



Moolarben Coal Complex OC4 South-West Modification

Environmental Assessment

ENVIRONMENTAL ASSESSMENT

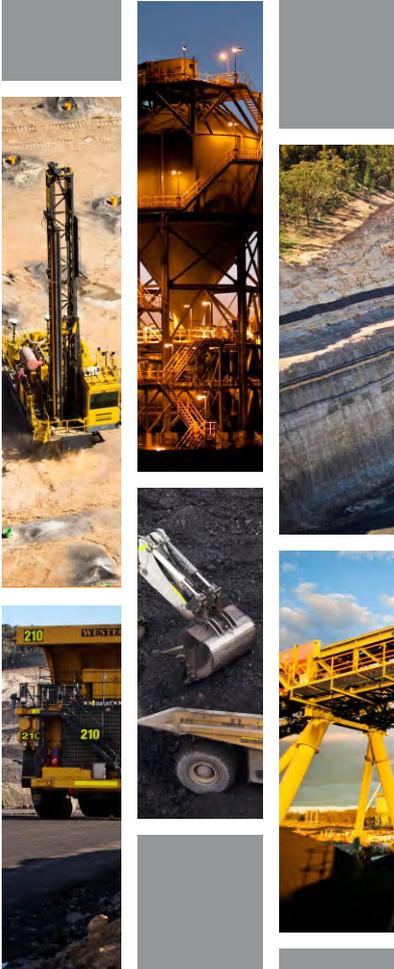


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1 INTRODUCTION

The Moolarben Coal Complex is located approximately 40 kilometres (km) north of Mudgee in the Western Coalfields of New South Wales (NSW) (Figure 1).

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

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).

Mining operations at the Moolarben Coal Complex are currently approved until 31 December 2038 in accordance with Project Approval (05_0117) (Moolarben Coal Project Stage 1) (as modified) and Project Approval (08_0135) (Moolarben Coal Project Stage 2).

Stage 1 mining operations are also undertaken in accordance with Approval Decisions EPBC 2007/3297 granted on 24 October 2007 (and varied by notice on 25 February 2009 and 11 May 2010) and EPBC 2013/6296 granted on 13 November 2014 under the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act). The current mining operations are also conducted in accordance with the requirements of the conditions of Mining Lease (ML) 1605, ML 1606, ML 1628 and ML 1691 granted under the *Mining Act, 1992*.

Since commencement of coal mining operations in 2010, mining activities have occurred within OC1 and OC2 (Figure 3). Subject to all necessary approvals being in place (both State and Commonwealth), development of the OC4 pit (Stage 2) is planned to commence during 2015. The development of the UG1 (i.e. highwall stabilisation, portal construction and drivage development) would also commence in 2015.

This Environmental Assessment (EA) has been prepared by MCO to support a request to modify both the Stage 1 and Stage 2 Project Approvals (05_0117 and 08_0135, respectively) under section 75W of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act) (the OC4 South-West Modification).

The OC4 South-West Modification includes construction of the OC4 south-west haul road (located south-west of the approved Stage 2 Haul Road), adjustments to the site water management system, refinements to the early stages of mining and associated infrastructure layout at OC4, and backfilling of the northern OC1 final void.

A copy of Project Approval (05_0117) and Project Approval (08_0135) are provided as Attachments 1 and 2.

1.1 BACKGROUND

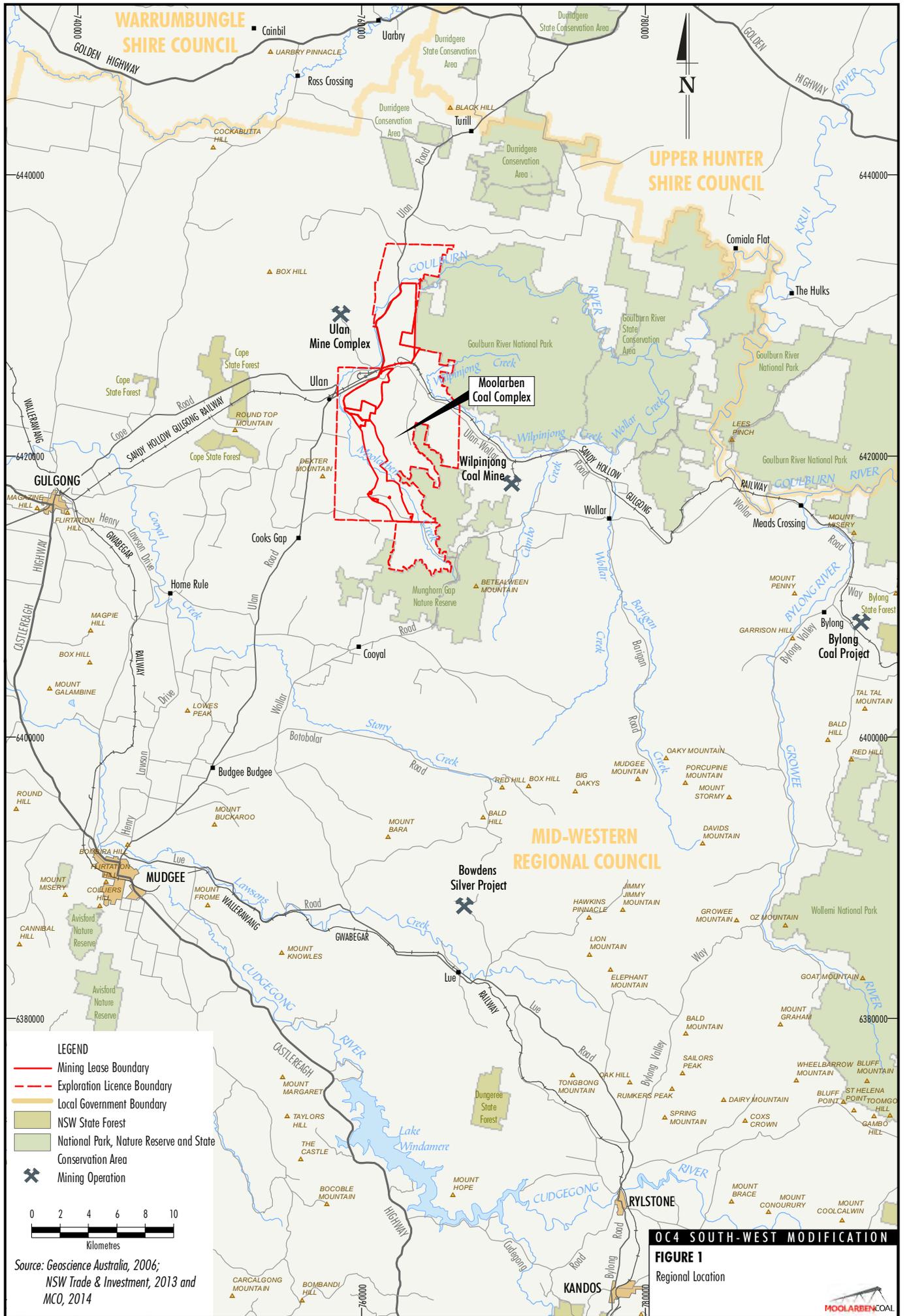
1.1.1 Moolarben Coal Complex History

The Moolarben Coal Project (Stage 1) was assessed in the *Moolarben Coal Project Environmental Assessment Report* (Moolarben Coal Mines Limited, 2006) (Stage 1 EA) and was approved by the NSW Minister for Planning on 6 September 2007 (Stage 1 Project Approval [05_0117]).

Stage 1 Project Approval (05_0117) has been subject to ten modifications. The modifications were generally required to reconfigure the mine layout (e.g. extension to mining areas, relocation of coal handling infrastructure and water infrastructure) and were aimed to improve the efficiency and operation of the Moolarben Coal Complex and enable access to additional economically viable coal reserves.

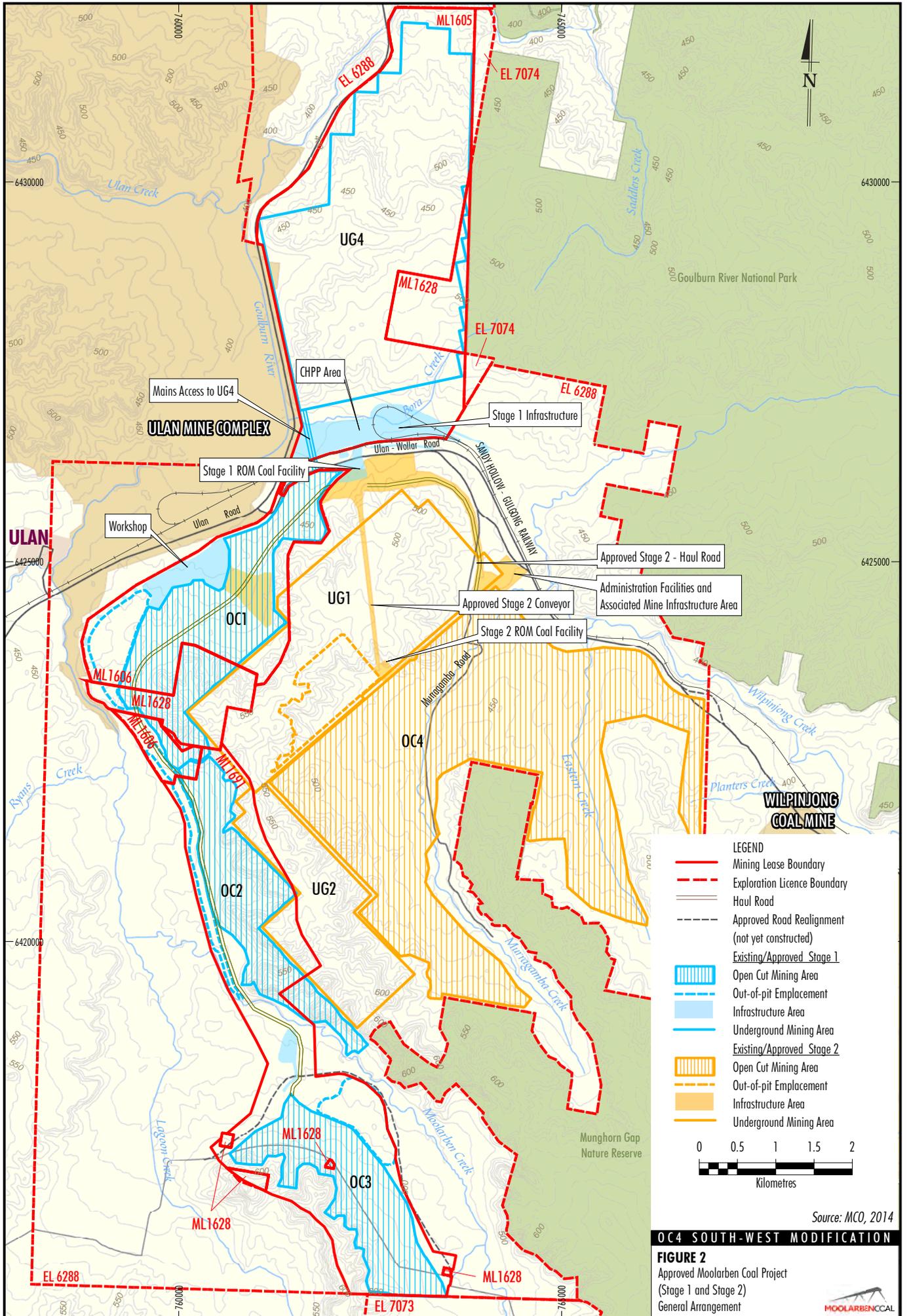
A Major Project Application for the Moolarben Coal Project (Stage 2) was lodged with the NSW Minister for Planning on 1 May 2008. Following exhibition of the Moolarben Coal Project Stage 2 Environmental Assessment (Stage 2 EA), MCM made a number of changes to the proposed layout and design of the Moolarben Coal Project Stage 2 in order to address issues raised by the Department of Planning and Infrastructure (DP&I) (now Department of Planning and Environment [DP&E]) 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 were described in a Preferred Project Report (Stage 2 PPR) which was exhibited from 31 January 2012 to 24 February 2012.

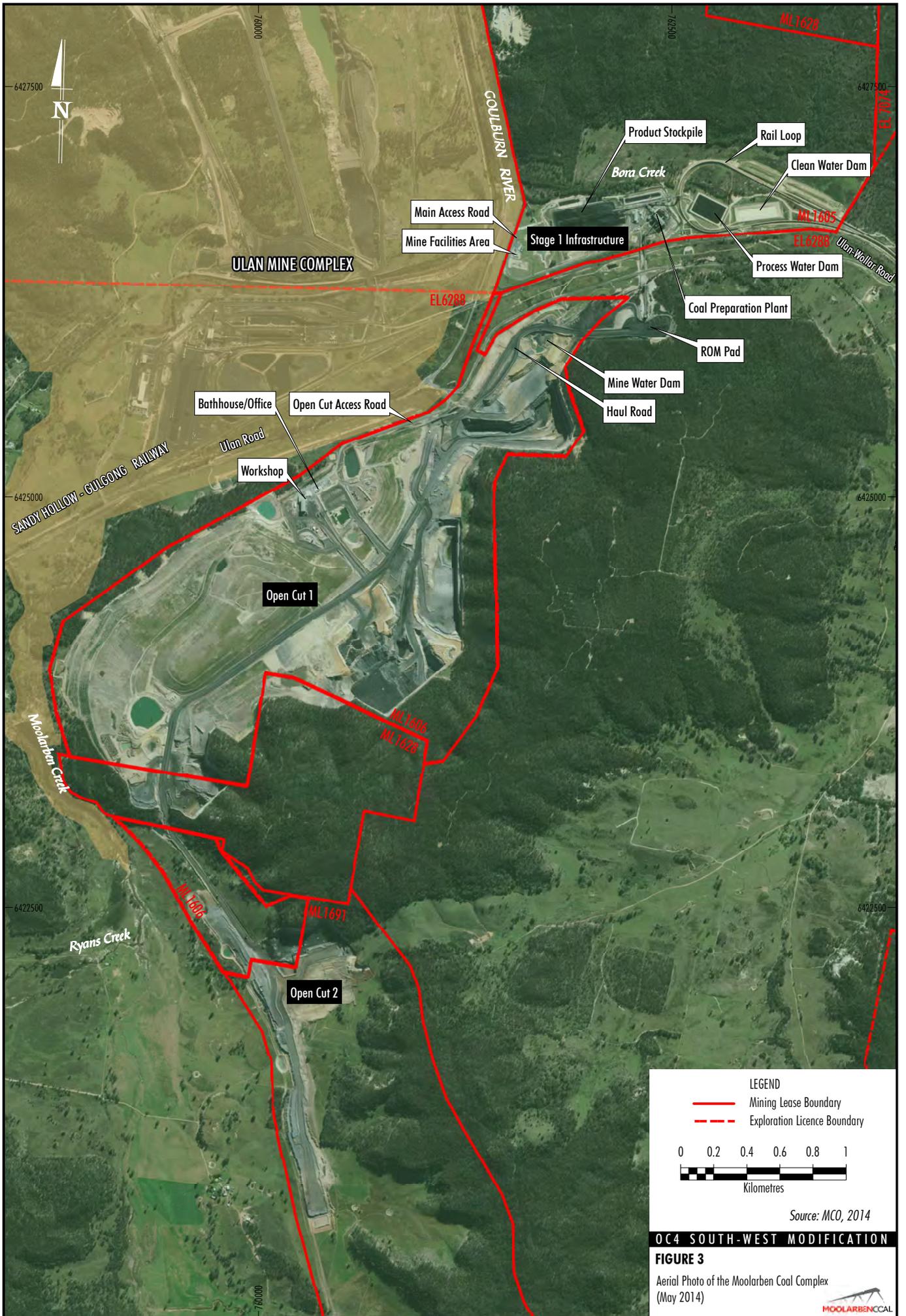
The Moolarben Coal Project Stage 2 was approved by the Planning Assessment Commission (as a delegate of the NSW Minister for Planning) on 30 January 2015 (Stage 2 Project Approval [08_0135]).



OC4 SOUTH-WEST MODIFICATION
FIGURE 1
 Regional Location







A Variation of Proposal to take Action (EPBC 2008/4444) under the EPBC Act for Moolarben Coal Project (Stage 2) was accepted on 26 April 2012. The Variation of Proposal to take Action (EPBC 2008/4444) will require separate approval under the EPBC Act.

The most recently approved modification of Stage 1 of the Moolarben Coal Project (Modification 3) was approved by the Planning Assessment Commission (as a delegate of the NSW Minister for Planning) on 30 January 2015.

Modification 3 allows for Stage 1 infrastructure to receive, handle and process Stage 2 coal for the life of Stage 2 (to 31 December 2038) and aligns approved mine operation timeframes between Stage 1 and Stage 2. An additional void at the northern end of OC1 was also approved to allow access to UG4.

A summary description of the existing/approved Moolarben Coal Complex is provided in Section 2. The general arrangement of the existing/approved Moolarben Coal Complex is shown on Figure 2.

1.1.2 Neighbouring Mine Operations/Projects

Potential interactions with neighbouring mine operations/projects to the Moolarben Coal Complex have been considered where relevant in this EA, including the Ulan Mine Complex and the Wilpinjong Coal Mine.

Ulan Mine Complex

The Ulan Mine Complex is located adjacent to and north-west of the Moolarben Coal Complex (Figure 1) and is operated by Ulan Coal Mines Limited (UCML) and managed by Glencore.

Operations at the Ulan Mine Complex are undertaken in accordance with Project Approval (08_0184) for the Ulan Continued Operations Project. The Ulan Mine Complex is approved to operate up to a maximum coal export capacity (from the site) of 20 million tonnes per annum (Mtpa) and all product coal is transported from the site by rail.

The location and extent of the approved Ulan Mine Complex are shown on Figure 2.

Wilpinjong Coal Mine

The Wilpinjong Coal Mine is located adjacent to and east of the Moolarben Coal Complex (Figures 1 and 2) and is owned and operated by Wilpinjong Coal Pty Ltd (WCPL), a wholly owned subsidiary of Peabody Energy Australia Pty Limited.

Operations at the Wilpinjong Coal Mine are undertaken in accordance with Project Approval (05_0021) for the Wilpinjong Coal Project. The Wilpinjong Coal Mine is approved to operate up to a maximum coal export capacity (from the site) of 12.5 Mtpa and all product coal is transported from the site by rail.

The location and extent of the approved Wilpinjong Coal Mine are shown on Figure 2.

1.2 MODIFICATION OVERVIEW

The OC4 South-West Modification includes the following key components:

- construction of the OC4 south-west haul road between OC4 and OC1 (and therefore the approved Stage 2 Haul Road would not need to be constructed) (Figure 4);
- adjustments to the site water management system to contain surface water runoff from the south-west haul road and diversion of upslope water;
- refinements to the early stages of mining and associated infrastructure layout at OC4 (wholly located within the approved surface disturbance footprint) (Figure 4); and
- backfilling of the northern OC1 final void to approximately pre-mining elevations (Figure 4).

Table 1 provides a summary comparison of the currently approved Moolarben Coal Complex under the Stage 1 Project Approval (05_0117) and Stage 2 Project Approval (08_0135), and the Moolarben Coal Complex incorporating the OC4 South-West Modification.

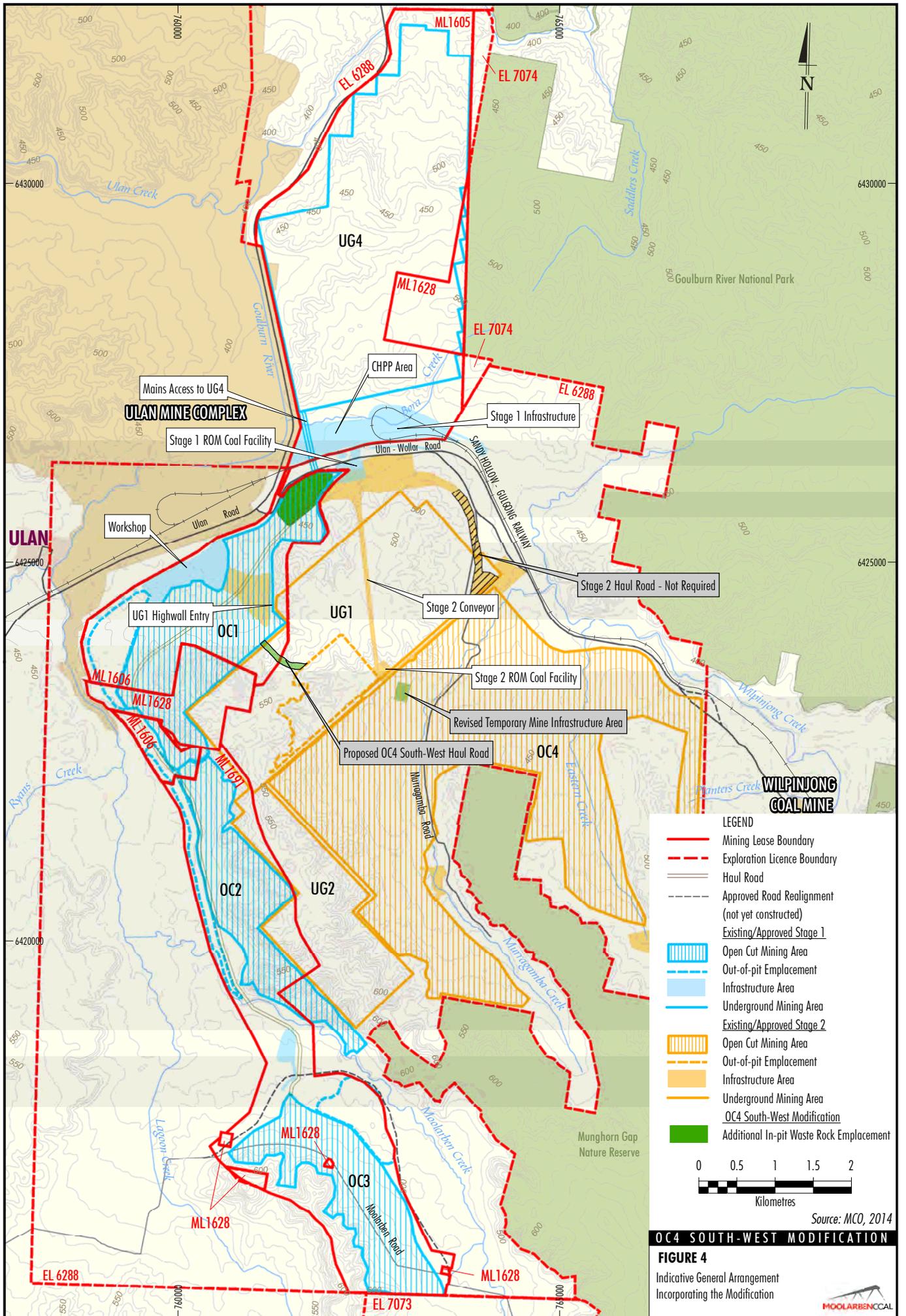


Table 1
Summary Comparison of Approved and Modified Moolarben Coal Project

Relevant Approval Component	Moolarben Coal Project		Moolarben Coal Project (including the OC4 South-West Modification)
	Stage 1 Project Approval (05_0117)	Stage 2 Project Approval (08_0135)	
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 a day, 7 days a week.		Unchanged.
Blasting Limits	A maximum of 2 blasts a day and up to 9 blasts a week (averaged over a calendar year), can be carried out at the Moolarben Coal Complex.		Unchanged.
	Blasting can be carried out on site between 9.00 am and 5.00 pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays, or at any other time without the written approval of the Secretary.		Unchanged.
Coal Extraction Limits	Up to 9 Mtpa of run-of-mine (ROM) coal can be extracted from the open cut mining operations in calendar years 2015 and 2016, and 8 Mtpa thereafter, from Stage 1.	Up to 12 Mtpa of ROM coal can be extracted from the open cut mining operations in any calendar year from Stage 2.	Unchanged.
	Up to 4 Mtpa (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	Up to 13 Mt (total) of ROM coal from the Moolarben Coal Complex can be processed in any calendar year from Stages 1 and 2.		Unchanged.
	All coal is to be transported from the site by rail.	The Proponent shall ensure that all coal extracted from the site is sent to the Moolarben Stage 1 mine surface infrastructure area for processing and/or transport to market.	Unchanged.
General Layout	The general layout is shown in Appendix 2A of Project Approval (05_0117).	The general layout is shown in Appendix 2 of Project Approval (08_0135).	The revised general layout is shown on Figure 4 and includes the following changes: <ul style="list-style-type: none"> Revised Stage 2 Haul Road between the Stage 1 infrastructure and OC4. Revised final landform in OC1 (including backfilling of the northern final void to approximately pre-mining elevations).
Biodiversity Offset Strategy	The Biodiversity Offset Strategy is shown conceptually in Appendix 8 of Project Approval (05_0117).	The Biodiversity Offset Strategy is shown conceptually in Appendix 7 of Project Approval (08_0135).	No change required.
Northern Section of the Approved Stage 2 Haul Road	N/A	Additional archaeological survey work is to be carried out prior to carrying out the development.	The approved Stage 2 Haul Road route is being avoided and therefore the additional archaeological survey is no longer required. Archaeological survey of the south-west haul road has been conducted as described in Section 4.7.
Ulan-Wollar Road Site Access	N/A	The site access intersection off Ulan-Wollar Road is to be designed, constructed, and maintained to the satisfaction of Mid-Western Regional Council (MWRC).	Unchanged.

Table 1 (Continued)
Summary Comparison of Approved and Modified Moolarben Coal Project

Relevant Approval Component	Moolarben Coal Project		Moolarben Coal Project (including the OC4 South-West Modification)
	Stage 1 Project Approval (05_0117)	Stage 2 Project Approval (08_0135)	
Water Management Design and Objectives	Design, install and maintain the dams generally in accordance with the series <i>Managing Urban Stormwater: Soils and Construction – Volume 1 and Volume 2E Mines and Quarries</i> .		Unchanged. A change to the general location of some of the sediment dams would be required.
	Maximise as far as reasonable and feasible the diversion of clean water around disturbed areas on site.		Unchanged. A change to the general location of some of the up-catchment water diversions would be required.
	Mine water storage infrastructure is designed to store a 50 year average recurrence interval 72 hour storm event.	Mine water storage infrastructure is designed to store a 100 year average recurrence interval 72 hour storm event.	Water management objectives remain unchanged.
	On-site storages (including tailings dams, mine infrastructure dams, groundwater storage and treatment dams), and the Ulan Seam sub-crop line of the most northerly final void are suitably lined to comply with a permeability standard of less than 1×10^{-9} metres per second (m/s).	On-site storages (including tailings dams, mine infrastructure dams, groundwater storage and treatment dams) are suitably lined to comply with a permeability standard of less than 1×10^{-9} m/s.	The requirement to line the Ulan Seam sub-crop line of the most northerly final void in OC1 would be made redundant as it would be backfilled to approximately pre-mining elevations (Figure 4). Other water management objectives for tailings dams, mine infrastructure dams, groundwater storage and treatment dams remain unchanged.

As shown in Table 1, the OC4 South-West Modification **does not** involve any change to the Moolarben Coal Project (Stages 1 and 2) for the following relevant approval components:

- operational mine life;
- hours of operation;
- blasting limits;
- coal extraction limits;
- coal processing, production and transport limits;
- Biodiversity Offset Strategy;
- coal conveyors between OC4 and Stage 1 ROM coal facility;
- number of full-time employees; or
- Ulan-Wollar Road site access.

A detailed description of the proposed OC4 South-West Modification is provided in Section 3.

Section 4 describes the potential environmental impacts of the OC4 South-West Modification and discusses how existing requirements in environmental management and monitoring programs at the Moolarben Coal Complex would be applied to manage potential environmental impacts.

1.2.1 Project Justification and Consideration of Alternatives

OC4 South-West Haul Route

Justification

The approved haul road (Figure 4) was included in the 2009 Stage 2 Environmental Assessment and 2012 Stage 2 PPR. The purpose of the haul road was to transport ROM coal from OC4 to Stage 1 infrastructure (e.g. CHPP area) (Figure 4).

The Moolarben Coal Complex mine layout has changed since the approved haul road was proposed. In particular, approved Stage 1 mining operations have progressed in OC1.

Recent review of the mine sequence and infrastructure layout has identified it would be more efficient to relocate the haul road from OC4 to the south-west (i.e. the OC4 south-west haul road). This would enable the use of established haul roads in OC1 to transport ROM coal from OC4 to the Stage 1 infrastructure and transport waste rock from OC4 to OC1 (e.g. as part of backfill of OC1 final void).

In comparison to the approved haul road location, the OC4 south-west haul road would involve:

- a shorter, more direct haul road, resulting in lower construction and operating costs;
- less disturbance (i.e. net reduction of approximately 13.4 hectares [ha]);
- reduced water management and sediment control requirements, as runoff from the OC4 south-west haul road catchment would report to water storages in either OC1 or OC4, whereas the approved haul road requires dedicated water management structure to prevent runoff from disturbed areas entering Murragamba Creek; and
- removal of the requirement for supporting administration facilities in the OC4 area associated with the temporary mine infrastructure area.

Based on the above, the OC4 south-west haul road would result in environmental and operational benefits in comparison to the approved haul road location.

Consideration of Alternatives

Several alternative haul road options were considered by MCO. The relative costs and environmental benefits of each option were considered and refinements made to the proposed south-west haul road route to minimise environmental impacts and capital and operating costs.

In comparison to these other alternative routes, the OC4 south-west haul road would result in:

- reduced potential noise impacts on Cooks Gap residences (compared to alternative options considered that were located further to the west);
- avoidance of impacts to Aboriginal cultural heritage sites; and
- reduced haul distance between OC1 and OC4 (e.g. resulting in lower potential dust and noise emissions).

Backfilling OC1 Final Void

Justification

Two final voids are approved in OC1. The northernmost of these voids was proposed to provide access to the Stage 1 UG4 underground mining area (Figure 4).

Following approval of Stage 2, mining in UG4 is not proposed to commence until mining in the Stage 2 UG1 underground mining area is completed. The preferred access to UG4 is now from UG1 (note that approval for access to UG4 via UG1 would be sought as part of a separate EA and approval application).

Therefore, the northern OC1 final void is no longer required to provide access to UG4, and would be backfilled with waste rock during mining operations to approximately pre-mining elevations, providing additional in-pit waste rock emplacement storage for the open cut operations.

Backfill of the OC1 final void would result in the following environmental benefits:

- one less void in the final landform;
- reduction in catchment excision (following rehabilitation); and
- improved compatibility with surrounding land-uses in the long-term.

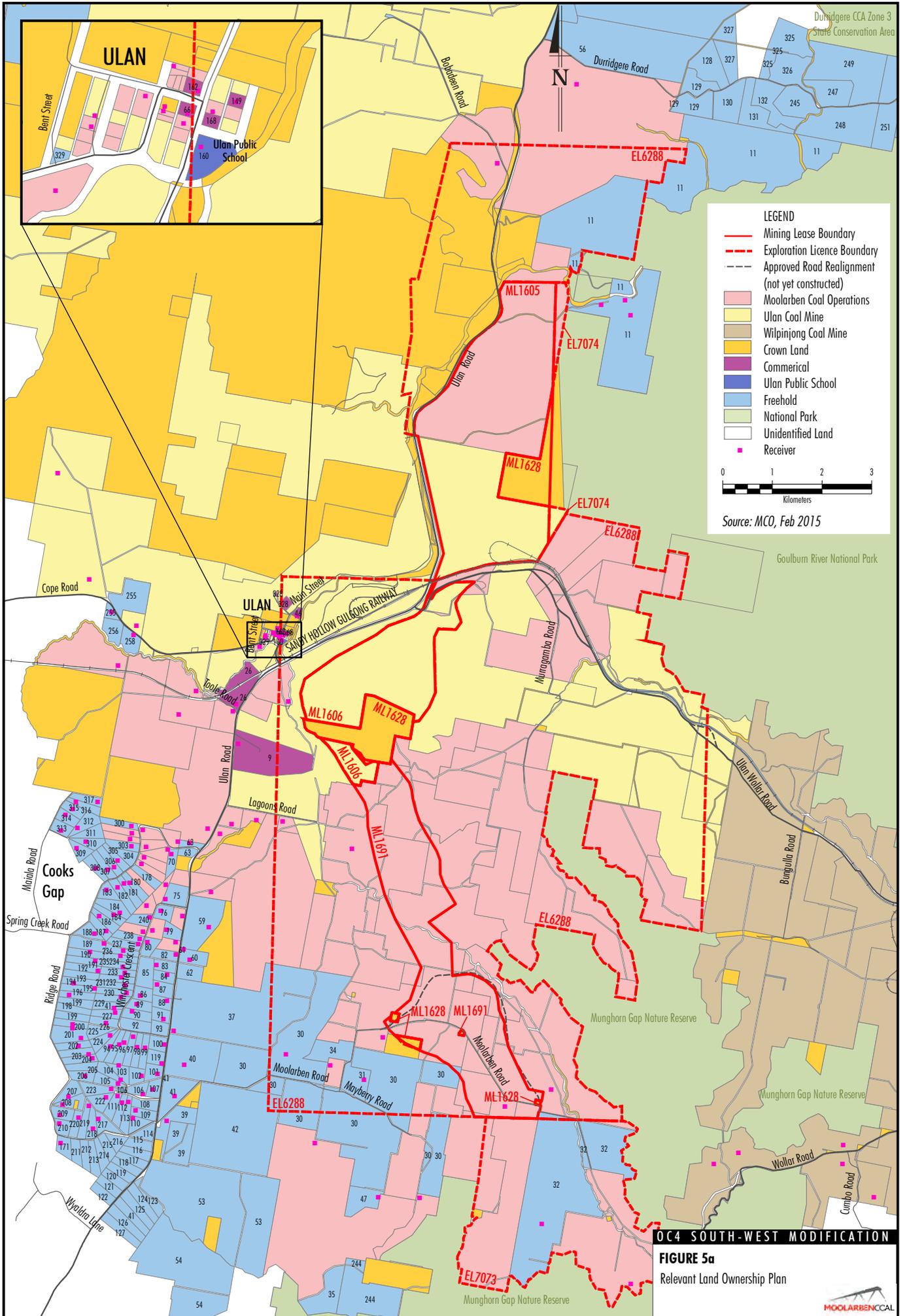
1.3 SITE LOCATION AND TENURE

The Moolarben Coal Complex is located within ML 1605, ML 1606, ML 1628, ML 1691 and Mining Lease Application (MLA) Area 458 and within Exploration Licence (EL) 6288 and EL 7074.

The Project Application Areas and the real property descriptions are provided in Appendix 1 of the Stage 1 and 2 Project Approvals, which are provided as Attachments 1 and 2 to this EA.

Relevant land ownership information within the immediate vicinity of the Moolarben Coal Complex is provided on Figures 5a and 5b.

The Moolarben Coal Complex is located within the Mid-Western Regional Local Government Area (LGA).



OC4 SOUTH-WEST MODIFICATION

FIGURE 5a
Relevant Land Ownership Plan



Ref No	Landholder	Ref No	Landholder	Ref No	Landholder
9	Orica Australia Pty Limited	112	MJ & LM Croft	215	SG & PM Green
11	JE Mullins & CD Imrie	113	CPG Ratcliff	216	G Holland & FA Handicott
26	Forty North Pty Limited	114	TF & K Holland	217	RP & JL Patterson
30	RB Cox	115	AK & BH Ouinn	218	GF & GEL Soady
31	MB Cox	116	DJ & SM Reid	219	T & S Riger
32	DJ & JG Stokes	117	JM Dick	220	SJ Rusten & NJ Smith
34	J Asztalos	118	A Scott	222	BJ Purtell
35	PR Johnson & MS & GJ Thompson & PH & FH Debreczeny	119	PJ Kearns	223	EW Palmer & JM Stewart
37	J Szymkarczuk	120	PS & DR Ord	224	RS & PCC Dupond
39	RM & DJ Sprigg	121	EJ Cullen	225	G & RF Doualetas
40	JM Devenish	122	WF Wirth	226	LAA & FC Muscat
41	PP Libertis	123	ND Sullivan	227	WP & JA Hughes
42	C & L Schmidt	124	WJ & HE Bailey	229	JJ & BA Lowe
46	North Eastern Wiradjuri Wilpinjong Community Fund Limited	125	DB McBride	230	DA Hoole & DT Rawlinson
47	SF & MR Andrews	126	MP Julian	231	T Morrison & SM Benny
53	WD & MS Bryant	127	BKT & SA Bracken	232	L & JA Hoaring
54	MA & C Harris	128	AW Sims	233	K & D Boal
56	MJ & V Cundy	129	M Yelds	234	D & L Gaw
59	G & GM Szymkarczuk	130	GP McEwen	235	LM & RS Wilson
60	CL Rayner & DM Munday	131	GR & RA King	236	RG & CA Donovan
61	MA Miller	132	N Atkins	237	A Puskaric
62	R Menchin	149	Mid-Western Regional Council	238	B Powell
63	BF & B Whiticker	151	AI Cunningham (Land entrusted to Catholic Church)	240	GJ & DM Hartley
66	Rostherne Pty Limited	160	Minister For Education And Training	244	JT & YR Jones
70	DJ & A Coventry	162	DM Harrison	245	MP & KLE Cresham
75	P Ban	168	PJL Constructions Pty Limited	247	J & K Batshon
76	SR & PC Carbone	171	AD & SA McGregor	248	G Boustani
79	PTJ & SE Nagle	178	PR Stone	249	CJ & JJ Eldridge
80	W & D Sebelic	180	CD & LL Barrett	251	NF Potter & CE Selley
82	SC Hungerford & MC Clemens	181	SM Forster	255	HJ & H Schmitz
83	CF & CR Wall	182	J Dutoitcook	256	RC Campbell
84	DS Sebelic	183	R & EA Steines	258	PM & CD Elias
85	J & Z Nikolovski	184	LA Stevenson	300	CM Collins & CY Marshall
86	NW Harris	186	RW & IJ Adamson	303	HJ Ungaro
87	BJ & K Howe	187	BT & KM Feeney	304	G Balajan
88	BC Meyers	188	KR & T Fielding	305	L Barisic & M Aul
89	MV & HM Glover & E & BJ Tomlinson	189	M, M, D & A Gaggin & J, A, P & R Hyde	306	E Armstrong
90	SA Powell	190	T & LK Sahyoun	307	M Chant & NK Young
91	HM Graham	191	BW & TS Lasham	308	NA Dower
92	VA Pulicino & J & S & G Bonnici	192	D Williams	309	GS Maher
93	F & M Fenech	193	DJ Maloney	310	KI Death
94	LK Mittmayer	194	PM & K Potts	311	BJ & LC Williamson
95	BJ Wrihington	195	R Cottam	312	MS & JJ Ioannou
96	D Lazicic	196	F Saxberg & M Weir	313	NJ & BDE Pracy
97	DJ & MD Smith	198	GR & ME Metcalfe	314	SL Ford
98	ME & JJ Piper	199	PGG & I Nielsen	315	WJ Richards & BJ Uzelac
99	DE Jenner & WB Jensen	200	VK Grimshaw	316	CR Vassel & CM Williams
100	A Kapista	201	KR & GM Towerton	317	RJ Hore & V Bingham
101	RD & DMZ Hull	202	H & VF Butler	325	S & T Fevale
102	KA Roberts	203	DJ Miller	326	AW & LM Murray
103	SB Burnett & SL Grant	204	RB & JE Donnan	327	CA Tanner
104	RA & LA Deeben	205	DW Sparrow & M Tallan	328	Essential Energy
105	DJ & N Katsikaris	206	CA Marshall & R Vella	329	Tuck-Lee
106	TB & JH Reid	207	AA & DM Smith		
107	ZJ & M & AA Raso	208	SA & CR Hasaart		
108	R Varga	209	F Mawson		
109	DA Evans	210	JM & AM Tebutt		
110	JT Thompson & HT Evans	211	SA McGregor & WJ Gray		
111	GJ & NJ McEwan	212	E & M Lepik		
		213	D & J Parsonage		
		214	RK & EG O'Neil		

Source: MCO, Feb 2015

OC4 SOUTH-WEST MODIFICATION

FIGURE 5b
Relevant Landholder List



1.4 CONSULTATION

MCO consults with relevant State Government agencies on a regular basis in relation to the approved Moolarben Coal Complex.

Consultation has been conducted with key State Government agencies, local councils, the local community and Aboriginal stakeholders during the preparation of this EA. A summary of this consultation to date is provided below. Consultation would continue during the public exhibition of this EA and the assessment of the OC4 South-West Modification.

Department of Planning & Environment

Briefings with the DP&E were conducted in May 2014 and February 2015 to provide an overview of the proposed OC4 South-West Modification and the proposed scope of environmental assessment.

Regulatory Agencies and Local Council

MCO sent briefing letters (dated April 2015) providing an overview description of the OC4 South-West Modification and proposed scope of environmental assessment to the following regulatory agencies:

- Office of Environment and Heritage (OEH);
- Environment Protection Authority (EPA);
- Department of Primary Industries – NSW Office of Water;
- NSW Division of Resource and Energy (within Department of Trade, Investment, Regional Infrastructure and Services); and
- Mid-Western Regional Council (MWRC).

Local Community

The Community Consultative Committee was established for the Moolarben Coal Complex in accordance with Project Approval (05_0117). The operation of the Community Consultative Committee was updated in March 2015 in accordance with Project Approval (08_0135).

The Community Consultative Committee provides a mechanism for ongoing communication between MCO and the local community. MCO sent a briefing letter (dated April 2015) to the Community Consultative Committee providing an overview description of the OC4 South-West Modification and proposed scope of environmental assessment.

Other Mines

MCO works closely with the operations of Ulan Mine Complex and Wilpinjong Coal Mine managing cumulative impacts associated with mining operations. The mining operations share their extensive environmental databases through a formal data sharing agreement to support relevant EAs or incident investigations and co-operate in the implementation of joint programs such as the Ulan Road Strategy.

Both UCML and WCPL were consulted in relation to the OC4 South-West Modification in April 2015.

1.4.1 Public Consultation

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

An environmental enquiry phone line (1800 556 484) allows members of the public to contact MCO with enquiries or complaints.

A copy of this EA would be made available on the Moolarben Coal website.

1.5 STRUCTURE OF THE EA

This EA is structured as follows:

Section 1	Provides an overview of the existing/approved Moolarben Coal Complex, the OC4 South-West Modification and a summary of the consultation undertaken in relation to the OC4 South-West Modification.
Section 2	Provides a description of the existing/approved Moolarben Coal Complex.
Section 3	Provides a description of the OC4 South-West Modification.
Section 4	Provides a review of the existing environment, assesses the potential impacts associated with the OC4 South-West Modification and describes the existing MCO environmental management systems and measures in place to manage and monitor any potential impacts.

Section 5 Provides the planning framework and statutory context.

Section 6 References.

Attachments 1 to 3 and Appendices A to E provide supporting information as follows:

Attachment 1 Stage 1 Project Approval (05_0117)

Attachment 2 Stage 2 Project Approval (08_0135)

Attachment 3 Site Verification Certificate

Appendix A Noise Assessment

Appendix B Air Quality Assessment

Appendix C Flora and Fauna Impact Assessment

Appendix D Surface Water Assessment Review

Appendix E Aboriginal Cultural Heritage Assessment

2 SUMMARY DESCRIPTION OF EXISTING/APPROVED MOOLARBEN COAL COMPLEX

2.1 APPROVALS HISTORY

Moolarben Coal Project (Stage 1)

The Moolarben Coal Project Stage 1 was approved under Part 3A of the EP&A Act by the NSW Minister for Planning on 6 September 2007 (Project Approval [05_0117]). Ten modifications to Project Approval (05_0117) have since been approved as summarised below:

- **MOD 1:** In August 2008, MCM submitted an application to modify Project Approval (05_0117) under section 75W of the EP&A Act to reconfigure the Coal Preparation Plant, emergency tailings dam, transfer stations and conveyors, rail loop, coal stockpiles, UG4 conveyor, groundwater treatment ponds and a water storage dam as well as amend the wording of three clauses in the Project Approval. The modification was approved by the NSW Minister for Planning on 26 November 2008.
- **MOD 2:** In December 2008, MCM submitted an application to modify Project Approval (05_0117) under section 75W of the EP&A Act to permit minor construction activities to commence at the site prior to completion of the main mine site access intersection off Ulan-Cassilis Road. The modification was approved by the NSW Minister for Planning on 18 December 2008.
- **MOD 3:** In February 2009, MCM submitted an application to modify Project Approval (05_0117) under section 75W of the EP&A Act to allow for Stage 1 infrastructure to receive, handle and process Stage 2 coal for the life of Stage 2 (to 31 December 2038). An additional void in OC1 was also proposed to allow access to UG4. The modification was approved by the NSW Planning and Assessment Commission (as a delegate of the NSW Minister for Planning) on 30 January 2015.
- **MOD 4:** In April 2009, MCM submitted an application to modify Project Approval (05_0117) under section 75W of the EP&A Act to change the configuration of the rail loop from a figure-8 to a balloon loop layout. The modification was approved by the NSW Minister for Planning on 30 June 2009.
- **MOD 5:** In July 2009, MCM submitted an application to modify Project Approval (05_0117) under section 75W of the EP&A Act to relocate the ROM coal facility and develop a water sharing pipeline from the Ulan Mine Complex. The modification was approved by the NSW Minister for Planning on 5 October 2009.
- **MOD 6:** In December 2009, MCM submitted an application to modify Project Approval (05_0117) under section 75W of the EP&A Act to relocate the rejects bin to a preferred location about 250 m north-west of its previously approved location. The modification was approved by the NSW Minister for Planning on 11 January 2010.
- **MOD 7:** In March 2010, MCM submitted an application to modify Project Approval (05_0117) under section 75W of the EP&A Act for the development and operation of a water supply and dewatering borefield and associated ancillary facilities. The modification was approved by the NSW Minister for Planning on 3 February 2011.
- **MOD 8:** In April 2010, MCM submitted an application to modify Project Approval (05_0117) under section 75W of the EP&A Act to establish and operate a ROM coal stockpile adjacent to the ROM coal dump hopper. The modification was approved by the NSW Minister for Planning on 27 May 2010.
- **MOD 9:** In May 2013, MCM submitted an application to modify Project Approval (05_0117) under section 75W of the EP&A Act to increase the extents of the approved Stage 1 open cuts. The modification was approved by the NSW Planning and Assessment Commission (as a delegate of the NSW Minister for Planning) on 16 June 2014.
- **MOD 10:** In February 2015, MCM submitted an application to modify Project Approval (05_0117) under section 75W of the EP&A Act to increase the Stage 1 ROM coal production rate from 8 to 9 Mtpa for calendar years 2015 and 2016. The modification was approved by the NSW Minister for Planning on 17 April 2015.

Moolarben Coal Project (Stage 2)

The Stage 2 EA was originally prepared by MCM under Part 3A of the EP&A Act. MCM made a number of changes to the proposed layout and design of the Moolarben Coal Project Stage 2 in order to address issues raised by the DP&I (now DP&E) 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 were described in the Stage 2 PPR which was exhibited from 31 January 2012 to 24 February 2012.

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

2.2 CONSTRUCTION

The majority of Moolarben Coal Project Stage 1 facilities were constructed in 2009, including the office administration complex, ROM pad, Coal Handling and Preparation Plant (CHPP), rail spur, rail loop and rail loading infrastructure. Additional infrastructure construction activities have occurred as required over the life of the mine (Figure 3).

Construction of Moolarben Coal Project Stage 2 facilities is yet to commence.

2.3 MINING OPERATIONS

Four open cut pits (OC1, OC2, OC3 and OC4) are approved at the Moolarben Coal Complex. MCM is currently approved to mine up to 9 Mtpa of ROM coal from OC1, OC2 and OC3 combined in calendar years 2015 and 2016, and 8 Mtpa thereafter (i.e. Stage 1), and up to 12 Mtpa of ROM coal from OC4 (i.e. Stage 2) using conventional open cut coal mining methods. A combined total of 13 Mtpa of ROM coal from Stages 1 and 2 is approved to be processed (i.e. the maximum ROM coal extraction rates from Stages 1 and 2 do not occur simultaneously).

MCO is currently conducting open pit mining at the Moolarben Coal Complex in the OC1 and OC2 pits (Figure 3).

Three underground mining areas (UG1, UG2 and UG4) targeting the Ulan Seam are approved to be mined at a combined rate of up to 4 Mtpa. Coal would be recovered using conventional longwall mining and transferred to surface by conveyors. Highwall entries for UG1 and UG4 mines are approved in the OC1 highwall but have not yet been constructed. Access to UG2 would be via UG1.

Mining is approved 24 hours per day, seven days per week.

2.4 COAL HANDLING AND PREPARATION

The Moolarben Coal Complex produces washed coal products from the open cut operations and would produce unwashed coal products from the underground operations. The coal handling and preparation infrastructure has been designed to accommodate the processing of raw coal and the handling of washed product coal. The coal handling and preparation infrastructure would be upgraded once underground operations commence to handle raw (bypass) coal.

ROM coal from the open cut operations is transferred to the Stage 1 ROM coal facility or ROM stockpile by internal haul roads. ROM coal from the underground operations would be transferred to the Stage 1 ROM coal facility or ROM stockpile by conveyor and internal haul roads.

Coal at the Stage 1 ROM coal facility is conveyed to the Coal Preparation Plant. Crushing and sizing facilities are included at the Stage 1 ROM coal facility and the Coal Preparation Plant. The Moolarben Coal Complex is approved to handle up to 17 Mtpa of ROM coal.

The CHPP area includes an existing 400,000 tonne (t) open cut (washed) product coal stockpile. An approved 200,000 t underground (unwashed) product coal stockpile is yet to be constructed.

Approved conveyors connecting the Stage 1 ROM coal facility to the OC4 pit are yet to be constructed (Figure 2). Once constructed, these conveyors would allow transfer of OC4 ROM coal to the Stage 1 ROM coal facility and Coal Preparation Plant rejects from the Stage 1 ROM coal facility to OC4.

The CHPP operates up to 24 hours per day, seven days per week.

2.5 PRODUCT COAL TRANSPORT

The Moolarben Coal Complex is approved to export up to 13 million tonnes (Mt) of product coal from site each year. Product coal is loaded onto trains using a dedicated rail loop and rail load out facility, and transported to the Port of Newcastle.

Product coal is loaded onto trains 24 hours per day, seven days per week. Trains arrive and depart the Moolarben Coal Complex 24 hours per day, seven days per week.

The approved Moolarben Coal Complex requires the dispatch of up to five product coal trains per day.

2.6 WASTE ROCK MANAGEMENT

With the exception of the initial boxcut development, overburden and interburden or partings material is progressively placed back in-pit once the coal has been mined.

A combination of temporary and permanent out-of-pit waste rock emplacements are located adjacent to the open cut mining operations (Figure 2).

2.7 DRILL AND BLAST

Overburden and coal material at the Moolarben Coal Complex is blasted where necessary to achieve optimal fragmentation while complying with relevant impact assessment criteria of Project Approval (05_0117) and Project Approval (08_0135).

Blasting is approved to occur between the hours of 9.00 am and 5.00 pm, six days per week (excluding public holidays or Sundays).

The approved blast frequency is nine blasts per week on average over any 12 month period with a maximum of two blasts on any day. These restrictions do not apply to blasts that generate ground vibration of 0.5 mm/s or less at any privately-owned land, blasts misfires or blasts required to ensure the safety of the mine or its workers.

2.8 COAL REJECT MANAGEMENT

The Moolarben Coal Complex generates coarse reject and tailings in the coal preparation process.

Reject and tailings are conveyed from the CHPP to the Stage 1 ROM coal facility and then hauled or conveyed to an open pit void for emplacement.

An emergency tailings storage dam has been constructed adjacent to the Coal Preparation Plant to cater for emergency tailings storage (if required). The dam is also used for runoff and dirty water collection. Tailings in the emergency storage dam are periodically removed and transported for disposal within the open cuts.

2.9 GENERAL INFRASTRUCTURE

2.9.1 Site Access and Infrastructure Areas

The main infrastructure areas approved at the Moolarben Coal Complex include the CHPP area and rail loading facilities, Stage 1 mine infrastructure area, Stage 2 mine infrastructure area, Stage 1 ROM coal facility and Stage 2 ROM coal facility. Access to these areas is via Ulan Road or Ulan-Wollar Road (Figure 2).

The Moolarben Coal Complex CHPP area and rail loading facilities comprise the Coal Preparation Plant, rail loop, rail loadout, conveyors, hoppers, coal stockpiles, mine water dams, fuel store, workshop, sump, B-double turning loop, office, bathhouse, stores, main substation, hardstand areas, crib shed, car park and a number of service facilities (i.e. potable water, sewerage, electricity, fire services and hydrocarbon management) (Figure 3).

The Stage 1 open cut mine infrastructure area includes a workshop, bathhouse, offices, fuel store, light and heavy vehicle parking and other minor infrastructure and supporting facilities (Figures 2 and 3). An approved underground Mine Infrastructure Area in the OC1 void adjacent to the UG1 entry (Figure 2), which would comprise offices, bath house, substation, sump and ventilation fan (among other ancillary facilities), is yet to be constructed.

The Stage 2 open cut mine infrastructure area would include offices, bathhouses, workshops, final storages, explosive facility and magazine storage. Temporary facilities would be established in advance of mining in OC4.

The Stage 1 and Stage 2 infrastructure would be integrated where possible to allow services and facilities to be shared between Stage 1 and Stage 2 operations.

The Stage 1 ROM coal facility includes sizing stations, crushers, conveyors, dump hoppers and other associated infrastructure (Figure 2).

The Stage 2 mine infrastructure area and ROM coal facility have not yet been constructed.

Minor disturbance associated with approved ancillary works would continue to be developed outside of open cut pit and infrastructure disturbance boundaries, including (but not limited to) firebreaks, water diversion structures, minor contour banks, tracks, pipelines, explosives/magazine storage facilities, power supply for rope shovel, powerlines, fences and sediment and erosion control structures as required.

2.9.2 Haul Roads

All coal is hauled on internal roads or conveyed, and all product coal is transported by rail. All waste rock is hauled on internal haul roads. Internal haul roads are progressively constructed between the open cut operations, mine waste rock emplacements and ROM coal stockpiles within approved development areas as required.

Haul roads are regularly watered to minimise dust generation.

2.9.3 Electricity Supply and Distribution

Power is supplied to the Moolarben Coal Complex at 66 kilovolt (kV) from the existing Essential Energy Ulan Switchyard. The 66 kV powerline runs adjacent to the road and rail corridor to the CHPP area where a 66/11 kV substation is located. Power is distributed around the site by overhead cable or underground cable where necessary.

MCM has approval to realign the existing 66 kV powerline along the old Ulan-Wollar Road. This realignment has not yet been undertaken.

2.9.4 Potable Water

Potable water for all facilities is sourced from a combination of rainwater captured from roofs of facilities, suitably treated bore water or imported from external sources. The potable water supply reticulation system services the appropriate areas around the site.

2.9.5 Ancillary Infrastructure

The Moolarben Coal Complex is supported by a range of ancillary infrastructure that are periodically relocated, modified or expanded as mining operations progress. Such components include water management features (e.g. bores, pipelines, pumps, drains, contour banks, diversion channels and dams), environmental monitoring equipment, electricity supply, access tracks, equipment such as communication towers, in-pit facilities including bulk fuel handling and personnel crib huts/ablution facilities (among other things).

2.10 WATER MANAGEMENT

The water management strategy for the Moolarben Coal Complex is based on the containment and re-use of mine water as well as the control of sediment that may be potentially carried with runoff from disturbed areas such as the waste rock emplacements or areas cleared in advance of mining.

The existing water management system at the Moolarben Coal Complex comprises the following:

- water management storages;
- diversion of runoff from catchment areas upslope of the mine disturbance area;
- runoff control on disturbed and rehabilitated areas at the mine;
- runoff control on infrastructure areas;
- sedimentation control;
- water transfer pumps and piping;
- open pit dewatering; and
- sewage treatment and disposal of effluent.

Water is required to operate the Coal Preparation Plant, for washdown of mobile equipment, dust suppression on haul roads and for dust emission control sprays in the ROM and product coal stockpile areas. Water would also be used in the underground mines once developed (e.g. dust suppression). The main water sources for the operation are:

- recovery from coal processing;
- groundwater inflows into the open cut voids;
- catchment runoff (from disturbed areas) and infiltration;
- incidental rainfall over water storages;
- water sharing arrangements with UCML; and
- groundwater extraction from licensed bores.

If stored water volumes are excessive, MCO can release water off-site in accordance with the requirements of Environment Protection Licence (EPL) 12932, subject to stringent release criteria and conditions being met.

The water balance of the system fluctuates with climatic conditions and as the extent of the mining operations changes over time. The water management system is progressively developed as water management requirements evolve in accordance with the approved Water Management Plan.

2.11 WASTE MANAGEMENT

MCO operates the Moolarben Coal Complex waste management system in accordance with the Waste Management Plan (MCO, 2013).

MCO waste disposal systems are designed to minimise the amount of waste generated by the mine that goes to landfill.

Waste generated at the Moolarben Coal Complex includes general rubbish, sewage, scrap timber; batteries, tyres, waste oil and filters and other hydrocarbons, empty drums and scrap metals.

Operation of the mining fleet generates waste hydrocarbons such as oils, greases and hydraulic fluids. These waste hydrocarbons are placed in suitable containers and removed from the site for disposal at either an EPA-approved hydrocarbon waste site or a recycling depot.

Treated effluent is discharged in accordance with EPL 12932.

Suppliers are encouraged to supply recyclable products and products that have the capacity for reuse in accordance with the specified 70% waste reduction target.

2.12 MANAGEMENT OF DANGEROUS GOODS

The transportation, handling and storage of all dangerous goods at the Moolarben Coal Complex is conducted in accordance with *Storage and Handling of Dangerous Goods – Code of Practice 2005* (Workcover, 2005).

2.12.1 Hydrocarbon Storages

A fuel and lubrication store contains above-ground bunded diesel-storage tanks in accordance with the requirements of Australian Standard (AS) 1940: *The Storage and Handling of Flammable and Combustible Liquids*.

Runoff water from mobile equipment service areas is directed to an interceptor trap to extract hydrocarbons, prior to it being discharged into the mine water management system. The trap is routinely emptied of hydrocarbons by a licensed contractor.

2.12.2 Explosives Storage

Explosives required for the Moolarben Coal Complex include initiating products and detonators, ammonium nitrate fuel oil and emulsion explosives.

Explosives on-site are stored, transported and used in accordance with the requirements of AS 2187.2:2006 *Explosives – Storage, Transport and Use – Use of Explosives*.

2.13 WORKFORCE

At full development, the Moolarben Coal Complex requires an average workforce of approximately 439 people. Stage 2 would require a construction workforce of 220 workers.

2.14 REHABILITATION AND FINAL LANDFORM

The Mining Operations Plan (MOP) for the Moolarben Coal Complex describes site activities and the progress toward environmental and rehabilitation outcomes required under the ML conditions and the Project Approvals (05_0117 and 08_0135).

Rehabilitation of the Moolarben Coal Complex Stage 1 has been undertaken in accordance with the Rehabilitation and Offset Management Plan¹. To December 2014, approximately 157 ha of the backfilled OC1 pit has been rehabilitated in accordance with the Rehabilitation and Offset Management Plan. Ongoing monitoring and maintenance is undertaken in accordance with the Rehabilitation and Offset Management Plan.

Rehabilitation of the Moolarben Coal Complex Stage 2 would be undertaken in accordance with a Rehabilitation Management Plan to be prepared for the Moolarben Coal Complex incorporating Stage 2. The proposed Stage 2 rehabilitation strategy is outlined in Appendix K of the Stage 2 PPR.

¹ On 30 January 2015, Stage 2 and Stage 1 Modification 3 of the Moolarben Coal Project were approved by the Planning Assessment Commission (as a delegate of the NSW Minister for Planning). To address the requirements of the Project Approvals (Attachments 1 and 2), MCO is preparing a complex-wide Biodiversity Management Plan and Rehabilitation Management Plan which will supersede the Landscape Management Plan (including the Rehabilitation and Offset Management Plan).

2.14.1 Rehabilitation Objectives

Stage 1 Rehabilitation

The rehabilitation objectives for Stage 1 of the Moolarben Coal Project are described in the Rehabilitation and Offset Management Plan and are as follows:

- Create a safe, stable, adequately drained post-mining landform that is consistent with the local surrounding landscape within the operational area to minimise visual impacts.
- Rehabilitate the OC1 footprint using native vegetation to create Box Gum Woodlands and Sedimentary Ironbark Forests with stands of *Allocasuarina*.
- Revegetate lands adjoining the northern part of the OC2 area and haul road linkage with OC1 that are under the control of MCO, to enhance vegetation cover and connectivity.
- Enhance Grassy White Box Woodland on basalt soils, in close proximity to Carrs Gap, that are located within the Moolarben Coal Complex Stage 1 application area.
- Improve the ecological integrity of the aquatic habitats through revegetation using native species identified in the Rehabilitation Management Plan.
- Revegetate the riparian zone of the Moolarben Creek to the east of OC3 to improve stream health and enhance the Alluvial Apple Forest.
- Manage the riparian zone of the Bora Creek to improve stream health.
- Rehabilitate mined land to a comparable standard as the relative analogue sites and completion criteria.
- Minimise site access by vehicles which can result in the compaction of soil (which can reduce the infiltration of water into the soil and restrict root growth, and consequently reduce natural regeneration), the spread of weeds and disturbance to vegetation.
- Conduct works associated with UG4 in accordance with an approved Extraction Plan to minimise subsidence impacts on vegetation.
- Protect portions of the lands located above UG4 with an appropriate conservation mechanism for the long-term security of this ecosystem.
- Separate clean and dirty water across the Moolarben Coal Complex Stage 1 application area.
- Promote biodiversity through weed and feral animal control programs.

- Rehabilitate OC2 and OC3 footprints principally for agricultural outcomes.

The OC4 South-West Modification proposes to backfill the northern OC1 final void to approximately pre-mining elevations and revegetate with woodland species.

Stage 2 Rehabilitation

Rehabilitation of Stage 2 is described in the Stage 2 Moolarben Coal Project Rehabilitation Strategy (MCO, 2011). The specific rehabilitation objectives for Stage 2 are:

- Create a natural looking, stable and well drained post-mining landform that is visually consistent with surrounding areas.
- Create a self-sustaining and ecologically diverse post-mining landscape that is compatible with the conservation values of the adjacent Munghorn Gap Nature Reserve and Goulburn River National Park.
- Revegetate and enhance remnant vegetation on non-mine owned land that is under the control of MCO with endemic native species.
- Create wildlife corridors and habitat links, where feasible, between existing remnant vegetation in the Munghorn Gap Nature Reserve, Goulburn River National Park and other surrounding areas by increasing the continuity of woodland vegetation.
- Maintain the diversity and genetic resource of flora currently existing within the locality.
- Maintain and enhance habitat for native fauna.
- Realign and rehabilitate Murragamba and Eastern creeks to be hydraulically and geomorphologically stable and ecologically diverse.
- Rehabilitate degraded riparian areas along Wilpinjong Creek and along Murragamba and Eastern creeks downstream from mined areas within the Moolarben Coal Complex Stage 2 application area.
- Reinstate subsidiary surface drainage.
- Improve soil condition and native seed bank.
- Prevent soil erosion and sedimentation.
- Provide access for monitoring and adaptive management, control of exotic flora and fauna species and suppression of fires.
- Progress towards meeting closure and post-mining land use objectives (to be developed in consultation with stakeholders and described in a Mine Closure Plan) in a timely and cost effective manner.

2.14.2 Final Landform

The approved final landform for the Moolarben Coal Complex includes final voids in the south of OC3, east of OC4 and two voids in the OC1. The currently approved mine plan provides underground access to UG4 via the northern OC1 void and underground access to UG1 and UG2 via the southern OC1 void (Figure 2).

In accordance with Condition 32 of Schedule 3 of the Stage 1 Project Approval (05_0117) (Attachment 1), MCO is required to line the Ulan Seam outcrop in the northern OC1 final void with a low permeable material. The intention of this condition is to reduce the potential recirculation of stored water in the northern OC1 void through the Ulan Seam and into the underground workings.

2.14.3 Rehabilitation Monitoring

In accordance with the MOP and Rehabilitation and Offset Management Plan, MCO currently conducts annual Ecosystem Function Analysis (EFA) monitoring and reporting which comprises:

- Landscape Function Analysis;
- Landscape Organisation Index;
- Soil Surface Assessment (producing stability, infiltration and nutrient indices); and
- Vegetation Dynamics (for woodland areas).

The EFA is used to assess the progress of rehabilitation sites against relevant reference sites located outside the disturbance footprint and is used to assess whether rehabilitation areas are satisfying rehabilitation objectives and are on a trajectory toward self-sustainability. Rehabilitation monitoring results are reported in the Annual Review.

2.15 ENVIRONMENTAL MANAGEMENT AND MONITORING

Environmental management and monitoring at the Moolarben Coal Complex is conducted in accordance with a range of plans required by Project Approvals (05_0117 and 08_0135) and EPBC 2013/6926.

Following the approval of Stage 2 and Stage 1 Modification 3 of the Moolarben Coal Project, the following environmental management plans are required under the state and federal approvals for the Moolarben Coal Complex²:

- Environmental Management Strategy.
- Noise Management Plan.
- Blast Management Plan.
- Air Quality Management Plan.
- Water Management Plan (including Site Water Balance, Surface Water Management Plan and Groundwater Management Plan).
- Biodiversity Management Plan.
- Heritage Management Plan.
- Rehabilitation Management Plan.
- Extraction Plan.
- Greenhouse Gas Minimisation Plan.
- Vegetation Clearance Protocol and Landscape Management Plan.
- Biodiversity Offset Management Plan.

The Moolarben Coal Complex has an extensive environmental monitoring regime. Environmental monitoring locations are shown on Figure 6.

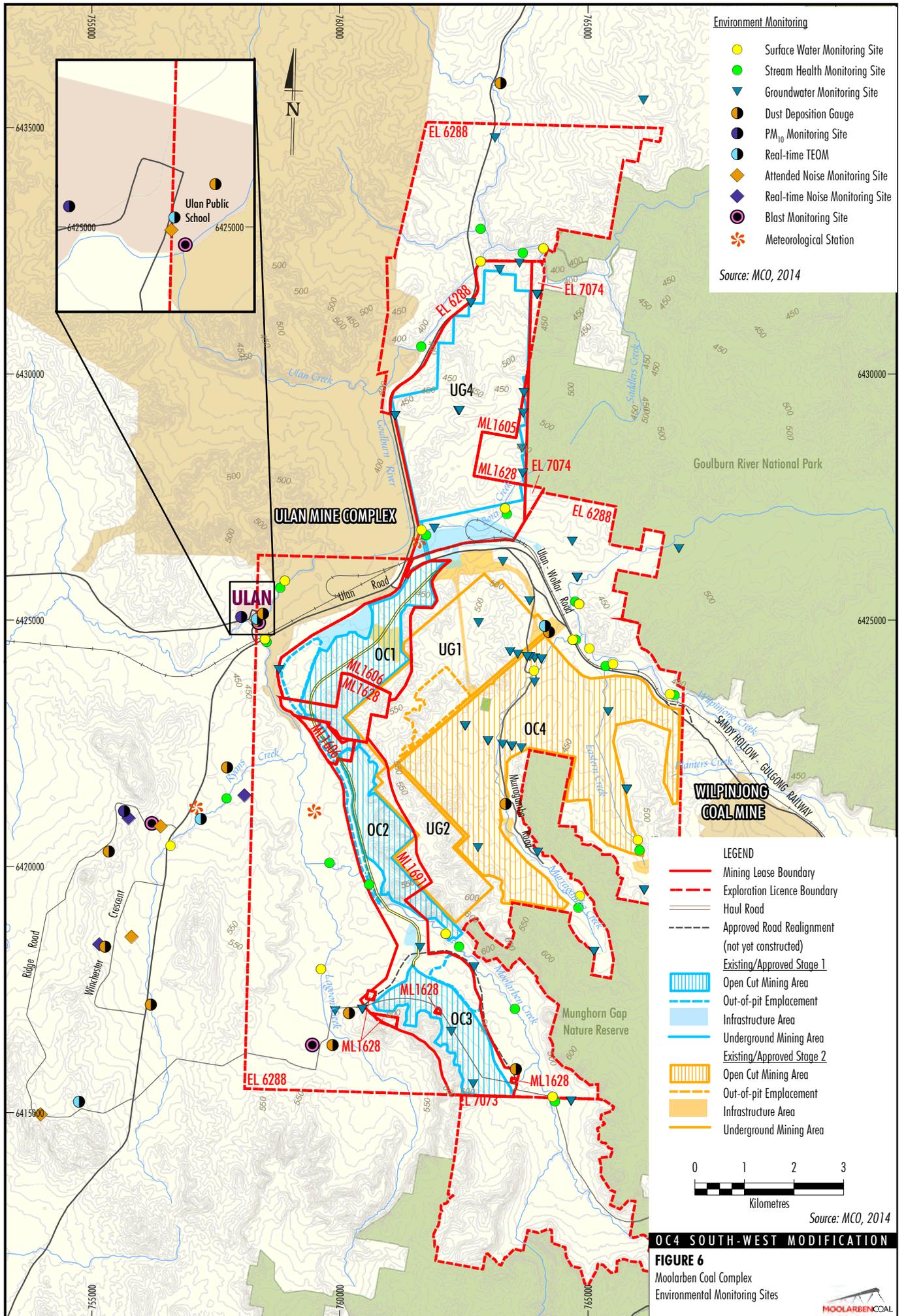
2.16 COMMUNITY CONTRIBUTIONS

MCO financial contributions to the MWRC are made in accordance with Moolarben Coal Complex Planning Agreements, Project Approval (05_0117) and Project Approval (08_0135).

UCML, WCPL, MCO and MWRC are also co-funding implementation of the Ulan Road Strategy that will result in significant upgrades to Ulan Road.

MCO also makes financial contributions to a number of non-Government and community organisations in the region. MCO financial contributions (in the form of sponsorships and donations) to various education, community development, health, environmental, arts, culture, and youth services in the region in the 2014 calendar year has totalled approximately \$215,000.

² On 30 January 2015, Stage 2 and Stage 1 Modification 3 of the Moolarben Coal Project were approved by the Planning Assessment Commission (as a delegate of the NSW Minister for Planning). To address the requirements of the Project Approvals (Attachments 1 and 2), MCO is preparing complex-wide environmental management plans.



Examples of recent financial contributions have included support for the following groups:

- Mudgee Readers Festival;
- Ulan Public School;
- Mudgee Rugby Club;
- Gulgong Historical Society;
- Mudgee Gymnastics;
- Gulgong Prince of Wales Eisteddfod;
- Ulan Public School;
- Rotary Club Of Rylstone – Kandos;
- Life Skills;
- Gulgong Heritage Festival Committee;
- Mudgee District Netball;
- Pioneer Auxiliary Ladies;
- Westpac Helicopter;
- Mudgee Rescue Volunteer Association;
- Mudgee Junior Rugby league;
- Riding for the disabled – Mudgee;
- Gulgong Rural Fire Brigade;
- Mudgee District Tennis Club;
- Mudgee High School;
- Mudgee Basketball Association;
- Gulgong District Pony Club;
- Mudgee Amateur Softball Association;
- Rylstone and Kandos volunteer search and rescue; and
- Mudgee Police.

2.17 COMPLAINTS

In accordance with the requirements of the Environmental Management Strategy, MCO records and responds to all complaints and provides a complaints register summary in the Annual Review each year.

In the 2012-2013 reporting period, a total of 120 complaints were received (MCO, 2013) from some 18 complainants with 55% of the 120 complaints coming from a single resident. The majority of complaints were related to noise impacts. The total number of complaints (120) was a significant reduction from the 2011-2012 reporting period which had a total of 359 complaints.

Mine-related complaints are managed in accordance with the Community Complaints Procedure as outlined in the Environmental Management Strategy.

3 DESCRIPTION OF THE PROPOSED MODIFICATION

Following a review of mine planning, MCO has identified opportunities to streamline the coordination and integration of Stage 2 mining activities with the existing Stage 1.

The OC4 South-West Modification includes the following key components:

- construction of the OC4 south-west haul road between OC4 and OC1 (and therefore the approved Stage 2 Haul Road would not need to be constructed) (Figure 4);
- adjustments to the site water management system to contain surface water runoff from the south-west haul road and diversion of upslope water;
- refinements to the early stages of mining and associated infrastructure layout at OC4 (wholly located within the approved surface disturbance footprint); and
- backfilling of the northern OC1 final void to approximately pre-mining elevations with waste rock from OC1 (Figure 4).

3.1 MINING OPERATIONS

There would be no change to the open cut mining method due to the OC4 South-West Modification. (Section 2.3).

There would be no change to the approved underground longwall mining method (Section 2.3) due to the OC4 South-West Modification.

Mining activities at the Moolarben Coal Complex would continue to occur 24 hours per day.

3.1.1 Mining Extent

The OC4 South-West Modification does not include any alteration to the approved extent of open cut or underground mining (Figure 4).

3.1.2 Mine Schedule

The OC4 South-West Modification would not change the currently approved mine life (i.e. to 2038).

There would be no increase to the currently approved maximum annual ROM coal production or waste rock extraction rates for the OC4 South-West Modification.

An indicative mine schedule for the Moolarben Coal Complex incorporating the OC4 South-West Modification is provided in Table 2.

Table 2
Indicative Mine Schedule

Year	Waste Rock (Mbcm)	Open Cut ROM Coal (Mtpa)	Underground ROM coal (Mtpa)
2015	42.4	9.0	0
2016	55.0	13.0	4.0
2017	52.6	13.0	4.0
2018	52.6	13.0	4.0
2019	52.4	13.0	4.0
2020 to 2038	55.0*	13.0*	4.0*

* Anticipated maximum production rate per annum.

3.1.3 OC4 South-West Haul Road

The OC4 South-West Modification would involve the construction of the south-west haul road between OC4 and OC1 (Figure 4). As a result, the approved Stage 2 Haul Road would not be needed and consequently would not be constructed (Figure 4).

Approximately 5.1 ha of surface disturbance would be required for the OC4 south-west haul road.

Removal of the approved Stage 2 Haul Road would result in the following environmental benefits:

- up to approximately 18.5 ha of approved surface disturbance being avoided associated with the Stage 2 Haul Road, and therefore, a total net reduction in surface disturbance of 13.4 ha; and
- improved water management and reduced risk of uncontrolled sediment discharge due to the reduction in disturbed surface catchment.

The proposed south-west haul road route also provides significant operational benefits, including:

- shorter travel distances to the OC1 Workshop Facilities; and
- removal of the requirement for supporting administration facilities in the OC4 area associated with the temporary mine infrastructure area.

3.1.4 Mobile Fleet

Additional fleet items would be required to meet expected production

The additional fleet items would be of low noise emission standard (e.g. all new fleet would be XQ [extra quiet] models). An indicative revised mine fleet has been assessed and is provided in the Noise and Blasting Assessment (Appendix A).

3.1.5 Waste Rock Management

During the initial development of OC4, waste rock would either be placed in the approved out-of-pit emplacement area. Waste rock from OC4 would then be placed in-pit behind the advancing open cut.

There would be minor changes to the shape of the OC4 out-of-pit waste rock emplacement to accommodate the OC4 south-west haul road. There would be no increase to the extent or maximum height of the OC4 out-of-pit waste emplacement due to the OC4 South-West Modification.

3.1.6 Underground Access to UG4

The northern OC1 void would be backfilled to approximately pre-mining elevations with waste rock from OC1 (Figure 4) reducing the number of voids in the final landform to three.

The backfilling of the northern OC1 void would result in the loss of access from the OC1 highwall to the approved UG4 which is scheduled to commence following the completion of UG1 and UG2. A revised access for UG4 would be sought as part of a separate EA and approval application. An indicative alternate access is shown on Figure 7.

3.1.7 Drill and Blast

There would be no change to the existing blasting technique, frequency or hours (Section 2.7) due to the OC4 South-West Modification.

3.1.8 Product Coal Transport

The OC4 South-West Modification would not change approved rates of maximum product transport (13 Mtpa) or the approved number of daily laden trains dispatched from site (up to five).

3.2 GENERAL INFRASTRUCTURE

Coal Handling and Preparation Infrastructure

There would be no change to the approved CHPP process or infrastructure (including Stage 1 ROM coal facility) or approved overland conveyors between OC4 and the Stage 1 ROM coal facility due to the OC4 South-West Modification.

Mine Infrastructure Area

Some Stage 2 administration facilities and mine infrastructure (e.g. muster area, crib room, car park and fuel farm) would be relocated to a temporary mine infrastructure area within the existing OC4 footprint (Figure 4).

Due to the shorter travel distance, mobile fleet operating within OC4 would use the OC1 Workshop Facilities.

The access road to OC4 off Ulan-Wollar Road would be retained.

3.3 WATER MANAGEMENT

Drainage structures would be constructed along the OC4 south-west haul road to capture and re-direct water from the haul road to mine water storages.

Runoff from the proposed OC4 south-west haul road would be captured in two water storages located within the currently approved disturbance area. The surface water management system already captures runoff from the OC4 south-west haul road area. In addition, the OC1 final void is not used as a water storage in the existing site water balance, and therefore backfilling the OC1 final void would not result in a loss of water storage capacity. Consequently negligible change to the water balance is anticipated (Appendix D). Notwithstanding, MCO would continue to undertake regular reviews of the water balance.

If stored water volume falls, MCO can source water through sharing arrangements with adjoining mines and/or from licensed water supply bores.

MCO can also manage excess water via off-site release in accordance with the requirements of EPL 12932, subject to stringent release criteria and conditions being met.

3.4 WASTE MANAGEMENT

The OC4 South-West Modification would not change the existing waste streams (Section 2.11) and accordingly, no changes to existing waste management practices at the Moolarben Coal Complex would be required.

3.5 MANAGEMENT OF DANGEROUS GOODS

The OC4 South-West Modification would not change the dangerous goods handled at the Moolarben Coal Complex (Section 2.12) and accordingly, no changes to the management of dangerous goods (e.g. hydrocarbons, explosives and chemicals) would be required.

3.6 WORKFORCE

The OC4 South-West Modification would not change the Moolarben Coal Complex operational workforce (Section 2.13).

3.7 CONSTRUCTION ACTIVITIES

There would be no additional construction activities associated with the OC4 South-West Modification.

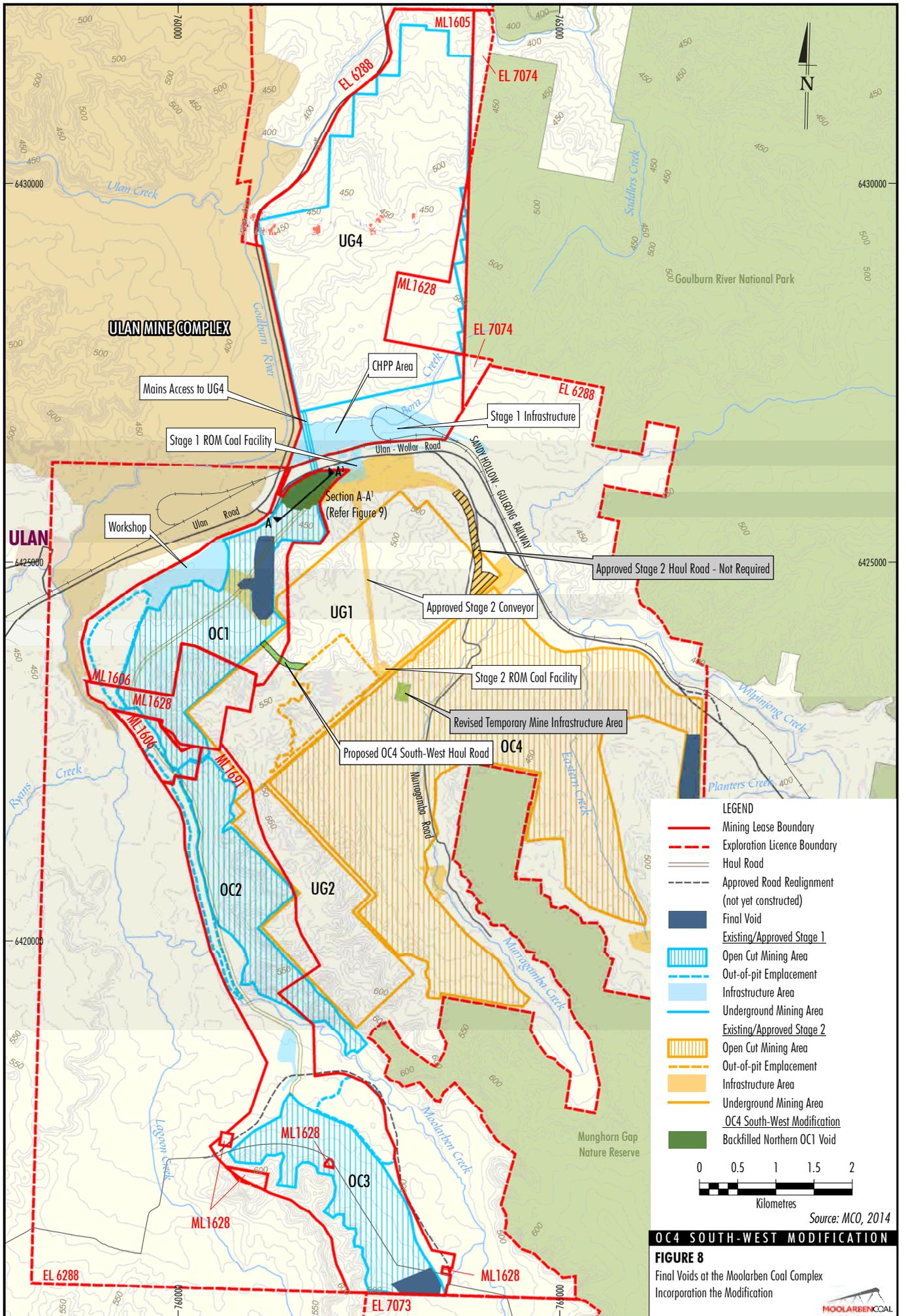
The proposed change to the haul road is considered to be part of the OC4 mining operations, as opposed to construction activities.

3.8 REHABILITATION AND FINAL LANDFORM

The approved rehabilitation objectives and concepts for the OC4 South-West Modification would remain generally unchanged with the exception of the following elements. Notwithstanding, a Rehabilitation Management Plan and MOP would be prepared to incorporate the OC4 South-West Modification.

3.8.1 Northern OC1 Final Void

The northern OC1 void would be backfilled to approximately pre-mining elevations with waste rock reducing the number of voids in the final landform across the Moolarben Coal Complex to three (Figure 8).

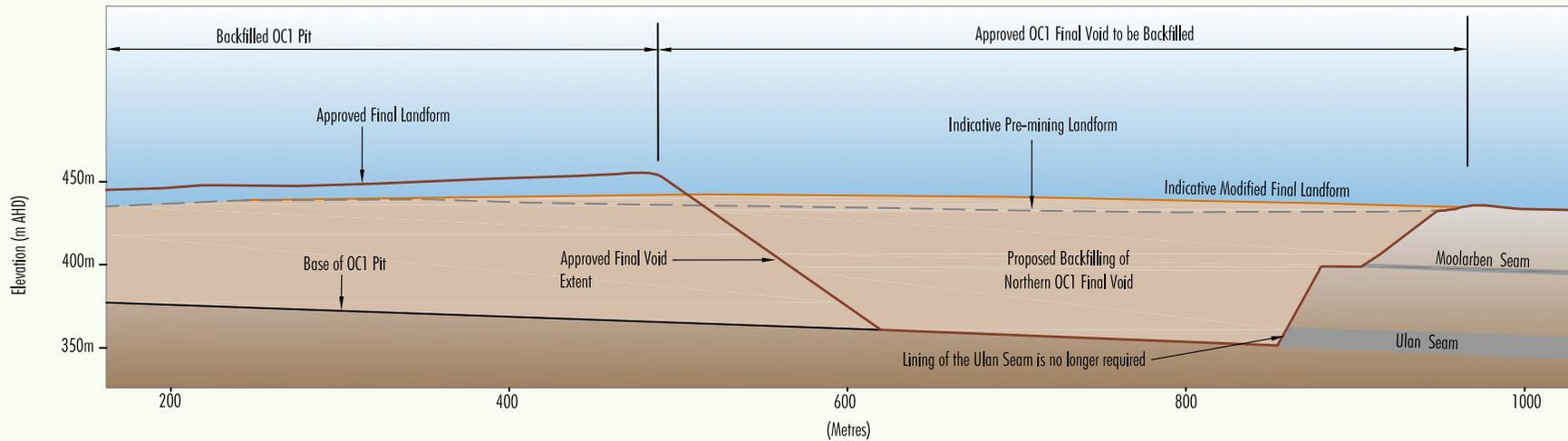


The backfilling of the northern OC1 final void would provide a beneficial post-mining rehabilitation outcome by integrating with the surrounding pre-mining landforms and reducing the amount of surface water that would be captured on-site by the post-mining landform. An indicative cross-section of the approved and proposed northern OC1 final landforms is shown on Figure 9.

As a consequence of backfilling the northern OC1 final void, there would no longer be a requirement to line the Ulan Seam as required by Condition 32 of Schedule 3 of the Stage 1 Project Approval (05_0117) (Attachment 1). MCO is seeking to remove this condition as part of the OC4 South-West Modification (Section 5.3.1).

3.8.2 OC4 South-West Haul Road

Rehabilitation of the OC4 south-west haul road would be undertaken prior to closure of the Moolarben Coal Complex. Following the cessation of mining, the OC4 south-west haul road would be re-profiled to free draining landforms, ripped and revegetated with woodland species.



LEGEND
 Waste Rock

Section A-A¹
 (Refer Figure 8)

Source: MCO, 2014

OC4 SOUTH-WEST MODIFICATION
FIGURE 9
 Conceptual Final Landform-Cross
 Section of the Northern OC1 Final Void



4 ENVIRONMENTAL ASSESSMENT

The following sub-sections present the EA for the OC4 South-West Modification, including a description of the existing environment, an assessment of the potential impacts of the OC4 South-West Modification on the environment, and where relevant, a description of the measures that would be implemented to avoid, minimise, mitigate and/or offset the potential impacts.

4.1 NOISE

A Noise Assessment for the OC4 South-West Modification was undertaken by SLR Consulting (2015) (Appendix A).

Aspects relating to noise emissions are discussed in the subsections below.

Potential blasting impacts are discussed separately in Section 4.8.2.

4.1.1 Background

Project Approval Noise Limits

A number of noise assessments have been undertaken since 2006 to assess the potential impacts of Stages 1 and 2 of the Moolarben Coal Project. The most recent assessment of operational noise impacts for the approved Moolarben Coal Complex (incorporating Stages 1 and 2) was conducted by EMGA Mitchell McLennan (EMM) (2013a).

The assessment predicted that six privately-owned residences would experience noise levels above the Project-specific noise limit (PSNL) of 35 A-weighted decibels (dBA) equivalent continuous noise level (dBA $L_{Aeq(15\text{minute})}$) (EMM, 2013a). MCO has since purchased one of these properties and a further property (Receiver 63) is subject to a private agreement with MCO.

These exceedances of the PSNL were approved, subject to the management, mitigation and monitoring of noise impacts from the Moolarben Coal Complex in accordance with the requirements of Project Approvals (05_0117 and 08_0135). This includes:

- the right to request property acquisition for Receiver 32 or where noise exceeds the Project Approval Land Acquisition Criteria at privately-owned residences or over 25% or more of privately-owned land;
- Project Approval noise limits for privately-owned residences;
- the right to request mitigation measures for residences where noise levels are greater than the Project Approval Noise Mitigation Criteria; and
- the right for the NSW Department of Education and Communities to request reasonable and feasible noise (and dust) mitigation measures to be implemented at the Ulan Public School or for MCO to contribute to or meet reasonable costs towards relocating the Ulan Public School.

Noise Management and Monitoring

The approved Noise Management Plan³ has been prepared to manage Project-specific and cumulative noise impacts associated with the Moolarben Coal Complex. The Noise Management Plan describes the noise monitoring program, which consists of a combination of operator-attended and continuous real-time noise monitoring, as well as two Automatic Weather Stations (AWS) (Figure 10). An additional AWS not described in the Noise Management Plan has been established near OC2 (Figure 10).

MCO implements a range of noise control and management measures at the Moolarben Coal Complex, including mine planning controls, operational controls, engineering controls, a real-time response protocol, meteorological forecasting and continuous improvement to identify and manage noise impacts aimed to achieve compliance with the approved noise criteria.

Reasonable and feasible on-site noise controls implemented to minimise noise emissions from the Moolarben Coal Complex include:

- attenuation of mobile equipment such as haul trucks, shovels and excavators, dozers and drills;
- fitting of a number of haul trucks with Dura-Trays to reduce the noise emissions associated with loading and unloading (Figure 11);
- locating mobile fleet (e.g. excavators) behind pit walls and at low elevations to shield noise emissions during adverse weather conditions (Figure 11);

³ On 30 January 2015, Stage 2 and Stage 1 Modification 3 of the Moolarben Coal Project were approved by the Planning Assessment Commission (as a delegate of the NSW Minister for Planning). To address the requirements of the Project Approvals (Attachments 1 and 2), MCO is preparing a complex-wide Noise Management Plan.

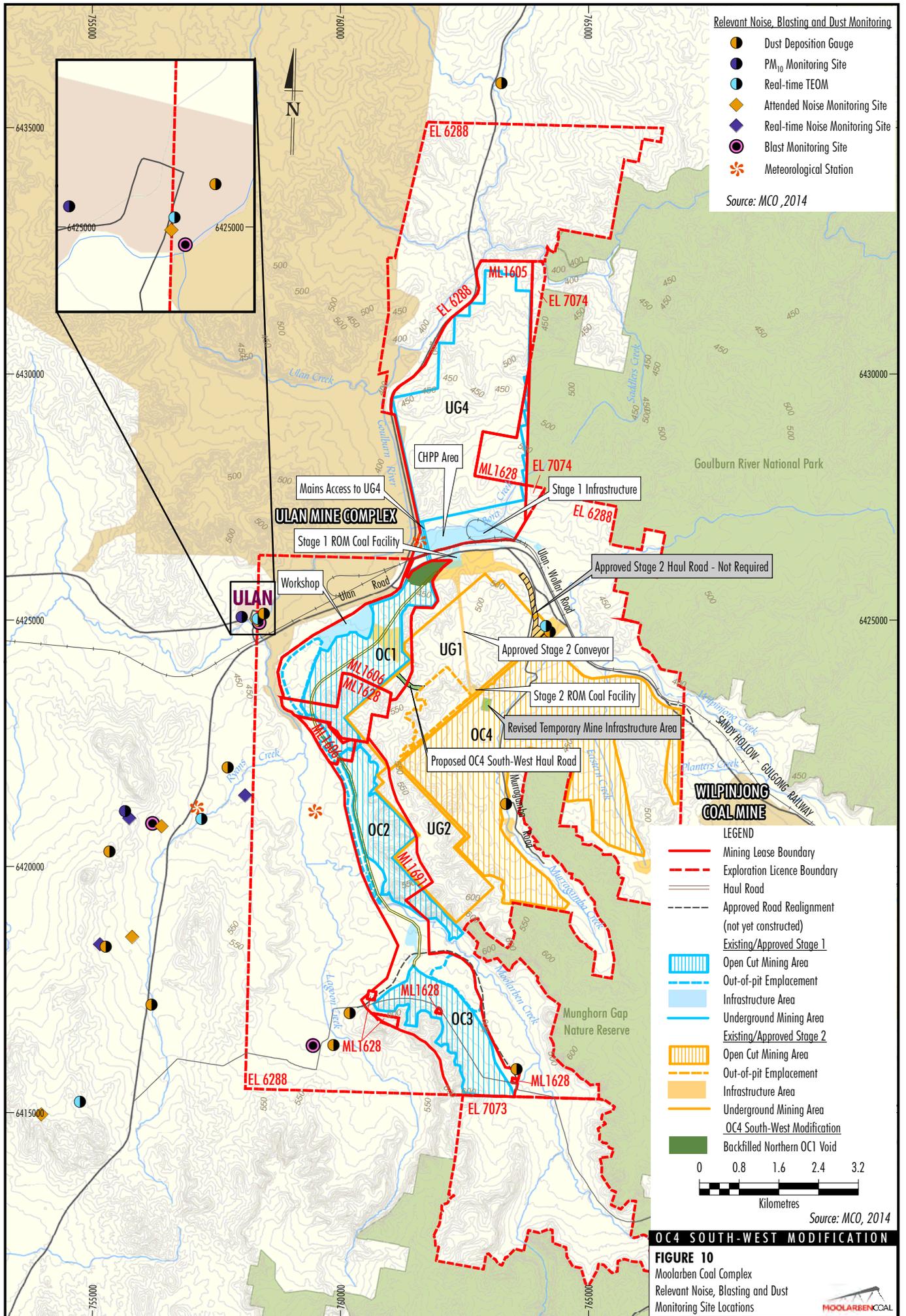




Plate 1 Haul truck fitted with Duratray



Plate 2 Excavator shielded by pit wall



Plate 3 Overburden dump area shielded by side of waste emplacement



Plate 4 Typical berms/bunding along haul roads

Source: MCO, 2014

OC4 SOUTH-WEST MODIFICATION

FIGURE 11

Current Noise Management Measures



- construction of steps in waste emplacements to allow dumping to occur at lower elevations during adverse weather conditions (Figure 11);
- construction of berms/bunds along haul roads which are exposed to receivers (Figure 11);
- implementation of meteorological forecasting to inform daily operations;
- use of real-time noise monitoring data that incorporate automatic noise alarms to assist operational personnel in proactive management of noise impacts; and
- use of operational personnel to monitor real time noise data to assist production supervisors in proactive management of noise impact.

Operator-attended noise monitoring is used to demonstrate compliance with Project Approval noise criteria, whilst continuous real-time monitoring is used as a noise management tool to assist MCO to take pre-emptive noise management actions to avoid potential non-compliances.

MCO has also recently implemented new software that assists in pro-active management of noise (and dust) emissions. The system provides daily reports and predictions of upcoming meteorological conditions and potential noise risks. Based on prevailing wind conditions, MCO can strategically alter its operations to reduce these impacts.

A description of these management measures is provided in Appendix A.

MCO maintains a complaints register in accordance with its Project Approvals (05_0117 and 08_0135). All noise related complaints received by MCO are responded to and investigated in accordance with the Community Complaints Procedure detailed in the Noise Management Plan. A review of noise related complaints is provided in Appendix A.

MCO reports noise monitoring results in its Monthly Environmental Monitoring Report, Quarterly Environmental Noise Monitoring Report and Annual Environmental Management Report (AEMR)/Annual Review. A review of the noise monitoring reports is provided in Appendix A.

4.1.2 Environmental Review

Noise modelling was conducted by SLR Consulting (2015) to predict potential noise impacts from the Moolarben Coal Complex incorporating the OC4 South-West Modification.

SLR Consulting conducted a noise investigation survey in July and August 2014 to validate the Moolarben Coal Complex noise model, reflect as-built features and to review the model calibration (Appendix A).

Assessable Meteorological Conditions

The NSW *Industrial Noise Policy* assessable meteorological noise modelling parameters are presented in Appendix A, and are generally consistent with the previously assessed meteorological conditions.

The Stage 1 Modification 9 noise assessment for the approved Moolarben Coal Complex assessed noise impacts during temperature inversions up to 3.9 degrees Celsius (°C) per 100 m.

Direct temperature gradient measurement at the 60 m high temperature tower at the Wilpinjong Coal Mine has provided additional data regarding temperature gradients that occur in the area (Appendix A).

Based on analysis of available data between August 2011 and July 2014, SLR Consulting identified that noise impacts during temperature gradients up to 5.2°C per 100 m were assessable under the NSW *Industrial Noise Policy*.

Modelling Scenarios

The OC4 south-west haul road would bring OC4-related haul truck movements closer to potential private receivers to the west of the Moolarben Coal Complex, in particular during the early years of the OC4 South-West Modification (Figure 4).

Therefore, SLR Consulting (2015) modelled two key scenarios in the early years of the OC4 South-West Modification to assess potential noise impacts associated with the modified Moolarben Coal Complex (2016 and 2018 mine scenarios). These scenarios are representative of potential maximum noise impacts at Ulan and Cooks Gap (Appendix A). Further justification for the scenario years is provided in Appendix A.

Reasonable and Feasible Mitigation Measures

Where relevant, existing mitigation measures (Section 4.1.1) were incorporated into the noise modelling conducted for the OC4 South-West Modification.

In addition, the following reasonable and feasible noise mitigation measures would be implemented for the OC4 South-West Modification (Appendix A):

- Extra-quiet (XQ or similar) mobile equipment fleet and “low noise” fixed plant (i.e. conveyor drives and conveyor idlers) would be purchased.
- Acoustic bunding would be established at selected locations around the site, targeting haul roads.
- From 2018, waste rock emplacement in OC4 during evening and night-time would occur at relatively lower elevations, using the main waste rock emplacement to shield receivers from Cooks Gap from potential noise impacts.
- In-pit hauling of waste rock in OC1 would be maximised (i.e. restricting fleet to lower elevations).

Potential Impacts

Noise modelling for the Moolarben Coal Complex incorporating the OC4 South-West Modification shows that, with the implementation of reasonable and feasible mitigation measures and the continued implementation of the noise management strategy, no exceedances of the current Project Approval noise limits are predicted at any privately-owned receiver.

Indicative noise contours for night-time operations under adverse meteorological conditions for the Moolarben Coal Complex incorporating the OC4 South-West Modification in Years 2016 and 2018 are shown on Figures 12 and 13, respectively.

4.1.3 Mitigation Measures, Management and Monitoring

MCO will continue to mitigate, monitor and manage potential noise impacts from the Moolarben Coal Complex in accordance with the Noise Management Plan, which would be updated to incorporate the OC4 South-West Modification, via a combination of the following:

- reasonable and feasible mitigation measures;
- predictive meteorological forecasting, and associated pre-emptive noise management measures when adverse meteorological conditions are predicted;
- real-time noise monitoring and associated pre-emptive noise management measures when trigger levels (set below Project Approval noise limits) are exceeded; and

- attended noise monitoring to confirm ongoing compliance with Project Approval noise limits.

Ulan Public School

In accordance with the requirements of the Project Approvals (Attachments 1 and 2), MCO would:

- consult with Department of Education and Communities and, if requested, implement agreed reasonable and feasible measures to ameliorate potential noise and/or dust impacts to Ulan Public School; or
- on a reasonable basis relating to the adverse effect of noise and/or dust from the Moolarben Coal Complex, negotiate with Department of Education and Communities to contribute to or meet reasonable costs toward relocating the Ulan Public School.

4.2 AIR QUALITY

An Air Quality Assessment for the OC4 South-West Modification was undertaken by Todoroski Air Sciences (2015) (Appendix B).

Aspects relating to dust emissions are discussed in the subsections below.

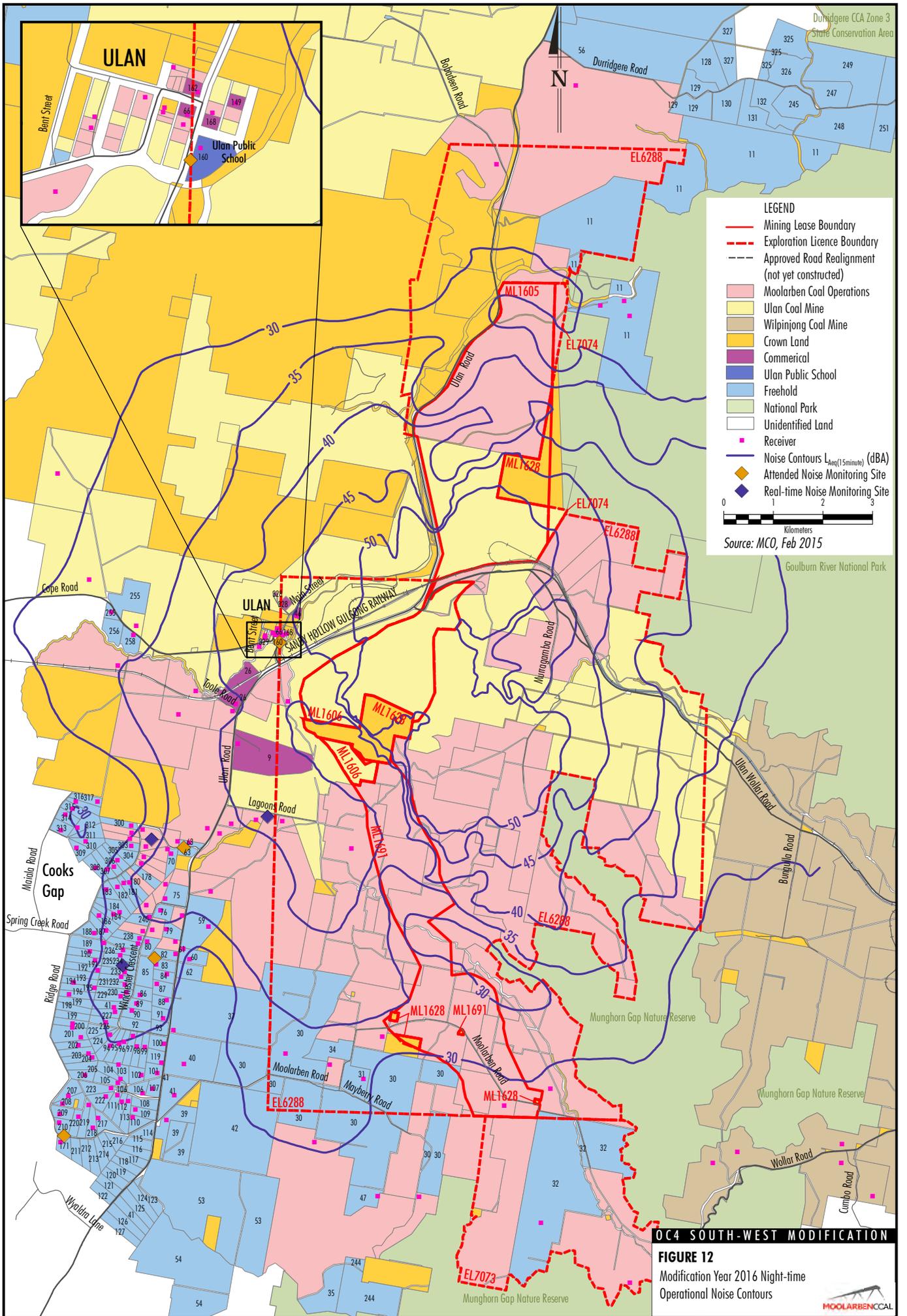
Greenhouse gas emissions are discussed separately in Section 4.8.3.

4.2.1 Background

Previous Assessment

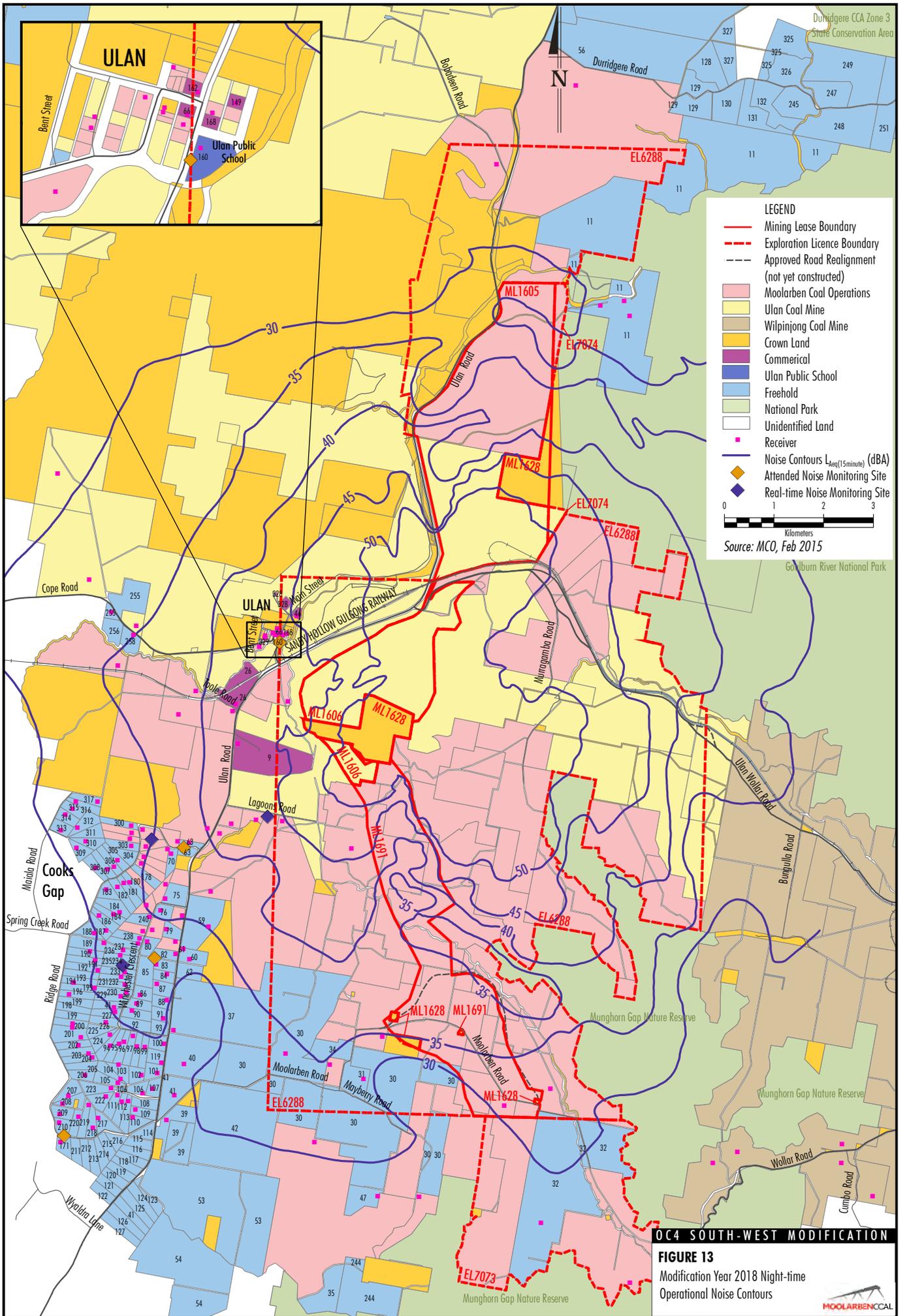
A number of air quality assessments have been undertaken since 2006 to assess the potential impacts of Stages 1 and 2 of the Moolarben Coal Project. The most recent assessment of the potential air quality impacts associated with the approved Moolarben Coal Complex (incorporating Stages 1 and 2) was undertaken by Todoroski Air Sciences (2013).

The assessment predicted there would be no exceedances of annual average criteria for particulate matter with diameter less than 10 microns (PM₁₀), total suspended particulate (TSP) or dust deposition levels due to emissions from the project only.



OC4 SOUTH-WEST MODIFICATION
FIGURE 12
 Modification Year 2016 Night-time
 Operational Noise Contours





An exceedance of 24-hour average PM₁₀ criterion was predicted at one private-owned receiver on one day (Receiver 46⁴). An exceedance of the cumulative annual average PM₁₀ criterion was also predicted at Receiver 46 when emissions from the Moolarben Coal Complex were considered cumulatively with background sources (Todoroski Air Sciences, 2013).

Previous assessment of cumulative 24-hour average PM₁₀ impacts found there would be a low potential risk for cumulative 24-hour average PM₁₀ impacts due to the Moolarben Coal Complex (i.e. an exceedance for one day only was predicted when emissions from Moolarben Coal Complex were considered cumulatively with background sources) (Todoroski Air Sciences, 2013).

Air Quality Management and Monitoring

The approved Air Quality Management Plan (MCO, 2013)⁵ describes the air quality management and monitoring regime at the Moolarben Coal Complex.

The Air Quality Management Plan describes:

- Project Approval air quality criteria.
- Dust monitoring locations and frequency, comprising (Figure 10):
 - TEOMs measuring PM₁₀ continuously (i.e. real-time monitoring);
 - High Volume Air Samplers (HVAS) measuring PM₁₀ on a one day in six cycle; and
 - dust deposition gauges.
- Ongoing dust management measures.
- Performance indicators (i.e. real-time response triggers set below Project Approval air quality criteria) which, if exceeded, trigger the implementation of additional dust management measures.

Air quality controls currently implemented at the Moolarben Coal Complex include:

- disturbance of only the minimum area necessary for mining (e.g. typically only one strip ahead of the active mining operations);

- limiting clearing and topsoil stripping activities as far as practicable during the drier months;
- adoption of progressive rehabilitation of mining operations, to minimise exposed soils;
- use of water carts on all trafficked areas to minimise dust generation as necessary and practicable;
- use of constructed roads only, minimisation of access roads and removal of obsolete access roads;
- employing appropriate dust suppression methods at the coal handling facilities;
- maintaining coal handling areas and stockpiles in a moist condition using water carts and/or water sprays;
- relocation, modification and/or temporarily ceasing mining operations in adverse meteorological conditions to minimise short term air quality impacts;
- use of dust suppression systems on stationary and mobile plant (such as the dump hopper, transfer stations, drill rigs);
- long term topsoil stockpiles, not used for over 6 months are revegetated with grass;
- use of dust aprons and water injection systems on drills;
- partial enclosure of coal transfer conveyors where possible;
- watering of out-of-pit emplacement areas that would remain inactive for prolonged period where practicable creating a dry crust layer to reduce dust emissions associated with wind erosion; and
- increasing excavator bench height when working on drier weathered rock near the surface to allow blending with underlying overburden which contains more moisture.

MCO has also recently implemented new software that assists in pro-active management of dust (and noise) emissions. The system provides daily reports and predictions of upcoming meteorological conditions and potential dust risks. Based on prevailing wind conditions, MCO can strategically alter its operations to reduce these impacts.

In accordance with the requirements of Project Approvals (05_0117 and 08_0135), MCO co-ordinates the air quality management on-site with air quality management at the Ulan and Wilpinjong Coal Mines to minimise cumulative air quality impacts.

⁴ Receiver 46 is a commercial property and is listed as a property that can request acquisition in the Ulan Coal Mine Development Consent (08_0184).

⁵ On 30 January 2015, Stage 2 and Stage 1 Modification 3 of the Moolarben Coal Project were approved by the Planning Assessment Commission (as a delegate of the NSW Minister for Planning). To address the requirements of the Project Approvals (Attachments 1 and 2), MCO is preparing a complex-wide Air Quality Management Plan.

MCO reports air quality monitoring results in its Monthly Environmental Monitoring Report and AEMR/Annual Review.

Pollution Reduction Programs

Pollution Reduction Programs (PRPs) are included as requirements of EPL 12932. As such, MCO implements dust control measures in accordance with the conditions of EPL 12932 described below:

- PRP U1: *Particulate Matter Control Best Practice Implementation - Wheel Generated Dust*, which requires a haul road dust control efficiency of 80% or more to be achieved and maintained at the Moolarben Coal Complex. A monitoring program demonstrated a control efficiency of 93 to 99% was achieved through the use of watering of haul roads, and that a control efficiency of 90% could be maintained on a day-to-day basis (Appendix B).
- PRP U2: *Particulate Matter Control Best Practice Implementation - Disturbing and Handling Overburden under Adverse Weather Conditions*, which requires MCO to alter or cease the use of equipment on overburden and the loading and dumping of overburden during adverse weather conditions.
- PRP U3: *Particulate Matter Control Best Practice Implementation – Trial of Best Practice Measures for Disturbing and Handling Overburden*, which requires MCO to assess the effectiveness of implementing dust management controls while loading and dumping overburden.

Existing Air Quality

Air quality monitoring results reported in the 2012 - 2013 AEMR and 2013 - 2014 AEMR show cumulative dust levels were below Project Approval criteria, with the exception of isolated exceedances of the 24-hour PM₁₀ criterion, which were attributable to regional smoke haze events and/or local background sources not associated with the Moolarben Mine Complex.

Complaints

MCO maintains a complaints register in accordance with its Project Approvals (05_0117 and 08_0135). All dust related complaints received by MCO are responded to and investigated in accordance with the Community Complaints Procedure detailed in the Air Quality Management Plan.

There was one complaint reported in the 2012-2013 AEMR relating to dust. There have been a total of three complaints reported over the last three AEMR reporting periods (i.e. 2010 to 2013). There have been two dust related complaints between 1 January 2014 and 30 November 2014.

4.2.2 Environmental Review

Modelling Methodology

Air quality dispersion modelling has been conducted by Todoroski Air Sciences (2015) to assess potential impacts for the operational scenario representative of maximum potential air quality impacts for the Moolarben Coal Complex incorporating the OC4 South-West Modification, particularly for receivers to the west.

Relevant to potential air quality impacts, 2016 was chosen for the air quality modelling scenario as this year includes (Appendix B):

- maximum ROM coal and waste rock extraction;
- first year of maximum fleet operations in OC4;
- maximum fleet using the proposed OC4 south-west haul road;
- fleet in OC4 focused in the west (i.e. potential maximum impacts at Ulan and Cooks Gap); and
- emplacement of waste rock on the OC4 out-of-pit waste emplacement.

Emissions Estimation

Emissions of TSP (i.e. dust) associated with the 2016 modelling were estimated by Todoroski Air Sciences (2015) using contemporary emission estimation methodologies.

Annual emissions of TSP for the Moolarben Coal Complex incorporating the OC4 South-West Modification were estimated to be generally similar or marginally lower than those estimated for the approved Moolarben Coal Complex in the previous assessment (Appendix B).

Meteorological Conditions

The CALMET meteorological model developed by Todoroski Air Sciences for the Stage 1 Modification 9 assessment was revised to incorporate changes in topography for the Year 2016 mine plan (Appendix B).

Predicted Impacts

Project Only

Concentrations of TSP, PM₁₀ and particulate matter 2.5 microns or less in diameter (PM_{2.5}) as well as dust deposition levels were predicted by Todoroski Air Sciences (2015).

With the implementation of proactive and reactive management measures, there were no predicted exceedances of the 24-hour average PM₁₀ criteria, or annual average TSP, PM₁₀ or dust deposition criteria at any privately-owned residence due to emissions from the project only (i.e. the Moolarben Coal Complex incorporating the OC4 South-West Modification) (Appendix B).

In addition, 24-hour average and annual average PM_{2.5} concentrations were predicted to be below reporting guidelines at all privately-owned residences (Appendix B).

Contours showing predicted project only 24-hour PM₁₀ concentrations are provided on Figure 14.

Cumulative

Given annual dust emissions are estimated to be similar or lower than those previously assessed for the Moolarben Coal Complex, and no additional project only exceedances of air quality criteria are predicted, Todoroski Air Sciences (2015) concluded it is unlikely there would be any increase in potential cumulative air quality impacts due to the OC4 South-West Modification (Appendix B).

4.2.3 Mitigation Measures, Management and Monitoring

MCO would continue to implement the existing air quality management measures described in the Air Quality Management Plan and required by the PRPs to minimise dust emissions and comply with relevant dust criteria in Project Approvals (05_0117 and 08_0135). The Air Quality Management Plan would be updated, where necessary, to incorporate the OC4 South-West Modification.

Ulan Public School

In accordance with the requirements of the Project Approvals (Attachments 1 and 2), MCO would:

- consult with Department of Education and Communities and, if requested, implement agreed reasonable and feasible measures to ameliorate potential dust and/or noise impacts to Ulan Public School; or
- on a reasonable basis relating to the adverse effect of dust and/or noise from the Moolarben Coal Complex, negotiate with Department of Education and Communities to contribute to or meet reasonable costs toward relocating the Ulan Public School.

4.3 ECOLOGY

A Flora and Fauna Impact Assessment was prepared for the OC4 South-West Modification by EcoLogical Australia (2015) and is presented in Appendix C.

4.3.1 Background

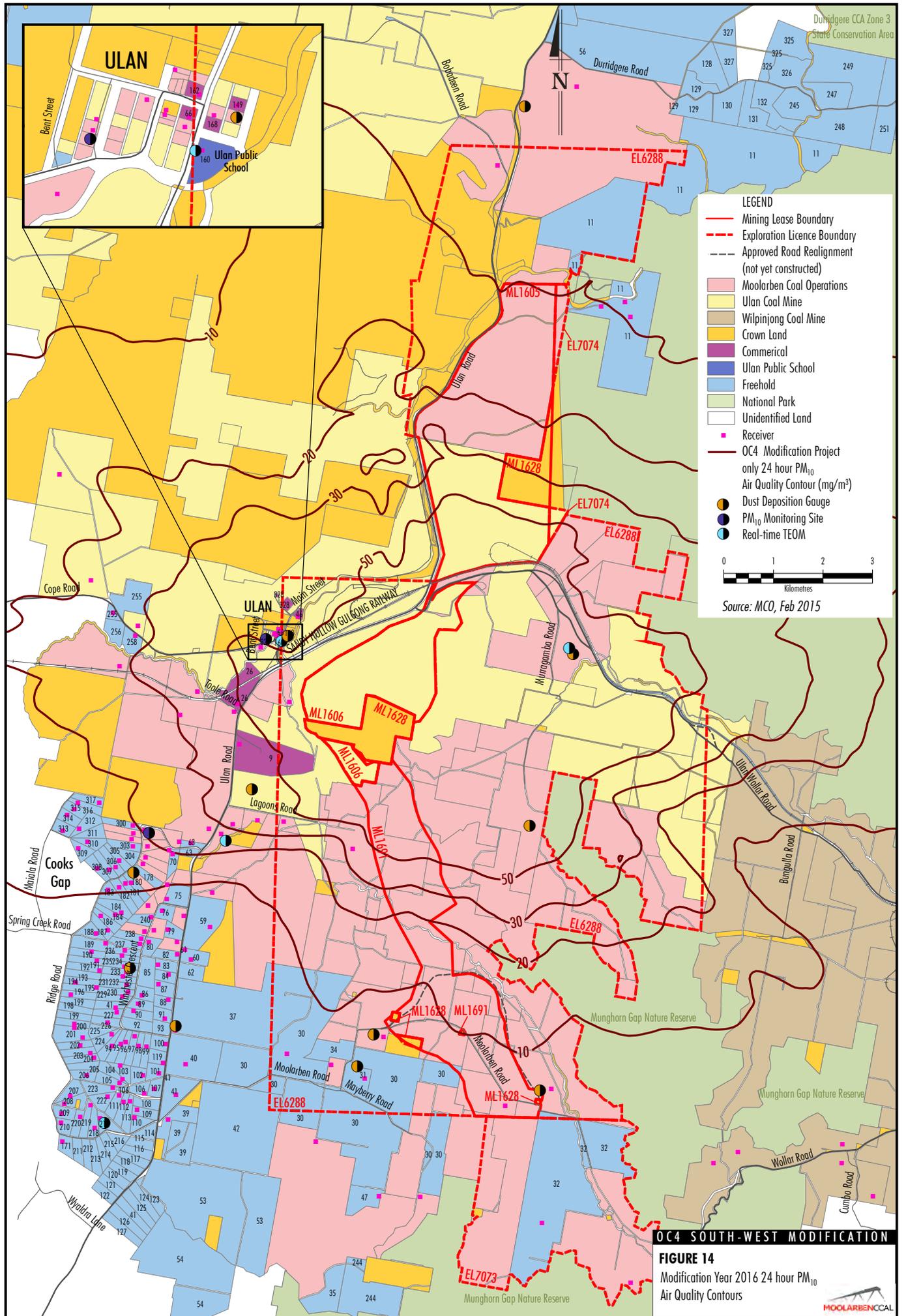
Detailed ecological impact assessments were prepared by Moolarben Biota (2006) and Ecovision (2008) for Stages 1 and 2 of the Moolarben Coal Project respectively. An ecological impact assessment was also undertaken in 2012 for the Moolarben Coal Project Stage 1 Modification 9 EA (EMM, 2013b).

In addition to the above, specific flora and fauna field surveys were conducted in the OC4 South-West Modification disturbance area (i.e. associated with the OC4 south-west haul road) and surrounds in July 2014 by EcoLogical Australia (Appendix C).

The 2014 surveys consisted of validating BioMetric vegetation types, identifying floristic structure, targeting threatened flora and fauna searches and undertaking habitat assessment. Whilst some threatened species were out of season for survey (e.g. *Diuris tricolor*), potential habitat for these species was targeted during the field survey (Appendix C).

Vegetation Communities

Vegetation communities were mapped within the OC4 South-West Modification disturbance area by EcoLogical Australia (2015) based on BioMetric vegetation types. Vegetation communities mapped by EcoLogical (Appendix C) are shown on Figure 15 and described in Table 3.



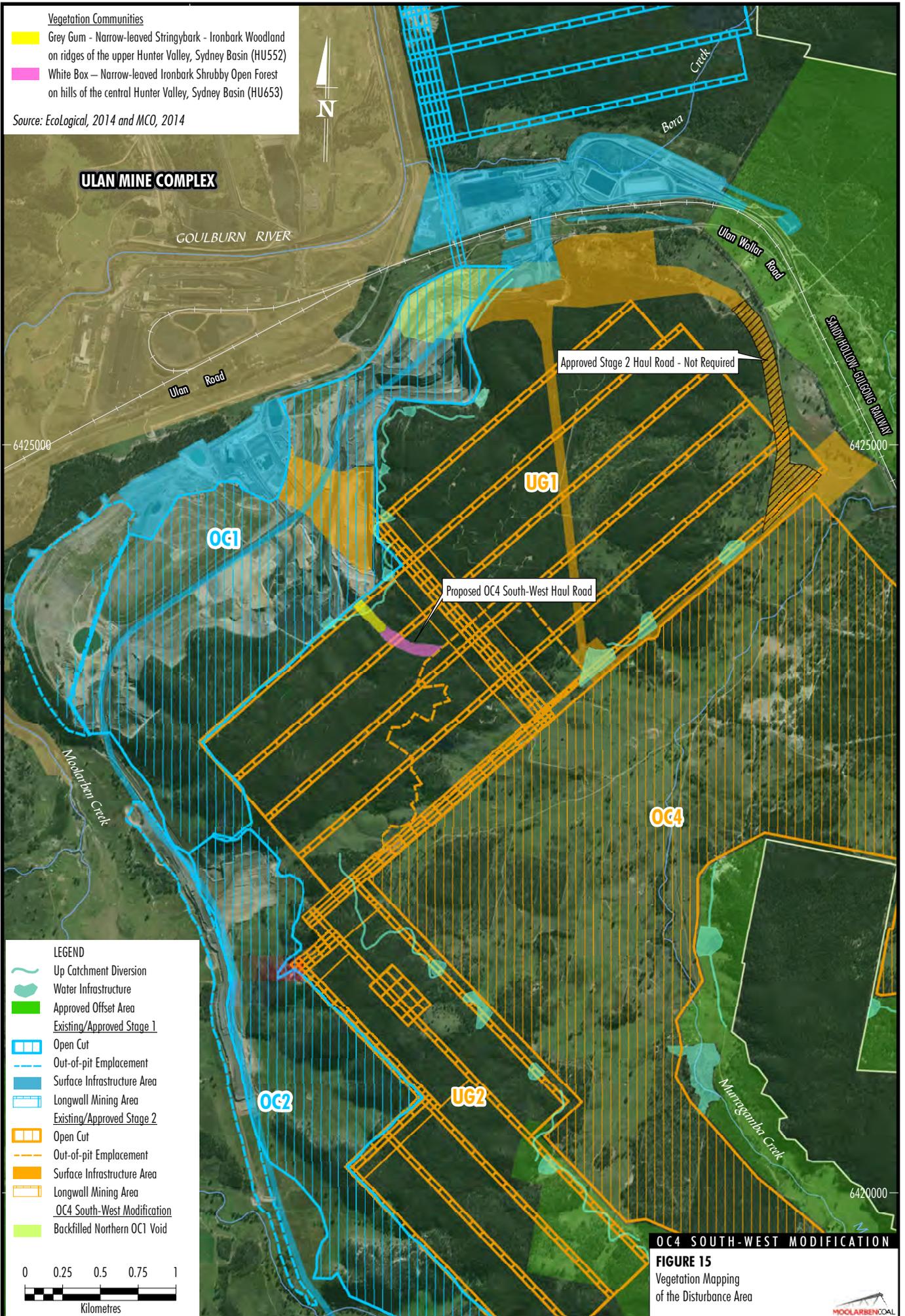
Vegetation Communities

- Grey Gum - Narrow-leaved Stringybark - Ironbark Woodland on ridges of the upper Hunter Valley, Sydney Basin (HU552)
- White Box - Narrow-leaved Ironbark Shrubby Open Forest on hills of the central Hunter Valley, Sydney Basin (HU653)

Source: Ecological, 2014 and MCO, 2014

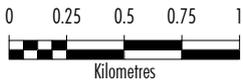


ULAN MINE COMPLEX



LEGEND

- Up Catchment Diversion
- Water Infrastructure
- Approved Offset Area
- Existing/Approved Stage 1
- Open Cut
- Out-of-pit Emplacement
- Surface Infrastructure Area
- Longwall Mining Area
- Existing/Approved Stage 2
- Open Cut
- Out-of-pit Emplacement
- Surface Infrastructure Area
- Longwall Mining Area
- OC4 South-West Modification
- Backfilled Northern OC1 Void



OC4 SOUTH-WEST MODIFICATION

FIGURE 15
Vegetation Mapping
of the Disturbance Area



Table 3
Native Vegetation Communities Recorded in the
OC4 South-West Modification Disturbance Area

Biometric Vegetation Types	Approximate Area (ha)
Grey Gum – Narrow-leaved Stringybark – Ironbark Woodland on ridges of the upper Hunter Valley, Sydney Basin (HU552)	1.8
White Box – Narrow-leaved Ironbark Shrubby Open Forest on hills of the central Hunter Valley, Sydney Basin (HU653)	3.3
Total	5.1

Source: Appendix C.

Threatened Flora Species and Populations

No threatened flora species or populations listed under the TSC or EPBC Acts were recorded within the OC4 South-West Modification disturbance area by the 2014 surveys undertaken by EcoLogical. Nor have they been recorded in this area by any other surveys conducted at the Moolarben Coal Complex for past assessments (Appendix C).

The OC4 South-West Modification disturbance area is not considered potential habitat for *Diuris tricolor* or any other threatened flora species (Appendix C).

Threatened Fauna Species and Populations

No threatened fauna species or populations listed under the TSC Act and/or the EPBC Act were recorded within the OC4 South-West Modification disturbance area by the 2014 surveys undertaken by EcoLogical. Nor have they been previously recorded in this area by any of the other surveys conducted at the Moolarben Coal Complex for past assessments (Appendix C).

Fauna Habitat

Fauna habitat in the vicinity of OC4 South-West Modification disturbance area consists of a suite of broad habitat elements including:

- derived native grasslands;
- shrubbery;
- mature woodland and paddock trees (flower, lerp and mistletoe bearing);
- hollow-bearing live trees and dead trees (stags);
- large woody debris (log and bark on the ground);
- sandstone outcrops and overhangs; and

- water impoundments (dams and ponds).

A detailed description of each habitat element is provided in Appendix C.

4.3.2 Environmental Review

Potential Impacts

Vegetation and Fauna Habitat Clearance

The approved Stage 2 haul road requires the clearance of approximately 18.5 ha of native vegetation (including woodland and derived native grassland). The proposed OC4 south-west haul road requires clearing of approximately 5.1 ha of native vegetation, some 13.4 ha less than the approved clearance. Therefore, the OC4 South-West Modification would result in a net reduction of native vegetation required to be cleared at the Moolarben Coal Complex.

Fragmentation of habitat occurs where areas that were once continuous become divided into separate, isolated fragments by non-woodland areas. The approved Stage 2 disturbance footprint includes a conveyor (and associated access track) through the same vegetation and parallel with the proposed OC4 south-west haul road. The approved Stage 2 disturbance footprint also includes a haul road around the north east edge of the woodland vegetation as well as clearance for ancillary works. Therefore, the proposed OC4 south-west haul road would not significantly alter potential disturbance/fragmentation impacts (i.e. in comparison to the currently approved Moolarben Coal Complex).

Threatened Species, Populations and Communities

Given no threatened species, populations or communities have been identified in the OC4 South-West Modification disturbance area, and given there would be a total net reduction in disturbance, EcoLogical Australia (2015) concluded there would be no significant impact on threatened species, populations and communities and migratory species listed under the EPBC Act and/or TSC Act (Appendix C).

Pest Species

MCO would continue to implement mitigation measures including feral animal management and control in accordance with the Biodiversity Management Plan.

Cumulative Impacts

No additional ecological impacts are expected as a result of the OC4 South-West Modification, and therefore, no additional cumulative impacts are expected.

4.3.3 Mitigation Measures, Management, Monitoring and Offset

The nature and scale of the vegetation to be cleared as part of the OC4 South-West Modification is considered minor when compared with the native vegetation within the currently approved Stage 2 disturbance footprint, and the significant Biodiversity Offset Strategy developed for Stage 2.

In addition, the OC4 South-West Modification would result in a reduction (i.e. of 13.4 ha) in the total approved native vegetation disturbance area at the Moolarben Coal Complex (Section 4.3.2).

Therefore, the Biodiversity Offset Strategy developed for Stage 2 adequately offsets the proposed impacts from the OC4 South-West Modification, with surplus area (Appendix C).

Notwithstanding, MCO would continue to implement management and mitigation measures at the Moolarben Coal Complex in accordance with the Biodiversity Management Plan, including:

- implementation of a vegetation clearance protocol including delineation of areas to be cleared, pre-clearing surveys, management of impacts to fauna, vegetation clearance procedures, collection and reuse of habitat features, where feasible;
- clear demarcation of clearing zones to restrict access;
- preparation of Ground Disturbance Permits to be approved by the Environment and Community Manager prior to the commencement of clearing activities;
- management measures for weeds and pests; and
- topsoil removed during construction works would be stockpiled and used in rehabilitation areas.

The Biodiversity Management Plan would be updated, where necessary, to incorporate the OC4 South-West Modification.

4.4 SURFACE WATER RESOURCES

A Surface Water Assessment Review for the OC4 South-West Modification was undertaken by WRM Water & Environment (2015). The Surface Water Assessment Review is presented in Appendix D.

4.4.1 Background***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 and Bora Creek are tributaries of the Upper Goulburn River sub-catchment and flow along the western and northern boundaries of the Moolarben Coal Complex (Figure 16).

Wilpinjong Creek is a tributary of Wollar Creek sub-catchment and flows along the east and north-eastern boundaries of the Moolarben Coal Complex into Wollar Creek, before joining the Goulburn River approximately 26 km downstream of the Moolarben Coal Complex (Figure 1).

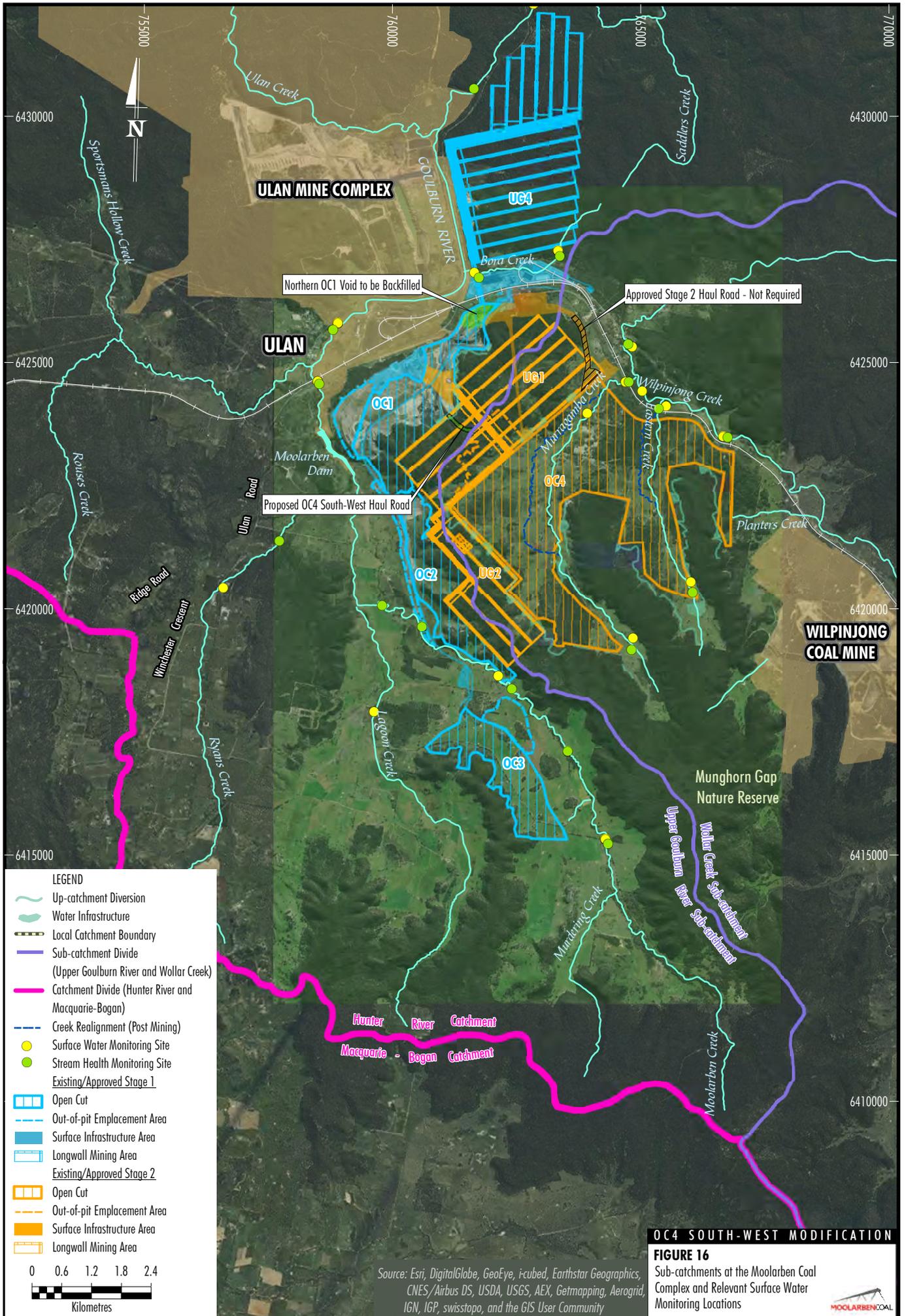
Site Water Management and Monitoring

Surface water monitoring and management at the Moolarben Coal Complex is conducted in accordance with the Water Management Plan, including Erosion and Sediment Control Plan, Surface Water Monitoring Program and Surface and Ground Water Response Plan⁶.

A review of the available surface water monitoring data conducted by WRM Water & Environment in 2013 concluded that the existing operations were not adversely affecting the quality of receiving waters (WRM Water & Environment, 2013).

The Moolarben Coal Complex surface water monitoring sites are shown on Figure 16.

⁶ On 30 January 2015, Stage 2 and Stage 1 Modification 3 of the Moolarben Coal Project were approved by the Planning Assessment Commission (as a delegate of the NSW Minister for Planning). To address the requirements of the Project Approvals (Attachments 1 and 2), MCO is preparing a complex-wide Water Management Plan.



4.4.2 Environmental Review

Site Water Management

A description of the water management system for the OC4 South-West Modification is described in Section 3.3.

WRM Water & Environment (2015) reviewed the site water balance for the OC4 South-West Modification. It was concluded there would be no significant change to the site water balance, given (Appendix D):

- The OC4 south-west haul road is located within a catchment area currently reporting to water storages in the approved water management system (i.e. there would be no increase in catchment area reporting to the water management system).
- The OC1 final void (to be backfilled) was not proposed to be used as a water storage in the currently approved water management system, and therefore, there would be no loss of water storage.

Stream Flows

The disturbance associated with the approved Stage 2 haul road would not be required as a result of the OC4 South-West Modification (i.e. 18.5 ha of disturbance would be avoided). Runoff from this area would no longer be required to be collected in the water management system. Therefore, the OC4 South-West Modification would result in a reduction in potential impacts to flows in Wilpinjong Creek (i.e. in comparison to the currently approved Moolarben Coal Complex) due to the reduction in catchment excision.

The OC1 final void would be backfilled to approximately pre-mining elevations creating a final landform that, following rehabilitation, would drain to Bora Creek and the Goulburn River. Therefore, the OC4 South-West Modification would also result in a reduction in potential impacts to flows in Bora Creek and the Goulburn River (i.e. in comparison to the currently approved Moolarben Coal Complex) due to the reduction in catchment excision in the long-term.

Surface Water Quality

Given no significant change to the site water balance is expected as a result of the OC4 South-West Modification (Appendix D), no change to the existing controlled release limits specified in EPL 12932 would be required. Therefore, no additional potential impacts to surface water quality in the receiving environment are expected as a result of the OC4 South-West Modification (Appendix D).

4.4.3 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 OC4 South-West Modification. Regular reviews of the site water balance would continue to be undertaken over the life of the Moolarben Coal Complex incorporating the OC4 South-West Modification.

4.5 GROUNDWATER RESOURCES

4.5.1 Background

A number of groundwater investigations, assessments and reviews have been undertaken since 2006 to assess the potential impacts of Stages 1 and 2 of the Moolarben Coal Complex. Recent groundwater assessments undertaken for the approved Moolarben Coal Complex include:

- Moolarben Coal Complex Stage 2 PPR Groundwater Impact Assessment November 2011 (RPS Aquaterra, 2012);
- Moolarben Coal Complex Stage 2 PPR Response to Submissions Additional Groundwater Impact Assessment (RPS Aquaterra, 2012); and
- Moolarben Coal Project Stage 1 Optimisation Modification Groundwater Assessment (AGE, 2013).

RPS Aquaterra (2012) predicted that drawdown impacts on privately-owned bores from the approved Moolarben Coal Complex would not exceed 0.6 m and therefore potential impacts to groundwater users would be minimal.

Groundwater monitoring and management at the Moolarben Coal Complex is conducted in accordance with the Water Management Plan, including the approved Surface and Ground Water Response Plan⁷.

The Moolarben Coal Complex groundwater monitoring sites are shown on Figure 6.

4.5.2 Environmental Review

The OC4 South-West Modification would not change the approved extent of the open cut pits or underground mines, or increase the maximum mining rate. Therefore, no increase in previously predicted groundwater inflow or drawdown is expected as a result of the OC4 South-West Modification.

Given the above, no additional water licence entitlements would be required as a result of the OC4 South-West Modification.

4.5.3 Mitigation Measures, Management and Monitoring

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

4.6 VISUAL

4.6.1 Background

A number of visual impact assessments have been prepared for the approved Moolarben Coal Complex including:

- Moolarben Coal Project Stage 1 Optimisation Modification Visual Impact Assessment (EMM, 2013c) which assessed the impacts of Stage 1 Modification 9.

Key potential viewpoints assessed in previous visual impact assessments for the Moolarben Coal Complex included Ulan, Ulan Road, Ulan-Wollar Road, Ridge Road, Moolarben Road, Winchester Crescent and Cope Road (Figure 17).

The level of visual impact of the approved mine from potential viewpoints varies with the progress of the open cuts. Views of the Moolarben Coal Complex are unimpeded from Ulan Road and Ulan-Wollar Road and include the approved out-of-pit emplacements, open cut pits, infrastructure and progressively rehabilitated mine landforms.

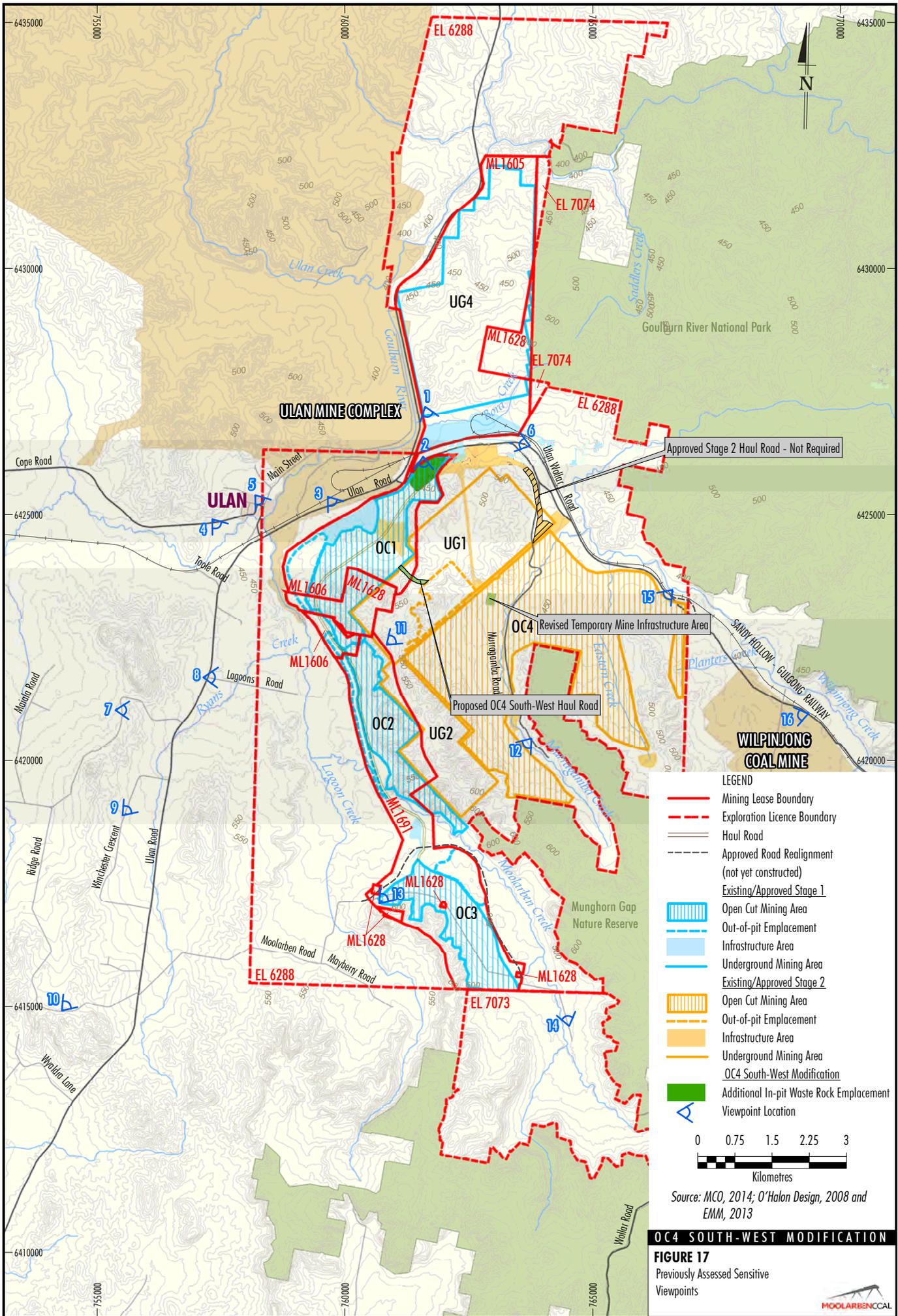
O'Hanlon Design (2006) concluded that viewpoints around the Stage 1 infrastructure area (e.g. from Ulan Road and Ulan-Wollar Road) would be significantly impacted by Stage 1 of the Moolarben Coal Complex (Figure 17). O'Hanlon Design (2006) concluded that potential impacts at viewpoints located further south and into the rural residential areas would be significantly lower due to the distance between the mine and receiver and shorter duration of impact.

O'Hanlon Design (2008) predicted that visual impacts from Stage 2 of the Moolarben Coal Complex would be generally equivalent of those predicted for Stage 1 with the exception of views of the OC4 pit from Ulan-Wollar Road.

EMM (2013c) predicted that the potential visual impacts of the approved Moolarben Coal Complex prior to the implementation of any management and mitigation measures would be slight to moderate at the majority of the 12 viewpoints assessed (Figure 17), with some residents along Ridge Road predicted to experience moderate to substantial potential visual impacts (EMM, 2013c). However, the assessment concluded that with the implementation of mitigation measures (e.g. vegetative screening), the potential visual impact would be reduced to an acceptable level at relevant sensitive receivers (EMM, 2013c).

A total of 16 viewpoints were assessed for Stages 1 and 2 of the Moolarben Coal Complex (Figure 17).

⁷ On 30 January 2015, Stage 2 and Stage 1 Modification 3 of the Moolarben Coal Project were approved by the Planning Assessment Commission (as a delegate of the NSW Minister for Planning). To address the requirements of the Project Approvals (Attachments 1 and 2), MCO is preparing a complex-wide Water Management Plan.



To ameliorate the visual impacts of Stage 1 of the Moolarben Coal Complex the following visual management measures have/will be implemented in accordance with the Stage 1 Project Approval Statement of Commitments (Attachment 1):

- Trees and shrubs would be planted to provide a visual screen:
 - to the switch and bore pads located adjacent to Saddlers Creek Road, where required.
 - along the southern edge of Cope Road, where views of OC1 Stage 1 Modification 9 extension areas would be possible, subject to landowner consent.
- The Rehabilitation Management Plan would be reviewed and updated to describe the measures that would be implemented to manage visual impacts associated with the OC1 and OC2 Stage 1 Modification 9 extension areas, such as:
 - vegetation screen planting, subject to landowner's consent, along the southern edge of Cope Road, in areas visually affected by direct views of the OC1 Stage 1 Modification 9 extension areas;
 - investigating the feasibility of targeted vegetation screen planting for affected properties along Ridge Road (with direct views from the residence to both OC1 and OC2 Stage 1 Modification 9 extension areas), to mitigate the visual and lighting impacts of OC1 and OC2 Stage 1 Modification 9 extension areas, subject to landowner consent;
 - building-up out-of-pit embankments first so that continued operations are obscured by the embankment. Wherever possible out-of-pit emplacements around the perimeter would be established first, providing a visual screen while work is undertaken in the central part of the emplacement;
 - seeding and grassing embankment outer faces visually exposed to private residents as soon as practically possible to soften the view;
 - where possible, maintaining a strip of vegetation along the leading face of the ridgeline associated with the OC1 Stage 1 Modification 9 extension area to provide a visual screen to workings for as long as practical;
- use of operational screening measures such as landform re-establishment sequencing and lighting management; and
- progressive rehabilitation.
- As far as practically possible, and where mine safety allows, management protocols would be established and implemented to:
 - locate mobile lighting plant to be directed away from private residences;
 - direct stationary lighting sources below the horizontal to minimise potential light spill;
 - design lighting systems that minimise light spillage; and
 - avoid lighting of light coloured surfaces that have greater reflectivity.

The following mitigation and management measures will also be implemented for Stage 2 of the Moolarben Coal Complex:

- progressive rehabilitation of disturbed areas;
- revegetation of existing cleared lands to increase the vegetation within the existing landscape;
- retaining existing vegetation around Stage 2 infrastructure areas and on road fringes of OC4 where it is not required to be cleared for safety purposes;
- construction of bunding and planting along the edge of Ulan-Wollar Road in areas where it abuts OC4; and
- operation of night lighting in accordance with AS 4282: 1997 - *Control of the Obtrusive Effects of Outdoor Lighting* and AS/NZS 1158: 2010 – *Lighting for Roads and Public Spaces*.

The progressive rehabilitation of disturbed areas and revegetation species selection would be described in the Rehabilitation Management Plan.

4.6.2 Environmental Review

A review of the potential visual impacts from the previously assessed sensitive viewpoints was undertaken for the OC4 South-West Modification (Figure 17). For each viewpoint, an assessment of intervening topography and vegetation was undertaken based on previous viewpoint simulations, landform contours and photos to determine whether there would be any views of the components of the OC4 South-West Modification from public or private vantage points.

A summary of potential visual impacts from the previously assessed viewpoints for the OC4 South-West Modification is provided in Table 4.

South-West Haul Road

The OC4 south-west haul road would be cut (up to approximately 5 m) into the ridgeline along the majority of its length, which would minimise direct views of the OC4 south-west haul road.

Therefore, it is unlikely that any previously assessed viewpoints or privately owned residences would have direct views of the proposed OC4 south-west haul road (Table 4 and Figure 17).

However, potential views of the proposed OC4 south-west haul road would likely be available from a small section of Ulan Road that is south of Ulan-Wollar Road and north of the OC1 Pit. The northern end of the OC4 south-west haul road disturbance area would be located approximately 1.6 km from the closest section of Ulan Road.

Where the limited views of the OC4 south-west haul road may be available, there would also be views of existing/approved mining infrastructure (e.g. OC1 pit and out-of-pit waste emplacement, OC1 workshop and ancillary infrastructure, Ulan Coal Mine CHPP and product stockpiles). As such, in consideration of this existing mining infrastructure, the level of visual modification associated with the OC4 south-west haul road would be minimal.

The OC4 south-west haul road connects two open cut mining areas approved to operate 24 hours per day (i.e. OC1 and OC4). As such, additional lighting requirements for the OC4 south-west haul road would be minor in comparison to the lighting requirements for the open pits and associated waste rock emplacement areas. As such, the scale and intensity of night-lighting for the OC4 South-West Modification would be similar to the approved Moolarben Coal Complex.

Following the completion of mining, the OC4 south-west haul road would be revegetated with woodland species, which would reduce any potential visual impacts in the long-term.

**Table 4
Summary of Visual Impacts**

Figure ID	Viewpoint Location	Significance of Approved Visual Impact (maximum during operations) ¹	Visual Impact with the OC4 South-West Modification
1	Ulan Road	High	Unchanged – direct views unlikely.
2	Ulan-Wollar Road (west)	High to very high	Unchanged.
3	Ulan Road	Moderate to high	Views of the OC4 south-west haul road from a small section of Ulan Road between VP2 and VP3 are likely.
4	Cope Road	Moderate	Unchanged – direct views unlikely.
5	Ulan	Moderate to high	Unchanged – direct views unlikely.
6	Ulan-Wollar Road (rail loop and CHPP area)	High to very high	Unchanged – direct views unlikely.
7	Ridge Road (north)	Moderate to very high	Unchanged – direct views unlikely.
8	Ulan Road (at Lagoons Road)	Slight	Unchanged – direct views unlikely.
9	Winchester Avenue	Moderate	Unchanged – direct views unlikely.
10	Ridge Road (south)	Low	Unchanged – direct views unlikely.
11	Carrs Gap Road ²	High	N/A
12	Murragamba Valley ²	High to very high	N/A
13	Moolarben Road (west)	High to very high	Unchanged – direct views unlikely.
14	Moolarben Road (south)	High to very high	Unchanged – direct views unlikely.
15	Ulan-Wollar Road (OC4 pit)	Moderate to high	Unchanged – direct views unlikely.
16	Ulan-Wollar Road (south)	Moderate to high	Unchanged – direct views unlikely.

Note 1: Maximum visual impact assessed under the Stage 1 and Stage 2 Moolarben Coal Project Visual & Lighting Impact Assessment (O'Hanlon Design, 2006; 2008) and/or Stage 1 Modification 9 Visual Impact Assessment (EMM, 2013c).

Note 2: Road currently subject to road closure application.

Backfilled OC1 Pit

The OC1 pit final void would be backfilled to approximately pre-mine levels and revegetated with Box Gum Woodlands and Sedimentary Ironbark Forests with stands of *Allocasurina*. As such, the backfilling of the OC1 final void would reduce potential visual impacts in the long-term (i.e. in comparison to the currently approved OC1 final void).

4.6.3 Mitigation Measures, Management and Monitoring

The mitigation and management measures described in Section 4.6.1 would continue to be implemented at the Moolarben Coal Complex incorporating the OC4 South-West Modification.

4.7 ABORIGINAL HERITAGE

4.7.1 Background

An Aboriginal Cultural Heritage Assessment (ACHA) was prepared for the OC4 South-West Modification by Niche Environment and Heritage (2015) and is presented in Appendix E.

The ACHA for the OC4 South-West Modification has been undertaken in consideration of the following codes and guidelines (Appendix E):

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

Previous Archaeological Investigations

A number of Aboriginal cultural heritage surveys, assessments and salvage programmes have been undertaken within the Moolarben Coal Complex and surrounds.

Key Aboriginal cultural heritage surveys and assessments were undertaken for Stages 1 and 2 of the Moolarben Coal Project in 2006, 2008, 2011 and 2012 (Archaeological Risk Assessment Services, 2006, 2008; AECOM, 2011; South East Archaeology, 2013). Various other minor surveys and assessment 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.

At the time of drafting the ACHA (Appendix E), a total of 531 Aboriginal sites had been identified at the Moolarben Coal Complex and surrounds, including artefact scatters, isolated finds, potential archaeological deposits, grinding grooves, ochre quarries, scarred trees and rock shelters (with or without artefacts, art and/or grinding grooves) (Appendix E).

The management of Aboriginal heritage at the Moolarben Coal Complex is currently conducted in accordance with the measures outlined in the Aboriginal Heritage Management Plan (Stage 1)⁸.

4.7.2 Environmental Review

Consultation

The ACHA included consultation with eight Registered Aboriginal Parties, identified via a registration process consistent with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a) (Appendix E). Participation of Registered Aboriginal Parties in the field surveys was in accordance with the existing engagement system in place at the Moolarben Coal Complex.

Consultation with Registered Aboriginal Parties regarding the existing Moolarben Coal Complex has been extensive and involved various methods of communication including public notices, meetings, written and verbal correspondence, archaeological survey attendance and site inspections.

A detailed description of the consultation undertaken for the OC4 South-West Modification is provided in Appendix E.

Desktop Review

An AHIMS search was undertaken in February 2014 (Appendix E) for the OC4 South-West Modification disturbance area and surrounds. This search identified no Aboriginal sites located within the OC4 South-West Modification disturbance area.

⁸ On 30 January 2015, Stage 2 and Stage 1 Modification 3 of the Moolarben Coal Project were approved by the Planning Assessment Commission (as a delegate of the NSW Minister for Planning). To address the requirements of the Project Approvals (Attachments 1 and 2), MCO is preparing a complex-wide Heritage Management Plan.

Archaeological Survey Design

Archaeological surveys of the OC4 South-West Modification disturbance area were undertaken in consultation with the Registered Aboriginal Parties in March and July 2014.

Archaeological Findings

No Aboriginal objects were identified during either the March 2014 or July 2014 surveys.

Archaeological and Cultural Heritage Values

There were no specific areas or places of cultural value identified by the Registered Aboriginal Parties during the archaeological survey undertaken for the OC4 South-West Modification. Previous assessments and surveys have identified and documented cultural values for the Moolarben Coal Complex and surrounds, which are documented in Appendix E.

Potential Impacts

The OC4 South-West Modification would not impact known Aboriginal archaeological or cultural heritage values (Appendix E).

The approved Stage 2 haul road that would be avoided as a result of the OC4 South-West Modification would have impacted a single Aboriginal site (AECOM, 2011). As a result of the OC4 South-West Modification, this site would no longer be impacted.

4.7.3 Management and Mitigation Measures

MCO would implement the management and mitigation measures described in Appendix E and the Heritage Management Plan, including monitoring and management measures to be implemented during the construction of the OC4 South-West Modification.

4.8 OTHER ENVIRONMENTAL ASPECTS

4.8.1 LAND RESOURCES

Site Inspection and Surveys

Site inspections and soil surveys were conducted in May and October 2014 and January 2015 to support a site verification certificate application for an area that included the OC4 South-West Modification disturbance area. Twenty-two soil test pits were surveyed, including nine detailed soil samples which were sent for laboratory analysis (Attachment 3).

The soil samples were assessed against the BSAL criteria in accordance with the *NSW Government Interim Protocol for Site Verification and Mapping of BSAL* (Interim Protocol) (NSW Government, 2013) and lodged in July 2014, November 2014 and February 2015. The soil sampling, visual observations and laboratory analysis indicated no sites met the BSAL criteria.

Therefore, Dr McKenzie (McKenzie Soil Management, 2014) concluded that the site verification certificate application area, which included the OC4 South-West Modification disturbance area, is not BSAL.

A site verification certificate was granted on 31 March 2015 verifying that the OC4 South-West Modification disturbance area is not BSAL. The site verification certificate is provided in Attachment 3.

Potential Impacts

The OC4 South-West Modification would result in the disturbance of approximately 5.1 ha of woodland. The disturbed areas would be rehabilitated with woodland vegetation.

As no BSAL is located within the OC4 South-West Modification disturbance area, and given no agricultural activities are currently undertaken in this area, there would be no impact to agricultural productivity as a result of the OC4 South-West Modification.

Mitigation Measures, Management and Monitoring

Land resource mitigation measures, management and monitoring would be conducted in accordance with an approved MOP and Rehabilitation and Offset Management Plan.

Rehabilitation of the Moolarben Coal Complex incorporating the OC4 South-West Modification is described in Section 3.8.

4.8.2 Blasting

As there would be no change to blast locations, sizes or frequencies as a result of the OC4 South-West Modification, there would be no additional blast impacts. Blasting would continue to be managed and monitored in accordance with the Blast Management Plan.

4.8.3 Greenhouse Gas Emissions

MCO calculates and reports annual greenhouse gas emissions and energy consumption from the Moolarben Coal Complex in accordance with the existing requirements of the Commonwealth National Greenhouse and Energy Reporting System (NGERS).

No material change to annual greenhouse gas emissions from the Moolarben Coal Complex is expected as a result of the OC4 South-West Modification.

Annual reporting of greenhouse gas emissions from the Moolarben Coal Complex would continue in accordance with the NGERS requirements, and the existing abatement measures would continue to be implemented.

4.8.4 Non-Aboriginal Heritage

Non-Aboriginal Heritage Assessments were prepared for Stages 1 and 2 of the Moolarben Coal Project. Collectively, these studies assessed the impacts associated with the Moolarben Coal Complex disturbance areas, including the OC4 South-West Modification disturbance area.

Previous surveys conducted in 2005 and 2008 (Wells Environmental Services, 2006 & 2008) did not identify any non-Aboriginal heritage sites in the OC4 South-West Modification disturbance area. Therefore, the OC4 South-West Modification is not considered likely to impact on non-Aboriginal heritage.

MCO would continue to implement its approved Heritage Management Plan⁹ at the Moolarben Coal Complex incorporating the OC4 South-West Modification.

4.8.5 Road Transport

There would be no change to the Moolarben Coal Complex operational workforce or ongoing deliveries to the Moolarben Coal Complex due to the OC4 South-West Modification. Accordingly there would be no change to road traffic movements generated by the Moolarben Coal Complex, and there would be no additional impacts on the capacity, condition, safety or efficiency of the surrounding road network due to the OC4 South-West Modification.

4.8.6 Aquatic Ecology

No threatened fauna listed under the NSW *Fisheries Management Act, 1994* are likely to be affected by the OC4 South-West Modification as there is no aquatic habitat within the OC4 South-West Modification disturbance area, and ephemeral watercourses nearby the OC4 South-West Modification disturbance area are unlikely to provide potential aquatic habitat.

4.8.7 Hazard and Risk

Preliminary Hazard Analyses (PHAs) were conducted for the Stage 1 Modification 9 EA and the Stage 2 PPR to assess the potential hazard and risk associated with the approved Moolarben Coal Complex. It is considered that the OC4 South-West Modification would not change the existing potential risks or hazard consequences identified in the PHAs as the proposed activities associated with the OC4 South-West Modification (e.g. open cut mining activities, transport to site and on-site storage) are consistent with those for the approved Moolarben Coal Complex.

⁹ On 30 January 2015, Stage 2 and Stage 1 Modification 3 of the Moolarben Coal Project were approved by the Planning Assessment Commission (as a delegate of the NSW Minister for Planning). To address the requirements of the Project Approvals (Attachments 1 and 2), MCO is preparing a complex-wide Heritage Management Plan.

5 STATUTORY CONTEXT

This section outlines the statutory requirements relevant to the assessment of the OC4 South-West Modification. It also provides a consideration of the OC4 South-West Modification against the objects of the EP&A Act.

5.1 GENERAL STATUTORY CONSIDERATIONS

5.1.1 State Legislation

Environmental Planning and Assessment Act, 1979

The Moolarben Coal Project Stage 1 was approved under Part 3A of the EP&A Act by the NSW Minister for Planning on 24 October 2007 (Project Approval (05_0117) [Attachment 1]). The Moolarben Coal Project Stage 2 was approved under Part 3A of the EP&A Act by the Planning Assessment Commission (as a delegate to the NSW Minister for Planning) on 30 January 2015 (Project Approval 08_0135 [Attachment 2]).

The Moolarben Coal Project Stage 1 and Stage 2 are 'transitional Part 3A projects' under clause 2 of Schedule 6A of the EP&A Act and therefore section 75W of the EP&A Act continues to apply to modifications to Project Approvals (05_0117 and 08_0135), despite its repeal¹⁰.

As outlined in Section 1.4, MCO consulted with the DP&E in May 2014 with regards to seeking the necessary approvals for the OC4 South-West Modification and based on this consultation, this EA has been prepared under section 75W of the EP&A Act.

Section 75W of the EP&A Act states:

75W Modification of Minister's Approval

(1) *In this section:*

Minister's approval means an approval to carry out a project under this Part, and includes an approval of a concept plan.

Modification of approval means changing the terms of a Minister's approval, including:

(a) *revoking or varying a condition of the approval or imposing an additional condition of the approval, and*

(b) *changing the terms of any determination made by the Minister under Division 3 in connection with the approval.*

(2) *The proponent may request the Minister to modify the Minister's approval for a project. The Minister's approval for a modification is not required if the project as modified will be consistent with the existing approval under this Part.*

(3) *The request for the Minister's approval is to be lodged with the Director-General. The Director-General may notify the proponent of environmental assessment requirements with respect to the proposed modification that the proponent must comply with before the matter will be considered by the Minister.*

(4) *The Minister may modify the approval (with or without conditions) or disapprove of the modification.*

...

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. As noted above, the OC4 South-West Modification is to be assessed under section 75W (Part 3A) of the EP&A Act.

Section 5 of the EP&A Act describes the objects of the EP&A Act as follows:

(a) *to encourage:*

(i) *the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*

(ii) *the promotion and co-ordination of the orderly and economic use and development of land,*

(iii) *the protection, provision and coordination of communication and utility services,*

(iv) *the provision of land for public purposes,*

(v) *the provision and co-ordination of community services and facilities, and*

(vi) *the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*

¹⁰ Part 3A of the EP&A Act (as in force immediately before its repeal) continues to apply for the Moolarben Coal Complex. The description and quotations of relevant references to clauses of Part 3A in this document are as if Part 3A of the EP&A Act is still in force.

- (vii) *ecologically sustainable development, and*
- (viii) *the provision and maintenance of affordable housing, and*
- (b) *to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and*
- (c) *to provide increased opportunity for public involvement and participation in environmental planning and assessment.*

The OC4 South-West Modification is considered to be generally consistent with the objects of the EP&A Act, because it is a modification that:

- incorporates measures for the management and conservation of natural resources (Section 4);
- would enable more efficient integration of mining operations across the complex;
- would not affect the ongoing provision of community services and facilities;
- would result in no significant impact on threatened species, population and ecological communities or their habitats;
- allows continued development of the State's mineral resources (i.e. coal resources) in a manner that minimises environmental impacts through the implementation of the Moolarben Coal Complex Environmental Management Strategy (Section 2.15) and other measures (Section 4); and
- involves public involvement and participation through consultation activities (Section 1.4), which would be ongoing following the public exhibition of this EA document and DP&E assessment of the OC4 South-West Modification in accordance with the requirements of the EP&A Act.

5.1.2 Other State Legislation

In addition to the EP&A Act, the following NSW Acts may be applicable to the Moolarben Coal Complex, incorporating the OC4 South-West Modification:

- *Crown Lands Act, 1989;*
- *Fisheries Management Act, 1994;*
- *Heritage Act, 1977;*
- *Mine Subsidence Compensation Act, 1961;*
- *Mining Act, 1992;*
- *National Parks and Wildlife Act, 1974 (NPW Act);*

- *Native Vegetation Act, 2003;*
- *Protection of the Environment Operations Act, 1997 (PoEO Act);*
- *Roads Act, 1993;*
- *TSC Act;*
- *Water Act, 1912;*
- *Water Management Act, 2000;*
- *Work Health and Safety Act, 2011; and*
- *Work Health and Safety (Mines) Act, 2013.*

Relevant licences or approvals required under these Acts would continue to be obtained for the Moolarben Coal Complex as required. Key plans, licences and agreements that would require revision to incorporate the OC4 South-West Modification are outlined in Section 5.3.

Additional detail on the likely requirements under some of these key Acts is provided in the subsections below.

Mining Act, 1992

MCO applied for Mining Lease Application (MLA) 327 on 20 March 2009. MCO applied for MLA 331 on 21 April 2009. The grant of MLA 327 and MLA 331 would be required for the OC4 South-West Modification.

Under the *Mining Act, 1992*, environmental protection and rehabilitation are regulated by conditions of MLs, including requirements for the submission of a MOP prior to the commencement of operations, and subsequent AEMRs (or Annual Reviews).

The Moolarben Coal Complex MOP would be updated to include the proposed layout of the OC4 South-West Modification prior to the commencement of OC4 (Section 5.3).

Protection of the Environment Operations Act, 1997

Construction and operations at the Moolarben Coal Complex are currently undertaken in accordance with an existing EPL 12932 issued under the PoEO Act.

If required, any variations to existing EPL 12932 for the OC4 South-West Modification would be undertaken in consultation with the EPA.

Water Management Act, 2000 and Water Act, 1912

The *Water Management Act, 2000* and the *Water Act, 1912* contain provisions for the licensing, allocation, capture and use of water resources. Under the *Water Management Act, 2000*, water sharing plans are being introduced for water sources. Water sharing plans establish rules for sharing water between different users (including the environment).

Licensing requirements under the *Water Management Act, 2000* and *Water Act, 1912* were evaluated as a component of the Stage 1 Modification 9 EA and Stage 2 PPR EA.

The OC4 South-West Modification would not involve any increase in pit inflows, water demand or mining rate, and hence no additional water licence entitlements would be required as a result of the OC4 South-West Modification (Section 4.5).

MCO would continue to obtain and hold sufficient licences required under the *Water Management Act, 2000* and *Water Act, 1912*.

National Parks and Wildlife Act, 1974

The NPW Act contains provisions for the protection and management of national parks, historic sites, nature reserves and Aboriginal heritage in NSW.

Section 75U(1) of the EP&A Act outlines authorisations that are not required for a transitional Part 3A project, such as the Moolarben Coal Complex. An Aboriginal heritage impact permit under section 90 of the NPW Act is not required for the Moolarben Coal Complex, including the OC4 South-West Modification.

Notwithstanding, an ACHA for the OC4 South-West Modification has been undertaken in consultation with Registered Aboriginal Parties in accordance with the existing engagement system in place at the Moolarben Coal Complex (Section 4.7).

Heritage Act, 1977

The *Heritage Act, 1977* regulates the conservation of items listed on the State Heritage Register or subject to an interim heritage order.

No items on the State Heritage Register or subject to an interim heritage order have been identified within the OC4 South-West Modification development areas (Section 4.8.4), therefore the *Heritage Act, 1977* is not relevant to the OC4 South-West Modification.

Threatened Species Conservation Act, 1995

The TSC Act protects threatened species and provides a framework for the assessment of a development's impacts on threatened species and ecological communities.

The potential impact of the OC4 South-West Modification on threatened species, populations and ecological communities was assessed as part of the Flora and Fauna Impact Assessment (Appendix C). Ecological (2015) concluded the OC4 South-West Modification would not have a significant impact on threatened species, populations and ecological communities with the implementation of the proposed management measures (Sections 4.3).

There would be an overall reduction in the disturbance area of approximately 13.4 ha due to the OC4 South-West Modification (Section 4.3.2).

5.1.3 Environmental Planning Instruments

The Stage 1 EA and Stage 2 PPR EA provided a detailed consideration of the Moolarben Coal Complex against State environmental planning policies and local environmental plans.

State environmental planning policies and local environmental plans that may be relevant to the OC4 South-West Modification are discussed below.

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) regularises the various environmental planning instruments that previously controlled mining activities.

Part 3 of the Mining SEPP outlines the matters to be considered when determining development applications. 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).*
- (b) *any advice by the Director-General of the Department of Trade and Investment, Regional Infrastructure and Services as to the relative significance of the resource in comparison with other mineral resources across the State.*
- (2) *The following matters are (without limitation) taken to be relevant for the purposes of subclause (1) (a):*
 - (a) *employment generation,*
 - (b) *expenditure, including capital investment,*
 - (c) *the payment of royalties to the State.*
- (3) *The Director-General of the Department of Trade and Investment, Regional Infrastructure and Services is, in providing advice under subclause (1) (b), to have regard to such matters as that Director-General considers relevant, including (without limitation):*
 - (a) *the size, quality and availability of the resource that is the subject of the application, and*
 - (b) *the proximity and access of the land to which the application relates to existing or proposed infrastructure, and*
 - (c) *the relationship of the resource to any existing mine, and*
 - (d) *whether other industries or projects are dependent on the development of the resource.*

The OC4 south-west haul road is located within the Application Areas in Project Approvals (05_0117 and 08_0135), and connects to approved open pits (i.e. OC1 and OC4). As such, the OC4 south-west haul road is compatible with the existing land use (i.e. coal mining).

The backfilling of the northern OC1 final void would improve compatibility with surrounding land-uses, as this area would be returned to approximately pre-mining levels.

No additional potential impacts to land-uses outside the Application Areas in Project Approvals (05_0117 and 08_0135) are expected due to the OC4 South-West Modification (e.g. no additional impacts associated with noise, air quality, visual amenity or groundwater [Section 4]).

Clause 12AA

Clause 12AA of the Mining SEPP requires:

- (1) *In determining an application for consent for development for the purposes of mining, the consent authority must consider the significance of the resource that is the subject of the application, having regard to:*
 - (a) *the economic benefits, both to the State and the region in which the development is proposed to be carried out, of developing the resource, and*
- (4) *In determining whether to grant consent to the proposed development, the significance of the resource is to be the consent authority's principal consideration under this Part.*
- (5) *Accordingly, the weight to be given by the consent authority to any other matter for consideration under this Part is to be proportionate to the importance of that other matter in comparison with the significance of the resource.*
- (6) *To avoid doubt, the obligations of a consent authority under this clause extend to any application to modify a development consent.*

The proposed OC4 South-West Modification would enable more efficient integration of mining operations at the Moolarben Mining Complex.

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, programmes or guidelines concerning greenhouse gas emissions.

The potential impacts of the OC4 South-West Modification on groundwater and surface water resources are discussed in Sections 4.4 and 4.5, including measures to minimise potential impacts which are described in Sections 4.4.3 and 4.5.3. The potential impacts of the OC4 South-West Modification on threatened species and biodiversity are described in Section 4.3, including measures to minimise potential impacts which are described in Sections 4.3.3.

Existing greenhouse gas abatement measures at the Moolarben Coal Complex and the potential increase in greenhouse gas emissions associated with the OC4 South-West Modification are described in Section 4.8.3.

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.*

The proposed OC4 South-West Modification would enable more efficient integration of mining operations across at the Moolarben Mining Complex.

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.*

The approved rehabilitation objectives and concepts for the OC4 South-West Modification would remain generally unchanged.

Backfilling of the OC1 final void to approximately pre-mine levels would provide a beneficial post-mining rehabilitation outcome as the backfilled final void would improve compatibility with the surrounding landform and reduce the amount of surface water captured on-site post-mining.

The Rehabilitation Management Plan and MOP would be revised to incorporate the OC4 South-West Modification.

**State Environmental Planning Policy No. 33
(Hazardous and Offensive Development)**

Clause 13 of SEPP 33 requires the consent authority, in considering a Development Application for a potentially hazardous or a potentially offensive industry, to take into account:

- (c) *in the case of development for the purpose of a potentially hazardous industry—a preliminary hazard analysis prepared by or on behalf of the applicant, and*
- (d) *any feasible alternatives to the carrying out of the development and the reasons for choosing the development the subject of the application (including any feasible alternatives for the location of the development and the reasons for choosing the location the subject of the application)...*

The OC4 South-West Modification would not change existing potential risks or hazard consequences as the proposed activities associated with the OC4 South-West Modification are consistent with those for the approved Moolarben Coal Complex (Section 4.8.7).

Notwithstanding, environmental management plans and monitoring programs would be reviewed, and if necessary, revised by MCO to include the OC4 South-West Modification and manage any associated environmental risks.

**State Environmental Planning Policy No. 44
(Koala Habitat Protection)**

SEPP 44 requires the consent authority for any Development Application in certain LGAs to consider whether land subject to a Development Application is "potential Koala habitat" or "core Koala habitat".

EcoLogical Australia (Appendix C) considers the OC4 South-West Modification disturbance area comprises potential Koala habitat, but does not comprise core Koala habitat.

**State Environmental Planning Policy No. 55
(Remediation of Land)**

SEPP 55 aims to provide a State-wide planning approach to the remediation of contaminated land. Under SEPP 55, planning authorities are required to consider the potential for contamination to adversely affect the suitability of the site for its proposed use.

Under clause 7(2), before determining an application for consent to carry out development that would involve a change of use of land, the consent authority must consider a report specifying the findings of a preliminary investigation of the land concerned, carried out in accordance with the contaminated land planning guidelines.

Because the OC4 South-West Modification is within the Project Application Areas in Project Approvals (05_0117 and 08_0135), no change of use is proposed and no preliminary land contamination investigation is required.

Mid-Western Regional Local Environmental Plan 2012

The Moolarben Coal Complex is located wholly within the Mid-Western Regional LGA and is covered by the *Mid-Western Regional Local Environmental Plan 2012* (MWR LEP).

Clause 2.3(2) of the MWR LEP relevantly provides:

The consent authority must have regard to the objectives for development in a zone when determining a development application in respect of land within the zone.

As outlined above, the consent authority for transitional Part 3A projects is the Minister for Planning.

The approved Stage 1 and Stage 2 of the Moolarben Coal Complex were considered by the relevant consent authorities to be consistent with the land-use objectives of the MWR LEP.

The OC4 South-West Modification would not change land-use within the Application Areas in Project Approvals (05_0117 and 08_0135), and therefore, would also be consistent with the land-use objectives of the MWR LEP.

5.1.4 Commonwealth Legislation

The current Stage 1 mining operations are undertaken in accordance with Approval Decisions (EPBC 2007/3297) granted on 24 October 2007 (and varied by notice on 25 February 2009 and 11 May 2010) and (EPBC 2013/6926) granted on 13 November 2014 under the EPBC Act.

A Variation of Proposal to take Action (EPBC 2008/4444) under the EPBC Act for Moolarben Coal Project (Stage 2) was accepted on 26 April 2012. The Variation of Proposal to take Action (EPBC 2008/4444) requires separate approval under the EPBC Act.

The potential impacts of the OC4 South-West Modification on flora and fauna have been assessed in Appendix C and summarised in Section 4.3. The assessment indicates that there would be no significant impact on threatened species, populations and communities and migratory species listed under the EPBC Act as a result of the OC4 South-West Modification.

The OC4 South-West Modification would result in a reduction to the total surface disturbance footprint (i.e. the proposed area to be avoided [18.5 ha] would be larger than the new surface disturbance [5.1 ha]).

It is expected the OC4 South-West Modification would reduce potential impacts to water resources (i.e. in comparison to the currently approved Moolarben Coal Complex) (Sections 4.4 and 4.5).

5.2 NSW GOVERNMENT POLICY

5.2.1 Strategic Regional Land Use Plan

As part of the Strategic Regional Land Use Policy, the NSW Government has introduced a 'Gateway Process' for the upfront assessment of the impacts of State Significant mining and coal seam gas proposals on Strategic Agricultural Land (NSW Government, 2012b).

The Strategic Regional Land Use Policy and the 'Gateway Process' apply to new State Significant Development applications or modifications for mining projects located outside of existing mining lease areas (NSW Government, 2012b).

MLA 327 and MLA 331 have not been granted for the area that covers the OC4 South-West Modification disturbance area and therefore the Gateway Process and Strategic Regional Land Use Policy have been considered for the OC4 South-West Modification.

The Upper Hunter Strategic Regional Land Use Plan does not map any Strategic Agricultural Land in the OC4 South-West Modification disturbance area.

Soil surveys in the OC4 South-West Modification disturbance area were undertaken in May and October 2014 and January 2015 to assess the land against the *Interim Protocol for site verification and mapping of biophysical strategic agricultural land* (NSW Government, 2013).

A site verification certificate issued on 31 March 2015 (Attachment 3) verified the OC4 South-West Modification disturbance area as non-BSAL.

5.2.2 Aquifer Interference Policy

The AIP (NSW Government, 2012c) has been developed by the NSW Government as a component of the NSW Government's Strategic Regional Land Use Policy. The AIP applies Statewide and details water licence and impact assessment requirements.

The AIP has been developed to ensure equitable water sharing between various water users and proper licensing of water taken by aquifer interference activities such that the take is accounted for in the water budget and water sharing arrangements. The AIP will also enhance existing regulation, contributing to a comprehensive framework to protect the rights of all water users and the environment in NSW.

The *Water Management Act, 2000* defines an aquifer interference activity as that which involves any of the following:

- *the penetration of an aquifer;*
- *the interference with water in an aquifer;*
- *the obstruction of the flow of water in an aquifer;*
- *the taking of water from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations; and*
- *the disposal of water taken from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations.*

The OC4 South-West Modification would not involve any increase in pit inflows, water demand or mining rate, and hence no additional water licence entitlements would be required as a result of the OC4 South-West Modification (Section 4.5). One of the two approved voids within OC1 would be backfilled under the OC4 South-West Modification. The OC4 South-West Modification would not result in any additional interference with the groundwater aquifers (Section 4.5) and therefore the AIP has not been considered any further.

MCO would continue to hold licence entitlements to account for the water-take as required.

5.3 APPROVALS, LICENCES AND PLANS

5.3.1 Project Approval Conditions

Condition 32, Schedule 3 of Project Approval (05_0117) (Attachment 1) includes a water management performance measure to line the Ulan Seam sub-crop of the northern OC1 final void with a suitably lined material to comply with a permeability standard of less than 1×10^{-9} m/s.

MCO is seeking to remove Condition 32, Schedule 3 of Project Approval (05_0117) as a component of the OC4 South-West Modification (Section 3.8.1).

In addition to the above, the following components of the Project Approvals would require amendment to incorporate the proposed layout of the OC4 South-West Modification:

- Appendix 2 (General Layout of Project) of Project Approval (05_0117);
- Appendix 2 (General Layout of Project) of Project Approval (08_0135);
- Appendix 8 (Aboriginal Heritage) of Project Approval (08_0135); and
- Appendix 10 (Rehabilitation Plan) of Project Approval (08_0135).

5.3.2 Management/Monitoring Plans

Some management plans may require revision to reflect updated environmental management measures or changes to Project Approval conditions resulting from the OC4 South-West Modification.

These are expected to include the Rehabilitation Management Plan, Water Management Plan, Heritage Management Plan, Noise Management Plan and Air Quality Management Plan.

5.3.3 Mining Operations Plan

The Moolarben Coal Complex MOP would be updated to include the proposed layout of the OC4 South-West Modification prior to the commencement of OC4 (Section 5.3.1).

6 REFERENCES

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