



Moolarben Coal Complex UG2 Modification

MODIFICATION REPORT



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1 INTRODUCTION

Moolarben Coal Operations Pty Ltd (MCO) is the operator of the Moolarben Coal Complex (Figure 1) on behalf of the Moolarben Joint Venture (Moolarben Coal Mines Pty Ltd [MCM], Yancoal Moolarben Pty Ltd [YM] and a consortium of Korean power companies). MCO, MCM and YM are wholly owned subsidiaries of Yancoal Australia Limited (Yancoal).

The Moolarben Coal Complex comprises of the Moolarben Coal Project Stage 1 and the Moolarben Coal Project Stage 2.

The Moolarben Coal Project Stage 1 operates in accordance with Project Approval (05_0117) (as modified), approved by the New South Wales (NSW) Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 6 September 2007.

MCO is proposing to modify the Stage 2 Project Approval (08_0135) to incorporate adjustments to the mine layout for the approved underground mine “UG2” (hereafter referred to as the UG2 Modification [the Modification]).

UG2 was approved under Stage 2 of the Moolarben Coal Complex, and accordingly this Modification Report has been prepared to support an application to modify the Stage 2 Project Approval (08_0135).

The Modification is being sought under section 4.55(2) of the EP&A Act. MCO is the applicant for the Modification.

This Modification Report has been prepared to support the modification application and has been prepared in consideration of the *State Significant Development Guidelines* (Department of Planning, Industry and Environment [DPIE], 2021a), in particular *Appendix E – Preparing a Modification Report* (DPIE, 2021b).

1.1 SUMMARY OF THE APPROVED MOOLARBEN COAL COMPLEX

The Moolarben Coal Complex is located approximately 40 kilometres (km) north of Mudgee in the Western Coalfields of NSW within the Mid-Western Regional Local Government Area (Figures 1 and 2).

The Moolarben Coal Complex is located within Mining Lease (ML) 1605, ML 1606, ML 1628, ML 1691 and ML 1715.

The Moolarben Coal Complex comprises four approved open cut mining areas (OC1 to OC4), three approved underground mining areas (UG1, UG2 and UG4) and other mining related infrastructure (including coal processing and transport facilities) (Figure 2).

Stage 1 of the Moolarben Coal Complex comprises open cut operations in OC1, OC2 and OC3, underground operations in UG4 and coal processing and transport facilities.

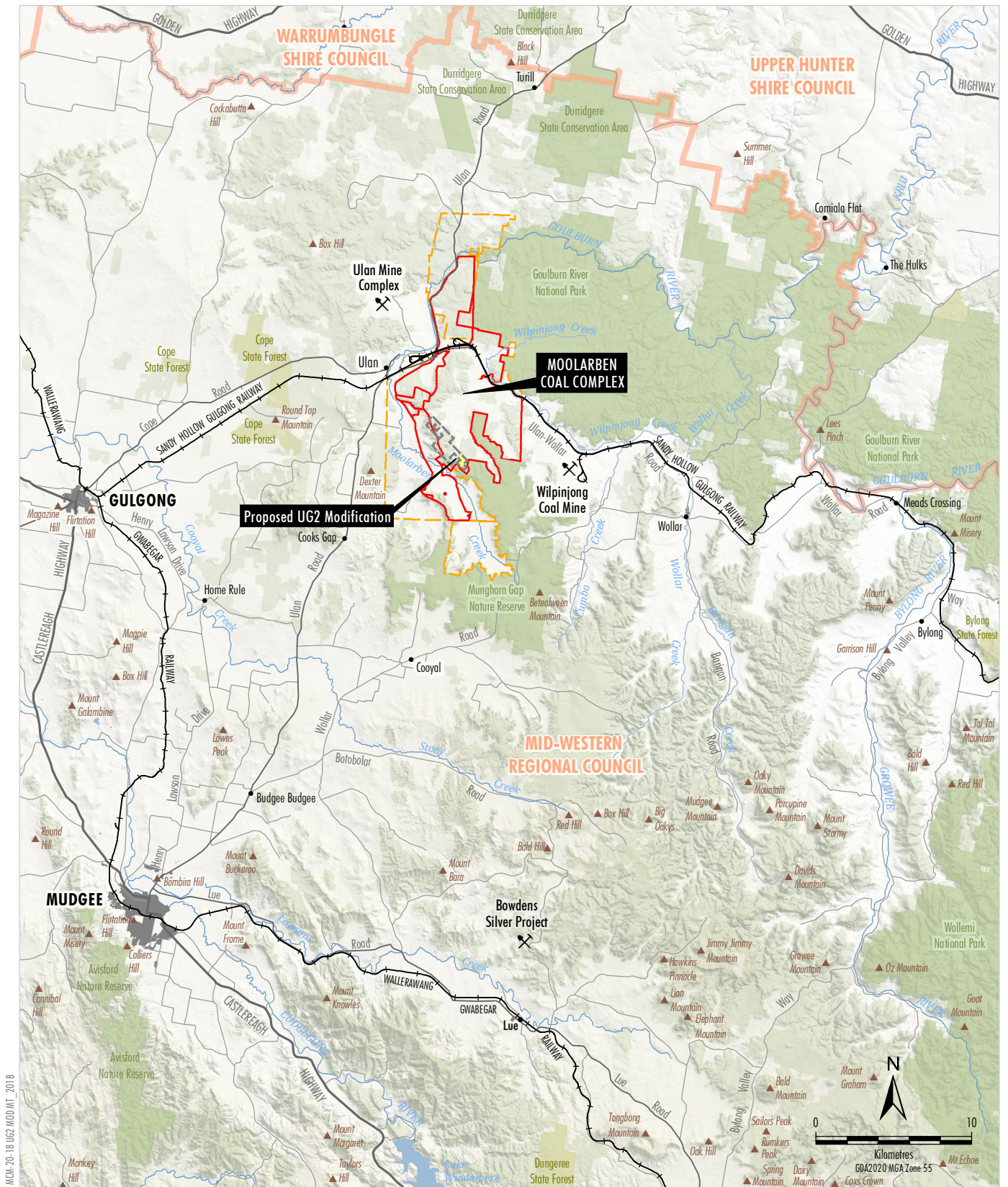
Stage 2 of the Moolarben Coal Complex comprises open cut operations in OC4 and underground operations in UG1 and UG2. All run-of-mine (ROM) coal produced by the Stage 2 operations is transported to the Stage 1 coal processing and transport facilities.

All freehold land associated with the approved Moolarben Coal Complex, including the UG2 mining area, is owned by Moolarben.

Since the commencement of coal mining operations in 2010, open cut mining activities have occurred within OC1, OC2, OC3 and OC4, underground mining has occurred in UG1 and development has commenced in UG4 (Figure 2).

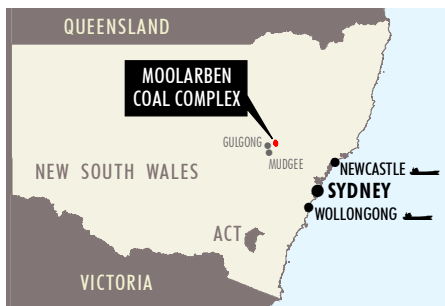
No mining or development has occurred in UG2, however, exploration activities have continued within MCO’s MLs.

Mining operations at the Moolarben Coal Complex are approved until 31 December 2038.



MOA-20-18 UG2 MOD INT_2018

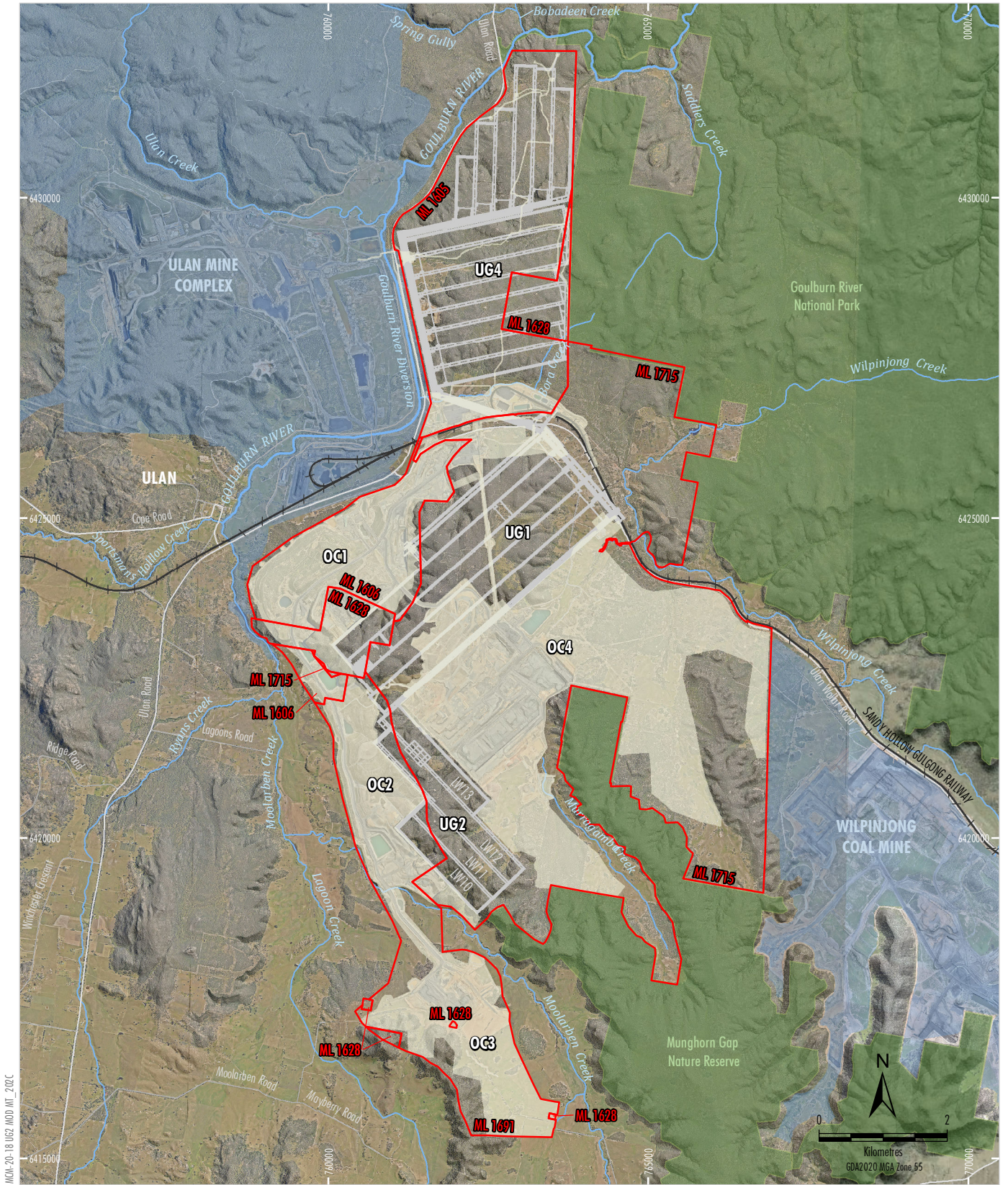
Source: NSW Spatial Services (2021)



- LEGEND**
- State Forest
 - National Parks/Nature Reserves
 - Local Government Boundary
 - Exploration Licence Boundary
 - Mining Lease Boundary
 - Mining Operation
 - Proposed UG2 Modification
 - Approximate Extent of Proposed Modified Longwalls
 - UG2 Longwall Extension Area


MOOLARBEN COAL COMPLEX
 Regional Location

Figure 1



MOL-20-18 UG2 MOD INT_202.C

- LEGEND**
- National Parks / Nature Reserves
 - Other Mining Operation
 - Mining Lease Boundary
 - Existing/Approved Development
 - Underground Longwall Layout
 - Moolarben Coal Complex Disturbance Footprint

Source: MCO (2021); NSW Spatial Services (2021)
 Orthophoto: MCO (Jan 2021)



MOOLARBEN COAL COMPLEX
 Approved General Arrangement

Figure 2

1.2 MODIFICATION OVERVIEW

Background to the Modification

In preparation for the commencement of development in UG2 in approximately 2023, detailed mine planning has been undertaken to optimise the approved UG2 mine layout, including consideration of the following:

- the limits of MCO's existing mining tenements ML 1715 and ML 1691;
- the outcomes of ongoing exploration activities in the UG2 mining area, which have identified further resources and a number of geological features that affect the approved UG2 mining layout;
- the existing and approved UG1 layout that was modified as part of Modification 2 to the Stage 2 Project Approval (08_0135) (UG1 Optimisation Modification) (MCO, 2015) and provides access, coal conveyance and other supporting underground infrastructure to UG2;
- the Stage 2 Project Approval (08_0135) subsidence impact performance measures; and
- the maximisation of coal recovery in a safe and efficient manner.

Description of the Modification

In summary, the Modification would include the following changes to the approved Moolarben Coal Complex:

- optimisation of the approved UG2 layout (including the extension of two approved longwall panels) (Section 3.2);
- increased UG2 extraction height from 3.0 metres (m) to 3.5 m (Section 3.2);
- revised UG2 mining sequence (Section 3.3);
- increased total UG2 ROM coal production from 9.4 million tonnes (Mt) to 13.9 Mt (Section 3.4);
- construction and operation of a remote services infrastructure area (indicatively two UG2 service boreholes/drop holes) within the approved OC4 disturbance footprint to support UG2 operations (Section 3.5);

- development of an additional non-subsiding gate road along the southern boundary of the UG1 mining area to assist with ventilation in UG2 (Section 3.6); and
- small reduction in the approved OC4 extent to accommodate the optimised UG2 layout (Section 3.8).

No other changes to the approved Moolarben Coal Complex (including disturbance footprint) would be required for the Modification (Section 3.7).

The modified UG2 general arrangement is shown on Figures 3a and 3b. Relevant landownership information within the immediate vicinity of the Moolarben Coal Complex is provided on Figures 4a and 4b.

Reasons for the Modification

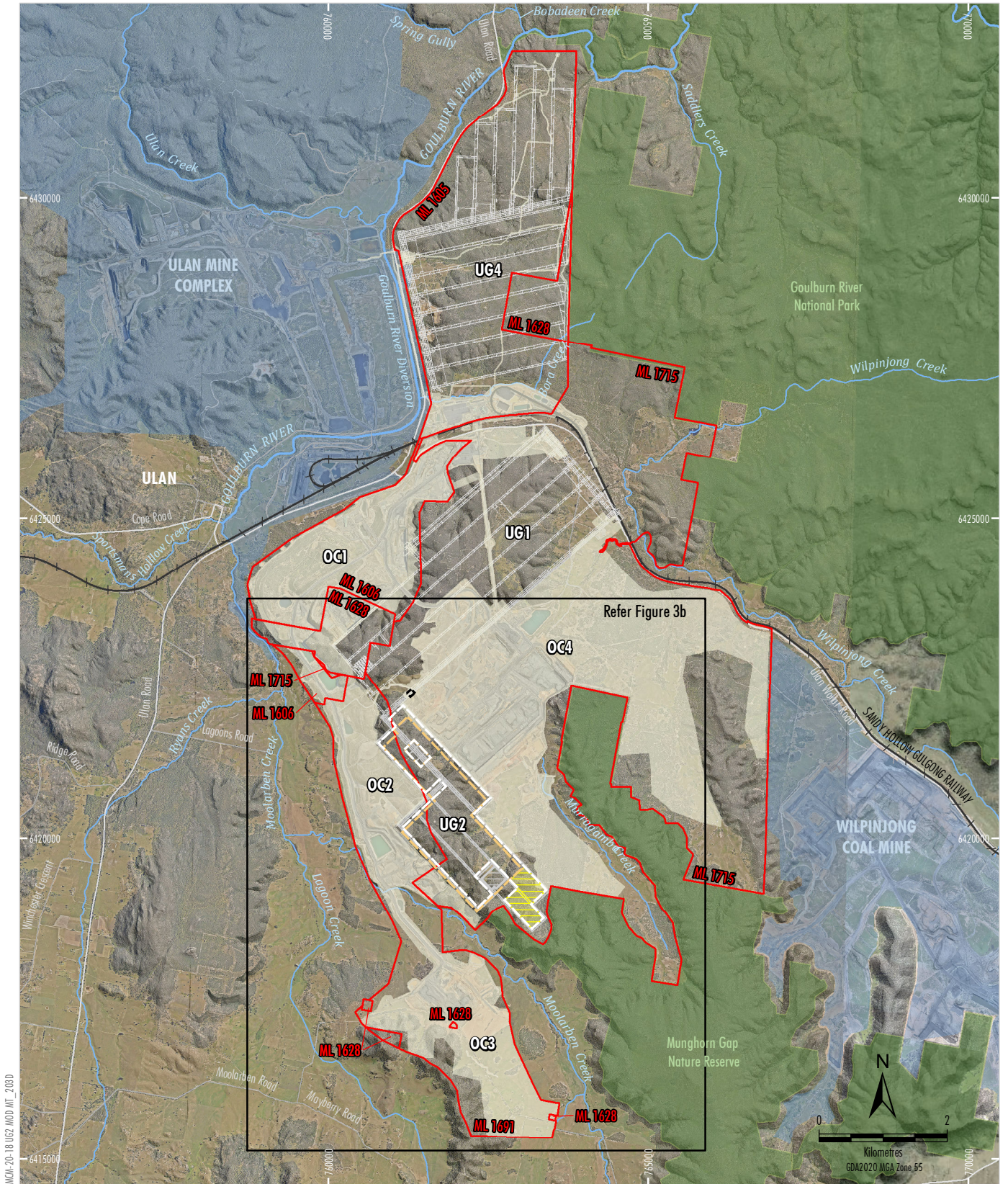
The Modification is required to optimise UG2 in consideration of the latest design information that has become available since Stage 2 of the Moolarben Coal Complex was approved in 2015.

Ongoing exploration activities in the approved UG2 mining area have identified a number of geological features that are required to be "stepped around" to maintain safe and efficient operations which will reduce ROM coal extraction from UG2. The Modification therefore includes augmentations to the approved UG2 layout to avoid some geological features.

The increased extraction height and the extension of two approved longwall panels are proposed as part of the Modification to offset the ROM coal resources that will otherwise need to be forgone due to the identified geological features. These additional ROM coal resources would be accessed with no change to the existing subsidence impact performance measures in the Stage 2 Project Approval (08_0135).

The minor augmentations to the mine layout within the approved UG2 mining area are required to optimise the connection of UG2 to the existing UG1 layout for efficient access, coal clearance and improved ventilation.

Detailed mine planning conducted as part of the UG2 optimisation also identified the requirement for a remote services infrastructure area (indicatively two UG2 service boreholes/drop holes) to support safe and efficient mining operations at UG2. The Modification therefore includes construction and operation of this additional surface infrastructure.



MCO-20-18 UG2 MOD INT_2020

- LEGEND**
- National Parks/Nature Reserves
 - Other Mining Operation
 - Mining Lease Boundary
 - Existing/Approved Development
 - Underground Longwall Layout
 - Approximate Extent of UG2 Longwalls
 - Moolarben Coal Complex Disturbance Footprint

- Proposed UG2 Modification
- Optimised UG2 Longwall Layout
- UG2 Longwall Extension Area
- Non-subsiding UG2 Secondary Workings
- Approximate Extent of Proposed Modified Longwalls
- Proposed Extent of RSIA

Source: MCO (2021); NSW Spatial Services (2021)
 Orthophoto: MCO (Jan 2021)


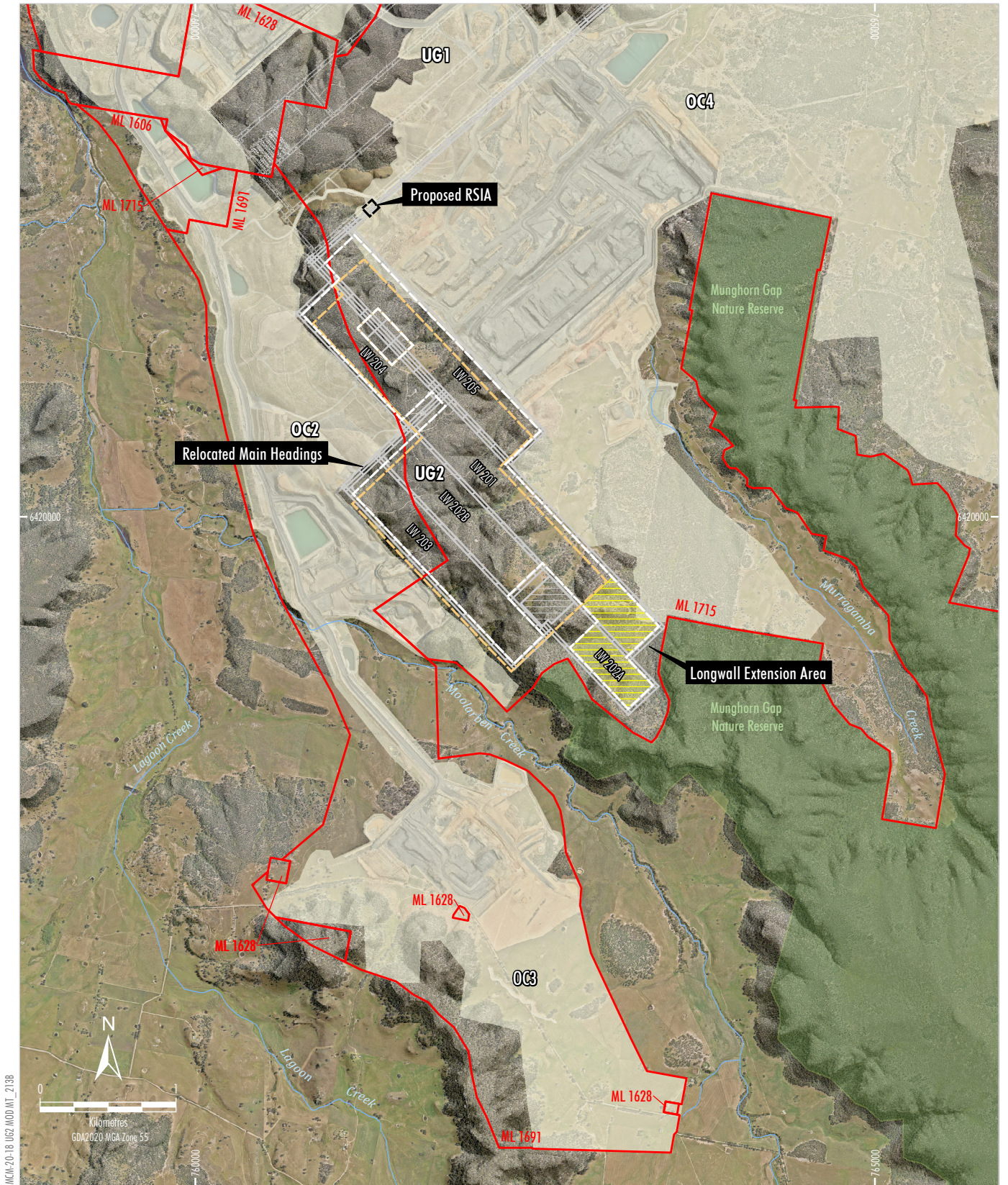

MOOLARBEN COAL COMPLEX
 Proposed Modified
 General Arrangement

Figure 3a



MCM-20-18 UG2 MOD INT 2138

- LEGEND**
- National Parks/Nature Reserves
 - Mining Lease Boundary
 - Existing/Approved Development
 - Underground Longwall Layout
 - Approximate Extent of UG2 Longwalls
 - Moolarben Coal Complex Disturbance Footprint

- Proposed UG2 Modification**
- Optimised UG2 Longwall Layout
 - UG2 Longwall Extension Area
 - Non-subsiding UG2 Secondary Workings
 - Approximate Extent of Proposed Modified Longwalls
 - Proposed Extent of RSIA

Source: MCO (2021); NSW Spatial Services (2021)
Orthophoto Mosaic: MCO (Jan 2021)



MOOLARBEN COAL COMPLEX
 Proposed Modified
 General Arrangement
 Inset

Figure 3b

| Ref No | Landholder | Ref No | Landholder | Ref No | Landholder |
|--------|---|---------|---|---------|-----------------------------------|
| 1-8 | Moolarben Coal Operations Pty Ltd | 106 | TB & JH Reid | 203 | DJ Miller |
| 9 | Orica Australia Pty Ltd | 107 | ZJ, M & AA Raso | 204 | RB & JE Donnan |
| 10 | Moolarben Coal Operations Pty Ltd | 108 | R Varga | 205 | DW Sparrow & M Tallan |
| 11 | C Imrie & J Mullins | 109 | DA Evans | 206 | CA Marshall & R Vella |
| 14-25 | Moolarben Coal Operations Pty Ltd | 110 | JT Thompson & HT Evans | 207 | AA & DM Smith |
| 26 | Forty North Pty Ltd | 111 | GJ & NJ McEwan | 208 | SA & CR Hasaart |
| 27-33 | Moolarben Coal Operations Pty Ltd | 112 | MJ & LM Croft | 209 | F Mawson |
| 34 | T Rheinberger | 113 | CPG Ratcliff | 210 | JM & AM Tebutt |
| 35-37 | Moolarben Coal Operations Pty Ltd | 114 | TF & K Holland | 211 | SA McGregor & WJ Gray |
| 38 | The State of New South Wales | 115 | PR McLean | 212 | E & M Lepik |
| 39 | RM & DJ Sprigg | 116 | DJ & SM Reid | 213 | D & J Parsonage |
| 40 | JM Devenish | 117 | JM Dick | 214 | RK & EG O'Neil |
| 41A | Moolarben Coal Operations Pty Ltd | 118 | A Scott | 215 | SG & PM Green |
| 41B | PP Libertis | 119 | PJ KEARNS | 216 | G Holland & FA Handicott |
| 41C | Moolarben Coal Operations Pty Ltd | 120 | PS & DR Ord | 217 | RP & JL Patterson |
| 42 | C & L Schmidt | 121 | EJ Cullen | 218 | GF & GEL Soady |
| 43-44 | Moolarben Coal Operations Pty Ltd | 123 | G Tuck-Lee & Symons | 219 | T & S Riger |
| 45 | Advance Ennergy | 124 | WJ & HE Bailey | 220 | SJ Rusten & NJ Smith |
| 46 | Moolarben Coal Operations Pty Ltd | 125 | DB McBride | 221 | The State of New South Wales |
| 46B | North-Eastern Wiradjuri Wilpinjong Community Fund Limited | 126 | MP Julian | 222 | BJ Purtell |
| 47-52 | Moolarben Coal Operations Pty Ltd | 127 | BKT & SA Bracken | 223 | EW Palmer & JM Stewart |
| 53 | WD & MS Bryant | 128 | AW Sims | 224 | RS & PCC Dupond |
| 58-59 | Moolarben Coal Operations Pty Ltd | 130 | GP Mcewen | 225 | G & RF Doualelas |
| 60 | C & D Rayner | 131 | GR & RM | 226 | LAA & FC Muscat |
| 61 | O'Malley | 132 | N Atkins | 227 | WP & JA Hughes |
| 62 | R Menchin | 134 | Moolarben Coal Operations Pty Ltd | 228 | PP Libertis |
| 63-64 | Moolarben Coal Operations Pty Ltd | 144 | Moolarben Coal Operations Pty Ltd | 229 | JJ & BA Lowe |
| 66 | Rosherne Pty Limited | 148 | Moolarben Coal Operations Pty Ltd | 230 | DA Hoole & DT Rawlinson |
| 69 | Moolarben Coal Operations Pty Ltd | 149 | Mid-Western Regional Council | 231 | T Morrison & SM Benny |
| 70 | DJ & A Coventry | 151-159 | Moolarben Coal Operations Pty Ltd | 232 | L & JA Haaring |
| 71-74 | Moolarben Coal Operations Pty Ltd | 160 | Minister for Education and Training | 233 | D & K Boal |
| 75 | P Ban | 160B | Moolarben Coal Operations Pty Ltd | 234 | D & L Gaw |
| 76-78 | Moolarben Coal Operations Pty Ltd | 161 | Moolarben Coal Operations Pty Ltd | 235 | LM & RS Wilson |
| 79 | P & S Nagle | 162 | Rowmint Pty Limited | 236 | RG & CA Donovan |
| 80 | W & DJ Sebelic | 163-167 | Moolarben Coal Operations Pty Ltd | 237 | B & S Stokes |
| 81 | Moolarben Coal Operations Pty Ltd | 168 | PJL Construction Complete Mine Service and Solution P/L | 238 | B Powel |
| 82 | SC Hungerford & MC Clemens | 169-177 | Moolarben Coal Operations Pty Ltd | 239-241 | Moolarben Coal Operations Pty Ltd |
| 83 | CF & CR Wall | 178 | P Stone | 253-254 | Ulan Coal Mines Limited |
| 84 | DS Sebelic | 179 | Moolarben Coal Operations Pty Ltd | 255 | H & H Schmitz |
| 85 | J & Z Nikolovski | 180 | C & L Barrett | 256 | R Campbell & S Frost |
| 86 | NW Harris | 181 | S Forster | 257 | Ulan Coal Mines Limited |
| 87 | BJ & K Howe | 182 | JAN Dutoitcook | 258 | P & C Elias |
| 88 | BC Mayers | 183 | R & E Steines | 300 | CM Collins & CY Marshall |
| 89 | MV & HM Glover, E & BJ Tomlson | 184-185 | L Stevenson | 301-302 | Moolarben Coal Operations Pty Ltd |
| 99 | SA Powell | 186 | RW & IJ Adamson | 303 | H Ungaro |
| 91 | HM Graham | 187 | BT & KM Feeney | 304 | G Balajan |
| 92 | VA Pulicino & J, S & G Bonnici | 188 | KR & T Fielding | 305 | L Barisic & M Aul |
| 93 | F & M Fenech | 189 | GA Fay | 306 | E Armstrong |
| 94 | LK Mittermayer | 190 | T & LK Sahyoun | 307 | M Chant & N Young |
| 95 | BJ Withigton | 191 | BW & TS Lasham | 308 | N Dower |
| 96 | D Lazic | 192 | D Williams | 309 | GS Maher |
| 97 | DJ & MD Smith | 193 | DJ Moloney | 310 | KI Death |
| 98 | ME & JJ Piper | 194 | PM & K Potts | 311 | BJ & LC Williamson |
| 99 | DE Jenner & WB Jensen | 195 | R Cottam | 312 | MS & JJ Loannou |
| 100 | W Ellem | 196 | F Saxberg & M Weir | 313 | NJ & BDE Pracy |
| 101 | RD & DMZ Hull | 197 | PGG & I Nielsen | 314 | SL Ford |
| 101A | PJ Kearns | 198 | GR & ME Metcalfe | 315 | WJ Richards & BJ Uselac |
| 102 | KA Roberts | 199 | PGG & I Nielsen | 316 | CR Vassel & CM Williams |
| 103 | SB Burnett & SL Grant | 200 | VK Grimshaw | 317 | RJ Hore & V Bingham |
| 104 | RA & LA Deeben | 201 | KR & GM Towerton | 320 | Moolarben Coal Operations Pty Ltd |
| 105 | DJ & N Katsikaris | 202 | H & VF Butler | 329 | G Tuck-Lee |

Source: MCO (2021); NSW Spatial Services (2021)



MOOLAR BEN COAL COMPLEX

Relevant Landholder List

Figure 4b

Analysis of Feasible Alternatives

The alternative to proceeding with the Modification would be to proceed with the sub-optimal approved UG2.

The consequence of this would be reduced extraction of the State's resources when compared to both the Modification and the approved layout (i.e. given the forgone resources within the approved UG2 mining area associated with geological constraints) with no material change in environmental outcomes.

1.3 STRUCTURE OF THE MODIFICATION REPORT

An overview of the main text of this Modification Report is presented below:

| | |
|-----------|--|
| Section 1 | Provides a summary of the approved Moolarben Coal Complex and an overview of the Modification. |
| Section 2 | Outlines the strategic context relevant to the Modification. |
| Section 3 | Provides a detailed description of the Modification. |
| Section 4 | Outlines the statutory provisions relevant to the Modification. |
| Section 5 | Describes the consultation and engagement undertaken in relation to the Modification and ongoing community involvement. |
| Section 6 | Details the environmental assessment of the Modification and describes the existing environmental management systems and measures that would be available to manage and monitor any potential impacts. |
| Section 7 | Provides an evaluation of the Modification, having regard to economic, environmental, and social impacts. |
| Section 8 | References. |
| Section 9 | Abbreviations. |

Attachments 1 and 2 and Appendices A to E provide supporting information as follows:

| | |
|--------------|--|
| Attachment 1 | Detailed Statutory Compliance Reconciliation Table |
| Appendix A | Subsidence Assessment |
| Appendix B | Groundwater Review |
| Appendix C | Surface Water Assessment |
| Appendix D | Biodiversity Development Assessment Report |
| Appendix E | Aboriginal Cultural Heritage Assessment |

2 STRATEGIC CONTEXT

The Moolarben Coal Complex is an existing and approved mining operation that comprises four approved open cut mining areas, three approved underground mining areas and other mining related infrastructure (including coal processing and transport facilities) (Figure 2).

The Modification would result in a minor change to the existing and approved Moolarben Coal Complex that would allow the recovery of an additional 4.5 Mt of ROM coal. The additional resources would contribute to NSW export income and royalties.

This coal would be mined within the approved Moolarben Coal Complex mine life, Stage 2 Project Boundary and mining tenements, would predominantly use the existing and approved surface infrastructure and would not increase the approved Moolarben Coal Complex surface disturbance footprint.

The optimised UG2 layout has been designed to comply with the existing subsidence impact performance measures in the Stage 2 Project Approval (08_0135). In addition, this Modification Report demonstrates the Modification can be conducted with minimal additional environmental impacts above those already approved for the Moolarben Coal Complex.

The use of existing/approved Moolarben Coal Complex infrastructure for the Modification maximises the potential benefits of previous MCO investment.

The Modification is considered to be consistent with the NSW Government's *Strategic Statement on Coal Exploration and Mining*, which outlines that the NSW Government will act in four areas, including "*supporting responsible coal production in areas deemed suitable for mining*".

3 DESCRIPTION OF THE MODIFICATION

3.1 OVERVIEW

Table 1 provides a summary comparison of the existing and approved Moolarben Coal Project Stage 2 and the Moolarben Coal Project Stage 2 incorporating the Modification.

The following sub-sections provide a description of the Modification components.

3.2 UG2 LAYOUT

The approved UG2 mining layout undermines a vegetated ridgeline, immediately adjacent to approved open cut mining areas (OC2 and OC4) and the Munghorn Gap Nature Reserve. The approved UG2 area contains remnant native vegetation and other natural features (e.g. rocky outcrops), inclusive of part of an approved onsite offset area (Sections 6.1 and 6.4).

The approved UG2 layout consists of four longwall panels (LW 10 to LW 13¹) (Figure 2). In preparation for the commencement of mining in UG2, detailed mine planning has been undertaken to optimise the approved UG2 layout.

The Modification includes the following optimisations to the approved UG2 layout:

- **Approved UG2 mining area** – minor augmentations to the approved UG2 layout within the approved UG2 mining area.
- **Extended UG2 mining area** – extensions to two of the approved UG2 longwall panels outside the approved UG2 mining area.

The proposed optimisations to the approved UG2 layout result in no net change in longwall mining area (i.e. secondary extraction area) within the approved UG2 mining area when compared to the approved UG2 layout.

Optimisations within Approved UG2 Mining Area

The Modification includes the following optimisations to the approved UG2 layout in the approved UG2 mining area:

- increased UG2 extraction height from 3.0 m to 3.5 m;
- increased maximum longwall panel width from 305 m to 311 m;
- reduced longwall mining (or changes to non-subsiding secondary workings) in approved areas due to geological constraints and to maintain the existing Stage 2 Project Approval (08_0135) subsidence impact performance measures;
- minor augmentations to the location of the approved UG2 development works (i.e. non-subsiding first workings) to optimise the connection to the UG1 layout for efficient access, coal clearance and improved ventilation;
- change in location of headings from the north-western end of the UG2 longwall panels to the middle of the approved UG2 mining area (Section 3.3); and
- revised location of the finishing ends of LW 202B, LW 203, LW 204 and LW 205 (previously LW 11, 10, 12 and 13, respectively).

The modified UG2 layout is shown on Figures 3a and 3b.

The modified UG2 layout has been designed such that there would be no change to Stage 2 Project Approval (08_0135) subsidence performance measures, in particular the design of the longwall layout to achieve “negligible” environmental consequences at mapped cliff lines C7, C9 and C10 and Aboriginal heritage site S2MC236 (Sections 6.1 and 6.5).

Extended UG2 Mining Area

Additional coal resources within ML 1715, immediately to the south-east of the approved UG2 mining area have been identified as part of ongoing exploration activities. The Modification includes the extension of two approved longwall panels to extract this additional resource and to maximise resource recovery within ML 1715.

¹ LW 10 is now LW 203; LW 11 is now LW 202B; LW 12 is now LW 201 (south-eastern end) and LW 204 (north-western end); and LW 13 is now LW 205. LW 202A is an extension of LW 202B.

Table 1
Summary Comparison of Approved and Modified Moolarben Coal Project

| Relevant Approval Component | Moolarben Coal Complex Stage 2 Project Approval (08_0135) (as modified) | Moolarben Coal Complex Stage 2 Project Approval (08_0135) (including this Modification) |
|---------------------------------------|--|--|
| Project Boundary | As per Appendix 2 of Project Approval (08_0135). | Unchanged. |
| Operational Mine Life | Mining operations can be carried out until 31 December 2038. | Unchanged. |
| Hours of Operation | Mining operations can be carried out 24 hours per day, seven days per week. | Unchanged. |
| Coal Extraction Limits | Up to 16 Mt of ROM coal can be extracted from the Stage 2 open cut mining operations in any calendar year. | Unchanged. |
| | Up to 16 Mt (total) of ROM coal extracted from the open cut operations at the Moolarben Coal Complex (Stage 1 and Stage 2 cumulatively) in any calendar year. | Unchanged. |
| Underground Coal Extraction Limits | Up to 8 Mt (total) of ROM coal can be extracted from the underground mining operations at the Moolarben Coal Complex in any calendar year. | Unchanged. |
| Coal Processing and Offsite Transport | The Proponent shall ensure that all coal extracted from the site is sent to the Moolarben Stage 1 mine surface infrastructure area for processing (washing) and/or transport to market. | Unchanged. |
| Site Access | Site access via Ulan Road and Ulan-Wollar Road. | Unchanged. |
| Employment | Peak operational workforce of 740 personnel. Average operational workforce of 667 personnel. Peak construction workforce of 250 personnel. Average construction workforce of 120 personnel. | Unchanged. |
| UG2 Layout | As per Figure 4.1 of Stage 2 Project Approval (08_0135). | Minor augmentations to the approved UG2 layout within the approved UG2 mining area. Extensions to two of the approved UG2 longwall panels outside the approved UG2 mining area. Development of an additional non-subsiding gate road along the southern boundary of the UG1 mining area to assist with ventilation in UG2. |
| UG2 Extraction Height | 3.0 m. | Increased extraction height across the entire UG2 mining area to 3.5 m. |
| UG2 ROM Coal Production | Total of 9.4 Mt of ROM coal. | Increased ROM coal production from 9.4 Mt to 13.9 Mt. |
| UG2 Surface Infrastructure | No specific UG2 surface infrastructure required. | Construction and operation of a remote services infrastructure area (indicatively two UG2 service boreholes/drop holes) within the approved OC4 disturbance footprint to support UG2 operations. |
| OC4 Pit Limit | As per Figure 4.1 of Stage 2 Project Approval (08_0135). | Small reduction in the approved OC4 extent to accommodate the optimised LW 201 if it is mined as proposed. |
| Onsite Biodiversity Offset Area | Approved UG2 mining area contains part of an approved Onsite Biodiversity Offset Area. | Increase in Onsite Biodiversity Offset Area within UG2 due to longwall extensions. |

The layout of the extended longwall panels (LW 201 and LW 202A) has been designed to:

- maintain the Stage 2 Project Approval (08_0135) subsidence impact performance measure of “negligible” environmental consequences at mapped cliff line C9;
- achieve negligible impact on the Munghorn Gap Nature Reserve, based on a 26.5 degree (°) angle of draw from the surveyed boundary of the Munghorn Gap Nature Reserve; and
- optimise efficient recovery of coal resource within existing tenements.

LW 201 and LW 202A would also have an extraction height of 3.5 m and a maximum longwall panel width up to 311 m.

3.3 UG2 MINING SEQUENCE

The approved UG2 mining sequence is to mine LW 10 to LW 13 sequentially commencing at the south-eastern end of each longwall panel and progressing towards the north-west.

The Modification proposes to mine LW 201 to LW 205 sequentially.

3.4 UG2 ROM COAL PRODUCTION

The approved UG2 layout would result in the extraction of approximately 9.4 Mt of ROM coal.

The modified UG2 would allow access to an additional 4.5 Mt of coal resource as a result of the increased extraction height and to a lesser extent the extended UG2 mining area (Section 3.2). The Modification would therefore increase total UG2 ROM coal production from 9.4 Mt to 13.9 Mt.

The Modification would not change the approved Moolarben Coal Complex annual underground mining ROM coal production rate of 8 million tonnes per annum (Mtpa) (cumulatively from all underground operations).

ROM coal would continue to be transported to the mine surface infrastructure area for processing and/or transport to market.

Underground ROM coal would continue to be sold as an unwashed (bypass) product and therefore no additional coal reject material would be generated as a result of the Modification.

3.5 REMOTE SERVICES INFRASTRUCTURE AREA

The Modification includes the construction and operation of a remote services infrastructure area (indicatively two UG2 service boreholes/drop holes) within the approved OC4 disturbance footprint to support safe and efficient mining operations at UG2.

The remote services infrastructure area would include the following:

- service boreholes (up to a nominal diameter of about 950 millimetres [mm]) for services including, but not limited to:
 - electrical;
 - concrete;
 - ballast;
 - stonedust; and
 - compressed air;
- temporary site office, lay-down areas and drill sumps during the construction phase;
- appropriate surface drainage and sediment control infrastructure, noting the area is within the catchment of the OC4 mine water management system; and
- other ancillary services and infrastructure (e.g. water tanks, sheds, electrical equipment, ballast and stonedust storage, compressors, sediment dams, soil stockpiles, fencing, etc.).

Vehicle access to the remote services infrastructure area would be via existing internal roads within OC4.

The indicative location of the remote services infrastructure area is shown on Figure 3b. As the remote services infrastructure area would be located within the approved OC4 disturbance footprint, no new surface disturbance would be required.

Construction of the remote services infrastructure area (including drilling of service boreholes) would generally be conducted during daytime hours (7.00 am to 6.00 pm) for a period of up to approximately six months.

Construction and operation activities would be managed in accordance with the existing environmental performance measures for the Moolarben Coal Complex, as outlined in the Stage 1 and Stage 2 Project Approvals, and would be immaterial relative to the approved and ongoing open cut mining activities (Section 6).

3.6 ADDITIONAL GATE ROAD

The Modification would include development of an additional non-subsiding gate road along the southern boundary of the UG1 (LW 105) mining area to assist with ventilation in UG2.

3.7 OTHER UG2 COMPONENTS

The Modification **would not change** the following approved UG2 components:

- underground mine access via UG1;
- underground equipment and mobile fleet;
- mine dewatering systems;
- coal clearance and conveying; and
- operational hours.

3.8 OC4 PIT LIMITS

The approved OC4 is located to the north and east of UG2. The proposed extension of LW 201 to the south-east (Section 3.2) would intersect with a portion of the approved OC4 extent (Figure 3b).

This portion of OC4 would no longer be mined using open cut methods if LW 201 is extended, as proposed. If MCO elected however to not mine (or partially mine) the extended LW 201, the full extent of the approved OC4 may still be mined using open cut methods.

Any reduction in coal extraction from OC4 due to the Modification would be negligible.

3.9 COMPONENTS OF MOOLARBEN COAL COMPLEX NOT BEING MODIFIED

The Modification **does not** involve changes to the Moolarben Coal Complex under the Stage 1 Project Approval (05_0117).

In summary, there would be no change to the following approved elements of the Moolarben Coal Complex:

- Stage 2 Project Boundary;
- mining tenements;
- operational mine life;
- open cut or underground coal extraction limits;
- OC1, OC2 or OC3 pit limits;
- UG1 or UG4 layouts;
- waste rock management;

- blasting activities;
- coal processing activities or limits;
- coal reject disposal;
- offsite product coal transport (i.e. train movements);
- water management infrastructure design and objectives;
- site access;
- hours of operation; and
- peak workforce.

3.10 STAGE 2 PROJECT APPROVAL (08_0135) CONDITIONS TO BE MODIFIED

It is not anticipated that any specific conditions of the Stage 2 Project Approval (08_0135) would require modification as a result of the Modification.

The figures shown in the appendices of the Stage 2 Project Approval (08_0135) would however be required to be updated to reflect the optimised UG2 mine layout.

3.11 “SUBSTANTIALLY THE SAME DEVELOPMENT”

A comparative analysis is provided in Table 1 that outlines the key elements of the approved Moolarben Coal Project Stage 2 and the key components of the Modification.

The Moolarben Coal Project Stage 2 incorporating the Modification would demonstrably remain a large open cut and underground coal mine that incorporates the key elements approved under Stage 2 Project Approval (08_0135) (as last modified under section 75W of the EP&A Act).

4 STATUTORY CONTEXT

This section outlines the statutory requirements relevant to the assessment of the Modification.

In accordance with the guideline *Preparing a Modification Report* (DPIE, 2021b), Attachment 1 provides a detailed statutory compliance table for the Project incorporating the Modification that identifies all the relevant statutory requirements and the relevant sections in this Modification Report that address these requirements.

4.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The EP&A Act and the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) set the framework for planning and environmental assessment in NSW.

Assessment Pathway

The Stage 2 Project Approval (08_0135) for the Moolarben Coal Project Stage 2 was granted by the Planning Assessment Commission (as delegate of the NSW Minister for Planning) under Part 3A of the EP&A Act on 30 January 2015.

As a result of amendments made to the EP&A Act which took effect on 1 March 2018, it is no longer possible for the Project Approval to be modified under the former section 75W of the EP&A Act.

The Moolarben Coal Project Stage 2 was declared a State Significant Development (SSD) under clause 6 of Schedule 2 to the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017* via Government Gazette on 28 June 2019.

Given that the Moolarben Coal Project Stage 2 is now considered to be SSD, MCO is seeking to modify the Stage 2 Project Approval (08_0135) under section 4.55(2) of the EP&A Act.

Section 4.55(2) of the EP&A Act relevantly states:

4.55 Modifications of consents - generally

...

(2) Other modifications

A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if:

- (a) *it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified (if at all), and*
- (b) *it has consulted with the relevant Minister, public authority or approval body (within the meaning of Division 4.8) in respect of a condition imposed as a requirement of a concurrence to the consent or in accordance with the general terms of an approval proposed to be granted by the approval body and that Minister, authority or body has not, within 21 days after being consulted, objected to the modification of that consent, and*
- (c) *it has notified the application in accordance with:*
 - (i) *the regulations, if the regulations so require, or*
 - (ii) *a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and*
- (c) *it has considered any submissions made concerning the proposed modification within the period prescribed by the regulations or provided by the development control plan, as the case may be.*

...

Clause 3BA(6) of Schedule 2 of the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017* relevantly provides:

3BA Winding-up of transitional Part 3A modification provisions on cut-off date of 1 March 2018 and other provisions relating to modifications

...

- (6) *In the application of section 4.55 (1A) or (2) or 4.56 (1) of the Act to the following development, the consent authority need only be satisfied that the development to which the consent as modified relates is substantially the same development as the development authorised by the consent (as last modified under section 75W):*
- (a) *development that was previously a transitional Part 3A project and whose approval was modified under section 75W,*

...

The consent authority is, therefore, required to satisfy itself that the Stage 2 Project Approval (08_0135) as modified would result in the Moolarben Coal Project Stage 2 remaining substantially the same development as was last modified under section 75W of the EP&A Act (i.e. Modification 3), inclusive of consideration of the changes arising from previously approved modifications.

For the reasons outlined in Section 3.11, the consent authority can be satisfied that the Moolarben Coal Project Stage 2, incorporating the Modification, would remain “substantially the same” as the development that was originally granted for the Moolarben Coal Project Stage 2, as last modified under section 75W of the EP&A Act (i.e. Modification 3).

This Modification Report is a Statement of Environmental Effects that has been prepared in support of the application to modify Stage 2 Project Approval (08_0135).

4.1.1 NSW Environmental Planning and Assessment Act 1979 Objects

Section 1.3 of the EP&A Act describes the objects of the EP&A Act as follows:

- (a) *to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State’s natural and other resources,*
- (b) *to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,*
- (c) *to promote the orderly and economic use and development of land,*
- ...
- (e) *to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,*
- (f) *to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),*
- ...
- (i) *to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,*
- (j) *to provide increased opportunity for community participation in environmental planning and assessment.*

The Modification is considered to be generally consistent with the objects of the EP&A Act, as it:

- would contribute to the financial resilience of the Moolarben Coal Complex, which would be achieved through the efficient development of the existing available resources (e.g. additional production can be achieved with no change to the existing infrastructure);
- would facilitate ecologically sustainable development (ESD), as economic efficiencies can be achieved with no change to the currently accepted environmental performance measures, and no increase in the duration of existing impacts of the Moolarben Coal Complex;

- would not require any new surface disturbance and includes setbacks from key environmental surface features, and therefore, potential impacts on biodiversity and cultural heritage items as a result of the Modification would be minimised; and
- would be developed in a manner that incorporates community engagement, with a wide range of stakeholders consulted through the preparation of this Modification Report (Section 5).

4.1.2 Evaluation under Section 4.15(1) of the Environmental Planning and Assessment Act 1979

In evaluating the Modification, under section 4.15(1) of the EP&A Act, the consent authority is required to take into consideration a range of matters as they are of relevance to the subject of the application, including:

(1) *Matters for consideration—general*

In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application—

- (a) *the provisions of—*
- (i) *any environmental planning instrument, and*
 - (ii) *any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and*
 - (iii) *any development control plan, and*
 - (iiia) *any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and*
 - (iv) *the regulations (to the extent that they prescribe matters for the purposes of this paragraph),*
- ...
- that apply to the land to which the development application relates,*
- (b) *the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,*

- (c) *the suitability of the site for the development,*
- (d) *any submissions made in accordance with this Act or the regulations,*
- (e) *the public interest.*

While this is a requirement of the consent authority, this Modification Report has been prepared to generally address the requirements of section 4.15(1) of the EP&A Act to assist the consent authority, as follows:

- Consideration of the requirements of relevant environmental planning instruments is provided in Section 4.3.
- Clause 11 of the *State Environmental Planning Policy (State and Regional Development) 2011* states that development control plans do not apply to SSDs, such as the Moolarben Coal Project Stage 2.
- The existing planning agreement with the Mid-Western Regional Council would continue to apply to the modified Moolarben Coal Project Stage 2.
- This Modification Report has been prepared in consideration of the prescribed matters in the EP&A Regulation.
- A description of the existing environment, an assessment of the potential environmental impacts associated with the Modification, and a description of the potential measures to avoid, mitigate, rehabilitate, remediate, monitor and/or offset the potential impacts of the Modification are described in Section 6 and Appendices A to E.
- The suitability of the proposed site for the Project has previously been considered and would not change for the Modification (i.e. the Modification is wholly located within the approved Stage 2 Project Boundary and the Project, as modified, would remain substantially the same).
- Consideration of whether, on evaluation, the Modification is considered to be in the public interest is provided in Section 7.

4.2 OTHER RELEVANT NSW LEGISLATION

In addition to the EP&A Act, other NSW legislation applicable to the Moolarben Coal Complex incorporating the Modification includes:

- *Water Management Act 2000;*
- *Biodiversity Conservation Act 2016 (BC Act);*
- *National Parks and Wildlife Act 1974;*

- *Mining Act 1992; and*
- *Protection of the Environment Operations Act 1997 (PoEO Act).*

Relevant licences or approvals required under these Acts would continue to be obtained for the Moolarben Coal Complex incorporating the Modification.

4.2.1 Water Management Act 2000

The *Water Management Act 2000* contains provisions for the licensing, allocation, capture and use of water resources.

Under the *Water Management Act 2000*, water sharing plans establish rules for sharing water between different users and between the various environmental sources (namely rivers or aquifers).

The Modification would not change peak water licensing, supply sources or storage requirements for the Moolarben Coal Complex (Appendix B).

MCO would continue to obtain and hold licences required under the *Water Management Act 2000* for licensable take.

4.2.2 Biodiversity Conservation Act 2016

The BC Act provides the legislative framework for biodiversity conservation in NSW.

A Biodiversity Development Assessment Report (BDAR) (Appendix D) was prepared by Niche (2021a) for the extended UG2 mining area in accordance with the Biodiversity Assessment Method (BAM) (DPIE, 2020a) (Appendix D).

As described in Section 6.4, with reference to clause 30A, sections 1(a) and 2(c) of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*, the Modification would not increase impacts on biodiversity values in the approved UG2 mining area (notwithstanding the proposed minor augmentations to the mine plan) and therefore, it is considered that a BDAR is not required for the proposed augmentations to the approved UG2 mining area. This is because:

- Subsidence impacts are approved in this area.
- There would be no change to the Stage 2 Project Approval (08_0135) subsidence impact performance measures, which includes environmental performance measures for biodiversity and habitat features susceptible to subsidence impacts (i.e. cliff lines, minor cliffs, rock face features and steep slopes).

- While the increased extraction height would increase vertical subsidence, there would be no change to maximum predicted tilts and curvatures and therefore no change to subsidence impacts relative to the approved UG2 longwalls (Appendix A).

4.2.3 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* contains provisions for the establishment, preservation and management of national parks, historic sites and Aboriginal cultural heritage in NSW.

Section 4.41 of the EP&A Act outlines authorisations that are not required for an SSD authorised by a development consent under Division 4.7 of Part 4 of the EP&A Act. An Aboriginal cultural heritage impact permit under section 90 of the *National Parks and Wildlife Act 1974* is not required for the Moolarben Coal Project Stage 2, including for the Modification.

An Aboriginal Cultural Heritage Assessment (ACHA) has been undertaken for the Modification by Niche (2021b) to assess the potential impacts of the Modification on Aboriginal cultural heritage (Appendix E).

4.2.4 Mining Act 1992

The objects of the *Mining Act 1992* are to encourage and facilitate the discovery and development of mineral resources in NSW, having regard to the need to encourage ESD.

The Modification would be wholly within existing mining leases (Figure 4a). Therefore, there would be no need for the amendment or variation of the existing authorities or the issue of new authorities under the *Mining Act 1992*.

MCO would revise the approved Mining Operations Plan (MOP) (or equivalent) to incorporate the Modification.

4.2.5 Protection of the Environment Operations Act 1997

The PoEO Act and the *Protection of the Environment Operations (General) Regulation 2009* set out the general obligations for environmental protection for industry in NSW, which is regulated by the NSW Environment Protection Authority (EPA).

Operations at the Moolarben Coal Complex are currently undertaken in accordance with existing Environment Protection Licence (EPL) 12932 issued under the PoEO Act.

It is not anticipated that any changes to EPL 12932 would be required as a result of the Modification.

4.3 STATE ENVIRONMENTAL PLANNING POLICIES

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

The *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (Mining SEPP) imposes planning controls to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources.

Part 3 of the Mining SEPP outlines some of the matters to be considered when determining development applications (noting that State Environmental Planning Policies are but one of a number of considerations that are required to be taken into account). Relevant clauses are discussed further below.

Clause 12

Clause 12 of the Mining SEPP requires that, before determining an application for consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must:

- (a) *consider:*
 - (i) *the existing uses and approved uses of land in the vicinity of the development, and*
 - (ii) *whether or not the development is likely to have a significant impact on the uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development, and*
 - (iii) *any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses, and*
- (b) *evaluate and compare the respective public benefits of the development and the land uses referred to in paragraph (a) (i) and (ii), and*
- (c) *evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a) (iii).*

Land use in the broader vicinity of the Moolarben Coal Complex is characterised by a combination of coal mining operations, agricultural land, rural residences and the village of Ulan. The Modification areas are contained entirely within MCO's existing mining leases.

The Modification involves augmentations to the approved UG2 mining area and minor longwall extensions within the Stage 2 Project Boundary within MCO's existing mining leases.

Accordingly, the Modification is considered to be compatible with existing and approved uses of land, namely underground coal mining.

The potential impact of the Modification on surrounding land uses are summarised in Section 6.

MCO would, where practicable, implement a range of measures to avoid or minimise incompatibility of the Modification with existing and future land uses in the area.

This would be achieved through the implementation of the existing Moolarben Coal Complex Environmental Management Strategy and management plans and other measures for the Modification (Section 6).

Clause 13

Clause 13(2) of the Mining SEPP requires that, before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must:

- (a) *consider:*
 - (i) *the existing uses and approved uses of land in the vicinity of the development, and*
 - (ii) *whether or not the development is likely to have a significant impact on current or future extraction or recovery of minerals, petroleum or extractive materials (including by limiting access to, or impeding assessment of, those resources), and*
 - (iii) *any ways in which the development may be incompatible with any of those existing or approved uses or that current or future extraction or recovery, and*
- (b) *evaluate and compare the respective public benefits of the development and the uses, extraction and recovery referred to in paragraph (a) (i) and (ii), and*
- (c) *evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a) (iii).*

The existing and approved use of the land in the vicinity of the Modification includes coal mining.

The Modification involves optimisations to the approved UG2 mine plan to improve the efficiency of resource recovery and is considered compatible with existing and approved surrounding land uses.

There would be no direct interaction with the Ulan or Wilpinjong Coal Mines for the Modification. As such, no measures to avoid or minimise incompatibility with existing and approved surrounding land uses is considered to be required.

Public benefits of the Modification include ongoing employment at the Moolarben Coal Complex, ongoing expenditure in the local and regional economies and increased royalties paid to the NSW Government.

Clause 14

Clause 14(1) of the Mining SEPP requires that, before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the approval should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure the following:

- (a) *that impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable,*
- (b) *that impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest extent practicable,*
- (c) *that greenhouse gas emissions are minimised to the greatest extent practicable.*

In addition, clause 14(2) requires that, without limiting clause 14(1), in determining a development application for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider an assessment of the greenhouse gas emissions (including downstream emissions) of the development, and must do so having regard to any applicable State or national policies, programs or guidelines concerning greenhouse gas emissions.

The potential impact of the Modification on groundwater and surface water resources are described in Sections 6.2 and 6.3, along with measures to minimise potential impacts.

The potential impact of the Modification on threatened species and biodiversity are described in Section 6.4, along with measures to avoid and minimise potential impacts.

The potential changes in annual greenhouse gas emissions associated with the Modification and associated measures to minimise greenhouse gas emissions at the Moolarben Coal Complex are described in Section 6.6.4.

Clause 15

Clause 15 of the Mining SEPP requires that:

- (1) *Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider the efficiency or otherwise of the development in terms of resource recovery.*
- (2) *Before granting consent for the development, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at optimising the efficiency of resource recovery and the reuse or recycling of material.*
- (3) *The consent authority may refuse to grant consent to development if it is not satisfied that the development will be carried out in such a way as to optimise the efficiency of recovery of minerals, petroleum or extractive materials and to minimise the creation of waste in association with the extraction, recovery or processing of minerals, petroleum or extractive materials.*

A key element of the Modification is to increase efficiency of resource recovery from UG2 through optimisation of the layout and extension of two longwalls.

Clause 16

Clause 16(1) of the Mining SEPP requires that, before granting consent for development for the purposes of mining that involves the transport of materials, the consent authority must consider whether or not the consent should be issued subject to conditions that do any one or more of the following:

- (a) *require that some or all of the transport of materials in connection with the development is not to be by public road,*
- (b) *limit or preclude truck movements, in connection with the development, that occur on roads in residential areas or on roads near to schools,*
- (c) *require the preparation and implementation, in relation to the development, of a code of conduct relating to the transport of materials on public roads.*

Product coal would continue to be transported from site by rail for the Modification.

As there would not be any increase in peak employees/contractors, there would be no change in the maximum daily operational vehicle movements for the Modification.

No specific additional traffic management or mitigation measures are considered to be warranted due to the Modification.

Clause 17

Clause 17 of the Mining SEPP requires that, before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the approval should be issued subject to conditions aimed at ensuring the rehabilitation of land that will be affected by the development. In particular, the consent authority must consider whether conditions of the consent should:

- (a) require the preparation of a plan that identifies the proposed end use and landform of the land once rehabilitated, or
- (b) require waste generated by the development or the rehabilitation to be dealt with appropriately, or
- (c) require any soil contaminated as a result of the development to be remediated in accordance with relevant guidelines (including guidelines under section 145C of the Act and the Contaminated Land Management Act 1997), or
- (d) require steps to be taken to ensure that the state of the land, while being rehabilitated and at the completion of the rehabilitation, does not jeopardize public safety.

There would be no change to the existing land uses above the UG2 area due to the Modification (i.e. native vegetation and biodiversity offset). The remote services infrastructure area would be decommissioned following the completion of mining, and its construction would not change the approved final land uses and rehabilitation in OC4.

The approved rehabilitation objectives for the Moolarben Coal Complex would continue for the Modification.

The Rehabilitation Management Plan and MOP would be revised to incorporate the Modification.

Any remediation required as a result of subsidence impacts in the UG2 area would be undertaken in accordance with an approved Extraction Plan.

State Environmental Planning Policy (Koala Habitat Protection) 2021

The *State Environmental Planning Policy (Koala Habitat Protection) 2021* commenced on 17 March 2021 and is currently in force. However, at the time of writing, for all land zoned as RU1, RU2 and RU3, outside of the Sydney Metropolitan Area and the Central Coast, the *State Environmental Planning Policy (Koala Habitat Protection) 2020* continues to apply.

The majority of the approved UG2 mining area and entirety of the extended UG2 mining area are zoned RU1, and therefore the *State Environmental Planning Policy (Koala Habitat Protection) 2020* would apply. The remainder of the approved UG2 mining area is zoned E3 Environmental Management, and therefore the *State Environmental Planning Policy (Koala Habitat Protection) 2021* would apply.

The extended UG2 mining area contains potential Koala habitat due to presence of feed trees and is also considered likely to be core Koala habitat on the basis of confirmed presence during surveys (Appendix D).

Since the Modification is an application to modify Project Approval (08_0135) under section 4.55(2) of the EP&A Act, the Mid-Western Regional Council will not be the consent authority. The provisions of *State Environmental Planning Policy (Koala Habitat Protection) 2020* and *State Environmental Planning Policy (Koala Habitat Protection) 2021* do not apply in circumstances where the consent authority is not the Council.

4.4 COMMONWEALTH LEGISLATION

4.4.1 Environment Protection and Biodiversity Conservation Act 1999

The current Moolarben Coal Project Stage 2 operations are approved to be undertaken in accordance with Approval Decision (EPBC 2008/4444) granted on 18 May 2015 (and varied by notice on 20 July 2016 and 20 July 2021) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The relevant controlling provisions were:

- listed threatened species and communities (sections 18 and 18A of the EPBC Act); and
- a water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E of the EPBC Act).

The potential impacts of the Modification on flora and fauna have been assessed in the BDAR (Appendix D) and summarised in Section 6.4.

The potential impacts of the Modification on water resources have been assessed in the Groundwater Review (Appendix B) and Surface Water Assessment (Appendix C) and summarised in Sections 6.2 and 6.3, respectively. Appendices B and C indicate that there would be no significant impact on water resources as a result of the Modification.

MCO may separately refer the Modification to the Commonwealth Minister to confirm if the proposed activities are a “Controlled Action” under the EPBC Act.

5 ENGAGEMENT

5.1 ENGAGEMENT APPROACH

MCO consults with key stakeholders on a regular basis in regard to the approved Moolarben Coal Complex.

Consultation for the Modification has been conducted with key State Government agencies, local councils, the local community, Aboriginal stakeholders and operators of neighbouring mines during the preparation of this Modification Report.

Key objectives of the engagement undertaken for the Modification are to:

- engage with key stakeholders about the Modification;
- seek input from key stakeholders on elements of the Modification; and
- continue the ongoing dialogue between MCO and key stakeholders regarding the development of the Moolarben Coal Complex.

A summary of consultation with key stakeholders is provided below. Consultation will continue during both the public exhibition of this Modification Report and the assessment of the Modification application.

5.2 DEPARTMENT OF PLANNING, INDUSTRY, AND ENVIRONMENT

Briefings with DPIE were conducted in February, June and July 2021 to provide an overview of the proposed Modification and the proposed scope of environmental assessment and stakeholder consultation.

A Scoping Letter was also provided to DPIE in September 2021. Following this correspondence, DPIE wrote to MCO on 29 September 2021 confirming the proposed approval pathway and that it was generally satisfied with the proposed scope of assessment and consultation for the Modification.

MCO will continue to consult with DPIE throughout the Modification assessment process.

5.3 OTHER GOVERNMENT AGENCIES

MCO consulted with the following regulatory agencies to provide an overview description of the Modification and proposed scope of environmental assessment relevant to their respective areas of interest:

- Biodiversity, Conservation and Science Directorate (BCS);
- Heritage NSW and NSW Heritage Council;
- NSW National Parks and Wildlife Service;
- Department of Regional NSW – Mining, Exploration and Geoscience;
- NSW Resource Regulator;
- DPIE - Water and Natural Resources Access Regulator;
- Transport for NSW; and
- EPA.

Meetings were held with the BCS on 7 July and 28 October 2021 to discuss the biodiversity assessment approach, scope of the BDAR and the outcomes of targeted surveys.

BCS outlined relevant technical aspects to be considered in the biodiversity assessment for the Modification and these have been addressed in the BDAR.

5.4 LOCAL COUNCIL

MCO regularly meets with representatives of the Mid-Western Regional Council regarding the approved Moolarben Coal Complex. An overview of the Modification and proposed scope of environmental assessment and engagement was presented at these regular meetings in May and November 2021.

5.5 NEIGHBOURING MINES

MCO consulted with Ulan Coal Mines Limited (operator of the Ulan Mine Complex) and Wilpinjong Coal Pty Ltd (operator of the Wilpinjong Coal Mine) to provide an overview of the Modification in April 2021.

No additional direct interaction between the Moolarben Coal Complex and the neighbouring mines is expected as a result of the Modification (i.e. beyond the currently approved Moolarben Coal Complex).

Potential cumulative impacts with the neighbouring mining operations have been considered where relevant in this Modification Report.

5.6 COMMUNITY ENGAGEMENT

Community Consultative Committee

The Moolarben Coal Complex Community Consultative Committee (CCC) was established in accordance with both Stage 1 and Stage 2 Project Approvals (05_0117 and 08_0135) in March 2015.

The CCC provides a mechanism for ongoing communication between MCO and representatives of the local community, including an independent chairperson, councillors from the Mid-Western Regional Council, the Mudgee Chamber of Commerce, local residents and community members.

MCO conducted briefings with the CCC in March, June and September 2021, providing an overview (and subsequent updates) of the Modification and proposed scope of environmental assessment.

Meeting minutes for the CCCs are publicly available on the MCO website.

Aboriginal Stakeholders

MCO consulted with Aboriginal stakeholders as part of the ACHA prepared for the Modification. Consultation was conducted with reference to the *Aboriginal cultural heritage consultation requirements for proponents 2010* (Department of Environment, Climate Change and Water [DECCW], 2010a) and the *National Parks and Wildlife Regulation 2019*.

Further detail on consultation with Aboriginal stakeholders, and how comments have been considered, is provided in Section 6.5 and Appendix E.

Public Consultation

The MCO website (www.moolarbencoal.com.au) provides regular updates on the Moolarben Coal Complex, and provides access to relevant environment and community information, including compliance reports and approval documents.

The Moolarben Coal Hotline (1800 556 484) allows members of the public to contact MCO with enquiries or complaints.

A copy of this Modification report will be made available on the MCO website.

Local Community

MCO notified the local community of the Modification via a newsletter, providing an overview of proposed projects for the Moolarben Coal Complex, including this Modification. The newsletter was distributed throughout June and July 2021.

6 ASSESSMENT OF IMPACTS

MCO has undertaken a review of the potential environmental impacts of the Modification to identify key potential environmental issues requiring assessment.

The key potential environmental impacts of the Modification are related to the modified UG2 layout and the associated subsidence impacts and consequences.

A discussion of the predicted subsidence effects and impacts is provided in Section 6.1. An assessment of the potential consequences of the predicted subsidence impacts is provided in Sections 6.1 to 6.5 and the relevant appendices for:

- natural and built features;
- groundwater;
- surface water;
- biodiversity; and
- Aboriginal cultural heritage.

In addition, the construction of the remote services infrastructure area (indicatively two UG2 service boreholes/drop holes) may result in changes to the existing/approved environmental impacts of the Moolarben Coal Complex (e.g. noise and air quality).

Sections 6.1 to 6.5 and the relevant appendices, include a description of the existing environment, an assessment of the potential impacts of the Modification and, where relevant, a description of the measures that would be implemented to avoid, minimise, mitigate and/or offset the potential impacts.

Section 6.6 discusses the potential environmental impacts of the Modification on other aspects, including land resources, non-Aboriginal heritage, greenhouse gas emissions and hazards and risk. Section 6.6 also discusses potential amenity (including noise and air quality), visual, social and economic outcomes of the Modification.

6.1 SUBSIDENCE

6.1.1 Methodology

A Subsidence Assessment has been prepared by Mine Subsidence Engineering Consultants (MSEC) (2021) for the Modification and is provided in Appendix A.

The Subsidence Assessment:

- provides revised predicted subsidence effects for the modified UG2 layout;
- compares the revised predicted subsidence effects with those for the approved UG2;
- identifies the natural and built features located within the extent of UG2 subsidence; and
- assesses the likely subsidence impacts on natural and built features in the approved and extended UG2 mining area, in conjunction with other specialist consultants, in consideration of the predicted subsidence effects and existing performance measures.

A summary of the key findings of the Subsidence Assessment is provided below.

6.1.2 Background

Previous Assessments

The Moolarben Coal Project Stage 2 Environmental Assessment (EA) was prepared in 2009 and incorporated a Subsidence Assessment (MSEC, 2008). Following lodgement, MCO made a number of changes to the proposed layout and design in order to address issues raised by the NSW Department of Planning and Infrastructure (now DPIE) and its independent technical reviewers, introduce additional impact avoidance measures and to enable the effective integration of Stage 2 with Stage 1.

Changes to the Moolarben Coal Project Stage 2 EA were described in the Moolarben Coal Project Stage 2 Preferred Project Report (PPR) (MCM, 2012), including a revised Subsidence Impact Assessment prepared by MSEC (2011).

The revised Subsidence Impact Assessment (MSEC, 2011) assessed the currently approved UG2 layout and concluded that the level of impact on natural and built features can be managed by the preparation and implementation of management strategies.

Subsidence Impact Performance Measures

Conditions 1 and 3, Schedule 4 of the Stage 2 Project Approval (08_0135) provide subsidence impact performance measures for natural, environmental and built features relevant to underground mining in the UG1 and UG2 mining areas (Table 2).

Table 2
Moolarben Coal Project Stage 2
Subsidence Impact Performance Measures

| Feature | Subsidence Impact Performance Measure |
|--|--|
| Natural and Heritage Features | |
| Drainage Lines (DL1 to DL7) | No greater subsidence impacts or environmental consequences than predicted in the EA. |
| Cliffs C7, C9 and C10 | Negligible environmental consequences (that is occasional rockfalls, displacement or dislodgement of boulders or slabs or fracturing, that in total do not impact more than 0.5% of the total face of such cliffs within any longwall mining domain). |
| Other cliffs | No greater subsidence impacts or environmental consequences than predicted in the EA. |
| Minor cliffs Rock face features Steep Slopes | Minor environmental consequences (that is, occasional rockfalls, displacement or dislodgment of boulders or slabs, or fracturing, that in total do not impact more than 5% of the total face area of each such type of feature within any longwall mining domain). |
| Threatened species, threatened populations or endangered ecological communities | Negligible subsidence impacts or environmental consequences. |
| Aboriginal heritage site S2MC236 | Negligible subsidence impacts or environmental consequences. |
| Historic heritage sites | No greater subsidence impacts or environmental consequences than predicted in the EA. |
| First workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible subsidence impacts or negligible environmental consequences | To remain long-term stable and non-subsiding. |
| Second workings | To be carried out only in accordance with an approved Extraction Plan |
| Built Features | |
| Other built features and improvements, including fences | Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. Damage must be fully repairable, and must be fully repaired or else replaced or fully compensated. |
| Public Safety | |
| Public safety | Negligible additional risk |

Source: Conditions 1 and 3, Schedule 4, Moolarben Coal Project Stage 2 Project Approval (08_0135).

EA = Moolarben Coal Project Stage 2 EA as modified, including the Moolarben Coal Project Stage 2 PPR (MCM, 2012).

These subsidence impact performance measures were developed in consideration of the predicted subsidence impacts in the Subsidence Impact Assessment (MSEC, 2011) for the Moolarben Coal Project Stage 2 PPR.

Extraction Plan

Condition 5, Schedule 4 of the Stage 2 Project Approval (08_0135) requires MCO to prepare an Extraction Plan for second workings prior to extraction.

Monitoring of Secondary Extraction in UG1

First workings for UG1 commenced in April 2016, with secondary workings (i.e. longwall extraction) commencing in October 2017. The approved UG2 has not yet been developed.

The UG1 LWs 101 to 105 Extraction Plan (MCO, 2020) includes a Subsidence Monitoring Program which comprises monitoring of subsidence lines, flora and fauna habitats, cliffs, landscape features, surface water, groundwater, heritage and built features.

Monitoring of subsidence and associated impacts in UG1 undertaken since 2017 has demonstrated that subsidence-related impacts comply with the relevant subsidence impact performance measures (MCO, 2020).

Minor remediation works have been required above UG1 to maintain access tracks, haul roads and infrastructure due to subsidence impacts in accordance with the approved UG1 LWs 101 to 105 Extraction Plan (MCO, 2020).

6.1.3 Prediction of Subsidence Effects

Subsidence is the vertical and horizontal movement of the overburden and land surface as a result of the extraction of underlying coal. These land surface movements are generically referred to as subsidence effects. The type and magnitude of the subsidence effects are dependent on a range of variables (e.g. mine geometry, topography and geology).

The normal ground movements from the extraction of longwalls can be categorised as conventional or non-conventional subsidence movements.

Prediction Methodology

Predictions of systematic subsidence parameters for the Modification were made using the Incremental Profile Method, which consists of subsidence prediction curves based on monitoring data from mines extracting coal from the Southern, Newcastle, Hunter and Western Coalfields of NSW (Appendix A).

The Incremental Profile Method has a tendency to over-predict the systematic subsidence parameters where the proposed mining geometry and geology are within the range of the empirical database (i.e. the method is based on upper bound curves and is generally conservative) (Appendix A).

For the modified UG2 layout, the predicted subsidence effects associated with the Modification have been assessed for both the approved UG2 mining area and the extended UG2 mining area (Figure 5).

A detailed description of the numerical methodologies used to predict subsidence effects associated with the Modification is provided in Appendix A.

Maximum Conventional Subsidence Effects

Conventional subsidence movements are described by the following parameters: vertical subsidence, tilt, curvature, and associated strains (tensile and compressive strains).

Table 3 presents a comparison of the maximum predicted subsidence effects from the approved and modified UG2 layout, including for the approved and extended UG2 mining areas.

The maximum predicted total vertical subsidence for the approved UG2 mining area component of the modified UG2 layout is slightly greater than previously predicted subsidence for the approved UG2 layout (Table 3). The increase in the maximum total vertical subsidence is mostly due to the proposed increase in the extraction height (Appendix A).

Table 3
Comparison of Predicted Systematic Subsidence Effects for the Approved and Modified Mining Layouts

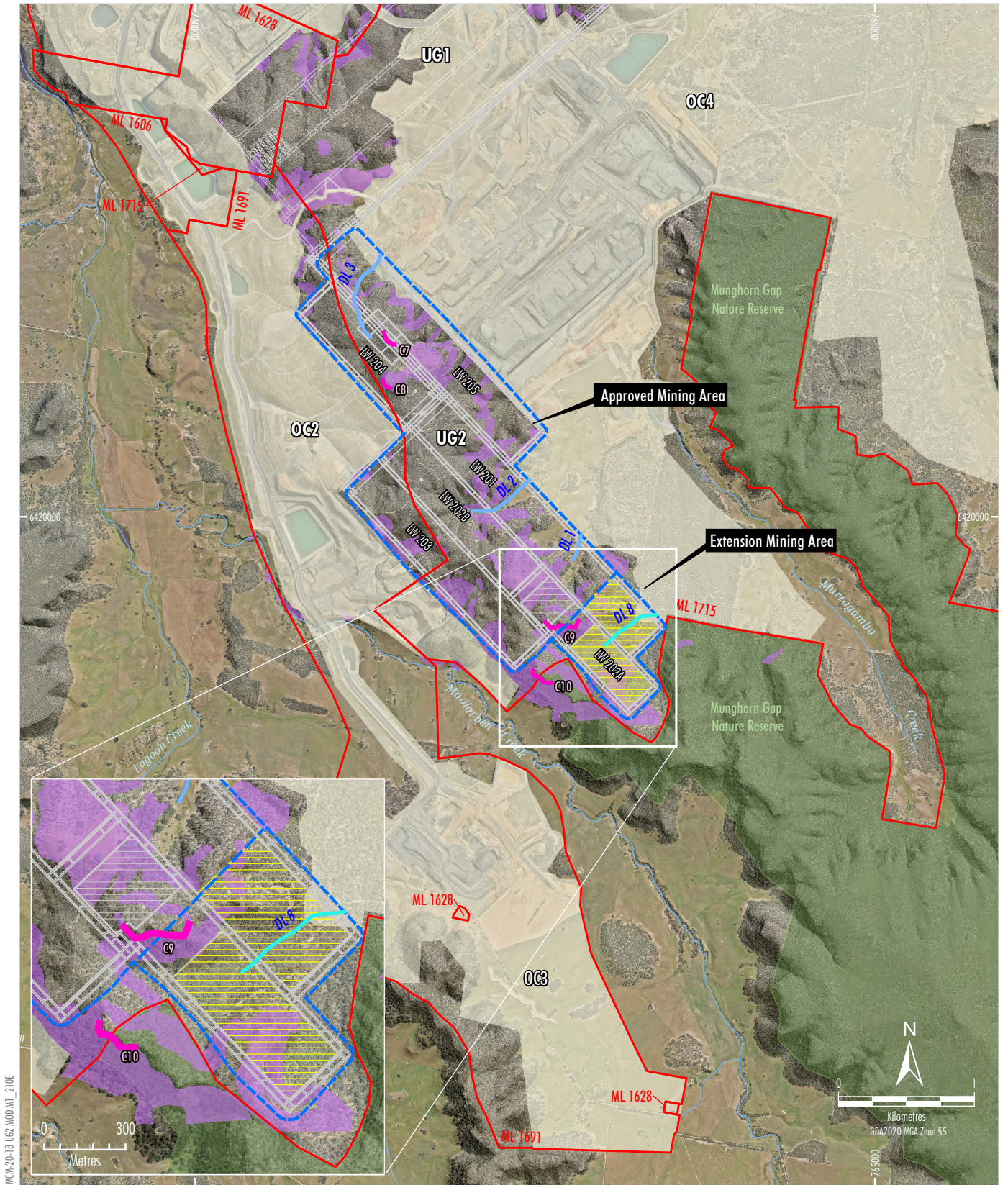
| Layout | Maximum Predicted Total Subsidence (mm) | Maximum Predicted Total Tilt (mm/m) | Maximum Predicted Hogging Curvature (km ⁻¹) | Maximum Predicted Sagging Curvature (km ⁻¹) |
|----------------------------|---|-------------------------------------|---|---|
| Approved UG2 Layout | | | | |
| Approved Mining Area | 1,980 | >100 | >3 | >3 |
| Modified UG2 Layout | | | | |
| Approved UG2 Mining Area | 2,500 | >100 | >3 | >3 |
| Extended UG2 Mining Area | 2,400 | 95 | >3 | >3 |
| Combined (Maximum) | 2,500 | >100 | >3 | >3 |

Source: Appendix A.

mm = millimetre.

mm/m = millimetre per metre.

km⁻¹ = per kilometre



MCN-20-18 UG2 MOD/INT_210E

- LEGEND**
- National Parks/Nature Reserves
 - Mining Lease Boundary
 - Cliff
 - Steep Slopes
 - Existing/Approved Development
 - Underground Longwall Layout
 - Moolarben Coal Complex Disturbance Footprint

- Proposed UG2 Modification
- Optimised UG2 Longwall Layout
- UG2 Longwall Extension Area
- Non-subsiding UG2 Secondary Workings
- Subsidence Study Area
- Stage 2 Project Approval (08_0135) Drainage Line Within
- Approved UG2 Mining Area
- Drainage Line within Extended UG2 Mining Area

Source: MCO (2021); NSW Spatial Services (2021)
Orthophoto Mosaic: MCO (Jan 2021); MSEC (2021)



MOOLARBEN COAL COMPLEX
 Natural Features Within
 the UG2 Modification Area

Figure 5

The maximum predicted total vertical subsidence for the extended UG2 mining area component of the modified UG2 layout is similar to the approved UG2 mining area (Table 3).

The maximum predicted total tilt, hogging curvature and sagging curvature and predicted strains for the modified UG2 layout (i.e. the approved and extended UG2 mining areas) are similar to those previously predicted for the approved UG2 layout (Appendix A).

Prediction of Non-conventional Subsidence Effects

Non-conventional subsidence movements include far-field horizontal movements, irregular subsidence movements and valley related movements (Appendix A).

Non-conventional subsidence movements have been included for the Modification. Potential impacts and consequences of predicted non-conventional subsidence movements are discussed below and in Appendix A.

6.1.4 Potential Environmental Consequences of Subsidence on Key Natural and Built Features

Subsidence impacts are the physical changes to the ground and its surface caused by the subsidence effects described above.

A summary of the potential environmental consequences of the predicted incremental subsidence impacts for the Modification is provided below, including cross-references to sub-sections with further detail.

Natural Features

Drainage Lines

There are no named watercourses located within the approved and extended UG2 mining areas (Figure 5).

A number of minor unnamed drainage lines overlie the approved and extended UG2 mining areas. The key drainage lines have been designated Drainage Line (DL) 1, DL2, DL3 and DL8 (Figure 5).

DL1, DL2, DL3 and DL8 all flow toward the approved OC4 pit extent (Figure 5) which will be disturbed prior to subsidence occurring as a result of UG2.

Although the predicted vertical subsidence at DL1 to DL3 would increase as a result of the Modification, as the maximum predicted tilts, curvatures and strains would be similar to the approved UG2 layout, the potential subsidence impacts to the drainage lines would be unchanged (Appendix A).

The potential subsidence impacts to DL1 to DL3 include increased levels of ponding and erosion over the short-term. Fracturing and dilation of bedrock in the drainage lines would also occur as a result of longwall mining (Appendix A).

The potential subsidence impacts on DL8 would be similar to DL1 to DL3 (Appendix A).

Potential impacts to the drainage lines are described in Section 6.3 and Appendix C.

Cliffs

A cliff is defined in Stage 2 Project Approval (O8_0135) as a continuous rock face having a minimum height of 10 m, a minimum length of 20 m and minimum slope of 2 in 1 (i.e. >63.4°).

There are three cliffs referred to as Cliffs C7, C8 and C9 located above the approved UG2 mining area. Another cliff, C10, is located approximately 125 m to the south-east of LW 203. There are no cliffs located directly above the extended UG2 mining area (Figure 5).

Cliff C7 would continue to be located above a sterilised coal pillar (Figure 5). The maximum predicted vertical subsidence, tilts, curvatures and strains would decrease compared to the approved UG2 layout due to changes in the longwall geometry in the vicinity of Cliff C7. The potential subsidence impacts at Cliff C7 are considered to remain negligible (Appendix A).

Although Cliff C8 is expected to experience increases in the maximum predicted vertical subsidence, tilts, curvatures and strains as a result of the Modification, there would be no incremental change to the approved subsidence impacts (i.e. potential rock falls and cliff instabilities) (Appendix A).

The Modification includes no longwall mining under Cliff C9 (Figure 5) resulting in a significant reduction in the maximum predicted vertical subsidence, tilts, curvatures and strains compared to the approved UG2 layout. The potential subsidence impacts at Cliff C9 are considered to be negligible (Appendix A).

Cliff C10 is located outside of the extent of the approved and modified UG2 subsidence and is not expected to experience any additional measurable tilts, curvatures or strains as a result of the Modification (Appendix A).

Steep Slopes, Minor Cliffs and Rock Face Features

The locations of natural steep slopes within the extent of subsidence for both the approved and extended UG2 mining area are shown on Figure 5.

The Stage 2 Project Approval (08_0135) provides a definition for classification of steep slopes, minor cliffs and rock face features.

The impacts predicted for steep slopes, minor cliffs and rock face features for the approved UG2 mining area as a result of the Modification are generally consistent with the approved UG2 layout and would include fracturing, rock falls and slabbing. MSEC (2021) concluded that impacts would be of minor environmental consequence (Appendix A).

For the extended UG2 mining area, the maximum predicted vertical subsidence, tilt and curvatures are similar to those predicted for the approved UG2 mining area. Therefore, potential impacts to steep slopes, minor cliffs and rock face features in the extended UG2 mining area would be similar to the approved UG2 mining area (i.e. minor environmental consequence) (Appendix A).

Land Use and Land Resources

Potential consequences on land resources and land use as a result of subsidence impacts are described in Section 6.6.1.

Groundwater Resources

Potential impacts on groundwater resources are described in Section 6.2 and Appendix B.

Threatened Species, Threatened Populations and Endangered Ecological Communities

Potential consequences on threatened species, threatened populations and endangered ecological communities as a result of incremental subsidence impacts from the Modification are discussed in Section 6.4 and Appendix D.

Munghorn Gap Nature Reserve

The Munghorn Gap Nature Reserve is located approximately 55 m from the extended longwalls proposed for the Modification at the closest point (Figure 5). The extended UG2 mining area was designed to maintain an offset equivalent to a 26.5° angle of draw from the boundary of the Munghorn Gap Nature Reserve to mitigate potential subsidence-related impacts.

The Munghorn Gap Nature Reserve is therefore beyond the predicted limits of the 20 mm subsidence contour (Figure 5) and is unlikely to be adversely impacted by subsidence movements associated with the Modification (Appendix A).

Aboriginal Cultural Heritage

A number of Aboriginal cultural heritage items, including rockshelters, artefact scatters and isolated finds, have been identified within the extent of UG2 subsidence. Potential consequences on Aboriginal cultural heritage items as a result of subsidence impacts are described in Section 6.5 and Appendix E.

Built Features

The following built features are located within and in the vicinity of the Modification:

- open cut mining areas (OC2 and OC4);
- access tracks; and
- fences.

All built features within the extent of UG2 subsidence are associated with land that is Moolarben owned.

The OC2 and OC4 open cut pits and highwalls are located immediately adjacent to the UG2 mining area (Figure 3b). A minimum 25 m barrier of solid coal would be maintained between longwall extraction in UG2 and any open cut mining areas.

Potential subsidence impacts on other built features and improvements (e.g. access tracks and fences) are presented in Appendix A.

Public Safety

The approved and extended UG2 mining areas are Moolarben owned. Surface cracking, erosion and ponding have the potential to pose a safety hazard to persons undertaking authorised access (e.g. MCO personnel and contractors) and unauthorised access of active subsidence areas.

Notwithstanding, MCO would prepare and implement a Public Safety Management Plan as part of the Extraction Plan requirements to mitigate risk to public safety.

Performance Measures

The existing subsidence performance measures in the Stage 2 Project Approval (08_0135) (Table 2 above) are still considered to be appropriate for the Modification as there is no predicted change in environmental consequences due to the incremental change in subsidence impacts for the approved UG2 mining area.

Additional subsidence impacts associated with the extended UG2 mining area are similar to the approved UG2 mining area. Therefore, the existing subsidence impact performance measures are also considered appropriate for the areas proposed for extended underground mining.

The Subsidence Assessment indicates that the levels of impact on natural and built features can be managed by the preparation and implementation of the appropriate mitigation strategies (Appendix A). Monitoring and mitigation measures are described in Section 6.1.5 below.

6.1.5 Mitigation Measures, Management and Monitoring

Mitigation measures and management for potential consequences on groundwater, surface water, biodiversity, Aboriginal cultural heritage and land resources are described in Sections 6.2 to 6.6.

Extraction Plan

The Stage 2 Project Approval (08_0135) requires MCO to prepare an Extraction Plan for secondary underground workings prior to extraction.

The Extraction Plan is required to:

- demonstrate that the subsidence impact performance measures (Table 2) can be achieved; and
- develop detailed monitoring and mitigation measures to manage the potential impacts and/or environmental consequences on natural and built features.

MCO would implement adaptive management in accordance with Condition 2, Schedule 6 of Stage 2 Project Approval (08_0135) so that subsidence impact performance measures (Table 2) are achieved at the modified UG2.

Adaptive management would involve the monitoring and periodic evaluation of the environmental consequences against the performance measures, and adjustment (if necessary) of the management and control measures to achieve the adopted performance measures.

In accordance with Condition 2, Schedule 4 of the Stage 2 Project Approval (08_0135), in the event that a subsidence impact or environmental consequence exceeds a performance measure MCO would be required to remediate the impact.

If subsidence remediation measures are not considered to be reasonable or feasible, or have not been successful in remediating the impact, MCO will provide an offset to compensate for the impact or environmental consequence.

Built Features

Measures to manage the impacts of subsidence on built features would be developed as a component of the relevant Extraction Plan, and would be consistent with the requirements of the Stage 2 Project Approval (08_0135).

Geotechnical assessment of highwall stability in OC2 and OC4 would be undertaken prior to commencement of secondary extraction. Monitoring would occur during extraction of UG2 longwalls to identify if any cracking or deformation of the highwalls develop.

If required, mitigation measures and/or remediation works for the OC2 and OC4 highwalls would be undertaken in accordance with the approved Extraction Plan.

Public Safety

The Extraction Plan for UG2 would include a Public Safety Management Plan as required under Condition 5, Schedule 4 of the Stage 2 Project Approval (08_0135).

The Public Safety Management Plan would include measures to maintain public safety (e.g. installation of appropriate signage, regular monitoring and remediation of surface cracking if required).

6.2 GROUNDWATER

6.2.1 Methodology

A Groundwater Review for the Modification has been prepared by Australasian Groundwater & Environmental Consultants Pty Ltd (AGE) (2021a) and is presented in Appendix B.

The Groundwater Review has been prepared in consideration of the following:

- *Water Management Act 2000* and relevant water sharing plans;
- *NSW Aquifer Interference Policy (AIP)* (NSW Government, 2012);
- PoEO Act; and
- EPBC Act, including the *Significant impact guidelines 1.3: Coal seam gas and large coal mining developments – impacts on water resources* (Commonwealth Department of the Environment [DotE], 2013).

6.2.2 Existing Environment

Previous Assessment

A number of groundwater investigations, assessments and reviews have been undertaken since 2006 to assess the potential impacts of the approved Moolarben Coal Complex. Recent groundwater assessments undertaken for the approved Moolarben Coal Complex include:

- Moolarben Coal Complex – UG1 Optimisation Modification – Groundwater Assessment (Dundon Consulting Pty Ltd, 2015) and supporting Groundwater Modelling Assessment (HydroSimulations, 2015);
- Moolarben Coal Open Cut Optimisation Modification Groundwater Assessment (HydroSimulations, 2017);
- Moolarben Coal Complex Extraction Plan Longwalls 104 to 105 Groundwater Technical Report (SLR Consulting Australia Pty Ltd, 2020); and
- Groundwater Technical Report on UG4 LW401-LW408 Extraction Plan (AGE, 2021b).

Groundwater Management and Monitoring

Groundwater management and monitoring at the Moolarben Coal Complex is conducted in accordance with the Water Management Plan, including the approved Groundwater Management Plan.

Hydrogeological Regime

The groundwater regime at the Moolarben Coal Complex and surrounds has been described in previous groundwater assessments and in the approved Groundwater Management Plan.

Longwall mining within the UG2 mining area will be undertaken in the Ulan Seam, which has been historically mined at the Moolarben Coal Complex (including the adjacent OC2, OC3, OC4 and UG1 mining areas) and at the adjacent operations (Ulan Mine Complex and Wilpinjong Coal Mine).

The UG2 mining area is located beneath an elevated ridgeline of outcropping Triassic Narrabeen Group sandstone. Where present, the Triassic sandstone ranges between 14 m and 55 m thick across the UG2 area (Appendix A). The Permian aged Illawarra Coal Measures underlie the Triassic sandstone and the target Ulan Seam. The Illawarra Coal Measures comprise interbedded claystones, siltstones, sandstones (fine to coarse grained) and coal seams (Appendix B).

The Permian and overlying Triassic strata generally dip in a north-easterly direction away from the edge of the Sydney Basin, which is located in close proximity to the subcropping Ulan Seam (Appendix B).

None of the hydrogeological units surrounding the Moolarben Coal Complex are considered to be 'highly productive' as defined under the AIP. A combination of low permeability and/or observed groundwater salinity effectively classifies the units as 'less productive' (Appendix B).

There has been extensive depressurisation of hard rock aquifers in the vicinity of the UG2 mining area, as a result of previous and current mining operations. The Triassic strata overlying the UG2 mining area are unsaturated, either naturally or from depressurisation caused by previous mining activities (Appendix B).

Recharge to the groundwater system occurs by the direct infiltration of rainfall and downward percolation through the near surface weathered rock. Recharge to the deeper units within the Permian coal measures predominantly occurs by downward seepage into the units where they subcrop beneath alluvium or weathered rock cover.

Recharge to the UG2 mining area has been limited by the existing open cut mining area (OC2) located immediately west of UG2.

6.2.3 Assessment

The Groundwater Review concludes that the potential for the Modification to affect the surrounding groundwater system is limited by the proximity of the UG2 mining area to the existing OC2, OC3 and OC4 open cut mining areas and the UG1 underground mining area (Appendix B).

The key findings of the Groundwater Review (Appendix B) are:

- no additional drawdown is predicted within surrounding alluvium/colluvium or the Ulan Seam as a result of the Modification;
- negligible changes to baseflow to surface water drainages;
- no impact to any private water supply work as there are no privately-owned bores in the vicinity of the UG2 mining area;
- no impact to The Drip, which is located over 10 km from the UG2 mining area;
- no impact to the nearest 'high priority' groundwater dependent ecosystem (GDE) listed in the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009* which is the Wappinguy Spring (located approximately 28 km north of the Goulburn River); and
- vegetation mapped by Niche Environment and Heritage (Niche) (2021a) in the extended UG2 mining area is not considered to be groundwater dependent and would, therefore, be unaffected by the minor incremental increase in drawdown in the hard rock aquifers that would occur as a result of the Modification.

Groundwater Inflows

The Modification would result in an increase of 108 megalitres per year (ML/year) in the peak inflow to the UG2 mining area. The Modification would not change the maximum predicted peak inflow for the Moolarben Coal Complex, which is predicted to occur during the mining of UG4, prior to longwall extraction commencing in UG2 (Appendix B).

The Modification would not change the maximum water licensing requirements for the approved Moolarben Coal Complex (Appendix B).

Groundwater Users

As there is no predicted incremental change in drawdown resulting from the Modification compared to the approved UG2 layout, there would be no additional impacts on other groundwater users (Appendix B). Notwithstanding, there are no privately-owned bores or GDEs in the vicinity of the UG2 mining area.

NSW Aquifer Interference Policy

An assessment of the Modification against the minimal impact considerations in the AIP (NSW Government, 2012) was conducted as part of the Groundwater Review (Appendix B). The Groundwater Review concluded that the Modification is within the 'Level 1' minimal impact considerations outlined in the AIP.

6.2.4 Mitigation Measures, Management and Monitoring

Groundwater monitoring and management measure outlined in the approved Water Management Plan would continue to be conducted for the Moolarben Coal Complex (incorporating the Modification).

The Water Management Plan would be reviewed and, where necessary, updated to incorporate the Modification.

6.3 SURFACE WATER

6.3.1 Methodology

A Surface Water Assessment for the Modification has been prepared by WRM Water & Environment Pty Ltd (WRM) (2021) and is presented in Appendix C.

6.3.2 Existing Environment

Regional Hydrology

The Moolarben Coal Complex is located in the Upper Goulburn River and Wollar Creek sub-catchments, which have catchment areas of approximately 2,455 square kilometres (km²) and 532 km², respectively. Both sub-catchments drain to the Goulburn River which flows in an easterly direction, eventually joining the Hunter River approximately 150 km downstream of the Moolarben Coal Complex.

Moolarben Creek is a tributary of the Upper Goulburn River sub-catchment and flows to the west of UG2 (Figure 5).

Murragamba Creek is a tributary of the Wollar Creek sub-catchment and flows to the east of UG2 (Figure 5).

Local Hydrology

A number of minor unnamed drainage lines (including DL1, DL2, DL3 and DL8) overlie the UG2 layout in relatively steep topography (Figure 5). These drainage lines are ephemeral and the direction of flow is towards approved Moolarben Coal Complex open cut mining areas (Appendix C).

Site Water Management and Monitoring

Surface water monitoring and management at the Moolarben Coal Complex is conducted in accordance with the Water Management Plan, including an Erosion and Sediment Control Plan, Surface Water Monitoring Program and Surface and Ground Water Response Plan.

6.3.3 Assessment

The following sub-sections describe any potential change to operational and post-mining impacts of the UG2 layout as a result of the Modification on surface water flow regimes and surface water quality.

Potential Subsidence Impacts

The maximum predicted subsidence on drainage lines DL1, DL2 and DL3 within the approved UG2 mining area would increase due to the increase in extraction height for the Modification, however maximum predicted tilts, curvatures and strains are similar to those predicted for the approved UG2 layout.

Therefore, there would not be any significant change to approved environmental consequences or proposed management measures for these drainage lines due to the Modification (Appendices A and C).

DL8 would not have previously experienced subsidence impacts due to mining of the approved UG2, however it is now located above the extended UG2 mining area (Figure 5). Maximum predicted vertical subsidence, tilts, curvatures and strains for DL8 would be similar to the approved UG2 mining area (Appendix A).

Subsidence has the potential to result in topographical depressions which can result in areas of ponding, dependent on a number of factors such as the topography of the land surface, rainfall, catchment sizes, surface water runoff, permeation and evaporation.

As a result of the Modification, topographical depressions within the approved UG2 mining area are predicted to form further downstream on these drainage lines compared to the approved UG2 layout (Appendix C).

Approximately five additional topographic depressions would form within the extended UG2 mining area with very shallow depths and small surface areas. However, the majority of this additional ponding is predicted to occur within the approved surface disturbance limits for OC4 and would therefore have no material environmental consequence (Appendix C).

Due to the ephemeral nature of the drainage lines, ponding in areas above the UG2 mining area would only occur for short durations after rainfall events. Increased gradients along drainage lines due to subsidence are predicted to approach grades similar to pre-mining over time, which would reduce the extent and frequency of ponding (Appendix C).

As the potential impact of the Modification on the depth, size and number of topographical depressions is minor, management and mitigation strategies remain unchanged for the Modification (Appendix C).

Site Water Balance

The Modification would have a negligible impact on the site water balance and operation of the water management system (Appendix C):

- The approved surface disturbance extent of the Moolarben Coal Complex would not increase as a result of the Modification.

- The underground water demand would not change as there would be no change to the approved rate of longwall mining.
- The Groundwater Review predicted that the Modification would not change peak groundwater inflows of the Moolarben Coal Complex (Appendix B).

Stream Flows and Water Quality

The pools that would form as a result of subsidence would have no detectable impact on total downstream flow as drainage lines in the UG2 subsidence area flow towards open cut areas and would therefore be substantially altered by approved open cut mining.

There would be no change to the surface water catchment drainage areas as a result of the incremental change in subsidence for the approved UG2 mining area or the extension of longwalls in the extended UG2 mining area (Appendix C).

Potential erosion and associated water quality impacts in the extended UG2 mining area are predicted to be negligible, similar to the approved UG2 mining area (Appendix C).

Therefore, the Modification would not have any material impact on stream flows or water quality (Appendix C).

6.3.4 Mitigation Measures, Management and Monitoring

Surface water monitoring and management for the Moolarben Coal Complex would continue to be conducted in accordance with the Water Management Plan.

The Water Management Plan would be reviewed and, where necessary, updated to incorporate the Modification.

Subsidence impacts including the potential for ponding and erosion and sediment control would be monitored and managed through the Extraction Plan process.

6.4 BIODIVERSITY

6.4.1 Biodiversity Development Assessment Report

A BDAR has been prepared by Niche (2021a) for the extended UG2 mining area in accordance with the BAM (DPIE, 2020a) and is presented in Appendix D.

Methodology

The BDAR was prepared using flora and fauna data collected by Eco Logical Australia (ELA), AMBS Ecology and Heritage (AMBS) and Niche in addition to relevant background literature and database searches.

The baseline vegetation assessment report prepared by ELA (2021) is attached to the BDAR (Appendix D). ELA (2021) assessed the plant community types (PCTs) within a Study Area encompassing the predicted extent of subsidence (the subject land) for the extended UG2 mining area and identified threatened ecological communities (TECs) listed under the BC Act and/or EPBC Act.

The threatened bat survey report prepared by AMBS (2021) is also attached to the BDAR (Appendix D). AMBS (2021) undertook harp trapping, ultrasonic bat detection, and habitat mapping. The bat surveys were in accordance with the BAM (DPIE, 2020a) and 'Species Credit' *Threatened Bats and Their Habitats NSW Survey Guide for The Biodiversity Assessment Method* (Office of Environment and Heritage [OEH], 2018). Unlike previous fauna survey guidelines, these survey guidelines require the capture and identification of breeding bats.

As part of preparing the BDAR, Niche (2021a) undertook targeted searches for threatened flora and fauna species listed under the BC Act and/or EPBC Act that were known, or likely to occur, in the subject land.

The threatened flora surveys were undertaken in accordance with the BAM (DPIE, 2020a) and *Surveying Threatened Plants and Their Habitats: NSW Survey Guide for The Biodiversity Assessment Method* (DPIE, 2020b).

The threatened fauna surveys were undertaken in accordance with the BAM (DPIE, 2020a), *Threatened Biodiversity Data Collection* (DPIE, 2020c), *NSW Survey Guide for Threatened Frogs* (DPIE, 2020d), and *Threatened Biodiversity Survey and Assessment Guidelines for Developments and Activities* (Department of Environment and Conservation, 2004).

Fauna survey techniques included habitat surveys, microbat habitat searches, camera trapping, diurnal habitat searches (including for threatened reptiles), diurnal call playback, frog surveys including nocturnal call playback, active searching, and active listening, systematic scat searches, and opportunistic observations (Appendix D).

Existing Environment

Landscape Features

The subject land is within an existing offset area held by MCO (i.e. as part of the Onsite Cluster of offset areas) (discussed further below).

Figure 6 shows the landscape features relevant to the biodiversity assessment of the subject land. The following features occur inside the subject land:

- Rocky outcrops (with caves and crevices) within and surrounding the subject land, which are exposed rock that protrudes above the surface of the surrounding land. The rocky outcrops (with caves and crevices) are generally a subset of the steep slopes (Section 6.1.4). Minor cliffs and rock face features are also a subset of steep slopes.
- Rocky areas, which are surface areas that contain exposed surface rock (generally without caves and crevices).
- Two first order ephemeral drainage lines that occur in the subject land and meet to form a second order ephemeral drainage line.

Two cliffs (Cliff Lines C9 and C10) with caves and crevices occur outside of the subject land (Figure 6). Cliffs are identified as a continuous rock face (greater than 20 m in length) that is at least 10 m high and includes overhangs.

MSEC (2021) describe that there are four regional structural fault features, none of which intersect the proposed underground mining areas.

The native vegetation in the subject land is connected to extensive areas of vegetation associated with Munghorn Gap Nature Reserve (Figure 1).

Native Vegetation and Threatened Ecological Communities

Eight PCTs were identified within the subject land (Figure 7) with PCTs 434, 1629 and 1614 mainly associated with steep slopes. PCTs 434, 472 and 1176 align to TECs listed under the BC and/or EPBC Act (Appendix D).

PCT 434 meets the criteria for the *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions Critically Endangered Ecological Community* listed under the BC Act and White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC listed under the EPBC Act (both Box-Gum Woodland CEEC).

PCT 472 meets the criteria for the Box-Gum Woodland CEEC listed under the BC Act (but not under the EPBC Act).

PCT 1176 meets the criteria for the *Hunter Valley Foothills Slaty Gum Woodland in the Sydney Basin Bioregion Vulnerable Ecological Community* listed under the BC Act (and also the criteria for the EPBC Act listed Central Hunter Valley Eucalypt Forest and Woodland CEEC).

No groundwater dependent ecosystems (GDEs) were identified within the subject land or surrounds (Appendices B and D). In addition, the Groundwater Review prepared for the Modification (Appendix B) confirmed that groundwater levels at UG2 are well below surface levels as the Triassic strata is unsaturated (i.e. there is no groundwater interaction with the surface) (Section 6.2).

Threatened Flora Species and Endangered Populations

No threatened flora species or populations listed under the BC Act or EPBC Act have been recorded within the subject land during recent targeted surveys (Appendix D).

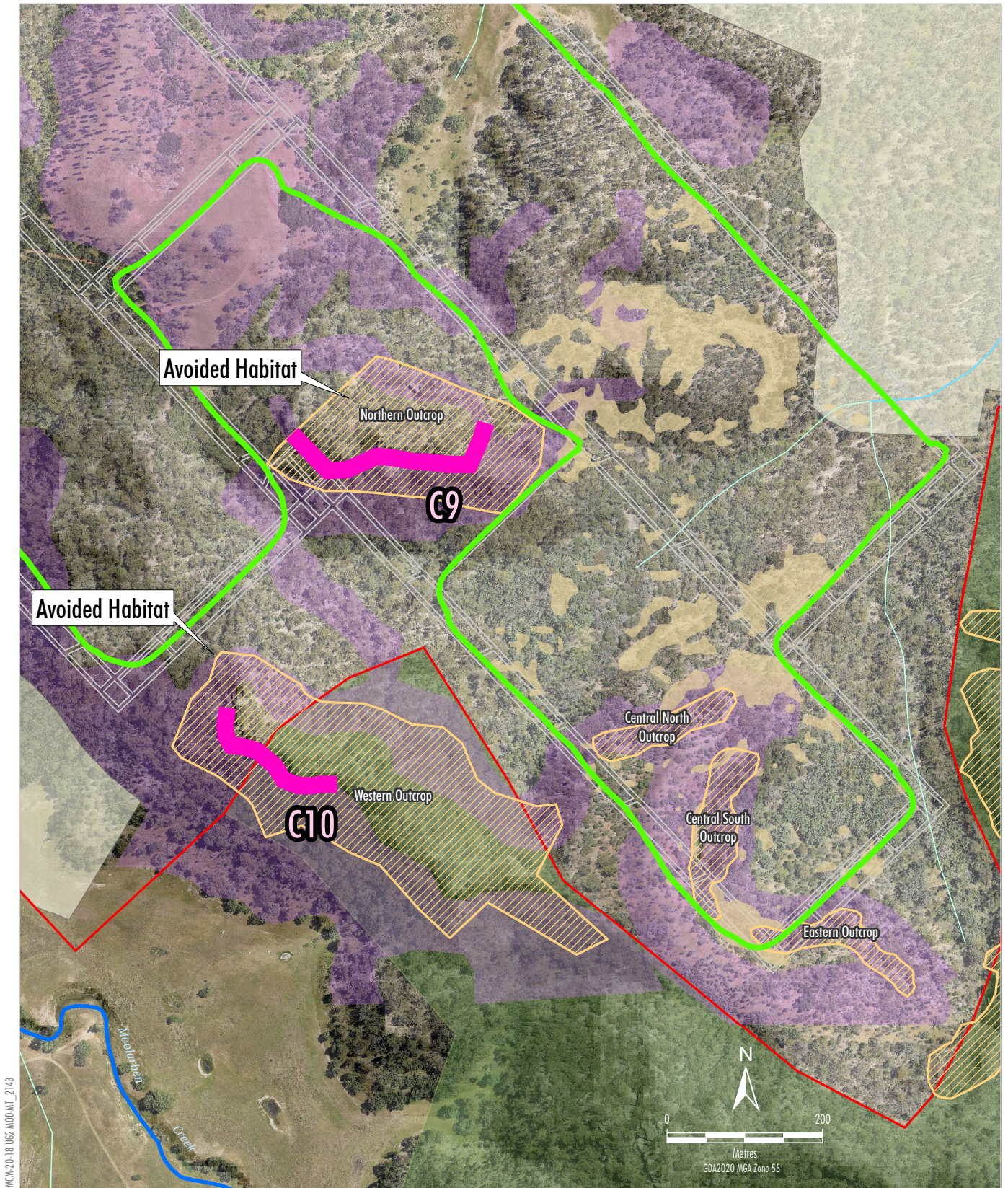
Two species (Austral toadflax [*Thesium australe*] and *Tylophora linearis*) could not be ruled out by targeted survey and were assumed present for the purpose of this assessment.

Threatened Fauna Species

Two cave-dwelling bat species (both 'species credit species') were recorded during recent targeted surveys (Appendix D):

- Large-eared Pied Bat (*Chalinolobus dwyeri*) (BC Act and EPBC Act); and
- Eastern Cave Bat (*Vespadelus troughtoni*) (BC Act).

These two species were recorded outside of the subject land near Cliff Lines C9 and C10 (Figure 8).



MCM-20-18 UG2 MOD/MT_2148

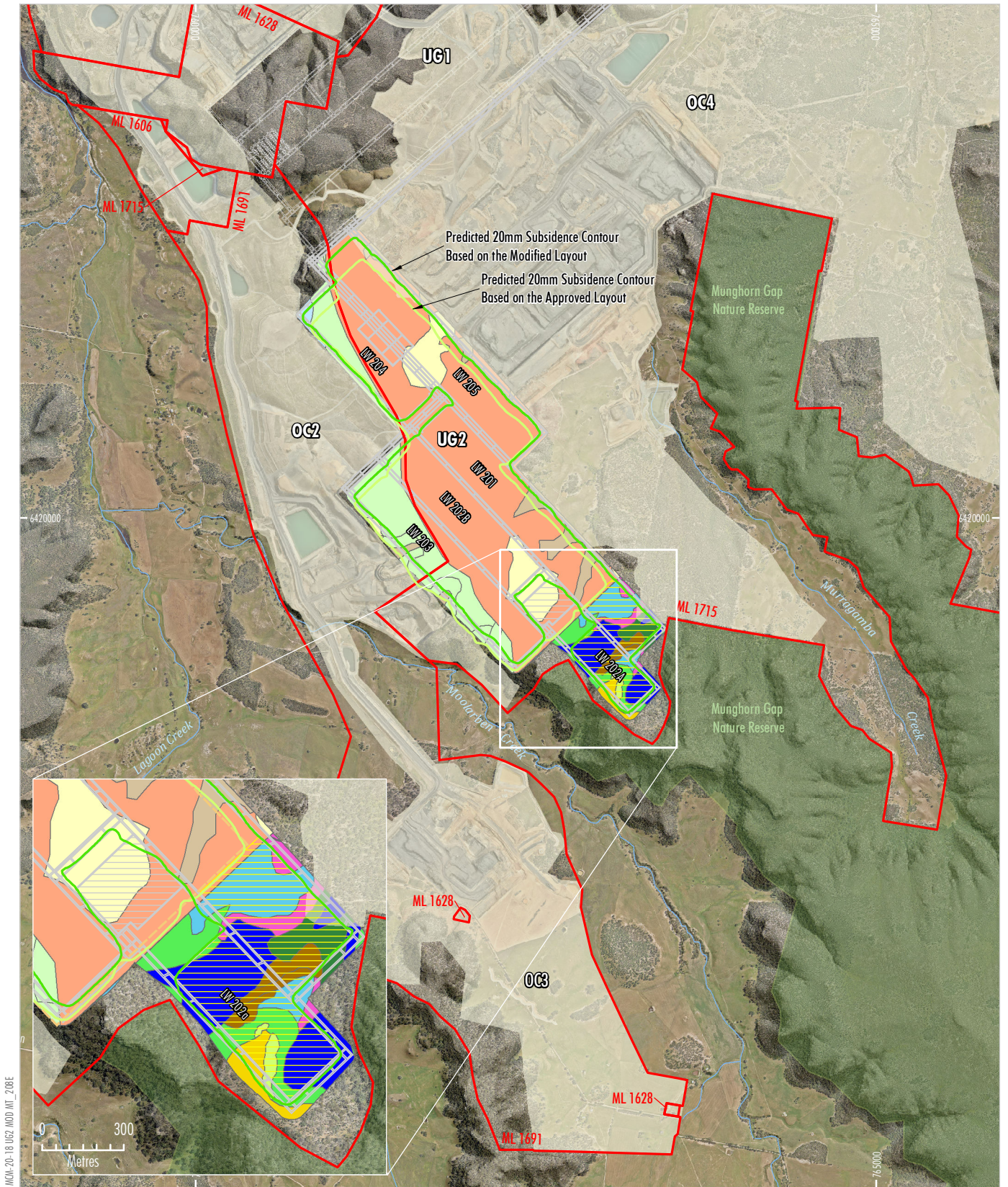
- LEGEND**
- National Parks/Nature Reserves
 - Mining Lease Boundary
 - Cliff
 - Steep Slopes
 - Rocky Outcrop (with Caves and Crevices)
 - Rocky Area
 - Moolarben Coal Complex Disturbance Footprint

- Proposed UG2 Modification**
- Optimised UG2 Longwall Layout
 - Predicted 20mm Subsidence Contour Based on the Modified Layout
- Strahler Stream Order**
- 1st Order
 - 2nd Order
 - 5th Order

Source: MCO (2021); NSW Spatial Services (2021)
 Orthophoto Mosaic: MCO (Jan 2021); MSEC (2021)


MOOLARBEN COAL COMPLEX
 Landscape Features Within
 Extended UG2 Mining Area

Figure 6



MCC-20-18 UG2 MOD INT_208E

LEGEND

- National Parks / Nature Reserves
- Mining Lease Boundary
- Existing / Approved Development
- Underground Longwall Layout
- Moolarben Coal Complex Disturbance Footprint
- Predicted 20mm Subsidence Contour Based on the Approved Layout
- Proposed UG2 Modification
- Optimised UG2 Longwall Layout
- UG2 Longwall Extension Area
- Non-subsiding UG2 Secondary Workings
- Predicted 20mm Subsidence Contour Based on the Modified Layout

PCT Vegetation Mapping (ELA, 2021)

- 1176³
- 1614
- 1629
- 1767
- 434¹
- 472²
- 478
- 479
- Access Track

Biometric Vegetation Mapping (MCO, 2020)

- HU552, HU574, HU608, HU653
- HU653
- HU654¹
- Grassland / Grazing

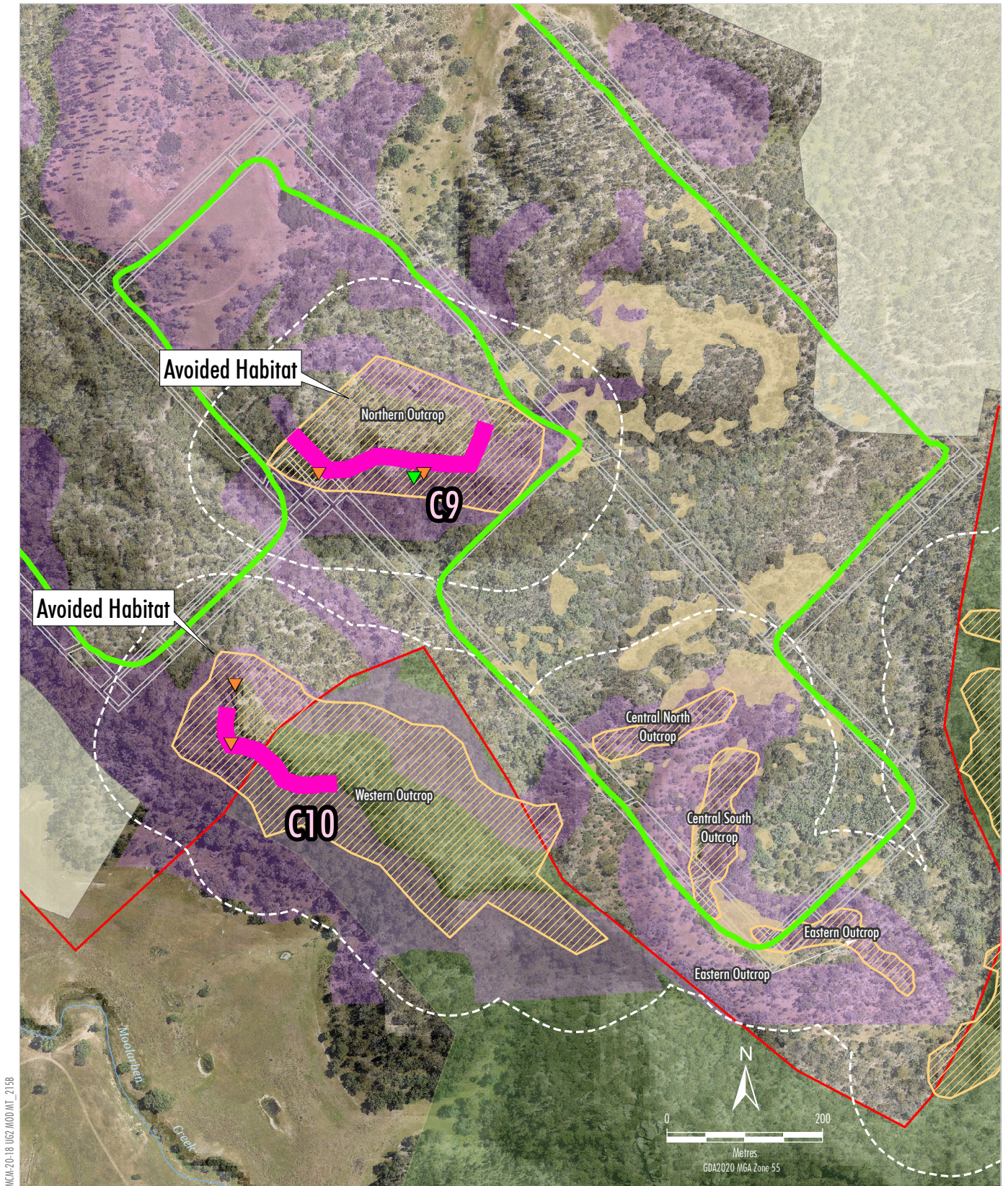
¹ Listed BC Act, White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland
 Listed EPBC Act, White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland
² Listed BC Act, White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland
³ Listed BC Act, Hunter Valley Footslopes Slaty Gum Woodland;
 Listed EPBC Act, Central Hunter Valley Eucalypt Forest and Woodland

Source: MCO (2021); NSW Spatial Services (2021)
 Orthophoto Mosaic: MCO (Jan 2021); MSEC (2021);
 ELA (2021)



MOOLARBEN COAL COMPLEX
 Vegetation Communities

Figure 7



MCM-20-18 UG2 MOD/MT 2158

- LEGEND**
- National Parks/Nature Reserves
 - Mining Lease Boundary
 - Cliff
 - Steep Slopes
 - Rocky Outcrop (with Caves and Crevices)
 - Rocky Area
 - 100m Buffer from Rocky Outcrop
 - Moolarben Coal Complex Disturbance Footprint

- Proposed UG2 Modification**
- Optimised UG2 Longwall Layout
 - Predicted 20mm Subsidence Contour Based on the Modified Layout
 - Large-eared Pied Bat
 - Eastern Cave Bat

Source: MCO (2021); NSW Spatial Services (2021)
 Orthophoto Mosaic: MCO (Jan 2021); MSEC (2021)



MOOLARBEN COAL COMPLEX
 Bat Habitat Within
 Extended UG2 Mining Area

Figure 8

A third threatened bat, the Corben's Long-eared Bat (*Nyctophilus corbeni*), was also recorded although this species is an 'ecosystem credit species' (i.e. species that can be predicted to be present based on a habitat assessment) and is associated with tree hollows rather than caves/crevices.

Two other threatened mammals listed under the BC Act were recorded in the subject land via the identification of scats, namely the Koala (*Phascolarctos cinereus*) (also listed under the EPBC Act) and the Parma Wallaby (*Macropus parma*), both of which are species credit species (Figure 9). Neither species was observed.

Seven threatened birds listed under the BC Act were recorded in the subject land, which are all ecosystem credit species in the subject land, namely Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*), Diamond Firetail (*Stagonopleura guttata*), Scarlet Robin (*Petroica boodang*), Dusky Woodswallow (*Artamus cyanopterus cyanopterus*), Little Lorikeet (*Glossopsitta pusilla*), Swift Parrot (*Lathamus discolor*) and Grey-crowned Babbler (eastern subspecies) (*Pomatostomus temporalis temporalis*) (Figure 9). The Swift Parrot is also listed under the EPBC Act.

The Regent Honeyeater (*Anthochaera phrygia*) (listed under the BC Act and EPBC Act) is assumed to occur in the subject land for the purpose of the assessment in the BDAR (Appendix D) as the subject land is mapped as important habitat (DPIE, 2021c).

In total, 9 threatened fauna species were recorded within the subject land. The flora and fauna surveys undertaken by Niche (2021a) were not able to rule out the potential for some other threatened species listed under the BC Act to use habitat in the subject land. The potential impacts on these threatened fauna species have been assessed in the BDAR (Appendix D).

Three additional species, namely Broad-headed Snake (*Hoplocephalus bungaroides*), Pink-tailed Legless Lizard (*Aprasia parapulchella*) and Striped Legless Lizard (*Delma impar*) have the potential to use rocky outcrops within the subject land.

Potential Impacts

The potential direct and indirect impacts on biodiversity have been assessed in the BDAR (Appendix D) and are described below.

Measures to Avoid and Minimise Impacts

The location of the Modification has been selected based upon the presence of coal seams able to be economically mined within MCO's existing tenements and the extensive geological and geotechnical data available within ML 1715.

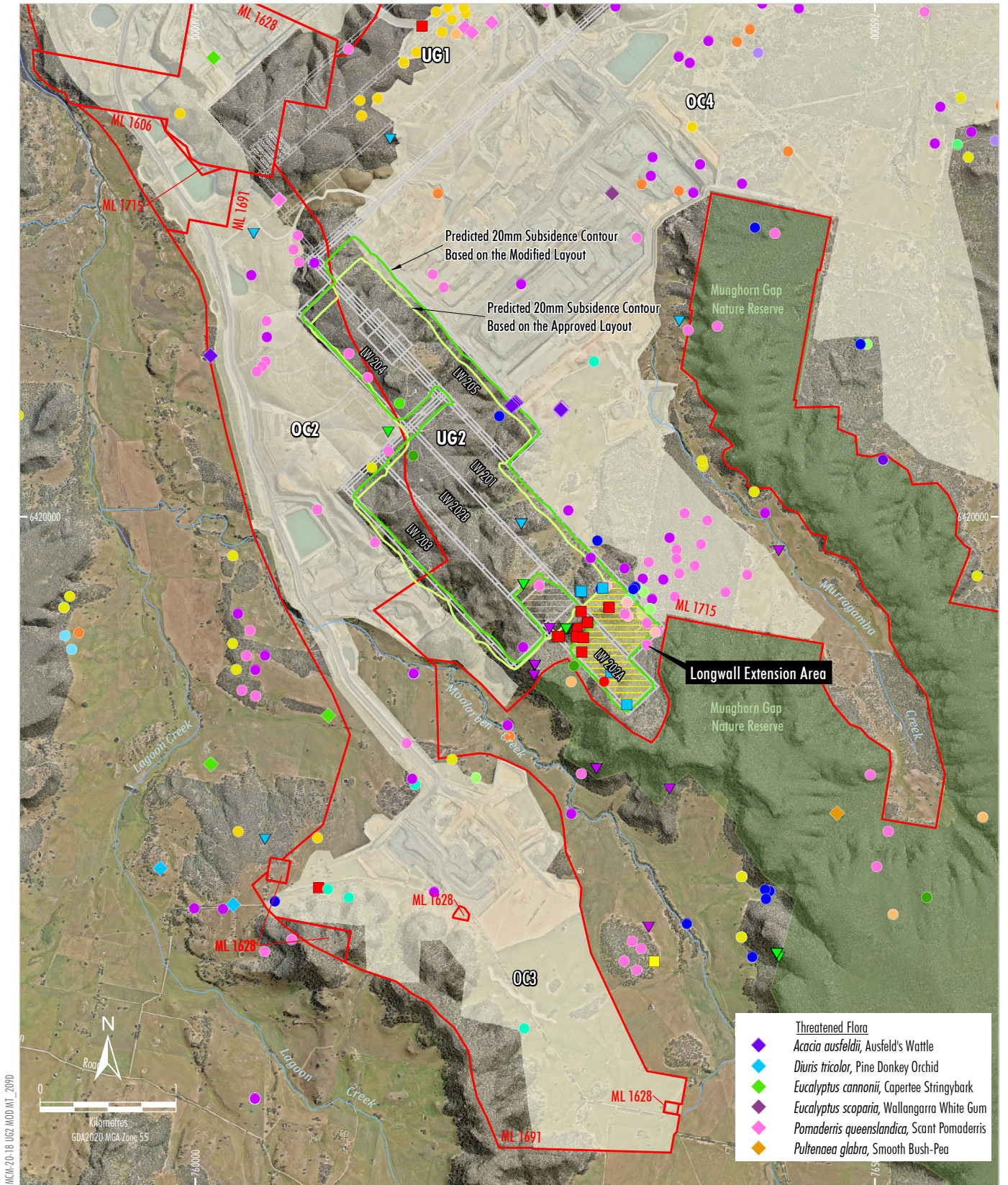
Coal would be mined within the approved Moolarben Coal Complex mine life, within the Stage 2 Project Approval Boundary and mining tenements. There is no required increase in the approved Moolarben Coal Complex surface disturbance footprint, as the Modification would predominantly use the existing and approved surface infrastructure. There would also be a small reduction in the approved OC4 pit extent to accommodate the extended LW 201 if it is mined as proposed.

Underground mining methods significantly reduce environmental impacts, including vegetation and habitat disturbance, in comparison to open cut mining methods. MCO has aimed to avoid and minimise impacts from the underground mining proposed for the Modification as the layout of the extended longwall panels (LW 201 and LW 202A) have been designed to:

- comply with the existing subsidence impact performance measures in the Stage 2 Project Approval (08_0135), including negligible subsidence impacts or environmental consequences on threatened species and communities;
- setback from Cliff Line C9 to maintain the subsidence impact performance measure of negligible environmental consequences and avoid impacts to associated threatened species habitat; and
- avoid Munghorn Gap Nature Reserve (i.e. the extended longwalls have been setback so the 26.5° angle of draw avoids the Munghorn Gap Nature Reserve) such that MSEC (2021) conclude that impacts to the Munghorn Gap Nature Reserve (landforms or features) resulting from the Modification are considered unlikely.

Direct Impacts

No native vegetation or threatened species habitats would be cleared for the Modification (i.e. there would be no direct impacts as defined by the BAM [DPIE, 2020a]). As such, the BAM Credit Calculator was not required to be submitted for the Modification.



MCM-20-18 UG2 MOD/INT_2019D

- Threatened Flora**
- ◆ *Acacia ausfeldii*, Ausfeld's Wattle
 - ◆ *Diuris tricolor*, Pine Donkey Orchid
 - ◆ *Eucalyptus cannonii*, Capertee Stringybark
 - ◆ *Eucalyptus scoparia*, Wallangarra White Gum
 - ◆ *Pomaderris queenslandica*, Scant Pomaderris
 - ◆ *Pultanea glabra*, Smooth Bush-Pea

Source: MCO (2021); NSW Spatial Services (2021); ALA (2021); DPIE (2021); BirdLife Australia (2021) Orthophoto Mosaic: MCO (Jan 2021)

- LEGEND**
- National Parks/Nature Reserves
 - ▭ Mining Lease Boundary
 - ▭ Existing/Approved Development
 - ▭ Underground Longwall Layout
 - ▭ Existing Approved Development
 - ▭ Predicted 20mm Subsidence Contour Base on the Approved Layout
 - ▭ Proposed UG2 Modification
 - ▭ Optimised UG2 Longwall Layout
 - ▭ UG2 Longwall Extension Area
 - ▭ Non-subsiding UG2 Secondary Workings
 - ▭ Predicted 20mm Subsidence Contour Base on the Modified Layout

- Threatened Fauna***
- Glossy Black Cockatoo
 - Little Lorikeet
 - Turquoise Parrot
 - Masked Owl
 - Powerful Owl
 - White-throated Needletail
 - Brown Treecreeper (eastern subspecies)
 - Speckled Warbler
 - Black-chinned Honeyeater (eastern subspecies)
 - Painted Honeyeater
 - Hooded Robin (south-eastern form)
 - Flame Robin

- Scarlet Robin
- Grey-crowned Babbler (eastern subspecies)
- Varied Sittella
- Dusky Woodswallow
- Diamond Firetail
- Swift Parrot
- Koala
- Squirrel Glider
- Parma Wallaby
- Corben's Long-eared Bat
- Large Bent-winged Bat
- Large-eared Pied Bat
- Eastern Cave Bat

* Note: Threatened fauna records represent observations made at a point in time.

Figure 9

Indirect Impacts

The potential subsidence impacts are assessed in Appendix A and summarised in Section 6.1.4. Potential subsidence impacts (and other indirect impacts) on habitat and vegetation are assessed in the BDAR (Appendix D). The predicted subsidence impacts would not impact vegetation integrity (or any threatened ecological communities). Prescribed biodiversity impacts from subsidence are described below.

Prescribed Biodiversity Impacts

The *Biodiversity Conservation Regulation 2017* (BC Regulation) identifies actions that are prescribed as impacts to be assessed under the NSW Biodiversity Offsets Scheme. Two relevant prescribed impacts are assessed in the BDAR, namely impacts on:

- karst, caves, crevices, cliffs, rocks and other geological features of significance; and
- water quality, water bodies, and hydrological processes.

The assessment of prescribed impacts is summarised below.

Karst, Caves, Crevices, Cliffs, Rocks and Other Geological Features of Significance

There are three sandstone rocky outcrops (with caves and crevices) in the subject land (Figure 6). The steep slopes (minor cliffs and rock face features) associated with rocky outcrops may be impacted by occasional rockfalls, displacement or dislodgement of boulders or slabs, or fracturing, that in total would not impact more than 5% of the total face of such features within any longwall mining domain (Appendix A).

There are five threatened fauna species that are potentially associated with the rocky outcrops, namely the Broad-headed Snake, Pink-tailed Legless Lizard, Striped Legless Lizard, Large-eared Pied Bat and Eastern Cave Bat.

In addition to rocky outcrops, rocky areas (comprising scattered surface rock) are present in the subject land and may provide potential habitat for the Pink-tailed Legless Lizard and/or Striped Legless Lizard. The fauna surveys undertaken by Niche (2021a) were not able to rule out the potential for the Pink-tailed Legless Lizard and Striped Legless Lizard to use habitat in the subject land (Appendix D). Subsidence impacts to rocky areas (areas with surface rock) not associated with steep slopes are likely to be restricted to surface cracking.

The BDAR concludes that there is a low likelihood of minor impact on a local population of the bats or reptiles that may use potential habitat in the subsidence extent and also in the wider surrounds. This is expected to result in negligible consequence to these threatened fauna species, consistent with the existing subsidence impact performance measures for threatened species.

Water Quality, Water Bodies, and Hydrological Processes

Ephemeral drainage lines occur in the subject land and associated potential subsidence impacts are summarised in Section 6.3.3. No water bodies or hydrological processes within the subject land sustain threatened entities.

Existing Biodiversity Offset Area

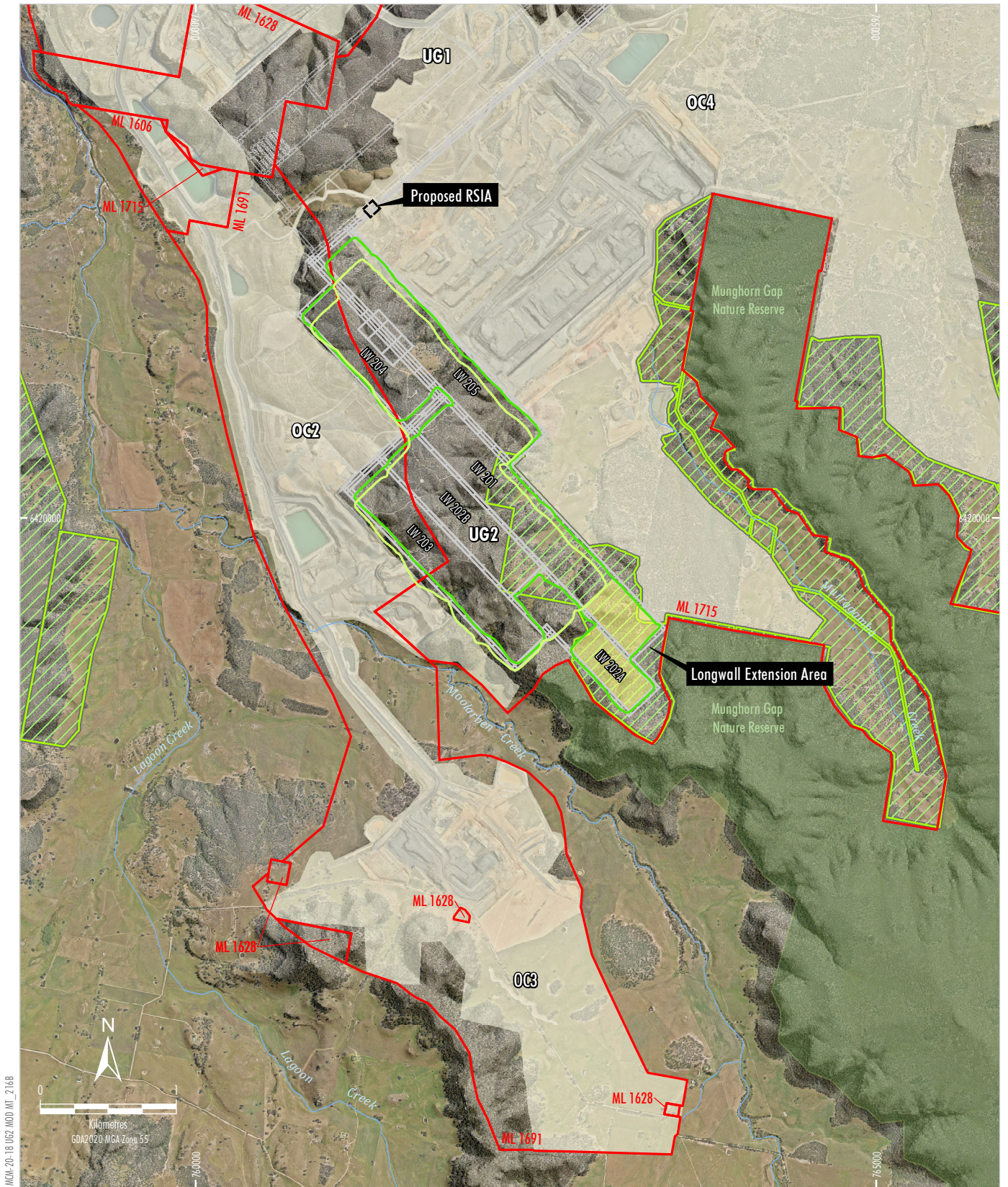
The subject land is within an existing offset area held by MCO (i.e. as part of the Onsite Cluster of offset areas) (Figure 10). The offset area was established as part of the Stage 2 Project Approval (08_0135) and EPBC Act Approval (EPBC 2008/4444). As such, the offset was established and approved in full knowledge that it would partially overlies an approved longwall mining area (i.e. UG2 longwalls), as recognised in the in-perpetuity conservation mechanism.

The offset area has been secured by registering on the title of the land a 'Positive Covenant' instrument and a 'Restriction on the Use of Land by a Prescribed Authority' instrument executed under section 88E(3) of the *Conveyancing Act 1919* and allows for underground mining beneath the offset area:

...

2. *This instrument does not prevent the following being carried out on the Land as long as the conditions contained in this instrument can be met:*
 - a. *carrying out environmental studies;*
 - b. *underground mining;*
 - c. *Surface Monitoring Activities;*
 - d. *Rehabilitation required in respect of underground mining; and*
 - e. *Exploration Drilling.*

The offset area was established for Box-Gum Woodland CEEC, Large-eared Pied Bat, Corben's Long-eared Bat, Regent Honeyeater, Swift Parrot and Spotted-tailed Quoll. The Modification would not impact the habitat for the Box-Gum Woodland CEEC, Corben's Long-eared Bat, Regent Honeyeater, Swift Parrot or Spotted-tailed Quoll. The risk to the potential habitat for the Large-eared Pied Bat is discussed above.



MOL-20-18 UG2 MOD AIT_2168

LEGEND

- National Parks / Nature Reserves
- Mining Lease Boundary
- Existing / Approved Development
- Underground Longwall Layout
- Moolarben Coal Complex Disturbance Footprint
- Existing Biodiversity Offset Area
- Predicted 20mm Subsidence Contour Based on the Approved Layout

- Proposed UG2 Modification
- Optimised UG2 Longwall Layout
- UG2 Longwall Extension Area
- Proposed Extent of RSIA
- Predicted 20mm Subsidence Contour Based on the Modified Layout

Source: MCO (2021); NSW Spatial Services (2021)
Orthophoto Mosaic: MCO (Jan 2021)



MOOLARBEN COAL COMPLEX
Existing Biodiversity Offset Area

Figure 10

Since the subject land underlies an existing offset area, the subject land would continue to be managed for long-term conservation purposes in accordance with the Stage 2 Project Approval (08_0135), Biodiversity and Offset Management Plan required under EPBC Act Approval (EPBC 2008/4444) and the terms of the in-perpetuity conservation mechanism.

Serious and Irreversible Impacts

Under the BC Act, a determination of whether an impact is serious and irreversible (SAII) must be made by DPIE for 'potential SAII entities'. There are five 'potential SAII entities' relevant to the Modification, namely:

- Box-Gum Woodland CEEC;
- Broad-headed Snake;
- Regent Honeyeater;
- Large-eared Pied Bat; and
- Eastern Cave Bat.

The BDAR provides relevant information on the above 'potential SAII entities' (Appendix D).

The BDAR concludes Box-Gum Woodland CEEC and Regent Honeyeater are unlikely to be impacted (Appendix D).

The BDAR also concludes that there is a low likelihood of minor impact on a local population of Broad-headed Snake, Large-eared Pied Bat and Eastern Cave Bat that may use potential habitat in the subject area and also in the wider surrounds. However, the Modification is expected to result in negligible consequence to these threatened fauna species.

6.4.2 Environmental Review of Changes to the Longwall Layout in the Approved UG2 Mining Area

The Modification would include optimisation of the approved UG2 layout. The potential subsidence impacts for the approved UG2 mining area are assessed in Appendix A and summarised in Section 6.1.4.

Table 4 provides a review of the changes in relation to the features identified in the subsidence impact performance measures in the Stage 2 Project Approval (08_0135) (Table 2).

In summary, the modified layout would result in the following within the approved UG2 mining area:

- reduction in cliff features within the predicted subsidence extent (Cliff Line C9, previously proposed to be undermined, would be avoided);
- reduction in area of steep slopes within the predicted subsidence extent (approximately 12 hectares [ha] less);
- a similar area of native vegetation in the predicted subsidence extents of both the approved and modified longwall layouts; and
- reduction in area of mapped TEC in the predicted subsidence extent (approximately 6.2 ha less).

As such, the Modification is expected to result in no increase in impacts to biodiversity values within the approved UG2 mining area relative to the approved UG2 layout.

One threatened flora species listed under the BC Act has been recorded in the approved UG2 mining area, namely Ausfeld's Wattle (*Acacia ausfeldii*) a shrub that grows between 2 to 4 m high. Multiple plants of this species were recorded by ELA (2018) during flora surveys for an exploration drilling program. The records are not located near steep slopes or cliffs (Figure 9).

Ausfeld's Wattle is generally associated with the Box-Gum Woodland CEEC. It is likely that fire plays a key role in the lifecycle of the species as fire burns off mature plants and stimulates germination of new individuals from a soil seedbank (DPIE, 2020c). Any subsidence impacts on this species are likely to be limited (low potential for surface cracking impacts on individuals) given the species is not located near steep slopes or cliffs. The local population is unlikely to be adversely impacted as new individuals have the potential to germinate from a soil seed bank.

6.4.3 Mitigation Measures, Management and Monitoring

Management Plans

Since the subject land underlies an existing offset area, the subject land would continue to be managed for long-term conservation purposes in accordance with the Stage 2 Project Approval (08_0135), Biodiversity and Offset Management Plan required under EPBC Act Approval (EPBC 2008/4444) and the terms of the in-perpetuity conservation mechanism.

Table 4
Comparison of the Predicted Subsidence Extent Associated
with the Approved and Modified Layout in the Approved UG2 Mining Area

| Feature (Stage 2 Project Approval 08_0135) | Subsidence Extent – Approved UG2 Layout | Subsidence Extent - Modified Layout (within Approved UG2 Mining Area)* |
|---|--|--|
| Cliffs C7, C9 and C10 (Figure 6) | More cliff features in predicted subsidence extent (cliff lines C7 and C9) | Reduction in cliff features within predicted subsidence extent (cliff line C9 avoided) |
| Steep Slopes (Figure 6) | Greater area of habitat associated with steep slopes in predicted subsidence extent (approximately 77 ha) | Reduction in area of habitat associated with steep slopes within predicted subsidence extent (approximately 65 ha in total [i.e. 12 ha less]) |
| Threatened Species (Figures 8 and 9) | Greater area of habitat associated with cliffs and steep slopes but similar area of native vegetation in predicted subsidence extents of both approved and modified layouts (approximately 264.2 ha in total of native vegetation) | Reduction in area of habitat associated with cliffs and steep slopes but similar area of native vegetation within predicted subsidence extents of both approved and modified layouts (approximately 264.45 ha in total of native vegetation) |
| Threatened Populations | N/A | N/A |
| Threatened Ecological Communities (Box-Gum Woodland CEEC) (Figure 7) | Greater area in predicted subsidence extent (approximately 25.2 ha in total) | Reduction in area within predicted subsidence extent (approximately 19 ha in total [i.e. 6.2 ha less]) |

* Excluding the extended UG2 mining area.

MCO currently has a number of existing management strategies and plans associated with the Stage 2 Project Approval (08_0135). Key management strategies and plans include:

- Environmental Management Strategy (EMS).
- Biodiversity Management Plan (complex-wide BMP).
- Rehabilitation Management Plan (RMP).

In addition to these plans, MCO will be required to prepare and submit an Extraction Plan for UG2 for approval by DPIE. The UG2 Extraction Plan would include:

- a summary of relevant background or baseline data;
- a review of predictions of the potential subsidence effects, subsidence impacts and environmental consequences, incorporating any relevant information (such as monitoring results obtained during mining);
- a monitoring program to provide data to assist with the management of risks associated with subsidence, validate subsidence predictions and analyse the relationship between subsidence effects and impacts and any ensuing environmental consequences;

- a plan to manage and remediate subsidence impacts and/or environmental consequences (e.g. remediation of observed cracking);
- trigger action response plans to identify risks and outline specific follow up actions to avoid exceedances of agreed performance measures;
- contingency plans that provide for adaptive management where monitoring indicates that there has been an exceedance of agreed performance measures; and
- reporting and review mechanisms.

The UG2 Extraction Plan would include a Biodiversity Management Plan (additional to the complex-wide BMP [MCO 2020d]) and Subsidence Monitoring Program. These management plans will likely be similar to those prepared for the UG1 Extraction Plan.

Subsidence and Biodiversity Monitoring and Mitigation Measures

The UG2 Extraction Plan would include a monitoring program, the purpose of which is to:

- assess the potential environmental consequences of an observed subsidence impact;

- identify appropriate management measures; and
- assess compliance with the relevant subsidence impact performance measures in the Stage 2 Project Approval (08_0135).

Generally consistent with the BAM (DPIE, 2020a)
The monitoring program would contain:

- pre-mining baseline data for two years prior to secondary extraction on:
 - rocky outcrops (caves and crevices) (e.g. rockfalls, displacement or dislodgement of boulders or slabs, or fracturing);
 - Eastern Cave Bat and Large-eared Pied Bat activity;
 - presence of surface cracking in native vegetation (including within the TECs);
 - tree health (including within the TECs); and
 - features along drainage lines.
- annual monitoring of the above during and for at least two years following secondary extraction;
- monitoring techniques and effort based on best practice;
- completion and performance criteria are ecologically-based and act as triggers for management measures;
- information that will be necessary to measure the impact over time; and
- consideration of the results from monitoring at UG1 and/or UG4.

The results from the monitoring program (or regular inspections by MCO) may trigger the need for remediation/rectification work. If required, surface cracking would be remediated by infilling with soil or other suitable materials, or by locally regrading and compacting the surface. Remediation of surface cracking would only be undertaken where the works would not create a greater impact than the subsidence impact.

Broad-headed Snake, Pink-tailed Legless Lizard and Striped Legless Lizard

In order to determine the presence/absence of Broad-headed Snake, Pink-tailed Legless Lizard and Striped Legless Lizard in the subject land and inform management measures, targeted surveys would be undertaken for these species in the extended UG2 mining area prior to the commencement of secondary extraction within potential habitat (as per Appendix D) and in consideration of published survey guidelines.

Contingency Measures/Controls

Subsidence impact performance measures in the Stage 2 Project Approval (08_0135) that are relevant to this assessment are presented in Table 2. In the event that a relevant subsidence impact performance measure is considered to have been exceeded or is likely to be exceeded, MCO would implement contingency measures/controls to address the impact.

Examples of contingency measures/controls that may be included in the UG2 Extraction Plan are:

- additional monitoring to confirm the performance measure has been exceeded;
- additional remedial works to address the impact (e.g. installation of artificial habitat for cave-dwelling microbats); and/or
- biodiversity offsets.

In regard to biodiversity offsets, Condition 2 of the Stage 2 Project Approval (08_0135) would continue to apply to the Modified Project. Stage 2 Project Approval (08_0135) states:

If the Proponent exceeds the performance measures in Table 18 and the Secretary determines that:

- it is not reasonable or feasible to remediate the impact or environmental consequence; or*
- remediation measures implemented by the Proponent have failed to satisfactorily remediate the impact or environmental consequence;*

then the Proponent shall provide a suitable offset to compensate for the impact or the environmental consequence, to the satisfaction of the Secretary.

Note: Any offset required under this condition must be proportionate with the significance of the impact or environmental consequence.

6.5 ABORIGINAL CULTURAL HERITAGE

6.5.1 Methodology

An ACHA for the Modification has been undertaken by Niche (2021b) and is presented in Appendix E.

The ACHA for the Modification has been undertaken in accordance with the relevant codes, regulations and guidelines, including (but not limited to):

- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a).
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b).
- Clause 60 of the *National Parks and Wildlife Regulation 2019*.
- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011).
- *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia International Council on Monuments and Sites [ICOMOS], 2013).
- *Ask First: A Guide to Respecting Indigenous Heritage Places and Values* (Australian Heritage Commission, 2002).
- *Engage Early* (DotE, 2016).

6.5.2 Background

Aboriginal Cultural Heritage Management

The management of Aboriginal heritage at the Moolarben Coal Complex is currently conducted in accordance with the measures outlined in the approved Heritage Management Plan.

Aboriginal Cultural Heritage Assessment

The ACHA (Appendix E) incorporates relevant information from previous assessments, the results of field surveys undertaken for the Modification and consultation with the Aboriginal community, including:

- results from extensive fieldwork and archaeological and cultural investigations previously undertaken by archaeologists and representatives of the Aboriginal community as part of previous investigations;

- search results from the Aboriginal Heritage Information Management System (AHIMS) database and other heritage registers;
- results of archaeological and cultural surveys conducted by archaeologists and representatives of the Aboriginal community for the Modification in May 2021;
- a consultation program undertaken for the Modification; and
- the outcomes of extensive consultation with the Aboriginal community regarding archaeological and cultural heritage values as part of both previous investigations and the ACHA.

The key steps involved in the preparation of the ACHA and associated consultation are described below.

Previous Archaeological Investigations

A number of Aboriginal cultural heritage surveys, assessments and salvage programs have been undertaken within the Moolarben Coal Complex and surrounds, including the approved UG2 mining area.

Aboriginal cultural heritage surveys and assessments relevant to the approved UG2 mining area were undertaken for the Moolarben Coal Project Stage 2 in 2008 and 2011 (Archaeological Risk Assessment Services, 2008; AECOM, 2011). Various other minor surveys and assessments have also been undertaken.

A detailed description of previous archaeological assessments and surveys undertaken at the Moolarben Coal Complex and surrounds is provided in Appendix E.

Aboriginal Community Consultation

Aboriginal community consultation for the Modification was undertaken with eight Registered Aboriginal Parties (RAPs) in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a) and *National Parks and Wildlife Regulation 2019*.

Consultation with the RAPs regarding the approved Moolarben Coal Complex and the Modification has been extensive and involved various methods including meetings, written and verbal correspondence and archaeological survey attendance.

Table 5 summarises the main stages of the Aboriginal cultural heritage consultation process undertaken for the Modification. A detailed account of the consultation process (including consultation records and a detailed consultation log) for the ACHA for the Modification is provided in Appendix E.

Desktop Review

An AHIMS search was undertaken in March 2021 (Appendix E) for the Modification area and surrounds.

Based on the AHIMS search and the Moolarben Coal Complex Aboriginal sites database, 32 previously recorded Aboriginal sites are located within the approved UG2 mining area. No previously recorded sites are located within the extended UG2 mining area.

Archaeological Survey Design and Methodology

Archaeological field surveys for the Modification were undertaken by suitably qualified archaeologists and accompanied by representatives of the RAPs on 11 and 12 May 2021.

Given the level of previous systematic survey and assessment over the approved UG2 mining area, survey for the Modification ACHA focused on the extended UG2 mining area and immediate surrounds.

In particular, Niche identified the following target landforms that were considered to have the greatest potential for Aboriginal cultural heritage (Appendix E):

- raised ridgelines, including cliffs and steep slopes;
- creek lines with exposed rock;
- land within 200 m of watercourses; and
- lower slopes and gullies.

During the survey and throughout the consultation process, representatives of the RAPs were asked to identify any areas of cultural significance within the Modification area and surrounds or any cultural values relevant to the area. During surveys and consultation, RAPs identified that Aboriginal cultural heritage site S2MC236 (a rock shelter, artwork and artefact scatter of high archaeological significance) was of high cultural significance. All cultural comments relating to the Modification area and/or wider region were recorded and are included in Appendix E.

Table 5
Summary of Aboriginal Cultural Heritage Consultation Undertaken for the Modification

| Date | Consultation Conducted |
|--|--|
| <i>Notification of the Project, Registrations, Proposed Methodology and Information Session</i> | |
| 22 April 2021 | Letters were sent to the existing eight (8) RAPs for the Moolarben Coal Complex to advise them of the Modification and notify them that they have been automatically registered as RAPs for the Modification. The Proposed Methodology for undertaking the ACHA was also distributed to the RAPs for review and comment. An invitation to an information session for the Proposed Methodology was also extended in this correspondence. |
| <i>Information Session</i> | |
| 10 May 2021 | Information session held to provide an overview of the Modification and the Proposed Methodology. |
| <i>Field Surveys</i> | |
| 11 and 12 May 2021 | Aboriginal cultural heritage survey was conducted by archaeologists from Niche accompanied by representatives of the RAPs. |
| <i>Draft ACHA Review</i> | |
| 15 October 2021 | A copy of the draft ACHA was provided to all RAPs for their review and comment. The draft ACHA included survey results, archaeological and cultural significance assessment (based on feedback received during consultation and fieldwork), potential impacts and proposed mitigation and management measures. All comments provided by the RAPs during the draft ACHA consultation period have been incorporated in the final ACHA. |

Source: After Appendix E.

Archaeological Findings

Ten new Aboriginal cultural heritage sites were identified during the field surveys for the Modification.

The 10 new Aboriginal cultural heritage sites comprise the following (Appendix E):

- one isolated artefact;
- five rock shelters with potential archaeological deposit (PAD);
- three rock shelters with artefacts and PAD; and
- one rock shelter with artefact.

All newly identified sites have been assessed as being of low or low-moderate archaeological significance (Appendix E).

Notwithstanding the outcomes of this assessment and classification of some of the identified archaeological sites and objects as having low archaeological significance, MCO acknowledges that this assessment in no way diminishes the recognition or significance of Aboriginal peoples past occupation and use of the land and its resources in the vicinity of the Moolarben Coal Complex.

A detailed discussion of the survey results and descriptions of the newly identified sites are presented in Appendix E.

6.5.3 Assessment

Potential Impacts from Surface Development

There would be no additional surface development as a result of the Modification and therefore no associated impacts to Aboriginal cultural heritage sites.

Potential Impacts from Subsidence Effects

Potential subsidence effects from underground mining operations at the Modification are discussed in detail in Section 6.1 and Appendix A. The potential impact of these effects on Aboriginal cultural heritage is summarised below and described further in Appendix E.

It is unlikely that open artefact sites such as scattered artefacts or isolated finds would be directly impacted by mine subsidence. However, it is possible that if remediation works to the surface areas around the sites was required after mining, these remediation works could potentially impact on archaeological sites (Appendix E).

The types of changes that may be experienced at rock shelter sites would be similar or identical to those that would be expected due to natural weathering processes, but exacerbated by subsidence. For example, a naturally weathering block which will have detached and fallen at some point in time may be detached and fall sooner due to differential movements of the rock strata induced by subsidence (Appendix E).

Approved UG2 Mining Area

While there is an increase in the predicted subsidence parameters (vertical subsidence, maximum predicted tilt and curvatures) at some Aboriginal heritage sites within the approved UG2 mining area, the overall impact assessments based on the Approved Layout do not change for the Modified Layout (Appendix A).

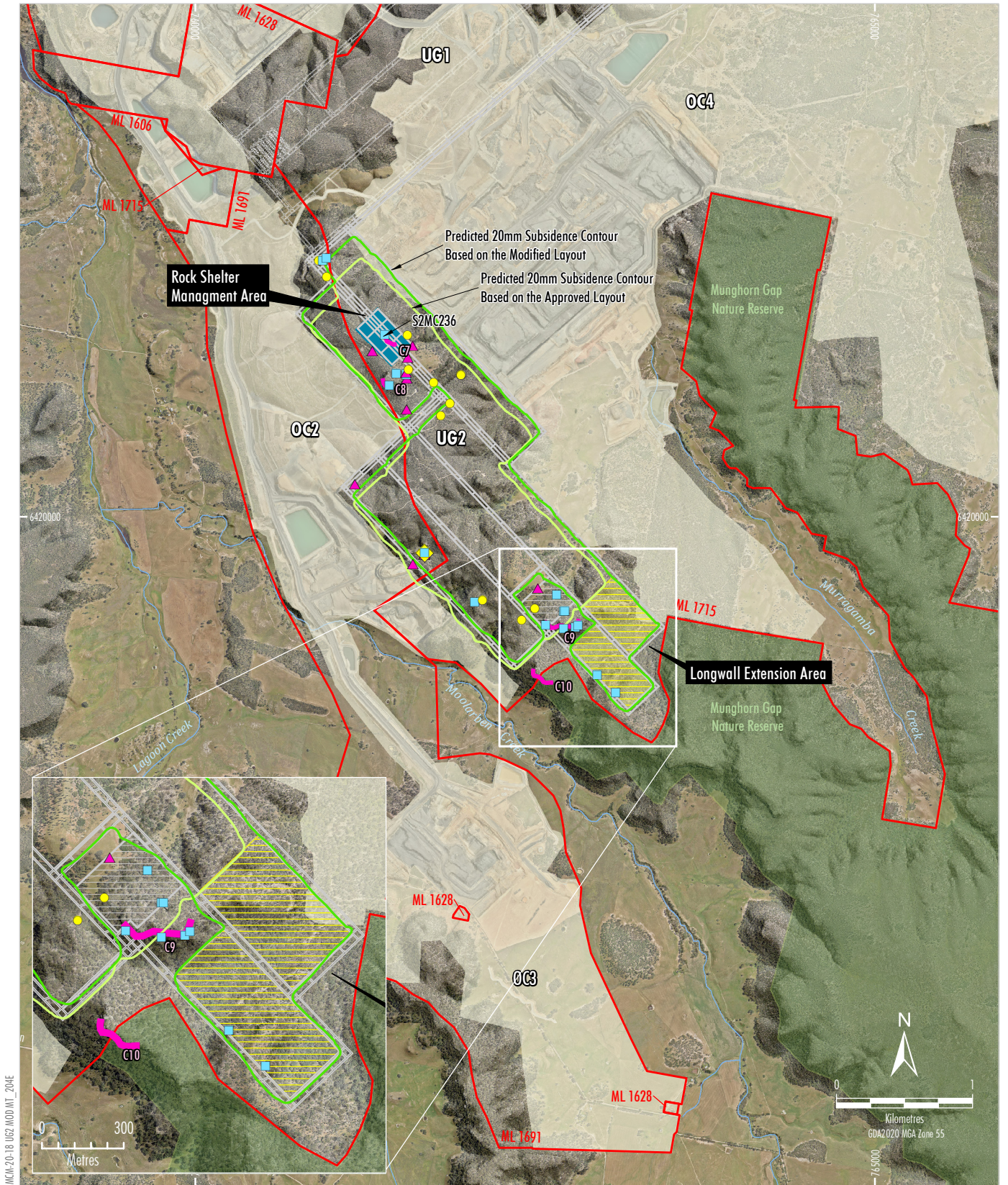
In addition, due to the setback of longwall mining from Cliff Line C9, a number of Aboriginal heritage sites would experience a reduction in predicted subsidence impacts as they previously would have been undermined (Appendix E).

On this basis, Aboriginal cultural heritage sites within the approved UG2 mining area would either experience no change or a decrease in the approved level of subsidence impact as a result of the Modification (Appendix E).

Aboriginal Cultural Heritage Site S2MC236

Aboriginal cultural heritage site S2MC236, a rock shelter, artwork and artefact scatter of high archaeological and cultural significance, is located at Cliff Line C7 within the approved UG2 mining area (Figure 11). Cliff Line C7 and Aboriginal heritage site S2MC236 are protected by a sterilised coal pillar based on 0.5 times the depth of cover from the mapped extent of Cliff Line C7 (Appendix A).

Based on the low magnitude of predicted subsidence parameters, the potential for subsidence impacts at Cliff Line C7 and S2MC236 is considered to be negligible (Appendix A). Therefore the Modification would not result in any change to the existing subsidence performance measure for S2MC236 of “negligible subsidence impacts or environmental consequences” provided in Project Approval (08_0135) (Appendix E).



MCM-20-18 UG2 MOD/INT_204E

- LEGEND**
- National Parks/Nature Reserves
 - Mining Lease Boundary
 - Cliff
 - Aboriginal Cultural Heritage Sites
 - Artefact Scatter
 - Isolated Artefact
 - PAD
 - Rock Shelter with Artefacts and/or Art and/or PAD

- Existing/Approved Development
- Underground Longwall Layout
- Moolarben Coal Complex Disturbance Footprint
- Predicted 20mm Subsidence Contour Based on the Approved Layout
- Proposed UG2 Modification
- Optimised UG2 Longwall Layout
- UG2 Longwall Extension Area
- Non-subsiding UG2 Secondary Workings
- Predicted 20mm Subsidence Contour Based on the Modified Layout

Source: MCO (2021); NSW Spatial Services (2021)
Orthophoto Mosaic: MCO (Jan 2021); MSEC (2021)


MOOLARBEN COAL COMPLEX
 Aboriginal Cultural Heritage Sites
 Within the UG2 Modification Area

Figure 11

Extended UG2 Mining Area

The predicted subsidence parameters in the extended UG2 mining area based on the Modified Layout are similar to those predicted for the approved UG2 mining area and therefore the potential impacts to Aboriginal heritage sites would be similar (Appendix A).

Three of the five known Aboriginal cultural heritage sites within the extended UG2 mining area (S2MC441, S2MC442 and S2MC443; all rock shelters and assessed as being of low to low-moderate archaeological significance) are considered unlikely to experience subsidence impacts as they are within the setback of the longwall layout from Cliff Line C9 and therefore would not be undermined (Appendix E).

The remaining two known Aboriginal cultural heritage sites (S2MC446 and S2MC447; both rock shelters and assessed as being of low archaeological significance) are predicted likely to experience subsidence impacts as they would be directly undermined (Appendix E).

Niche (2021b) concluded that sites S2MC446 and S2MC447 which would be undermined do not warrant test excavation due to either the condition or location of the PAD.

There have been no open artefact sites identified within the extended UG2 mining area to date. As such, indirect impacts are unlikely for Aboriginal cultural heritage sites within the extended UG2 mining area.

Cumulative Impacts

A consideration of the potential cumulative impacts associated with the Modification has been undertaken and is presented in Appendix E.

The Modification would result in an increase in potential for harm and loss of values to two Aboriginal cultural heritage sites considered to have low archaeological value in the extended UG2 mining area. The Modification does not propose any change to approved subsidence impacts to sites within the approved UG2 mining area.

Taken within the context of the over 550 known Aboriginal heritage sites across the Moolarben Coal Complex as well as more than 1,500 and 700 known sites across the Ulan Mine Complex and Wilpinjong Coal Mine (respectively), which are managed in accordance with the respective management plans, the Modification with incorporation of appropriate management and mitigation measures would not result in a significant increase in cumulative impacts to archaeological values of Aboriginal cultural heritage (Appendix E).

Notwithstanding, MCO recognises that any potential impact to known Aboriginal cultural heritage sites has significance to the Aboriginal community.

MCO has identified and manages a number of designated heritage conservation areas on Moolarben owned land within and surrounding the Moolarben Coal Complex (including the Rock Shelter Management Area for S2MC236). The heritage conservation areas preserve Aboriginal cultural heritage in perpetuity and are managed in accordance with the Moolarben Coal Complex Heritage Management Plan.

6.5.4 Mitigation Measures, Management and Monitoring

MCO would implement the management and mitigation measures described in Appendix E, which are consistent with the protocols of the approved Moolarben Coal Complex Heritage Management Plan.

The Moolarben Coal Complex Heritage Management Plan would be reviewed and updated to incorporate the Modification (e.g. to include additional sites identified during the survey undertaken for the ACHA) in consultation with the RAPs and DPIE.

MCO would undertake detailed monitoring of Aboriginal cultural heritage site S2MC236 in accordance with the Moolarben Coal Complex Heritage Management Plan and an Extraction Plan that would be prepared for UG2. Specific Trigger Action Response Plans would also be developed for S2MC236 to inform implementation of mitigation measures in consideration of monitoring outcomes.

Previously unrecorded Aboriginal heritage sites identified during surveys for the Modification would be managed consistent with the requirements outlined in the Moolarben Coal Complex Heritage Management Plan. MCO would continue to liaise with the RAPs throughout the assessment and activities associated with the Modification.

6.6 OTHER ENVIRONMENTAL ASPECTS

6.6.1 Land Resources

The Modification would not result in any additional surface disturbance at the Moolarben Coal Complex.

Potential impacts on soils and land capability for the Modification would be associated with the following subsidence impacts:

- surface cracking; and
- ponding and changes to drainage line gradients.

There would be no change to predicted subsidence impacts and environmental consequences as a result of the Modification for the approved UG2 mining area (Appendix A).

For the extended UG2 mining area, the maximum predicted vertical subsidence, tilt and curvatures are similar to those predicted for the approved UG2 mining area (Appendix A). Therefore, any impacts to land resources in the extended UG2 mining area would be similar to those in the approved UG2 mining area.

On this basis, and considering that there is no agricultural activity undertaken in this area, there would be negligible impacts to soils and land capability as a result of the modified layout for the approved UG2 mining area and extension of longwalls in the extended UG2 mining area.

The Modification area is undisturbed and it is understood no activities have occurred that would have resulted in contamination of land. The Modification would also not result in any change in land use as the proposed underground mining areas are wholly within existing mining tenements.

6.6.2 Non-Aboriginal Heritage

A Non-Aboriginal Heritage Assessment was prepared for the Moolarben Coal Project Stage 2 EA (Veritas Archaeology and Heritage, 2005). No non-Aboriginal heritage sites were identified within the approved UG2 mining area.

In consideration of the outcomes of the Stage 2 EA Non-Aboriginal Heritage Assessment (Veritas Archaeology and Heritage, 2005), as well as searches of relevant heritage registers, no known non-Aboriginal heritage sites have been identified within the extended UG2 mining area.

The Modification is not predicted to impact on any known non-Aboriginal heritage sites, including within the extended UG2 mining area.

The Moolarben Coal Complex operates in accordance with a Heritage Management Plan. MCO would continue to implement the Heritage Management Plan at the Moolarben Coal Complex incorporating the Modification.

6.6.3 Visual

The Moolarben Coal Complex as approved comprises numerous open cut and underground mining domains. There are also a number of approved open cut and underground coal mining operations in the vicinity of the Moolarben Coal Complex, including the Ulan Mine Complex and Wilpinjong Coal Mine.

Views of the Moolarben Coal Complex are available from some private dwellings and from publicly-accessible national parks and nature reserves, but are generally restricted due to intervening topography and existing vegetation. The Moolarben Coal Complex can also be seen from sections of Ulan Road and Ulan-Wollar Road.

As described in Section 6.1, the type and magnitude of predicted incremental subsidence impacts for the Modification would be similar to the approved UG2 layout. Subsidence impacts from the Modification longwalls would also be restricted to Moolarben owned land. Given the undulating terrain in the vicinity of the MCO, the impact of subsidence on the landscape and visual amenity would be negligible.

The only additional surface infrastructure that would be constructed for the Modification would be within the remote services infrastructure area. The remote services infrastructure area is entirely within the approved OC4 disturbance footprint and therefore would be visually indistinguishable from existing Moolarben Coal Complex operations.

As the Modification is largely limited to underground operations, the only additional infrastructure is within an approved open cut mining area and in the context of the existing visual landscape (i.e. a number of surrounding open cut and underground coal mining operations), there would be no change to the visual landscape due to the Modification.

Given the Modification is predicted to have negligible visual amenity impact, no specific management or mitigation measures are considered to be warranted.

Notwithstanding, existing visual mitigation and management measures would continue to be implemented at the Moolarben Coal Complex incorporating the Modification.

6.6.4 Greenhouse Gas Emissions

Greenhouse gas emissions from the Moolarben Coal Complex are currently managed in accordance with a Greenhouse Gas Minimisation Plan and measured and reported annually in accordance with the National Greenhouse and Energy Reporting Scheme (NGERS).

Incremental greenhouse gas emissions associated with the Modification would be related to underground mining (i.e. additional diesel and electricity consumption and fugitive emissions) and the processing, transportation and downstream use of the additional ROM coal.

In the 2020-2021 reporting period, fugitive emissions from underground operations at the Moolarben Coal Complex resulted in 0.2 Mt carbon dioxide equivalent (CO₂-e) of methane emissions. Fugitive emissions due to the Modification are expected to be negligible in comparison to the approved UG2, as the target coal seam has a low gas volume and open cut and underground mining has occurred on three sides of the approved UG2 mining area.

Additional Scope 1 and Scope 2 greenhouse gas emissions due to the Modification would be negligible relative to the approved Moolarben Coal Complex.

As the Modification would not change the approved annual coal production rates or intensity of mining, there would be no change in annual emissions from the Moolarben Coal Complex due to the Modification over the life of the mine.

MCO would continue to monitor and manage Scope 1 and Scope 2 greenhouse gas emissions in accordance with the Greenhouse Gas Minimisation Plan, which would be updated to incorporate the Modification as required.

Reporting of energy consumption and Scope 1 and 2 greenhouse gas emissions would continue in accordance with NGERS.

Scope 3 emissions would not physically occur in NSW or Australia as product coal would be exported to overseas customers. Combustion of the additional 4.5 Mt of product coal extracted for the Modification by downstream users would result in an incremental increase in Scope 3 emissions of approximately 11.75 Mt CO₂-e over the life of the mine (based on 2021 National Greenhouse Accounts Factors for anthracite coal).

6.6.5 Social

The Modification involves optimisations to the approved Moolarben Coal Complex, which has been operating since 2010.

The Modification would not change the peak workforce or approved mine life at the Moolarben Coal Complex. As such, no additional demand for services (e.g. housing and health services) in the region is expected.

The Moolarben Coal Complex incorporating the Modification would continue to comply with Project Approval limits for noise, air quality and blasting.

As such, the Modification would not result in any additional social impacts than the existing Moolarben Coal Complex.

MCO would continue to support local and regional businesses and contribute to local government for community infrastructure and services.

6.6.6 Economic

The Modification would allow for the recovery of an additional 4.5 Mt of ROM coal. These additional resources would contribute approximately \$24 million (M) in additional royalties to the state of NSW in real terms over the life of the mine (based on coal price of \$75.30 per tonne and a royalty rate of 7.2% for underground mining).

This coal would be mined within the approved Moolarben Coal Complex mine life, Stage 2 Project Boundary and mining tenements and would predominately use the existing and approved surface infrastructure.

The use of existing/approved Moolarben Coal Complex infrastructure for the Modification maximises the potential benefits of previous MCO investment.

6.6.7 Amenity

The Moolarben Coal Complex as approved comprises numerous large open cut and underground mining domains as well as coal processing, and transport facilities that operate 24 hours per day, seven days per week.

Potential incremental noise and air quality impacts associated with the Modification (e.g. construction and operation of the remove services infrastructure area) would be minor and immaterial compared to the existing Moolarben Coal Complex operations.

Noise and air quality management at the Moolarben Coal Complex would continue to be conducted in accordance with the approved Noise Management Plan and Air Quality Management Plan. The Noise Management Plan and Air Quality Management Plan would be reviewed and, where necessary, updated to incorporate the Modification.

6.6.8 Hazard and Risk

A Preliminary Hazard Analysis (PHA) was conducted for the Moolarben Coal Project Stage 2 EA to assess the potential hazards and risks associated with Stage 2 of the approved Moolarben Coal Complex (SKM, 2008).

It is considered that the Modification would not change the existing potential risks or hazard consequences identified in the PHA as the proposed activities associated with the Modification (e.g. underground mining activities) are consistent with those previously considered for Stage 2 of the approved Moolarben Coal Complex.

Notwithstanding, environmental management plans and monitoring programs would be reviewed, and where necessary, updated to include the Modification and manage any associated environmental risks.

7 EVALUATION OF MERITS

This section provides a justification for the Modification and conclusion for the Modification Report.

As part of the justification of the modified Project, consideration has been given to:

- the engagement undertaken for the Modification (Section 7.1);
- key environmental assessment outcomes including the potential impacts of the Modification (Section 7.2);
- the relevant statutory and policy requirements (Section 7.3); and
- the benefits of the Modification and the Project (Section 7.4).

7.1 STAKEHOLDER ENGAGEMENT OVERVIEW

MCO has consulted with a number of stakeholders during the Modification process, including:

- key State and Commonwealth Government agencies;
- local councils;
- the local community;
- Aboriginal stakeholders; and
- neighbouring mine operators.

Notwithstanding the consultation undertaken by MCO for the Modification, stakeholders either indicated they would provide comment on the Modification after it was lodged, or no material feedback was provided.

7.2 CONSOLIDATED SUMMARY OF ASSESSMENT OF IMPACTS

MCO has undertaken a review of the potential environmental impacts of the Modification and the key potential environmental impacts are related to the modified UG2 layout and the associated subsidence impacts and consequences (Section 6).

It is concluded that the existing subsidence performance measures in the Stage 2 Project Approval (08_0135) (Table 2) are still considered to be appropriate for the Modification.

7.3 COMPLIANCE WITH RELEVANT STATUTORY AND POLICY REQUIREMENTS

An outline of the statutory requirements relevant to the assessment of the Modification is provided in Section 4.

The Modification is considered to be generally consistent with the objects of the EP&A Act (Section 4.1.1).

In evaluating the Modification, under section 4.15(1) of the EP&A Act, the consent authority is required to take into consideration a range of matters as they are of relevance to the subject of the application. While this is a requirement of the consent authority, this Modification Report has been prepared to generally address the requirements of section 4.15(1) of the EP&A Act to assist the consent authority (Section 4.1.2).

A detailed statutory compliance table for the Project incorporating the Modification that identifies all the relevant statutory requirements and the relevant sections in this Modification Report that address these requirements is provided in Attachment 1.

7.4 EVALUATION OF THE MODIFICATION

The Moolarben Coal Complex operates in accordance with Project Approval (05_0117) (Moolarben Coal Project Stage 1) and Project Approval (08_0135) (Moolarben Coal Project Stage 2).

The Moolarben Coal Complex comprises four approved open cut mining areas (OC1 to OC4), three approved underground mining areas (UG1, UG2 and UG4) and other mining related infrastructure (including coal processing and transport facilities) (Figure 2).

The Modification seeks to optimise UG2 in preparation for the commencement of development in 2023 taking into consideration the latest design information that has become available since Stage 2 of the Moolarben Coal Complex was approved.

The Modification would include the following changes to the approved Moolarben Coal Complex (Section 3):

- optimisation of the approved UG2 layout (including the extension of two approved longwall panels);
- increased UG2 extraction height from 3.0 m to 3.5 m;

- revised UG2 mining sequence;
- increased UG2 ROM coal production from 9.4 Mt to 13.9 Mt;
- construction and operation of a remote services infrastructure area (indicatively including two UG2 service boreholes/drop holes and associated facilities) within the approved OC4 disturbance footprint to support UG2 operations;
- development of an additional non-subsiding gate road along the southern boundary of the UG1 mining area to assist with ventilation in UG2; and
- small reduction in the approved OC4 extent to accommodate the optimised UG2 layout.

No other changes to approved Moolarben Coal Complex (including disturbance footprint) would be required for the Modification.

The Modification would:

- Contribute to the financial resilience of the Moolarben Coal Complex, which would be achieved through the efficient development of the existing available resources (e.g. additional production can be achieved with no change to the existing infrastructure).
- Facilitate ESD, as economic efficiencies can be achieved with no change to the currently accepted environmental performance measures, use of existing mining, coal handling and processing infrastructure and associated support facilities and no increase in the duration of existing impacts of the Moolarben Coal Complex.
- Not require any new surface disturbance and includes setbacks from key environmental surface features, and therefore, potential impacts on biodiversity and cultural heritage items as a result of the Modification would be avoided and minimised.
- Result in the recovery of an additional 4.5 Mt of ROM coal which would contribute to increased NSW export income and royalties.
- Extend the duration of employment for the underground workforce.
- Be developed in a manner that incorporates community engagement, with a wide range of stakeholders consulted through the preparation of this Modification Report.

- Be consistent with the NSW Government's Strategic Statement on Coal Exploration and Mining, which outlines that the NSW Government will act in four areas, including *"supporting responsible coal production in areas deemed suitable for mining"*.

As such, the approval of the Modification is considered to be justified.

7.5 CONCLUSION

The Moolarben Coal Project Stage 2, incorporating the Modification, would remain substantially the same as the development that was originally granted for the Moolarben Coal Project Stage 2, as last modified under section 75W of the EP&A Act (i.e. Modification 3).

The Moolarben Coal Project Stage 2 (as modified) would continue to comply with existing criteria, subsidence performance measures and limits described in the Stage 2 Project Approval (08_0135).

MCO would also continue to operate the Moolarben Coal Project Stage 2 (as modified) in accordance with the existing management and monitoring regime described in the Stage 2 Project Approval (08_0135).

In weighing up the main environmental impacts (costs and benefits) associated with the proposal, as assessed and described in this Modification Report, the Modification, on balance, is considered to have merit.

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9 ABBREVIATIONS

| | | | |
|--------------------|---|-----------------|---|
| | | ha | hectare |
| | | km | kilometres |
| ACHA | Aboriginal Cultural Heritage Assessment | km ² | square kilometres |
| AGE | Australasian Groundwater and Environmental Consultants | LW | Longwall |
| | | m | metres |
| AHIMS | Aboriginal Heritage Information Management System | M | million |
| AIP | <i>NSW Aquifer Interference Policy</i> | MCM | Moolarben Coal Mines Pty Ltd |
| AMBS | AMBS Ecology and Heritage | MCO | Moolarben Coal Operations Pty Ltd |
| BAM | Biodiversity Assessment Method | Mining SEPP | <i>State Environmental Planning Policy (Mining Petroleum Production and Extractive Industries) 2007</i> |
| BC Act | <i>Biodiversity Conservation Act 2016</i> | | |
| BCS | Biodiversity, Conservation and Science Directorate | ML | Mining Lease |
| BDAR | Biodiversity Development Assessment Report | ML/year | megalitres per year |
| | | mm | millimetres |
| CCC | Community Consultative Committee | mm/m | millimetres per metre |
| CEEC | Critically Endangered Ecological Community | MOP | Mining Operations Plan |
| | | MSEC | Mine Subsidence Engineering Consultants |
| CO ₂ -e | carbon dioxide equivalent | Mt | million tonnes |
| DECCW | NSW Department of Environment, Climate Change and Water | Mtpa | million tonnes per annum |
| DL | drainage line | NGERS | National Greenhouse and Energy Reporting Scheme |
| DotE | Commonwealth Department of the Environment | Niche | Niche Environment and Heritage |
| DPIE | NSW Department of Planning, Industry and Environment | NSW | New South Wales |
| | | OC | Open cut |
| EA | Environmental Assessment | OEH | NSW Office of Environment and Heritage |
| EPA | NSW Environment Protection Authority | PAD | potential archaeological deposit |
| EP&A Act | <i>Environmental Planning and Assessment Act 1979</i> | PCT | plant community type |
| EP&A Regulation | <i>Environmental Planning and Assessment Regulation 2000</i> | PHA | Preliminary Hazard Analysis |
| EPBC Act | <i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i> | PoEO Act | <i>Protection of the Environment Operations Act 1997</i> |
| | | PPR | Preferred Project Report |
| EPL | Environment Protection Licence | RAPs | Registered Aboriginal Parties |
| ESD | ecologically sustainable development | ROM | run-of-mine |
| | | SAII | serious and irreversible impact |

| | |
|---------|---------------------------------|
| SSD | State Significant Development |
| TEC | Threatened Ecological Community |
| UG | Underground |
| WRM | WRM Water and Environment |
| Yancoal | Yancoal Australia Limited |
| YM | Yancoal Moolarben Pty Ltd |

ATTACHMENT 1
DETAILED STATUTORY COMPLIANCE RECONCILIATION TABLE

**Table A1-1
Summary Statutory Compliance for State Legislation**

| Relevant Legislation or Instrument | Mandatory Consideration | Relevant Section in Modification Report | Modified Project Compliance Status |
|--|--|---|------------------------------------|
| <i>Environmental Planning and Assessment Act 1979 (EP&A Act)</i> | | | |
| section 1.3 | Relevant objects of the EP&A Act: <ul style="list-style-type: none"> • Promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources. • Facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment. • Promote the orderly and economic use and development of land. • Protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats. • Promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage). • Promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State. • Provide increased opportunity for community participation in environmental planning and assessment. | Sections 4.1.1 and Section 7 | ✓ |
| section 4.15 | Relevant environmental planning instruments: <ul style="list-style-type: none"> • <i>State Environmental Planning Policy (Koala Habitat Protection) 2020.</i> • <i>State Environmental Planning Policy (Koala Habitat Protection) 2021.</i> • <i>State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP).</i> • <i>State Environmental Planning Policy (SEPP) No 33: Hazardous and Offensive Development (SEPP 33).</i> • <i>State Environmental Planning Policy No.55 – Remediation of Land (SEPP 55).</i> • <i>Mid-Western Regional Local Environmental Plan 2012.</i> • Any planning agreement or draft planning agreement that a developer has entered into under section 7.4 of the EP&A Act. • <i>The Environmental Planning and Assessment Regulation 2000 (EP&A Regulation).</i> The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality; the suitability of the site for the development; any submissions made in accordance with the EP&A Act or the EP&A Regulation; the public interest. | Section 4.1.2, 4.3 and Table A1-2 | ✓ |

Table A1-1 (Continued)
Summary Statutory Compliance for State Legislation

| Relevant Legislation or Instrument | Mandatory Consideration | Relevant Section in Modification Report | Modified Project Compliance Status |
|---|--|---|------------------------------------|
| <i>EP&A Regulation</i> | | | |
| clause 115AA | An application for modification of a development consent for State significant development under the Act, section 4.55(1), (1A) or (2) or 4.56(1) must— a) be in the form approved by the Planning Secretary and made available on the NSW planning portal, and b) include particulars of the nature of the proposed modification to the development consent, and c) be prepared having regard to the State Significant Development Guidelines, and d) be lodged on the NSW planning portal. | Sections 1 to 7 | ✓ |
| <i>Biodiversity Conservation Act 2016</i> | | | |
| section 7.14(2) | The consent authority is to take into consideration the likely impact of the proposed development on biodiversity values as assessed in the BDAR. | Sections 4.2.2 and 6.4, Appendix D | ✓ |
| section 7.16(3) | If the consent authority is of the opinion that the Modification is likely to have serious and irreversible impacts on biodiversity values, the consent authority is required to: <ul style="list-style-type: none"> • take those impacts into consideration; and • determine whether there are any additional and appropriate measures that will minimise those impacts if consent or approval is to be granted. | Sections 4.2.2 and 6.4, Appendix D | ✓ |
| <i>Protection of the Environment Operations Act 1997 (PoEO Act)</i> | | | |
| section 43 | Operations at the Moolarben Coal Complex are currently undertaken in accordance with existing EPL 12932 issued under the PoEO Act. The EPL contains conditions that relate to emission and discharge limits, environmental monitoring and reporting. It is not anticipated that any changes to EPL 12932 would be required as a result of the Modification. | Section 4.2.5 | ✓ |
| <i>Water Management Act 2000</i> | | | |
| sections 89, 90 and 91 | The Modification would not change peak water licensing, supply sources and storage requirements for the Moolarben Coal Complex. MCO would continue to obtain and hold licences required under the <i>Water Management Act 2000</i> for licensable take. | Section 4.2.1 | ✓ |
| <i>National Parks and Wildlife Act 1974</i> | | | |
| section 90 | An Aboriginal cultural heritage impact permit under section 90 of the <i>National Parks and Wildlife Act 1974</i> is not required for the Moolarben Coal Project Stage 2, including for the Modification. | Section 4.2.3 | ✓ |

**Table A1-2
Summary Statutory Compliance for Environmental Planning Instruments**

| Relevant Legislation or Instrument | Mandatory Consideration | Relevant Section in Modification Report | Modified Project Compliance Status |
|------------------------------------|---|---|------------------------------------|
| <i>Mining SEPP</i> | | | |
| clause 12 | <p>Before determining an application for consent for the purposes of mining the consent authority must:</p> <p>(a) consider –</p> <p>(i) the existing uses and approved uses of land in the vicinity of the development, and</p> <p>(ii) whether or not the development is likely to have a significant impact on the uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development, and</p> <p>(iii) any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses, and</p> <p>(b) evaluate and compare the respective public benefits of the development and the land uses referred to in paragraph (a)(i) and (ii), and</p> <p>(c) evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a)(iii).</p> | Section 4.3 | ✓ |
| clause 13 | <p>Before determining an application for development in the vicinity of mining, petroleum or extractive industry, the consent authority must (among other things) consider whether or not the development is likely to have a significant impact on current or future extraction or recovery of minerals, petroleum or extractive materials (including by limiting access to, or impeding assessment of, those resources), and any ways in which the development may be incompatible with any of those existing or approved uses or that current or future extraction or recovery.</p> | Section 4.3 | ✓ |
| clause 14 | <p>Before determining an application for consent for the purposes of mining the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner (including conditions to ensure that impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable, that impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest extent practicable, and that greenhouse gas emissions are minimised to the greatest extent practicable). This includes considering an assessment of greenhouse gas emissions (including downstream emissions) having regard to any applicable State or National policies, programs of guidelines concerning greenhouse gas emissions.</p> | Sections 4.3 and 6 | ✓ |
| clause 15 | <p>Before determining an application for consent for the purposes of mining the consent authority must consider the efficiency of the development in terms of resource recovery and whether or not the consent should be issued subject to conditions aimed at optimising the efficiency of resources recovery and the reuse or recycling of material.</p> | Section 4.3 | ✓ |

Table A1-2 (Continued)
Summary Statutory Compliance for Environmental Planning Instruments

| Relevant Legislation or Instrument | Mandatory Consideration | Relevant Section in Modification Report | Modified Project Compliance Status |
|---|--|---|------------------------------------|
| <i>Mining SEPP (Continued)</i> | | | |
| clause 16 | Before determining an application for consent for the purposes of mining the consent authority must consider whether or not the consent should be issued subject to conditions regarding transport of materials. | Section 4.3 | ✓ |
| clause 17 | Before determining an application for consent for the purposes of mining the consent authority must consider whether or not the consent should be issued subject to conditions regarding rehabilitation, including the particular considerations set out in clause 17(2). | Section 4.3 | ✓ |
| <i>SEPP 33</i> | | | |
| clause 13 | A consent authority must consider current circulars or guidelines published by the DPIE relating to hazardous or offensive development, whether to consult with relevant public authorities regarding any environmental or land use safety requirements, a preliminary hazard analysis prepared by the applicant, feasible alternatives to the development and likely future use of surrounding land. | Section 6.6.7 | ✓ |
| <i>SEPP 55</i> | | | |
| clause 7(1) | A consent authority must consider whether the land is contaminated and be satisfied that, if the land is contaminated, the land is suitable in its contaminated state (or will be suitable after remediation) for the purpose of the Project. | Section 6.6.1 | ✓ |
| <i>State Environmental Planning Policy (Koala Habitat Protection) 2020 and State Environmental Planning Policy (Koala Habitat Protection) 2021.</i> | | | |
| | Since the Modification is an application to modify Project Approval (08_0135) under section 4.55(2) of the EP&A Act, the Mid-Western Regional Council will not be the consent authority. The provisions of <i>State Environmental Planning Policy (Koala Habitat Protection) 2020</i> and <i>State Environmental Planning Policy (Koala Habitat Protection) 2021</i> do not apply in circumstances where the consent authority is not the Council. | Section 4.3 | ✓ |
| <i>Mid-Western Regional Local Environmental Plan 2012</i> | | | |
| clause 2.3 | A consent authority must have regard to the objectives for development in a zone when determining a development application in respect of land within that zone. | No change. | ✓ |
| clause 5.10(4) | If applicable, a consent authority must, before granting consent under clause 5.10 in respect of a heritage item or heritage conservation area, consider the effect of the proposed development on the heritage significance of the item or area concerned. | Section 6.6.2 | ✓ |

Table A1-2 (Continued)
Summary Statutory Compliance for Environmental Planning Instruments

| Relevant Legislation or Instrument | Mandatory Consideration | Relevant Section in Modification Report | Modified Project Compliance Status |
|------------------------------------|--|--|------------------------------------|
| clause 5.10(8) | If applicable, a consent authority must, before granting consent under clause 5.10 to the carrying out of development in an Aboriginal place of heritage significance, consider the effect of a proposed development on the heritage significance of the place and any Aboriginal object known or reasonably likely to be located at the place by means of an adequate investigation and assessment. | Section 6.5 and Appendix E | ✓ |
| clause 6.3 | If applicable, a consent authority must, before granting development consent for earthworks, consider the effect of proposed earthworks on drainage patterns, soil stability, quality of fill, likely amenity impacts, likelihood of disturbing relics and proximity to and potential impacts on water courses. | No change to approved surface disturbance footprint. | ✓ |