



Moolarben Coal Complex Open Cut Optimisation Modification

Environmental Assessment

EXECUTIVE SUMMARY



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This Environmental Assessment has been prepared for Moolarben Coal Operations Pty Ltd (MCO) for the Moolarben Coal Complex Open Cut Optimisation Modification (the Modification).

ES1 BACKGROUND

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

MCO is the operator of the Moolarben Coal Complex on behalf of the Moolarben Joint Venture. MCO is a wholly owned subsidiary of Yancoal Australia Limited.

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 ES-2).

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

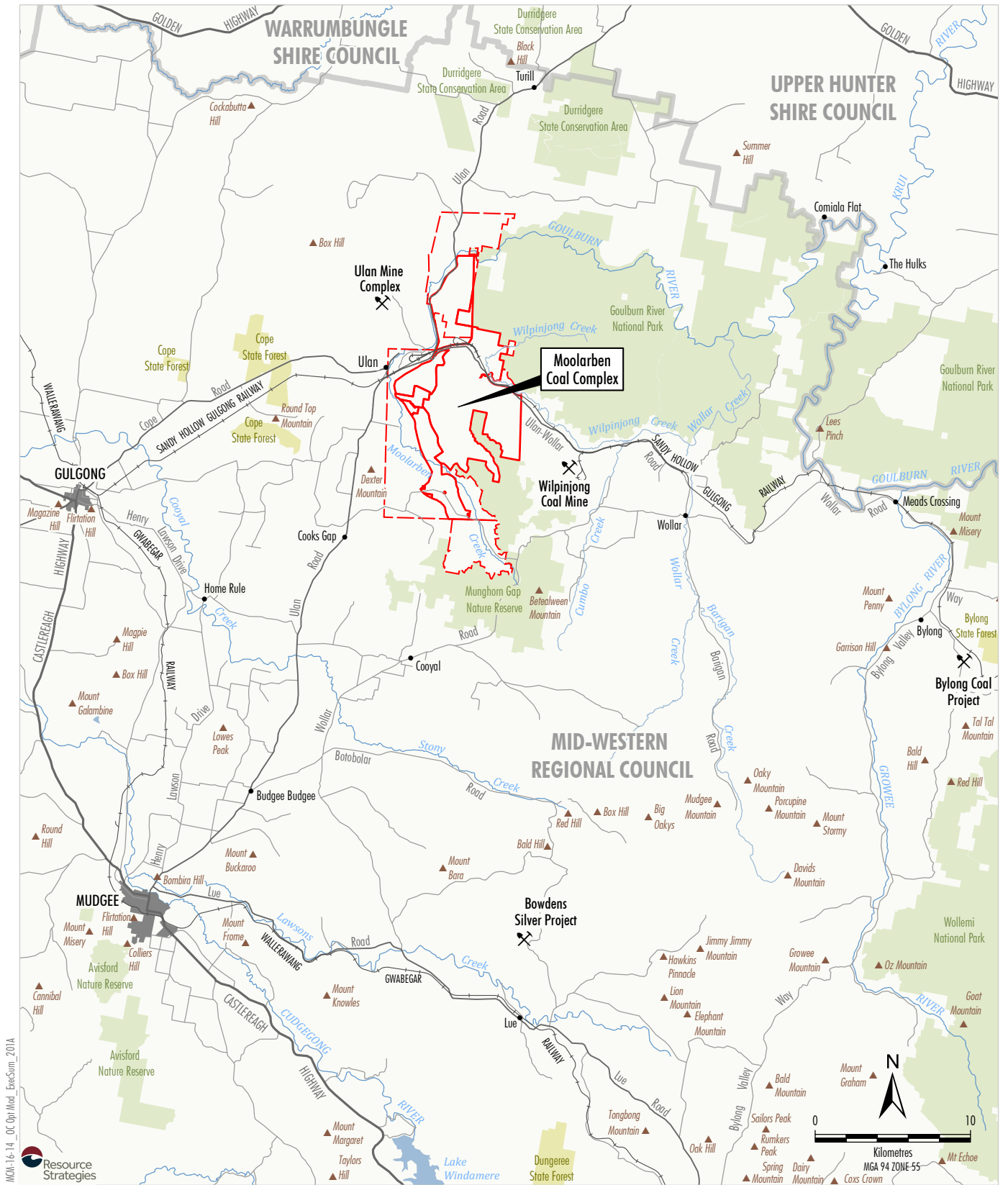
This Environmental Assessment has been prepared to:

- support requests 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*;
- address Secretary's Environmental Assessment Requirements issued for the Modification by the NSW Department of Planning and Environment; and
- address Commonwealth Department of the Environment and Energy assessment requirements (as relevant components of the Modification were referred to the Commonwealth and are a 'controlled action' under the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999*).

ES2 MODIFICATION OVERVIEW

The Modification involves optimisations to approved operations at the Moolarben Coal Complex. The key elements of the Modification include:

- Increased annual run-of-mine (ROM) coal production from the open cuts:
 - from 8 to 10 million tonnes per annum (Mtpa) from the Stage 1 open cuts (OC1, OC2 and OC3 [combined]);
 - from 12 to 16 Mtpa from the Stage 2 open cut (OC4); and
 - from 13 to 16 Mtpa from the Stage 1 and Stage 2 open cuts combined.
- Associated increases to the following:
 - increase from 13 to 16 Mtpa in the coal processing (washing) limit;
 - increase from 21 to 24 Mtpa in the combined open cut and underground ROM coal limit;
 - increase from 18 to 22 Mtpa in the product coal limit; and
 - increase in daily product coal rail movements (one additional train on average and two additional trains at peak).
- Additional surface disturbance associated with (Figure ES-2):
 - minor extensions to the OC2 pit limit;
 - minor extensions and minor reductions of the OC3 open cut pit limit;
 - relocated/additional OC3 surface infrastructure;
 - internal road between OC2 and OC4; and
 - construction of a bypass conveyor system for open cut ROM coal.
- Other minor changes to surface infrastructure within the extent of approved development.
- Rehabilitating portions of OC2 and OC3 to native vegetation rather than agricultural land.
- Installation of water treatment facilities and associated infrastructure adjacent to the existing rail loop.
- Relocation of a current licensed discharge point, piping of water from the proposed water treatment facility to the relocated discharge point and an associated increase in the peak volume of water released via licensed discharge from 10 to 20 megalitres per day (ML/d).



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Resource Strategies

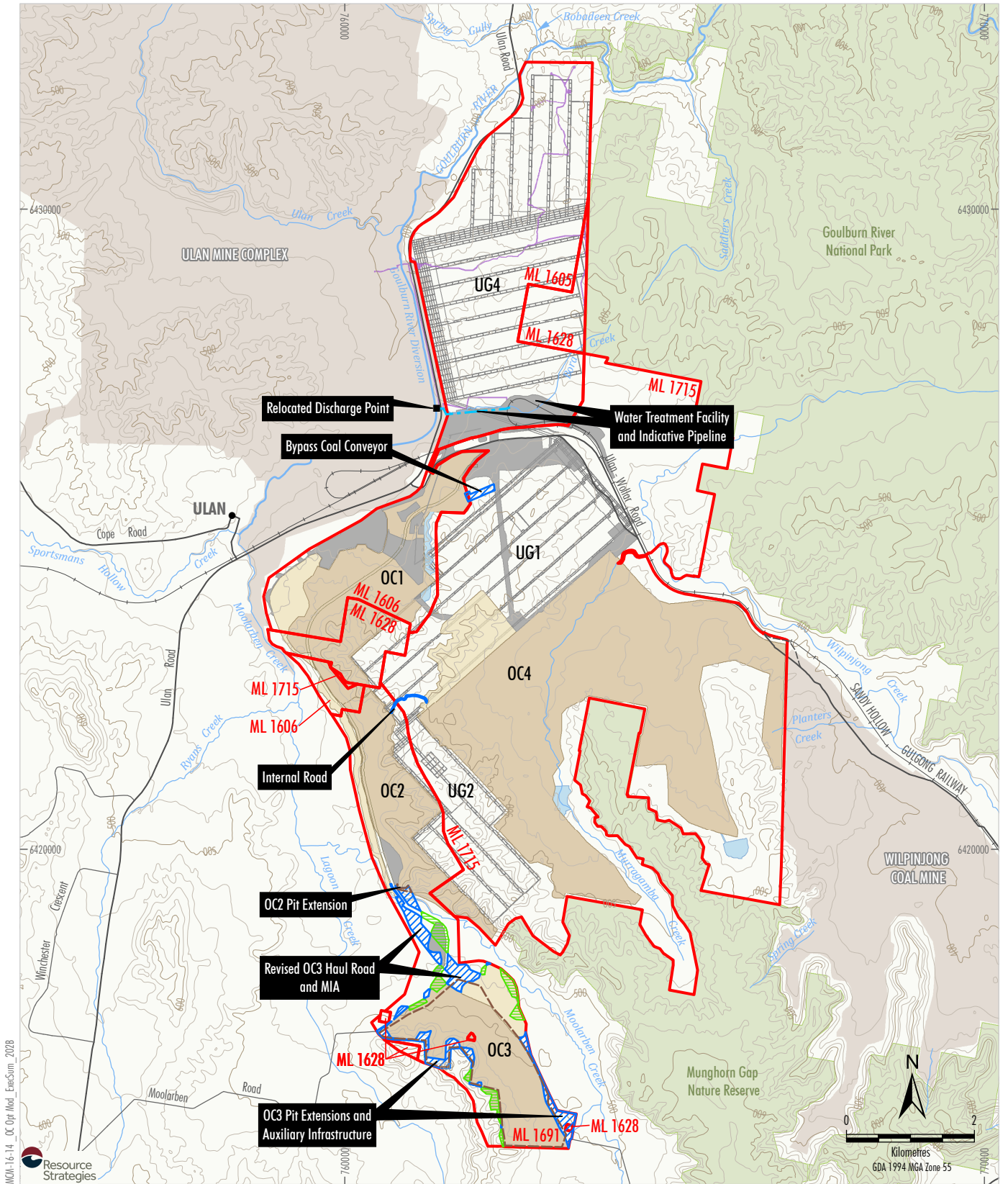


- LEGEND**
- State Forest
 - NSW National Parks and Wildlife Service
 - Local Government Boundary
 - Exploration Licence Boundary
 - Mining Lease Boundary
 - Mining Operation

Source: NSW Land & Property Information (2017); NSW Department of Industry (2017); Office of Environment and Heritage NSW (2017)


MOOLARBEN COAL
 MOOLARBEN COAL COMPLEX
 Regional Location

Figure ES-1



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- LEGEND**
- NSW National Parks and Wildlife Service
 - Other Mining Operations
 - Mining Lease Boundary
 - Existing/Approved Development
 - Open Cut Mining Area
 - Out-of-pit Emplacement
 - Surface Infrastructure Area
 - Pipeline and Borefield Infrastructure
 - Clean Water Diversion Infrastructure
 - Underground Longwall Layout
 - Haul Road
 - Road Realignment (not yet constructed)

- Open Cut Optimisation Modification**
- Approximate Extent of Revised Open Cut Mining Area
 - Approximate Extent of Additional Surface Development
 - Approved Open Cut Mining Area, Out-of-pit Emplacement and Surface Infrastructure to be Relinquished

Source: MCO (June 2017); NSW Dept of Industry (2017); NSW Land & Property Information (2017); Office of Environment and Heritage NSW (2017)

MOOLARBEN COAL
MOOLARBEN COAL COMPLEX
Open Cut Optimisation Modification
General Arrangement

Figure ES-2

The Modification **does not** involve changes to the following approved components of the Moolarben Coal Complex (Stages 1 and 2):

- operational mine life;
- OC1 or OC4 pit limits;
- hours of operation;
- underground coal extraction limits or mine layouts;
- blasting frequency limits;
- site access;
- method of reject disposal; and
- peak workforce.

Relinquishment of Approved Elements of the Moolarben Coal Complex

The ongoing mine planning has also identified that elements of approved Moolarben Coal Complex would no longer be required.

Areas of approved surface disturbance at OC3 would no longer be required for open cut mining or major surface infrastructure.

These areas (Figure ES-2) would be relinquished as part of this Modification to minimise net additional biodiversity impacts.

In addition, the approved OC3 out-of-pit emplacement would no longer be required for permanent out-of-pit waste rock emplacement (Figure ES-2). Instead, waste rock extracted during the initial development of OC3 would be used as backfill material in OC2 and OC3 (some waste rock may be temporarily emplaced in this area during initial OC3 establishment).

ES3 ENVIRONMENTAL REVIEW

To assess the potential environmental impacts of the Modification, the following specialist environmental reviews were completed:

- Noise Assessment;
- Air Quality Assessment;
- Biodiversity Assessment Review and Biodiversity Offset Strategy;
- Aboriginal Cultural Heritage Assessment;
- Site Water Balance and Surface Water Assessment;

- Controlled Water Release Impact Assessment;
- Aquatic Ecology Assessment;
- Geochemistry Review; and
- Groundwater Assessment.

A summary of the key findings of these environmental reviews and key commitments with respect to managing potential impacts of the Modification is provided in Table ES-1.

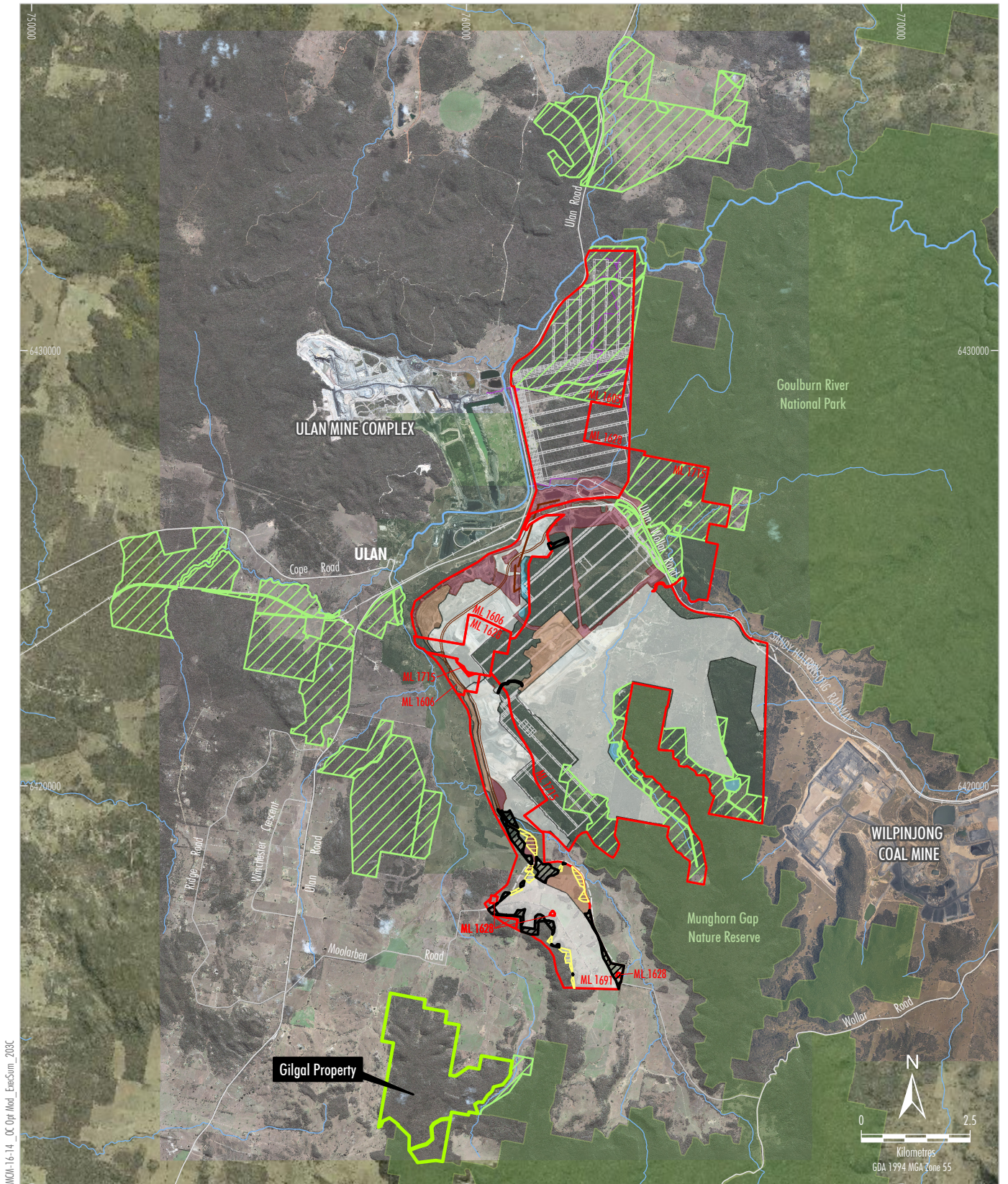
ES4 JUSTIFICATION FOR THE MODIFICATION

Justification for the Modification is based on the following:

- The proposed increases in the rate of open cut ROM coal production can be achieved with no material change in fleet and no exceedances of the Project Approval limits for noise and air quality.
- A suitable offset strategy, which includes land based offsets at the MCO-owned Gilgal property (Figure ES-3), has been identified to compensate for the residual potential impacts to biodiversity.
- The Modification would result in an improved final landform due to the removal of the approved OC3 permanent out-of-pit emplacement.
- The Modification would improve efficiency of resource recovery, which would result in an increase in Government royalties of approximately \$82 million (net present value of approximately \$69 million).
- The increased production limits allow annual revenue to increase. This improves the productivity of the Moolarben Coal Complex, which improves the security of the continued employment of the existing workforce and ongoing expenditure in the State and local economies.
- The modifications and additions to infrastructure for the Modification would result in construction employment at the Moolarben Coal Complex.

**Table ES-1
Key Outcomes of the Environmental Reviews**

Environmental Aspect	Summary of Environmental Review	Key Management, Mitigation or Monitoring Measures for the Modification
Noise	<ul style="list-style-type: none"> Noise monitoring demonstrates ongoing compliance and effectiveness of noise management measures. Continued compliance with Project Approval noise limits predicted. 	<ul style="list-style-type: none"> Continued implementation of Noise Management Plan, including real-time triggers and management responses.
Air quality	<ul style="list-style-type: none"> Air quality monitoring demonstrates ongoing compliance and effectiveness of dust management measures. Continued compliance with Project Approval air quality limits predicted. 	<ul style="list-style-type: none"> Continued implementation of Air Quality Management Plan, including real-time triggers and management responses.
Biodiversity	<ul style="list-style-type: none"> No significant impact to State or Commonwealth threatened species or vegetation communities expected. Potential impacts due to the disturbance of 39 hectares of native vegetation minimised by the relinquishment of 12 hectares of approved disturbance of native vegetation (with equivalent vegetation communities). The proposed Biodiversity Offset Strategy compensates for residual potential impacts. 	<ul style="list-style-type: none"> Avoidance of some areas of threatened ecological communities and habitat features (e.g. rocky outcrops) based on initial field surveys. Minimisation of net additional impact to biodiversity due to relinquishment of areas of approved disturbance. Biodiversity Offset Strategy, with majority of offset credits likely to be satisfied by MCO-owned Gilgal property (Figure ES-5). Continued implementation of Biodiversity Management Plan.
Aboriginal heritage	<ul style="list-style-type: none"> Consultation with Registered Aboriginal Parties, including surveys. Likely direct impact to two additional Aboriginal heritage sites. 	<ul style="list-style-type: none"> Avoidance of direct impact to some Aboriginal heritage sites identified during surveys. Continued implementation of monitoring and management measures through the Heritage Management Plan. Salvage of sites that would be directly impacted.
Surface water resources and aquatic ecology	<ul style="list-style-type: none"> Site water balance modelling indicates increased volume of licensed discharge required (up to 20 ML/d). Treatment of water to a quality that complies with Environment Protection Licence water quality concentration limits prior to controlled release from site. Water treatment facility used to control water quality. No adverse impacts to downstream water quality predicted. Predicted minor changes in downstream water depth (0.05 metres) during 20 ML/d discharge. Predicted minor increases in average downstream river velocity (0.3 metres per second) during 20 ML/d discharge. Negligible impacts to downstream aquatic ecology. 	<ul style="list-style-type: none"> Water treatment facility. Licensed discharge point relocated to stable rock shelf. Spreader/diffuser at discharge outlet to minimise scour potential. Direct discharge at the Bora Creek confluence with the Goulburn River Diversion into a section of the Diversion with a vegetated bed of reeds and grass. Piping to relocated licenced discharge point avoids erosion potential along sandy channel bed of Bora Creek. Continued monitoring in accordance with the Water Management Plan. Monitoring of all licensed discharge events would be undertaken in accordance with Environment Protection Licence requirements. Expansion of surface water quality triggers to include key metals.
Groundwater	<ul style="list-style-type: none"> Updated and recalibrated groundwater model. Negligible additional drawdown, and associated negligible impacts to groundwater users and groundwater dependent ecosystems due to the Modification. No change to peak groundwater licence requirements (timing of peak inflows would change). 	<ul style="list-style-type: none"> Continued monitoring in accordance with the Water Management Plan. Continued licensing to account for mining at the Moolarben Coal Complex incorporating the Modification, as required.



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LEGEND

- Mining Lease Boundary
- Existing/Approved Development
- Open Cut Mining Area
- Out-of-pit Emplacement
- Surface Infrastructure Area
- Pipeline and Borefield Infrastructure
- Clean Water Diversion Infrastructure
- Underground Longwall Layout
- Haul Road
- Road Realignment (not yet constructed)
- Existing Biodiversity Offset Area

Open Cut Optimisation Modification

- Approximate Extent of Additional Surface Development
- Approved Open Cut Mining Area, Out-of-pit Emplacement and Surface Infrastructure to be Relinquished
- Proposed Offset Area

Source: MCO (2017); NSW Dept of Industry (2016);
Office of Environment and Heritage NSW (2016)
Orthophoto Mosaic: MCO (April 2016 - May 2014);
Department Finance, Services & Innovation (2017)

MOOLARBEN COAL
MOOLARBEN COAL COMPLEX
Gilgal Property

Figure ES-3