



APPENDIX 6

Aboriginal Cultural Heritage and Archaeological Assessment



**LWB4-B7 MODIFICATION
ABORIGINAL CULTURAL
HERITAGE ASSESSMENT
REPORT**

Austar Coal Mine

FINAL

May 2017



LWB4-B7 MODIFICATION ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

Austar Coal Mine

FINAL

Project Director: Barbara Crossley
Project Manager: Gabrielle Allan
Technical Director: Nicola Roche
Technical Manager: Nicola Roche
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Newcastle

75 York Street
Teralba NSW 2284

Ph. 02 4950 5322

www.umwelt.com.au



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Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
Final	N Roche	26/05/17	B Crossley	26/05/17

Acknowledgement

Umwelt (Australia) Pty Limited (Umwelt), Yancoal Australia Limited (Yancoal) and Austar Coal Mine Pty Ltd (Austar) would like to acknowledge the traditional custodians of the Quorrobolong Valley and pay respect to their cultural heritage, beliefs and continuing relationship with the land.

Umwelt, Yancoal and Austar would also like to acknowledge the post-contact experiences of Aboriginal people who have attachment to the Quorrobolong Valley.

We pay our respect to the Elders – past, present and future – for they hold the memories, traditions, culture and hopes of Aboriginal people in the area.

Executive Summary

Austar Coal Mine Pty Ltd (Austar) is seeking to modify development consent DA29/95 (the Bellbird South Consent) to permit the transfer and processing of coal from four proposed longwall panels. This modification is referred to as the LWB4-B7 Modification and is sought under section 75W of the *Environmental Planning and Assessment Act 1979*.

The LWB4-B7 Modification seeks to extend the Bellbird South consent area to cover the four proposed longwall panels. No other changes to the approved mining operations associated surface facilities or production rates are proposed as part of the modification.

Austar engaged Umwelt (Australia) Pty Ltd (Umwelt) to work with the registered Aboriginal parties to complete an Aboriginal Cultural Heritage Assessment for the proposed modification. This report has been prepared in accordance with *The Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010). The Aboriginal Cultural Heritage Assessment Report (ACHAR) will inform the Environmental Assessment for the proposed modification to development consent DA 29/95.

The potential impacts of the proposed LWB4-B7 Modification on Aboriginal archaeology and cultural heritage have been assessed within the 20 millimetre subsidence contour for LWB4-B7. This area is referred to as the 'LWB4-B7 Modification Area'. The LWB4-B7 Modification Area incorporates portions of the previously assessed LWB1-B3 Modification Area (Umwelt 2015), therefore the archaeological survey and cultural heritage assessment findings from the LWB1-B3 Modification have been considered in this assessment where appropriate.

A search of the Aboriginal Heritage Management System and a targeted pedestrian survey of the LWB4-B7 Modification Area identified one existing and thirteen new archaeological sites, one of which was located outside the LWB4-B7 Modification Area. These sites consisted of isolated artefacts and artefact scatters, with only two sites (ACM38 and ACM40) containing more than five artefacts. The distribution and contents of these sites is relatively comparable to the outcomes of previous archaeological investigations within the Austar Coal Mine and surrounds. No grinding grooves or scarred trees were identified within the LWB4-B7 Modification Area and no areas of outcropping sandstone were present within Quorrobolong Creek.

Registered Aboriginal parties who participated in the survey identified that Quorrobolong Creek is a key water resource within the area and has high cultural value for both its natural aspects and its association with archaeological evidence. Maintaining the health of watercourses within the LWB4-B7 Modification Area was seen as very important to ensure protection of natural and cultural values.

The registered Aboriginal party representatives indicated general agreement with the identification of areas of archaeological potential in association with Quorrobolong Creek and the elevated landform in the north-western portion of the LWB4-B7 Modification Area. The registered Aboriginal party representatives indicated that the identified archaeological sites have inherent Aboriginal cultural value. It was identified by one of the registered Aboriginal party representatives that the sites or areas of potential where there is an increased likelihood that deposits will retain integrity are of greater value as the interpretation of these sites/deposits could provide more specific information about the Aboriginal occupation of the area and how this may have changed over time.

Based on the criteria for the assessment of archaeological potential, the majority of the LWB4-B7 Modification Area has low archaeological potential. The exceptions to this are the valley flats bordering Quorrobolong Creek (moderate potential), slopes within 100 metres of the main channel of Quorrobolong Creek and identified overflow channels and the spur crest in Survey Unit 9 (all of which have low to moderate archaeological potential).

The archaeological significance of the identified sites was assessed as low, with the exception of sites ACM38 and ACM40, which were assessed as having low-moderate archaeological significance, largely based on their research potential. Cultural information provided by registered Aboriginal parties confirmed the cultural significance of the local landscape and any sites (recorded and unrecorded) within the surrounding area. Quorrobolong Creek was considered to hold high importance and cultural significance to the Aboriginal community. Specific reference was also made to the cultural values associated with Ellalong Lagoon (which is outside the LWB4-B7 Modification Area).

The proposed modification does not involve any additional surface development and therefore will have no direct impact on Aboriginal archaeological sites as a result of land clearing. The potential impact of the proposed modification on archaeological sites is therefore limited to indirect impacts associated with subsidence, including the potential for surface cracking and changes to hydrology (including ponding or alterations to creekline morphology). Based on the outcomes of assessments undertaken by MSEC (2017) and Umwelt (2017c), the proposed LWB4-B7 Modification is unlikely to result in direct or indirect impacts to the identified archaeological sites or on the identified areas of low-moderate or higher archaeological potential.

The following recommendations have been developed in light of the outcomes of consultation with the registered Aboriginal parties, the archaeological context of the LWB4-B7 Modification Area; the findings of the current survey and the previous survey of the LWB1-B3 Modification Area; the low likelihood of impact of the proposed modification on identified archaeological sites and areas of archaeological potential and current cultural heritage legislation:

- Austar Coal Mine should continue to implement the management strategies currently in place at the Austar Coal Mine, including those in the Austar Aboriginal Cultural Heritage Management Plan (ACHMP). Consistent with existing management strategies, in the unlikely event that subsidence remediation works are required that will impact on the identified sites or areas of low-moderate or higher archaeological potential, an Aboriginal Heritage Impact Permit (AHIP) will be sought for the portion of the site or area of potential to be impacted prior to the commencement of any remediation works in proximity to the recorded site or area of potential (noting that, in some instances, it may be necessary to undertake test excavation to inform the requirement for an AHIP). Appropriate mitigation measures for the site or area of potential to be impacted by the remediation works will be developed as part of the AHIP application process in consultation with the registered Aboriginal parties and in accordance with OEH requirements.
- The Austar ACHMP should be reviewed to incorporate the outcomes of this assessment and to include provisions for the monitoring of identified archaeological sites within the LWB4-B7 Modification Area in accordance with the management strategies currently implemented within the Austar Coal Mine.

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Appendices

Appendix 1	RAP Consultation
Appendix 2	Archaeological Technical Report

1.0 Introduction

Austar Coal Mine Pty Ltd (Austar), a subsidiary of Yancoal Australia Limited (Yancoal) operates the Austar Coal Mine, an underground coal mine located approximately 10 kilometres south of Cessnock in the Lower Hunter Valley in NSW (refer to **Figure 1.1**). The Austar Coal Mine incorporates the former Pelton, Ellalong, Cessnock No. 1 (Kalingo) and Bellbird South Collieries and includes coal extraction, handling, processing and rail and road transport facilities.

Austar is proposing to modify development consent DA 29/95 (the Bellbird South Consent) under section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The modification is required to permit the transfer and processing of coal from four (4) additional longwall panels (LW) B4 to B7 via the existing Bellbird Mains and to extend the development consent area to encompass the four proposed longwall panels (refer to **Figure 1.2** and **Figure 1.3**). There will be no change to surface facilities, approved rates of mining, coal processing and handling or product transport rates as a result of the modification.

Austar engaged Umwelt (Australia) Pty Ltd (Umwelt) to work with the registered Aboriginal parties to complete an Aboriginal Cultural Heritage Assessment for the proposed modification. Umwelt and Austar recognise that the registered Aboriginal parties have primary responsibility for assessing the cultural significance of the lands for which they are traditional custodians and/or to which they have contemporary connection and all comments and feedback provided by Aboriginal parties are documented in this report.

This Aboriginal cultural heritage assessment report (ACHAR) has been prepared in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011), with all consultation undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a) (the consultation requirements), as documented in **Appendix 1**. An archaeological technical report (ATR) for the proposed modification was prepared in accordance with *The Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) (the Code of Practice) and is provided in **Appendix 2**. This ACHAR will inform the Environmental Assessment (EA) for the proposed modification to the Bellbird South Consent.

1.1 Austar Coal Mine Background

Extensive mining has been undertaken within the Austar Coal Mine since 1916. Historical mining was predominantly via bord and pillar mining and more recently via conventional longwall mining and Longwall Top Coal Caving (LTCC) methods. Mining within the Bellbird South areas (Southland, Stage 1 and Stage 2 refer to **Figure 1.2**) was approved by the Minister for Urban Affairs and Planning in 1996 under DA 29/95 (the Bellbird South Consent), while mining of Stage 3 was approved by the Minister for Planning in 2009 under Project Approval 08_0111. Longwall mining commenced in the Ellalong Colliery area in 1983 and has subsequently progressed into the Bellbird South and the Stage 3 areas.

Mining is currently being undertaken in the LWB1-B3 mining area in accordance with the Bellbird South Consent. A review of accessible coal resources within the Bellbird South/Ellalong Colliery areas has identified the potential for four additional longwall panels (LWB4-B7) adjacent to LWB3 (refer to **Figure 1.3**). It is noted that the impacts of mining LWB1-B3 on Aboriginal cultural heritage was assessed in 2015 (Umwelt 2015) as part of a previous modification of the Bellbird South Consent.

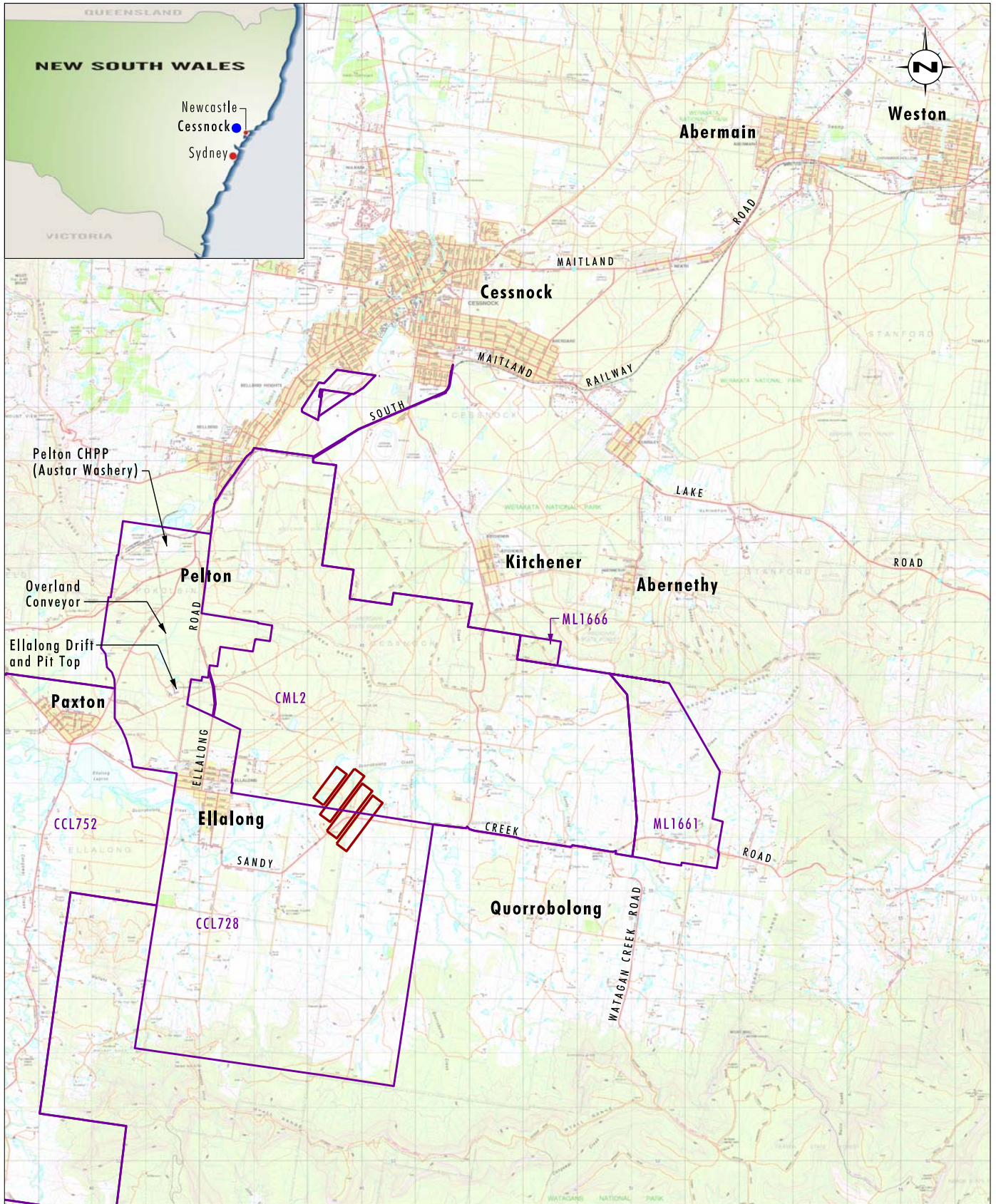
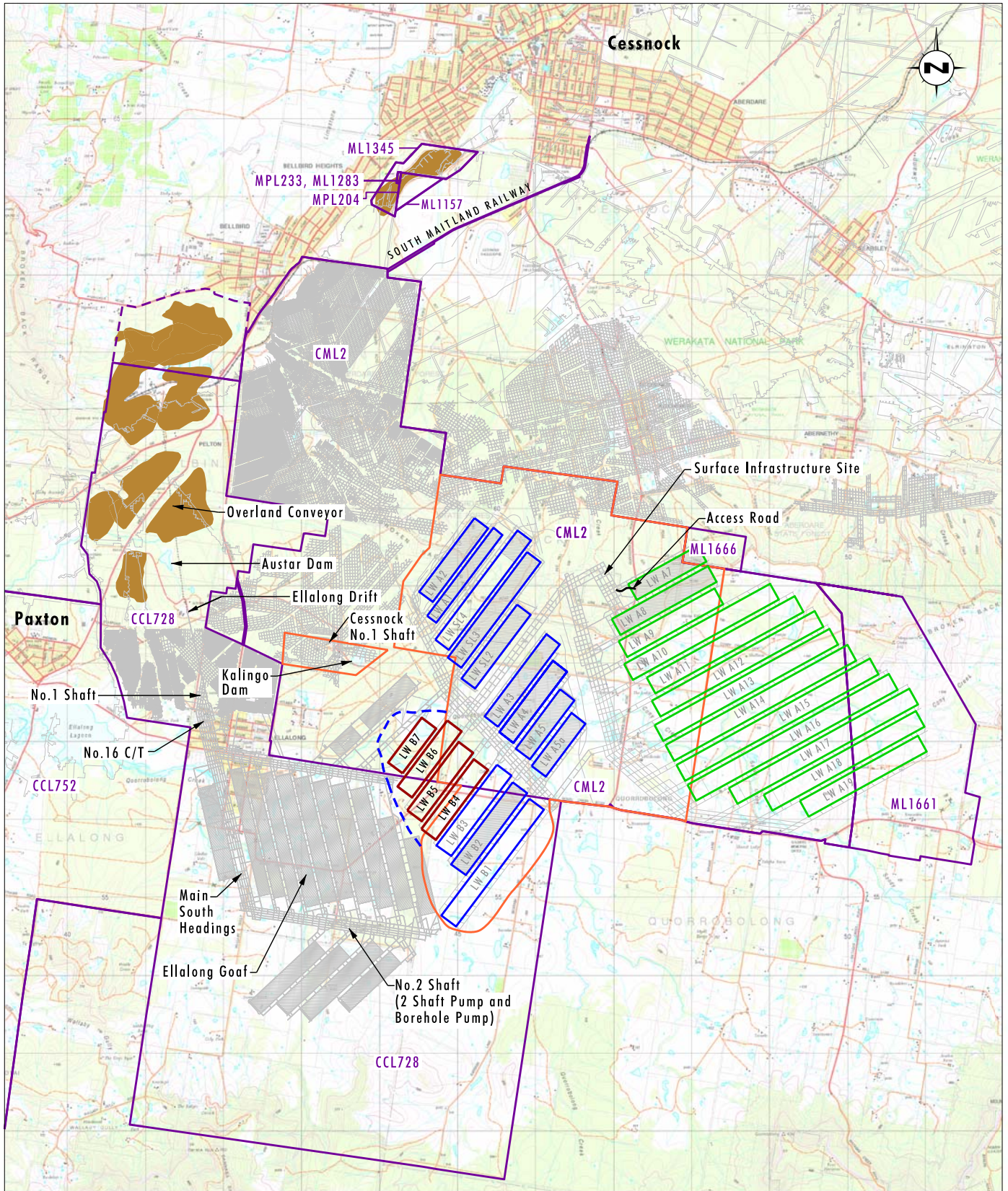


Image Source: LPI NSW (2009)
 Data Source: Austar Coal Mine (2016)

Legend

- Proposed LWB4-B7 Longwall Panels
- Mining Lease Boundary

FIGURE 1.1
Locality Plan



0 1 2 3km
 1:70 000

Legend

- ▭ Bellbird South Stage 1, Stage 2, Southland and LWB1-B3 Longwall Panels (DA 29/95)
- ▭ Proposed LWB4-B7 Longwall Panels (DA 29/95)
- ▭ Stage 3 Longwall Panels (PA08_0111)
- DA 29/95 Bellbird South Consent Area (Subsurface) - As Approved
- DA 29/95 Bellbird South Consent Area (Subsurface) - Proposed Extension
- Approved Reject Emplacement Areas
- Completed Underground Workings
- Mining Lease Boundary
- Austar owned CHPP Land

FIGURE 1.2

Austar Coal Mine and
 Proposed LWB4-B7

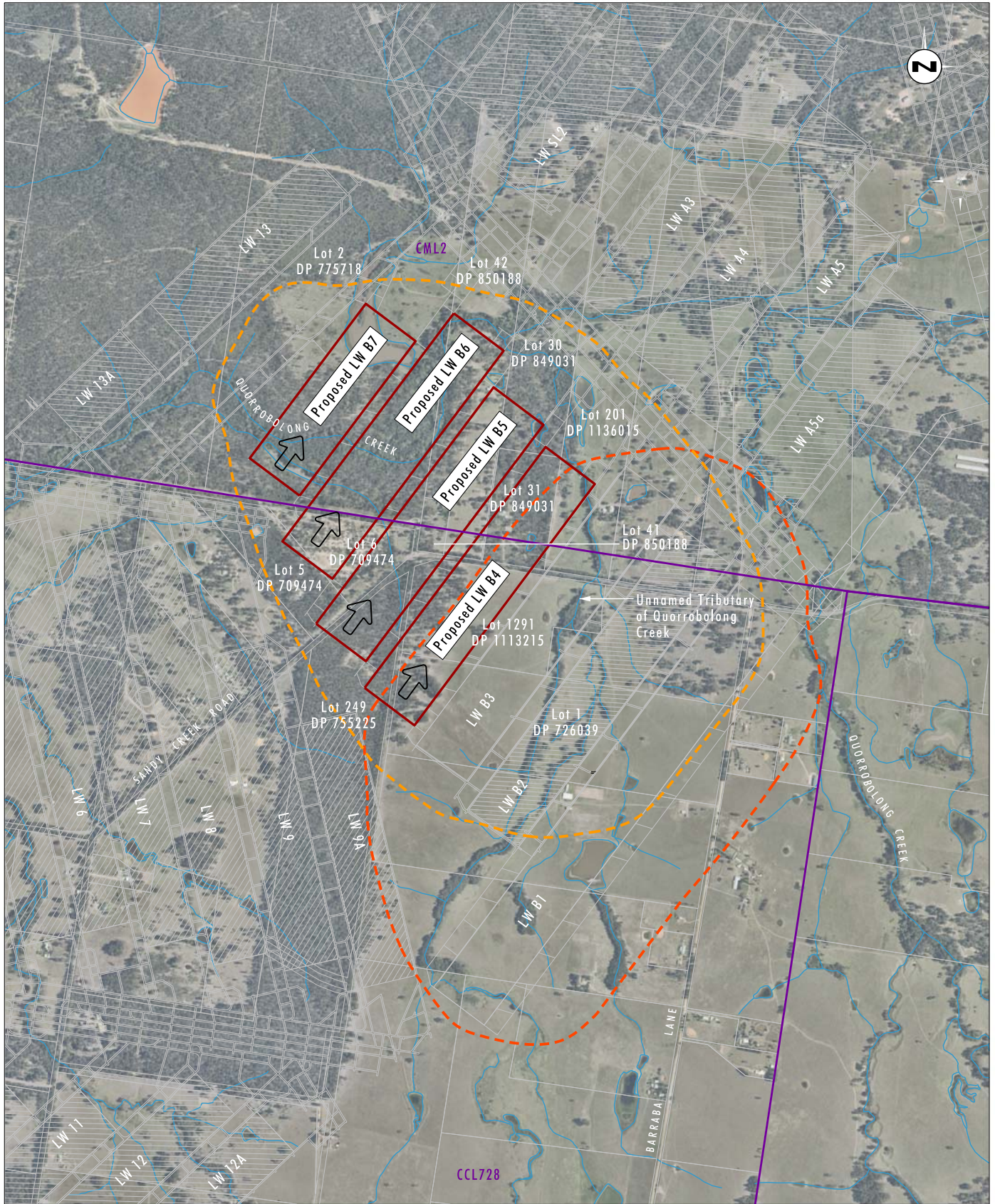


Image Source: Nearmap (2017)
 Data Source: Austar Coal Mine (2016)

- Legend**
- Proposed LWB4-B7 Longwall Panels
 - LWB4-B7 Modification Area (Proposed)
 - LWB1-B3 Modification Area (Proposed)
 - Mining Lease Boundary
 - Completed Underground Workings
 - Direction of Mining
 - Drainage Line

FIGURE 1.3

Proposed LWB4-B7 Modification

The potential impacts of the proposed LWB4-B7 Modification on Aboriginal archaeology and cultural heritage have been assessed within the 20 millimetre subsidence contour for LWB4-B7. This area is referred to as the 'LWB4-B7 Modification Area' and is shown on **Figure 1.3**. The 20 millimetre subsidence contour is considered the vertical limit of subsidence. The LWB4-B7 Modification Area incorporates portions of the previously assessed LWB1-B3 Modification Area (Umwelt 2015), therefore the archaeological survey and cultural heritage assessment findings from the LWB1-B3 Modification have been used to supplement this assessment where appropriate. The detailed survey data from the assessment of the LWB1-B3 Modification is not repeated within this report but the outcomes of the previous assessment are used to inform the current assessment (including the location of site #37-6-3398).

The LWB4-B7 Modification Area is located entirely within the Austar mining authorities CCL728 and CML 2 and no change to Austar's existing mining authorities would be required to accommodate the LWB4-B7 Modification.

1.2 Modification Description

Austar proposes to modify the Bellbird South consent to:

- permit the transfer and processing of coal from LWB4-B7 via the existing Bellbird mains
- extend the development consent area to encompass the four proposed longwall panels (refer to **Figure 1.3**).

Coal will be extracted from LWB4-B7 using conventional longwall mining techniques. The existing Austar Coal Mine infrastructure is sufficient to support the mining of the four proposed longwalls and there will be no change to surface facilities, approved rates of mining, coal processing and handling or product transport rates as a result of the modification.

The proposed modification does not involve any additional surface development and therefore will have no direct impact on Aboriginal archaeological sites as a result of land clearing. The potential impact of the proposed modification on archaeological sites is therefore limited to potential indirect impacts associated with subsidence, including surface cracking and changes to hydrology (including ponding or alterations to creekline morphology). The potential impacts of subsidence are discussed in detail in **Section 7.0**. However, it is noted that the predicted levels of subsidence within the LWB4-B7 Modification Area are lower than those that have occurred in the previously approved Stage 2 and Stage 3 mining areas (refer to **Figure 1.2**), where there has been no significant or visible surface cracking observed and no requirement for remediation of any ground surface cracking (MSEC 2017).

1.3 Legislative and Approvals Context

The following section provides an overview of the legislative frameworks relating to the protection and management of the Aboriginal cultural heritage within the LWB4-B7 Modification Area. The management and conservation of Aboriginal cultural heritage is subject to a range of statutory provisions under the NSW state government legislation. Key pieces of legislation with reference to the current assessment are the *Environmental Planning and Assessment Act 1979* (the EP&A Act) and the *National Parks and Wildlife Act 1974* (the NPW Act).

1.3.1 Environmental Planning and Assessment Act 1979

The EP&A Act is the main system of land use planning and development regulation legislation in NSW. The EP&A Act requires that consideration be given to potential environmental impacts during the planning process including the potential impact on Aboriginal cultural heritage.

The Bellbird South Consent was granted by the Minister for Urban Affairs and Planning under Part 4 of the EP&A Act in 1996 prior to the commencement of the (now repealed) Part 3A provisions. For the purposes of this modification, however, the consent is considered a transitional Part 3A project and Section 75W is the appropriate approval pathway for the proposed LWB4-B7 Modification.

Despite being assessed under Section 75W, the proposed modification to the Bellbird South Consent will remain an approval under Part 4 of the EP&A Act. Therefore the exemptions which apply to approved Part 3A projects relating to permits under Section 87 or consents under Section 90 of the NPW Act do not apply.

1.3.1.1 Cessnock Local Environmental Plan 2011

The proposed LWB4-B7 Modification Area is located within the Cessnock Local Government Area. The Cessnock Local Environmental Plan (LEP) 2011 is a planning instrument established under the EP&A Act. Section 5.10 of the Cessnock LEP contains provisions for heritage conservation, including the conservation of Aboriginal objects and Aboriginal places of heritage significance. Clause 8 of Section 5.10 further specifies that an assessment of ‘the effect of the proposed development on the heritage significance of the place and any Aboriginal object known or reasonably likely to be located at the place’ and includes requirements for consultation with Aboriginal parties.

1.3.2 National Parks and Wildlife Act 1974

The Office of Environment and Heritage (OEH) is primarily responsible for regulating the management of Aboriginal cultural heritage in New South Wales under the *National Parks and Wildlife Act 1974* (the NPW Act). The NPW Act is accompanied by the *National Parks and Wildlife Regulation 2009* (the Regulation) and a range of codes and guides including the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011), the consultation requirements and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b).

The NPW Act defines an Aboriginal object as:

..any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales.

Under Section 84 of the NPW Act, an Aboriginal Place must be declared by the Minister as a place that, in the opinion of the Minister, is or was of special significance with respect to Aboriginal culture. Section 86(4) of the NPW Act states that a person must not harm or desecrate an Aboriginal place.

In accordance with Section 86(1) of the NPW Act, it is an offence to harm or desecrate a known Aboriginal object, whilst it is also an offence to harm an Aboriginal object under Section 86(2). Harm to an object or place is defined as any act or omission that:

- *destroys, defaces or damages an object or place, or*
- *in relation to an object – moves the object from the land on which it had been situated, or*
- *is specified by the regulations, or*
- *causes or permits the object or place to be harmed in a manner referred to in paragraph (a), (b) or (c),*

but does not include any act or omission that:

- *desecrates the object or place (noting that desecration constitutes a separate offence to harm), or*
- *is trivial or negligible, or*
- *is excluded from this definition by the regulations.*

Section 87(1) of the NPW Act specifies that it is a defence to prosecution under Section 86(1) and Section 86(2) if the harm or desecration of an Aboriginal object was authorised by an Aboriginal Heritage Impact Permit (AHIP) and the activities were carried out in accordance with that AHIP.

1.4 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) includes provisions for the protection of Aboriginal cultural heritage. To determine if there were any federally listed Aboriginal heritage sites or places present within the proposal site, an updated search was undertaken of the EPBC Act Protected Matters Search Tool on 7 April 2017 (refer to **Appendix 2**, Attachment 1). No World Heritage Properties, National Heritage Places or other protected matters were identified within the search area including the LWB4-B7 Modification Area.

1.5 Report Authorship

During the process of the development of this report, information relevant to the assessment of the Aboriginal cultural heritage values of the LWB4-B7 Modification Area was provided by all representatives of registered Aboriginal parties who participated in the survey. Additional correspondence pertaining to this assessment methodology was provided by Peter Townsend (Awabakal Local Aboriginal Land Council), Tracey Skene (Culturally Aware), Arthur Fletcher (Kauwal) and Jakub Czastka (Tocomwall). Correspondence and comments provided by Aboriginal parties are included in **Section 3**.

Nicola Roche (Umwelt Manager Cultural Heritage) was the primary author of the ATR (**Appendix 2**) and compiled this ACHAR. Nicola was assisted by Joshua Madden and Alison Lamond (Umwelt Senior Archaeologists). This ACHAR was reviewed on behalf of Umwelt by Barbara Crossley (Managing Director).

1.6 Objectives of this Assessment

The key objective of this assessment is to ensure that the Aboriginal cultural values of the LWB4-B7 Modification Area are appropriately assessed with reference to the approach specified in the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011) and the consultation requirements. In order to achieve this it is emphasised that Aboriginal people are the primary determinants of the cultural significance of their heritage and this ACHAR is primarily prepared to ensure that the information provided by registered Aboriginal parties is documented and presented in a manner that informs decision making on the management of Aboriginal cultural heritage within the LWB4-B7 Modification Area.

2.0 Description of the Modification Area

The LWB4-B7 Modification Area is illustrated in **Figure 1.1**, **Figure 1.2** and **Figure 1.3**, which show its boundaries with reference to key topographic features and cadastral information. As identified in **Section 1.3.1.1**, the LWB-B7 Modification Area is within the Cessnock Local Government Area and is within the parishes of Ellalong and Quorrobolong in the County of Northumberland.

As part of this assessment, the following key information is provided for the LWB4-B7 Modification Area:

- A description of land where Aboriginal objects and places of Aboriginal significance have been identified, both as a result of previous assessments (**Section 4.2.5**) and as part of this assessment (**Section 5.0**). Information on the nature of potential impacts (or harm) to these objects and places of significance is provided in **Section 7.0**.
- A description of the environment as relevant to the modification area (refer to **Section 4.1**), including photographs and mapping of land units (refer to **Section 5.0**).
- A description of other information relevant to Aboriginal peoples past use of the LWB4-B7 Modification Area and surrounds including key landscape features and resource availability (refer to **Section 4.1** and **Section 5.0**).

3.0 Consultation Process

Consultation with Aboriginal parties is an integral part of identifying and assessing the significance of Aboriginal objects and/or places, and determining and carrying out appropriate strategies to mitigate impacts upon Aboriginal heritage. In accordance with current requirements and expectations, consultation with Aboriginal parties regarding the proposal was undertaken in accordance with the relevant aspects of Part 8A, Clause 80C of the NPW Regulation and the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010). The documentation of the outcomes of Aboriginal party consultation in this report reflects the requirements of the *Guide to investigating assessing and reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011).

3.1 Identification of Registered Aboriginal Parties

Consultation with Aboriginal parties in relation to approved activities at Austar Coal Mine and the development of Aboriginal cultural heritage management plans has been ongoing since 2007 and has been undertaken in accordance with all relevant requirements and to the satisfaction of the regulatory authorities. At the commencement of the current assessment, Umwelt contacted the Office of Environment and Heritage (OEH) and identified that consultation with the registered Aboriginal parties participating in previous assessments for Austar had been consistent and ongoing, including consultation regarding the ACHMP (Austar 2017), which occurred in October/November 2016. OEH advised that Austar could continue to consult with the existing group of registered Aboriginal parties for the LWB4-B7 Modification and was not required to undertake a further public notification and registration process (refer to email correspondence provided in **Appendix 1**).

Twenty Aboriginal parties registered an interest in ongoing consultation regarding the Austar Coal Mine and were consulted regarding this modification (previous consultation is detailed in the Aboriginal Cultural Heritage Management Plan: Austar Coal Mine, Austar 2017).

The registered Aboriginal parties are:

- Aboriginal Native Title Consultants
- Awabakal Local Aboriginal Land Council
- Culturally Aware
- Deslee Talbott Consultant
- Giwiirr Consultants
- Hunter Valley Cultural Consultants
- Hunter Valley Cultural Surveying
- Lower Hunter Wonnarua Council
- Lower Wonnarua Tribal Consultancy
- Mindaribba Local Aboriginal Land Council
- Mingga Consultants

- The Awabakal and Guringai People
- Tocomwall Pty Ltd
- Upper Hunter Heritage Consultants
- Wanaruah Custodians
- Wattaka Wonnarua Cultural Consultants Services
- Wonn 1 Contracting
- Wonnarua Culture Heritage
- Wonnarua Elders Council Inc.
- Yinarr Cultural Service.

In relation to the registered Aboriginal parties listed above, it is noted that the area subject to the Astar ACHMP (Astar 2017) includes lands within the boundaries of two registered native title claims. These are NC2013/006 (Scott Franks and Anor on behalf of the Plains Clan of the Wonnarua People) and NCS2013/002 (Awabakal and Guringai People). However, the LWB4-B7 Modification Area specifically falls within the boundaries of the registered claim of the Scott Franks and Anor on behalf of the Plains Clan of the Wonnarua People (refer to **Figure 3.1**). The Chief Executive Officer of Tocomwall, Mr Scott Franks, is listed as an applicant on claim NC2013/006.

The LWB4-B7 Modification Area includes land within the boundaries of both the Mindaribba Local Aboriginal Land Council and the Awabakal Local Aboriginal Land Council, as shown in **Figure 3.2**.

3.2 Consultation regarding Assessment Methodology

A draft methodology for the ACHAR was provided to all registered Aboriginal parties on 5 January 2017. It was requested that all Aboriginal parties provide comment on the proposed assessment methodology. Particular emphasis was placed on comments relating to the Aboriginal cultural values of the modification area and the way in which the assessment may or may not contribute to documenting these values and assisting in their management. Copies of all communication regarding the draft methodology are provided in full in **Appendix 1** and summarised in **Table 3.1** below.

Nine Aboriginal parties did not provide any response to the draft methodology. Three Aboriginal parties (Awabakal Local Aboriginal Land Council, Culturally Aware and Wonn1 Contracting) responded to the draft methodology and did not identify any concerns or issues with the draft methodology but did not provide any additional information on cultural values. An additional seven registered Aboriginal parties did not provide a specific response regarding the draft methodology but submitted an Expression of Interest for participation in the survey of the LWB4-B7 Modification Area.

Tocomwall provided detailed comments on the methodology raising a number of issues with the methodology by email on 6 February 2017 (refer to **Appendix 1**). Umwelt provided a response to the comments on 7 February 2017 (refer to **Appendix 1**). Tocomwall requested further clarification on 9 February 2017 and Astar responded on 8 March 2017, including further technical response provided by Umwelt, and a further offer for Tocomwall to participate in a survey of the area.

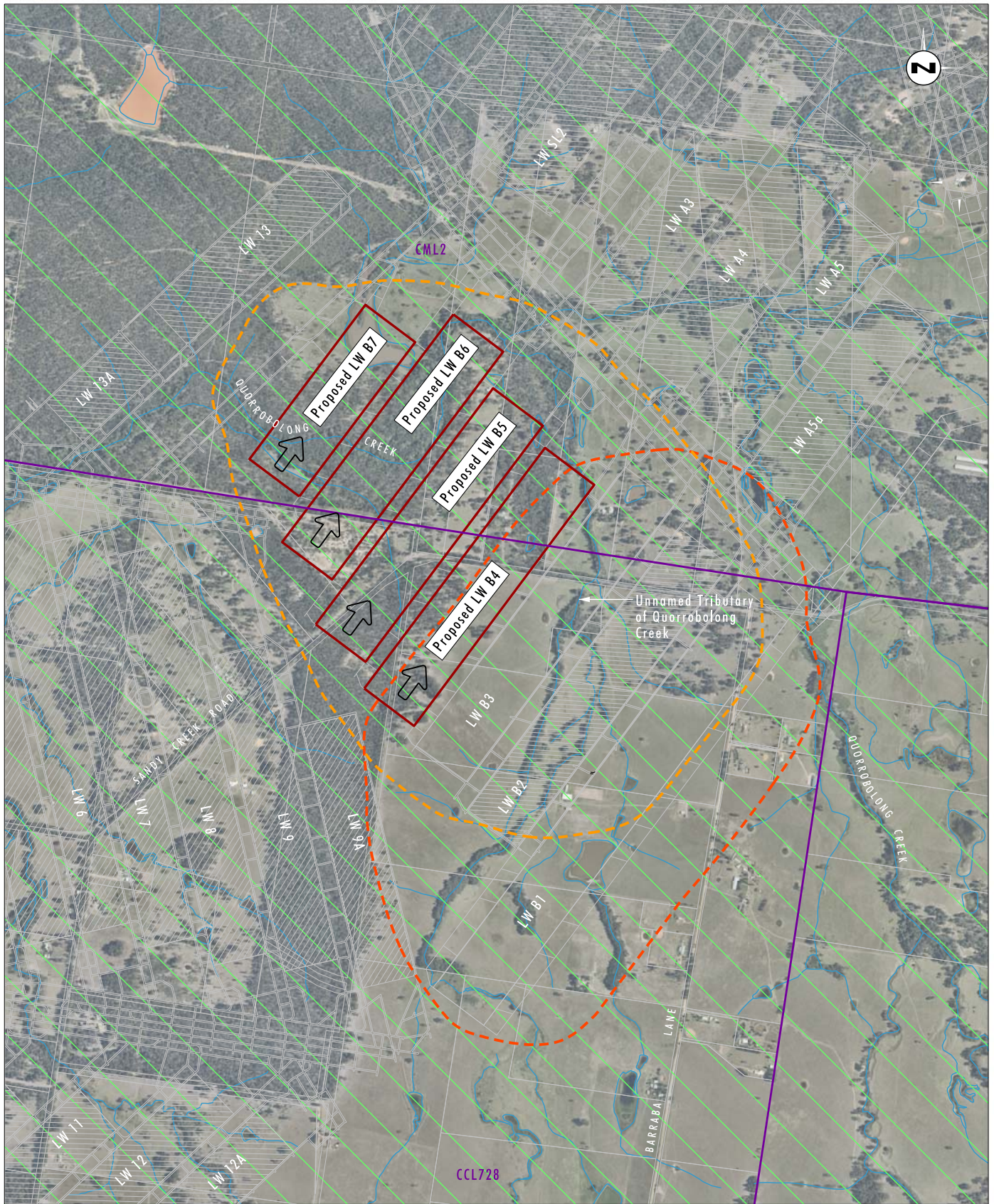


Image Source: Nearmap (2017)
 Data Source: Austar Coal Mine (2016)

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- Legend**
- Proposed LWB4-B7 Longwall Panels
 - LWB4-B7 Modification Area (Proposed)
 - LWB1-B3 Modification Area
 - Mining Lease Boundary
 - Completed Underground Workings
 - Direction of Mining
 - Drainage Line
 - Scott Franks and Anor on behalf of the Plains Clans of the Wannarua People

FIGURE 3.1

Location of Native Title Claim Boundaries

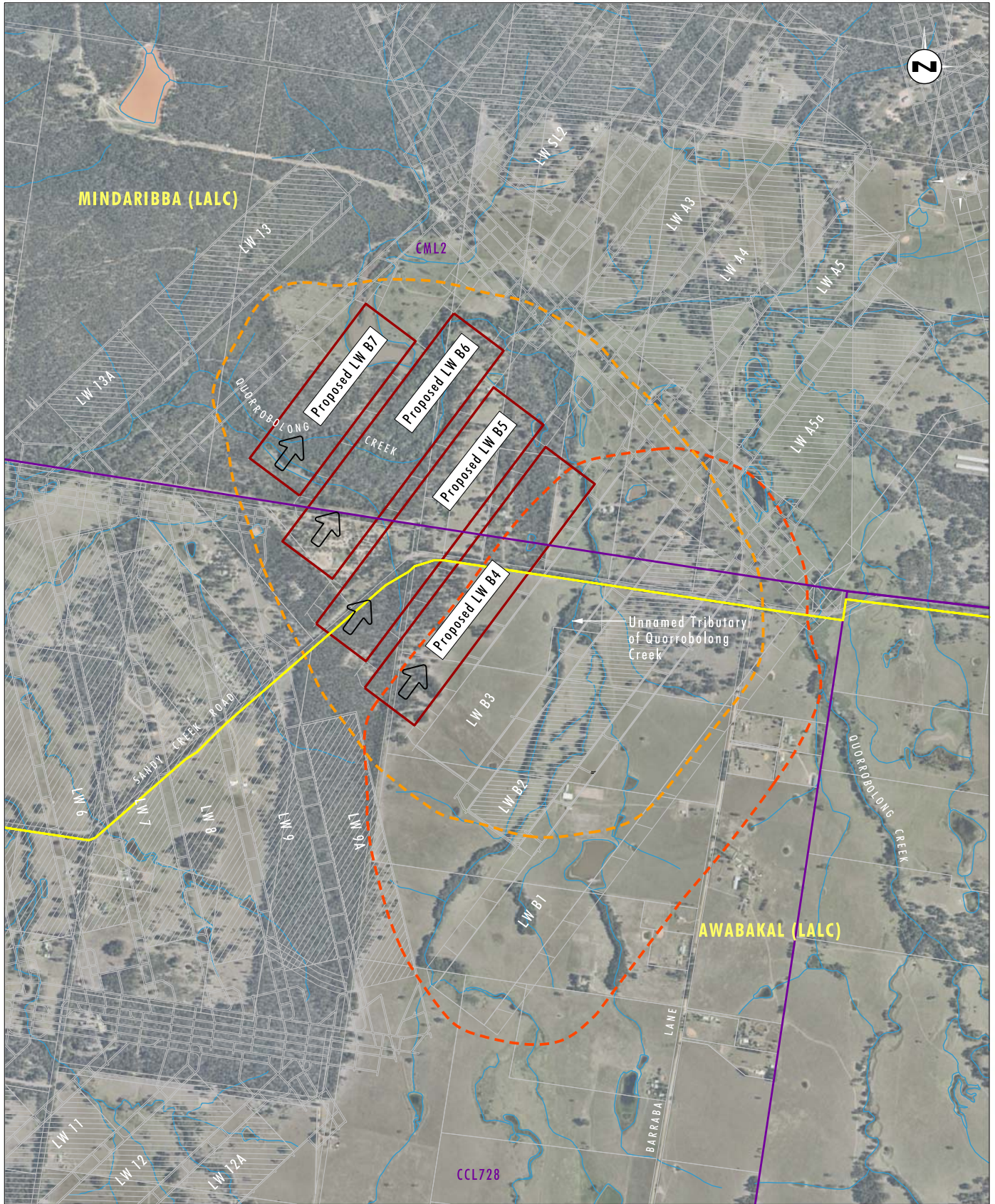


Image Source: Nearmap (2017)
 Data Source: Austar Coal Mine (2016)

0 0.25 0.5 1.0 km
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- Legend**
- Proposed LWB4-B7 Longwall Panels
 - LWB4-B7 Modification Area (Proposed)
 - LWB1-B3 Modification Area
 - Mining Lease Boundary
 - Completed Underground Workings
 - Direction of Mining
 - Drainage Line
 - Local Aboriginal Land Council (LALC) Boundary

File Name (A4): R04/3900_079.dgn
 20170516 12.58

FIGURE 3.2
Location of LALC boundaries

Table 3.1 Summary of Aboriginal Party Consultation

Date	Type of Consultation	Aboriginal Parties Contacted	Outcome
05/01/2017	Provision of assessment methodology to RAPs for review and comment. Correspondence re-sent with the inclusion of relevant figures and signature provided 19/01/17	Aboriginal Native Title Consultants	No response.
		Awabakal Local Aboriginal Land Council	Response provided by email on 17/01/17 stating satisfaction with the proposed methodology.
		Culturally Aware	Response provided by email on 16/01/17 stating no issues or concerns with the proposed methodology.
		Deslee Talbott Consultant	No response.
		Giwirr Consultants	No response.
		Hunter Valley Cultural Consultants	No response.
		Hunter Valley Cultural Surveying	EOI for fieldwork provided by email 24/01/17.
		Lower Hunter Wonnarua Council	EOI for fieldwork provided by email 31/01/17.
		Lower Wonnarua Tribal Consultancy	EOI for fieldwork provided by email 23/01/17.
		Mindaribba Local Aboriginal Land Council	EOI for fieldwork provided by email 24/01/17.
		Mingga Consultants	No response.
		The Awabakal and Guringai People	No response.
		Tocomwall Pty Ltd	Initial email response received 18/01/17 requesting signed copy of methodology with accompanying figures. Methodology resent 19/01/17. Response received from Tocomwall on 6/02/17 raising a number of concerns with proposed methodology (refer to main text).
		Upper Hunter Heritage Consultants	No response.
Wanaruah Custodians	No response.		

Date	Type of Consultation	Aboriginal Parties Contacted	Outcome
		Wattaka Wonnarua Cultural Consultants Services	EOI for fieldwork provided by email 20/01/17.
		Wonn 1 Contracting	Response provided by email on 20/01/17 stating no problems with the proposed methodology.
		Wonnarua Culture Heritage	EOI for fieldwork provided via email on 16/01/17.
		Wonnarua Elders Council Inc.	No response.
		Yinarr Cultural Services	EOI for fieldwork provided by email 24/01/17.
7/02/2017	Response provided to Tocomwall regarding comments on draft methodology	Tocomwall Pty Ltd	Further comments received from Tocomwall (by email 9/2/2017) noting remaining concerns regarding the methodology.
9/02/2017	Telephone conversation between Nicola Roche and Jakub Czatska	Tocomwall Pty Ltd	During telephone conversation, Jakub advised that due to outstanding concerns regarding the assessment methodology, Tocomwall would not be attending the survey. Nicola and Jakub discussed that consultation regarding the matter would remain ongoing.
9/02/2017	Email from Gary Mulhearn (Austar)	Tocomwall Pty Ltd	In response to provision of letter noting remaining concerns regarding the methodology, Austar indicated that survey had commenced on 9/02/17 with other Aboriginal parties but that this would not preclude Tocomwall from attending a future survey
9-10/02/2017	Survey of modification area with registered Aboriginal parties that provided EOI	Awabakal Local Aboriginal Land Council	Peter Townsend attended survey.
		Culturally Aware	Maree Waugh attended survey.
		Hunter Valley Cultural Surveying	Luke Hickey attended survey.

Date	Type of Consultation	Aboriginal Parties Contacted	Outcome
		Lower Hunter Wonnarua Council	Tom Miller attended survey.
		Lower Wonnarua Tribal Consultancy	Barry Anderson attended survey.
		Mindaribba Local Aboriginal Land Council	Jason Brown attended survey.
		Wattaka Wonnarua Cultural Consultants Services	Rod Hickey attended survey.
		Wonn 1 Contracting	Arthur Fletcher attended survey.
		Wonnarua Culture Heritage	Did not attend survey.
		Yinarr Cultural Services	Kathie Steward Kinchela attended survey on 9/02/17 only.
8/03/2017	Provision of further information requested by Tocomwall regarding assessment methodology	Tocomwall Pty Ltd	Response by email 17/03/17 to schedule survey.
21/03/2017	Survey of modification area undertaken with Tocomwall	Tocomwall Pty Ltd	Attended survey.
26/04/2017	Provision of draft ACHAR to registered Aboriginal parties for review and comment	Aboriginal Native Title Consultants	Verbal response received 16/05/17 (see below).
		Awabakal Local Aboriginal Land Council	Written response received 22/05/17 (see below).
		Culturally Aware	Written response received 26/05/17 (see below).
		Deslee Talbott Consultant	No response received as at 26/05/17
		Giwirr Consultants	No response received as at 26/05/17
		Hunter Valley Cultural Consultants	No response received as at 26/05/17
		Hunter Valley Cultural Surveying	No response received as at 26/05/17

Date	Type of Consultation	Aboriginal Parties Contacted	Outcome
		Lower Hunter Wonnarua Council	No response received as at 26/05/17.
		Lower Wonnarua Tribal Consultancy	Written response received 25/05/17 (see below).
		Mindaribba Local Aboriginal Land Council	Written response received 25/05/17 (see below).
		Mingga Consultants	No response received as at 26/05/17.
		The Awabakal and Guringai People	No response received as at 26/05/17.
		Tocomwall Pty Ltd	No response received as at 26/05/17.
		Upper Hunter Heritage Consultants	No response received as at 26/05/17.
		Wanaruah Custodians	No response received as at 26/05/17.
		Wattaka Wonnarua Cultural Consultants Services	No response received as at 26/05/17.
		Wonn 1 Contracting	Written response received 25/05/17 (see below).
		Wonnarua Culture Heritage	Verbal response received 16/05/17 (see below).
		Wonnarua Elders Council Inc.	No response received as at 26/05/17.
		Yinarr Cultural Services	No response received as at 26/05/17.
26/04/2017	Provision of draft ACHAR to Plains Clan of the Wonnarua People for review and comment	Plains Clan of the Wonnarua People	No response received as at 26/05/17.
16/05/2017	Telephone call reminder of closing date for comment on draft report	Aboriginal Native Title Consultants	Margaret Matthews advised that she did not attend the survey and has not reviewed the report in detail but is happy to endorse it on the strength of previous assessments done at Austar

Date	Type of Consultation	Aboriginal Parties Contacted	Outcome
		Awabakal Local Aboriginal Land Council	Peter Townsend advised would submit comment. Response subsequently received (see below)
		Culturally Aware	Left message advising of closing date for comment Response subsequently received (see below).
		Deslee Talbott Consultant	Left message advising of closing date for comment No subsequent response received.
		Giwirr Consultants	No telephone number available. Sent email advising of closing date for comment No subsequent response received.
		Hunter Valley Cultural Consultants	Left message advising of closing date for comment No subsequent response received.
		Hunter Valley Cultural Surveying	Left message advising of closing date for comment No subsequent response received.
		Lower Hunter Wonnarua Council	Tom Miller advised would email comment to Nicola Roche No subsequent response received.
		Lower Wonnarua Tribal Consultancy	Left message advising of closing date for comment Response subsequently received (see below)
		Mindaribba Local Aboriginal Land Council	Left message advising of closing date for comment Response subsequently received (see below)
		Mingga Consultants	Left message advising of closing date for comment No subsequent response received.

Date	Type of Consultation	Aboriginal Parties Contacted	Outcome
		The Awabakal and Guringai People	Peter Leven advised would provide comment Kerrie Brauer advised would provide comment No subsequent response received.
		Tocomwall Pty Ltd	Left message advising of closing date for comment No subsequent response received.
		Upper Hunter Heritage Consultants	Left message advising of closing date for comment No subsequent response received.
		Wanaruah Custodians	No answer and not possible to leave message or send email No subsequent response received.
		Wattaka Wonnarua Cultural Consultants Services	Des Hickey advised would provide comment No subsequent response received.
		Wonn 1 Contracting	Arthur Fletcher advised he will discuss with Suzie Worth and provide comment Response subsequently received
		Wonnarua Culture Heritage	Gordon Griffiths advised that he did not participate in the survey and cannot provide comment
		Wonnarua Elders Council Inc.	Left message advising of closing date for comment No subsequent response received.
		Yinarr Cultural Services	Left message advising of closing date for comment No subsequent response received.

Date	Type of Consultation	Aboriginal Parties Contacted	Outcome
22/05/17	Letter from Awabakal Local Aboriginal Land Council	Awabakal Local Aboriginal Land Council	Letter provided indicating agreement with the Austar Coal Aboriginal Cultural Heritage Management Plan. No comment made regarding current document.
25/05/17	Letter from Lower Wonnarua Tribal Consultancy	Lower Wonnarua Tribal Consultancy	Letter provided identifying minor corrections required to this section (adopted) and agreeing with the recommendations provided in Section 8.
25/05/17	Email from Wonn1 Contracting (Kauwal)	Wonn1 Contracting (Kauwal)	Email received from Arthur Fletcher indicating that he had been ill but 'with my limited understanding of it, I will be supporting this one.'
25/05/17	Letter from Mindaribba Local Aboriginal Land Council	Mindaribba Local Aboriginal Land Council	Response provided to Mindaribba Local Aboriginal Land Council by Umwelt addressing matters raised in their response to the draft report.
26/06/17	Email from Culturally Aware	Culturally Aware	Email provided referencing specific cultural values of Ellalong Lagoon, Quorrobolong Creek and the modification area more generally. Monitoring of sites and landscape features identified as appropriate management strategy

3.3 Aboriginal party participation in survey

In conjunction with the provision of the draft assessment methodology, the registered Aboriginal parties were invited to provide expressions of interest in being engaged to undertake the survey work. All eligible Aboriginal parties who submitted a complete Expression of Interest document (including provision of required insurance information) within the required timeframe were invited to participate in the survey. Survey participants are listed in **Table 3.2** below.

Following the completion of the survey on 9-10 February 2017 and on 21 March 2017, a meeting was held with the participants for each survey period, to review the outcomes of the survey, to discuss the LWB4-B7 Modification and to document any further feedback or comments that Aboriginal party representatives wished to make.

Table 3.2 On-site meeting and survey participants

Date	Organisation	Name
9/02/17	Austar	Josh Chadwick
	Umwelt	Nicola Roche
	Umwelt	Joshua Madden
	Culturally Aware	Maree Waugh
	Hunter Valley Cultural Surveying	Luke Hickey
	Wattaka Wonnarua	Rod Hickey
	Lower Hunter Wonnarua Consultancy Services	Tom Miller
	Lower Wonnarua Tribal Consultancy	Barry Anderson
	Mindaribba Local Aboriginal Land Council	Jason Brown
	Awabakal Local Aboriginal Land Council	Peter Townsend
	Kawul TA Wonn1	Arthur Fletcher
Yinarr Cultural Services	Kathy Steward Kinchela	
10/02/17	Austar	Josh Chadwick
	Umwelt	Nicola Roche
	Umwelt	Joshua Madden
	Culturally Aware	Maree Waugh
	Hunter Valley Cultural Surveying	Luke Hickey
	Wattaka Wonnara	Rod Hickey
	Lower Hunter Wonnarua Consultancy Services	Tom Miller

Date	Organisation	Name
	Lower Wonnarua Tribal Consultancy	Barry Anderson
	Mindaribba Local Aboriginal Land Council	Jason Brown
	Awabakal Local Aboriginal Land Council	Peter Townsend
	Kawul TA Wonn1	Arthur Fletcher
21/03/17	Austar	Josh Chadwick
	Umwelt	Nicola Roche
	Tocomwall	Danny Franks

3.3.1 Outcomes of in-field consultation

This section documents specific feedback received from Aboriginal party representatives during the survey and post-survey meetings. It is noted that all recording of Aboriginal archaeological sites during the survey was undertaken in consultation with Aboriginal parties.

In terms of specific feedback, the Aboriginal party representatives present during survey on 9 February 2017 requested that the landform adjoining an exposed artefact scatter be recorded as part of the site. The boundaries for this site (ACM38) were discussed and agreed with the Aboriginal party representatives. Similarly, the Aboriginal party representatives identified that the elevated spur crest in the north-west of the LWB4-B7 Modification Area be recorded as an area of archaeological potential.

During the survey, a large living red gum exhibiting two large scars was identified on the bank of Quorrobolong Creek at MGA E344925 N6357211. One scar is located approximately two metres from the base of the tree, is not symmetrical in shape and exhibits uneven scar margins, as shown in Archaeology Technical Report (ATR – refer to **Appendix 2**, Attachment 2, Plate 56). Based on the lack of symmetry to the scar, the uneven margins, the height of the scar on the tree and the presence of another minor scar higher up the tree that had resulted from limb tear, this scar is considered highly unlikely to be of Aboriginal cultural origin. This conclusion was discussed and agreed with Aboriginal party representatives present during survey.

The second scar on the tree is generally symmetrical (sub-ovoid) in shape, is located approximately 3.5 metres from the base on the tree, exhibits an estimated 15-20 centimetres of callus regrowth (not measurable due to height from ground surface) and is approximately 1.5-2 metres in length by 0.8 metres in width (refer to **Appendix 2**, Attachment 2, Plate 57). No evidence of scarring associated with the cutting of footholds was present on the tree trunk below the scar and there were no disconformities (such as burls) that would render the section of the tree trunk accessible from the ground unsuitable for use. This scar exhibits some characteristics associated with Aboriginal scarred trees (namely that it is a suitable species, is a mature tree, has a scar that is symmetrical and is relatively old based on the extent of callus regrowth). However, the scar is located a considerable distance off the ground surface, meaning that if it was made by an Aboriginal person, he or she would have been required to climb up to 5-5.5 metres to reach the top of the scar. The absence of footmarks in the tree trunk indicates that this climbing would have been done by some other means (which is not unknown within accounts of Aboriginal scarring practices). In contrast the tree trunk immediately below the scar and directly accessible from the ground does not exhibit any

evidence that it would have been unsuitable for use. In addition, the tree exhibits other clear evidence of damage from limb tears.

Based on the available evidence, this scar does not present sufficient evidence to warrant the recording of the tree as an archaeological site. This conclusion was discussed with the Aboriginal party representatives present during survey. Several of the Aboriginal party representatives indicated that they felt that the scar may be of cultural origin and requested that the above information be included within the report.

During the post-survey meeting on 10 February 2017, Aboriginal party representatives identified that Quorrobolong Creek was an important resource and that maintaining the watercourses within the LWB4-B7 Modification Area is a key aspect of the natural and cultural values of this area. It was noted that feral flora and fauna species were identified during the survey. This included the identification of feral pigs and their traces within Quorrobolong Creek and the presence of a range of weed species within the creek. Aboriginal party representatives indicated that controlling feral species is key to the health of the area and requested that landowners consider the need for weed management and feral animal controls within its landholdings.

The Aboriginal party representatives indicated that they felt that the level of survey coverage was adequate and indicated general agreement with the identification of areas of archaeological potential in association with Quorrobolong Creek and the elevated landform in the north-western portion of the LWB4-B7 Modification Area (as will be discussed further in **Section 5.0**). The Aboriginal party representatives also indicated that the number of sites and artefacts recorded within the LWB4-B7 Modification Area was interesting, being slightly higher than identified in the adjoining LWB1-B3 Modification Area. It was discussed that, based on subsidence predictions, it was unlikely that the identified archaeological sites or areas of archaeological potential would be subject to direct or indirect impact as a result of the proposed modification and that the sites would be subject to ongoing monitoring, consistent with the approach that forms part of the current Austar ACHMP (Austar 2017).

During the post-survey meeting on 21 March 2017, Danny Franks indicated that he was satisfied with the extent of survey undertaken and indicated general agreement with the identification of areas of archaeological potential in association with Quorrobolong Creek and the elevated landform in the north-western portion of the LWB4-B7 Modification Area (as will be discussed further in **Section 5.0**). Danny also indicated that he felt that the sites or areas of potential where there is an increased likelihood that deposits will retain integrity are of greater value as the interpretation of these sites/deposits could provide more specific information about the Aboriginal occupation of the area and how this may have changed over time.

3.3.2 Consultation regarding draft ACHAR

A copy of the draft Aboriginal cultural heritage and archaeological assessment report was provided to all registered Aboriginal parties on 26 April 2017 with an invitation to review and comment on all aspects of the document. All comments received will be documented included in full in **Appendix 1** and summarised in **Table 3.1**. Verbal comment on the draft report was provided by Margaret Matthews (Aboriginal Native Title Consultants) who indicated that she did not participate in the survey and had not reviewed the draft report, but based on her previous experience at Austar, she did not have any major concerns. Verbal comment was also provided by Gordon Griffiths (Wonnaua Culture Heritage) who identified that he had not participated in the survey and therefore could not comment on the draft report.

Written comment was received from Awabakal Local Aboriginal Land Council regarding the Austar Coal Aboriginal Cultural Heritage Management Plan but not specifically regarding this report. Written comment was also received from Arthur Fletcher (Wonn 1 Consulting/Kauwal) who did not raise any concerns regarding the draft report. Barry Anderson (Lower Wonnarua Tribal Consulting) requested some minor corrections to the draft report regarding his organisation's name (which have been made) and provided agreement with the recommendations in the draft report.

Written response was also received from Mindaribba Local Aboriginal Land Council requesting clarification of aspects of the draft report and the provision of additional information. These comments were addressed via correspondence to Mindaribba Local Aboriginal Land Council, including the provision of some additional information in this report. A copy of the correspondence provided to Mindaribba Local Aboriginal Land Council is included in **Appendix 1**.

Written comment was also received from Tracey Skene (Culturally Aware) referencing the high cultural significance of Ellalong Lagoon and noting that 'the assessment area has a known creek called Quorrobolong Creek, this area may have low scientific value but holds a high importance and cultural significance to the Aboriginal Community'. Ms Skene identified that monitoring of the recorded sites is an adequate management strategy and emphasised the importance of keeping the natural surrounds free from damage.

4.0 Contextual Information

This section presents a review of background information undertaken to gain an initial understanding of the cultural landscape. In order to avoid duplication, this section is cross-referenced with information presented in the ATR provided in **Appendix 2**.

4.1 Physical Setting

The majority of the LWB4-B7 Modification Area can be broadly classified as low relief rolling hills bordering Quorrobolong Creek, which is the main watercourse in the modification area. Based on the available topographic information, provisional landform mapping was undertaken within the LWB4-B7 Modification Area, as shown in **Figure 4.1**. Within the LWB4-B7 Modification Area, Quorrobolong Creek is an ephemeral watercourse with flows only occurring as a result of prolonged or high rainfall periods. Areas of ponding do however occur along its alignment within the modification area. A 4th order unnamed tributary of Quorrobolong Creek flows in a northerly direction through the LWB4-B7 Modification Area above LWB1 to LWB4, converging with Quorrobolong Creek upstream of LWB5. Of these watercourses, Quorrobolong Creek comprises the most reliable source of water and is bordered by relatively broad valley flats formed through alluvial deposition.

Information of the geology and soils of the LWB4-B7 Modification Area is provided in Section 2.1 of **Appendix 2** and is not replicated here other than to note that the depths of topsoil within the area is typically expected to be less than 50 centimetres. The possible exception to this is within the alluvial formations mentioned above.

A review of the range of flora and fauna that would have been likely to occur within the LWB4-B7 Modification Area prior to non-Aboriginal landscape modification would have included a large range of animals and plants targeted by Aboriginal people for use as food, medicines and to manufacture various implements (refer to Table 2.2 in **Appendix 2**). However, the area has been subject to occupation by non-Aboriginal people since the early 1830s, with the majority of the LWB4-B7 Modification Area located within the Barraba Estate which was granted in 1834 (Umwelt 2008). Since this time, the area has been used for grazing and some limited agriculture purposes. From the early 1900s, mining commenced within the local area, with the establishment of the Pelton, Ellalong, Bellbird and Southland Collieries resulting in increased activity within the local area, noting that grazing and agriculture remained a key land use.

As a result of the land use history described above, a relatively large proportion of the LWB4-B7 Modification Area has been subject to modification as a result of grazing and agricultural land use, including clearance of large portions of native vegetation and the introduction of pasture grasses, with mining related activity also occurring in the local area. The ongoing clearance of the landscape, the introduction of hard hoofed animals and attempts at water conservation (in the form of construction of dams and works such as contour banks) would have had significant impacts on stream morphology and hydrology. Throughout the Hunter Valley, these changes have resulted in incision of tributary streams and extension of gullies, erosion and sedimentation during major floods, and in some places, increases in water salinity (Dean-Jones and Mitchell 1993:4). Other areas of localised impacts visible within the modification area include a former quarry south of Sandy Creek Road and a number of houses and associated outbuildings (as visible in **Figure 1.3**). The extent of these disturbances has implications for the likely Aboriginal cultural values of the landscape, including any archaeological evidence that may remain.

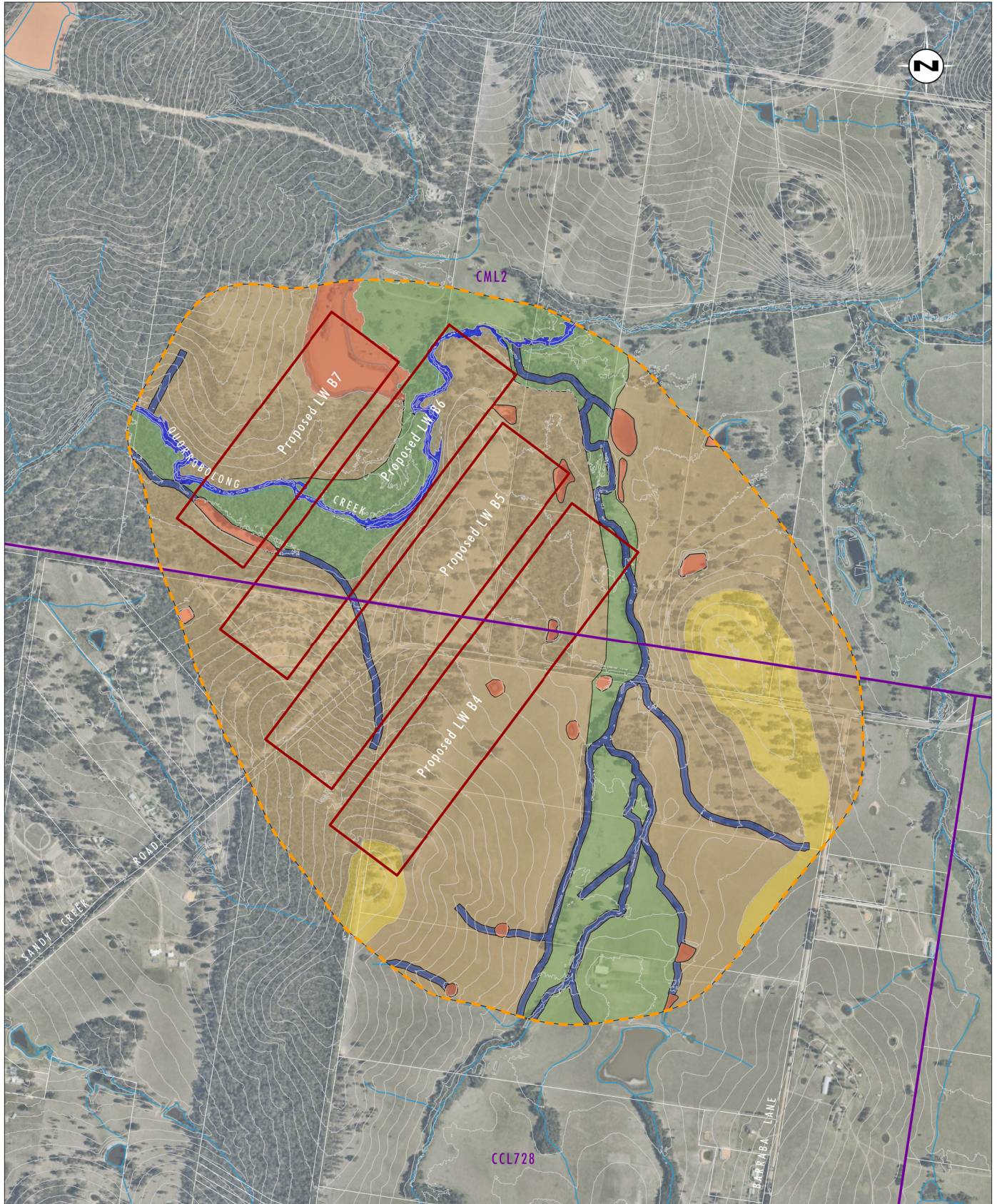


Image Source: Nearmap (2017)
 Data Source: Austar Coal Mine (2017)
 Note: Contour Interval 2m

0 250 500 750 m
 1:15 000

Legend

- | | |
|--|--|
| Proposed LWB4-B7 Longwall Panels | Drainage Depression |
| LWB4-B7 Modification Area (Proposed) | Valley Flat |
| Mining Lease Boundary | Slopes (Unspecified) |
| Modified (Dam) | |
| Hill Crest | |
| Stream Channel (Quorrobolong Creek) | |

FIGURE 4.1

Preliminary Landform Mapping

4.2 Ethnohistoric Information

Historical records, such as official records and personal observations recorded in diaries or publications, can provide information on Aboriginal history of a region since European contact. Although a valuable source of information, the limitations of these documents must be recognised as colonial observers generally tended to record unusual rather than everyday events, religious and social life rather than economic activity, and men's behavior rather than that of women and children. Further, early observations of the Hunter Valley tended to focus on coastal regions rather than inland areas. As such, ethnohistoric records are neither unbiased nor complete, and they cannot provide a complete understanding of Aboriginal beliefs and practices at the time of contact.

Published ethnohistoric sources for the Central Lowlands of the Hunter Valley region are relatively rare, although information can be found in sources such as Breton (1833), Cunningham (1827), Curr (1887), Dawson (1830), Ebsworth (1826), Eyre (1859), Grant (1803), Howe (1819), Ridley (1864) and Sturt (1833). Secondary sources such as Blyton et al (2004), Brayshaw (1966; 1986), Davidson and Lovell-Jones (1993), Miller (1985), Needham (1981) and Wood (1972) form the basis of the following discussion of the Aboriginal history of the Central Lowlands and the Cessnock-Wollombi area, with specific reference to locations and material culture utilised to provide context for this ACHAR.

These sections of the report are adapted from information originally presented by Umwelt (2008b).

4.2.1 Traditional Boundaries

The issue of identifying the boundaries of Aboriginal nations and tribes is complex. The LWB4-B7 Modification Area is located an area broadly indicated by Tindale (1974) as being located in the vicinity of the boundary between the lands of the Wonnarua¹ and Awabakal people, with Wonnarua territory mapped as extending south of Cessnock and north of Sugarloaf Range. However, there is a degree of variability in how Aboriginal tribal boundaries are mapped and, in this regard it was thought more appropriate to choose to use the registered Native Title boundaries as these have been mapped by and for Aboriginal people and not ethnographers or archaeologists.

The LWB4-B7 Modification Area is located within the boundaries of a registered native title claim (NC2013/006 *Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People*). A second application (NC2013/002), falls just outside the LWB4-B7 Modification Area, but covers other land within the Austar Coal Mine. Representatives from the NC2013/002 registered native title application (*Kerrie Brauer & Ors on behalf of the Awabakal and Guringai People*) have previously registered an interest in the Austar Coal Mine, as parts of the mine are within their registered Native Title application area. The details of these native title claims are not reviewed in detail here as the detailed information may represent sensitive cultural knowledge and it is the prerogative of the relevant claimants to identify how they wish this information to be shared. It is however noted that representatives of both claimant groups are registered Aboriginal parties for this ACHAR and may provide additional cultural information where relevant.

¹ The Wonnarua have variously been called: Wanaruah, Wonaruah, Wanarua and Wonnah-Ruah. Wonnarua is the spelling which will be used in this report except where a direct quote from another source is cited.

4.2.2 Historical accounts of Aboriginal people in the region

Early European observers recorded the lives of Aboriginal people in the Hunter Valley as intensely religious and constrained by strictly enforced laws (Ridley 1864 in Brayshaw 1986). The traditional lives of the Aboriginal people focused on the Hunter Valley and were structured around a schedule of social interactions designed to take advantage of seasonal availability of resources; meaning that people moved often, but not at random. Before the arrival of the Europeans the Wonnarua was a large grouping of individual family units and bands which occasionally came together for religious and ceremonial functions (Davidson and Lovell-Jones, 1993:3). People travelled freely within the broad area of responsibility of their own group. Social responsibilities and obligations meant that people also travelled beyond their own territories to attend ceremonies with neighbours, to trade and to develop social networks that linked people across extensive areas. There were documented links between the Wonnarua and the Awabakal and other tribal groups along the coastline and into western New South Wales (Brayshaw 1986: 38-41).

Ancestral Aboriginal people often lived and travelled in small groups of less than twenty people, but regularly met relations and neighbours for ceremonies where hundreds and sometimes thousands of people gathered for weeks at a time. Events like this were scheduled when and where seasonal resources were plentiful. Successive gatherings were rotated between a number of sites to allow the local environment to fully recover from periods of intensive exploitation. These gatherings were an opportunity to trade a wide range of goods from ceremonial songs and dances to stone axes, spears and native tobacco (Mulvaney 1986). Different groups sometimes specialised in producing high quality trade goods.

Most of the time, Aboriginal people were recorded as living in small groups moving regularly from camp site to camp site, living on local resources. There is little ethnographic evidence about where Aboriginal people camped; however, there is mention of the importance of fresh water, particularly in a non-coastal context. Also of importance when determining the location of camp sites, was the suitability of a site as a vantage ground in the case of enemy attack (Fawcett 1898:152 in Brayshaw 1986:42). While camping at a particular site, people would travel each day through the surrounding country to gather plant foods and to hunt or to visit areas that provided other required resources (for example stone, ochre, bark and resin). The daily foraging area was generally within a day's walk of camp (usually within about five kilometres).

Brayshaw (1986:59) notes that of all raw materials available, bark appears to have been the most widely used and the most adaptable. Use of bark for huts, or 'gunyers' as they are frequently referred to, is well documented, with descriptions by Caswell (1841) and Threlkeld (in Gunson 1974:45). Breton (1833) and Eyre (1859) noted suitable trees were also available to provide bark for wooden implements such as shields.

Early historic reports describe the Hunter Valley as having extensive grasslands and floodplains with few trees (Breton 1833, Cunningham 1827, Howe 1819). These grasslands are thought to be the result of Aboriginal fire stick farming techniques, which involved continually burning the countryside as a hunting strategy (Davidson and Lovell-Jones, 1993:5). Burning also cleared the undergrowth and fresh growth produced green shoots that attracted prey animals. Fawcett (1898) refers to the use of fire by the Wonnarua; and other early accounts (Cunningham 1827) also report the use of fire in the area.

Kangaroos, emus, possums and fish were recorded as plentiful (Breton 1833, Cunningham 1827, Dawson 1830), and mention was made of an abundance of food on the flatter ridges and plains that supported large populations of kangaroos (Cunningham 1827: 157). Early observations refer to hunted animal species, including kangaroos, wallabies and emus (Fawcett 1898:153), echidna (Fitzpatrick 1914:43 from Brayshaw 1986), goanna and native dogs (Dawson 1830:203), bandicoot (Ebsworth 1826:80), snakes (Threlkeld (in Gunson 1974:55), flying foxes (Dawson 1830:309), possums (Dawson 1830:68) and larvae (Grant 1803:162-3). There is very little evidence regarding the place of birds in the Aboriginal diet, although there are references to the mutton bird hunted on Nobbys Island, and ducks, geese, swans and pigeons (Threlkeld in

Gunson 1974:55). Hunting was frequently a group exercise, although animals were sometimes speared by individual hunters.

Weirs, or fish traps, were observed by early colonial observers, such as one observed by Grant (1803:154-155 in Brayshaw 1986:42) along the lower Hunter in 1801. The construction of a weir was also described by Threlkeld (in Gunson 1974:190) as:

...planting sprigs of bushes in a zig-zag form across the streams, leaving an interval at the point of every angle where the men stand with their nets to catch what others frighten towards them by splashing in the water.

Brayshaw (1986:83) describes initiation ceremonies of the Hunter, which are described as using one or two cleared circles, which were often 350 metres apart. Around the circles, the trees were carved and in some cases, figures of raised earth were created on the ground. Threlkeld (in Gunson 1974:63-66) described that red ochre was used on important ceremonial occasions, as well as for other purposes. Threlkeld further describes that Aborigines got red ochre that was used on important ceremonial locations, being from a volcano 'up the River Hunter'. Reddish earth was sourced from this location, which was transformed into red ochre through a process involving wetting the earth, moulding it into balls and burning them in a strong fire.

Several forms of burial have been recorded in the Hunter Valley. Burial in the earth is the most commonly recorded, although the placement of the body could be varied and could be extended or flexed, face down or on its side or up (Brayshaw 1986:86). The use of bark as a burial shroud was widespread. There is some indication that burial practices varied between coastal and inland areas, with Threlkeld (in Gunson 1974:47,89,100) indicating that coastal burials were deliberately smoothed and scattered with branches to leave little indication of the burial on the surface. This contrasts with descriptions of inland burials (Breton 1833, Howitt 1904:446, Sturt 1833:14), where burials were usually marked with carved trees. A description of the burial of four men and two women of the Kamilaroi tribe by Breton (1833:203-204) involves the individuals being covered with mounds of earth (instead of being placed in a hole) in the centre of a circle approximately thirty feet in diameter cleared of vegetation. Breton further notes that the trees for some distance were carved with figures representing kangaroos, emus, possums and weapons, some of which extended twenty feet above ground.

4.2.3 Impacts of non-Aboriginal occupation

European arrival in the Hunter Valley began with the discovery of coal at Newcastle in 1797. By 1801 the Valley was reserved by the Crown as both a new convict settlement (a penal settlement was established in the Newcastle area in 1804) and for its resources in coal and timber (Davidson and Lovell-Jones, 1993:8). This reservation placed on the region by the Crown effectively restricted free settlement of the area; however, by 1819 the demand for grazing land and land for rural settlement increased beyond the current bounds of the colony's free settlement area and in 1821 Henry Dangar was commissioned to undertake a survey of the Hunter area to assess its suitability for settlement and farming.

Davidson and Lovell-Jones state that within months of Dangar reporting the Hunter Valley as suitable for settlement, claims for purchase and leasehold were being made from selectors in Sydney and by 1825 '...both sides of the Hunter River and associated brooks had been claimed' (Davidson and Lovell-Jones, 1993:8). The rapid settlement in the area disrupted the Aboriginal economy and, in a very short time, the Aboriginal population was substantially affected by a combination of starvation, introduced diseases and massacres.

First contact between the Wonnarua and the settlers may have been cordial (see citations in Davidson and Lovell-Jones, 1993:10) but rapidly turned hostile and violent with the Aboriginal community actively resisting the colonisation and appropriation of their land and resources, and the European landholders and their stockmen implementing ‘widespread and indiscriminate’ violence against Aboriginal people. This violence escalated significantly after 1826 and was fuelled in particular by the institutionalised violence by the Mounted Police (MacDonald and Davidson, 1998:60).

Documentary evidence suggests that by 1830 (only nineteen years after the first European settlers arrived in the Hunter) ‘all armed resistance by local Aborigines’ had ceased (Davidson and Lovell-Jones, 1993:17) and the traditional use of the land by Aboriginal people and their social structure and interactions had dramatically been affected – all within one generation. On the other hand, there are also some accounts of cultural ceremonies being conducted decades later, such as a ceremony held at Bulga in 1852, noted by Blyton et al. (2004:9); and a ceremony held at the junction of the Page and Isis Rivers at Gundy reported in the 1870s (McDonald 1878:255-258).

Since European settlement the Hunter Valley landscape has undergone radical changes. European colonisation saw the establishment of pastoral holdings, small towns and villages. Blyton et al. (2004:9) argue that the European pattern of settlement and land use rapidly became the normative occupation pattern ‘replacing traditional Aboriginal communities’ (Blyton et al., 2004:9). Davidson and Lovell-Jones (1993:17) also argue that shortly after European settlement all that remained were isolated family groups of Aboriginal people in the Hunter Valley existing ‘on the fringes of towns and on properties trying as best they could to survive in a European modified environment’.

The material culture of Aboriginal people also changed dramatically following contact, with the rapid influx of new technologies and materials. For example, Threlkeld (in Gunson 1974:54, 67) provides two examples of new technologies being utilised by Aboriginal people within the Lake Macquarie area, noting that bottle glass was replacing stone (‘fragments of quartz’) in Aboriginal weapons and that iron and glass were being used for fish hooks.

European settlement and encroachment on resources and traditional camping groups restricted Aboriginal occupation and dramatically affected Aboriginal communities, but it did not completely destroy connections to traditional camping grounds. There is a continuation of cultural connection and in some cases occupation of these places that date well into the twentieth century.

4.2.4 Records relating to Cessnock and Wollombi

In addition to the above, there are a number of specific references to the Aboriginal history of the Cessnock and Wollombi areas. Aboriginal camp sites were recorded by early observers, such as Felton Mathew’s recording (as late as 1830) of Aborigines camped in a ‘romantic spot’ on the bank of the Wollombi River near Broke (Brayshaw 1986:42). Another observation from this early period relates to local Aboriginal tribal groups, with Breton (1833:90-92 in Brayshaw 1986:57) stating:

Some miles from the inn we fell in with several of the aborigines, and the farther we rode the more we saw, until at length there were not less than sixty with us... These people consisted of the two tribes, one from Illarong, the other belonging to the Wallombi [sic] and were on their way to wage war with another tribe. Some of them were diligently employed in painting their sable bodies in a most fantastic manner, with a substance that resembled pipe clay.

Needham (1981) discusses the Aboriginal history of the Cessnock and Wollombi region, based on review of primary sources and from discussions with local residents and Percy Haslam (University of Newcastle lecturer), and the Aboriginal meaning of several locations within the Quorrobolong Valley, as listed in **Table 4.1**.

Table 4.1 Aboriginal Place Names in the local area (Needham 1981:8)

Aboriginal Place Name	Meaning	Reference
Quorrobolong	A line of low hills	P. Haslam (<i>pers. comm.</i>)
Barraba	Place of Descent	P. Haslam (<i>pers. comm.</i>)
Congewai	Valley of the Lily	E. Crawford (<i>pers. comm.</i>)
Ellalong	Low swampy ground	NA
Coorabare	Derivation of the word: corroboree	P. Haslam (<i>pers. comm.</i>)
Watagan	Place of Many Ridges	P. Haslam (<i>pers. comm.</i>)
Wollombi	Place where the waters meet	NA

Needham identifies a number of Aboriginal sites within the Cessnock and Wollombi region, including one ceremonial ground (1981:35.) and two burial sites (1981:38) at Quorrobolong, based on information from Percy Haslam and local residents. The ceremonial location at Quorrobolong is described as a small ring with an apparent corridor leading away from it, therefore exhibiting bora characteristics (Needham 1981:36 from Haslam *pers. comm.*). The description further states there is no evidence of a larger ring, which is known on several other Hunter Valley bora grounds. A second ceremonial site is also described as being near Payne's Crossing (to the west of Millfield), and this site is described as consisting of a triplet of rings.

The burial sites at Quorrobolong are reported to be two of three known in the Wollombi region (1981:38 from Reynolds *pers. comm.*). All three burial sites are described as being under a tree or trees. As outlined in Needham (1981:35 from Reynolds *pers. comm.*):

The positioning and detail at one Quorrobolong site would suggest that the deceased was a person of some importance within the tribe. This rectangular plot measures three metres in length by two metres wide. There is a raised mound at the site...At each corner of the plot there stood an ironbark tree. However, only two of these trees now remain. One was chopped down, and the other was struck by lightning. The site faces north.

Needham (1981:38) further states the second burial at Quorrobolong was reportedly of a young boy.

A map of the Aboriginal sites along the major creek systems of the Cessnock-Wollombi area is presented in Needham (1981:37), and this map illustrates two burial sites near Quorrobolong Creek. To determine the locations of these two areas more accurately, an attempt to overlay Needham's map on a topographic map for analysis was made; however, this was unsuccessful as the Needham map is unscaled and the creek systems illustrated do not match the actual creek line configuration of the area. Although the map cannot be used to identify any exact burial locations, it does depict both burials in a large southern bend of Quorrobolong Creek.

Mr Reynolds (the informant cited by Needham) was contacted by Umwelt on 12 April 2011 to establish the reliability of this information. He explained the burials he referred to were shown to him by his father and were located in relation to an earthen mound on a ridge (midslope) in a resource rich habitat near Wallis Creek near the Sandy Creek bridge. Mr Reynolds clarified that the bora site was also as being located in low lying land no more than 150 metres from Wallis Creek (Umwelt 2011). These locations are over 5

kilometres south-east of the LWB4-B7 Modification Area. However, the presence of highly significant sites of this type indicates that ceremonial activities were being undertaken within the local area.

Needham (1991) also references the importance of Ellalong Lagoon to local Aboriginal people. This is supported by the information included on a site card held by OEH. The site (AHIMS #37-6-0473) was recorded as a natural/mythological site based on a secondary account received from a Mr E. Cody who identified that the early non-Aboriginal occupants of the area referred to the lagoon as Catch-a-Boy Swamp based on their understanding of an Aboriginal cultural belief that the lagoon was inhabited by an entity who had taken a small boy who had been playing or swimming in the lagoon. This account is somewhat unclear and, in all likelihood, represents a simplification of a complex cultural story that was told at varying levels depending on the cultural knowledge of both the story teller and their audience. However, it does provide evidence of the assignation of cultural beliefs to key landscape features within the local area.

In describing the period of early non-Aboriginal settlement of the local area (including the Congewai Valley to the south-west of the LWB4-LWB7 Modification Area), Needham (1981:67) documented accounts from local non-Aboriginal informants relating to conflict between early non-Aboriginal people and the traditional owners of the area. In one account, poison bread was intentionally provided to Aboriginal people to ensure that they did not remain within the local area.

4.2.5 Material Evidence of Aboriginal land use

A review of previous archaeological investigations undertaken in the local area (refer to Section 3.1.1 of **Appendix 2**) focused on investigations undertaken within the Austar Coal Mine area. It is acknowledged that this does not represent an exhaustive review of Aboriginal archaeological assessments within the Hunter Valley. However, it is considered that the scale of review of available documentation is appropriate to the requirements of the current assessment.

These investigations (refer to Umwelt 2008b, 2011, 2013 and 2015) resulted in the identification of a number of Aboriginal archaeological sites, the majority of which comprise isolated stone artefacts or low density artefact scatters. All sites containing more than ten artefacts were identified in landforms bordering Cony Creek, including adjacent to a former terrace on Cony Creek (a creek that feeds into Quorrobolong Creek) on a creek flat. The landforms bordering Cony Creek and Sandy Creek (both of which flow into Quorrobolong Creek) were considered to have higher archaeological potential based on the likely resource availability within these areas when considered with reference to the pattern of site distribution in the local area, although it was acknowledged that these landforms were likely to have been subject to disturbance.

Other site types included one grinding groove site (AHIMS #37-6-1890) which was identified on a sandstone conglomerate platform within a first order drainage line, one scarred tree (AHIMS #37-6-2756) and four areas of Potential Archaeological Deposit. The areas of Potential Archaeological Deposit were identified in association with potential terrace landforms bordering Cony Creek.

Based on the outcomes of the previous archaeological investigations undertaken within the locality (particularly those undertaken within the Austar Coal Mine), a range of extensive predictions have been made and reassessed based on the outcomes of previous assessments (as undertaken in Umwelt 2008a, 2011, 2013). The key aspects of these predictions, with reference to the environmental context of the LWB4-B7 Modification Area, are provided below.

- Artefact scatters and isolated artefacts are the most likely site type to occur within the LWB4-B7 Modification Area. These sites may occur in any landform within the modification area but are most likely to occur in proximity to watercourses (noting that it must be taken into account that watercourse morphology may have been subject to significant change, as will be discussed below). Elevated areas (such as spur crests or ridge crests) that provide access to water resources may also be associated with higher numbers of sites and densities of sites.
- For sites containing stone artefacts, site numbers and artefact densities will typically be relatively low, with the majority of sites likely to contain less than 10 artefacts. However site and artefact densities may increase in proximity to the main channel of Quorrobolong Creek based on the more reliable nature of this watercourse when compared to others within the general locality (with the exception of Ellalong Lagoon).
- While pre-survey landform mapping did not identify any areas of terracing within the LWB4-B7 Modification Area, previous assessments have identified small areas of potential terracing along Cony Creek and the channel of Quorrobolong Creek (outside the LWB4-B7 Modification Area). In addition, it was identified that there is the potential for colluvial/alluvial interfaces within the areas of valley flats bordering the watercourses, particularly Quorrobolong Creek. Terraces and areas of alluvial-colluvial interface have the potential to contain archaeological deposit at depth, with the subsequent deposition of alluvial and/or colluvial material potentially introducing an element of stratigraphic integrity to any such deposits. Landforms of these types, should they occur within the modification area, may have higher archaeological potential than the surrounding landforms within which deposits have been subject to higher levels of impact and are unlikely to retain stratigraphic integrity.
- Scarred trees may occur in portions of the LWB4-B7 Modification Area where mature native vegetation remains. Based on the land use history of the modification area, the majority of the vegetation may comprise regrowth however consideration should be given to the potential for scarred trees to remain.
- Grinding groove sites (and potentially other sites associated with sandstone such as engraving sites) may occur in the LWB4-B7 Modification Area if suitable sandstone outcrops are exposed within the channel of Quorrobolong Creek and associated watercourses. However, given the relatively sandy nature of much of the soils within the local area, the potential for sandstone outcrops (and therefore sites found on sandstone outcrops) is relatively low.
- Levels of disturbance across the LWB4-B7 Modification Area are likely to have impacted the visibility and integrity of sites that may be present. The extent of these impacts will depend on the nature of the disturbance and the likely depth of any archaeological deposits that may be present.

The survey of the LWB4-B7 Modification Area was undertaken with reference to the predictions outlined above. The outcomes of the survey are summarised in **Section 5.0**, with further details provided in the ATR in **Appendix 2**.

4.2.6 Previous Statements Regarding Aboriginal Cultural Values

As discussed in **Section 3.1**, ongoing consultation has occurred at regular intervals with the registered Aboriginal parties since 2007. Over this period, the outcomes of consultation indicate that there is a strong connection from registered Aboriginal parties to the wider areas subject to prior assessment. Key value statements or comments provided by registered Aboriginal parties are summarised below.

In relation to the assessment of the Stage 3 area (refer to **Figure 1.2**), during the field survey all Aboriginal representatives involved in survey stated that all archaeological sites are of cultural significance, but that the grinding groove site (ACM6) identified in that area was of particular significance due to its rarity.

Registered Aboriginal party representatives also stated that site ACM14, an artefact scatter along Cony Creek, was also of higher cultural significance as the area would have been an area of high occupation and use. In addition, Arthur Fletcher (Kauwal) stated that areas around water courses are culturally significant as they represent a livelihood and a connection to country. On the ACM6 grinding groove, Mr Fletcher indicated that the site is of particular significance as it represents a tangible link to past traditional use of the area. The grooves represent an area where tools could have been repaired, and are evidence of our cultural existence and belonging to the area. Mr Fletcher further indicated that this area is of the highest cultural significance as it serves as a cultural link to his ancestors' lives. On the ACM14 artefact scatter, Mr Fletcher indicated that the site represents an obvious area of high occupation, on which basis the area is highly culturally significant.

During consultation for the LWB1-B3 Modification Area (part of which overlaps with the current Modification Area), the majority of registered Aboriginal parties did not supply additional cultural information. However, Margaret Matthews (Aboriginal Native Title Consultants) indicated that she felt that the area was not likely to have contained a camp site and that it was used more transiently by Aboriginal people moving between Ellalong Lagoon and Wollombi (Umwelt 2015).

On behalf of Tocomwall, Danny Franks raised some concerns with the nature of the archaeological survey and requested that any future assessment give consideration to 'all of the data the study area in question has to offer' and requested that 'in future developments the scientific approach towards the study area needs to take into account the diffusion of values and ideologies that the landscape and archaeological record can provide to future stakeholders.' Mr Franks then went on to reference the importance of documenting stone artefact assemblages as part of the assessment process. These comments (as documented in Umwelt 2015) have been taken into consideration in terms of the information provided in the ATR (**Appendix 2**).

It is acknowledged that the information presented above may be subject to change with reference to the current ACHAR however this information is provided to demonstrate that previous statements made by Aboriginal parties regarding cultural values have been accepted and used to inform the current assessment.

5.0 Outcomes of Survey of Modification Area

The survey of the LWB4-B7 Modification Area was conducted on 9-10 February 2017, with an additional survey undertaken on 21 March 2017. This section documents the survey outcomes.

5.1 Information provided by Aboriginal Party Representatives

In accordance with the approved methodology, Aboriginal party representatives who participated in the survey were requested to provide information on any Aboriginal cultural values that they identified within the LWB4-B7 Modification Area. Key information provided by Aboriginal party representatives is documented in **Section 3.3.1** and is not repeated here.

5.2 Aboriginal Archaeological Sites/Areas of Archaeological Potential

Detailed information on the archaeological sites and areas of archaeological potential is provided in the ATR (**Appendix 2**) and is summarised below. The LWB4-B7 Modification Area was divided into survey units, as shown with reference to key landforms in **Figure 5.1**. These survey units were subject to pedestrian inspection by Aboriginal party representatives and archaeologists. During the survey, it was noted that the modification area has been subject to a range of disturbance factors associated with historical land use however the potential for alluvial soils to exist in areas along Quorrobolong Creek was identified.

A total of 13 new sites were identified, of which one is located outside the LWB4-B7 Modification Area. Site cards for each site have been completed and submitted to OEH in accordance with the requirements of the NPW Act.

Site locations are shown in **Figure 5.2** and information on sites is summarised in **Table 5.1**.

Table 5.1 Contents of newly identified archaeological sites

Site Name	Site Type	# of Artefacts	Artefact classes	Artefact raw materials
ACM37	Artefact scatter	2	Flakes	Mudstone, quartz
ACM38	Artefact scatter	27	Broken flakes, flakes, broken backed flakes, broken grindstone, flaked piece, heat shatter	Mudstone, silcrete, quartz, tuff, sandstone
ACM39	Isolated artefact	1	Flake	Silcrete
ACM40	Artefact scatter	29	Broken flakes, flakes, broken backed flakes, core, flaked piece, retouched flake	Mudstone, silcrete, quartz, chert, quartzite, petrified wood
ACM41	Isolated artefact	1	Flake	Quartz
ACM42	Artefact scatter	4	Broken flakes, flakes, core	Silcrete, quartzite

Site Name	Site Type	# of Artefacts	Artefact classes	Artefact raw materials
ACM43	Artefact scatter	4	Broken flake, grindstone, retouched flake	Silcrete, unknown
ACM44	Artefact scatter	3	Broken flake, flake, retouched flake	Silcrete, quartzite, fine grained siliceous
ACM45	Artefact scatter	3	Broken flake, retouched flake	Mudstone, silcrete
ACM46	Isolated artefact	1	Flake	Mudstone
ACM47	Artefact scatter	3	Broken flakes	Mudstone, silcrete
ACM48	Isolated artefact	1	Flake	Silcrete
ACM49	Isolated artefact	1	Flaked piece	Silcrete

These sites consisted of isolated artefacts and artefact scatters, with only two sites (ACM38 and ACM40) containing more than five artefacts. The distribution and contents of these sites is relatively comparable to the outcomes of previous archaeological investigations within the Austar Coal Mine and surrounds. No grinding grooves or scarred trees were identified within the LWB4-B7 Modification Area and no areas of outcropping sandstone were present within Quorrobolong Creek.

Based on the criteria for the assessment of archaeological potential, the majority of the LWB4-B7 Modification Area was assessed as having low archaeological potential. The exceptions to this are the valley flats bordering Quorrobolong Creek (moderate potential), slopes within 100 metres of the main channel of Quorrobolong Creek and identified overflow channels and the spur crest in Survey Unit 9 (all of which have low to moderate archaeological potential).

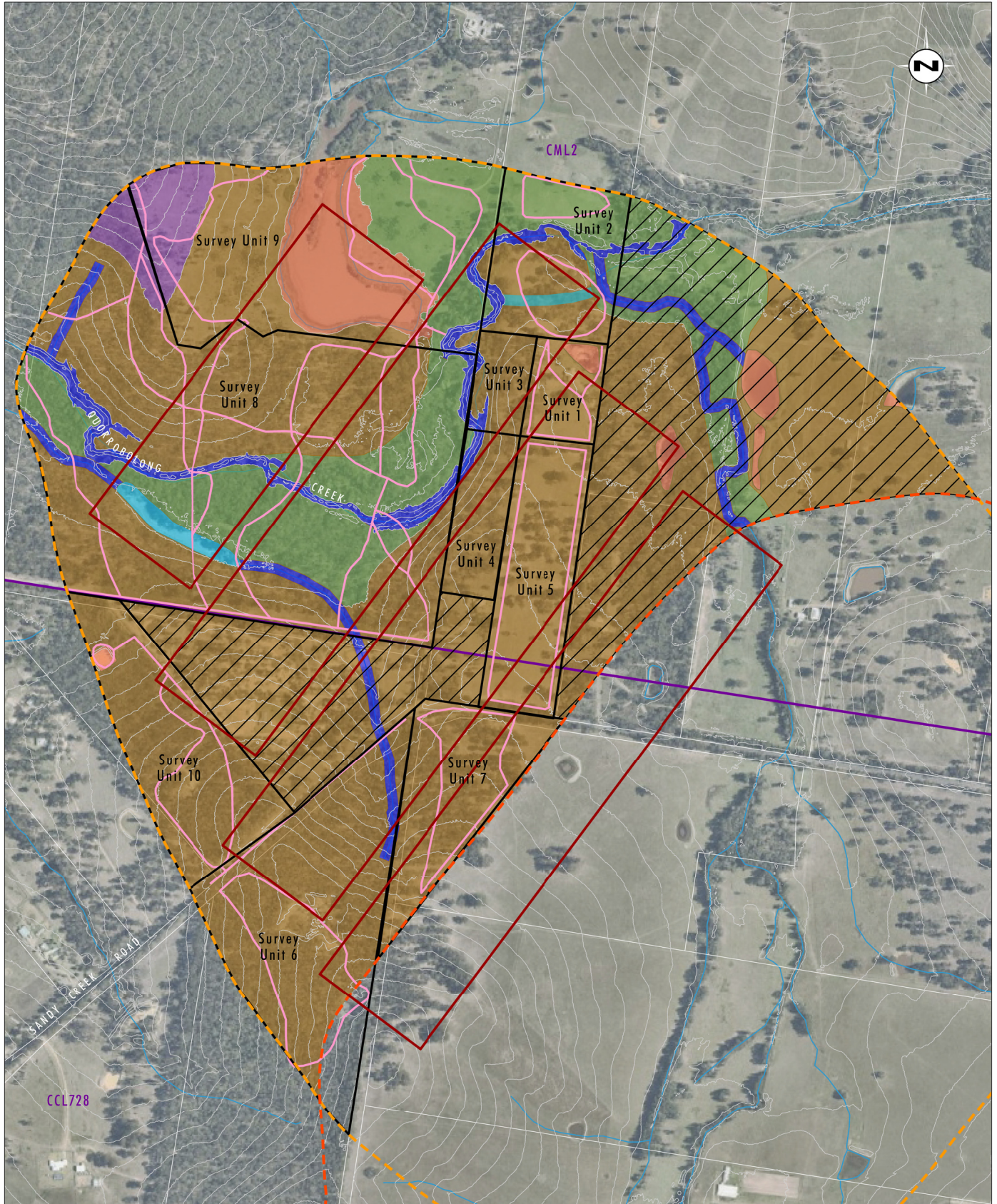


Image Source: Nearmap (2017)
 Data Source: Austar Coal Mine (2017)
 Note: Contour Interval 2m

0 100 250 500m
 1:10 000

Legend

- | | |
|--------------------------------------|-------------------------------------|
| Proposed LWB4-B7 Longwall Panels | Stream Channel (Quorrobolong Creek) |
| LWB4-B7 Modification Area (Proposed) | Valley Flat |
| LWB1-B3 Modification Area | Slopes (Gently Inclined) |
| Mining Lease Boundary | Minor Spur Crest |
| Modified (Dam) | Survey Transect |
| Hill Crest | Survey Unit |
| Overflow Channel | Area not accessible for survey |

FIGURE 5.1
Survey Units

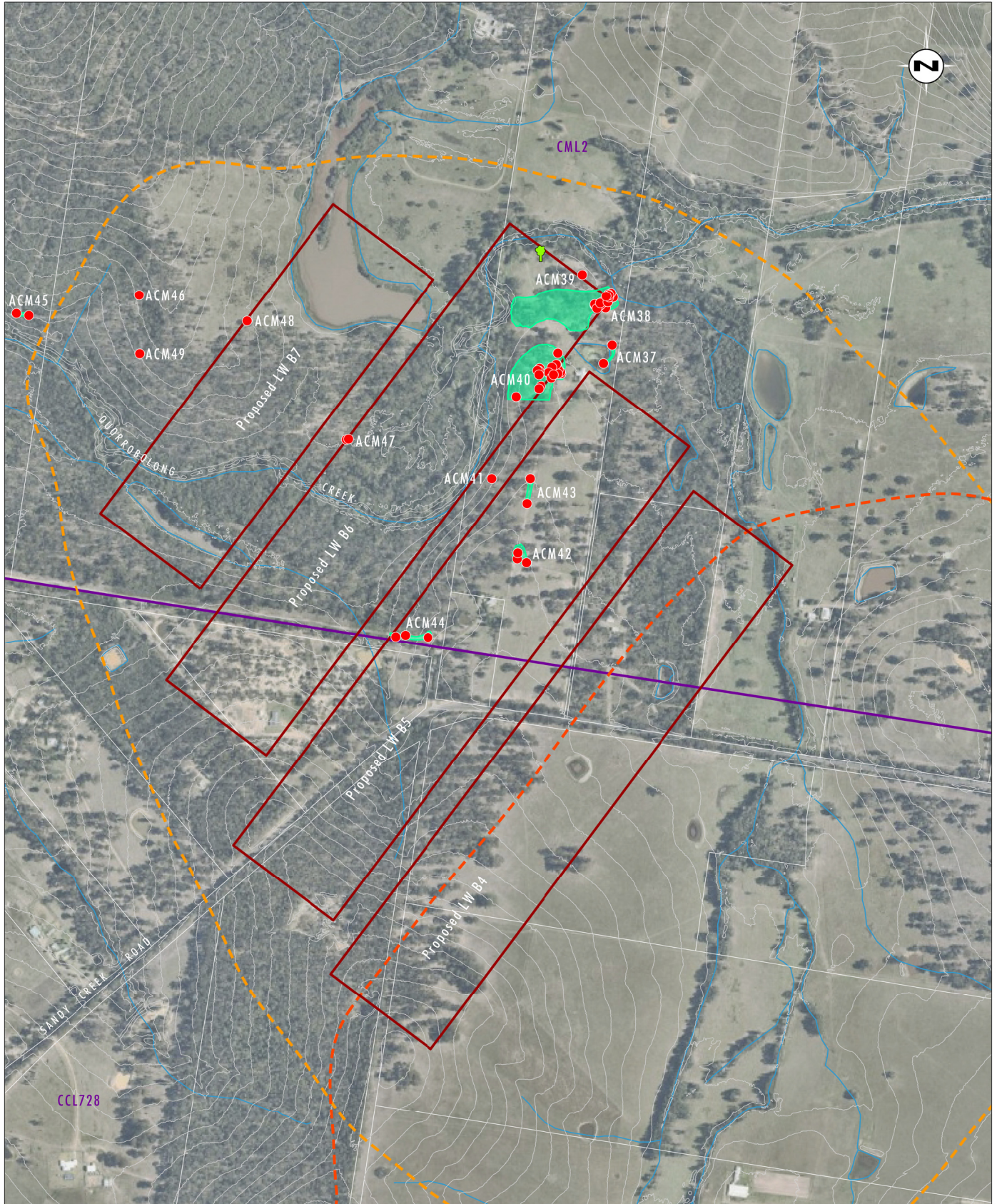


Image Source: Nearmap (2017)
 Data Source: Austar Coal Mine (2017)
 Note: Contour Interval 2m

0 100 250 500m
 1:10 000

Legend

- Proposed LWB4-B7 Longwall Panels
- LWB4-B7 Modification Area (Proposed)
- LWB1-B3 Modification Area
- Mining Lease Boundary
- Archaeological Site Area
- Artefact Location
- 🌳 Tree with Non-cultural Scarring

FIGURE 5.2
Location of Newly Identified Sites

6.0 Assessment of Cultural Value

6.1 Social or Cultural Value

Cultural heritage value refers to the spiritual, traditional, historical or contemporary associations and attachments a place has for Aboriginal people (OEH 2011:8). There is not always consensus about the cultural value of a place as people experience places and events differently, and in some instances cultural values may be in direct conflict. Cultural significance can only be determined by Aboriginal people, and is identified through Aboriginal community consultation.

A draft of this report was provided to the registered Aboriginal parties with an invitation to provide information regarding the cultural significance of the LWB4-B7 Modification Area, the landscape features, archaeological sites and areas of archaeological potential that it contains. . No objections were raised by registered Aboriginal parties to the following summary of information regarding cultural values within the LWB4-B7 Modification Area and surrounds provided by registered Aboriginal parties to date.

Over the course of previous assessments undertaken in the local area, the registered Aboriginal parties have identified that the landscape including the LWB4-B7 Modification Area is of cultural value due to the natural and cultural features it contains and its place within the broader cultural landscape. Previously identified sites have been assessed as being culturally significant as the artefacts within these sites provide a tangible connection to Aboriginal use of the area. In the past, a grinding groove site located outside the LWB4-B7 Modification Area has been identified as having very high Aboriginal cultural significance due to its comparative rarity within the local area and the nature of this particular site type. Registered Aboriginal party representatives also stated that site ACM14, an artefact scatter along Cony Creek, was also of higher cultural significance as the area would have been an area of high occupation and use.

In relation to the current assessment, registered Aboriginal party representatives who participated in the survey identified that Quorrobolong Creek is a key water resource within the area and has high cultural value for both its natural aspects and its association with archaeological evidence. Maintaining the health of watercourses within the LWB4-B7 Modification Area was seen as very important to ensure protection of natural and cultural values.

The Aboriginal party representatives indicated general agreement with the identification of areas of archaeological potential in association with Quorrobolong Creek and the elevated landform in the north-western portion of the LWB4-B7 Modification Area. The Aboriginal party representatives indicated that the identified archaeological sites have inherent Aboriginal cultural value. Danny Franks (Tocomwall) indicated that he felt that the sites or areas of potential where there is an increased likelihood that deposits will retain integrity are of greater value as the interpretation of these sites/deposits could provide more specific information about the Aboriginal occupation of the area and how this may have changed over time.

In providing comments on the draft report, Tracey Skene (Culturally Aware) identified that the landscape in the vicinity of the LWB4-B7 Modification Area has high cultural significance, with each site (both recorded and unrecorded) having unique spiritual and cultural values and connections. The high significance of Ellalong Lagoon was identified by Ms Skene who also stated that the LWB4-B7 Modification Area 'has a known creek called Quorrobolong creek, this area may have a low scientific values but holds a high importance and cultural significance to the Aboriginal Community.'

6.2 Historic Value

Historic value encompasses all aspects of history and as such is often underlying other values. A place may have historic value because it has influenced, or been influenced by, an historic event, phase, movement or activity, person or group of people. The historical values associated with the LWB4-B7 Modification Area are assessed in Umwelt (2017a:Section 6.7). This assessment did not identify any items of historical significance at the local or State level within the LWB4-B7 Modification Area.

As a result of this assessment and previous assessments undertaken in the local area, no specific areas or items of historical value with a direct association with Aboriginal people have been identified. No further information regarding historic value was provided by Aboriginal parties in response to the draft report.

6.3 Scientific (archaeological) Value

An assessment of the scientific (archaeological) value of the sites and areas of archaeological potential is conducted in Section 6 of **Appendix 2**. This assessment was conducted in accordance with OEH requirements and with reference to the key criteria identified in *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011). The factors taken into account in assessing scientific significance are described in Section 6 of **Appendix 2**, with a summary of outcomes provided below.

The archaeological significance of the identified sites was assessed as low, with the exception of sites ACM38 and ACM40, which were assessed as having low-moderate archaeological significance, largely based on their research potential. The assessment of significance of areas of archaeological potential remains a provisional assessment of potential significance only and is linked almost entirely to the research potential of the site. That is, areas of moderate archaeological potential have a provisional assessment of moderate archaeological significance, with areas of low-moderate potential having low to moderate significance.

6.4 Aesthetic Value

Aesthetic value refers to the sensory and perceptual experience of a place. It may consider form, scale, texture and material of the fabric or landscape and may also include smell and sounds associated with the place (OEH 2011:9).

No further information regarding aesthetic value was provided by Aboriginal parties in response to the draft report.

7.0 Impacts of Proposed Modification

The purpose of this section is to identify whether the LWB4-B7 Modification will result in impacts to Aboriginal cultural heritage within the LWB4-B7 Modification Area.

7.1 Subsidence Predictions

The maximum predicted subsidence parameters within the LWB4-B7 Modification Area have been determined by MSEC (2017) and are summarised in **Table 7.1**. The values presented in **Table 7.1** represent the maximum cumulative subsidence associated with the extraction of approved LWB1-B3 and proposed LWB4-B7.

Table 7.1 Maximum predicted subsidence parameters for Aboriginal archaeological sites within the LWB4-B7 Modification Area

Longwall	Max. Predicted Total Subsidence (mm)	Max. Predicted Total Tilt (mm/m)	Max. Predicted Total Hogging Curvature (km ⁻¹)	Max. Predicted Total Sagging Curvature (km ⁻¹)
After LWB4	125	1.5	0.03	<0.01
After LWB5	400	3.0	0.03	0.01
After LWB6	1025	3.5	0.03	0.04
After LWB7	1225	4.5	0.04	0.04

The subsidence predictions outlined in **Table 7.1** for the LWB4-B7 Modification Area are less than those for the previously approved Stage 2 and Stage 3 mining areas, where there has been no significant or notable subsidence or surface cracking observed and no requirement for remediation of any ground surface cracking.

7.2 Potential Impacts of the Proposed Modification

The LWB4-B7 Modification does not involve any additional surface development and therefore will have no direct impact on the landscape within the LWB4-B7 Modification Area. The potential impacts of the proposed modification on archaeological sites are therefore limited to indirect impacts associated with subsidence, including potential landscape impacts, surface cracking, subsidence remediation works or hydrological changes.

7.2.1 Landscape Impacts

The nature of the modification (i.e. underground longwall mining) and the existing undulating landform means there is very limited potential for detectable changes to the landscape to occur as a result of the modification. Potential visual impacts are limited to minor changes in terrain associated with subsidence within the LWB4-B7 Modification Area. Based on this assessment, it is unlikely that the extent of subsidence and subsequent changes to the overall landscape will be able to be detected by eye.

7.2.2 Subsidence related Surface Cracking and Remediation

Potential changes in the ground surface resulting from subsidence have been assessed by MSEC (2017). MSEC notes that surface cracking in soils as the result of conventional subsidence movements is not commonly observed where the depths of cover are greater than 400 metres, as is the case for the proposed modification. The subsidence assessment findings indicate that due to the depth of mining within the proposed modification area (minimum 400 metres), the massive nature of the Branxton Formation sandstones overlying the coal seam resulting in the small magnitudes of predicted ground curvatures and strains and the absence of steep slopes or cliffs within the modification area, the potential for surface cracking is low.

This conclusion is supported by subsidence monitoring evidence within the Stage 2, Stage 3 and LWB1-B3 mining areas, where there has been no significant or visible surface cracking above previously extracted longwalls A3 to A8 or LWB2.

Any surface cracking that does occur is expected to be minor and isolated and unlikely to directly or adversely impact the LWB4-B7 Modification Area. Based on previous experience within the broader Austar Coal Mine, remediation of surface cracking is unlikely to be required within the LWB4-B7 Modification Area.

7.2.3 Hydrological Changes

Flood modelling has been undertaken by Umwelt (2017d) to assess the potential changes in flooding and surface water flows resulting from predicted subsidence associated with the extraction of LWB4-B7. The flooding and drainage assessment concludes that the proposed modification is unlikely to have a significant impact on runoff regimes, bank stability or channel alignment and will not result in scouring or increased erosion of the landscape. The assessment predicts minor changes to remnant ponding around some existing flow paths and farm dams. These minor changes to the extent of remnant ponding occur within low lying areas that are already subject to periodic inundation during periods of high rainfall. Therefore additional periods of inundation in these locations are highly unlikely to result in any additional impact to Aboriginal cultural values that may be present. It is noted that the proposed extent of subsidence is considered unlikely to result in changes to the course of Quorrobolong Creek or to necessitate any mitigation works along the Quorrobolong Creek or associated watercourses.

7.2.4 Summary

Based on the outcomes of assessments undertaken by MSEC (2017) and Umwelt (2017d), the proposed LWB4-B7 Modification is unlikely to result in direct or indirect impacts that will impact the Aboriginal cultural values associated with the area. On this basis, it is not currently necessary to develop avoidance or mitigation strategies as there is no identified impacts.

8.0 Recommendations

The following recommendations were provided to the registered Aboriginal parties for review and comment prior to the finalisation of this report. The recommendations have been developed to reflect the outcomes of consultation with the registered Aboriginal parties and in light of the archaeological context of the LWB4-B7 Modification Area; the findings of the current survey and the previous survey of the LWB1-B3 Modification Area; the low likelihood of impact of the proposed modification on identified archaeological sites and areas of archaeological potential and current cultural heritage legislation:

- The Austar Coal Mine should continue to implement the management strategies currently in place at the Austar Coal Mine, including those in the Austar Aboriginal Cultural Heritage Management Plan (ACHMP). Consistent with existing management strategies, in the unlikely event that subsidence remediation works are required that will impact on the identified sites or areas of low-moderate or higher archaeological potential, an Aboriginal Heritage Impact Permit (AHIP) will be sought for the portion of the site or area of potential to be impacted prior to the commencement of any remediation works in proximity to the recorded site or area of potential (noting that, in some instances, it may be necessary to undertake test excavation to inform the requirement for an AHIP). Appropriate mitigation measures for the site or area of potential to be impacted by the remediation works will be developed as part of the AHIP application process in consultation with the registered Aboriginal parties and in accordance with OEH requirements. The ACHMP includes provision for pre and post subsidence monitoring of recorded sites to provide comparative data on site condition and to allow for the identification of any unexpected subsidence impacts.
- The Austar ACHMP should be reviewed to incorporate the outcomes of this assessment and to include provisions for the monitoring of identified archaeological sites within the LWB4-B7 Modification Area in accordance with the management strategies currently implemented within the Austar Coal Mine.

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