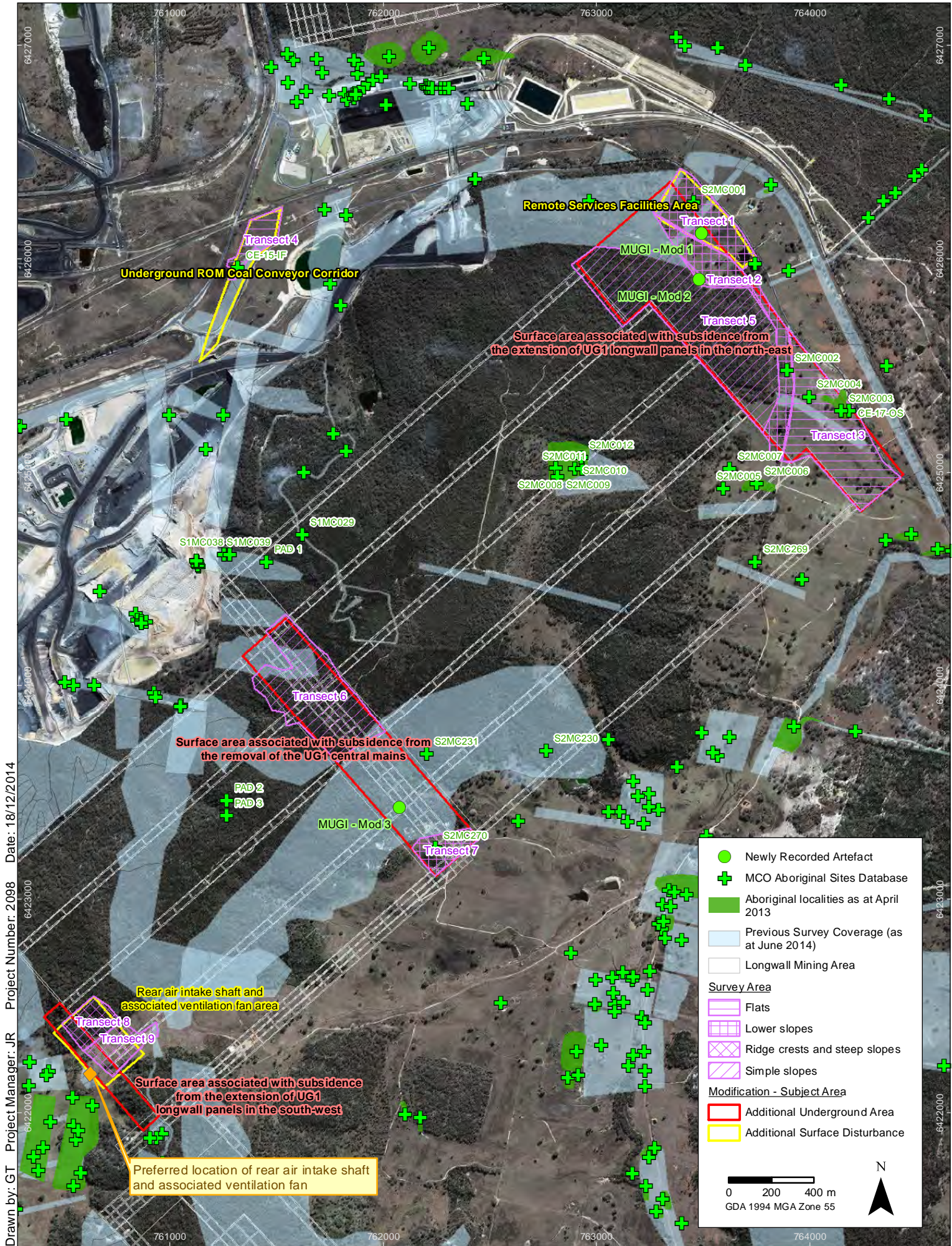
Table 9: Landform Summary Data

Landform	Landform Area (m <sup>2</sup> )	Area Effectively Surveyed (m <sup>2</sup> )	Landform Effectively Surveyed (%)	Number of Sites	Number of Features
Flats	227,814	5,912	2.60	4	7 (artefacts)
Lower slopes	244,293	20,618	8.44	5	5 (artefacts)
Simple slopes	547,111	47,354	8.66	1	1 (artefacts)
Ridge crests and steep slopes	79,035	7,494	9.50	0	0
Not in transect	-	-	-	1*	2 (artefacts)

\* Site MUG1-Mod 3 recorded when walking between survey transects.

In addition to the newly discovered sites, previously recorded artefacts were also observed at several previously recorded sites within the subject area. The survey findings specific to the subject area are summarised in Table 10, including a description of the survey unit and landform that each site was recorded in.

A summary of the artefacts recorded during the UG1 Modification survey campaigns and a detailed description of the relevant landforms is provided in the subsections below.



Drawn by: GT Project Manager: JR Project Number: 2098 Date: 18/12/2014

Landforms and Survey Results  
Moolarben UG1 Optimisation Modification

**FIGURE 5**

Imagery: (c) YanCoal 2013-08-12

Table 10: UG1 Survey Results

Site Name	AHIMS	Features	Artefacts	Subject Area	Survey Unit	Landform	Significance	Observations
MUG1-Mod 1*	Pending	Isolated Find	1	Remote services facilities area	Transect 1	Lower Slopes	Low	New record
MUG1-Mod 2*	Pending	Isolated Find	1	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east	Transect 2	Lower Slopes	Low	New record
MUG1-Mod 3*	Pending	Open Artefact Site	2	Surface area associated with subsidence from longwall extraction of the UG1 central mains	-	Simple Slopes	Low	New record
CE-15-IF	36-3-0691	Isolated Find	1	Underground ROM coal conveyor corridor	Transect 4	Flats	Low	Artefact as previously recorded
CE-17-OS	36-3-0693	Open Artefact Site	3	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east	Transect 3	Flats	Low	Artefact within boundary recorded on MCO site database
S2MC001	36-3-1150	Isolated Find	1	Remote services facilities area	Transect 1	Lower Slopes	Low	-
S2MC002	36-3-1151	Isolated Find	1	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east	Transect 2	Lower Slopes	Low	-
S2MC003	36-3-1152	Open Artefact Site	2	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east	Transect 3	Flats	Low	Artefacts within boundary recorded on MCO site database
S2MC004	36-3-1153	Isolated Find	1	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east	Transect 3	Flats	Low	-
S2MC270	Pending	Isolated Find	1	Surface area associated with subsidence from longwall extraction of the UG1 central mains	Transect 7	Simple slopes	Low	Artefact within fenced area to protect from exploration works
S2MC277	Pending	Isolated Find	1	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east	Transect 2	Lower Slopes	Low	-

\* Recorded during the July 2014 survey campaign.

## Flats Landform

Part of the surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east and the entire underground ROM coal conveyor corridor are situated on this landform. The landform is characterised by flat to gently undulating land with slope gradients of less than 1.5 degrees. The soils present in this landform are generally shallow, stony and sandy loams of low fertility. There is extensive disturbance within this landform from land clearing and agricultural development (fences and dams for example), and most of the landform has been given over to pasture and is generally devoid of native vegetation except for occasional remnant eucalypts, areas of improved pasture, foreign grasses and weeds. The underground ROM coal conveyor corridor sits in a location where there has been extensive previous development associated with Moolarben Coal Complex, including drainage works, roads, an electricity transmission line and fencing. This landform within the subject area did not contain any permanent drainage features, although Murragamba Creek is approximately 200 m south of the surface area associated with subsidence of the extension of the UG1 longwall panels in the north-east.

Although there was a lack of permanent water that may help predict the presence of Aboriginal heritage sites within this landform, the previous survey results show sites recorded on low rises and the landform has archaeological potential for open sites containing a low density of Aboriginal stone artefacts to be present. Plate 1 shows an example of this landform.

Plate 1: Example of the Flats Landform



The open sites with stone artefacts S2MC003 (36-3-1152), S2MC004 (36-3-1153) and CE-17-OS (36-3-0693) were located in the flats landform within the surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east. Stone artefacts were observed at S2MC003 and CE-17-OS, but were not visible at S2MC004. Also on the flats landform, in the underground ROM coal conveyor corridor area, site CE-15-IF (36-3-0691) was located and the single stone artefact was observed.

## Lower Slopes Landform

Part of the surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east, the entire remote services facilities area and part of the surface area associated with subsidence from longwall extraction of the UG1 central mains are situated on this landform. The landform is characterised by slopes with gradients of between 10 and 1.5 degrees that occur between the Simple Slopes Landform, and the Flats Landform. The soils present in this landform are generally stony skeletal soils of low fertility. There is extensive disturbance within this landform from land clearing and agricultural development (fences and dams for example), and most of the landform consists of pasture paddocks, with rural improvements (dams, tracks and dwellings [of which concrete slabs and plumbing was visible as remains]). This landform within the subject area did not contain any natural drainage features, and is devoid of vegetation except for occasional trees, areas of shrubs and pasture in poor condition.

Although there was a lack of drainage lines that may predict the presence of Aboriginal heritage sites within this landform, the previous survey results show three sites recorded on this landform and the landform has archaeological potential for open sites containing a very low density of Aboriginal stone artefacts to be present. Plate 2 shows an example of this landform.

Two new Aboriginal heritage sites (MUG1-Mod 1, an open site containing an isolated stone artefact and MUG1-Mod 2, an open site containing an isolated stone artefact) were discovered on the lower slopes landform during the UG1 Modification survey campaign within the remote services facilities area and the surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east, where the simple slopes landform transitions to the lower slopes landform.

The isolated find S2MC001 (36-1-1150) was located within the lower slopes landform, within the remote services facilities area, however the artefact was not visible. The isolated finds S2MC002 (36-3-1151) and S2MC277 were located on the lower slopes landform, within the surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east, however the stone artefacts were not visible.

Plate 2: Example of the Lower Slopes Landform



### Simple Slopes Landform

Part of the surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east, and part of the surface area associated with subsidence from longwall extraction of the UG1 central mains are situated on this landform. This landform was characterised by low relief slopes with slope gradients of less than 10 degrees. The soils encountered in this landform were loose, coarse siliceous soils with low fertility. For the most part the landform was generally heavily treed with cypress pine and eucalyptus, with a clear understorey possibly due to cattle grazing. Rock outcrops were an occasional feature, and where observed formed distinctive inversion of relief with tor-like structures being present. A small part of the surface area associated with subsidence from longwall extraction of the UG1 central mains area included rock outcrops forming potential shelters, and here the areas under shelters were small and without floors. All proposed disturbance areas within this landform were surveyed, as explained in this section.

Due to a lack of terrain differentiation on this landform (there are no drainage lines for example), and based on the results of this and previous survey results, the landform is considered to have low archaeological potential. However an isolated find has been previously recorded on this landform. Plate 3 shows an example of this landform.



Plate 3: Example of the Simple Slopes Landform



One new Aboriginal heritage site MUG1-Mod 3 (an open site containing two stone artefacts) was discovered on this landform during the UG1 Modification survey campaign. MUG1-Mod 3 was situated in an open depression, in a location that had been previously surveyed for the UG1 underground approval. MUG1-Mod 3 was discovered whilst the survey team was walking between survey transects. MUG1-Mod 3 is situated in the surface area associated with subsidence from longwall extraction of the UG1 central mains. The open site with an isolated stone artefact S2MC270 (AHIMS# pending) was located in this landform in the surface area associated with subsidence from longwall extraction of the UG1 central mains, respectively. Stone artefacts were observed at S2MC270.

### **Ridge Crests and Steep Slopes Landform**

The entire rear air intake shaft and associated ventilation fan area is located on this landform. This landform was characterised by steep slopes (gradients greater than 10 degrees, but highly variable above this), ridge crests, and occasional low cliffs. The soils were loose and skeletal, but frequently the ground surface was either stone rubble, or bare rock surfaces at rock outcrops, which were frequent and consisted of tor-like structures and boulders.

The majority of the disturbance footprint within this landform was covered by the survey, except for a small portion of the rear air intake shaft and associated ventilation fan area, which was inaccessible due to its proximity to the OC1 high wall. However, this was not considered to be a significant constraint to the survey.

The landform is well vegetated, generally with eucalypts and shrubs/bushes, however approximately half of the rear air intake shaft and associated ventilation fan area has been previously cleared of vegetation for farming. Overall this landform is generally very steep and rocky terrain. Where boulders and outcrops formed potential shelters these were inspected, but these areas were rare. Due to the ruggedness of this landform, and the lack of large shelter formations within the subject area (which may have made the landform more attractive for habitation or use to Aboriginal people in the past) this landform was determined to have low archaeological potential. Plate 4 shows an example of the ridge crests and steep slopes landform.

Plate 4: Example of the Ridge Crests and Steep Slopes Landform



## Site Descriptions

During the UG1 Modification survey campaign, three new Aboriginal heritage sites were identified and recorded within the subject area. These sites are summarised below.

### MUG1-Mod 1

*Description:* This is an isolated artefact, located on the lower slopes landform on very gentle side slope, in a paddock (Plate 5). The site is located within the proposed remote services facilities area. The artefact was a quartz proximal flake, located in a natural ground exposure. There were five other pieces of broken quartz noted within 5 m of the artefact, however these did not have artefact attributes or features.

*Assessed Significance:* Low (see Section 14).

Plate 5: Location of MUG1-Mod 1



#### MUG1-Mod 2

*Description:* This is an isolated artefact, located on the lower slopes landform, where the slopes transition to the flats, on the edge of the cleared paddock. The site is located in the surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east. The artefact was located in exposures caused by erosion associated with a vehicle track (Plate 6). The artefact was a quartz flake.

*Assessed Significance:* Low (see Section 14).

Plate 6: Location of MUG1-Mod 2



### MUG1-Mod 3

*Description:* This site consists of two artefacts within 15 m of each other, located on the simple slopes landform, on the edge of a flat-bottomed open depression. The area has not been cleared of vegetation, and the site is located in the surface area associated with subsidence from longwall extraction of the UG1 central mains. The artefacts were located in natural ground exposures caused by sheet wash (Plate 7). The artefacts were a quartz flake, and a quartz proximal flake. Two other pieces of broken quartz were located in close proximity to the artefacts, however these did not have artefact attributes.

*Assessed Significance:* Low (see Section 14).

Plate 7: Location of MUG1-Mod 3



A list of the sites recorded during the survey work for the UG1 Modification, and those sites previously recorded within the subject area and wider study area during previous assessment work is presented in Table 11.

Table 11: Sites Located within Subject Area and Wider Study Area

Site Name	AHIMS	Features	Artefacts	Subject Area or Study Area <sup>1</sup>	Location within Subject Area
MUG1-Mod 1*	Pending	Isolated Find	1	Subject Area	Remote services facilities area
MUG1-Mod 2*	Pending	Isolated Find	1	Subject Area	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east
MUG1-Mod 3*	Pending	Open Artefact Site	2	Subject Area	Surface area associated with subsidence from longwall extraction of the UG1 central mains
CE-15-IF	36-3-0691	Isolated Find	1	Subject Area	Underground ROM coal conveyor corridor
CE-17-OS	36-3-0693	Open Artefact Site	3	Subject Area	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east
S2MC001	36-3-1150	Isolated Find	1	Subject Area	Remote services facilities area
S2MC002	36-3-1151	Isolated Find	1	Subject Area	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east
S2MC003	36-3-1152	Open Artefact Site	2	Subject Area	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east
S2MC004	36-3-1153	Isolated Find	1	Subject Area	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east
S2MC270	Pending	Isolated Find	1	Subject Area	Surface area associated with subsidence from longwall extraction of the UG1 central mains
S1MC029	36-3-0826	Isolated Find	1	Study Area	-
S1MC038	36-3-0835	Isolated Find	1	Study Area	-
S1MC039	36-3-0836	Isolated Find	1	Study Area	-
PAD 01	36-3-0837	PAD 1	-	Study Area	-
PAD 02	36-3-0838	PAD 2	-	Study Area	-
PAD 03	36-3-0839	PAD 3	-	Study Area	-
S2MC005	36-3-1154	Artefact Scatter	2	Study Area	-
S2MC006	36-3-1155	Artefact Scatter	25	Study Area	-
S2MC007	36-3-1156	Isolated Find	1	Study Area	-
S2MC008	36-3-1157	Isolated Find	1	Study Area	-
S2MC009	36-3-1158	Isolated Find	1	Study Area	-
S2MC010	36-3-1159	Artefact Scatter	3	Study Area	-
S2MC011	36-3-1160	Isolated Find	1	Study Area	-
S2MC012	36-3-1161	Isolated Find	1	Study Area	-
S2MC230	36-3-1046	Artefact Scatter	69	Study Area	-
S2MC231	36-3-1378	Rock Shelter with Artefacts	31	Study Area	-
S2MC269	36-3-1084	Isolated Find	1	Study Area	-
S2MC277	Pending	Isolated Find	1	Study Area	Surface area associated with subsidence from the extension of the UG1 longwall panels in the north-east
S2MC271	Pending	Isolated Find	1	Study Area	-
S2MC272	Pending	Isolated Find	1	Study Area	-

<sup>1</sup> Refer to Section 2 for a description of the study area and subject area.

\* Recorded during the July 2014 survey campaign.

## 13. Analysis and Discussion

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The subject area was characterised by the predictive model as being likely to contain low density stone artefact sites in open contexts, and possible rock shelter sites where suitable rock formations occur. These sites represent only the sparse archaeological traces of transient movement through the area by Aboriginal people in the past. The main reasons for this were:

- ❑ distances generally greater than 1 km from water;
- ❑ outside of a primary or secondary resource zone based on current models of Aboriginal past land use for the Moolarben, Wilpinjong and Ulan coal mine areas; and
- ❑ in places, steep, rocky terrain that may contain shelter deposits.

A survey of the subject area was conducted, and previous systematic surveys have also been conducted within the subject area and the wider study area. Some small areas within the subject area were not surveyed, however this is not considered a notable constraint as the current survey and previous surveys have concluded the local area is of low archaeological potential and cultural value. The survey achieved a good level of effective survey coverage, and inspected all features, such as potential rock shelters, boulders and tor-like structures that were present within the subject area for evidence of past Aboriginal land use. The survey also inspected all areas of ground surface exposure that were encountered, as these areas are most likely to reveal any Aboriginal stone objects that may be present.

The survey discovered three new Aboriginal heritage sites, adding to the eight previously recorded Aboriginal heritage sites within the subject area. The newly discovered sites, like the previously recorded sites, were open sites containing isolated stone artefacts or low densities of stone artefacts.

The survey results are in line with the expectations of the predictive model, and are commensurate with the results of previous surveys that have overlapped with the subject area, and previous surveys in areas adjacent to the subject area, which has similarly found only low numbers of Aboriginal objects.

## 14. Scientific Values and Significance Assessment

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### The Burra Charter

The *Burra Charter* (Australia International Council on Monuments and Sites 1999) defines the basic principles and procedures to be observed in the conservation of important heritage places. It provides a primary and 'best-practice' framework within which decisions about the management of heritage sites in Australia should be made. The *Burra Charter* defines cultural significance as being derived from the following four values:

**Aesthetic Value:** This 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:** This 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, a historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives *in-situ*, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.

**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, and on the degree to which the place may contribute further substantial information.

**Social Value:** This value embraces the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group.

### Scientific Significance Assessment of Aboriginal Heritage Sites

The NSW Aboriginal cultural heritage regulatory framework supports the significance assessment of Aboriginal heritage sites and provides guidelines for this assessment 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. 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 Object in New South Wales* (DECCW 2010b). The *Code of Practice for Archaeological Investigation of Aboriginal Object 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*. Notwithstanding the circularity of this advice, the scientific values described in the *Burra Charter* (above) 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 presented below:

**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. 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.

The scientific significance assessments for each site located within the subject area are presented in Table 12. Educational potential and aesthetic values are not considered to be criteria against which scientific values and significance can be assessed. Aesthetic values should be considered as a distinct category (rather than a criteria that contributes to scientific value) in accordance with the *Burra Charter* and the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011). Educational potential is considered to be a criterion that contributes to social value, rather than scientific value, and hence this is considered below in the overall cultural significance assessment.

## Assessment of Significance

The assessment of significance has been completed based on the results of the current survey, and in consideration of previous assessments.

### Statement of Significance for New Sites

*MUG1-Mod 1:* This site is an isolated find, in an open context. The site is assessed to have *low* scientific value against the archaeological criteria. As an isolated artefact with no potential archaeological deposit it has low research potential, is not rare and is a low diversity representative of the most frequently occurring class of site. No notable cultural values were noted by the RAPs representatives whilst at the site.

*MUG1-Mod 2:* This site is an isolated find, in an open context. The site is assessed to have *low* scientific value against the archaeological criteria. As an isolated artefact with no potential archaeological deposit it has low research potential, is not rare and is a low diversity representative of the most frequently occurring class of site. No notable cultural values were noted by the RAPs representatives whilst at the site.

*MUG1-Mod 3:* This site is an open artefact site, in an open context with two stone artefacts identified. The site is assessed to have *low* scientific value against the archaeological criteria. As artefacts with no potential archaeological deposit the site has low research potential, is not rare and is a low diversity representative of the most frequently occurring class of site. No notable cultural values were noted by the RAPs representatives whilst at the site.

There were no observations or finds made at the previously recorded sites within the subject area that would alter their previously determined significance. The individual significance assessments for each site are located with the subject area and wider study area summarised in Table 12.

Table 12: Summary of Significance - Individual Sites

Site Name	Features	Research Potential	Representativeness	Rarity	Significance
MUG1-Mod 1	Isolated Find	Low	Low	Low	Low
MUG1-Mod 2	Isolated Find	Low	Low	Low	Low
MUG1-Mod 3	Open Artefact Site	Low	Low	Low	Low
CE-15-IF	Isolated Find	<i>Previously assessed<sup>1</sup></i>			Low
CE-17-OS	Open Artefact Site	<i>Previously assessed<sup>1</sup></i>			Low
S2MC001	Isolated Find	<i>Previously assessed<sup>2</sup></i>			Low
S2MC002	Isolated Find	<i>Previously assessed<sup>2</sup></i>			Low
S2MC003	Open Artefact Site	<i>Previously assessed<sup>2</sup></i>			Low
S2MC004	Isolated Find	<i>Previously assessed<sup>2</sup></i>			Low
S2MC270	Isolated Find	<i>Previously assessed<sup>2</sup></i>			Low
S1MC029	Isolated Find	<i>Previously assessed<sup>2</sup></i>			Low
S1MC038	Isolated Find	<i>Previously assessed<sup>2</sup></i>			Low
S1MC039	Isolated Find	<i>Previously assessed<sup>2</sup></i>			Low
PAD 01	PAD	<i>Previously assessed<sup>2</sup></i>			Uncertain
PAD 02	PAD	<i>Previously assessed<sup>2</sup></i>			Uncertain
PAD 03	PAD	<i>Previously assessed<sup>2</sup></i>			Uncertain
S2MC005	Artefact Scatter	<i>Previously assessed<sup>2</sup></i>			Low
S2MC006	Artefact Scatter	<i>Previously assessed<sup>2</sup></i>			Medium
S2MC007	Isolated Find	<i>Previously assessed<sup>2</sup></i>			Low
S2MC008	Isolated Find	<i>Previously assessed<sup>2</sup></i>			Low
S2MC009	Isolated Find	<i>Previously assessed<sup>2</sup></i>			Low
S2MC010	Artefact Scatter	<i>Previously assessed<sup>2</sup></i>			Low
S2MC011	Isolated Find	<i>Previously assessed<sup>2</sup></i>			Low
S2MC012	Isolated Find	<i>Previously assessed<sup>2</sup></i>			Low

Site Name	Features	Research Potential	Representativeness	Rarity	Significance
S2MC230	Artefact Scatter		<i>Previously assessed<sup>2</sup></i>		Low
S2MC231	Rock Shelter with Artefacts		<i>Previously assessed<sup>2</sup></i>		High
S2MC269	Isolated Find		<i>Previously assessed<sup>3</sup></i>		Low
S2MC277	Isolated Find		<i>Previously assessed<sup>3</sup></i>		Low
S2MC271	Isolated Find		<i>Previously assessed<sup>3</sup></i>		Low
S2MC272	Isolated Find		<i>Previously assessed<sup>3</sup></i>		Low

<sup>1</sup> Source: *Moolarben Coal Mine Aboriginal Sites Database; MCO 2014.*

<sup>2</sup> Source: *Moolarben Coal Mine Aboriginal Sites Database; Hamm 2008a.*

<sup>3</sup> Source: *Moolarben Coal Mine Aboriginal Sites Database; MCO 2015 (later revision).*

## Cultural Significance Assessment of Aboriginal Heritage Sites

The *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011: 18) requires that a “clear description of the heritage values present across the area of the proposed activity” be presented, and be linked back to the information collected during the assessment process, in particular to any submissions received from RAPs. The *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011: 18) advises that “the assessment of values is a discussion of *what* is significant and *why*”. The purpose of the statement of significance is to create a comprehensive assessment of values and significance by considering and stating the values identified under each of the value categories defined by the *Burra Charter*, namely, social values, historic values, scientific values, and aesthetic values. The *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011:10) states:

*The assessment and justification in the statement of significance must discuss whether any value meets the following criteria (NSW Heritage Office 2001):*

- *does the subject area have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons? - social value*
- *is the subject area important to the cultural or natural history of the local area and/or region and/or state? - historic value*
- *does the subject area have potential to yield information that will contribute to an understanding of the cultural or natural history of the local area and/or region and/or state? - scientific (archaeological) value*
- *is the subject area important in demonstrating aesthetic characteristics in the local area and/or region and/or state? - aesthetic value.*

Statements of significance for the subject area are presented in the following sub-sections.

The subject area contain 11 identified Aboriginal heritage sites (including three sites recorded during the July 2014 survey campaigns), but otherwise no areas of Aboriginal cultural heritage value were identified. The sites in the subject area are all of low archaeological value, and it is therefore concluded that the subject area is of low Aboriginal heritage significance.

### **Social Value**

For the reasons described below, the Moolarben Coal Complex area has social value to the Wiradjuri community. It is also noted that Aboriginal people who are not Wiradjuri have identified a social and cultural connection to the place (Kuskie 2013a: 59).

### **Aesthetic Value**

The subject area has not been demonstrated to be important in demonstrating aesthetic characteristics in the local area and/or region and/or state.

### **Historic Value**

The subject area has not been demonstrated to be important to the cultural or natural history of the local area and/or region and/or state.

### **Scientific (Archaeological) Value**

The subject area does not have potential to yield information that would contribute to a further understanding of the cultural or natural history of the local area and/or region and/or state. The subject area contains Aboriginal objects, but these have very limited research or information potential beyond their current recording and incorporation into the AHIMS and Moolarben Coal Mine Aboriginal Sites Database.

### **Cultural Value**

With the exception of the Aboriginal heritage sites identified during this survey and previous surveys there were no specific areas or places of cultural value identified during the survey for the UG1 Modification. However, previous assessments have identified and documented cultural values for the Moolarben Coal Complex area, including:

- Archaeological sites having contemporary cultural value because they provide a tangible link to the traditional past (Kuskie 2013a: 59).
- The presence of flora and fauna species with known traditional uses (Kuskie 2013a: 59).
- The area of Moolarben Ridge to the south of Carrs Gap having contemporary cultural value to the Wiradjuri community (Hamm 2008b, Kuskie 2013a). The UG1 Modification would not affect this area or these values.
- The area along the Goulburn River known as "The Drip" (approximately 8 km north of the subject area) are considered to have high cultural value as the sites represent easily identified material remains and the area is ceremonially important (Hamm 2006a). The UG1 Modification would not affect this area or these values.

## 15. Impact Assessment

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As described in Sections 11 and 12, an extensive and systematic pedestrian surface survey was undertaken within the subject area. The survey provided consistent survey coverage of the subject area with a focus on areas of visibility and areas of potential sensitivity, such as ground surface exposures and rock formations that may have formed rock shelters suitable for art or habitation.

A total of 11 Aboriginal heritage sites were identified within the subject area (including three newly identified sites recorded during the UG1 Modification survey campaigns). As these sites are all low density stone artefact open sites of low archaeological value, the subject area is deemed to have low archaeological value and low archaeological potential beyond the current recordings and knowledge.

There are two categories of impact that may be anticipated from the proposed UG1 Modification works:

- ❑ Impact from surface development works<sup>3</sup> at the rear air intake shaft<sup>4</sup> and associated ventilation fan area, remote services facilities area (including upcast and downcast shafts) and underground ROM coal conveyor corridor.
- ❑ Possible impact from mine subsidence or subsidence remediation works associated with the extension of the UG1 longwall panels in the north-east, longwall extraction of the UG1 central mains, the extension of the UG1 longwall panels in the south-west<sup>5</sup> and increase in coal seam extraction thickness.

### Summary of Potential Impacts

As described in Section 2, this report focuses on the assessment of those sites/areas that have the potential to experience impacts as a result of the UG1 Modification which are not already approved for impact associated with the Moolarben Coal Project Stage 1 or Moolarben Coal Project Stage 2. Notwithstanding, those sites with approved subsidence impacts (i.e. from the Moolarben Coal Project Stage 2) are also considered in terms of the incremental impacts or change in impacts that may occur as a result of the longwall panel reconfiguration associated with UG1 Modification.

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<sup>3</sup> The final location of discrete surface facilities (e.g. shaft locations) would be subject to detailed design as part of the Mining Operations Plan(s) in consideration of known Aboriginal heritage sites.

<sup>4</sup> The construction of the rear air intake shaft and associated ventilation fan would require a drill rig and associated water tank, both of which would sit on the ground surface (i.e. no soil stripping). An area of approximately 10 metres [m] x 20 m would be required during construction. The rear air intake shaft itself would only require an ongoing fenced disturbance footprint of approximately 5 m x 5 m.

<sup>5</sup> Note that there are no Aboriginal heritage sites located directly above the longwall extension area in the south-west, and no existing Aboriginal heritage sites located in proximity to the area.

Table 13 provides a summary of the potential impacts from the UG1 Modification on known sites within the subject area and the wider study area (differentiating between new and existing/approved impacts). These sites are considered further in the subsections below.

Table 13: Potential Impacts of the UG1 Modification on Aboriginal Heritage Sites

Site Name	Site Type	Location <sup>1</sup>	Potential Impact Mechanism	Level of Impact from the UG1 Modification
MUG1-Mod 1*	Isolated Find	Subject Area	Surface Disturbance	Total
MUG1-Mod 2*	Isolated Find	Subject Area	Subsidence	Unlikely
MUG1-Mod 3*	Open Artefact Site	Subject Area	Surface Disturbance	Nil <sup>2</sup>
CE-15-IF	Isolated Find	Subject Area	Surface Disturbance	Total
CE-17-OS	Open Artefact Site	Subject Area	Subsidence	Unlikely
S2MC001	Isolated Find	Subject Area	Surface Disturbance	Total
S2MC002	Isolated Find	Subject Area	Subsidence	Incremental
S2MC003	Open Artefact Site	Subject Area	Subsidence	Unlikely
S2MC004	Isolated Find	Subject Area	Subsidence	Unlikely
S2MC270	Isolated Find	Subject Area	Surface Disturbance	Nil <sup>2</sup>
S1MC029	Isolated Find	Study Area	Subsidence	Incremental
S1MC038	Isolated Find	Study Area	Subsidence	Unlikely
S1MC039	Isolated Find	Study Area	Subsidence	Unlikely
PAD 01	PAD 1	Study Area	Subsidence	Incremental
PAD 02	PAD 2	Study Area	Subsidence	Incremental
PAD 03	PAD 3	Study Area	Subsidence	Incremental
S2MC005	Artefact Scatter	Study Area	Subsidence	Incremental
S2MC006	Artefact Scatter	Study Area	Subsidence	Incremental
S2MC007	Isolated Find	Study Area	Subsidence	Incremental
S2MC008	Isolated Find	Study Area	Subsidence	Incremental
S2MC009	Isolated Find	Study Area	Subsidence	Incremental
S2MC010	Artefact Scatter	Study Area	Subsidence	Incremental
S2MC011	Isolated Find	Study Area	Subsidence	Incremental
S2MC012	Isolated Find	Study Area	Subsidence	Incremental
S2MC230	Artefact Scatter	Study Area	Subsidence	Incremental
S2MC231	Rock Shelter with Artefacts	Study Area	Surface Disturbance	Nil <sup>2</sup>
S2MC269	Isolated Find	Study Area	Subsidence	Incremental
S2MC277	Isolated Find	Subject Area	Subsidence	Nil <sup>2</sup>
S2MC271	Isolated Find	Study Area	Subsidence	Nil <sup>2</sup>
S2MC272	Isolated Find	Study Area	Subsidence	Nil <sup>2</sup>

\* Recorded during the July 2014 survey campaign.

<sup>1</sup> Refer to Section 2 for a description of the subject area and study area.

<sup>2</sup> Located within Stage 2 surface impact area.

## Potential Subsidence Impacts

Subsidence estimates for the UG1 Modification area (including specific predictions for Aboriginal cultural heritage sites) have been provided by MSEC (2015) (Appendix 5). The subsidence predictions are informed by previous experience of underground mining in the Ulan and Moolarben area.

Table 14 presents the subsidence predictions for the sites located within the subject area and study area that would not otherwise be impacted by surface disturbance activities associated with the approved Stage 2 Project (Figure 4).

Table 14: Subsidence Predictions for Sites in the Moolarben UG1 Modification Subject Area and Study Area

Site Name	Site Type	Location	Predicted Total Subsidence based on Approved Stage 2 Project (mm)	Incremental Subsidence as a result of the UG1 Modification (mm) <sup>#</sup>	Predicted Total Tilt based on Approved Stage 2 Project (mm/m)	Incremental Tilt as a result of the UG1 Modification (mm/m) <sup>-</sup>	Maximum Predicted Hogging Curvature after LW105 (km <sup>-1</sup> )	Maximum Predicted Sagging Curvature after LW105 (km <sup>-1</sup> )
MUG1-Mod 2*	Isolated Find	Subject Area	-	(1129)	-	(46)	1.3	-1.6
CE-17-OS	Open Artefact Site	Subject Area	-	(0)	-	(0)	0.0	0.0
S2MC002	Isolated Find	Subject Area	-	(32)	-	(3)	0.2	-0.1
S2MC003	Open Artefact Site	Subject Area	-	(0)	-	(0)	0.0	0.0
S2MC004	Isolated Find	Subject Area	-	(0)	-	(0)	0.0	0.0
S1MC029	Isolated Find	Study Area	1495	-220 (1275)	34.5	16.5 (51)	1.5	-1.7
S1MC038	Isolated Find	Study Area	-	(0)	-	(0)	0.0	-0.0
S1MC039	Isolated Find	Study Area	-	(0)	-	(0)	0.0	-0.0
PAD 01	PAD	Study Area	-	(862)	-	(64)	1.8	-2.2
PAD 02	PAD	Study Area	-	(2182)	-	(6)	3.7	-4.4
PAD 03	PAD	Study Area	-	(2278)	-	(0)	>5	<-5
S2MC005	Artefact Scatter	Study Area	1816	379 (2196)	2.9	-0.9 (2)	>5	<-5
S2MC006	Artefact Scatter	Study Area	1320	-990 (330)	45.3	-26.3 (19)	2.4	-0.7
S2MC007	Isolated Find	Study Area	1817	383 (2200)	1.1	-1.1 (0)	>5	<-5
S2MC008	Isolated Find	Study Area	939	-423 (516)	34.5	-16.5 (18)	1.0	-0.4
S2MC009	Isolated Find	Study Area	261	-35 (226)	7.2	-3.2 (4)	0.2	-0.2
S2MC010	Artefact Scatter	Study Area	219	25 (224)	4.5	-1.5 (3)	0.2	-0.3
S2MC011	Isolated Find	Study Area	472	-85 (387)	24.8	-10.8 (14)	1.2	-0.4
S2MC012	Isolated Find	Study Area	241	-7 (234)	6.3	-2.3 (4)	0.2	-0.2
S2MC230	Artefact Scatter	Study Area	1770	-309 (1461)	45.6	1.4 (47)	2.5	-3.3
S2MC269	Isolated Find	Study Area	-	(2113)	-	(6)	>5	<-5

Source: MSEC (2015).

\* Recorded during the July 2014 survey campaign.

# The value in the brackets represents the predicted total subsidence.

- The value in the brackets represents the predicted total tilt.

MSEC (2015) has predicted that subsidence effects as a result of the UG1 Modification in the vicinity of known Aboriginal heritage sites within the subject area would not exceed 2,278 mm (i.e. PAD 03). In some instances, the UG1 Modification results in a reduction to the subsidence previously assessed for sites as part of the approved Moolarben Coal Project Stage 2 (i.e. S1MC029, S2MC006, S2MC008, S2MC009, S2MC011, S2MC012 and S2MC230). The reduction in proposed impacts ranges between 7 mm and 990 mm (Table 14).

Sites CE-17-OS, S2MC003, S2MC004, S1MC038 and S1MC039 are not located within the zone of subsidence (i.e. are not located directly above the longwall panels and/or within the angle of draw) and therefore are not predicted to experience any differential ground movements induced by mine subsidence.

Open sites containing artefact scatters and/or isolated finds have the potential to be adversely affected by mine subsidence through the cracking of surface soils. Whilst it is unlikely that the scattered artefacts or isolated finds themselves would be impacted by mine subsidence, it is possible that, if remediation works to the surface areas around the archaeological sites was required after mining, these works could potentially impact on the archaeological sites. Remediation works in areas adjacent to these sites should be supervised by a qualified archaeologist should any works be required.

Therefore, no sites are anticipated to be significantly impacted as a result of subsidence associated with the UG1 Modification.

## Potential Surface Disturbance Impacts

Table 15 outlines the level of surface impact to sites due to the UG1 Modification.

Table 15: Level of Surface Impact for Sites in the Moolarben UG1 Modification Subject Area and Study Area

Site Name	Site Type	Location	Impacts Due to UG1 Modification
MUG1-Mod 1*	Isolated Find	Subject Area	Total
MUG1-Mod 3*	Open Artefact Site	Subject Area	Nil <sup>1</sup>
CE-15-IF	Isolated Find	Subject Area	Total
S2MC001	Isolated Find	Subject Area	Total
S2MC270	Isolated Find	Subject Area	Nil <sup>1</sup>
S2MC231	Rock Shelter with Artefacts	Study Area	Nil <sup>1</sup>

<sup>1</sup> Located within the Stage 2 surface impact area.

\* Recorded during the July 2014 survey campaign.

As described in Table 15, three Aboriginal heritage sites would be impacted by surface disturbance associated with the UG1 Modification, including site MUG1-Mod 1, CE-15-IF and S2MC001. Sites S2MC001 and MUG1-Mod 1 are located within the proposed remote services facilities area, while site CE-15-IF is located within the underground ROM coal conveyor corridor.



All three sites to be impacted are isolated finds of low archaeological significance.

As described in Section 2, the subject area for the UG1 Modification do not necessarily represent the extent of the proposed UG1 Modification workings or disturbance; rather these areas provide an indicative survey area for the purpose of this assessment. On this basis, it is considered that sites located within the surface disturbance subject area (i.e. the remote services facilities area or the underground ROM coal conveyor corridor) may not necessarily be subject to direct disturbance as a result of the UG1 Modification. However, all three of these sites have conservatively been assessed as being subject to potential direct impacts associated with surface disturbance activities.

### Potential Impact Assessment Summary

For the purposes of this assessment (and as described above), sites that occur within the remote services facilities area, underground ROM coal conveyor corridor and rear air intake shaft and ventilation fan area are conservatively considered to have the potential to be directly impacted by the proposed surface works in these localities, which will involve ground disturbance activities to establish new infrastructure. It is noted there are no sites in the rear air intake shaft and associated ventilation fan area, and none are considered to be likely to occur.

In the case of the sites situated above the underground development areas, the UG1 Modification is not expected to result in material harm or loss of value to any sites.

As required by the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b), the likely impacts (and loss of value) to Aboriginal heritage sites from the Moolarben UG1 Optimisation Modification project is limited to the three sites listed in Table 16.

Table 16: Impact Assessment Table

Site Name	Type of Harm	Degree of Harm	Consequence of Harm
MUG1-Mod 1	Direct	Total	Total loss of value
CE-15-IF	Direct	Total	Total loss of value
S2MC001	Direct	Total	Total loss of value
CE-17-OS	None	None	No loss of value
S2MC002	None	None	No loss of value
S2MC003	None	None	No loss of value
S2MC004	None	None	No loss of value
S2MC270	None	None	No loss of value
MUG1-Mod 2	None	None	No loss of value
MUG1-Mod 3	None	None	No loss of value
S2MC005	None	None	No loss of value
S2MC006	None	None	No loss of value
S2MC007	None	None	No loss of value
S2MC008	None	None	No loss of value

Site Name	Type of Harm	Degree of Harm	Consequence of Harm
S2MC009	None	None	No loss of value
S2MC010	None	None	No loss of value
S2MC011	None	None	No loss of value
S2MC012	None	None	No loss of value
S1MC029	None	None	No loss of value
S1MC038	None	None	No loss of value
S1MC039	None	None	No loss of value
S2MC230	None	None	No loss of value
S2MC231	None	None	No loss of value
S2MC269	None	None	No loss of value
PAD 1	None	None	No loss of value
PAD 2	None	None	No loss of value
PAD 3	None	None	No loss of value
S2MC277	None	None	No loss of value
S2MC271	None	None	No loss of value
S2MC272	None	None	No loss of value

The incremental potential impacts on sites located within the wider study area, as a result of the UG1 Modification, are considered to be negligible and therefore have been classified as having no impact in Table 16 above.

The proposed UG1 Modification is located in an area of low Aboriginal archaeological potential that has been extensively surveyed, and unanticipated impacts and harm to cultural values are not likely. Taken within the context of the 603 known Aboriginal heritage sites on the Moolarben Coal Mine Aboriginal Sites Database, the sites discussed in this report are all of low archaeological value, and harm to some of these sites represents a low level of harm and loss of cultural value. Such low levels of harm are not significant in terms of the principles of *ecological sustainable development* and *inter-generational equity* described and recommended in the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011).

## 16. Management, Mitigation Measures and Recommendations

The existing *Aboriginal Heritage Management Plan Stage 1* (MCO 2013) anticipates the type of harm described in this assessment, and as such provides a robust management framework within which to manage both the impacts and avoidance of harm to Aboriginal heritage sites and values. It is understood that a complex wide revision to this plan is currently in preparation. While the management measures recommended herein are consistent with the currently approved plan, management should be undertaken consistent with the contemporary management plan that exists at the time of the works.

MCO should ensure that the proposed works proceed as planned, and remain within the assessed boundaries of the subject area and that the contingencies of the *Aboriginal Heritage Management Plan Stage 1* (MCO 2013) (or its revision) are followed at all times.

On this basis, the following recommendations are made:

1. For the sites MUG1-Mod 1, CE-15-IF and S2MC001 which will be subject to direct harm as a result of the UG1 Modification:
  - a. Sites should be salvaged prior to harm.
2. For any previously unrecorded open artefact sites identified during works:
  - a. Where feasible, MCO will seek to redesign the proposed works such that impacts are minimised or avoided to the heritage evidence;
  - b. Where the site is assessed as being of low significance and impacts cannot be avoided, following detailed recording of the evidence, impacts will be permitted to occur without further action;
  - c. Where the site is assessed as being of low to moderate, or moderate significance, and impacts cannot be avoided, evidence will be subject to detailed recording. Following recording, the Environmental and Community Manager of MCO will determine in consultation with a heritage expert the extent of proposed impacts, and where impacts are substantial, the evidence within the impact area will be subject to surface collection before impacts are permitted to occur. Where the consensus agreement of MCO and the RAPs is reached, additional mitigation measures, such as surface scrapes and/or hand excavation, may be implemented for evidence within the impact area. Where the impacts are determined to be minimal, impacts will be permitted to occur without further action; and
  - d. Where the site is assessed as being of moderate to high, or high significance, and impacts cannot be avoided, evidence will be subject to detailed recording. Following recording, the Environmental and Community Manager of MCO will determine in consultation with a heritage expert the extent of proposed impacts, and where impacts are substantial, the evidence within the impact area will be subject to surface collection and any other mitigation measures, such as surface scrapes and/or hand excavation, as determined by the consensus agreement of MCO and the RAPs before impacts occur. Where the impacts are determined to be minimal, impacts will be permitted to occur after the evidence within the impact area has been subject to surface collection. In the event that consensus agreement cannot be reached between MCO and the RAPs about the mitigation strategy, the Environmental and Community Manager of MCO will determine that strategy in consultation with a heritage expert, but it will as a minimum involve surface collection of the evidence.
3. For any previously unrecorded open grinding groove sites identified during works:

- a. Where feasible, MCO will seek to redesign the proposed works such that impacts are minimised or avoided to the heritage evidence;
  - b. Where the site is assessed as being of low, low to moderate, or moderate significance and impacts cannot be avoided, following detailed recording of the evidence and use-wear and residue analysis<sup>6</sup>, impacts will be permitted to occur without further action; and
  - c. Where the site is assessed as being of moderate to high, or high significance, following detailed recording of the evidence and use-wear and residue analysis, the Environmental and Community Manager of MCO will determine in consultation with a heritage expert the extent of proposed impacts. Where impacts are substantial, the evidence will be subject to any mitigation measures, such as removal of the sandstone slab hosting the grooves and subsequent display for educational purposes, as determined by the consensus agreement of MCO and the RAPs before impacts are permitted to occur. In the event that consensus agreement cannot be reached between MCO and the RAPs about the mitigation strategy, the Environmental and Community Manager of MCO will determine that strategy in consultation with a heritage expert. Where the impacts are determined to be minimal, impacts will be permitted to occur without further action.
4. For any previously unrecorded rock shelters identified during works in a surface disturbance (i.e. not subsidence) area:
- a. MCO will seek to redesign the proposed works such that impacts are minimised or avoided to the heritage evidence;
  - b. Where the site is assessed as being of low to moderate, or moderate significance, and impacts cannot be avoided, following detailed recording of the evidence, where the consensus agreement of MCO and the RAPs is reached, the site will be subject to test excavation and consideration of further mitigation measures (salvage excavation). In the event that consensus agreement cannot be reached between MCO and the RAPs about the mitigation strategy, the Environmental and Community Manager of MCO will determine that strategy in consultation with a heritage expert; and

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<sup>6</sup> Use-wear and residue analysis is only required when the impact is surface based (i.e. not subsidence).

- c. Where the site is assessed as being of moderate to high, or high significance, and impacts cannot be avoided, it will be subject to test excavation and any other mitigation measures, such as salvage excavation by hand, as determined by the consensus agreement of MCO and the RAPs before impacts are permitted to occur. In the event that consensus agreement cannot be reached between MCO and the RAPs about the mitigation strategy, the Environmental and Community Manager of MCO will determine that strategy in consultation with a heritage expert, but it will as a minimum involve test excavation of the shelter.
5. For any previously unrecorded shelters identified in the subsidence area:
    - a. For rock shelter sites/PADs assessed as being of low significance, following detailed recording of the evidence, impacts will be permitted to occur without further action;
    - b. For rock shelter sites/PADs assessed as being of low to moderate, moderate or high significance, following detailed recording of the evidence, MCO will engage a qualified subsidence expert to provide an assessment of potential subsidence impacts:
      - Where the potential for subsidence impacts is assessed as 10% or less, impacts will be permitted to occur without further action; and
      - Where the potential for subsidence impacts is assessed as greater than 10%, impacts will be permitted to occur with monitoring and subject to the consensus agreement of MCO and the RAPs, any mitigation measures deemed necessary will be implemented.
  6. For any other previously unrecorded site types (i.e. site types other than open artefact scatters, grinding grooves and rock shelters) identified during works:
    - a. MCO will seek to redesign the proposed works such that impacts are minimised or avoided to the heritage evidence. Where avoidance of impacts is not feasible, the Environmental and Community Manager of MCO will determine an appropriate mitigation strategy in consultation with a heritage expert and with the consensus agreement of the RAPs. In the event that consensus agreement cannot be reached between MCO and the RAPs about the mitigation strategy, the Environmental and Community Manager of MCO will determine that strategy in consultation with a heritage expert. Where the site is assessed as being of moderate to high, or high significance, and impacts are substantial, some form of management will be implemented before impacts are permitted to occur.

7. MCO should implement emergency response procedures for the unexpected discovery of Aboriginal objects during design and construction activities for the UG1 Modification:
  - a. With the exception of skeletal material, where the newly identified heritage evidence may be subject to impacts, MCO will engage an appropriately qualified and experienced archaeologist to undertake a detailed archaeological recording of the evidence and assess the significance of the evidence in consultation with the RAPs, assess the nature of the proposed impacts, and provide advice on appropriate management strategies consistent with the approved MCO Aboriginal Heritage Management Plan Stage 1 (or its revision); and
  - b. If human skeletal material is identified, all work in the area of the material will cease immediately and notification and protection procedures will be implemented.
8. That the approved MCO Aboriginal Heritage Management Plan (or other relevant contemporary heritage management plan [i.e. the complex-wide Heritage Management Plan currently being prepared]) is updated to include the extent of the UG1 Modification and the management of Aboriginal heritage values within it.
9. MCO should continue to liaise with the RAPs throughout the design and construction activities for the UG1 Modification.
10. That the final location of discrete surface facilities (e.g. shaft locations) (following detailed design as part of the Mining Operations Plan(s)) be subject to systematic survey (in consultation with the Aboriginal community) if the area has not already been surveyed. Any new sites recorded (if any) should be managed in accordance with Recommendations 2 to 7.

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## Glossary

Term	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.
Aboriginal Object(s)	The legal definition for material Aboriginal cultural heritage under the NSW <i>National Parks and Wildlife Act 1974</i> .
Registered Aboriginal Party	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 project.
Archaeology	The scientific study of human history, particularly the relics and cultural remains of the distant past.
Archaeological Deposit	A layer of soil material containing archaeological remains.
Archaeological Investigation	The process of assessing the archaeological potential of an impact area by a qualified archaeologist.
Archaeological Site	A site with material evidence of past Aboriginal or non-Aboriginal activity in which material evidence (artefacts) of past activity is preserved.
Artefact	An object made by human agency (e.g. stone artefacts).
Assemblage	<ol style="list-style-type: none"> <li>1. A group of stone artefacts found in close association with one another.</li> <li>2. Any group of items designated for analysis - without any assumptions of chronological or spatial relatedness.</li> </ol>
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 or a groundwater system derives its water.
Development	The operations involved in preparing a mine for extraction, including cutting roadways and headings. Also includes tunnelling, sinking, crosscutting, drifting, and raising.
Drainage	Natural or artificial means for the interception and removal of surface or subsurface water.
Exploration	The work done to prove or establish the extent of the coal resource.
Flake	A piece of stone detached from a core, displaying a bulb of percussion and striking platform.
Harm	With regard to Aboriginal objects this has the same meaning as the NSW <i>National Parks and Wildlife Act 1974</i> .
Impact	Influence or effect exerted by a project or other activity on the natural, built and community environment.
Impact Area	An area that requires archaeological investigation and management assessment.
<i>In situ</i>	Latin words meaning 'on the spot, undisturbed'.
Isolated Find	A single artefact found in an isolated context.
Landform 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.
Management Plans	Conservation plans which identify short and long term management strategies for all known sites recorded within a (usually approved) project area.
Methodology	The procedures used to undertake an archaeological investigation.
Minimum Requirements	The minimum standard of which the NSW Office of Environment and Heritage will accept the reporting of an archaeological investigation.
Mitigation	To address the problem of conflict between land use and site conservation.
Open Camp Site	An archaeological site situated within an open space (e.g. archaeological material located on a creek bank, in a forest, on a hill, etc.).

Term	Definition
PAD	Potential archaeological deposit. A location considered to have a potential for subsurface archaeological material.
Site Recording	The systematic process of collecting archaeological data for an archaeological investigation.
Site	A place where past human activity is identifiable.
Spatial Significance	A site which may contain potential sub-surface deposits or in situ material useful in the analysis of human use of land and site formation process.
Survey Coverage	A graphic and statistical representation of how much of an impact area was actually surveyed and therefore assessed.
Tributary	A river or stream flowing into a larger river or lake.

## Appendix I Consultation Log

Date	Organisation/Person Contacted	How Contacted	Contacted By	Nature of Consultation
3/06/2014	Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, North East Wiradjuri Company Ltd, Craig McConnell, Aleisha Lonsdale, Warranha Ngumbaay, NC01	Email	Moolarben Coal Operations Pty Ltd (MCO)	Copies of the Proposed Methodology and covering letter (including an invitation to attend the information session on 17 June 2014) were emailed to each of the Registered Aboriginal Parties.
3/06/2014	Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, North East Wiradjuri Company Ltd, Craig McConnell, Aleisha Lonsdale, Warranha Ngumbaay, NC01	Post	Moolarben Coal	Copies of the Proposed Methodology and covering letter (including an invitation to attend the information session on 17 June 2014) were posted to each of the Registered Aboriginal Parties.
4/06/2014	Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, North East Wiradjuri Company Ltd	Email	Moolarben Coal	Moolarben Coal emailed an invitation to attend the field surveys for the UG1 Modification on 18 and 19 June 2014.
6/06/2014	Moolarben Coal	Email	NC01	A representative of NC01 emailed to confirm that two representatives would be attending the information session on behalf of NC01.
9/06/2014	Moolarben Coal	Email	North East Wiradjuri Company Ltd	Lyn Syme emailed Moolarben Coal to provide comments on the Proposed Methodology for the UG1 Modification ACHA.
10/06/2014	Moolarben Coal	Email	Warrabinga Native Title Claimants Aboriginal Corporation	Kristen Kerr emailed Moolarben Coal to provide comments on the Proposed Methodology for UG1 Modification ACHA.
13/06/2014	Moolarben Coal	Returned Mail	Australia Post	Returned mail received from Australia Post with the hard copy of the Proposed Methodology and covering letter addressed to NC01.
13/06/2014	NC01	Telephone	Moolarben Coal	Called representative of NC01 at 1.35pm to confirm the correct postal address. The representative for NC01 advised Moolarben Coal that NC01 had received the electronic version of the Proposed Methodology and covering letter and confirmed the correct postal address. The representative for NC01 was advised that Moolarben Coal would re-post the Proposed Methodology and covering letter.
13/06/2014	NC01	Post	Moolarben Coal	Copy of the Proposed Methodology and covering letter (including an invitation to attend the information session on 17 June 2014) was re-posted to NC01.
13/06/2014	Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, North East Wiradjuri Company Ltd	Email	Moolarben Coal	Moolarben Coal emailed the Registered Aboriginal Parties to advise that the survey work had been delayed until after the close of the Proposed Methodology review period, and to advise that Moolarben Coal would be in touch regarding the rescheduled dates.

Date	Organisation/Person Contacted	How Contacted	Contacted By	Nature of Consultation
17/06/2014	NC01, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, Mudgee Local Aboriginal Land Council and North East Wiradjuri Company Ltd	In Person	Moolarben Coal	Attendance at Information Session.
19/06/2014	Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, North East Wiradjuri Company Ltd, Craig McConnell, Aleisha Lonsdale, Warranha Ngumbaay, NC01	Email	Moolarben Coal	Email to all Registered Aboriginal Parties following the information session providing a copy of the information session presentation.
19/06/2014	Moolarben Coal	Email	Warranha Ngumbaay	Warranha emailed Moolarben Coal to confirm receipt of the information session presentation.
20/06/2014	Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, North East Wiradjuri Company Ltd, Craig McConnell, Aleisha Lonsdale, Warranha Ngumbaay, NC01	Post	Moolarben Coal	Copies of the information session presentation were posted to all Registered Aboriginal Parties following the information session.
1/07/2014	Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, North East Wiradjuri Company Ltd, Craig McConnell, Aleisha Lonsdale, Warranha Ngumbaay, NC01	Email	Moolarben Coal	Email to all Registered Aboriginal Parties to provide a reminder that the review period for the Proposed Methodology closes on 3 July 2014.
2/07/2014	Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, North East Wiradjuri Company Ltd, Craig McConnell, Aleisha Lonsdale, Warranha Ngumbaay, NC01	Email	Moolarben Coal	Moolarben Coal emailed the Registered Aboriginal Parties to confirm the survey dates for July 2014.
3/07/2014	Moolarben Coal	Email	Murong Gialinga Aboriginal & Torres Strait Islander Corporation	Debbie Foley emailed Moolarben Coal to provide comments on the Proposed Methodology for the UG1 Modification ACHA.
7/07/2014	Moolarben Coal	Email	Warrabinga Native Title Claimants Aboriginal Corporation	Kristen Kerr emailed Moolarben Coal to advise that Warrabinga Native Title Claimants Aboriginal Corporation were unable to provide comments on the Proposed Methodology for the UG1 Modification ACHA within the review period, however they will provide any comments by COB 07/07/2014.
16/07/2014 and 17/07/2017	Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, North East Wiradjuri Company Ltd	In Person	Moolarben Coal	Attendance at field surveys on Wednesday 16 and Thursday 17 July 2014.
25/07/2014	Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, North East Wiradjuri Company Ltd	Email	Moolarben Coal	Moolarben Coal emailed the Registered Aboriginal Parties to confirm the additional survey dates for July 2014.
31/07/2014	Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, North East Wiradjuri Company Ltd	In Person	Moolarben Coal	Attendance at field surveys on Thursday 31 July 2014.



Date	Organisation/Person Contacted	How Contacted	Contacted By	Nature of Consultation
14/10/2014	Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, North East Wiradjuri Company Ltd, Craig McConnell, Aleisha Lonsdale, Warranha Ngumbaay, NC01	Post	Moolarben Coal	Copies of the draft ACHA were provided to all RAPs for their review and comment.
20/10/2014	Warranha Ngumbaay	Email	Moolarben Coal	An electronic copy of the draft ACHA was emailed to Warranha and advising that a hard copy had been posted to her care of Aleisha Lonsdale.
20/10/2014	Moolarben Coal	Email	Warranha Ngumbaay	Warranha confirmed receipt of the email.
11/11/2014	Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, North East Wiradjuri Company Ltd, Craig McConnell, Aleisha Lonsdale, Warranha Ngumbaay, NC01	Email	Moolarben Coal	Moolarben Coal emailed a reminder to all RAPs of the close of the period for comment on the draft ACHA.
11/11/2014	Moolarben Coal	Telephone	NC01	NC01 called Moolarben Coal at 4.15pm and advised that NC01 agree to the findings of the report, however they were disappointed that they had not been invited to the field survey as it is within their traditional lands. NC01 thanked Moolarben Coal for allowing them participate in the consultation meetings. It was noted that the NC01 representative has also spoken with a survey participant to confirm the findings.
11/11/2014	Moolarben Coal	Telephone	Warrabinga Native Title Claimants Aboriginal Corporation	Kristen Kerr called to advise that Warrabinga Native Title Claimants Aboriginal Corporation had not received their copy of the draft ACHA.
11/11/2014	Warrabinga Native Title Claimants Aboriginal Corporation	Email	Moolarben Coal	Moolarben Coal emailed Warrabinga Native Title Claimants Aboriginal Corporation to provide an additional electronic copy of the draft ACHA and covering letter.
14/11/2014	Moolarben Coal	Email	Warrabinga Native Title Claimants Aboriginal Corporation	Kristen Kerr emailed Moolarben Coal to request an extension on the period for the provision of comments on the draft ACHA.
17/11/2014	Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal & Torres Strait Islander Corporation, North East Wiradjuri Company Ltd, Craig McConnell, Aleisha Lonsdale, Warranha Ngumbaay, NC01	Email	Moolarben Coal	Moolarben Coal emailed all RAPs to provide an extension of the period for the provision of comments on the draft ACHA.
19/11/2014	Moolarben Coal	Email	Aleisha Lonsdale	Aleisha Lonsdale emailed Moolarben Coal to provide comments on the draft ACHA for herself and on behalf of Warranha Ngumbaay.
19/11/2014	Moolarben Coal	Email	Mudgee Local Aboriginal Land Council	Tony Lonsdale emailed Moolarben Coal to provide comments on the draft ACHA on behalf of the Mudgee Local Aboriginal Land Council.

Date	Organisation/Person Contacted	How Contacted	Contacted By	Nature of Consultation
19/11/2014	Moolarben Coal	Email	Murong Gialinga Aboriginal and Torres Strait Islander Corporation	Debbie Foley emailed Moolarben Coal to provide comments on the draft ACHA on behalf of Murong Gialinga Aboriginal and Torres Strait Islander Corporation.
20/11/2014	Moolarben Coal	Email	Warrabinga Native Title Claimants Aboriginal Corporation	Kristen Kerr emailed Moolarben Coal to provide comments on the draft ACHA on behalf of Warrabinga Native Title Claimants Aboriginal Corporation.

## Appendix 2 Methodology

### PROPOSED METHODOLOGY FOR THE MOOLARBEN COAL MINE UG1 RECONFIGURATION MODIFICATION ABORIGINAL CULTURAL HERITAGE ASSESSMENT

3 June 2014

#### Introduction

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

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

Stage 1 of the Moolarben Coal Mine (i.e. the Moolarben Coal) Project) was approved in 2007 as a Major Project (05\_0117) under Part 3A of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act). Stage 1 consists of three open cut coal mines (OC1, OC2, OC3), one underground mine (UG4), a coal handling and preparation plant, coal stockpiles, a rail loop, rail loader, and office and workshop support facilities. Modifications to the Stage 1 approval include Modifications (approved and currently proposed) 1, 2, 3, 4, 5, 6, 7, 8 and 9. An Aboriginal Heritage Management Plan for Stage 1 has been approved and is currently implemented.

Moolarben Coal is seeking to expand its operations as part of Stage 2 of the Moolarben Coal Project. A Major Project Application (08\_0135) has been submitted to the NSW Department of Planning and Environment. Stage 2 comprises an open cut mine (OC4), two underground mines (UG1 and UG2) and associated infrastructure.

Moolarben Coal has identified that an opportunity exists to reconfigure the UG1 mine to achieve mining efficiencies and increase underground run-of-mine (ROM) coal production. This will require an Aboriginal Cultural Heritage Assessment to be undertaken in relation to those areas that the reconfiguration applies (Figures 1 and 2).

The UG1 Reconfiguration Modification (the UG1 Modification) involves the relocation of main headings, reconfiguration of longwall panels to extract additional coal, construction of additional surface support facilities and increasing the extraction rate of underground ROM coal.

Of relevance to the Aboriginal Cultural Heritage Assessment, the UG1 Modification would involve the following activities:

- Longwall panels to be lengthened in the north-east by 250 to 550 metres (m) (to access an additional 3.7 million tonnes of ROM coal).
- Relocation of central mains to the north-east.
- Extraction via longwall method of the central panel of coal that previously contained main headings.
- Increasing the total coal seam extraction height by approximately 30 centimetres to a maximum extraction height of 3.5 m.
- Increase to longwall panel width by 5 m, resulting in a 5 m extension of secondary extraction to the north-east.
- Underground ROM coal to be conveyed to the Coal Handling and Preparation Plant area directly or via a ROM coal stockpile in OC1.
- Construction of remote services facilities (including upcast shaft, fans and intake raise) above north-east mains location partially within an approved surface disturbance area.

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- Construction of a rear air intake shaft and associated ventilation fan above the start of the longwall panels in the south-west.
- Construction of coal handling infrastructure (e.g. conveyors) partially within an approved surface disturbance area.

The proposed UG1 Modification would require a modification to both the Stage 1 and Stage 2 Moolarben Coal Project Approvals (05-0117 and 8\_0135) (once granted) under Section 75W of the 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 75W of the NSW *Environmental Planning and Assessment Act, 1979*. The Modification request is referred to as the UG1 Modification.

The areas of land that the above activities relate to are shown on Figures 1 and 2 (at the back of this document). These include additional surface disturbance areas and additional subsidence areas. Of note is that large portions of these areas have previously been approved and/or assessed for disturbance and the management of Aboriginal heritage in these areas is guided by the approved Aboriginal Heritage Management Plan Stage 1 (Moolarben Coal, 2013). Areas that overlap with previously assessed and/or approved areas would not be re-assessed as part of this UG1 Modification.

An Environmental Assessment would be prepared for the UG1 Modification and it is expected to include the following key specialist assessments:

- Aboriginal Cultural Heritage Assessment
- Subsidence Assessment
- Flora and Fauna Assessment
- Surface Water Assessment
- Groundwater Assessment
- Noise Assessment
- Air Quality Assessment

The Proposed Methodology for the Aboriginal Cultural Heritage Assessment of the UG1 Modification is outlined below. Moolarben Coal invites Registered Aboriginal Parties 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 Mine, 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 – State 1 Optimisation Modification, Near Ulan, Central Tablelands of New South Wales: Aboriginal Cultural Heritage Assessment* (Southeast 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, draft [2014]).

- Various campaigns of pre-clearance salvage.
- Various campaigns of test pit investigations and monitoring.

Based on the results of these previous investigations, Figure 2 presents the location of Aboriginal heritage sites in proximity to the Study Area. Attachment 1 provides further information on the existing Aboriginal heritage sites. Sites in proximity to the Study Area are labelled on Figure 2 and correspond to the information provided in Attachment 1.

#### **Proposed Methodology**

The Proposed Methodology for the UG1 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.
- 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 Moolarben Coal to Registered Aboriginal Parties for comments regarding the cultural significance of Aboriginal heritage sites and/or areas within the Study Area.
- In consultation with the Aboriginal parties, 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 Registered Aboriginal Parties for their review and feedback.
- Documentation of feedback received as part of the cultural assessment from Registered Aboriginal Parties 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), Moolarben Coal requests that Registered Aboriginal Parties 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 Registered Aboriginal Party has sensitive or restricted public access information, it is proposed that Moolarben Coal 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 Registered Aboriginal Party 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 Registered Aboriginal Parties, of the cultural information in the material.

All Registered Aboriginal Parties 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 Registered Aboriginal Parties 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 UG1 Modification.
- Detailed records of the consultation conducted with Registered Aboriginal Parties and how any comments received throughout the assessment process were considered.
- Management and mitigation recommendations drawing on information provided by Registered Aboriginal Parties and the results of the Aboriginal Cultural Heritage Assessment.

#### **Critical Timelines**

Critical timelines for the UG1 Modification Aboriginal Cultural Heritage Assessment are outlined below:

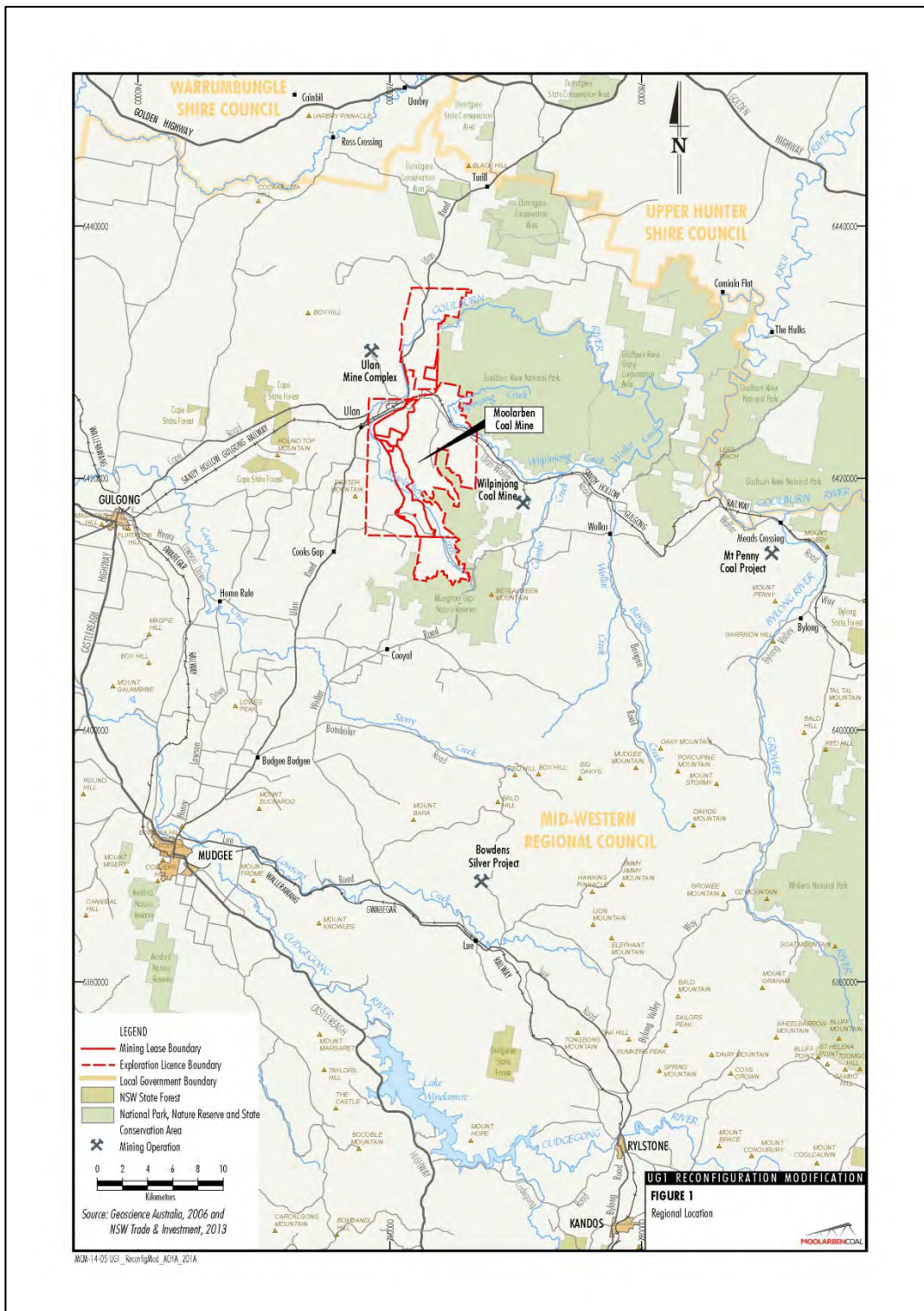
1. Collation of cultural significant information – ongoing throughout process until the end of the draft Aboriginal Cultural Heritage Assessment review period.
2. Information Session – Tuesday 17 June 2014.
3. Field survey – Wednesday 18 June and Thursday 19 June 2014.
4. Provision of comments on the Proposed Methodology to Moolarben Coal – 3 July 2014.
5. Provision of a draft Aboriginal Cultural Heritage Assessment (including proposed management and mitigation measures) to Registered Aboriginal Parties for review and comment – July 2014 (following field survey).
6. Provision of comments from Registered Aboriginal Parties on draft Aboriginal Cultural Heritage Assessment to Moolarben Coal – August 2014.
7. Finalise Aboriginal Cultural Heritage Assessment in consideration of comments received – August/September 2014.

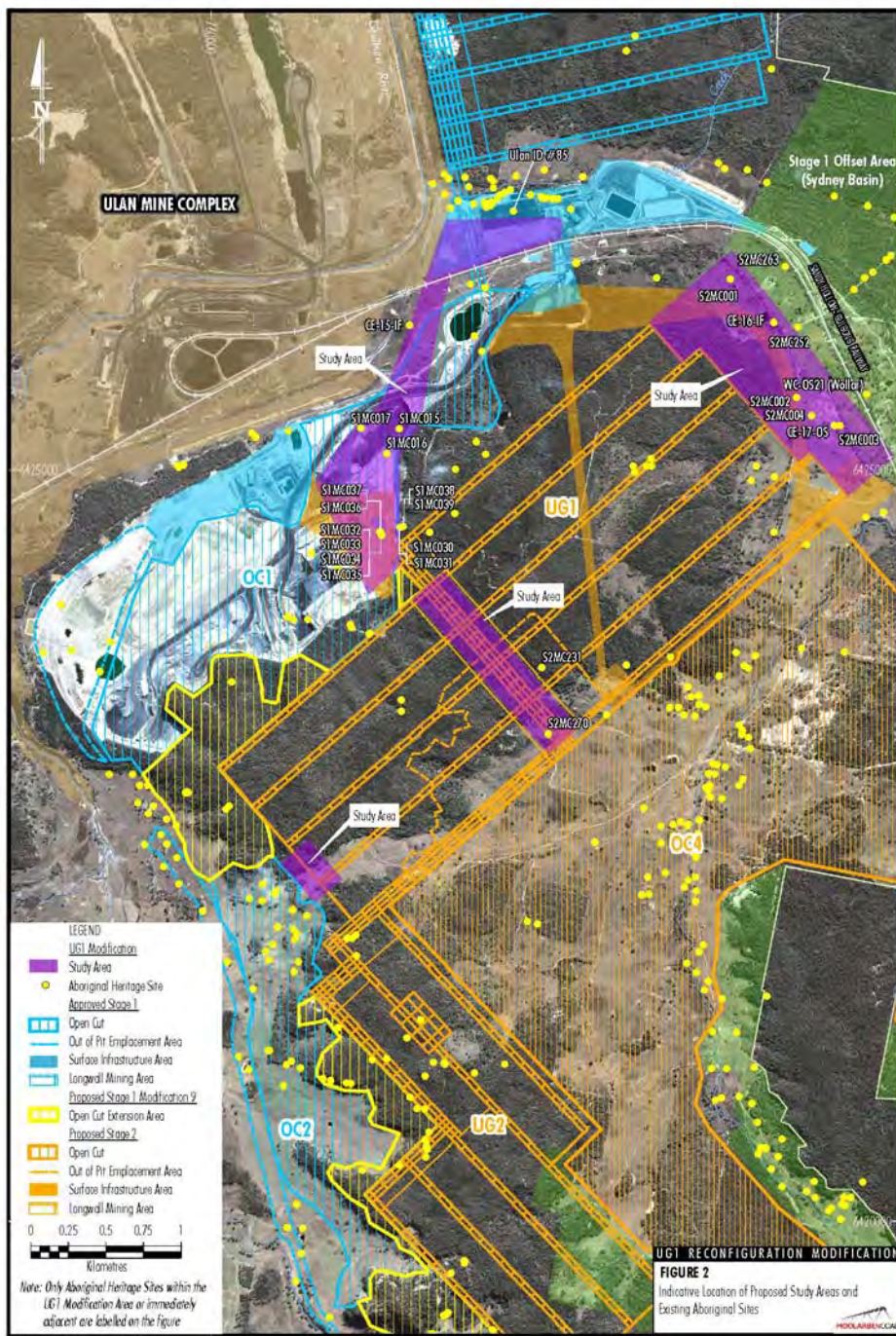
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- Aboriginal Risk Assessment Services Pty Ltd (20086) *Moolarben Coal Project Aboriginal Cultural Heritage Assessment Report Stage 2*. Report prepared for Moolarben Coal Mines Pty Limited.
- AECOM (2011) *Moolarben Preferred Project Report: Aboriginal Archaeological and Cultural Heritage Addendum*. Unpublished report to Hansen Bailey.
- Department of Environment, Climate Change and Water (2010) *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*.
- Moolarben Coal Operations Pty Ltd (2013) *Aboriginal Heritage Management Plan Stage 1* Approved May 2013.
- Southeast 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.

FIGURES







ATTACHMENT 1

**Table 1**  
**Existing Aboriginal Heritage Sites in Proximity to Proposed UG1 Modification**

Site Name	AHIMS #	Site Type
CE-15-IF	36-3-0891	Open Artefact Site
CE-16-IF	36-3-0892	Open Artefact Site
CE-17-OS	36-3-0893	Open Artefact Site
S1MC015	36-3-0812	Isolated Find
S1MC016	36-3-0813	Isolated Find
S1MC017	36-3-0814	Isolated Find
S1MC030	36-3-0827	Isolated Find
S1MC031	36-3-0828	Isolated Find
S1MC032	36-3-0829	Isolated Find
S1MC033	36-3-0830	Isolated Find
S1MC034	36-3-0831	Isolated Find
S1MC035	36-3-0832	Isolated Find
S1MC036	36-3-0833	Isolated Find
S1MC037	36-3-0834	Isolated Find
S1MC038	36-3-0835	Isolated Find
S1MC039	36-3-0836	Isolated Find
S2MC001	36-3-1150	Isolated Find
S2MC002	36-3-1151	Isolated Find
S2MC003	36-3-1152	Artefact Scatter
S2MC004	36-3-1153	Isolated Find
S2MC231	36-3-1378	Rock Shelter with Artefacts
S2MC252	36-3-1397	Isolated Find
Ulan ID #85	36-3-1475	Open Artefact Site
S2MC283	pending	Artefact Scatter
S2MC270	pending	Isolated Find
WC-OS21 (Wollar)	36-3-1136	Open Artefact Site

Source: Moolarben Coal Mines Site Database (January, 2014).  
 AHIMS - Aboriginal Heritage Information Management System.

## Appendix 3 Copies of Correspondence to (examples provided) and from the Registered Aboriginal Parties



If you wish to provide input on the following components of the Proposed Methodology, please make a written submission to Moolarben Coal by **Thursday 3 July 2014**:

- 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.

#### **Field Survey**

Field surveys for the UG1 Modification are planned to be undertaken on **Wednesday 18 June and Thursday 19 June 2014**. Consistent with the approved Aboriginal Cultural Heritage Management Plan, groups invited to provide one (1) representative to attend the surveys include the Mudgee Local Aboriginal Land Council, Warrabinga Native Title Claimants Aboriginal Corporation, Murong Gialinga Aboriginal and Torres Strait Islanders Corporation and North-East Wiradjuri Company Ltd.

Could you please advise by **Wednesday 11 June 2014** the name(s) of the representative(s) from the Mudgee Local Aboriginal Land Council who will be attending the surveys on 18 and 19 June 2014, via the contact details provided below. Please note that all survey participants will require a valid induction.

Registered Aboriginal Parties are encouraged to provide input into the Aboriginal Cultural Heritage Assessment at any point during the consultation and assessment process. This includes whether there are any Aboriginal objects of cultural value and/or any places of cultural value to Aboriginal people in the study area. This could include places of social, spiritual and cultural value, historic places with cultural significance, and potential places/area of historic, social, spiritual and/or cultural significance.

#### **Information Session**

An information session with all Registered Aboriginal Parties, the consulting archaeologists from Niche Environment and Heritage, and Moolarben Coal representatives will be held on **Tuesday 17 June 2014** to discuss the UG1 Modification. The information session will be held at the Moolarben Coal administration offices, and will commence at 10:00am and conclude at approximately 12:00pm.

At this information session Moolarben Coal will provide a presentation on the nature and scale of the UG1 Modification, an overview of the impact assessment process and will discuss the roles, functions and responsibilities of participants and protocols for the management of any sensitive cultural heritage information. This information session will also provide Registered Aboriginal Parties with an opportunity to raise any cultural issues or comments/perspectives regarding the UG1 Modification or the assessment methodology. Note that issues can also be raised at any point during the UG1 Modification consultation process.

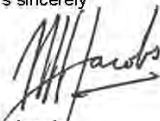
Please inform Donna Whillock by **Wednesday 11 June 2014** whether you will be attending the information session. If you are not able to attend the information session, the presentation material will be posted and/or emailed to you.

**Contact Details**

If you have any queries regarding the UG1 Modification, to provide any comments on the Proposed Methodology or to notify who will be attending the field surveys, could you please direct all correspondence to:

Moolarben Coal  
C/- Donna Whillock  
Cultural Heritage Officer  
Locked Bag 2003  
MUDGEES NSW 2850  
Email: [dwhillock@moolarbencoal.com.au](mailto:dwhillock@moolarbencoal.com.au)  
Phone: 02 6376 1403

Yours sincerely



**Mark Jacobs**  
General Manager, Environment, Approvals &  
Community Relations



NORTH EAST WIRADJURI  
COMPANY LTD

7<sup>th</sup> June, 2014.

Mark Jacobs,  
General Manager, Environment, Approvals & Community Relations,  
Moolarben Coal,  
Locked Bag 2003,  
MUDGEE. NSW. 2850.

Dear Mark,

**Moolarben Coal Mine – UG 1 Reconfiguration Modification Aboriginal Cultural Heritage Assessment.**

In response to your letter of 3<sup>rd</sup> June and the above Assessment, I would like to advise that the hard copy of this correspondence was received on 6/6/14 – the day comments were due to close, thus our request for an extension.

**Stage 1:**

The Open Cut Extension Area is already covered by the already approved Aboriginal Cultural Heritage Management Plan for Stage 1.

**Stage 2:**

**UG1 Modification:**

It is unfortunate that the Registered Aboriginal Parties have not yet received a copy of the final draft of the Aboriginal Cultural Heritage Management Plan for Stage 1 and Stage 2.

We would expect (hope) that many of the comments made in this Heritage Assessment would be covered by that plan. We note that MCO had provided the very minimal

PO BOX 29,  
KANDOS. NSW. 2848  
ABN: 18125329526  
lynzyme@bigpond.com  
0425332434



consultation process and had planned to submit the final draft to the DoP without the RAPS sighting the final document.

We do not agree that areas that have been approved and or previously assessed for disturbance should not be revisited for at least a cursory examination to see if circumstances have changed.

**Proposed Methodology:**

This should be conducted in accordance with the ACHMP.

We note that unusually in this methodology, the methodology is to be approved 2 weeks after the survey has been conducted.

**Sensitive Cultural Information – Management Protocol :**

All cultural information is sensitive.

- *Restrictions on access to the material:*  
Any response to this should be on a case by case basis.
- *Restrictions on communication of the material:*  
Each RAP will have the right of fair dealing and internal reporting to their organization  
No communication of any cultural information or material to any third party.
- *Any restrictions on the location/storage of the material:*  
All storage of material must be located in the already established Keeping Place.
- *Any cultural recommendations on handling the material:*  
In accordance with the ACHMP and on a case by case basis.
- *Any contextual information:*  
On a case by case basis.
- *Any names and contact details of persons authorized by the relevant RAP to make decisions concerning the Aboriginal material and the degree of authorisation:*  
No individual should have this authorization and the relevant Board of Directors of each RAP would make decisions regarding this.
- *Any details of any consent given in accordance with customary law:*  
This is the right, the role and the responsibility of the Traditional Owners as established under The Native Title Act.
- *Level of confidentiality to be accorded to the material:*  
Case by case basis.
- *Any access and use by the Registered Aboriginal Parties, of the cultural information in the material.*  
Each RAP will have the right of fair dealing and internal reporting to their organization

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0425332434

**Critical Timelines.**

- 3. Field Survey  
On inspection of the Study area as noted in Figure 2, 2 days is insufficient to provide a good representative sample within the survey and does not do justice to obtaining cultural material and information from the study area.  
  
We note again, that unusually in this methodology, the methodology is to be approved 2 weeks after the survey has been conducted.
- 5. Provision of draft ACHA – Review and Comment:  
We note the previous attempt by MCO to take review and comments from RAPS without the RAPS being able to see the final version before submission to the Government.
- 6. Provision of Comments  
We would expect to see how our comments are incorporated in the final draft before submission to Government.
- 7. Finalise ACHA in consideration of comments received:  
As noted in 6, our organization expects to see how our comments are incorporated into the final draft. We would also expect that we see in that final draft, what MCO has omitted.

Yours in Indigenous Struggle,

Lyn Syme,  
Director / Co Secretary.

PO BOX 29,  
KANDOS. NSW. 2848  
ABN: 18125329526  
lynsyme@bigpond.com  
0425332434

**From:** Kristen Kerr [<mailto:kristen.kerr@warrabinga.com.au>]  
**Sent:** Tuesday, 10 June 2014 4:39 PM  
**To:** Donna Whillock  
**Cc:** [info@warrabinga.com.au](mailto:info@warrabinga.com.au)  
**Subject:** RE: Moolarben UG1 Modification - Aboriginal Cultural Heritage Assessment

Hi Donna,

We find it's not appropriate for any survey to take place prior to the Methodology being finalized, therefore we suggest that fieldwork be postponed to the 7<sup>th</sup> July 2014.

We will have a person attending the information session on 17<sup>th</sup> June but required a copy of the presentation material to be emailed prior to the information day.

Kind regards,

Kristen Kerr  
On behalf of  
Warrabinga NTCAC

**From:** Murong Gialinga [<mailto:muronggialinga@hotmail.com>]  
**Sent:** Thursday, 3 July 2014 1:02 PM  
**To:** Donna Whillock  
**Subject:** RE: Moolarben UG1 Modification - ACHA Proposed Methodology

Hi Donna after speaking to our directors on the Moolarben UG1 Modification -ACHA Proposed Methodology they have asked me to send their replies which are as follows ! All Aboriginal Reps should have fair /equal say and all comments taken on board not taking into consideration.2 All areas to be surveyed 100% in the area Regards Debbie Foley

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**From:** Donna Whillock [mailto:Donna.Whillock@yancoal.com.au]  
**Sent:** Tuesday, 11 November 2014 7:25 AM  
**Subject:** FW: Moolarben UG1 Modification - Draft ACHA

Good morning all,

You would have by now received a copy of the Draft Aboriginal Cultural Heritage Assessment for the Moolarben Coal Mine UG1 Modification for your review and comment (sent 14 October 2014).

Please note that the closing date for the provision of comments and feedback (either in writing or verbally) on the draft report is **5.00pm Friday 14 November 2014**. All comments received by that date will be taken into consideration (and appended in full) in the finalisation of the assessment.

To provide any comments on the draft ACHA, please don't hesitate to send me an email ([Donna.Whillock@yancoal.com.au](mailto:Donna.Whillock@yancoal.com.au)) or a hard copy letter (Locked Bag 2003 Mudgee NSW 2850 Australia).

Regards,

Donna

**Donna Whillock** | CULTURAL HERITAGE OFFICER

**Moolarben Coal Operations Pty Ltd**

SITE: 4250 Ulan Road, Ulan NSW 2850  
POSTAL: Locked Bag 2003 Mudgee NSW 2850 Australia  
PHONE: 02 6376 1403  
FAX: +61 2 6376 1599  
MOBILE: N/A  
EMAIL: [Donna.Whillock@yancoal.com.au](mailto:Donna.Whillock@yancoal.com.au)  
WEBSITE: [www.moolarbencoal.com.au](http://www.moolarbencoal.com.au)



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**From:** Donna Whillock [mailto:Donna.Whillock@yancoal.com.au]  
**Sent:** Monday, 17 November 2014 2:27 PM  
**To:** Donna Whillock  
**Subject:** FW: Moolarben UG1 - Draft ACHA

Good afternoon all,

Further to my correspondence on Tuesday 11 November 2014, please note that the closing date for the provision of comments and feedback (either in writing or verbally) on the Draft Aboriginal Cultural Heritage Assessment for the Moolarben Coal Mine UG1 Modification has been extended to **5.00pm Wednesday 19 November 2014**. All comments received by that date will be taken into consideration (and appended in full) in the finalisation of the assessment.

To provide any comments on the draft ACHA, please don't hesitate to send me an email ([Donna.Whillock@yancoal.com.au](mailto:Donna.Whillock@yancoal.com.au)) or a hard copy letter (Locked Bag 2003 Mudgee NSW 2850 Australia).

Regards,

Donna

**Donna Whillock** | CULTURAL HERITAGE OFFICER

**Moolarben Coal Operations Pty Ltd**

SITE: 4250 Ulan Road, Ulan NSW 2850  
POSTAL: Locked Bag 2003 Mudgee NSW 2850 Australia  
PHONE: 02 6376 1403  
FAX: +61 2 6376 1599  
MOBILE: N/A  
EMAIL: [Donna.Whillock@yancoal.com.au](mailto:Donna.Whillock@yancoal.com.au)  
WEBSITE: [www.moolarbencoal.com.au](http://www.moolarbencoal.com.au)



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**From:** Aleshia Lonsdale [<mailto:tirikee1@hotmail.com>]

**Sent:** Wednesday, 19 November 2014 2:53 PM

**To:** Donna Whillock

**Subject:** FW: Draft Moolarben ACHA

Hi Donna,  
just writing to formally advise that myself and Warranha Ngumbaay have reviewed the Draft ACHA for Moolarben UG1 Modification and we are happy with the contents.

Regards

Aleshia Lonsdale

0411451776

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**From:** MUDGEES LOCAL ABORIGINAL LAND COUNCIL [<mailto:mudgeelalc@bigpond.com>]  
**Sent:** Wednesday, 19 November 2014 3:12 PM  
**To:** Donna Whillock  
**Subject:** RE: Moolarben UG1 - Draft ACHA

Hi Donna,

The Mudgee LALC has reviewed the Draft Aboriginal Cultural Heritage Management Plan re Moolarben UG1 Modification and have no issues with the document.

If you have any queries please let me know.

Regards

Tony Lonsdale



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**From:** Murong Gialinga [<mailto:muronggialinga@hotmail.com>]

**Sent:** Wednesday, 19 November 2014 10:05 PM

**To:** Donna Whillock

**Subject:** RE: Moolarben UG1 Modification - Draft ACHA

Hello Donna i apologise for our delay in our response but i had to wait to get all comments from directors after reading the Aboriginal Cultural Heritage Assessment by Niche we see no problems with the assessments Regards Debbie Foley

# WARRABINGA

*Native Title Claimants Aboriginal Corporation*

PO Box 282  
Mudgee NSW 2850  
Office: 02 4627 8622  
Fax: 02 4605 0815



Moolarben Coal  
Attn: Donna Whillock  
Cultural Heritage Officer  
Locked Bag 2003  
Mudgee NSW 2850

19th November 2014

Mrs Whillock,

**RE: Comment on Moolarben Coal Mine – Moolarben Coal Mine UG1 Optimisation  
Modification Draft Aboriginal Cultural Heritage Assessment**

Below you will find our comments for the Aboriginal Cultural Heritage Assessment completed by Niche Environment and Heritage for the Moolarben Coal Mine UG1 Optimisation Modification undertaken on the 16, 17 and 31<sup>st</sup> July 2014.

Warrabing has reviewed the report prepared by Niche Environment and Heritage and whilst we can see that it will in the main meet all regulatory requirements we are of the opinion that it has aspects that can be improved. The first area of improvement relates to the colour scheme used in the referenced maps, such as Figure 4 and Figure 5; there are some areas in the maps where the "MCO Aboriginal Site database" blends in with the aerial image and/or with the "Aboriginal locations as at April 2013", this results in difficulty clearly identifying where identified Aboriginal sites are located. This issue is again identified when we reviewed Figure 5, the location of "Artefact" either blends in with the aerial image, or is lost amongst the "Aboriginal Site points" (previously referred to in Figure 4 as "MCO Aboriginal Site database").

It was noted on page 21 and 22 that while an AHIMS search had been undertaken on the 6<sup>th</sup> February and 22<sup>nd</sup> September 2014, "in some cases the AHIMS data was not consistent with the database held by MCO, with some sites being located in different positions on AHIMS when compared to the Moolarben Coal Mine Aboriginal Sites Database", and as such the Moolarben Coal Mine Aboriginal Sites Database site position where used for the basis for the Niche report. We have some queries in relation to this; we would like to see the audit trail that led to the decision to use the Moolarben Coal Mine Aboriginal Sites Database site positions over that of the AHIMS site locations.

If there are errors in relation to the positioning of some of the AHIMS sites compared to the Moolarben Coal Mine Aboriginal Sites Database site positions, have site cards with the coordinates and datum been provided to AHIMS to ensure that AHIMS has current records of the sites. We would like confirmation that updated site cards have been provided to AHIMS.

# WARRABINGA

*Native Title Claimants Aboriginal Corporation*

PO Box 282  
Mudgee NSW 2850  
Office: 02 4627 8622  
Fax: 02 4805 0815



Besides the identified differences between the AHIMS sites identified within the Moolarben Coal Mine and the Moolarben Coal Mine Aboriginal Sites Database, could you please confirm that there were no other differences between the two datasets, i.e. site status, sites identified within Moolarben Coal Mine that have not been recorded on AHIMS.

It is critical that this document contain sufficient information that a person unfamiliar with the project be able to gain an appreciation of the project and what the results of the site inspection were. We would appreciate the inclusion of photographs and dimensions of all previously unidentified Aboriginal stone artefacts that were recorded during the course of the surveys in the report.

We would appreciate confirmation that the AHIMS site cards for the previously unidentified Aboriginal sites have been lodged with AHIMS.

We do not feel it is appropriate for a Heritage Consultant to comment on Aboriginal cultural significance without providing a justification for their decision. There is a difference between archaeological significance and Aboriginal cultural significance, and they are not necessarily the same thing. It should not be assumed that just because an area is of low archaeological significance that it is of low Aboriginal cultural significance. Aboriginal cultural significance should only be assessed by the Aboriginal community.

Should you wish to have a meeting to discuss the issues we have raised please coordinate this with our office via email ([info@warrabinga.com.au](mailto:info@warrabinga.com.au)).

Regards,

A handwritten signature in blue ink, appearing to read 'Lance Syme'. The signature is written in a cursive, flowing style.

Lance Syme  
Director

## Appendix 4 AHIMS Search Results

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-3-0237	MC11	AGD	55	763384	6421070	Open site	Valid	Artefact : -		
	<b>Contact</b>	<b>Recorders</b>	Mr.David Maynard						<b>Permits</b>	
36-3-0238	MC10	AGD	55	763226	6422860	Open site	Valid	Artefact : -		
	<b>Contact</b>	<b>Recorders</b>	Mr.David Maynard						<b>Permits</b>	
36-3-0239	MC8	AGD	55	763193	6422680	Open site	Valid	Artefact : -		
	<b>Contact</b>	<b>Recorders</b>	Mr.David Maynard						<b>Permits</b>	
36-3-0240	MC6	AGD	55	763113	6421940	Open site	Valid	Artefact : -		
	<b>Contact</b>	<b>Recorders</b>	Mr.David Maynard						<b>Permits</b>	
36-3-0241	MC4	AGD	55	763161	6421650	Open site	Valid	Artefact : -		
	<b>Contact</b>	<b>Recorders</b>	Mr.David Maynard						<b>Permits</b>	
36-3-2790	S1MC396	GDA	55	763700	6426207	Open site	Valid	Artefact : -		
	<b>Contact</b>	<b>Recorders</b>	Mr.Peter Kuskie						<b>Permits</b>	
36-3-1150	S2MC1	GDA	55	763454	6426266	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm						<b>Permits</b>	
36-3-1151	S2MC2	GDA	55	763893	6425480	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm						<b>Permits</b>	
36-3-1152	S2MC3	GDA	55	764147	6425290	Open site	Valid	Artefact : 2		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm						<b>Permits</b>	
36-3-1153	S2MC4	GDA	55	763996	6425355	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm						<b>Permits</b>	
36-3-1154	S2MC5	GDA	55	763592	6424924	Open site	Valid	Artefact : 2		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm						<b>Permits</b>	
36-3-1155	S2MC6	GDA	55	763750	6424949	Open site	Valid	Artefact : 26		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm						<b>Permits</b>	
36-3-1156	S2MC7	GDA	55	763625	6425020	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm						<b>Permits</b>	
36-3-1157	S2MC8	GDA	55	762810	6425021	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm						<b>Permits</b>	
36-3-1158	S2MC9	GDA	55	762818	6424980	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm						<b>Permits</b>	
36-3-1159	S2MC10	GDA	55	762899	6425019	Open site	Valid	Artefact : 3		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm						<b>Permits</b>	
36-3-1160	S2MC11	GDA	55	762932	6425019	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm						<b>Permits</b>	

Report generated by AHIMS Web Service on 10/09/2014 for Jamie Reeves for the following area at Datum :GDA, Zone : 55, Eastings : 762800 - 765100, Northings : 6420978 - 6426639 with a Buffer of 0 meters. Additional Info : EA report. Number of Aboriginal sites and Aboriginal objects found is 118

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

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-3-1161	S2MC12	GDA	55	762928	6425072	Open site	Valid	Art (Pigment or Engraved) : 1		101603
	<a href="#">Contact</a>								<a href="#">Permits</a>	
36-3-1162	S2MC13	GDA	55	763963	6424498	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>								<a href="#">Permits</a>	
36-3-1163	S2MC14	GDA	55	764599	6424642	Open site	Valid	Artefact : 16, Potential Archaeological Deposit (PAD) : 1		101603
	<a href="#">Contact</a>								<a href="#">Permits</a>	
36-3-1164	S2MC15	GDA	55	764474	6424713	Open site	Valid	Artefact : 28		101603
	<a href="#">Contact</a>								<a href="#">Permits</a>	
36-3-1165	S2MC16	GDA	55	764356	6424682	Open site	Valid	Artefact : 2		101603
	<a href="#">Contact</a>								<a href="#">Permits</a>	
36-3-1166	S2MC17	GDA	55	763927	6423811	Open site	Valid	Artefact : 27, Potential Archaeological Deposit (PAD) : 1		101603
	<a href="#">Contact</a>								<a href="#">Permits</a>	
36-3-1167	S2MC18	GDA	55	763623	6423760	Open site	Valid	Artefact : 15, Ochre Quarry : 1		101603
	<a href="#">Contact</a>								<a href="#">Permits</a>	
36-3-1168	S2MC19	GDA	55	763569	6423675	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>								<a href="#">Permits</a>	
36-3-1169	S2MC20	GDA	55	763544	6423690	Open site	Valid	Artefact : 3		101603
	<a href="#">Contact</a>								<a href="#">Permits</a>	
36-3-1170	S2MC21	GDA	55	763492	6423781	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>								<a href="#">Permits</a>	
36-3-1171	S2MC22	GDA	55	763514	6423298	Open site	Valid	Artefact : 3		101603
	<a href="#">Contact</a>								<a href="#">Permits</a>	
36-3-1172	S2MC23	GDA	55	763533	6423263	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>								<a href="#">Permits</a>	
36-3-1173	S2MC24	GDA	55	763527	6423238	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>								<a href="#">Permits</a>	
36-3-1174	S2MC25	GDA	55	763577	6423216	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>								<a href="#">Permits</a>	
36-3-1136	WC-OS21 (Wollar)	GDA	55	764360	6425500	Open site	Valid	Artefact : 3		101681

Report generated by AHIMS Web Service on 10/09/2014 for Jamie Reeves for the following area at Datum :GDA, Zone : 55, Eastings : 762800 - 765100, Northings : 6420978 - 6426639 with a Buffer of 0 meters. Additional Info : EA report. Number of Aboriginal sites and Aboriginal objects found is 118

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

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Doctor.Jodie Benton,OzArk Environmental and Heritage Management						<a href="#">Permits</a>		
36-3-2603	S2MC263	GDA	55	763818	6426350	Open site	Valid	Artefact : 1			
	<a href="#">Contact</a>	<a href="#">Recorders</a>	South East Archaeology						<a href="#">Permits</a>	3583	
36-3-2655	S2MC268	GDA	55	764721	6423673	Open site	Valid	Artefact : 1			
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.Peter Kuskie,South East Archaeology						<a href="#">Permits</a>		
36-3-2656	S2MC267	GDA	55	764215	6423785	Open site	Valid	Artefact : 1			
	<a href="#">Contact</a>	<a href="#">Recorders</a>	South East Archaeology						<a href="#">Permits</a>		
36-3-2658	S2MC265	GDA	55	763376	6423623	Open site	Valid	Artefact : 1			
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.Peter Kuskie,South East Archaeology						<a href="#">Permits</a>		
36-3-2659	S2MC264	GDA	55	763192	6423485	Open site	Valid	Artefact : 1			
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.Peter Kuskie,South East Archaeology						<a href="#">Permits</a>		
36-3-2654	S2MC269	GDA	55	763744	6424582	Open site	Valid	Artefact : 1			
	<a href="#">Contact</a>	<a href="#">Recorders</a>	South East Archaeology						<a href="#">Permits</a>		
36-3-0337	MC7	AGD	55	763136	6422480	Open site	Valid	Artefact : 32			
	<a href="#">Contact</a>	T Russell	<a href="#">Recorders</a>	Mr.David Maynard						<a href="#">Permits</a>	
36-3-0692	CE-16-IF	AGD	55	763631	6425794	Open site	Valid	Artefact : 1			
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.Lance Syme						<a href="#">Permits</a>	2531	
36-3-0693	CE-17-OS	AGD	55	764072	6425106	Open site	Valid	Artefact : 3			
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.Lance Syme						<a href="#">Permits</a>	2531	
36-3-0694	CE-18-OS	AGD	55	764552	6424451	Open site	Valid	Artefact : 11			
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.Lance Syme						<a href="#">Permits</a>	2531	
36-3-0695	CE-19-OS	AGD	55	764594	6424380	Open site	Valid	Art (Pigment or Engraved) : 3			
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.Lance Syme						<a href="#">Permits</a>	2531	
36-3-0696	CE-20-OS	AGD	55	764646	6424228	Open site	Valid	Artefact : 34			
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.Lance Syme						<a href="#">Permits</a>	2531	
36-3-0697	CE-21-OS	AGD	55	764890	6423937	Open site	Valid	Artefact : 2			
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.Lance Syme						<a href="#">Permits</a>	2531	
36-3-0698	CE-22-OS	AGD	55	764986	6423883	Open site	Valid	Artefact : 2			
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.Lance Syme						<a href="#">Permits</a>	2531	
36-3-0720	WC1 - WILPINJONG CREEK 1	AGD	55	764680	6425480	Open site	Valid	Art (Pigment or Engraved) : 1			
	<a href="#">Contact</a>	T Russell	<a href="#">Recorders</a>	Mr.David Maynard						<a href="#">Permits</a>	
36-3-1193	S2MC48	GDA	55	763246	6421790	Open site	Valid	Artefact : 1		101603	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.Giles Hamm						<a href="#">Permits</a>		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-3-1195	S2MC50	GDA	55	763428	6421011	Open site	Valid	Artefact : 68		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1196	S2MC51	GDA	55	763330	6421014	Open site	Valid	Artefact : 17		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1271	S2MC125	GDA	55	765088	6422558	Open site	Valid	Artefact : 30		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1320	S2MC174	GDA	55	764630	6422763	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1321	S2MC175	GDA	55	764630	6422219	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1322	S2MC176	GDA	55	763310	6422975	Open site	Valid	Artefact : 3		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1323	S2MC177	GDA	55	763292	6422884	Open site	Valid	Artefact : 2		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1376	S2MC229	GDA	55	763056	6423750	Open site	Valid	Artefact : 14		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1381	S2MC234	GDA	55	763698	6421496	Open site	Valid	Artefact : 2		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1175	S2MC29	GDA	55	762864	6422165	Open site	Valid	Artefact : 12		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1176	S2MC30	GDA	55	762907	6422288	Open site	Valid	Artefact : 58		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1177	S2MC31	GDA	55	762915	6422176	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1178	S2MC32	GDA	55	762993	6422509	Open site	Valid	Artefact : 8		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1179	S2MC33	GDA	55	762993	6422509	Open site	Valid	Artefact : 6		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1180	S2MC34	GDA	55	763086	6422475	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1181	S2MC35	GDA	55	763022	6422318	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1182	S2MC36	GDA	55	763218	6422447	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-3-1183	S2MC37	GDA	55	763228	6422422	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1184	S2MC38	GDA	55	763224	6422287	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1185	S2MC39	GDA	55	763171	6422268	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1186	S2MC40 & 41	GDA	55	763149	6422219	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1187	S2MC42	GDA	55	763239	6422576	Open site	Valid	Artefact : 47		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1188	S2MC43	GDA	55	763401	6421479	Open site	Valid	Artefact : 152		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1189	S2MC44	GDA	55	763280	6421535	Open site	Valid	Artefact : 18		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1190	S2MC45	GDA	55	763308	6421596	Open site	Valid	Artefact : 16		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1191	S2MC46	GDA	55	763230	6421656	Open site	Valid	Artefact : 20, Potential Archaeological Deposit (PAD) : 1		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1192	S2MC47	GDA	55	763167	6421714	Open site	Valid	Artefact : 5, Potential Archaeological Deposit (PAD) : 1		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1198	S2MC53	GDA	55	763336	6421261	Open site	Valid	Artefact : 43		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1201	S2MC56	GDA	55	763691	6426485	Open site	Valid	Artefact : 110		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1204	S2MC59	GDA	55	763611	6421022	Open site	Valid	Artefact : 25		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1206	S2MC59b	GDA	55	764799	6426542	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1210	S2MC63	GDA	55	763818	6426350	Open site	Valid	Artefact : 28		101603
	<b>Contact</b>								<b>Permits</b>	
36-3-1213	S2MC66	GDA	55	764188	6422001	Open site	Valid	Artefact : 1		101603

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1389	S2MC244	GDA	55	765096	6426564	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1392	S2MC247	GDA	55	764525	6426421	Open site	Valid	Artefact : 3		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1393	S2MC248	GDA	55	764492	6426391	Open site	Valid	Artefact : 2		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1394	S2MC249	GDA	55	764401	6426311	Open site	Valid	Artefact : 7		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1395	S2MC250	GDA	55	764346	6426273	Open site	Valid	Artefact : 2		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1396	S2MC251	GDA	55	764275	6426197	Open site	Valid	Artefact : 12		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1397	S2MC252	GDA	55	763900	6425946	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1324	S2MC178	GDA	55	763320	6422819	Open site	Valid	Artefact : 8		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1325	S2MC179	GDA	55	763315	6422895	Open site	Valid	Artefact : 8		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1326	S2MC180	GDA	55	763348	6422969	Open site	Valid	Artefact : 2		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1327	S2MC181	GDA	55	763367	6423035	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1328	S2MC182	GDA	55	763420	6423022	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1329	S2MC183	GDA	55	763540	6422937	Open site	Valid	Artefact : 5		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1330	S2MC184	GDA	55	763512	6422894	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1331	S2MC185	GDA	55	763401	6422810	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1332	S2MC186	GDA	55	763589	6423143	Open site	Valid	Artefact : 2		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1333	S2MC187	GDA	55	763124	6422657	Open site	Valid	Artefact : 1		101603

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1334	S2MC188	GDA	55	763169	6422625	Open site	Valid	Artefact : 2		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1335	S2MC189	GDA	55	763172	6422639	Open site	Valid	Artefact : 2		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1336	S2MC190	GDA	55	762881	6422748	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1337	S2MC191	GDA	55	763677	6422559	Open site	Valid	Artefact : 2		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1338	S2MC192	GDA	55	763077	6422559	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1339	S2MC193	GDA	55	763126	6422520	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1340	S2MC194	GDA	55	763075	6422634	Open site	Valid	Artefact : 3		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1341	S2MC195	GDA	55	764894	6425757	Open site	Valid	Artefact : 3		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1253	S2MC107	GDA	55	763292	6423420	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1254	S2MC108	GDA	55	763221	6423355	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1255	S2MC109	GDA	55	763245	6423435	Open site	Valid	Artefact : 5		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1256	S2MC110	GDA	55	763247	6423496	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1257	S2MC111	GDA	55	763173	6423555	Open site	Valid	Artefact : 3		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1258	S2MC112	GDA	55	763144	6423363	Open site	Valid	Artefact : 2		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1259	S2MC113	GDA	55	763109	6423414	Open site	Valid	Artefact : 1		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1260	S2MC114	GDA	55	763054	6423414	Open site	Valid	Artefact : 4		101603
	<a href="#">Contact</a>	<a href="#">Recorders</a>		Mr.Giles Hamm				<a href="#">Permits</a>		
36-3-1406	S2MC261	GDA	55	763640	6426505	Open site	Valid	Grinding Groove : 92		101603

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# AHIMS Web Services (AWS)

## Extensive search - Site list report

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	<u>Contact</u>	<u>Recorders</u>		Mr.Giles Hamm				<u>Permits</u>		
36-3-1342	S2MC196	GDA	55	764900	6425851	Open site	Valid	Artefact : 8		101603
	<u>Contact</u>	<u>Recorders</u>		Mr.Giles Hamm				<u>Permits</u>		
36-3-1343	S2MC197	GDA	55	764995	6425835	Open site	Valid	Artefact : 13		101603
	<u>Contact</u>	<u>Recorders</u>		Mr.Giles Hamm				<u>Permits</u>		
36-3-1344	S2MC198	GDA	55	765094	6425881	Open site	Valid	Artefact : 2		101603
	<u>Contact</u>	<u>Recorders</u>		Mr.Giles Hamm				<u>Permits</u>		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-3-0134	Murragamba_No:1; <a href="#">Contact</a>	AGD	55	761300	6421170	Closed site	Valid	Art (Pigment or Engraved) : - <a href="#">Permits</a>	Shelter with Art	
36-3-0060	Ulan Creek Site 18 <a href="#">Contact</a>	AGD	55	760215	6426006	Open site	Valid	Artefact : - <a href="#">Permits</a>	Open Camp Site	361,1299
36-3-0016	Ulan Murragamba <a href="#">Contact</a>	AGD	55	760796	6421957	Closed site	Valid	Art (Pigment or Engraved) : - <a href="#">Permits</a>	Shelter with Art	1299
36-3-0843	S1MC301 <a href="#">Contact</a>	AGD	55	758993	6424099	Open site	Valid	Artefact : 1 <a href="#">Permits</a>	3439	
36-3-0844	S1MC302 <a href="#">Contact</a>	AGD	55	758886	6423780	Open site	Valid	Artefact : 1 <a href="#">Permits</a>	3439	
36-3-0845	S1MC40 <a href="#">Contact</a>	AGD	55	760441	6421958	Open site	Valid	Artefact : 1 <a href="#">Permits</a>		
36-3-0846	S1MC41 <a href="#">Contact</a>	AGD	55	760384	6421732	Open site	Valid	Artefact : 1 <a href="#">Permits</a>		
36-3-0847	S1MC42 <a href="#">Contact</a>	AGD	55	760408	6421838	Open site	Valid	Artefact : 1 <a href="#">Permits</a>		
36-3-0848	S1MC43 <a href="#">Contact</a>	AGD	55	760558	6421874	Open site	Valid	Artefact : 1 <a href="#">Permits</a>		
36-3-0849	S1MC44 <a href="#">Contact</a>	AGD	55	760550	6421657	Open site	Valid	Artefact : 1 <a href="#">Permits</a>		
36-3-0850	S1MC45 <a href="#">Contact</a>	AGD	55	760582	6421721	Open site	Valid	Artefact : 1 <a href="#">Permits</a>		
36-3-0851	S1MC46 <a href="#">Contact</a>	AGD	55	760547	6421941	Open site	Valid	Artefact : 1 <a href="#">Permits</a>		
36-3-0852	S1MC47 <a href="#">Contact</a>	AGD	55	760637	6422033	Open site	Valid	Artefact : 1 <a href="#">Permits</a>		
36-3-0853	S1MC48 <a href="#">Contact</a>	AGD	55	760569	6421916	Open site	Valid	Artefact : 1 <a href="#">Permits</a>		
36-3-0854	S1MC49 <a href="#">Contact</a>	AGD	55	760543	6422069	Open site	Valid	Artefact : 1 <a href="#">Permits</a>		
36-3-0855	S1MC50 <a href="#">Contact</a>	AGD	55	760340	6422126	Open site	Valid	Artefact : 1 <a href="#">Permits</a>		
36-3-0856	S1MC51	AGD	55	760434	6422195	Open site	Valid	Artefact : 1		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
36-3-0857	S1MC52	AGD	55	760422	6422175	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
36-3-0858	S1MC53	AGD	55	759942	6422062	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
36-3-0859	S1MC54	AGD	55	760966	6421764	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
36-3-0860	S1MC55	AGD	55	760964	6421902	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
36-3-0861	S1MC56	AGD	55	760936	6421882	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
36-3-0862	S1MC57	AGD	55	760906	6421882	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
36-3-1041	S1MC 225	AGD	55	761752	6425887	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>	3439	
36-3-1042	S1MC226	AGD	55	761726	6426232	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>	3439	
36-3-1043	S1MC227	AGD	55	761825	6426206	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>	3439	
36-3-1044	S1MC228	AGD	55	762428	6426370	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>	3439	
36-3-1045	S1MC229	AGD	55	762430	6426375	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>	3439	
36-3-1059	S1MC243	AGD	55	762310	6424801	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>	3439	
36-3-0798	S1MC1	AGD	55	760670	6424444	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>		
36-3-0799	S1MC2	AGD	55	760840	6424339	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>	3439	
36-3-0800	S1MC3	AGD	55	760846	6424309	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>	3439	
36-3-0801	S1MC4	AGD	55	760866	6424307	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>						<b>Permits</b>	3439	

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-3-0802	S1MC5	AGD	55	760867	6424306	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0803	S1MC6	AGD	55	760890	6424301	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0804	S1MC7	AGD	55	760867	6424294	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0805	S1MC8	AGD	55	760548	6424002	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0806	S1MC9	AGD	55	760508	6424018	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0807	S1MC10	AGD	55	760645	6424004	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0808	S1MC11	AGD	55	760924	6423968	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0809	S1MC12	AGD	55	760933	6423948	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0810	S1MC13	AGD	55	761054	6423910	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0811	S1MC14	AGD	55	761050	6423907	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0812	S1MC15	AGD	55	761252	6425269	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0813	S1MC16	AGD	55	761168	6425107	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0814	S1MC17	AGD	55	760997	6425271	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0815	S1MC18	AGD	55	759777	6425026	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-0816	S1MC19	AGD	55	759786	6425012	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-0817	S1MC20	AGD	55	759816	6425028	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-0818	S1MC21	AGD	55	760296	6425214	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-3-0819	S1MC22	AGD	55	760297	6425216	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-0820	S1MC23	AGD	55	760269	6425239	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-0954	PAD 8 Moolarben Coal	AGD	55	761478	6421053	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-0955	PAD 9 Moolarben Coal	AGD	55	761552	6421040	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-0956	PAD 10 Moolarben Coal	AGD	55	761551	6421051	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-0957	PAD 11 Moolarben Coal	AGD	55	761426	6420964	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-0958	PAD 12 Moolarben Coal	AGD	55	761318	6420832	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-0821	S1MC24	AGD	55	760514	6425250	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0822	S1MC25	AGD	55	761802	6425783	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0823	S1MC26	AGD	55	761766	6425183	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-0824	S1MC27	AGD	55	761828	6425100	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-0825	S1MC28	AGD	55	761627	6425002	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-0826	S1MC29	AGD	55	761619	6424707	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-0827	S1MC30	AGD	55	761135	6424559	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-0828	S1MC31	AGD	55	761132	6424567	Open site	Valid	Artefact : 1		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>	3439	
36-3-0829	S1MC32	AGD	55	761124	6424585	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>	3439	
36-3-0830	S1MC33	AGD	55	761125	6424584	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>	3439	
36-3-0831	S1MC34	AGD	55	761128	6424583	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>	3439	
36-3-0832	S1MC35	AGD	55	761125	6424584	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>	3439	
36-3-0833	S1MC36	AGD	55	761255	6424616	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>	3439	
36-3-0834	S1MC37	AGD	55	761256	6424618	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>	3439	
36-3-0835	S1MC38	AGD	55	761279	6424617	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>	3439	
36-3-0836	S1MC39	AGD	55	761280	6424620	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>	3439	
36-3-0837	PAD 1 Moolarben Coal	AGD	55	761452	6424581	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>		
36-3-0838	PAD 2 Moolarben Coal	AGD	55	761265	6423464	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>		
36-3-0839	PAD 3 Moolarben Coal	AGD	55	761265	6423392	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>		
36-3-0840	S1MC298	AGD	55	759258	6423654	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>	3439	
36-3-0841	S1MC299	AGD	55	759331	6423850	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>	3439	
36-3-0842	S1MC300	AGD	55	759071	6423798	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>		Mr.Giles Hamm				<b>Permits</b>	3439	
36-3-1143	S1MC306	GDA	55	762426	6426370	Open site	Valid	Artefact : 1		101600

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	<a href="#">Contact</a>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-1144	S1MC307	GDA	55	762110	6421138	Open site	Valid	Artefact : 1		101600
	<a href="#">Contact</a>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-1145	S1MC308	GDA	55	761997	6421905	Open site	Valid	Artefact : 1		101600
	<a href="#">Contact</a>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>	3439	
36-3-2602	S2MC262	GDA	55	762104	6421992	Open site	Valid	Artefact : 1		
	<a href="#">Contact</a>	<b>Recorders</b>	South East Archaeology					<b>Permits</b>		
36-3-2657	S2MC266	GDA	55	762632	6423366	Open site	Valid	Artefact : 1		
	<a href="#">Contact</a>	<b>Recorders</b>	Mr.Peter Kuskie,South East Archaeology					<b>Permits</b>		
36-3-2660	S1MC355	GDA	55	760344	6422239	Open site	Valid	Artefact : 1		
	<a href="#">Contact</a>	<b>Recorders</b>	Mr.Peter Kuskie,South East Archaeology					<b>Permits</b>		
36-3-2661	S1MC356	GDA	55	760362	6421794	Open site	Valid	Artefact : 1		
	<a href="#">Contact</a>	<b>Recorders</b>	Kayandel Archaeological Services,Ms.Bridget Walker					<b>Permits</b>		
36-3-2662	S1MC357	GDA	55	760253	6422144	Open site	Valid	Artefact : 1		
	<a href="#">Contact</a>	<b>Recorders</b>	Kayandel Archaeological Services,Ms.Bridget Walker					<b>Permits</b>		
36-3-2607	S1MC325	GDA	55	760137	6423587	Open site	Valid	Artefact : -		
	<a href="#">Contact</a>	<b>Recorders</b>	South East Archaeology					<b>Permits</b>		
36-3-2653	S2MC270	GDA	55	762243	6423241	Open site	Valid	Artefact : 1		
	<a href="#">Contact</a>	<b>Recorders</b>	South East Archaeology					<b>Permits</b>		
36-3-2608	S1MC326	GDA	55	759832	6422848	Open site	Valid	Potential Archaeological Deposit (PAD) :-		
	<a href="#">Contact</a>	<b>Recorders</b>	South East Archaeology					<b>Permits</b>		
36-3-2609	S1MC327	GDA	55	759841	6422853	Open site	Valid	Potential Archaeological Deposit (PAD) :-		
	<a href="#">Contact</a>	<b>Recorders</b>	South East Archaeology					<b>Permits</b>		
36-3-2610	S1MC328	GDA	55	759847	6422847	Open site	Valid	Artefact : -		
	<a href="#">Contact</a>	<b>Recorders</b>	South East Archaeology					<b>Permits</b>		
36-3-2611	S1MC329	GDA	55	760119	6422761	Open site	Valid	Potential Archaeological Deposit (PAD) :-		
	<a href="#">Contact</a>	<b>Recorders</b>	South East Archaeology					<b>Permits</b>		
36-3-2612	S1MC330	GDA	55	760097	6422739	Open site	Valid	Potential Archaeological Deposit (PAD) :-		
	<a href="#">Contact</a>	<b>Recorders</b>	South East Archaeology					<b>Permits</b>		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-3-2613	S1MC331	GDA	55	760843	6421283	Open site	Valid	Artefact : -		
	<b>Contact</b>	<b>Recorders</b>	South East Archaeology					<b>Permits</b>		
36-3-2633	S1MC351	GDA	55	761070	6421070	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	<b>Contact</b>	<b>Recorders</b>	South East Archaeology					<b>Permits</b>		
36-3-2634	S1MC352	GDA	55	761168	6421080	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	<b>Contact</b>	<b>Recorders</b>	South East Archaeology					<b>Permits</b>		
36-3-0222	Moolabən Creek MC1	AGD	55	760420	6420820	Open site	Valid	Artefact : -	Open Camp Site	
	<b>Contact</b>	<b>Recorders</b>	Mr.David Maynard					<b>Permits</b>		
36-3-0223	MC2	AGD	55	760420	6420880	Open site	Valid	Artefact : -	Open Camp Site	
	<b>Contact</b>	<b>Recorders</b>	Mr.David Maynard					<b>Permits</b>		
36-3-0691	CE-15-IF	AGD	55	761205	6425777	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Lance Syme					<b>Permits</b>	2531	
36-3-0703	CE-27-IF	AGD	55	758686	6425350	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Lance Syme					<b>Permits</b>	2531	
36-3-0704	CE-28-IF	AGD	55	758674	6425288	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Lance Syme					<b>Permits</b>	2531	
36-3-0705	CE-29-IF	AGD	55	758745	6425257	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Lance Syme					<b>Permits</b>	2531	
36-3-0706	CE-30-IF	AGD	55	758769	6425190	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Lance Syme					<b>Permits</b>	2531	
36-3-0707	CE-31-IF	AGD	55	759498	6425055	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Lance Syme					<b>Permits</b>	2531	
36-3-0708	CE-32-IF	AGD	55	760509	6425477	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Lance Syme					<b>Permits</b>	2531	
36-3-0709	CE-33-IF	AGD	55	760810	6425593	Open site	Valid	Artefact : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr.Lance Syme					<b>Permits</b>	2531	
36-3-1273	S2MC127	GDA	55	762552	6422517	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1377	S2MC230	GDA	55	762763	6423968	Open site	Valid	Artefact : 1		101603
	<b>Contact</b>	<b>Recorders</b>	Mr.Giles Hamm					<b>Permits</b>		
36-3-1378	S2MC231	GDA	55	762203	6423681	Open site	Valid	Habitation Structure : -, Artefact : 31		101603

Report generated by AHIMS Web Service on 06/02/2014 for Clare Anderson for the following area at Datum :GDA, Zone : 55, Eastings : 758739 - 762800, Northings : 6420978 - 6426639 with a Buffer of 0 meters. Additional Info : arch assessment. Number of Aboriginal sites and Aboriginal objects found is 117

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

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	<u>Contact</u>	<u>Recorders</u>	Mr.Giles Hamm					<u>Permits</u>		
36-3-1208	S2MC61	GDA	55	762172	6421977	Open site	Valid	Artefact : 51		101603
	<u>Contact</u>	<u>Recorders</u>	South East Archaeology,Mr.Giles Hamm					<u>Permits</u>		
36-3-1209	S2MC62	GDA	55	762104	6421992	Open site	Valid	Artefact : 67		101603
	<u>Contact</u>	<u>Recorders</u>	South East Archaeology,Mr.Giles Hamm					<u>Permits</u>		
36-3-1482	Identifier 91, T10 to 11	GDA	55	760234	6426304	Open site	Destroyed	Modified Tree (Carved or Scarred) : -		
	<u>Contact</u>	<u>Recorders</u>	Ms.Laila Haglund					<u>Permits</u>		
36-3-1483	Identifier 92, T12	GDA	55	759813	6426292	Open site	Destroyed	Modified Tree (Carved or Scarred) : -		
	<u>Contact</u>	<u>Recorders</u>	Ms.Laila Haglund					<u>Permits</u>		
36-3-1382	S2MC237	GDA	55	761302	6421217	Open site	Valid	Artefact : 1		101603
	<u>Contact</u>	<u>Recorders</u>	Mr.Giles Hamm					<u>Permits</u>		
36-3-1383	S2MC238	GDA	55	761752	6420984	Open site	Valid	Artefact : 104		101603
	<u>Contact</u>	<u>Recorders</u>	Mr.Giles Hamm					<u>Permits</u>		
36-3-1384	S2MC239	GDA	55	761953	6421041	Open site	Valid	Artefact : 3		101603
	<u>Contact</u>	<u>Recorders</u>	Mr.Giles Hamm					<u>Permits</u>		

Report generated by AHIMS Web Service on 06/02/2014 for Clare Anderson for the following area at Datum :GDA, Zone : 55, Eastings : 758739 - 762800, Northings : 6420978 - 6426639 with a Buffer of 0 meters. Additional Info : arch assessment. Number of Aboriginal sites and Aboriginal objects found is 117

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## Appendix 5 MSEC Subsidence Assessment Extract

**Table D.03 - MCC UG1 - Longwalls 101 to 105**  
**Comparisons of Predicted Systematic Subsidence Parameters for the Archaeological Sites using PrefML and ModML**

Easting	Northing	SiteName	SiteType	PrefML			ModML				Incremental Change		
				Total Subsidence after LW105 (mm)	Total Tilt after LW105 (mm/m)	Maximum Predicted Tensile Strain during or after LW510	Maximum Predicted Compressive Strain during or after LW105	Total Subsidence after LW105 (mm)	Maximum Tilt (mm/m)	Maximum Predicted Hogging Curvature after LW105 (km-1)	Maximum Predicted Sagging Curvature after LW105 (km-1)	Incremental Subsidence as a result of the Modification (mm)	Incremental Tilt as a result of the Modification (mm/m)
761619	6424707	S1MCC29	Isolated Find	1495	34.5	15.4	-13.6	1275	51	1.5	-1.7	-220	17
761279	6424617	S1MCC38	Isolated Find	-	-	-	-	0	0	0.0	0.0	N/A	N/A
761279	6424617	S1MCC39	Isolated Find	-	-	-	-	0	0	0.0	0.0	N/A	N/A
761452	6424581	PAD 01	Isolated Find	-	-	-	-	862	64	1.8	-2.2	N/A	N/A
761265	6423464	PAD 02	-	-	-	-	-	2182	6	3.7	-4.4	N/A	N/A
761265	6423392	PAD 03	PAD 3	-	-	-	-	2278	0	>5	<-5	N/A	N/A
763592	6424824	S2MCC05	Artefact Scatter	1816	2.9	1.4	-1.8	2186	2	>5	<-5	380	-1
763750	6424949	S2MCC06	Artefact Scatter	1320	45.3	31.1	-25.0	330	19	2.4	-0.7	-890	-28
763625	6425020	S2MCC07	Isolated Find	1817	1.1	1.1	-0.9	2200	0	>5	<-5	383	-1
762810	6425021	S2MCC08	Isolated Find	939	34.5	11.1	0.0	516	18	1.0	-0.4	-423	-16
762818	6424980	S2MCC09	Isolated Find	281	7.2	2.8	0.0	226	4	0.2	-0.2	-35	-3
762899	6425019	S2MCC10	Artefact Scatter	219	4.5	2.5	0.0	244	3	0.2	-0.3	25	-2
762932	6425019	S2MCC11	Isolated Find	472	24.8	16.8	0.0	387	14	1.2	-0.4	-85	-11
762928	6425072	S2MCC12	Isolated Find	241	6.3	2.6	0.0	234	4	0.2	-0.2	-7	-2
762763	6423698	S2MCC20	Isolated Find	1770	45.6	25.6	-24.3	1461	47	2.5	-3.3	-309	1
762203	6423681	S2MCC21	Rock Shelter & Artefact Scatter	1788	81.0	71.4	-58.1	2119	9	3.9	-4.7	331	-72
763744	6424682	S2MCC28	Isolated Find	-	-	-	-	2113	6	>5	<-5	N/A	N/A
763495	6426120	MJG1-Mod 1	Isolated Find	-	-	-	-	0	0	0.0	0.0	N/A	N/A
763481	6425603	MJG1-Mod 2	Isolated Find	-	-	-	-	1128	46	1.3	-1.6	N/A	N/A
762078	6423457	MJG1-Mod 3	Artefacts	-	-	-	-	190	2	0.9	-1.2	N/A	N/A
761318	6425961	CE-15-1F	Isolated Find	-	-	-	-	0	0	0.0	0.0	N/A	N/A
764185	6425290	CE-17-OS	Artefacts	-	-	-	-	0	0	0.0	0.0	N/A	N/A
763454	6426266	S2MCC01	Isolated Find	-	-	-	-	0	0	0.0	0.0	N/A	N/A
763893	6425480	S2MCC02	Isolated Find	-	-	-	-	32	3	0.2	-0.1	N/A	N/A
764147	6425290	S2MCC03	Artefacts	-	-	-	-	0	0	0.0	0.0	N/A	N/A
763906	6425355	S2MCC04	Isolated Find	-	-	-	-	0	0	0.0	0.0	N/A	N/A
762243	6423241	S2MCC270	Isolated Find	-	-	-	-	1897	22	>5	<-5	N/A	N/A
763404	6426033	S2MCC277	Isolated Find	-	-	-	-	1797	18	3	2	N/A	N/A
764384	6424816	S2MCC271	Isolated Find	-	-	-	-	-	-	-	-	N/A	N/A
764059	6424664	S2MCC272	Isolated Find	-	-	-	-	-	-	-	-	N/A	N/A