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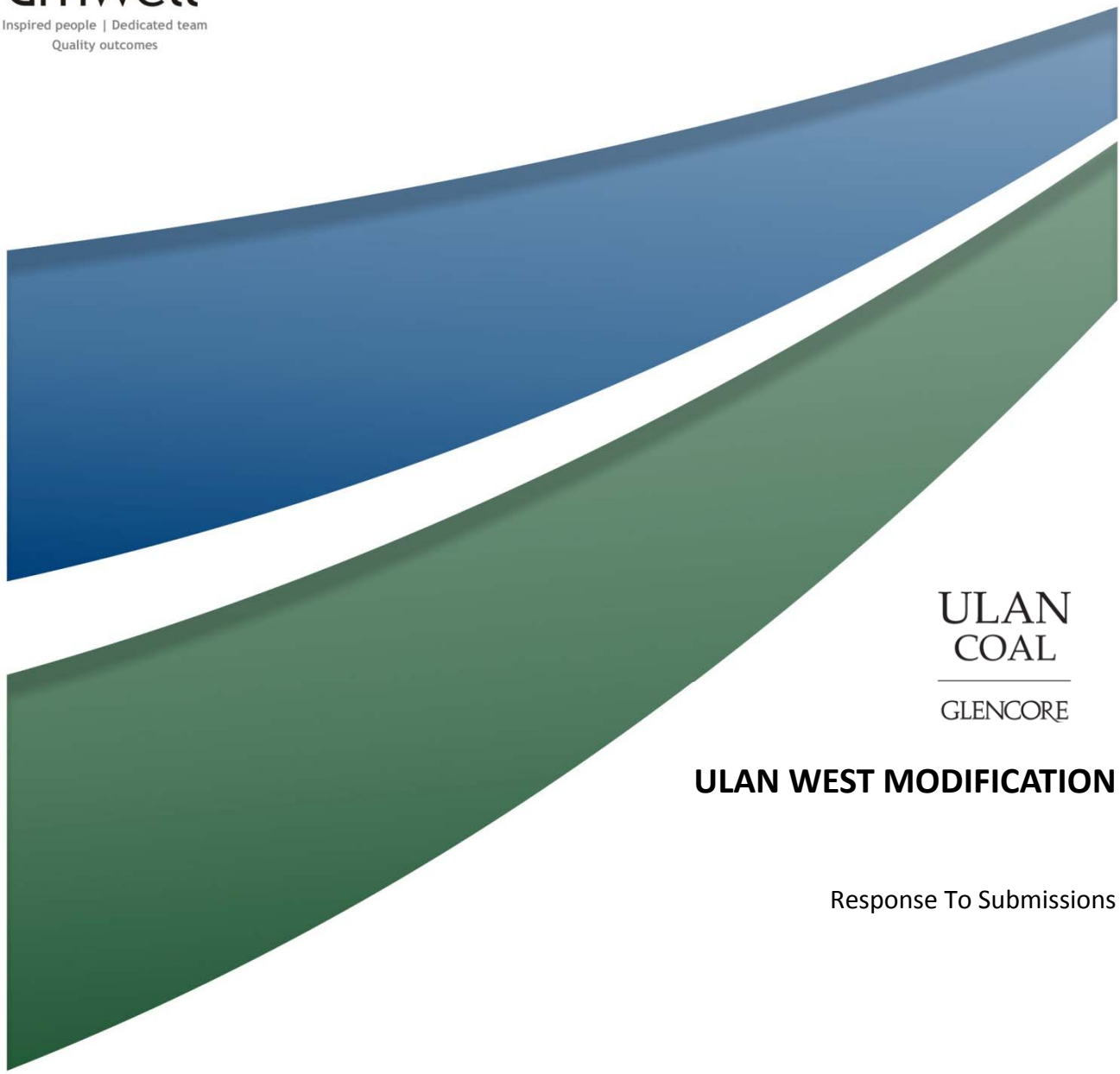

ULAN COAL

GLENCORE

# ULAN WEST MODIFICATION

Response To Submissions

**August 2015**

ULAN COAL

GLENCORE

# ULAN WEST MODIFICATION

## Response To Submissions

**August 2015**

Prepared by
Umwelt (Australia) Pty Limited

on behalf of
Ulan Coal Mines Limited

| | |
|---|---|
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| Report No. | **R10_Final** |
| Date: | **August 2015** |

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# APPENDICES

# 1.0 Introduction

This document provides a response to the issues raised in submissions made during the public exhibition of Environmental Assessment (EA) for the proposed Ulan West Modification (proposed modification) at the Ulan Coal Complex. The EA was lodged with the Department of Planning and Environment (DP&E) and exhibited from 20 March 2015 to 17 April 2015. As requested by the DP&E, this report has been prepared on behalf of Ulan Coal Mines Limited (UCML) to respond to the issues raised in the submissions.

## 1.1 Proposed Modification

As described in the EA, UCML is a joint venture between Glencore Coal Pty Limited (Glencore) (90 per cent) and Mitsubishi Development (10 per cent). The Ulan Coal Complex is located approximately 38 kilometres north-north-east of Mudgee and 19 kilometres north-east of Gulgong in New South Wales (refer to **Figure 1.1**). Operations at the Ulan Coal Complex are located approximately 1.5 kilometres east of the village of Ulan and entirely within the Mid-Western Regional Council Local Government Area (LGA).

UCML was granted Project Approval (PA) 08_0184 under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 15 November 2010 for the *Ulan Coal – Continued Operations Project* (UCCO Project). Approved mining operations within the Ulan Coal Complex consist of underground mining in the Ulan No.3 and Ulan West areas as well as open cut mining, and associated coal handling and processing, and transport through to August 2031 (refer to **Figure 1.2**). UCML also has an existing approval (EPBC No 2009/5252) under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) which was granted on 30 November 2010.

UCML has an existing exploration licence (EL 7542) over an area south west and an area to the north of the currently approved Ulan West mine plan (refer to **Figure 1.3**). UCML has applied for a mining lease in respect of the southern portion of EL7542 (MLA475). As described in Section 2.2 of the EA, UCML is seeking to modify the approved Ulan West underground operations to provide access to additional coal resources within existing mining titles and allow for a realignment of approved longwall panels to provide for the current mine plan (refer to **Figure 1.4**).

The proposed modification will produce approximately an additional 13 million tonnes of run of mine (ROM) coal and extend the life of the Ulan Coal Complex by approximately 2 years. There is no change proposed to the approved Ulan Coal Complex extraction rate of 20 million tonnes per annum (Mtpa) of product coal.

## 1.2 Submissions Made on the Proposed Modification

The Department of Planning and Environment (DP&E) advised that a total of nine submissions were received during the EA exhibition period. Submissions from government agencies that raised issues that required a response were from:

- Mid Western Regional Council;
- Office of Environment and Heritage (OEH);
- Environment Protection Authority (EPA);

- Department of Primary Industries (DPI), including:
    - Crown Lands; and
    - NSW Office of Water (NOW); and
- NSW Trade and Investment, Regional Infrastructure and Services, Division of Resources and Energy (DRE).

Issues raised in these submissions are addressed in detail in **Section 2.0** of this report.

In addition to the above, a submission was received from Roads and Maritime Service (RMS). RMS did not raise any issues to be addressed as part of this report.

A submission from the Wellington Valley Wuradjuri Aboriginal Corporation was received on the proposed modification. This submission was supportive of the proposed modification but raised some specific management recommendations which are addressed in **Section 3.2** of this report.

One public submission was received on the EA. The public submission objected to the proposed modification and raised a number of issues which are addressed in **Section 3.2** of this report.

The issues raised by each government agency (**Section 2.0**) and by the community (**Section 3.0**) are summarised in **bold** in the following sections, followed by a response in normal type.


FIGURE 1.1

Locality Map

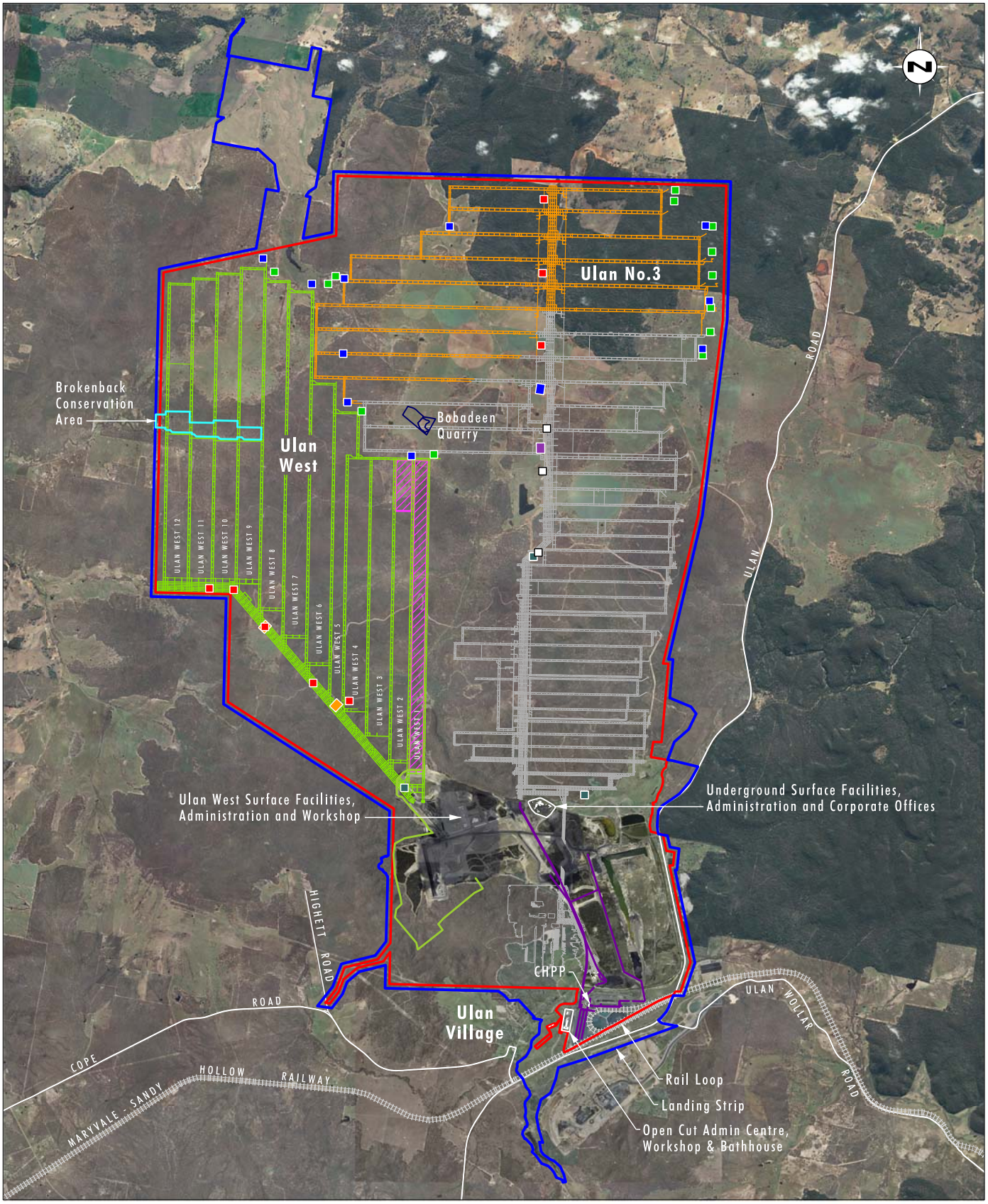


Image Source: Ulan Coal (2008, 2010, 2012, 2014)
Data Source: Ulan Coal (2013)

0 1.0 2.5 5.0km
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## Legend

- Existing Colliery Holding Boundary
- UCML Continued Operations Project Approval Area
- Approved Open Cut Extension
- Approved Brokenback Conservation Area
- Bobadeen Quarry
- Approved Ulan West Mine Plan
- Approved Ulan No.3 Underground Mine Plan
- Previous Underground Mining Operations
- Conveyors
- Approved Upcast Ventilation Shaft
- Approved Downcast Ventilation Shaft
- Approved Service Borehole Facility
- Approved Man Riding Shaft
- Approved Dewatering Bore
- Existing Ventilation Shaft
- Existing Service Borehole
- Longwall Progression as at July 2015

FIGURE 1.2

**Approved Ulan Complex Operations**

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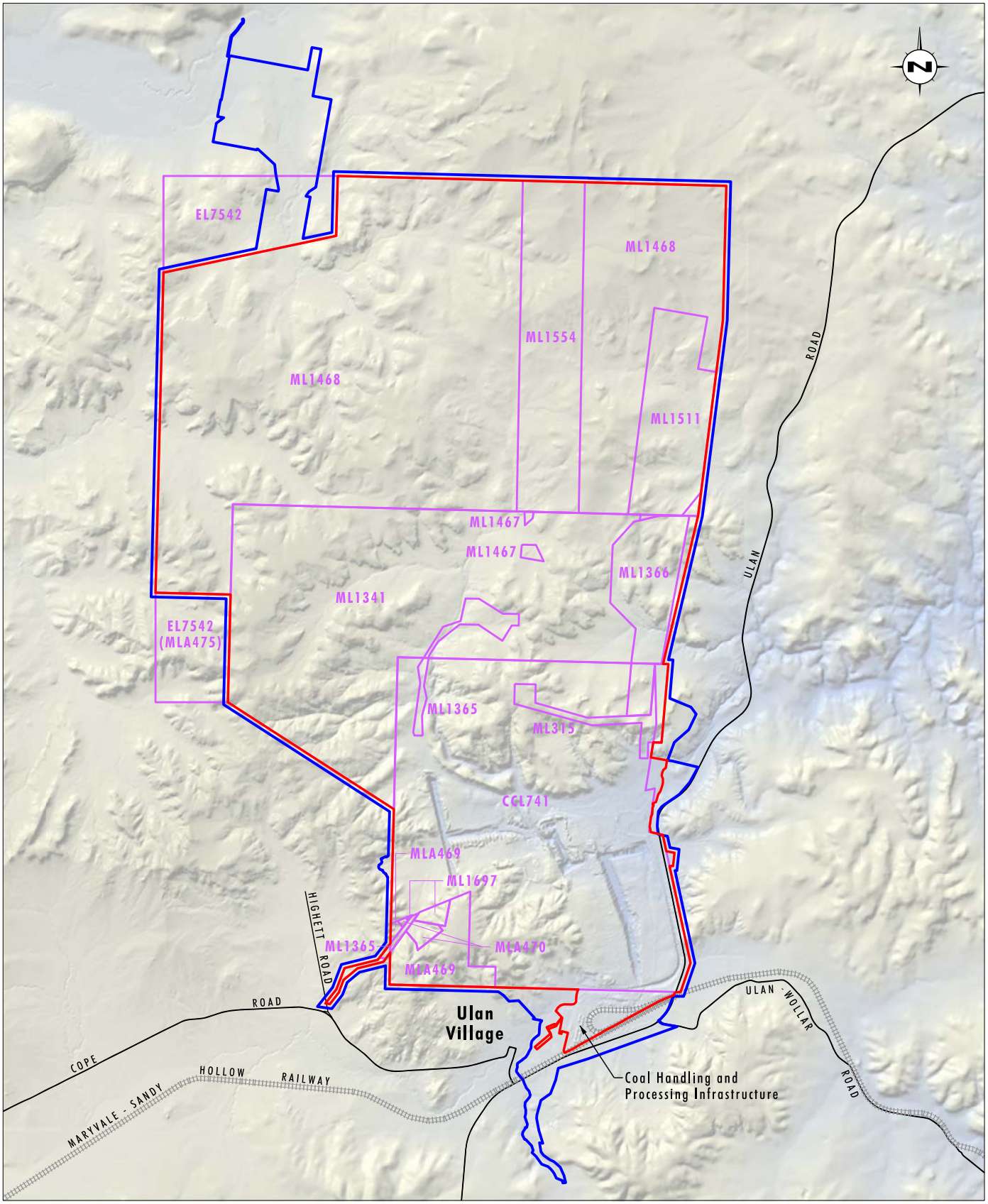
20150804 9.20




Data Source: Ulan Coal (2014)

0 1.0 2.5 5.0km
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## Legend

- Existing Colliery Holding Boundary
- UCML Continued Operations Project Approval Area
- Mine Lease Boundary

FIGURE 1.3

# Existing Mining and Exploration Lease Titles

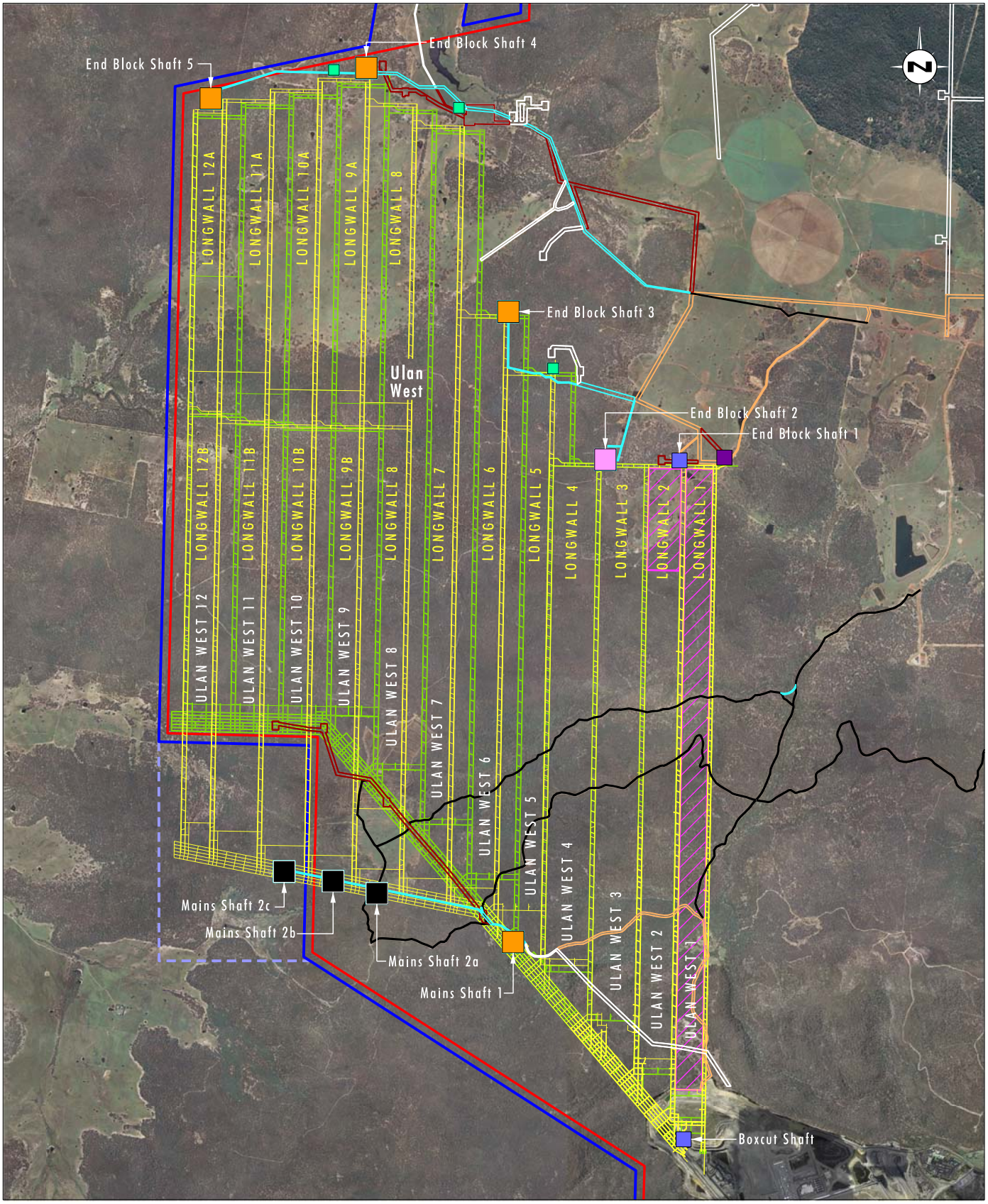


Image Source: Ulan Coal (2008, 2010, 2014)
Data Source: Ulan Coal (2014)

0 1.0 2.0 2.5km
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## Legend

- Existing Colliery Holding Boundary
- UCML Continued Operations Project Approval Area
- MLA 475
- Longwall Progression as at July 2015
- Approved Ulan West Mine Plan
- Proposed Conceptual Ulan West Mine Plan
- Approved Infrastructure Corridor
- Approved Infrastructure Corridor Not to be Constructed
- Proposed Infrastructure Corridor
- Constructed Infrastructure Corridor
- Existing Access Road
- Existing Vent Shaft Compound
- Existing Dewatering Bore Compound
- Proposed Realigned Dewatering Bore Compound
- Proposed New Ventilation Shaft Compound
- Proposed Realigned Ventilation Shaft Compound
- Potential Location of Realigned Ventilation Shaft Compound

FIGURE 1.4

**Proposed Ulan West Modification**

File Name (A4): R10/3363_114.dgn
20150804 9.08

# 2.0 Response to Government Agency Submissions

## 2.1 Mid Western Regional Council

**Council has reviewed the Environmental Assessment and has no submission to make in reference to the proposal to modify the Ulan Continued Operations Project Approval, on the understanding that the Voluntary Planning Agreement between Ulan Coal Mines Limited and Mid-Western Regional Council is extended to cover the additional lifespan of the mine.**

UCML have an existing Voluntary Planning Agreement (VPA) with Mid Western Regional Council. In accordance with Schedule 2 of the VPA, UCML will make additional contributions towards the maintenance of Cope Road for the additional two years of operations.

## 2.2 Department of Trade and Investment, Division of Resources and Energy

**DRE has no objection to the application or any additional requirements to those for the current approval.**

**Subject to the approval of development consent for this proposal, DRE requires the Proponent to submit a revised Mining Operations Plan (MOP) consistent with the modified Project Approval to be submitted and approved by the Secretary of the Department of Trade and Investment.**

UCML currently operate under an approved Integrated Mining Operations Plan (hereafter referred to as the MOP) for the period of 2012 to 2017. UCML will submit a revised MOP to incorporate the proposed modification, consistent with any modified project approval. The MOP will be prepared generally in accordance with all relevant guidelines including the requirements of *ESG3: Mining Operations Plan (MOP) Guidelines* (DRE, September 2013) or its latest version.

## 2.3 Office of Environment and Heritage

**OEH considers that, prior to making a decision the Department of Planning and Environment (DP&E) should be fully satisfied that the current operations of Ulan Coal have been conducted in full accordance with the current Project Approval for application number 08_0184.**

In accordance with Schedule 5 Condition 3 of PA 08_0184, an Annual Environment Report is submitted every year including monitoring results and any exceedances of criteria or non-compliances. The Annual Review is provided to DP&E and OEH.

In accordance with Schedule 5, Condition 8 of PA 08_0184, UCML must also conduct independent environmental audits every three years. The last independent environmental audit was conducted in June 2013.

The independent environmental audit report concluded that a good standard of environmental management is being applied to the Ulan Coal Complex operations. Of particular note the standard of completed rehabilitation, water management and air and noise emissions management were considered commendable.

No non compliances against the relevant criteria for air quality, noise or blasting occurred at private receivers over the audit period. Three minor exceedances occurred as a result of surface water discharges during the audit period. These were with regard to exceedances of the criteria for EC and pH. These incidents were self-reported to the EPA as required under EPL 394.

The audit identified some minor non-compliances against conditions of PA 08_0184 and other licences and approvals. The audit identified that non-compliances were largely administrative in nature.

The independent environmental compliance audit report is available on the Ulan Coal Complex website (www.ulancoal.com.au). The next independent environmental audit will be undertaken in 2016, in accordance with PA 08_0184.

### 2.3.1 Aboriginal Cultural Heritage

OEH's submission noted that the proposed modification has altered the original number of Aboriginal sites that will be harmed, and that in response the proponent has revisited management strategies for those sites within the proposed extension area. OEH is satisfied with the adequacy of information gathered for the proposed additional areas, which includes the survey methods used and the consultation undertaken with the Registered Aboriginal Parties (RAPs).

OEH noted that the Aboriginal Cultural Heritage (ACH) assessment report has recommended, as part of the proposed management strategies, to conduct salvage excavations in select locations. OEH recommended:

**1.1 That suitable research questions are developed for the salvage operations in partnership with the RAPs prior to amending the Heritage Management Plan.**

As identified in Section 10 of the ACHA for the proposed modification (SEA, 2015), the current Ulan Heritage Management Plan (HMP) will be revised and updated should the proposed modification be approved to consider the revised management and mitigation measures proposed. It is also identified that the Rock Shelter Test Excavation Sampling Strategy (Kuskie, 2013) developed as a requirement of Section 3.5.4 of the HMP will also be revised and updated to consider the additional impacts associated with the proposed modification. This will include a revision to the research questions contained within the Rock Shelter Test Excavation Sampling Strategy (Kuskie, 2013), in consultation with the RAPs, as recommended by OEH.

**In addition, OEH notes the request from the Wellington Valley Wiradjuri Aboriginal Corporation (letter dated 15/4/2015) with regard to examining the cost benefit of mitigation, and offsetting instead with RAP projects such as a heritage centre or education program.**

UCML have undertaken ongoing consultation with the RAPs and proposed a number of potential management measures. These include:

- conduct residue analysis of Haglund's SG5 artefacts;
- 3D scanning of selected rock shelter sites that can be used for education and heritage awareness;

- collecting and investigating bush food plants across the Ulan Coal Complex that can be used for education and awareness;

- Wiradjuri Language Program recording stories and sharing knowledge via the creation of a digital resource that can be used for education and heritage awareness;

- rock shelter text excavation sampling at four of the Cockabutta Creek sites; and

- improving access to Hands on Rock including walking tracks, road access and signage.

The Wellington Valley Wiradjuri Aboriginal Corporation (WVWAC) have indicated they are supportive of the proposed mitigation measures in correspondence dated 30 June 2015. Other RAPs, including the Murong Gialinga group, have also been supportive of the proposed mitigation measures as discussed further in **Section 3.1**. UCML will continue to consult with the RAPs on an ongoing basis throughout the life of operations and in accordance with the HMP.

### 2.3.2 Subsidence and the scope of the Environmental Assessment

**OEH is concerned that the environmental assessment (EA) makes statements that broadly compare the impacts of the proposed modification with the currently approved project without clearly substantiating claims made.**

A detailed subsidence assessment was prepared by Strata Control Technologies (SCT) for the proposed modification and is contained within Appendix 2 of the EA and a summary provided in Section 5.2 of the EA main text.

As outlined in Section 3.3 of the Subsidence Assessment (Appendix 2 of the EA), the approach to estimating subsidence used in the SCT assessment is based on a review of previous experience over 33 previous longwall panels at Ulan No. 3 mine and estimating the maximum likely subsidence based on this data. This method is an empirical approach suitable for providing an upper limit based on experience to date. Actual subsidence and subsidence parameters are expected to be generally less and in most cases significantly less than the upper limit values provided by an empirical approach, as has been experienced previously at the Ulan Coal Complex. The upper limit estimate of subsidence movements is considered appropriate for assessment purposes.

Recent experience in Ulan West LW1 has indicated that subsidence behaviour for mining to date in the Ulan West area is as expected (SCT 2015a). The measured values are generally less than predicted and of the expected form. Maximum subsidence to date has been 1.2 metres (SCT 2015a).and within the 0.9 to 1.5 metre range predicted in the Subsidence Assessment for the EA.

The approach taken in the SCT (2015) assessment for the EA has been to provide conservative estimates of subsidence, recognising that in the particular circumstances at Ulan West Mine, none of the impacts are likely to be particularly sensitive to the specific magnitude of subsidence, but rather to the general nature of the subsidence expected. Further refinement is expected to be possible as the subsidence database for shallower areas and observations of subsidence behaviour across multiple depth ranges increases with further high quality subsidence monitoring.

Subsidence for the modified Ulan West mining area is expected to be generally consistent with subsidence experienced in the previously mined longwall panels within Ulan No.3 subject to the prediction estimates, particularly vertical subsidence and angle of draw as discussed below. The key subsidence impact parameter prediction results are outlined in **Table 1**.

**Table 1 – Predicted Subsidence Parameters**

| Parameter | Maximum | Typical |
|---|---|---|
| Vertical Subsidence (m) | 2.1 (1.6) | 0.9-1.5 (0.9-1.5) |
| Tilt (mm/m) | 120 (120) | 15-40 (10-40) |
| Horizontal Movement (mm) | 500 (500) | 150-200 (150-200) |
| Strain (mm/m) | 50 (50) | 15-20 (5-15) |
| Crack width (mm) | 250 (250) | 20-100 (40-100) |
| Goaf Edge Subsidence (mm) | 130 (130) | 130 (130) |
| Angle of Draw (°) | 45 (41) | 20-30 (10-30) |

**Note:** The approved UCCO Project subsidence predictions are provided in brackets.

The maximum vertical subsidence prediction has increased from the UCCO Project assessment. The magnitude of subsidence is greater in the lower depth of cover areas associated with the proposed modified Ulan West mining area and the nominal mining height used for assessment purposes has increased from 2.9 metres in the UCCO Project assessment to 3.2 metres in the assessment associated with the proposed modification, due to the estimated likely height feasible to extract.

Figure 6 of the Subsidence Assessment (Appendix 2 of the EA) demonstrates the predicted subsidence for the modified Ulan West mining area.

Section 4 of the Subsidence Impact Assessment provides an assessment of the subsidence impacts on surface features located within the modified Ulan West mining area and an assessment of the specific subsidence impacts focussing on those features where the changes in mine layout have potential to cause different impacts to the impacts described in the UCCO assessment.

**For example, in relation to the Talbragar Fish Fossil Reserve, section 5.2.4.5 of the EA (and section 4.6 of the Subsidence Assessment) simply states,**

***The changes to the mine layout associated with the proposed modification are not expected to have any significantly different impact on the Talbragar Fish Fossil Reserve compared to the impacts of the mining layout described in the approved UCCO Project. Mining subsidence is expected to cause lowering of the ground surface and possible surface cracking. However, given the fragmented nature of the chert beds and the low strength nature of the underlying strata, it is considered likely that mining subsidence movements would be accommodated without significant disturbance to the fish fossil beds.***

**There is no discussion in the EA regarding the extent of subsidence predicted for the Fish Fossil Reserve, nor the extent to which this has changed given the proposed repositioning of the longwalls and pillars in relation to the Reserve. It is noted that condition 24 of the current Project Approval requires negligible subsidence impact on the Talbragar Fish Fossil Reserve.**

The Talbragar Fish Fossil Reserve is located above Longwall 9 in the northern part of the Ulan West mining area. The Talbragar Fish Fossil Reserve is located on and adjacent to a currently approved chain pillar. Under the proposed modification, the Talbragar Fish Fossil Reserve would be located approximately 12 metres from the edge of a chain pillar. As discussed below, the Subsidence Assessment for the EA assessed the potential change in subsidence associated with the modified mine plan and concluded that the impacts on the Fish Fossil Reserve will remain negligible, consistent with current project approval requirements.

Impacts of longwall mining on the Talbragar Fish Fossil Reserve was first assessed by Australian Museum Business Services (AMBS) in 1996.

The Talbragar Fish Fossil Reserve includes the majority of a deposit of Jurassic age sediments that contain an abundance of extremely well preserved fish, plant and invertebrate fossils. The fossils were first discovered in 1889. Collection has taken place ever since and over 100 years a large amount of rock has been removed. The deposit covers an area of approximately 4 hectares (550 by 100 metres) (AMBS 1996). The site is thought to be the erosional remnant of the margin of a small fresh water lake bed deposit, with a thickness no greater than 60 centimetres.

The site itself is inconspicuous, forming a north to south orientated low ridge on the side of a small hill. It is made up of hard cherty shales, characteristically weathered into rectangular slabs (the fossil bearing rock) with concentric iron stained bands. These slabs float over the soil and part readily along bedding planes to reveal perfectly preserved plant and fish fossils. The first fossil to be described from the locality was an insect specimen, *Cicada Lowei*. A further twelve species of plant fossils have been described from the site, as well as eight species of fish fossils, all of which are unique to the locality (DEWHA RNE listing 465).

The site has been significantly disturbed as a result of two major trenches that have been excavated across the deposit by tertiary education institutions as part of field investigations. Artefacts from this survey are now contained within the Gulgong Pioneer museum which houses an exhibit dedicated to the Fish Fossil Reserve and describes the University field trip.

An assessment of the impact of underground mining on the Talbragar Fish Fossil Reserve was undertaken by AMBS (1996), prior to the grant of development consent (DA 113-12-98) for longwall mining beneath this site.

The impact of underground mining on the Fish Fossil Reserve was also later assessed for the UCCO Project EA (Umwelt 2009), which concluded that:

> *While the subsidence movements will result in a change in elevation to the location of the Talbragar Fish Fossil Reserve and possible cracking of the ground surface, these movements are expected to be accommodated without significant disturbance to the fish fossil beds because of their already fragmented nature. These changes are not predicted to be important, notable or of consequence or result in either direct or indirect impacts on the existing character or heritage values of the site. The impacts on the Talbragar Fish Fossil Reserve are not considered to be significant.*

The Talbragar Fish Fossil Reserve has been specifically assessed in the Subsidence Impact Assessment for the currently proposed modification to longwall mining (SCT 2015). The assessment found that the proposed impacts to the Talbragar Fish Fossil Reserve will be consistent with the approved impacts despite the realignment of longwalls associated with the proposed modification. Based on the Subsidence Impact Assessment (SCT 2015) the proposed impacts will be consistent with Condition 24 of PA 08_0184, being negligible.

**Further OEH raised a general concern regarding the level of discussion of any specific environmental impacts that the proposed westerly shift in longwall positions might have on particular features of significance and recommended:**

**2.1 That the predicted change in subsidence with the relocation of the longwalls, and the impacts of this on features of significance, be clearly quantified.**

The westerly shift in longwall positions was specifically assessed in the Subsidence Impact Assessment (SCT 2015). The predicted subsidence for the modified Ulan West mining area is shown on Figure 6 of the Subsidence Assessment (Appendix 2 of the EA). Section 4.0 of the Subsidence Impact Assessment (SCT 2015) provides an impact assessment for the proposed modification compared to the approved Ulan West mining area.

In response to item 2.1 in the submission by OEH, Section 4.0 of the Subsidence Impact Assessment specifically discusses potential subsidence impacts in relation to all key significant surface features including:

- sandstone cliff formations;
- watercourses;
- natural seeps and springs;
- Talbragar Fish Fossil Reserve;
- archaeological sites;
- European heritage features;
- surface improvements, including:
    - power lines;
    - Ulan trigonometry station;
    - residences;
    - fences;
    - farm dams;
    - water bores; and
    - access roads and tracks.

Relevant sections of the EA have drawn upon this assessment of potential subsidence impacts on relevant surface features, placing particular emphasis on potential impacts on features of significance. For example, the ecological assessment in Appendix 5 and Section 5.5 of the EA, draws on specific subsidence predictions in relation to the potential impacts on sandstone cliff lines, to describe and assess potential impacts on threatened bat species. All Aboriginal sites which are susceptible to new or modified subsidence impacts as a result of the modified mine plan are listed in Table 2 of Appendix 2 of the EA, including a direct comparison to previous subsidence predictions for the approved mine plan, and an assessment of the predicted impact associated with the modified mine plan. Similarly, the groundwater modelling and assessment by Mackie (2014) draws upon the subsided landform analysis provided by SCT in order to assess impacts on groundwater resources (refer to Section 5.3 and Appendix 3 of the EA).

Additionally, an Extraction Plan will require specific details on features and predicted subsidence. Each Extraction Plan will be prepared in accordance with relevant guidelines and approved by DP&E and DRE.

### 2.3.3 Offsets

OEH notes that there will be an overall 2ha increase in the total area of native vegetation cleared for the proposal compared with the UCCO. Further, OEH acknowledges UCML's efforts to avoid areas of significant native vegetation (such as White Box Woodland) when relocating surface infrastructure, resulting in a decrease of approximately 14.4 ha of White Box Woodland being impacted.

OEH recognises the objectives of the Ecological Assessment in relation to offsetting as being focused on any: residual unavoidable significant impact to threatened or migratory species, endangered populations, TECs, or their habitats recorded (or with potential to occur) in the proposed modification areas (refer to Section 1.2 of the Ecological Assessment).

**While the Ecological Assessment does not identify any significant impacts, no discussion is provided regarding offset requirements.**

As noted by OEH, the proposed surface infrastructure for the proposed modification will impact a total of 2.1 additional hectares from that already approved. The vegetation communities subject to this additional impact include:

- Dry Heathland on Rocky Outcrops;
- Ironbark Open Forest Complex on Sandstone;
- Ironbark Open Forest Complex on Sandstone (Regenerating);
- Rough-barked Apple Open Forest on Alluvium/Colluvium (regenerating); and
- Stringybark-Ironbark Open Forest on Sandstone Slopes.

There is no impact (in terms of condition or viability) predicted on vegetation communities falling within the subsidence affectation area.

As also noted by OEH, a number of vegetation communities have experienced a net decrease in impact as a result of the proposed modification. Importantly, there has been a net reduction in impact on the White Box Woodland TEC as a result of the proposed modification.

Based on the OEH submission, UCML propose to increase the Spring Gully Cliff Line Management Area (refer to **Figure 2.1**). This addition is primarily driven by the potential cliff lines impacts associated with the proposed modification (as discussed in further detail in **Section 2.3.5**). However, this proposed addition will also capture a total of approximately 62.4 hectares of existing vegetation. The vegetation composition of the existing and proposed Spring Gully Cliff Line Management Area is provided in **Table 2**. This shows that there will be a total of approximately 273.2 hectares of intact vegetation captured within this revised area. The addition of approximately 62.4 hectares of vegetation to the existing management area covers three of the four impacted communities (excluding regenerating variants). It includes an additional community (being Scribbly Gum Woodland – Heathland on Sand Plateaux) which occurs in a similar landscape position to the Dry Heathland on Rocky Outcrops, which is not included in the management area.

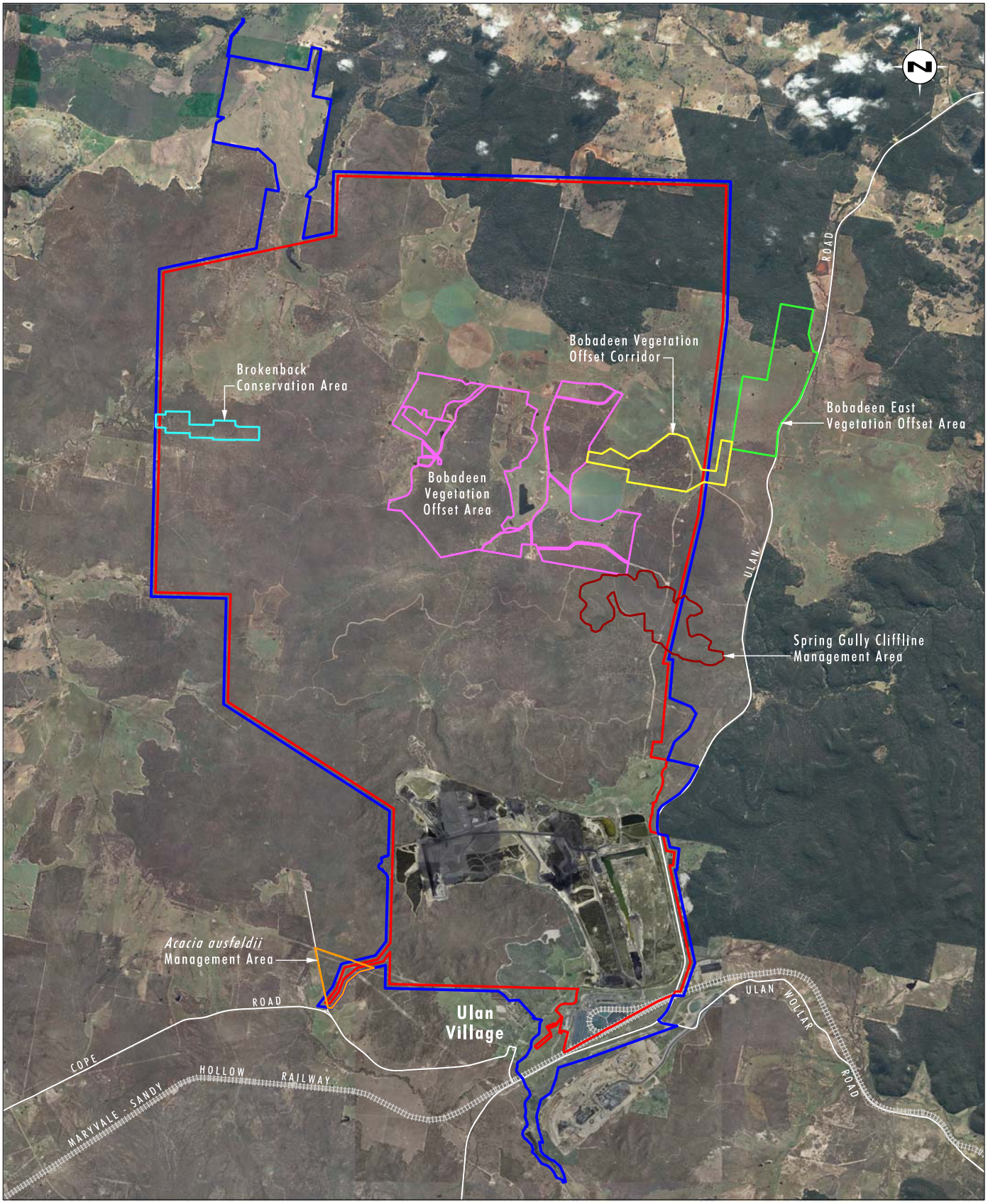


Image Source: Ulan Coal (2008, 2010, 2012, 2014)
Data Source: Ulan Coal (2015)

0 1.0 2.5 5.0km
1:100 000

## Legend

- Existing Colliery Holding Boundary
- UCML Continued Operations Project Approval Area
- Approved Brokenback Conservation Area
- Bobadeen Vegetation Offset Area
- Bobadeen East Vegetation Offset Area
- Spring Gully Cliff Line Management Area
- Bobadeen Vegetation Offset Corridor
- *Acacia ausfeldii* Management Area

FIGURE 2.1

**Biodiversity Offset Areas**

File Name (A4): R10/3363_115.dgn
20150715 9.02

**Table 2 – Vegetation Within the Spring Gully Cliff Line Management Area**

| Vegetation Type | Spring Gully Existing Management Area (Ha) | Spring Gully Proposed Additional Management Area (Ha) | Total (Ha) |
|---|---|---|---|
| Ironbark Open Forest Complex on Sandstone | 79.7 | 30.7 | 110.4 |
| Narrow-leaved Ironbark Open Forest on Alluvium/Colluvium | 13.8 | 0.0 | 13.8 |
| Rough-barked Apple Open Forest | 19.9 | 3.2 | 23.1 |
| Scribbly Gum Woodland – Heathland on Sand Plateaux | 69.7 | 14.1 | 83.8 |
| Stringybark-Ironbark Open Forest on Sandstone Slopes | 27.7 | 14.4 | 42.1 |
| **Total Vegetation** | **210.8** | **62.4** | **273.2** |

This addition to the existing management area will be managed in accordance with the objectives and criteria for the approved Spring Gully Cliff Line Management Area, as defined within the current Ulan Offset Management Program (OMP) and Ulan Biodiversity Management Plan (BMP).

**OEH notes that the current Project Approval for 08_0184 includes Condition 43 Long Term Security of Offset. This condition requires:**

***Within 1 year of the date of final Orders being made by the Land and Environment Court in proceedings No. 10998 of 2010, the Proponent shall make suitable arrangements to provide appropriate long term security for the Bobadeen Vegetation Offset Area, the Bobadeen East Offset Area, the Brokenback Conservation Area, the stand of Acacia ausfeldii along the eastern side of Highett Road and the Spring Gully Cliffline Management Area to the satisfaction of the Director- General.***

**There is no information in the EA or the Environmental regarding the status of these offset areas, or whether this condition has been fulfilled.**

**3.1 That details of the offset areas listed in Condition 43 be provided, including:**

- **Objectives of each offset area,**
- **Management actions that have been implemented**
- **Mechanisms used to provide long term security of the offsets**

UCML is managing its offset areas in accordance with the BMP and OMP. Both the OMP and BMP were developed in consultation with OEH to the satisfaction of DP&E and have been approved.

The BMP and OMP include objectives for each offset and management area and detailed management measures. The specific measures undertaken each year are reported in the UCML Annual Environmental Review. The UCML Annual Environmental Reviews are available on the Ulan Coal Complex website (www.ulancoal.com.au) and are provided to OEH and DP&E annually.

Within the EA, the proposed modification did not propose any changes to the existing offset areas at the Ulan Coal Complex. As such, there was limited discussion of existing offsets or the current status of the existing offsets at the Ulan Coal Complex as part of the EA for the proposed modification. The status of these offset areas is reported in the Annual Environment Report each year, a copy of which is provided to OEH.

As identified in the OEH submission, UCML have a number of offset and management areas, including:

- Bobadeen Vegetation Offset Area;
- Bobadeen East Offset Vegetation Area;
- Brokenback Conservation Area;
- Spring Gully Cliff Line Management Area; and
- Highett Road *Acacia ausfeldii* stand.

The location of the offset and management areas is shown on **Figure 2.1**. The Brokenback Conservation Area is the only offset or management area within the Ulan West mining area. As outlined in the EA, the proposed modification has been designed to maintain the existing Brokenback Conservation Area.

The above offsets are established although the mechanism for long term security is still being resolved. Delays have resulted from the fact that, until recently, there had been no formal government policy regarding the available mechanisms for long term security. There is still no clear consensus amongst the government agencies as to the appropriate mechanism to be used.

Consultation with DP&E and OEH continues and the timeframe for this to be resolved was extended with a resolution to be agreed by 31 December 2015 (as per correspondence received from DP&E dated 17 June 2015). Offsets continue to be managed in accordance with the Biodiversity Management Plan (BMP) which was developed in consultation with DoE, OEH and DP&E.

Management measures are are reported in the UCML Annual Environmental Review. The UCML Annual Environmental Reviews are available on the Ulan Coal Complex website (www.ulancoal.com.au).

**3.2 That the offset requirements of the modification be assessed.**

As described above, and in **Section 2.3.5** of this report, in response, UCML propose to increase the existing Spring Gully Cliff Line Management Area. Approximately 62.4 hectares of additional existing vegetation will be included in the existing management area covering three of the four impacted communities (excluding regenerating variants). It includes an additional community (being Scribbly Gum Woodland – Heathland on Sand Plateaux) which occurs in a similar landscape position to the Dry Heathland on Rocky Outcrops, which is not included in the existing management area.

### 2.3.4 Acacia ausfeldii

OEH notes the identification of additional Ausfeld's wattle (Acacia ausfeldii) locations in the southwest UCCO Project boundary and queries the location and management intent for these identified plants. Further clarification is also sought by OEH on the location of an offset area dedicated to protecting this species in the south west of the Ulan Coal Complex along Highett Road. Specifically, OEH recommend:

**4.1 That the additional Ausfeld's wattle locations, and any intended management actions, be provided.**

As detailed in Table 4.6, Section 4.1.3 of the Ecological Assessment for the proposed modification, there were no *Acacia ausfeldii* populations identified in the area of Ulan West modification, however it was assessed as having a moderate likelihood of occurring. The assessment concluded that the proposed modification is unlikely to have a significant impact on the *Acacia ausfeldii* populations.

**4.2 That detail is provided regarding the Highett Road Ausfeld's wattle population. This should include a map at an appropriate scale depicting the areal extent of the population, the status of the offset security, and the management actions that have been implemented.**

The location of the *Acacia ausfeldii* adjacent to Highett Road is provided on **Figure 2.1**. The management and monitoring commitments are summarised below and detailed in the BMP and OMP.

The population of *Acacia ausfeldii* located along Highett Road (approximately 1.5 kilometres south-west of southern extent of open cut disturbance area) does form an in-situ offset to be given long term protection, in accordance with PA 08_0184. As previously discussed in **Section 2.3.3**, the security mechanism for the offset and management areas is still being resolved in consultation with OEH and DP&E.

The population is located along the eastern side of Highett Road, including within the road reserve and adjoining UCML owned land, and contains approximately 200 plants. The habitat is dominated by *E. Dwyeri* and *Callitris endlicheri*. Highett Road is owned and managed by Mid-Western Regional Council and is a low use road. Threatened species conservation markers are placed on the road to ensure persons maintaining the road are aware of the presence of *Acacia ausfeldii* in the vicinity. The proposed management including protection and monitoring of this area is outlined in the BMP.

Every year the existing population of *Acacia ausfeldii* along the eastern side of Highett Road is monitored and the following vegetation characteristics recorded:

- density, height and DBH of Acacia ausfeldii seedlings, saplings and mature shrubs;
- floristic composition (including cover and abundance of species) and structure;
- general health of vegetation;
- evidence of natural regeneration;
- occurrence and abundance of weed species;
- presence of threatened or other significant species;
- signs of disturbance, either by stock or humans;
- evidence of feral animals; and
- any observable impacts, such as the effectiveness of fencing and weed control actions.

The average height of mature individuals increased from 1.92 metres in 2013 to 2.07 metres in 2014, indicating continued growth in *Acacia ausfeldii* plants within the offset area established at Highett Road (refer to **Figure 2.1**) (Ecological Australia 2015). Condition ratings and notes recording senescence or snapped stems reflect a decline in overall population health. This is consistent with the ecology of *Acacia ausfeldii* being a short-lived pioneer species which requires disturbance and in particular soil disturbance (Ecological Australia 2015).

Further, *Acacia ausfeldii* appear to be establishing in significant numbers within the rehabilitated areas in the open cut. Results of monitoring of the populations of *Acacia ausfeldii* within the two post-mining open cut translocation plots indicate that there has been successful germination of *Acacia ausfeldii* seedlings from the topsoil seed bank and sub-soil root zone, and that these are developing into healthy saplings (Ecological Australia 2015). An additional area of *Acacia ausfeldii* was recently identified at a location near to the Highett Road population.

The implementation of a limited hazard reduction burn program within the offset area is being considered for 2015/16 to promote regeneration of the species. This would target areas where populations are declining due to lack of disturbance.

### 2.3.5 Cliff line Habitat

**The Ecological Assessment recommends that the current monitoring program be extended (where necessary) to include monitoring of the anticipated impacts resulting from the proposed modification. Particular emphasis should be placed on the monitoring of micro-bats and cliff line habitats within the proposed modification areas.**

As outlined in the BMP and OMP, targeted micro-bat monitoring is completed in cliff line areas within the Ulan Coal Complex to assess micro-bat habitat usage and as part of ongoing subsidence management monitoring. The results of this monitoring are detailed in the Annual Environment Report which is provided to OEH. The current micro-bat monitoring programs will be extended to include monitoring of the potential impacts resulting from the proposed modification.

**While OEH concurs with the extension of the monitoring program, we are concerned that, despite the doubling of the area of predicted cliff line impact and the assumption that this area may be used by micro bats, the Ecological Assessment and EA do not provide any options for avoidance and/or mitigation measures to reduce the potential for cliff fall. The assessments also do not provide a review of offset requirements or any information regarding the objectives, security and management of the Spring Gully Cliffline offset area.**

The extent of cliff lines across the Ulan Coal Complex and immediate surrounds were identified as part of the UCCO Project through a combination of digital elevation modelling, comparison with 1:25,000 series topographical maps, and field observations. Cliffs are defined for the purposes of assessment as being greater than 10 metres in height. A digital elevation model (DEM) was developed based on airborne laser scanning (ALS) survey data (prepared in 2007) of the Ulan Coal Complex. Slope analysis of the DEM was used to identify the steeper sections of terrain and estimated heights of these sections. Field observations, height resolution contours and previous mapping of cliff lines on 1:25,000 series topographical maps were used to cross check the locations and heights of the identified cliff lines.

Experience at the Ulan Coal Complex and other sites based on extensive monitoring indicates that rock falls are likely along 10 to 20 per cent of the length of cliff formations located directly above longwall panels and the intermediate chain pillars (SCT 2015).

Cracking and other subsidence related disturbance is typically perceptible on 70 per cent of cliff formations directly under mined. In general, cliff formations that are high, overhanging and laterally extensive are impacted more than low, isolated features such as boulders or pagoda formations particularly when these isolated features are less than 20 metres in lateral dimension and less than 3 metres high (SCT 2015).

Monitoring of subsidence impacts on fauna habitat within cliff lines in the Ulan No.3 mine, specifically the North 1 area, has been undertaken by Ecological Australia. The aim of the monitoring was to document the post-mining monitoring results of cliff line monitoring and provide a quantitative assessment against pre-mining data to compare these results against the subsidence impact performance measure at the Ulan Coal Complex.

The monitoring undertaken indicates that the North 1 mining area did not experience mining-induced rock fall of more than 20 per cent of the total length of cliff line and as such UCML did not exceed the related subsidence impact performance measure. The monitoring has demonstrated the actual impact experienced in North 1 is an average of 6.0 per cent of the total length of cliff line within the predicted subsidence impact area. Further, the bat monitoring, undertaken by Fly by Night, over four years found that overall microbat diversity has not declined and that the age composition and body condition of the two most regularly captured species has remained relatively stable over this period.

The proposed modification will result in a net decrease in potential cliff line impact as a result of the proposed surface infrastructure, when compared to the approved surface infrastructure (approximately 35.2 metres proposed impact compared to approximately 105 metres of approved impact). However, the subsidence affectation area for the proposed modification will result in a net increase in potential cliff line impact of up to approximately 1,256 metres. However, based on the subsidence modelling and previous monitoring of cliff-line impacts, this estimate is considered to be conservative.

As described in **Section 2.3.3**, UCML propose an addition to the existing Spring Gully Cliff Line Management Area in order to compensate for the net increase in potential impact to the modelled cliff lines as a result of the proposed modification (refer to **Figure 2.2**).

The approved Spring Gully Cliff Line Management Area is part of the offset strategy for UCML as required by Schedule 3, Condition 41 of PA 08_0184 and specifically addresses impacts to cliff lines and the species which rely on these areas, particularly the threatened large-eared pied bat (*Chalinolobus dwyeri*). The Spring Gully area is of particular value to this species as a lactating female was captured there in 2004, thus indicating a reasonable likelihood of a maternity roost being present.

The proposed addition to the Spring Gully Cliff Line Management Area is of equivalent length to the cliff line predicted to be impacted as a result of the proposed modification. This results in the total area of cliff line conserved in this area being approximately 6,140 metres in length, which equates to an approximately 20 per cent increase to cliff lines conserved within the Spring Gully Cliff Line Management Area and an overall increase to the area of approximately 30 per cent.

The objectives and management of the Spring Gully Cliff Line Management Area are provided in the BMP and OMP. The Spring Gully Cliff Line Management Area provides for the protection of cliff line, caves or other structures that are likely to provide habitat for micro-bats. It is provided to mitigate the loss of cliff line and cave habitat from the open cut disturbance area, together with potential damage to cliff line and cave habitat from subsidence. The objectives of the Spring Gully Cliff Line Management Area are:

- to provide for the protection and management of cliff line areas; and

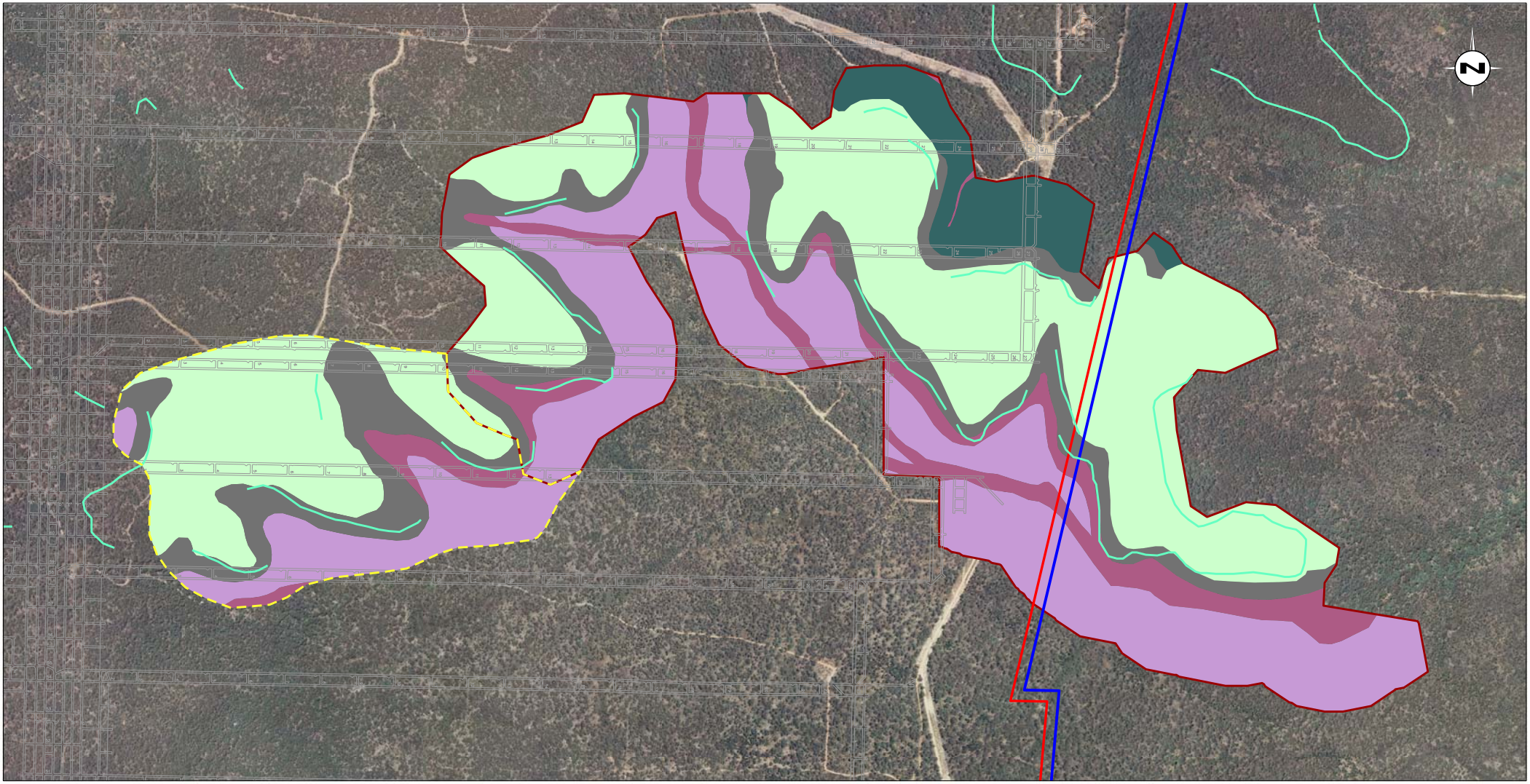


Image Source: Ulan Coal (2010)
Data Source: Ulan Coal (2013)

0 250 500 750m
1:15 000

## Legend

- Existing Colliery Holding Boundary
- UCML Continued Operations Project Approval Area
- Previous Underground Mining Operations
- Spring Gully Cliff Line Management Area
- Proposed Extension To Spring Gully Cliff Line Management Area
- Cliff Line
- Ironbark Open Forest Complex on Sandstone
- Narrow-leaved Ironbark Open Forest on Alluvium/Colluvium
- Rough-barked Apple Open Forest on Alluvium/Colluvium
- Scribbly Gum Woodland – Heathland on Sand Plateaux
- Stringybark-Ironbark Open Forest on Sandstone Slopes

FIGURE 2.2

# Proposed Extension to Spring Gully Cliff Line Management Area

File Name (A4): R10/3363_110.dgn
20140214 9.05

- to protect and enhance fauna habitat, particularly cliff line area for habitat specific fauna species.

Management measures undertaken within the Spring Gully Cliff Line Management Area include:

- seed collection and propagation
- removal of stock;
- weed control, where monitoring works identify the need;
- feral fauna control, where monitoring works identify the need;
- bushfire management;
- passive regeneration;
- habitat augmentation, if monitoring deems necessary;
- monitoring; and
- fencing/access control and signage, where necessary.

The addition to the existing management area will be managed in accordance with the objectives and criteria for the approved Spring Gully Cliff Line Management Area, as defined within the current OMP. As previously discussed, the security mechanism for the offset and management areas is still being resolved in consultation with OEH and DP&E.

**Recommendations**

**5.1 That options for avoidance, mitigation and offsetting of cliffline impacts be considered.**

As described above, in response to OEH's concerns, UCML proposes to increase the existing Spring Gully Cliff Line Management Area by 30 per cent to offset cliff line impacts associated with the proposed modification, as detailed above.

**5.2 That detail regarding the Spring Gully Cliffline offset area be provided as per recommendation 3.1.**

A summary of the Spring Gully Cliff Line Management Area is outlined above and details are provided in the BMP and OMP which were developed in consultation with OEH to the satisfaction of DP&E. The location of the Spring Gully Cliff Line Management Area is shown on **Figure 2.1**.

### 2.3.6 Groundwater and surface water

**While no groundwater dependent ecosystems were identified within or nearby the proposed modification area, OEH has concerns regarding the potential impacts of changes to groundwater and surface water on riparian vegetation.**

An assessment of potential impacts on Groundwater Dependent Ecosystems was included in the Ecological Assessment (Appendix 5 of the EA) and Groundwater Assessment (Appendix 3), and in Sections 5.3.2.4 and 5.5.5.2 of the EA main text. Potential impacts from the proposed modification on baseflows within the Talbragar and Goulburn River catchments is also assessed in the Groundwater Assessment and in Section 5.3.2.1 of the EIS main text. Potential impacts from ponding and watercourse stability are assessed in the Surface Water Assessment (Appendix 4) and the Ecological Assessment, and are discussed in Section 5.4.2.1 and 5.5.5.2 of the EA main text.

There are no identified groundwater dependent ecosystems (GDEs) within or nearby the Ulan West mining area. Some of the red gum-dominated riparian communities mapped within the Ulan Coal Complex have the potential to be classified as GDEs, according to the Groundwater Dependent Ecosystem Policy (DLWC 2002) as either:

- wetlands and red gum forests;
- other terrestrial vegetation; or
- ecosystems in streams fed by groundwater.

While there are potentially several examples of these ecosystems throughout the Ulan Coal Complex, these are generally not well-defined, blend into adjacent drier communities and are not significant GDEs such as hanging swamps and limestone cave systems, which are not present in the Ulan West mining area or more broadly at the Ulan Coal Complex. There have been no records of significant known GDEs from ecological surveys completed within the Ulan Coal Complex or Ulan West mining area to date.

“The Drip” is located approximately 10 kilometres to the east of the Ulan West mining area and is recognised as an important natural feature which sustains GDEs. It is sustained by surficial and relatively shallow groundwater storage which is governed mostly by short term rainfall events that surcharge the shallow strata. No impacts are likely as a result of the proposed modification which is moving westward away from The Drip.

Any other GDE’s located within the region surrounding the proposed modification area are also unlikely to be impacted given the minor nature of groundwater extraction associated with the proposed modification, the limited lateral extent of depressurisation, the negligible impacts to baseflows and the distance between the depressurisation area and any regionally located GDE’s.

The Groundwater Assessment has identified that the proposed modification is likely to result in negligible impacts to baseflows within the Talbragar and Goulburn River catchments, with an additional 0.002 ML/day predicted for the Talbragar River catchment and no additional losses predicted from the Goulburn River catchment compared with the losses associated with the approved mine plan.

The analysis in the Surface Water Assessment indicates that the predicted subsidence associated with the proposed modification to the Ulan West mine plan results in minor changes to the pattern of remnant ponding compared to the approved Ulan West mine plan within the catchment areas of Mona Creek, Cockabutta Creek and Ulan Creek. Historical and recent site inspections indicate that in the majority of areas where the topographical survey indicates existing remnant ponding, water does not pond in these areas as the soils are sandy and relatively free draining. As such, it is considered unlikely, based on the analysis of the predicted subsidence that any additional remnant ponding will occur within the predicted subsidence affectation area. This is due to both the steepness of the existing landform and sandy soils.

The Surface Water Assessment also predicted that subsidence impacts will not result in any substantial changes to watercourse stability relative to the current approved impacts. In accordance with existing monitoring and management plans, UCML proposes to continue to monitor areas where potential ponding, bank slumping, head cut erosion or drainage realignment may occur to determine the need for any further erosion control measures at these locations If monitoring indicates that remediation works are required, remediation works will need to maintain channel grades and take into consideration channel stabilities and existing channel characteristics.

In summary, the proposed modification is not predicted to have significant impacts on groundwater, surface watercourses, groundwater dependent ecosystems or riparian habitat.

**It is noted that the current Project Approval (condition 39) requires a Groundwater Monitoring Program to monitor and/or validate the impacts of the project on riparian vegetation along the Goulburn and Talbragar Rivers and associated creeks.**

**Condition 40 of the Project Approval requires a Surface and Ground Water Response Plan, which must describe what measures and/or procedures would be implemented to mitigate and/or offset any adverse impacts on riparian vegetation.**

**No assessment has been provided in the EA of the results of these monitoring programs and plans to date.**

As provided in the EA, the UCML Water Management Plan will be reviewed and updated as necessary as a result of the proposed modification. The Surface Water and Groundwater Monitoring Programs and Surface Water and Groundwater Response Plans will also be reviewed and updated as necessary as a result of the proposed modification.

The results for surface and groundwater monitoring are included each year in the Annual Environmental Report which is provided to agencies including OEH annually, and made available to the public on the UCML website. The Annual Environmental Report includes the results of creek line stability assessment and stream health monitoring, these have concluded that the areas are stable with no recommendations for remedial works to date.

**From the Subsidence Assessment summary:**

***Water bores and groundwater seeps located directly over the longwall panels are expected to dry up as a result of mining subsidence movements. Although it is possible that some of these may return, alternative arrangements are considered likely to be necessary to supplement water supplies that rely on any bores located over and within close proximity of the proposed Ulan West modification area.***

Further to the above statements in the Subsidence Assessment, the Groundwater Assessment (MER, 2015) contains an assessment of the potential impacts on water bores, and as detailed in the response above, the Ecological Assessment and Groundwater Assessment assess the potential impacts on Groundwater Dependent Ecosystems.

In relation to the potential impacts on water bores, relatively shallow groundwater resources have been exploited by the construction of bores and wells throughout the region. the Groundwater Assessment included details of the location of all registered bores, obtained from a records search on the NOW database, extending 8 kilometres or more beyond the Ulan No.3 and Ulan West longwall panel footprint.

There are no private boreholes located within or in proximity to the modified Ulan West mining area that will be affected by mining induced drawdowns associated with the proposed modification. The Groundwater Assessment (MER, 2015) determined that the proposed modification does not change regional drawdown contours for the Triassic aquifer which is used as a groundwater resource. In the extended Ulan West mining area, the Triassic lithology is 0 to 3 metres in depth and is not productive as a groundwater source.

UCML maintains its commitment to supplement or provide alternative water supplies for any private bores impacted by mining induced drawdown associated with UCML operations.

## Recommendations

**6.1 That measures and/or procedures to be implemented to mitigate and/or offset any adverse impacts on riparian vegetation be provided.**

As outlined above, there are no significant impacts predicted on riparian vegetation. In Section 7 of the Surface Water Assessment and Section 5.4.6 of the EA main text, the UCML Water Management Plan will be updated in consultation with key government agencies to the satisfaction of DP&E to include the proposed modification. Monitoring of ponding and watercourse stability and hence riparian vegetation will continue to be undertaken and reported in the Ulan Coal Complex Annual Review, which is provided to the key government agencies including OEH and is made available to the community via the UCML website.

**6.2 That monitoring of subsidence impacts should lead to both remediation and to modifications of mining techniques to reduce additional impacts.**

UCML will continue to undertake monitoring of operations to identify subsidence and subsidence related impacts, as detailed in the Subsidence Assessment (SCT, 2015) and EA main text. Monitoring data collected from 33 previously mined longwall panels, is used to refine subsidence predictions and environmental assessment findings. Subsidence monitoring is carried out in accordance with the Subsidence Monitoring Program (part of the Extraction Plan). The subsidence performance criteria are stipulated in Condition 24, Schedule 3 of PA 08_0184. Each Extraction Plan specifies how potential environmental consequences from longwall mining will be managed to achieve the requirements of PA 08_0184 and other relevant approvals, including:

- mine design;
- remediation measures;
- subsidence monitoring;
- adaptive management; and
- contingency plans.

Performance indicators are developed to assess if there is a potential or likely chance the performance measures will be exceeded or are likely to be exceeded during longwall extraction. Analysis of monitoring data is undertaken to assess impacts against performance measures. Mitigation measures and contingency plans for all known features are presented which includes potential remediation measures.

The measured subsidence values across Ulan No.3 have generally been less than predicted and of the expected form, with some minor anomalies such as small step features. The mining impacts observed over Ulan No.3 have generally included minor surface cracks along the panel edges and on bare surfaces such as earth embankments and compacted road surfaces on access tracks. Impacts to surface water, groundwater and biodiversity are generally within predictions.

The Ulan West mining operation is a longwall retreat method. It is not feasible to change mining technique within the Ulan West mining area. UCML will continue to monitor subsidence impacts, operate within relevant approval conditions, including the performance criteria stipulated within PA 08_0184, and implement remedial actions as identified,.

UCML will continue to report on subsidence monitoring within End of Panel reporting and Annual Environmental Reports.

## 2.4 Environment Protection Authority

### 2.4.1 Noise

The EPA confirms that the day/evening noise limits for receivers R57 and R254 in EPL 394 for the Ulan Coal Mine are 37 dB(A) and 38 dB(A) respectively and the night time limit for R57 and R254 is 36 dB(A), respectively. It is noted that that should the proposed modification be approved, UCML will need to apply to the EPA to vary the licence for the Mine. UCML also note the EPA's advice that should the Mine enter into a negotiated agreement with the affected landowners, notification should be provided to the EPA for the EPA's records.

**The EPA notes the predicted noise levels at receivers R57 and R254 during the proposed construction of end block shafts 4 and 5, in particular the predicted noise levels will not exceed the original Project Specific Noise Levels (PSNL) by 5 dB(A).**

As discussed in Section 5.7.5 of the EA, the results indicate that with appropriate control measures in place, the predicted noise levels from the proposed modification would not exceed the target PSNLs, during operational phases, at all of the receiver locations utilised in the calculations with the exception of residential receiver R57.

Residential receiver R57 is predicted to exceed the original PSNL and established noise limits during the construction of End Block Shafts 4 and 5 during the day time period. With the use of suitable noise controls such as mobile noise barriers and managing construction activities during adverse weather conditions, UCML will be able to maintain the noise levels such that the established PSNL of 37 dB(A) is not exceeded by more than 5 dB(A).

**The EPA recommends:**

- **the Noise Management Plan for the Mine be updated to include a monitoring program specifically for receivers R57 and R254 during the construction period;**

Supplementary noise monitoring will be undertaken at residential receiver R57 during construction activities at End Block Shafts 4 and 5. Additionally, noise monitoring will be undertaken at residential receiver R254 during construction at End Block Shaft 5.

The attended monitoring program, consistent with the approved Noise Management Plan, will be performed in accordance with the Industrial Noise Policy (INP) including:

- measurements of $L_{A90,15\ minute}$ and $L_{Aeq,15\ minute}$ ambient noise levels during the hours of construction;
- measurements and/or calculations of the contributed noise level from the construction activities;
- measurement of other statistical noise levels representative of the noise environment including the maximum and minimum noise levels measured during the interval; and
- recording of weather conditions at the monitoring site.

The Noise Management Plan will be updated to include these additional monitoring requirements.

- **the Mine specifically defines "adverse" weather and that a Trigger Action Response Management Plan (TARP) be developed and implemented utilising this definition in conjunction with the noise monitoring program for receivers R57 and R254 to respond to any elevated noise levels;**

Adverse weather in relation to the Noise Impact Assessment undertaken for the proposed modification is defined as anything that does not meet the criteria of Chapter 11 of the NSW Industrial Noise Policy being:

- wind speeds of up to 3 m/s at 10 metres above ground level; or
- temperature inversion conditions of up to 3ºC/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

UCML will develop and implement a Trigger Action Response Management Plan (TARP) to be used in conjunction with the noise monitoring program to address adverse weather conditions for receivers R57 and R254.

- **that any approval granted by DPE for the Proposal includes conditions requiring the implementation of the noise management strategies contained in the EA which aim to reduce noise levels at receivers R57 and R254.**

Agreed.

**Currently, the licence for the Mine has $LA1_{(1min)}$ criterion limits for sleep disturbance which is consistent with the current approval. The EPA notes that sleep disturbance levels for the Proposal have been assessed utilising $L_{Amax}$ criterion. The EPA supports altering the sleep disturbance criteria from $LA1_{1min}$ to $L_{Amax}$ in any approval granted by DPE. A variation of the licence will also be required should this alteration be approved.**

In the Noise Impact Assessment (Appendix 7 of the EA), *Table 2.3 – Development Consent and EPL Noise Limits* has specified the sleep disturbance criteria as $L_{A1,1min}$. There was one reference to $L_{Amax}$ used instead of $L_{A1,1min}$ once in Section 5.3 of the Noise Impact Assessment. This reference should have been written as $L_{A1,1min}$.

$L_{Amax}$ is for a 15 minute interval and has historically been used interchangeably with $L_{A1,1min}$. However, $L_{A1,1min}$ is now the standard format used when discussing sleep disturbance. As per the EPA INP application notes, the $L_{A1,1min}$ descriptor is meant to represent a maximum noise level measured under 'fast' time response.

UCML does not agree to changing the sleep disturbance criteria from the current limit expressed as $LA1_{1min.}$

### 2.4.2 Surface Water and Site Water Balance

**The EPA would like to advise that at the current time, the licence permits a total daily discharge volume of 30 ML/day from licence discharge points 3, 6 and 19 and 2 ML/day from licence discharge point 4, not 52 ML/day as indicated in the EA. The EPA notes that as a result of the Proposal, groundwater reporting to the Ulan West mining area will increase by an estimated 2.1% and when considering the proposed increase in groundwater levels, clarification should be provided to DPE regarding the site water balance considering the permitted discharge volume at the Mine.**

UCML proposes to continue to maintain a neutral site water balance by utilising existing and approved discharge facilities in accordance with the conceptual water discharge management strategy outlined in the UCCO Surface Water Assessment (Umwelt, 2009) which was prepared as part of the EA for the UCCO Project. The discharge strategy currently approved in PA 08_0184 provides a maximum discharge volume of approximately 52 ML per day based on 100 per cent utilisation of the water discharge facilities. It is acknowledged that the current UCML EPL licenses the discharge volume of 30 ML per day. UCML will seek later variations to the EPL, consistent with the current project approval, as required to allow for utilisation of approved water discharge facilities.

Section 5.3 of the Surface Water Assessment provides an update to the water balance associated with the proposed modification. The maximum water surplus for the Ulan Coal Complex, including the proposed modification, is predicted to occur during Year 13 with a maximum modelled water surplus of approximately 10,106 ML per year (i.e. 27.7 ML per day) which remains within the licensed discharge limit of the current EPL.

**For many years the EPA has worked with the Mine in response to increasing amounts of mine water requiring treatment and offsite disposal. At the current time, discharges from the Mine are limited to discharges via Ulan Creek and ultimately into the Goulburn River. The approved potential discharge into the Talbragar Review catchment has not eventuated. Considering the current volume being discharged from the Mine, greater flexibility in the water management system at the Mine is required for a number of reasons. Any potential increase in the volume requiring discharge reinforces the need for implementation of an alternate point of discharge from the Mine.**

The UCCO Project included a water management strategy that allowed for excess mine water to be utilised via a hierarchy of usage and discharge options. The water management strategy was described in the Surface Water Assessment (Umwelt, 2009) and included:

- usage at the Bobadeen Irrigation Scheme;
- water sharing with Moolarben and Wilpingjong mines;
- discharge via the Bobadeen Water Treatment Facility (Ulan Creek);

- discharge via the Rowans Dam Water Treatment Facility (Ulan Creek); and
- discharge via the Ulan West Water Treatment Facility (Talbragar River).

The combined and currently approved discharge strategy accounts for 52 ML per day, the water could be discharged to the Talbragar system, if required, once a licence for that discharge has been approved. The strategy for mine water management is prioritised based on environmental and mine water requirements, which have variability, particularly in respect of climate. The modelling systems used to forecast inflows and discharge requirements are calibrated on a six monthly basis and provide essential information to assist the prioritisation process.

Ulan Coal Complex currently utilises four of the five approved discharge options. The only discharge option not currently constructed (or licensed under the POEO Act) is discharge via the Ulan West Water Treatment Facility to the Talbragar River.

As outlined in the EPA submission, the UCML EPL currently limits discharges to Ulan Creek up to a maximum of 30 ML per day. As detailed in the Surface Water Assessment (Umwelt, 2015) the maximum water surplus for the Ulan Coal Complex, including the proposed modification, is predicted to occur during Year 13 with a maximum modelled water surplus of approximately 10,106 ML per year (i.e. an average of 27.7 ML per day). While this can be accommodated within existing EPL discharge limits, UCML will continue to review its water management requirements and continue to work with the EPA as required in relation to any future commissioning and licensing of the Ulan West Water Treatment Facility (Talbragar River).

## 2.5 Department of Primary Industries

### 2.5.1 NSW Office of Water

**2. <u>Information Requests</u>**

**The following information is requested prior to determination of the project.**

- **Clarification is requested on the potential surface water take and downstream impacts following subsidence in first order watercourses and out of channel areas.**

The potential surface water take and downstream impacts following subsidence in first order watercourses and out of channel areas is expected to be negligible. This assessment is based on consideration of the potential for impact on watercourses as a result of remnant ponding both in and out of drainage lines, surface cracking, as well as consideration of catchment boundaries and watercourse stability, as outlined below.

The analysis in the Surface Water Assessment (Umwelt, 2015c) indicates that the predicted subsidence associated with the proposed modification to the Ulan West mine plan results in minor changes to the pattern of remnant ponding compared to the approved Ulan West mine plan within the catchment areas of Mona Creek, Cockabutta Creek and Ulan Creek. The analysis indicates that the remnant ponding will remain within channels of the watercourses with no areas of remnant ponding predicted to occur outside of the existing watercourse channels.

Historical and recent site inspections indicate that in the majority of areas where the topographical survey indicates existing remnant ponding, water does not pond in these areas as the soils are sandy and relatively free draining. As such, it is considered unlikely, based

on the analysis of the predicted subsidence that any additional remnant ponding will occur within the predicted subsidence affectation area. This is due to both the steepness of the existing landform and sandy soils.

The potential for impacts from surface cracking in watercourses was discussed in the Surface Water Assessment (Umwelt, 2015c). As stated by SCT in the Subsidence Assessment (SCT 2015) as the vertically interconnected fracture network created by mining subsidence increases the permeaiblity of the overburden strata but the tortuous nature of the fracture network means that the magnitude of any flow is relatively limited. Further, the soils within the predicted subsidence affectation area along the drainage lines are typically shallow sandy soils.

There is some potential for cracking, caused by mining subsidence, to connect through the sandy soil layers to the surface. However if cracking does occur through the surface soil layers this cracking may potentially be self healing or require remediation. Therefore, there is some potential that during the time between mining and completion of any required surface remediation works some minor stream capture may occur during rainfall events. As such there is potential to influence the volume of runoff available for harvestable rights at downstream properties. However, it is considered that this potential is limited as the catchment areas upstream of the mining areas are small, sequential mining will affect only short sections of creek at any time, runoff rates are relatively low and as such only a relatively low volume of runoff could be captured during storm events due to surface cracking.

As any cracking will be detected by monitoring after longwall mining, regular checking and resealing of in-channel cracks will be undertaken. These progressive resealing works will significantly reduce the potential for loss of surface flows due to subsidence cracking.

The Surface Water Assessment (Umwelt, 2015c) also includes a commitment that UCML will continue the existing subsidence monitoring program with the longwalls within the modification area and specifically commits to the continuation of the existing watercourse stability monitoring program. Further to this it should be noted that the existing subsidence monitoring program includes monitoring to confirm that actual subsidence impacts are as predicted. The subsidence monitoring program includes monitoring lines lengthwise and across each longwall panel and walk over inspections of these areas. As such the subsidence monitoring program will assist in identifying confirming the predicted impacts to surface water flows as a result of minor cracking and subsequent rehealing and allow prompt identification of any unforeseen impacts that are occurring.

As the predicted cracking mechanism are expected to, and have in the past been measured to, produce a tortuous fracture network and that the bed conditions of the surface water drainage systems are typically sandy with no permanent alluvial groundwaters. It is expected that surface cracking in drainage lines, including first order drainage lines, and in areas outside of the drainage channels will be self healing and have limited connectivity due to the tortuous fracture network. Due to the small contributing catchments and as such small surface water flow volumes, self healing ability and limited connective below the sandy bed systems, it is expected that water take from drainage lines, including first order drainage lines, will be negligible.

The Surface Water Assessment (Umwelt, 2015c) also predicted that subsidence impacts will not result in any substantial changes to watercourse stability relative to the current approved impacts. In accordance with existing monitoring and management plans, UCML proposes to continue to monitor areas where potential ponding, bank slumping, head cut erosion or drainage realignment may occur to determine the need for any further erosion control measures at these locations. If monitoring indicates that remediation works are required,

remediation works will need to maintain channel grades and take into consideration channel stabilities and existing channel characteristics.

Gauging stations are currently being installed at locations downstream of approved mining operations, with a gauging station now in place on the Talbragar River . In addition, eight existing water quality monitoring sites across the Ulan Complex are being upgraded to include water flow monitoring.

These are:

- Ulan Creek at Old Ulan (SW04);
- Ulan Creek at Pleuger Road (SW05);
- Spring Gully (SW06)
- Bobadeen Creek (SW07)
- Curra Creek (SW08)
- Talbragar River (SW09)
- Mona Creek (SW10)
- Cockabutta Creek (SW11).

The monitoring results from these gauging stations will be utilised to assist in understanding surface water flows in the catchment areas and potential impacts of underground mining. The results from subsidence and watercourse monitoring will be reported for each panel in the End of Panel Reports and Annual Environmental Reports.

- **A process and commitment to acquire the additional entitlement in the Sydney Basin MDB groundwater source is requested.**

As detailed in the Groundwater Assessment (MER, 2015), the annual license required for the MDB at the peak of groundwater extraction is 7660 ML at its peak in 2022 - 2023. UCML are currently licensed to extract 750 ML per year. UCML is committed to obtaining the necessary licenses required to permit groundwater extraction. *The Water Sharing Plan for the NSW Murray-Darling Basin Porous Rock Groundwater Sources 2011* (MDB Porous Rock Groundwater Sources) is the relevant plan, it currently allows for:

*(a) 205,640 ML/year for the Gunnedah–Oxley Basin MDB Groundwater Source,* and

*(c) 60,443 ML/year for the Sydney Basin MDB Groundwater*.

In the Gunnedah –Oxley Basin MDB Groundwater Source, 5757 ML are currently allocated while in the Sydney Basin MDB Groundwater source approximately 3228 ML are allocated. UCML holds Water Access Licence 37192 within the Sydney Basin MDB Groundwater source, where the majority of licensing is required. Announcements of water allocations are monitored and ostensibly from 2017 the licences will be expanded by approximately 400 ML per year, depending on available allocation and in consultation with NOW.

- **The water entitlement to be surrendered to offset the long term groundwater take post mining is requested.**

As currently required of Schedule 3, Condition 29 of the UCML PA 08_0184, UCML will "offset the loss of any baseflow to the Goulburn and Talbragar Rivers caused by the project to the satisfaction of the Director-General. The offset should be affected by the retirement of water entitlements within the catchments of the Goulburn and Talbragar Rivers unless the Proponent can provide alternative means of offsetting baseflow to the satisfaction of the Director-General, in which case the Proponent may offset any losses by those alternative means."

During operations, UCML offsets the loss in baseflow by discharge of water to the watercourses affected by the operations and will surrender licences in the *Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012*.to offset baseflow losses to the Talbragar, when the impact occurs. At the completion of mining operations, UCML will surrender licenses, as appropriate, to offset future losses, as currently required of PA 08_0184.

At the completion of operations, groundwater will not continue to be extracted from the underground workings, and groundwater levels will recover, therefore there will be no ongoing impact to the Sydney Basin MDB groundwater source requiring the surrender of entitlements.

- **Update Table B1 in Appendix B of the Groundwater Assessment (Appendix 3) due to the extended aquifer depressurisation to demonstrate the peak amount of water level drawdown at the locations and the impact categorised according to the Aquifer Interference Policy (AIP).**

Figure 20 contained within the Groundwater Assessment in the EA (MER, 2015) illustrates the difference in drawdown in 2029 (the last year of underground mining at the Ulan Complex) between the currently approved mine plan and the modified mine plan associated with the proposed modification. As shown in **Figure 2.3**, the drawdown associated with the proposed modification is restricted to a small area associated with the extension of longwalls 6 to 12. The long term steady state residual drawdown difference between the approved and modified mine plan is illustrated in **Figure 2.4** in the Groundwater Assessment. This also shows drawdown to be restricted to small areas predominantly within the Ulan West mine plan footprint. Figure B1 in Appendix B of the Groundwater Assessment illustrates the location of licensed groundwater bores. There are no licensed groundwater bores within the residual drawdown areas (at 2029 or long term) associated with the proposed modification.

The Groundwater Assessment completed for the proposed action (MER, 2015) assesses the proposed modification against the minimal harm criteria of the Aquifer Interference Policy (AIP) as follows:

- Water table - there are no high priority GDEs or high priority culturally significant sites within the impact area, and no water supply works within or in proximity to the proposed modification area;

- Water pressure – a pressure head decline will exceed 40% in the Triassic sandstone and Permian strata will be dewatered, however, there are no water supply works within or in proximity that will be affected; and

- Water quality – no long term adverse water quality or long term change in salinity is expected as a result of the proposed modification and there are no highly connected water sources within or in proximity to the proposed modification area that are likely to be adversely impacted.

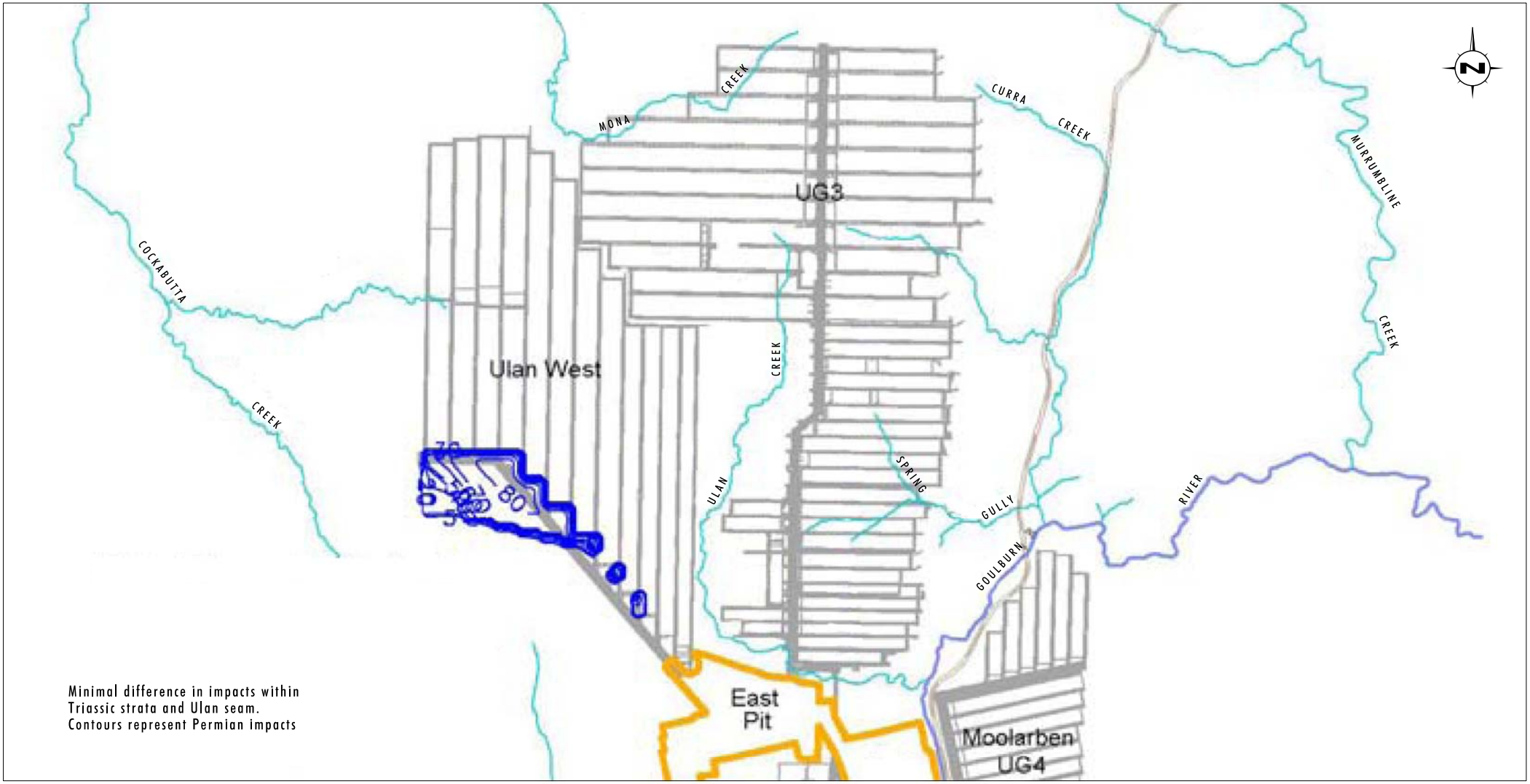


Image Source: Mackie Environmental Research (2015)

0 1.0 2.5 5.0km
1:100 000

FIGURE 2.3

Difference in Residual Drawdown Between Proposed Modification and Approved Operations Year 2029

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20150812 9.53

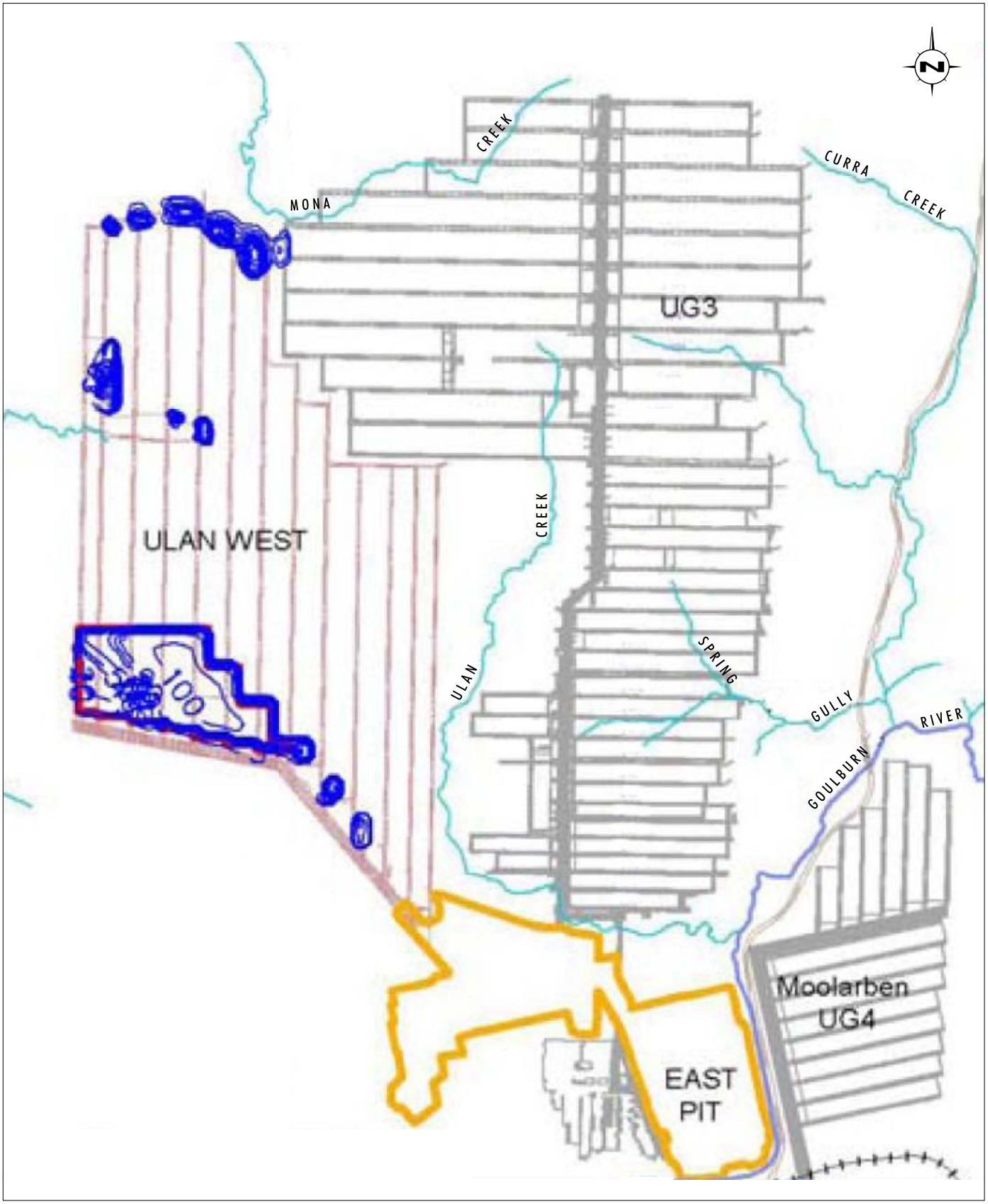



Image Source: Mackie Environmental Research (2015)

0 1.0 2.0 3.0km
1:75 000

FIGURE 2.4

Difference in Residual Drawdown Between
Proposed Modification and Approved Operations

On this basis, the proposed modification meets the minimal harm criteria of the AIP. Based on the assessment against the minimal harm criteria of the AIP and the fact that there are no licensed groundwater bores within the residual drawdown areas (as 2029 or long term) associated with the proposed modification, it is considered that Table B1 therefore does not require updating.

- **An independent review of the groundwater model.**

An independent review of the groundwater model was undertaken by Kalf and Associates Pty Limited during the preparation of the Mackie (2015) Groundwater Assessment. A final peer review report was issued in June, 2015 and is contained in **Appendix 1**.

The peer review assessed the adequacy of the hydrogeological data and the development of a numerical model for predicting the local and drawdown effects of the proposed modification. The peer review found that the hydrogeological description, conceptualisation, model design, simulations and reporting have been conducted in a professional manner. No fatal flaws were detected in the description or modelling work conducted. The peer review also found that the predictions of drawdown due to the proposed modification are minor compared to approved operations. All drawdown predictions, and in particular water table drawdown within the modification, were considered plausible.

In addition to the peer review conducted of the Groundwater Assessment completed for the proposed modification, it should also be noted that the original groundwater model was highly scrutinised as part of the UCCO Project and subsequent merit appeal and was found to be adequate.

**3. <u>Recommended Conditions of Approval</u>**

**The Proponent shall review the Water Management Plan for the project. This Plan must be developed in consultation with the NSW Office of Water.**

As discussed in Section 5.4 of the EA main text, UCML will revise and update its Water Management Plan as a result of the proposed modification, should it be approved. This will be undertaken in consultation with NSW Office of Water to the satisfaction of DP&E.

### 2.5.2 Crown Lands

**Crown Lands have reviewed the proposed modification application for the Ulan Continued Operations Project (08_0184 MOD3) and advise no objection to the proposed modifications subject to the appropriate Crown Lands Act approvals being obtained prior to any use and occupation of any Crown land (including Crown roads).**

UCML will seek appropriate Crown Lands Act approvals prior to any use and occupation of any Crown land affected by the Ulan West mining operations, including the proposed modification.

**It is also recommended that the proponent apply to close and purchase any Crown Public Roads associated with the proposal in order to avoid restrictions on access and development on these parcels.**

UCML will consult with Crown Lands and adjoining land holders in regards to closing any Crown Public Roads permanently affected by the proposed modification. The Extraction Plan will identify any temporary road closure that may be required to maintain public safety, to the satisfaction of DP&E.

**Investigations determined that the proposed extension of longwall panels 6 to 12 will impact the remainder of Lot 49 DP750735 and Lot 7302 DP1148421 both of which are held under a Crown Lands Act licence for grazing. Part Lot 49 was included in the original approval area.**

Noted.

# 3.0 Response to Community and Public Submissions

## 3.1 Wellington Valley Wuradjuri Aboriginal Corporation

Wellington Valley Wiradjuri Aboriginal Corporation (WVWAC) is supportive of any efforts to provide facilities and business for the community at large within our Traditional Lands, provided proponents have consulted with WVWAC and negotiated an agreed outcome in relation to their cultural, heritage and environmental concerns. WVWAC are generally supportive of the proposed modification and agree with the potential mitigation and management strategies proposed for the proposed modification. In relation to the management approach outlined in the Aboriginal Heritage Report included in the EA, WVWAC also recommended the following:

- **Trial of mitigation techniques in regards to digging around rock shelters with Moderate to High Cultural Heritage Significance in a location where there is very low cultural heritage or significance to test this strategy and minimise environmental disturbance around the heritage sites and evaluate the outcome.**

- **Looking at the cost benefit of the mitigation techniques which may or may not be successful and offsetting this by investing in various RAP projects such as Cultural Heritage Centres or Cultural Heritage Education Programs.**

A review of mitigation techniques has been completed as part of the preparation for the Aboriginal Cultural Heritage Assessment. As referenced in the WVWAC submission, a conceptual technique where trenches are cut into the rock strata around significant rock shelter heritage sites to minimise the impact of subsidence was reviewed with relevant specialists and RAPs. It was found that the disturbance associated with undertaking the potential technique was likely to be significant and the confidence level of success of the technique was not adequate. Given the steep terrain surrounding the sites, there were substantial environmental and safety risks associated with this approach. In addition, uncertainty around defining the scope of work to complete the program, and potentially high costs were also identified. At this time, due to high impacts, high risks, lack of technical certainty, high costs and questionable benefits, UCML do not intend to employ such methods for mitigation.

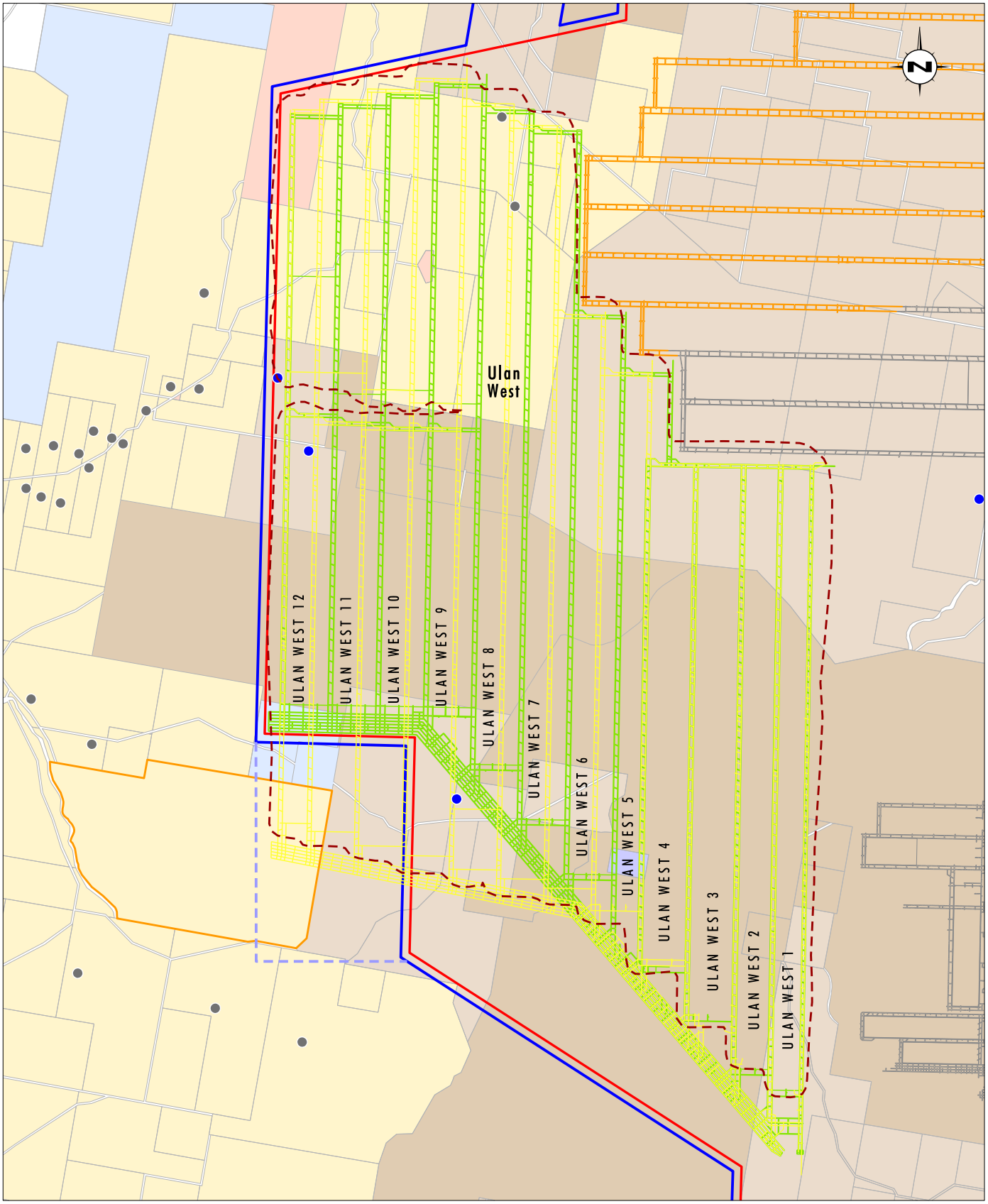
UCML have consulted with the RAPs to develop appropriate mitigation measures for the proposed modification at a meeting on 3 June 2015 attended by representatives of Murong Gialinga Aboriginal, North East Wiradjuri Company Ltd, Warrabinga Native Title Claimants Aboriginal Corporation, WVWAC and Mudgee Local Aboriginal Land Council. This ongoing consultation has resulted in a number of management measures being agreed. These include:

- 3D scanning of selected rock shelter site that can be used for education and heritage awareness;

- collecting and investigating bush food plants across the Ulan Coal Complex that can be used for education and awareness;

- Wiradjuri Language Program recording stories and sharing knowledge via the creation of a digital resource that can be used for education and heritage awareness;

- rock shelter text excavation sampling at four of the Cockabutta Creek sites; and




Data Source: Ulan Coal (2014)

0 1.0 2.0 2.5km

1:50 000

## Legend

- Existing Colliery Holding Boundary
- UCML Continued Operations Project Approval Area
- MLA 475
- Approved Ulan West Mine Plan
- Proposed Ulan West Mine Plan
- Approved Ulan No.3 Underground Mine Plan
- Previous Underground Mining Operations
- Predicted 20 mm Subsidence Contour (Proposed)
- Crown Land
- Crown Land Leased (UCML)
- Crown Land Leased (Private)
- Mined Owned (UCML)
- Private
- The State Of NSW
- Mine Owned Residence (UCML)
- Private Residence
- Private Lot Partially Located Within Proposed Ulan West Mining Area

FIGURE 3.1

**Location of Private Property Subject of Public Submission**

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20150814 12.09

- improving access to Hands on Rock including walking tracks, road access and signage.

**WVWAC would prefer that no disturbance to Cultural Heritage sites of the environment within the mining lease however we know that is unavoidable and ask that where possible new technology and salvage methods be used to protect significant Cultural Heritage sites such as Ochre Quarries, Rock Art and Shelters.**

UCML has attempted to minimise impact to significant cultural heritage sites as far as practicable. As detailed above, UCML have explored additional mitigation measures to avoid and mitigate impacts, however, they have not proved to be effective and would result in significant additional impacts. UCML will continue to explore new technologies and their applicability to their operations and discuss these with RAPs. The management measures agreed between UCML and the RAPs outlined above will be implemented.

## 3.2 Public Submission

**Why was the Environment study only done on their half of the land in question and not on the whole area which would then include my land?**

Agreement to access the private property for the purposes of the environmental assessment studies was not reached with the landholder to enable the property to be accessed. UCML sent a letter to the landholder on 31 March 2014 to request access to conduct environment surveys with an offer of compensation. This letter was returned to UCML in April 2014 with a noted attached stating that the private landholder would not agree to access. UCML did not seek to utilise Section 252 of the *Mining Act* to gain access for environmental study purposes given that:

- only 28 hectares of this rural property are proposed to be subject to potential subsidence from underground mining, late in the proposed mine plan (i.e. 2026), and there are no built surface features, or land use constraints to proposed underground mining;

- no mining surface facilities are proposed to be located at this property, and it was determined that the underground mining could progress beneath this property without the need for surface access for mining purposes; and

- adequate information was available for the assessment of potential impacts for the EA, and there is sufficient lead time and an appropriate management plan regime is in place to allow identification and formulation of any further specific mitigation measures that may be required for this property.

The EA noted that a portion of the proposed modification area (approximately 88 hectares of which 28 hectares may be potentially impacted by subsidence impacts) was not able to be accessed for the purposes of ecological and Aboriginal archaeological surveys (refer to Section 3.2.5 of the Ecological Assessment). Despite access not being obtained, the EA does include an assessment of the potential impacts of the proposed modification on the private property.

Part of the private property was subject to limited survey for the review of environment factors,[1] prepared for exploration drilling with the landholders permission. Further habitat descriptions were extrapolated from adjoining habitat types, as detailed in Section 3.2.5 the Ecological Assessment (Appendix 5 of the EA).

[1] Eco Logical Australia (2012) EL7542 Exploration Drill holes EL6288 – Ecological Assessment

The exploration ecological assessment, detailed literature review, aerial photographic interpretation, visual assessments of vegetation from adjoining vantage points (where possible) and extrapolation of data from adjoining communities were used to inform vegetation mapping.

Knowledge of existing vegetation patterns from vegetation mapping for the Ulan Coal Complex was also used in order to inform the mapping.

The vegetation mapping for this area is based on sufficient information and local familiarity to have an acceptable level of confidence for the purposes of the Ecological Assessment. While posing some limitation in terms of confidence in threatened species presence, the habitat assessment provides for sufficient information to consider the likelihood of occurrence of threatened species and the precautionary principle has been applied in terms of assessing potential impacts. That is, based on habitat assessment and extensive knowledge from the adjoining areas, potentially occurring threatened species were assumed to be located in the area, and assessed accordingly.

Clarification in relation to assessment of other issues, including Aboriginal Cultural Heritage Assessment and water resources, is provided in response to specific queries on these issues, in the text below.

It is noted that the private lot is approximately 334 hectares and only approximately 28 hectares may be potentially impacted by subsidence impacts (refer to **Figure 3.1**). There will be no direct impact on the private property as a result of the proposed modification. UCML will not undermine the private property until late in the mine schedule, in approximately 2026.UCML will seek access as required to conduct further site inspections and confirm any mitigation prior to undermining the property.

**Where is the koala study for the land part which is on my land as I know there are koalas there?**

A detailed Ecological Assessment has been undertaken for the proposed modification and is included in Appendix 5 of the EA and Section 5.5 of the EA main text. As discussed above and in Section 3.2.5 of the Ecological Assessment, a portion of the proposed modification area could not be accessed for the purposes of ecological survey. While posing some limitation in terms of confidence in the threatened species presence, the habitat assessment provides for sufficient information to consider the likelihood of occurrence of threatened species and the precautionary principle has been applied in terms of assessing potential impacts.

The koala (*Phascolarctos cinereus*) was recorded during field surveys in the proposed modification area as described in the Ecological Assessment (Appendix 5 of the EA). Some of the vegetation within the proposed modification area consists of 15 per cent or more of Schedule 2 tree species in the upper and lower strata, thus comprising potential koala habitat. Only two koala records have been obtained within the Ulan Coal Complex (first from 1986), despite detailed monitoring since 1995. The level of survey completed to date and scarcity of resulting records suggests that usage of the proposed modification area (and broader habitats of the Ulan Coal Complex) by koalas is likely to be sporadic and transient. There is no evidence suggesting core koala habitat (requiring a resident population or breeding females) is present.

There is no proposed surface infrastructure located on this property. Further the loss of habitat as a result of subsidence is not likely to occur as the proposed modification is not expected to result in a decrease to the extent or condition of vegetation communities and their associated habitat within the subsidence affectation area.

**What has happened to the underground water on my property and was a water scenario done on my land that is affected by this development?**

A detailed Groundwater Assessment has been undertaken for the proposed modification and is included in Appendix 3 of the EA and Section 5.3 of the EA main text. The Groundwater Assessment considered potential impacts on groundwater associated with the proposed modification, including potential impacts on all privately owned land potentially affected by the proposed modification.

As summarised in Section 5.3.2 of the EA, there will be minor increases to the approved groundwater seepage and volume of groundwater reporting to the underground operations. The additional groundwater will be drawn almost entirely from Permian strata. Since the Permian strata also exhibit low hydraulic conductivities and porosities, and relatively high salinity, they are considered to have low utility value for groundwater supply purposes.

The Groundwater Assessment also includes an assessment of impacts on registered private bores and wells located within a zone extending approximately 8 kilometres beyond the Ulan West longwall panel footprint. There are no registered bores or wells within or in proximity to the proposed modification, including on the private property the subject of this submission. The Groundwater Assessment found that there are no bores or wells that would be affected by the proposed modification.

**Has anyone taken into account the effects that this development has done on both my wife and myself?**

A program of community consultation has been undertaken for the proposed modification and is detailed in Section 3 of the EA main text. The views and concerns of the community were identified through this consultation process and addressed in the EA.

UCML have undertaken ongoing consultation with this private landholder in relation to the proposed modification and other matters. UCML has been open and transparent in all communications with the private landholder and will continue to engage with the landholder if the landholder is prepared to participate further.

The private lot is approximately 334 hectares. The area within it that may potentially be impacted by subsidence is approximately 28 hectares (refer to **Figure 3.1**). There are no buildings or significant infrastructure in the area that would be impacted by subsidence, with the exception of a fence that traverses the boundary of the property. Under the proposed schedule, mining beneath the property would commence in approximately 2026.

**Had an Aboriginal study been done on the land?**

An Aboriginal Cultural Heritage Assessment has been completed for the proposed modification and is contained in Appendix 6 of the EA and Section 5.6 of the EA main text.

As noted above, the private lot is approximately 334 hectares and only approximately 28 hectares may be potentially impacted by subsidence impacts. There will be no direct impact on the private property as a result of the proposed modification. Additionally, UCML is not seeking surface rights within MLA 475 for the private property, due to the concerns raised by the private landholder,

A portion of the proposed modification area could not be accessed for the purposes of archaeological survey due to permission for access not being granted by the private landholder. Despite this, as discussed in Section 5.6.2 of the Aboriginal Cultural Heritage

Assessment, the extent of survey coverage was considered satisfactory to present an effective assessment of Aboriginal heritage resources identified and potentially present within the proposed modification area.

Part of the private property has previously been subject to limited survey for exploration drilling, outside the scope of the EA. As detailed in the Aboriginal Cultural Heritage Assessment (Appendix 6 of the EA), three sites were identified on the private property. The three sites were artefact scatters of low significance that will not be directly impacted in relation to the proposed modification.

In accordance with PA 08_0184, a HMP has been prepared in consultation with OEH and RAPs to facilitate ongoing management of the Ulan Coal Complex's Aboriginal and European/Natural heritage resources. The HMP provides for the management of heritage sites, timing and methodology for the salvage of sites, the preparation of a management strategy for sites in the proposed Brokenback Conservation Area and the ongoing management of sites within the Ulan Coal Complex. In accordance with the HMP, there are no management or mitigation measures proposed for the sites located on the private property as they will not be directly impacted and are of low significance.

**I have requested them (UCML) on numerous occasions to simply buy this land that I can't sell, because of this conversion to a mining lease...I wasn't expecting a coal mine to come to me when I bought it, as I have owned it for many years.**

UCML acknowledge that the private landholder has requested that their property be purchased on numerous occasions.

The proposed modification would include longwall mining beneath the private property but does not include any surface infrastructure. There are no built features on the private property that are likely to be impacted by subsidence or other mining activities. Underground mining of the private property is not anticipated to occur until approximately 2026. This private property has no acquisition rights under the current project approval, and is not predicted to experience significant impacts warranting acquisition rights under the proposed modification.

UCML has had a number of meetings and discussions with the private landholder in relation to exploration activities, mining activities associated with UCML's operations, and access for environmental studies. UCML believe that proposed underground mining can occur beneath this property without the need for surface access, with negligible impacts to the current land use or environment, and that the two land uses can effectively co-exist. Consequently UCML do not intend to purchase this private property. UCML have conveyed this to the private landholder.

Other protection measures will be in place to ensure that the existing low intensity grazing activities can continue through the implementation of the Extraction Plan that will be required by DP&E.

**Mr Charlie Allan who is in charge of the mine along with two other staff members were in my home recently and told me nothing that I didn't already know, I simply got nowhere, I have now had their staff visit me in my home on 4 occasions and numerous meetings in their office at the mine and again got no information from them.**

UCML have attempted to consult with the landholder on numerous occasions. As the private landholder does not live in the Ulan area, UCML representatives have travelled to his home

(approximately 3 hours drive from the Ulan Coal Complex) in order to consult with the landholder.

UCML are committed to consulting with the community and in particular this private landholder. The landholder has been provided information on the mining lease application process, site verification process and the proposed modification. Copies of information presented to the private landholder can be provided to DP&E under separate cover.

**...I had Robyn Stoney from the Mine call at my home at 3pm to sign an access agreement for the mine to rectify land rehabilitation that the mine left on my property when it drilled on my land in May last year. The mine is rehabilitating the land that they rehabilitated after the drilling last year, in other words they simply made a mess and are now paying me $500 per week for them to fix it, when would your offices see this sort of thing in their documentation without talking to a landowner?**

Exploration drilling was undertaken on the private property during August 2013, under agreement with the private landholder. The rehabilitation was completed to a standard consistent with the requirements of DRE in November 2013. During a meeting with the private landholder in October 2014, the private landholder indicated that the rehabilitation undertaken on his property was not satisfactory. An access agreement for collection of the brush matting and clearing of the tracks was signed in October 2014. The works were scheduled to occur in December 2014, but were rescheduled to January 2015 due to poor weather conditions.

A site inspection was held with the private landholder, two representatives of DRE and two representatives of UCML on 31 March 2015. The private landholder detailed his concerns in relation to the adequacy of the studies, the completion of the rehabilitation and the impacts on water resources in the area. During the site visit, the private landholder indicated his preference that additional works be conducted to remove brush matting from a drill site. This work was completed under a further access agreement in May 2015.

**I know they (UCML) are now wanting to change the exploration lease EL7542 to a mining lease No MLA475. I had been in talks with the mine in regards to Access Agreements in relation to studies taking 6 months on my land we had problems in getting an accepted payment plan but I never said that I wouldn't give them access.**

During 2013 and 2014 the landholder was consulted in relation to land access agreements and agreed for exploration drilling to proceed on their property. UCML then sent correspondence to the private landholder on 31 March 2014 requesting access to their property to undertake environmental surveys for the proposed modification. UCML offered compensation to the private landholder for access to their property to undertake the required surveys. The letter was returned to the UCML offices in early April 2014 with a note attached indicating that the private landholder would not agree to access.

As detailed above, it is considered that the environmental assessments adequately addressed the private property.

**The mine has now advised that they have arranged for the environment study to be done on the land they now have under their control, leased government land and it means that they didn't do a study on the lands effected by me at all which is half of the area involved.**

As detailed in the above responses, the EA includes an assessment of the impacts on the private property despite access not being granted to the property during the EA studies.

The currently approved Ulan West mining area covers approximately 3060 ha. The proposed modification will extend this by approximately 275 ha. The area of the private property potentially susceptible to subsidence impacts from the proposed modification is approximately 28 hectares. This area is relatively small in terms of the proposed modification and equates to approximately 10 per cent of the proposed extension area, and less than 1 per cent of the total proposed Ulan West underground mining area.

# 4.0 Summary of Additional Management Controls and Commitments

A summary of additional management controls and commitments identified in this report is provided below.

### General

- In accordance with Schedule 2 of the existing VPA, UCML will make additional development contributions towards the maintenance of Cope Road for the additional two years of operations.

- UCML will submit a revised MOP to incorporate the proposed modification, consistent with any modified project approval. The MOP will be prepared generally in accordance with all relevant guidelines including the requirements of *ESG3: Mining Operations Plan (MOP) Guidelines* (DRE, September 2013).

### Crown Lands

- UCML will seek appropriate Crown Lands Act approvals prior to any use and occupation of any Crown land affected by the Ulan West mining operations, including the proposed modification.

- UCML will consult with Crown Lands and adjoining land holders in regards to closing any Crown Public Roads permanently affected by the proposed modification. The Extraction Plan will identify any temporary road closure that may be required to maintain public safety, to the satisfaction of DP&E.

### Offsets

- UCML propose to increase the Spring Gully Cliff Line Management Area as shown on **Figure 2.1**. The details of the proposed increase to the Spring Gully Cliff Line Management Area are summarised below.

| | Spring Gully Existing | Spring Gully Addition | Total |
|---|---|---|---|
| **Cliff Lines** | 4,885.8 | 1,257.0 | 6,142.8 |
| **Total Vegetation** | 210.8 | 62.4 | 273.2 |
| Ironbark Open Forest Complex on Sandstone | 79.7 | 30.7 | 110.4 |
| Narrow-leaved Ironbark Open Forest on Alluvium/Colluvium | 13.8 | 0.0 | 13.8 |
| Rough-barked Apple Open Forest | 19.9 | 3.2 | 23.1 |
| Scribbly Gum Woodland – Heathland on Sand Plateaux | 69.7 | 14.1 | 83.8 |
| Stringybark-Ironbark Open Forest on Sandstone Slopes | 27.7 | 14.4 | 42.1 |

### Ecology

- UCML commits to the current micro-bat monitoring programs being extended to include monitoring of the potential impacts resulting from the proposed modification.

## Noise

- Supplementary noise monitoring will be undertaken at residential receiver R57 during construction activities at End Block Shafts 4 and 5. Additionally, noise monitoring will be undertaken at residential receiver R254 during construction at End Block Shaft 5.

- UCML will develop and implement a Trigger Action Response Management Plan (TARP) to be used in conjunction with the noise monitoring program to address adverse weather conditions for receivers R57 and R254.

# 5.0 References

Australian Museum Business Services (AMBS Consulting), 1996. *Assessment of the Talbragar Fish Fossil Reserve.* Report prepared for Kinhill Engineers on behalf of Ulan Coal Mines Limited.

Division of Resources and Energy 2013. *ESG3: Mining Operations Plan (MOP) Guidelines*

Ecological Australia 2015. *Floristic Monitoring Report 2014*.

Mackie Environmental Research 2014. *Assessment of Groundwater Related Impacts Arising from Modifications to the Ulan West Mine Plan*.

South East Archaeology 2013. *Ulan Coal Mines Limited, Rock Shelter Test Excavation Sampling Strategy*

South East Archaeology 2015. *Ulan Coal Mines Limited, Central Tablelands of New South Wales: Ulan West Modification – Aboriginal Cultural Heritage Assessment*

Strata Control Technologies 2009. *Part 3A Subsidence Assessment Ulan Coal – Continued Operations*.

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# APPENDIX 1

Groundwater Peer Review

**KALF AND ASSOCIATES Pty Ltd**
**Hydrogeological, Numerical Modelling Specialists**

# Ulan Coal Mines Ltd

# KA Peer Review of MER Hydrogeological Modelling Assessment of the Ulan West Mine Plan Modification

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17 June 2015

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## Background and Brief Summary

This report is the Kalf and Associates Pty Ltd (KA) peer review commissioned by Ulan Coal Mines Ltd for the Mackie Environmental Research (MER 2015) hydrogeological modelling assessment of the impacts due to modifications to the Ulan West mine plan. This review follows on from contributions by KA to a revision of an earlier draft version of the MER report.

Ulan Coal Mines Ltd is seeking approval to modify the currently approved Ulan West mine longwalls in a southerly direction designated as the *'Modification' (*MER 2015 Fig 1.) Longwall panels LW4 to LW12 are to be realigned with LW6 to LW12 extended to various distances in a southerly direction. Overall the 'modification' zone is comprised of a relatively small area when compared to the much larger proposed and approved Ulan West Underground mining zone.

The addition of the modification longwall mining zone will allow continued mining of Permian coal at a rate of 20 million tonnes per annum for 15 years or more.

Permian coal strata, interburden and overburden are overlain by Triassic Sandstone within the 'modification' zone and also in the majority of the area surrounding the proposed modification.

Modelling of the proposed mining at Ulan West including the influence of previous mined zones and the proposed modification, indicates that the proposed modification alone will have localised watertable drawdown in the Permian overburden above the Ulan coal seam. This is so because the Triassic strata would be unsaturated or partially saturated in this zone due to prior drawdown in the Triassic induced by the approved mining extraction (MER 2015 Fig. 20).

Drawdowns in the coal strata within the entire Ulan mine will extend many kilometres from the borders of the approved mined areas. But these drawdowns comprise pressure declines and not strata dewatering. Additional pressure change created by the modification will have negligible influence on the overall pressure changes in comparison with those created by the approved mine extraction. Hence the modification would not increase any losses of any significance over and above the 0.183 ML/day for the Goulburn and 0.039 ML/day for the Talbragar Rivers created by the approved mining extraction nor have any significant influence on other creek flow in the region.

There are no landholders' bores located within or in the proximity of the proposed modification area that would be affected by mining drawdown within that area. Any drawdown influence on private bores would only be created by the existing No 3 Underground, and the much larger area of the previously approved Ulan West Underground. The current MER report (2015 Appendix B) lists those private bores that are, or will be affected under the AIP policy.

Additional inflow rates in the extracted modification zone will vary from 6 ML/day after the first two longwalls are extracted to a maximum of 12.5 Ml/day towards the end of the mining. Total volume of modification mine inflow would only amount to a 2.1% increase of 1.1 GL over and above the 51.2 GL for the approved mine plan. However, Dr Mackie (pers. comm.) has advised that mining commenced in Ulan West Underground (at LW1 north) has indicated that the actual inflows are much less than predicted by the MER model and therefore inflow volume predictions for the Ulan West Underground (including the modification) are likely to be conservative.

Average electrical conductivity of the Ulan coal seam, Permian and Triassic strata are respectively 1310, 1151 and 471 µS/cm. Inflow to the mined out approved mining zone voids will be a mixture of these salinities in the range 700 to 1300 mg/l. However, although post mining there will be slow recovery of the watertable the mining zones will tend to remain a 'sink' in the sub-surface and therefore no groundwater within the underground voids would escape into the surrounding geological strata over time. This would also apply to the modification zone.

KA is in agreement with the assessment of the key issues presented in the MER report as summarised above based on the MER reporting and model predictions.

## Peer Review Assessment

### Previous Studies and Reviews

Previous studies are listed in the MER report in the References section of the report. The approved mining zones were the subject of a previous modelling study (MER 2009).

### Hydrogeological and Modelling Description

The hydrogeological description of the region and modelling work described in the MER (2015) report is comprehensive and has been completed and presented in a professional manner in my opinion.

The report covers a wide range of topics that include descriptions of: regional setting of drainage, geology and structural features; groundwater hydrology within the various geological formations; groundwater monitoring of water levels and quality and mine inflows; computer simulation of the proposed modification that includes model re-calibration and predicted drawdowns and mine groundwater inflows; and potential environmental impacts; licensing requirements and impacts verification. In addition Appendices deal with rainfall analyses; registered bores and wells; strata hydraulic properties; groundwater monitoring and details about the regional groundwater model.

### Model Conceptualisation, Design and Simulation Methods

Use is made of the variably saturated computer modelling code MODFLOW-SURFACT (MS) and GIS package.

The model conceptualisation is considered suitable and described in the MER report. The model used is based on a previous model used for simulating longwall mining at the Ulan mine (MER 2009). The model is comprised of 11 model anisotropic layers representing the various rock strata including coal seams together with interburden strata into separate single layers in the simulated geological profile. The model surface area is 1681 square kilometres with variable cell sizes.

The four boundaries chosen for this model area are adequately situated at a distance not to be significantly affected by drawdown created in the mining zone.

The Goulburn River and part of the Talbragar River downstream of Mona Creek and Bobadeen Creek have been simulated using the MS 'River package' while tributaries and minor stream channels that are known to be ephemeral have been modelled using the 'drain' package. This approach is suitable.

The model uses net recharge as input rather than application of gross recharge and the evapotranspiration function. This approach is suitable for the area.

Hydraulic parameters are based on values used in previous modelling studies by MER (2009). The range of permeability for the geological strata is provided in the MER (2015) report Appendix C.

## Re-Calibration

The report states that re-calibration was conducted and MER (2015 Appendix E) provides pre-mining steady state watertable distribution and Ulan coal seam pre-mining heads. In addition figures showing comparisons between simulated and measured head levels in the Triassic Sandstone and Ulan coal seam following mining extraction of a large section of Underground No 3 mining zone. The figures indicated an acceptable visual fit between the simulated and measured heads. Statistical fits for the steady state and transient calibrations are provided in Figures E13 and 14 and are considered to be acceptable.

## Groundwater Monitoring

There is currently a comprehensive groundwater monitoring network in place at the Ulan mine as outlined in the MER report Appendix D (MER 2015) with bore locations shown in the MER Figure D1. There are several pore pressure transducers and standpipe that straddle the proposed modification zone (Fig. D1).

The MER report stipulates in section 7 that monitoring in the future should include groundwater pressures; water quality within the monitoring network; inflows (seepages) and inflow water quality within Ulan mine West and other operations as well as compliance monitoring of any surface water discharges and quality.

KA is in agreement with these ongoing monitoring initiatives.

## Conclusions and Considerations

This peer review has assessed the adequacy of the hydrogeological data and the development of a numerical model for predicting the local and drawdown effects of the modification longwall area that extends the Ulan West mining plan. The hydrogeological description, conceptualisation, model design, simulations and reporting have been conducted in a professional manner and described in detail. No fatal flaws were detected in the description or modelling work conducted.

Predictions of drawdown due to the modification extension of the Ulan West mine plan are minor compared to the influence of the much larger Ulan West mining area north of the modification. No private bores in the area will be affected by the modification and total inflow to the mined modification zone will only increase by about 2% over and above the inflow of the approved mining at the Ulan mine site. All drawdown predictions, and in particular water table drawdown within the modification, are considered plausible.

Monitoring of the pressure transducers and standpipe surrounding the modification should be reviewed 3 years after commencement of longwall mining in the modification area. The results should be compared with the model predictions for that period.

## References

***Mackie Environmental Research (MER) 2015*** *Assessment of Groundwater related impactsarising from modifications to the Ulan West Mine Plan. Report prepared for Ulan Coal Mines Ltd. Report 2747-14/Rev3*

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