

WAMBO COAL PTY LIMITED



WAMBO COAL MINE LONGWALL 24 TO 26 MODIFICATION

MODIFICATION REPORT

For the Modification of DA 305-7-2003 (MOD 19)
Optimisation and Continued Operation
of the Approved South Bates Extension Underground Mine

August 2022

Peabody



WAMBO COAL MINE LONGWALL 24-26 MODIFICATION MODIFICATION REPORT

Prepared by Wambo Coal Pty Ltd

PROJECT NO.	WAM-09-15
DOCUMENT NO.	01141665
DATE:	AUGUST 2022

EXECUTIVE SUMMARY

Background

The Wambo Coal Mine is situated approximately 15 kilometres west of Singleton, near the village of Warkworth, New South Wales (NSW), and is operated in accordance with Development Consent (DA 305-7-2003).

The Wambo Coal Mine is owned and operated by Wambo Coal Pty Limited (WCPL), a subsidiary of Peabody Energy Australia Pty Limited.

WCPL is proposing to modify Development Consent (DA 305-7-2003) for the Wambo Coal Mine to allow for optimisation and continued operations of the South Bates Extension Underground Mine (hereafter referred to as the Modification).

The Modification is being sought under section 4.55(2) of the NSW *Environmental Planning and Assessment Act 1979*.

Modification Overview

The Modification would allow for the continuation and improved efficiency of the South Bates Extension Underground Mine and would include:

- reorienting Longwalls 24 and 25 of the South Bates Extension Underground Mine;
- an additional longwall panel (i.e. Longwall 26);
- processing of run-of-mine coal from Longwalls 24 to 26 at the existing on-site coal handling and preparation plant;
- an overall reduction in the approved area of overlying land predicted to experience potential subsidence impacts (relative to the layout assessed and approved by Modification 17); and
- an additional mining lease over a component of Authorisation 444.

The Modification would not extend the approved overall life of the Wambo Coal Mine, but would allow for continued operations at the South Bates Extension Underground Mine for a further three years (as the approved Longwalls 24 and 25 would not be mined in their current arrangement).

No other changes to the approved Wambo Coal Mine (including surface development area) would be required for the Modification.

The approved and modified Wambo Coal Mine general arrangement is provided on Figure ES-1.

Assessment of Impacts

WCPL has undertaken a review of the potential environmental impacts of the Modification in the Modification Report.

The Wambo Coal Mine (as modified) would continue to comply with existing criteria, performance measures and limits described in Development Consent (DA 305-7-2003).

The Modification would involve minimal additional environmental impact compared to the approved Wambo Coal Mine.

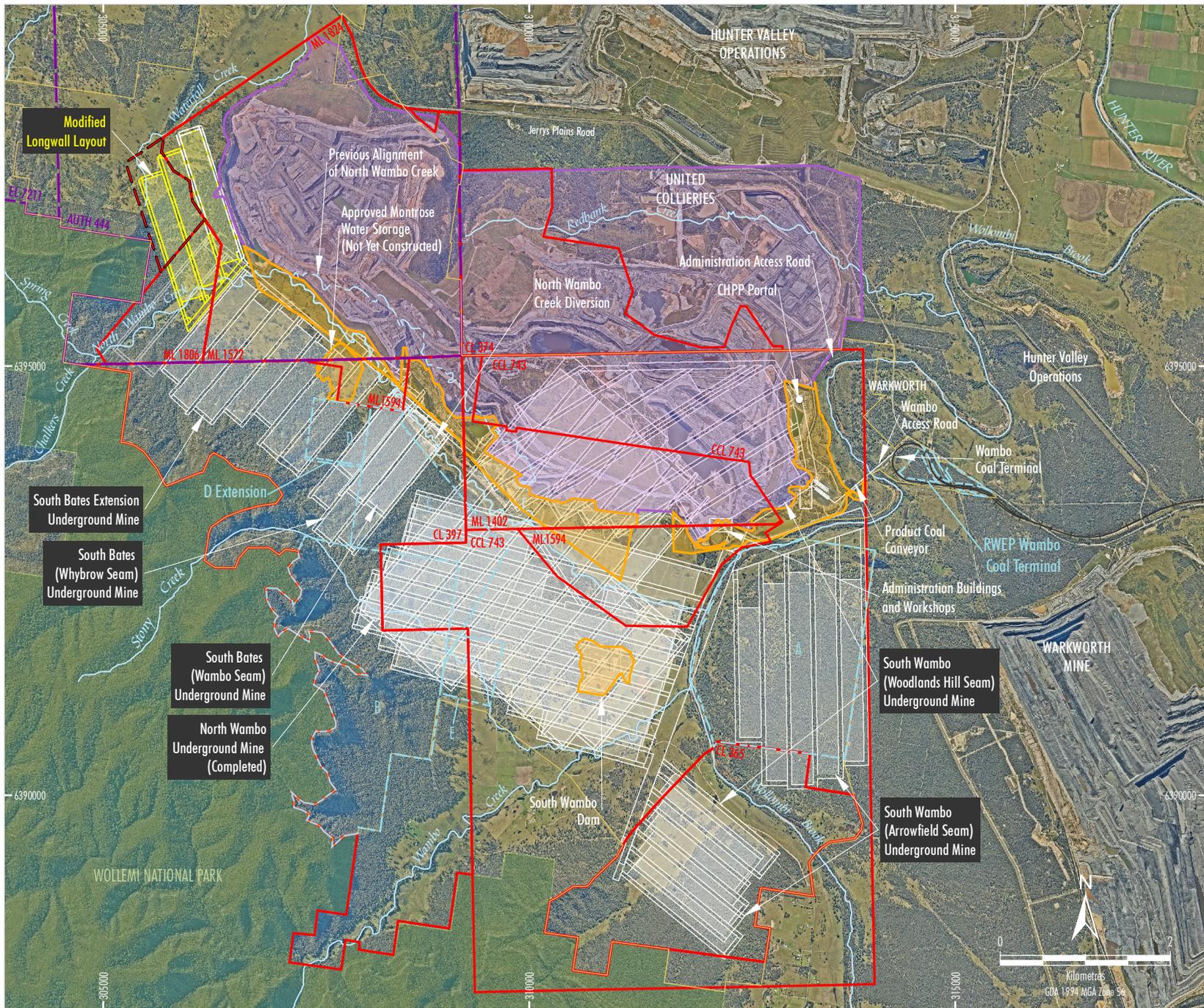
WCPL would continue to operate the Wambo Coal Mine (as modified) in accordance with the existing environmental management plans and environmental monitoring programs.

Justification of the Modified Project

The Wambo Coal Mine, incorporating the Modification, would be substantially the same development as was last modified under section 75W of the NSW *Environmental Planning and Assessment Act 1979*, inclusive of consideration of the changes arising from previously approved modifications.

The Modification would:

- Contribute to the financial resilience of the Wambo Coal Mine, which would be achieved through the logical and efficient development of the viable coal resources adjacent to the approved underground mining area with no change to the existing infrastructure.
- Avoid geological features and other technical issues, which have required the previously completed longwalls in the South Bates Extension Underground Mine to be shortened at both the commencing and finishing ends.
- Facilitate ecologically sustainable development, as economic efficiencies can be achieved with no change to the currently accepted environmental performance measures, use of existing mining, coal handling and processing infrastructure and associated support facilities and no increase in the duration of existing impacts of the Wambo Coal Mine.
- Be consistent with the NSW Government's Strategic Statement on Coal Exploration and Mining, which outlines that the NSW Government will act in four areas, including "supporting responsible coal production in areas deemed suitable for mining".



- LEGEND**
- National Park
 - SSD 7142 Operational Area #
 - WCPL Owned Land
 - Wambo Coal Mine
 - Exploration Licence Boundary (AUTH, EL)
 - Mining and Coal Lease Boundary (ML, CL, CCL)
 - Proposed Mining Lease Application Area
 - Remnant Woodland Enhancement Program (RWEF) Area
 - Existing/Approved Wambo Coal Mine Surface Development Area
 - Existing/Approved Underground Development
 - Approved Orientation of Longwalls 24 and 25
 - Existing/Approved Underground Development (First Workings only)
 - Modification 19
 - Modified Longwall Layout

Under Phase 2 of mining at Wambo Coal Mine (commenced 1 December 2020), this area is operated by United Collieries Pty Ltd under the United Wambo Joint Venture Project.

Source: WCPL (2022); NSW Spatial Services (2022)
 Orthophoto: WCPL (May 2022)

Figure ES-1

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Appendix H	Land Contamination Assessment
Appendix I	Greenhouse Gas Assessment

1 INTRODUCTION

The Wambo Coal Mine is situated approximately 15 kilometres (km) west of Singleton, near the village of Warkworth, New South Wales (NSW) (Figure 1), and is operated in accordance with Development Consent (DA 305-7-2003).

The Wambo Coal Mine is owned and operated by Wambo Coal Pty Limited (WCPL), a subsidiary of Peabody Energy Australia Pty Limited.

WCPL is proposing to modify Development Consent (DA 305-7-2003) for the Wambo Coal Mine to allow for optimisation and continued operations of the South Bates Extension Underground Mine (hereafter referred to as the Modification).

The Modification is being sought under section 4.55(2) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). WCPL is the applicant for the Modification.

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

1.1 SUMMARY OF THE APPROVED WAMBO COAL MINE

A range of open cut and underground mine operations have been conducted at the Wambo Coal Mine since mining operations commenced in 1969. Mining under Development Consent (DA 305-7-2003) commenced in 2004, with both open cut and underground operations conducted until 2020.

From 1 December 2020, the Wambo Coal Mine transitioned into Phase 2 operations which includes underground mining and coal handling and processing, as described in Development Consent (DA 305-7-2003):

The phase of the development that comprises underground mining operations at Wambo underground mine, the operation of Wambo infrastructure within the green operational area identified in Figure 2 of Appendix 2 and associated surface development. An aerial photograph of Wambo, illustrating the existing/approved extent of the underground mine operations and locations of key infrastructure is provided on Figures 2a and 2b.

Development Consent (DA 305-7-2003) (as modified) allows for the following mining and processing operations at the Wambo Coal Mine (Figures 2a and 2b):

- Underground mining operations in the approved North Wambo Underground Mine (completed).
- Underground mining operations in the approved South Bates Underground Mine (completed).
- Underground mining operations in the approved South Bates Extension Underground Mine (in progress).
- Underground mining operations in the approved South Wambo Underground Mine (future operation).
- Ongoing operation of the Coal Handling and Processing Plant (CHPP) and processing of coal from the underground mining operation and the United Wambo Open Cut Coal Mine, with up to 14.7 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal processed at the CHPP in any calendar year.

Underground mining operations at the Wambo Coal Mine are approved until 31 August 2042.

Development Consent (DA 305-7-2003) has been modified 17 times since approval for the Wambo Coal Mine was granted, most recently under section 4.55(1A) of the EP&A Act.

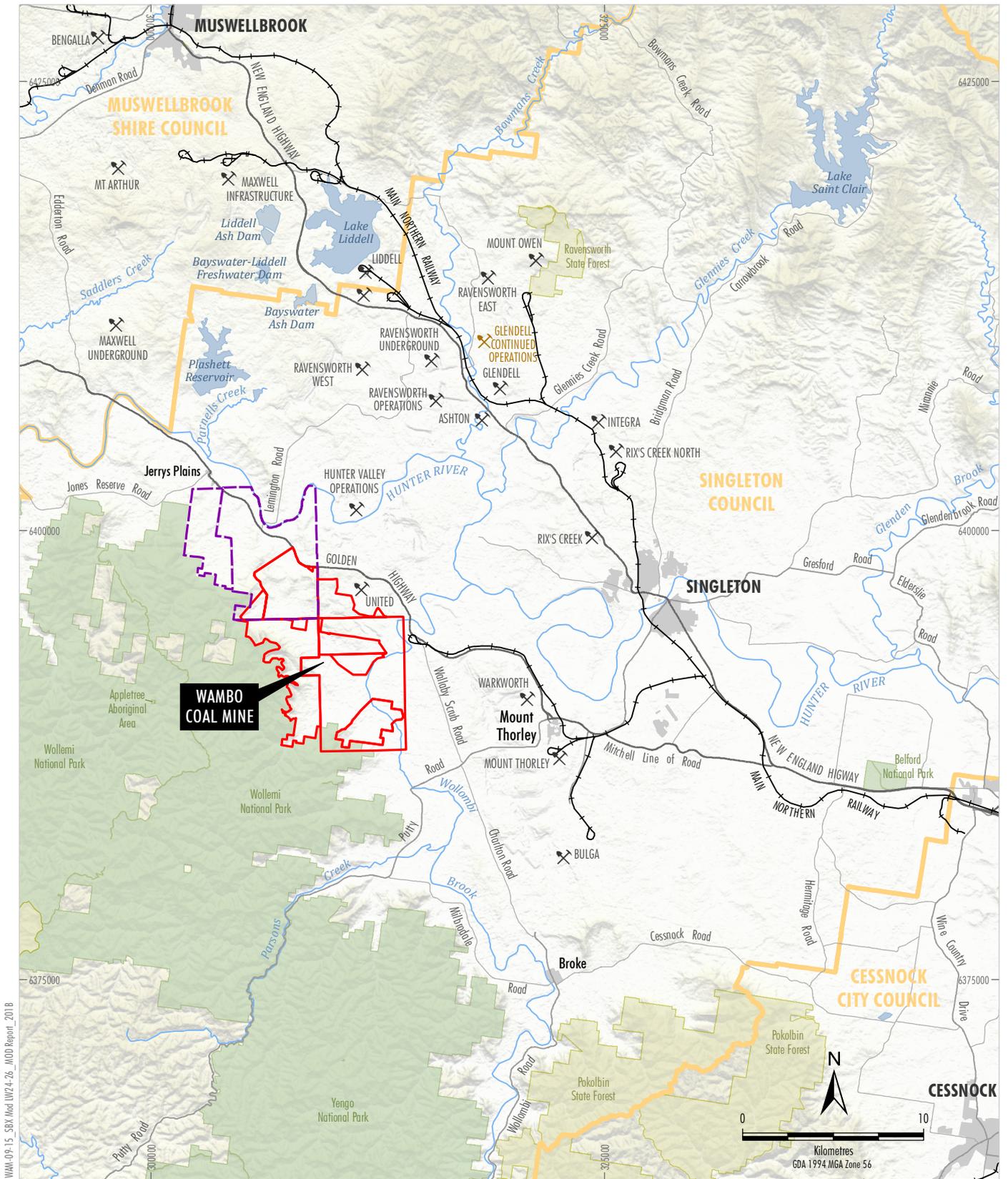
The Wambo Coal Terminal (Figures 2a and 2b) operates under a separate Development Consent (DA 177-8-2004).

A State Significant Development application for the United Wambo Open Cut Coal Mine (SSD 7142) was granted in August 2019 to allow for open cut coal mining operations at the United Wambo Open Cut Coal Mine as well as the approved Wambo Open Cut.

1.2 OVERVIEW OF THE MODIFICATION

1.2.1 Background to the Modification

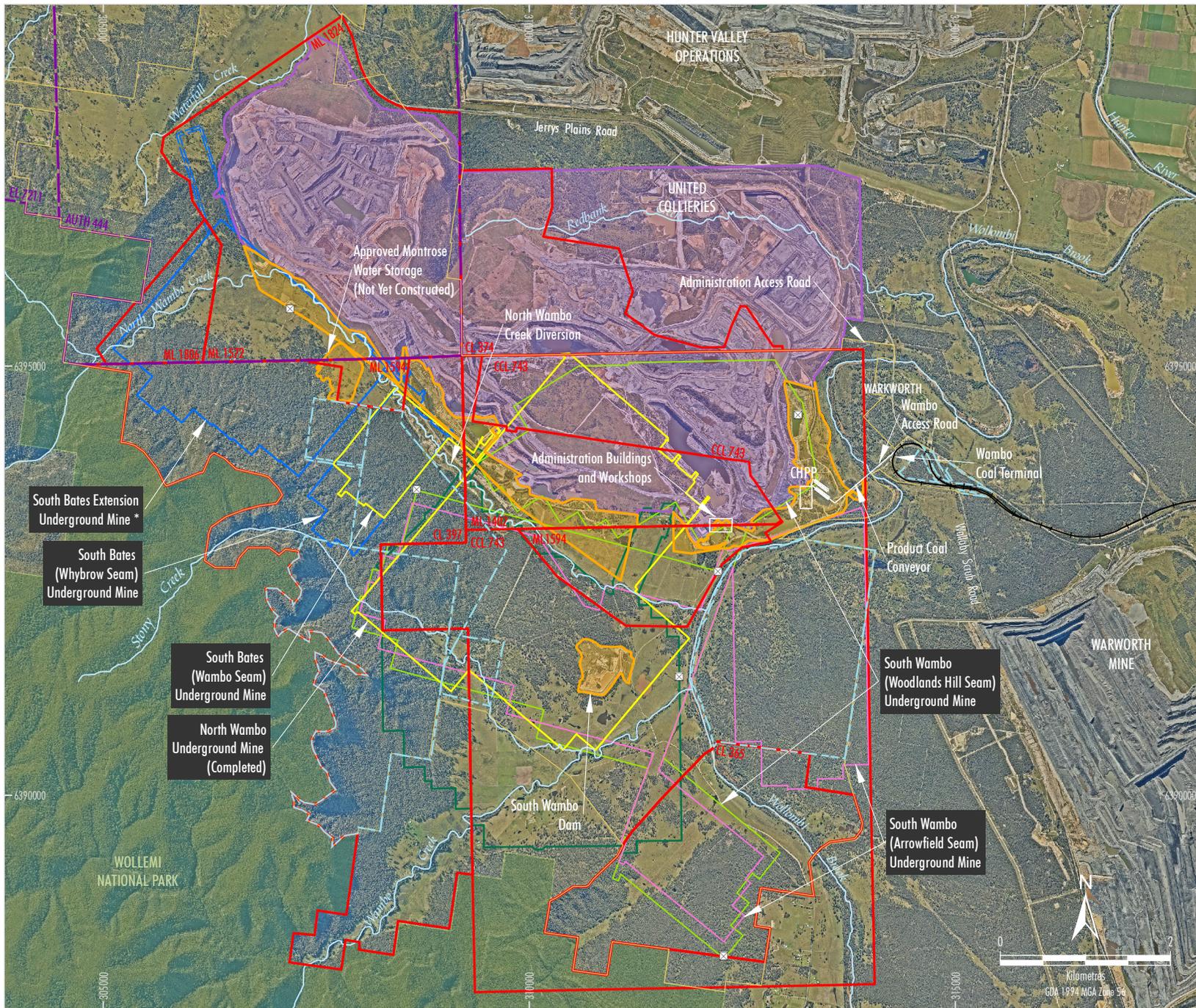
The South Bates Extension Underground Mine was approved in December 2017 (as part of Development Consent [DA 305-7-2003] Modification 17) and comprises Longwalls 17 to 25 in the Whybrow Seam (Figures 2a and 2b). Operations commenced in Longwall 17 in 2018.



- LEGEND**
- Exploration Licence Boundary (AUTH, EL)
 - Mining and Coal Lease Boundary (ML, CL, CCL)
 - Local Government Area
 - National Park
 - State Forest
 - ⚒ Mining Operation
 - ⚒ Proposed Mining Operation (Under Assessment)

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 W A M B O C O A L M I N E
 Regional Location

Figure 1



- LEGEND**
- National Park
 - SSD 7142 Operational Area #
 - WCPL Owned Land
 - Wambo Coal Mine
 - Exploration Licence Boundary (AUTH, EL)
 - Mining and Coal Lease Boundary (ML, CL, CCL)
 - Remnant Woodland Enhancement Program (RWEPP) Area
 - Existing/Approved Surface Development Area (Phase 2)
 - Ventilation Shaft
 - Underground Mining Areas
 - Whybrow Seam*
 - Whybrow Seam (First Workings only)
 - Wambo Seam
 - Woodlands Hill
 - Arrowfield Seam
 - Previous Underground Workings in Whybrow Seam

Under Phase 2 of mining at Wambo Coal Mine (commenced 1 December 2020), this area is operated by United Collieries Pty Ltd under the United Wambo Joint Venture Project.

* Approved underground development as per South Bates Extension Underground Mine Modification Environmental Assessment. The actual longwall layouts may include minor revisions but are contained within this boundary.

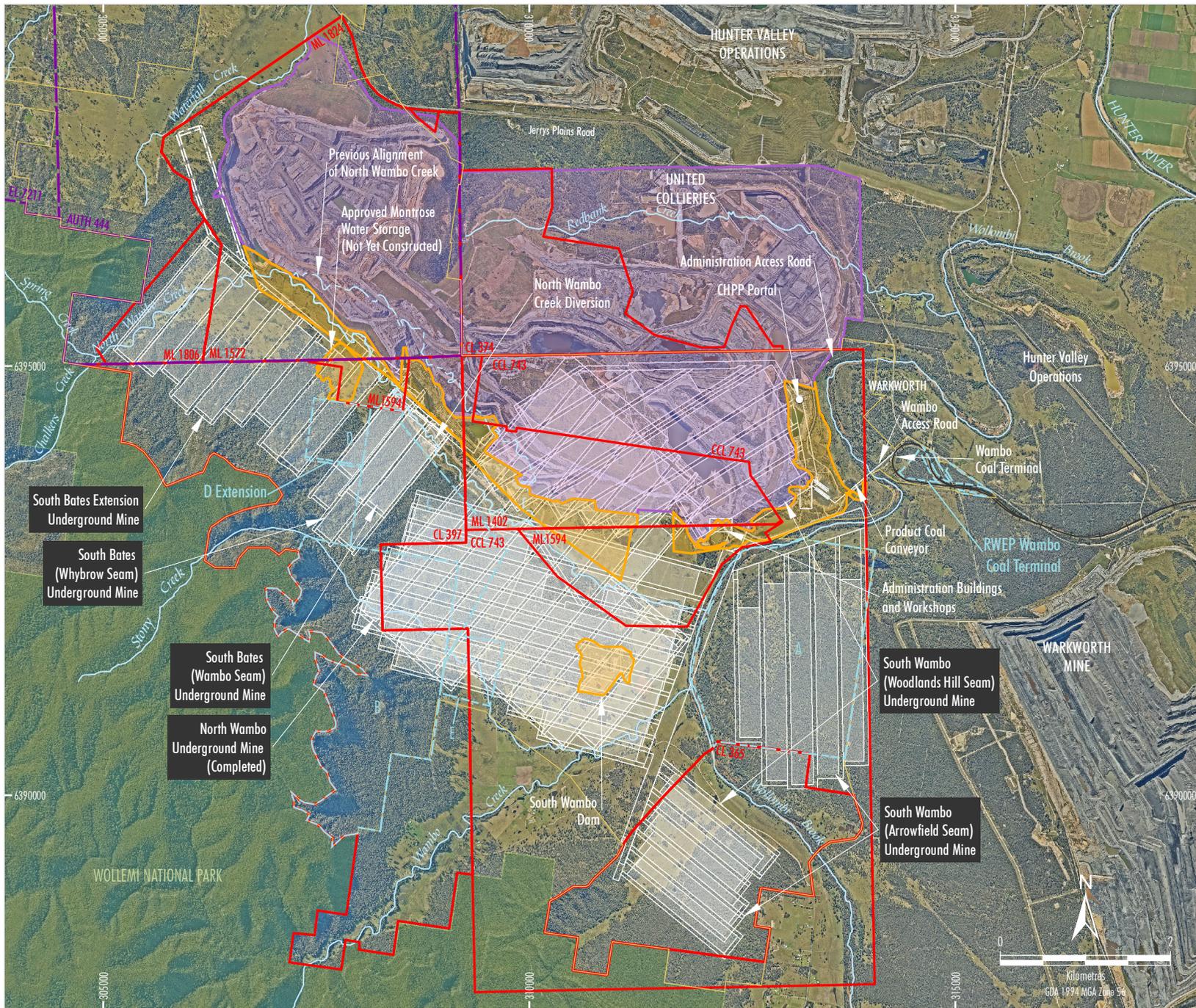
Source: WCPL (2022); NSW Spatial Services (2022)
 Orthophoto: WCPL (May 2022)

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W A M B O C O A L M I N E

Existing/Approved Wambo Coal Mine
 General Arrangement

Figure 2a



- LEGEND**
- National Park
 - SSD 7142 Operational Area #
 - WCPL Owned Land
 - Wambo Coal Mine
 - Exploration Licence Boundary (AUTH, EL)
 - Mining and Coal Lease Boundary (ML, CL, CCL)
 - Remnant Woodland Enhancement Program (RWEF) Area
 - Existing/Approved Wambo Coal Mine Surface Development Area
 - Existing/Approved Underground Development
 - Existing/Approved Underground Development (First Workings only)

Under Phase 2 of mining at Wambo Coal Mine (commenced 1 December 2020), this area is operated by United Collieries Pty Ltd under the United Wambo Joint Venture Project.

Source: WCPL (2022); NSW Spatial Services (2022)
 Orthophoto: WCPL (May 2022)

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 W A M B O C O A L M I N E
 Existing/Approved Wambo Coal Mine
 Longwall Layout

Figure 2b

WCPL is currently mining Longwall 22 and developing first workings for Longwall 23 and 24 in accordance with the approved mine plan.

As a result of ongoing evaluation and mine planning, WCPL identified an opportunity for the continuation and improved efficiency of the South Bates Extension Underground Mine by reorienting Longwalls 24 and 25, and adding Longwall 26.

To maintain continuity of first workings development (and subsequent longwall extraction), first workings for the reorientated Longwall 24 were required to commence in February 2022. WCPL therefore, separately obtained approval for the development of first workings associated with the reoriented Longwall 24 within Mining Lease (ML) 1572 and ML 1806, but outside of the approved South Bates Extension Underground Mine (Modification 18).

Modification 18 was approved under section 4.55(1A) of the EP&A Act on 25 January 2022.

1.2.2 Description of the Modification

The Modification includes the following changes to the approved Wambo Coal Mine (Section 3):

- reorienting Longwalls 24 and 25 of the South Bates Extension Underground Mine;
- an additional longwall panel (i.e. Longwall 26);
- processing of ROM coal from Longwalls 24 to 26 at the existing on-site CHPP;
- an overall reduction in the approved area of overlying land predicted to experience potential subsidence impacts (relative to the layout assessed and approved by Modification 17); and
- an additional mining lease over a component of Authorisation (AUTH) 444.

No other changes to the approved Wambo Coal Mine (including surface development area) would be required for the Modification (Section 3.6).

The approved and modified South Bates Extension Underground Mine general arrangement is shown on Figures 3 and 4.

1.2.3 Requirement for the Modification

The Modification is required to allow for the continued operations of the South Bates Extension Underground Mine.

Throughout operation of the South Bates Extension Underground Mine, WCPL has continued to evaluate the recoverable coal reserves in the Whybrow Seam.

As mining operations have progressed, significant geological structures along with adverse geotechnical conditions have impacted the originally proposed longwall extraction at both the commencing (south-western) and finishing (north-eastern) ends of the blocks, resulting in a reduction of coal recovery from the South Bates Extension Underground Mine.

1.2.4 Analysis of Feasible Alternatives

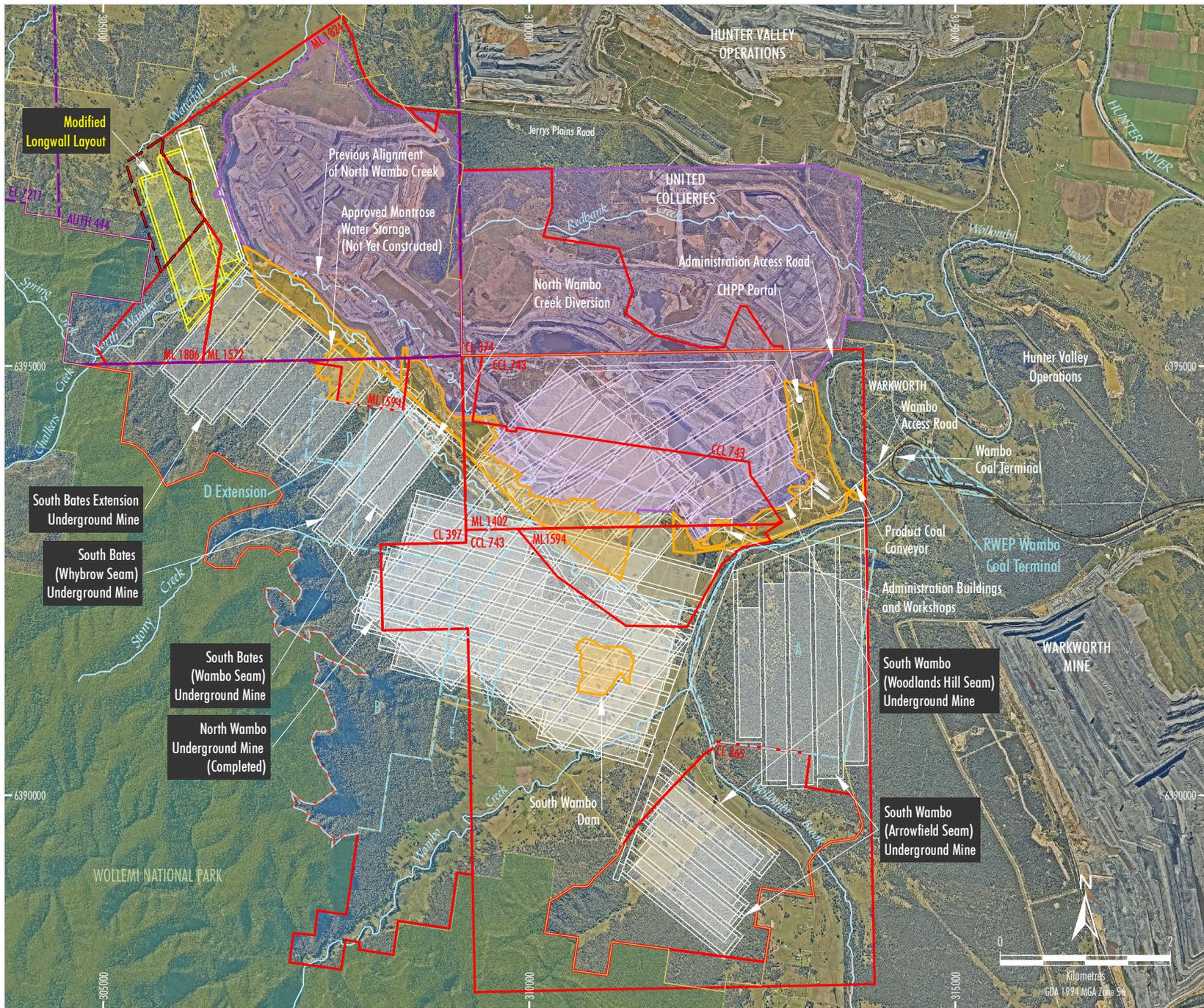
This Modification is being pursued as an alternative to the approved mine layout for the South Bates Extension Underground Mine which was developed in 2016. The results of additional exploration activities and experience gained during mining of Longwalls 17 to 21 of the South Bates Extension Underground Mine have led to the development of the revised mine plan including reorientation of Longwalls 24 and 25, and the addition of Longwall 26.

The location of modified Longwalls 24 to 26 (the subject of this Modification) are dictated by the existing South Bates Extension Underground Mine, the coal resource and surrounding natural environmental features (e.g. Wollemi National Park and the associated Wollemi Escarpment).

As the approved layout for Longwalls 24 and 25 is not considered economical to mine, the only realistic alternative to the Modification would be to cease mining activities at the South Bates Extension Underground Mine following the completion of Longwall 23. WCPL would then either proceed with mining in the approved South Wambo Underground Mine, or cease mining at the Wambo Coal Mine, and transition into a care and maintenance phase.

The Modification was selected as being the preferred option on the basis that it would:

- allow for the logical and efficient recovery of viable coal resources adjacent to the approved underground mining area;
- utilise existing surface infrastructure at the South Bates Extension Underground Mine without the need for additional surface infrastructure; and
- provide continuity of employment for the current Wambo Coal Mine workforce.



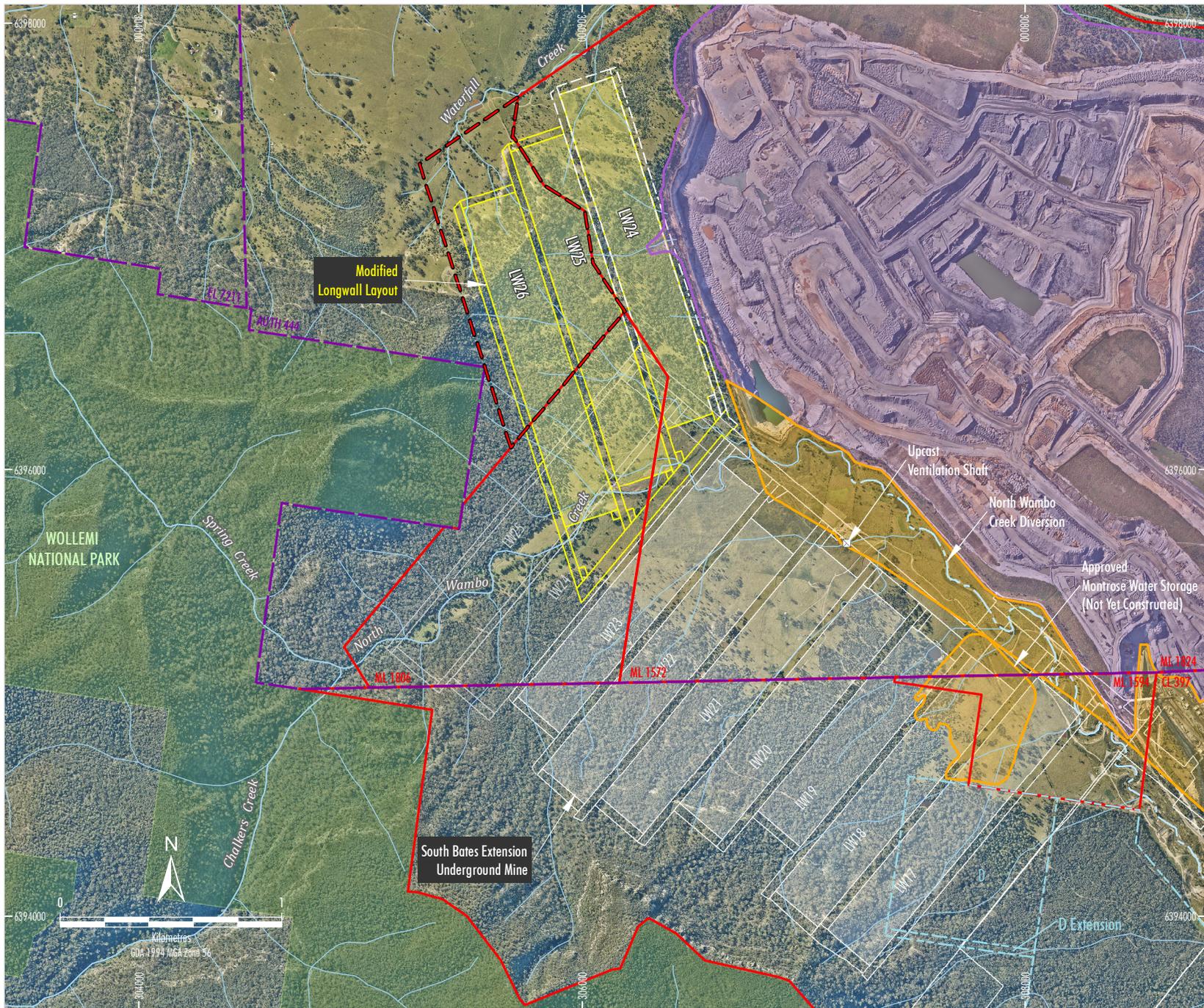
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 - Existing/Approved Wambo Coal Mine Surface Development Area
 - Existing/Approved Underground Development
 - Approved Orientation of Longwalls 24 and 25
 - Existing/Approved Underground Development (First Workings only)
 - Modification 19
 - Modified Longwall Layout

Under Phase 2 of mining at Wambo Coal Mine (commenced 1 December 2020), this area is operated by United Collieries Pty Ltd under the United Wambo Joint Venture Project.

Source: WCPL (2022); NSW Spatial Services (2022)
 Orthophoto: WCPL (May 2022)

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 W A M B O C O A L M I N E
 Approved and Modified Wambo Coal Mine
 General Arrangement

Figure 3



- LEGEND**
- National Park
 - SSD 7142 Operational Area # Wambo Coal Mine
 - Exploration Licence Boundary (AUTH, EL)
 - Mining and Coal Lease Boundary (ML, CL, CCL)
 - Proposed Mining Lease Application Area
 - Remnant Woodland Enhancement Program (RWEF) Area
 - Existing/Approved Wambo Coal Mine Surface Development Area
 - Ventilation Shaft
 - Existing/Approved Underground Development
 - Approved Orientation of Longwalls 24 and 25
 - Existing/Approved Underground Development (First Workings only)
 - Modification 19
 - Modified Longwall Layout

Under Phase 2 of mining at Wambo Coal Mine (commenced 1 December 2020), this area is operated by United Collieries Pty Ltd under the United Wambo Joint Venture Project.

Source: WCPL (2022); NSW Spatial Services (2022)
 Orthophoto: WCPL (May 2022)

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W A M B O C O A L M I N E

**Approved and Modified
 South Bates Extension Underground Mine
 General Arrangement**

Figure 4

The consequence of not proceeding with the Modification would be reduced extraction of the State's resources when compared to the approved layout (i.e. given the forgone resources within the approved South Bates Extension Underground Mine area associated with geological and technical constraints) with no material change in environmental outcomes.

1.3 APPLICANT'S DETAILS

The Applicant for the Modification is:

Wambo Coal Pty Limited
 Jerrys Plains Road
 Warkworth NSW 2330

1.4 STRUCTURE OF THE MODIFICATION REPORT

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

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

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

Attachment 1	Revised Schedule of Lands
Attachment 2	Detailed Statutory Compliance Reconciliation Table
Appendix A	Subsidence Assessment.
Appendix B	Groundwater Assessment.
Appendix C	Surface Water Assessment.
Appendix D	Aboriginal Cultural Heritage Assessment.
Appendix E	Historic Heritage Assessment.
Appendix F	Biodiversity Review.
Appendix G	Agricultural Resource Assessment
Appendix H	Land Contamination Assessment.
Appendix I	Greenhouse Gas Assessment.

2 STRATEGIC CONTEXT

2.1 PROJECT CONTEXT

The Wambo Coal Mine is an existing and approved mining operation which commenced in 1969 and comprises open cut and underground mining areas and other mining related infrastructure (including coal processing and transport facilities) (Figures 2a and 2b).

The Wambo Coal Mine is located within a recognised mining precinct, with the United Wambo Open Cut Coal Mine and Hunter Valley Operations located to the north, and the Mount Thorley Warkworth operation located to the east.

Land uses other than mining in the vicinity of the Wambo Coal Mine comprise a combination of agricultural land uses, industrial and residential areas in the village of Jerrys Plains.

The Modification is required to allow for the continuation and efficient operation of the South Bates Extension Underground Mine in response to multiple geological and other technical issues encountered within the approved longwall layout.

Pursuing underground mining of the coal resource to the north-west of the approved South Bates Extension Underground Mine is a logical and efficient progression for the Wambo Coal Mine.

The Modification would not extend the approved overall life of the Wambo Coal Mine, but would allow for continued operations at the South Bates Extension Underground Mine for a further three years (as the approved Longwalls 24 and 25 would not be mined in their current arrangement).

The Modification would allow for the continuity of employment for the current Wambo Coal Mine workforce and direct flow-on economic effects that would likely not be realised if the Modification does not proceed. In addition, royalty payments to NSW would also continue as a result of the Modification.

The reorientated Longwalls 24 and 25, and additional Longwall 26, have been designed to comply with the existing subsidence impact performance measures in Development Consent (DA 305-7-2003).

The Modification would provide improved environmental and social outcomes than if WCPL continued to develop the South Bates Extension Underground Mine as currently approved.

The Modification is located within existing mining and exploration tenements, would use the existing and approved surface infrastructure and would not increase the Wambo Coal Mine surface development footprint.

2.2 STRATEGIC STATEMENT ON COAL EXPLORATION AND MINING IN NSW

The *Strategic Statement on Coal Exploration and Mining in NSW* outlines how the NSW Government will continue to support responsible resource development for the benefit of the State (NSW Government, 2020). The *Strategic Statement on Coal Exploration and Mining in NSW* recognises the value of coal production to the NSW economy, including:

- The long history of coal mining in NSW and its close ties with regional communities in the Hunter region.
- The potential for coal production to provide significant benefits to local communities, including jobs and investment.
- Coal production's significant contributions to export earnings as the State's biggest single export earner.

The Modification would facilitate the continuation of the Wambo Coal Mine, allowing the safe and efficient extraction of significant coal resources at the Wambo Coal Mine, subject to the conditions of the relevant State approvals.

The Modification is considered to be consistent with the *Strategic Statement on Coal Exploration and Mining in NSW* (NSW Government, 2020), which outlines that the NSW Government will act in four areas, including "supporting responsible coal mining in areas deemed suitable for mining".

2.3 NSW GOVERNMENT CLIMATE CHANGE POLICIES

The NSW Government has released the *NSW Climate Change Policy Framework* (Office of Environment and Heritage [OEH], 2016), which commits NSW to the ‘aspirational long-term objective’ of achieving net-zero emissions by 2050.

The *NSW Climate Change Policy Framework* endorses the Paris Agreement and includes as one of its aspirational objectives the implementation of policies consistent with the Commonwealth Government’s plans for long-term greenhouse gas emission reductions. It also includes an objective for NSW to be more resilient to climate change impacts (OEH, 2016).

The NSW Government’s *Net Zero Plan Stage 1: 2020 – 2030* (Net Zero Plan) has recently reiterated that the State’s actions on climate change should not undermine the business, jobs and communities supported by mining (DPIE, 2020a). This illustrates that the State of NSW is adopting an approach to emissions reduction that balances both socio-economic factors and emission reduction opportunities for the long-term benefit of the State.

Greenhouse gas emissions for the Modification compared to the approved Wambo Coal Mine are considered in Section 6.9.

3 DESCRIPTION OF THE MODIFICATION

3.1 OVERVIEW

A comparative summary of the approved and modified operations for the Wambo Coal Mine is provided in Table 1.

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

3.2 SOUTH BATES EXTENSION UNDERGROUND MINE LAYOUT

The approved South Bates Extension Underground Mine commenced in 2017 and comprises Longwalls 17 to 25 in the Whybrow Seam. WCPL is currently mining Longwall 22 and developing first workings for Longwalls 23 and 24 in accordance with the approved mine plan.

The Modification includes reorienting Longwalls 24 and 25 of the South Bates Extension Underground Mine to maximise ROM coal recovery in consideration of identified geological structures and adverse geotechnical conditions within the approved mining layout.

As part of ongoing exploration activities, additional coal resources have been identified immediately to the west of the reorientated Longwalls 24 and 25. As such, the Modification includes an additional longwall panel (i.e. Longwall 26) to extract this additional resource and maximise resource recovery.

The proposed layout of the Modification is shown on Figure 4.

The proposed layout of the Modification is within existing WCPL mining tenements (i.e. ML 1572 and ML 1806) and over a component of the WCPL exploration tenement AUTH 444.

3.3 SOUTH BATES EXTENSION UNDERGROUND MINE LIFE

If the Modification were to not proceed, operations at the South Bates Extension Underground Mine would finish in 2023 as WCPL would not mine the approved Longwalls 24 and 25 in their current arrangement.

Therefore, the Modification would allow for continued operations at the South Bates Extension Underground Mine for a further three years (i.e. until 2026, which is within the approved life of the Wambo Coal Mine until 31 August 2042).

3.4 SOUTH BATES EXTENSION UNDERGROUND MINE ROM COAL PRODUCTION

The identified geological and geotechnical mining constraints have resulted in a reduction of coal recovery from the approved South Bates Extension Underground Mine.

The reorientated and additional longwall panels proposed for the Modification would offset the reduced coal recovery. Therefore without the Modification, approximately 5 million tonnes (Mt) of ROM coal would be foregone over the life of the mine.

Longwall mining operations for the Modification would be undertaken consistent with operations at the approved South Bates Extension Underground Mine.

Consistent with the existing South Bates Extension Underground Mine operations, the ROM coal recovered from the development of Longwalls 24 to 26 would be processed at the existing CHPP prior to being loaded onto trains for transportation to market.

The peak ROM coal mining rate for the Modification would be within the approved maximum annual underground mining rate of 9.75 Mtpa for the Wambo Coal Mine. There are no proposed upgrades to the coal handling or CHPP infrastructure required for the Modification.

Table 1
Summary Comparison of Approved and Modified Wambo Coal Mine

Project Component	Approved Wambo Coal Mine ¹	Modified Wambo Coal Mine
Life of Mine	Underground mining operations may be carried out until 31 August 2042.	No change.
Open Cut Mining	No open cut mining activities following commencement of Phase 2 operations.	No change.
Underground Mining Rate	Longwall mining of up to 9.75 Mtpa of ROM coal.	No change.
Underground Mine Target Seams	Extraction from the Whybrow, Wambo, Woodlands Hill and Arrowfield Seams.	No change.
Longwall Layout (South Bates Extension Underground Mine)	As per Figure 3 of Development Consent (DA 305-7-2003).	Reorientation of Longwalls 24 and 25, and the addition of Longwall 26 (Figure 4).
Total ROM Coal Mined	Underground ROM coal reserves estimated at 161.3 Mt.	No change.
Total CHPP Rejects	Approximately 40.3 Mt of coarse rejects and approximately 24.5 Mt of tailings.	No change.
Subsidence Commitments and Management	The subsidence impact performance measures listed in Conditions B1 and B4 of Development Consent (DA 305-7-2003).	No change.
Waste Rock Management	No open cut mining activities or associated waste rock management following commencement of Phase 2 operations.	No change.
Coal Washing	Up to 14.7 Mtpa of ROM coal from the Wambo Coal Mine and United Wambo Open Cut Coal Mine may be processed at the Wambo Coal Mine CHPP in any calendar year.	No change.
CHPP Reject Management	Coarse rejects and tailings would be incorporated, encapsulated and/or capped within open cut voids and emplacement areas associated with the United Wambo Open Cut Coal Mine.	No change.
Water Supply	Make-up water demand to be met from runoff recovered from tailings storage areas, operational areas, dewatering, licensed extraction from Wollombi Brook and Hunter River. Ongoing exchange of water between the United Wambo Open Cut Coal Mine and the Wambo Coal Mine to allow for integration of the water management systems.	No change.
Surface Facilities	Construction of surface facilities within the approved surface development area.	No change.
Mining Tenements	Coal Lease (CL) 365, CL 374, CL 397, Consolidated Coal Lease (CCL) 743, ML 1402, ML 1572, ML 1594, ML 1806, AUTH 444, Exploration Licence 7211.	An additional mining lease over a component of exploration tenement AUTH 444.

¹ Development Consent (DA 305-7-2003) (as modified).

3.5 OTHER SOUTH BATES EXTENSION UNDERGROUND MINE COMPONENTS

3.5.1 Gas and Ventilation Management

Ventilation of Longwalls 24 to 26 would be integrated with the existing/approved ventilation system for the South Bates Extension Underground Mine¹. No additional surface ventilation infrastructure (i.e. ventilation shafts) would be required for the Modification.

3.5.2 Water Management

Groundwater that accumulates in the underground workings would be pumped to the surface via underground sumps and access drifts, consistent with approved operations at the South Bates Extension Underground Mine.

The Modification would not require any changes to water management at the Wambo Coal Mine as, relative to the approved operations, it would:

- not require a change in the maximum processing rate at the CHPP;
- not increase the approved surface development footprint; and
- result in a small change in groundwater inflows, compared to the approved underground operations (Appendix B).

WCPL would continue to obtain and hold relevant licences under the NSW *Water Management Act 2000* (WM Act) to account for the take of water associated with the Wambo Coal Mine, including the Modification.

The Longwalls 21 to 24 Extraction Plan would be revised to incorporate the Modification.

3.5.3 Infrastructure and Services

The existing South Bates Underground Mine support facilities (including offices, control room, crib room, other support buildings, workshop, ablution building, laydown areas and a range of service facilities), access roads and utilities are currently used to support the South Bates Extension Underground Mine operations.

¹ Note that the existing/approved ventilation shaft is currently being relocated approximately 50 metres (m) from its current location within the approved surface development area.

These infrastructure and facilities would continue to be utilised for the Modification.

Minor extensions and upgrades to existing utilities (e.g. electrical supply and communications) may be conducted for the Modification as required. Additional minor infrastructure required for the Modification may include:

- extensions/relocations of conveyor belts/drives;
- electrical infrastructure;
- communications infrastructure;
- service pipelines;
- water management/flood control infrastructure; and
- ventilation and gas management infrastructure.

3.6 COMPONENTS OF SOUTH BATES EXTENSION UNDERGROUND MINE NOT BEING MODIFIED

The Modification would not change the following approved South Bates Extension Underground Mine components:

- ROM coal production rate;
- mine access;
- mine workforce;
- equipment and mining fleet;
- coal clearance and conveying; and
- operational hours.

3.7 OTHER COMPONENTS OF THE WAMBO COAL MINE

The Modification would not require any changes to the following approved components of the Wambo Coal Mine:

- underground mining method or extraction rates;
- coal handling or processing;
- management of waste rock or reject material;
- annual production rates;
- offsite product coal transport;

- overall mine life;
- site access;
- peak workforce; and
- operational hours.

Although the Modification would not change the approved South Wambo Underground Mine layout or peak mining rate, longwall mining in the South Wambo (Woodlands Hill Seam) Underground Mine would commence two years later than currently scheduled due to the extension of the South Bates Extension Underground Mine life (Section 3.3).

The period that longwall mining occurs concurrently in the Woodlands Hill Seam and Arrowfield Seam at the South Wambo Underground Mine would also increase from four to six years to allow underground mining operations to finish within the approved mine life of the Wambo Coal Mine (i.e. 31 August 2042).

The Modification would also not require changes to the Wambo Coal Terminal Development Consent (DA 177-8-2004) or to the United Wambo Open Cut Coal Mine Development Consent (SSD 7142).

3.8 "SUBSTANTIALLY THE SAME DEVELOPMENT"

A comparative analysis is provided in Table 1 which outlines the key elements of the approved Wambo Coal Mine and the Modification.

The Wambo Coal Mine incorporating the Modification would demonstrably remain an underground coal mine that incorporates the key elements approved under the Development Consent (DA 305-7-2003) (as modified).

3.9 DEVELOPMENT APPLICATION AREA

Appendix 1 of Development Consent (DA 305-7-2003) describes the Development Application area for the approved Wambo Coal Mine.

The Modification requires an extension to the parcels of land listed in Appendix 1 of Development Consent (DA 305-7-2003).

A revised Schedule of Lands for the Wambo Coal Mine (including the Modification) is provided in Attachment 1.

In addition, Appendix 1 of Development Consent (DA 305-7-2003) currently incorrectly includes Lot 92 DP 548749. It is proposed that Lot 92 DP 548749 be corrected to Lot 92 DP 755267 (Attachment 1).

4 STATUTORY CONTEXT

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

In accordance with the guideline *Preparing a Modification Report* (DPIE, 2021b), Attachment 2 provides a detailed statutory compliance table for the Wambo Coal Mine incorporating the Modification that identifies all the relevant statutory requirements and the relevant sections in this Modification Report that address these requirements.

4.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The EP&A Act and NSW *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) set the framework for planning and environmental assessment in NSW.

Assessment Pathway

The potential environmental impacts of the Wambo Coal Mine were assessed in the *Wambo Development Project Environmental Impact Statement* (WCPL, 2003).

Development Consent (DA 305-7-2003) for the Wambo Coal Mine was granted by the then NSW Minister for Urban Affairs and Planning under Part 4 of the EP&A Act on 4 February 2004.

Development Consent (DA 305-7-2003) has been modified 17 times since approval for the Wambo Coal Mine was granted, most recently under section 4.55(1A) of the EP&A Act.

WCPL is seeking to modify Development Consent (DA 305-7-2003) under section 4.55(2) of the EP&A Act.

Section 4.55(2) and 4.55(3) of the EP&A Act relevantly provides:

4.55 Modification of consents—generally

...

(2) Other modifications

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

- (a) *it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified (if at all), and*
 - (b) *it has consulted with the relevant Minister, public authority or approval body (within the meaning of Division 4.8) in respect of a condition imposed as a requirement of a concurrence to the consent or in accordance with the general terms of an approval proposed to be granted by the approval body and that Minister, authority or body has not, within 21 days after being consulted, objected to the modification of that consent, and*
 - (c) *it has notified the application in accordance with:*
 - (i) *the regulations, if the regulations so require, or*
 - (ii) *a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and*
 - (d) *it has considered any submissions made concerning the proposed modification within the period prescribed by the regulations or provided by the development control plan, as the case may be.*
- (3) *In determining an application for modification of a consent under this section, the consent authority must take into consideration such of the matters referred to in section 4.15(1) as are of relevance to the development the subject of the application. The consent authority must also take into consideration the reasons given by the consent authority for the grant of the consent that is sought to be modified.*

....

Substantially the Same Development

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

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

...

(6) *In the application of section 4.55 (1A) or (2) or 4.56 (1) of the Act to the following development, the consent authority need only be satisfied that the development to which the consent as modified relates is substantially the same development as the development authorised by the consent (as last modified under section 75W):*

(a) *development that was previously a transitional Part 3A project and whose approval was modified under section 75W,*

...

The consent authority is, therefore, required to satisfy itself that the Wambo Coal Mine incorporating the Modification would remain substantially the same development as was last modified under section 75W of the EP&A Act (i.e. Modification 16), inclusive of consideration of the changes arising from previously approved modifications.

Since 1 December 2020 (i.e. following commencement of Phase 2 operations, as defined by Development Consent (DA 305-7-2003), subsequent to the approval of the United Wambo Open Cut Coal Mine), the Wambo Coal Mine has been an underground coal mining operation. This would continue to be the case if the Modification was approved (Table 1).

The proposed Modification would:

- be contiguous with the approved South Bates Extension Underground Mine;
- be adjacent to the existing open cut operations for the United Wambo Open Cut Coal Mine;
- be within the current ML 1572, ML 1806 and AUTH 444;
- be designed to remain stable and non-subsiding in the long-term (to the satisfaction of the NSW Resources Regulator);
- require no additional surface infrastructure, as the reorientated Longwalls 24 and 25 and additional Longwall 26 would involve the continued use of the existing South Bates Extension Underground Mine surface infrastructure;
- result in the extraction of approximately 5 Mt of ROM coal that would otherwise be foregone over the life of the mine, with no increase in approved maximum extraction rate; and
- result in an overall decrease in mine footprint, relative to the approved Modification 17 longwall layout.

For the reasons outlined above and in Section 3.7, the consent authority can be satisfied that the Wambo Coal Mine, incorporating the Modification, would remain “substantially the same” as the development as last modified under section 75W of the EP&A Act (i.e. Modification 16).

4.1.1 NSW Environmental Planning and Assessment Act 1979 Objects

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

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

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

- would contribute to the financial resilience of the Wambo Coal Mine, which would be achieved through the efficient development of the existing available resources to offset reduced coal recovery due to identified geological and geotechnical mining constraints within the approved South Bates Extension Underground Mine area (with no change to existing infrastructure);
- would facilitate ecologically sustainable development (ESD), as economic efficiencies can be achieved with no change to the currently accepted environmental performance measures, and no increase in the duration of existing impacts of the Wambo Coal Mine;
- would not require any new surface development and therefore, potential impacts on biodiversity and cultural heritage items as a result of the Modification would be minimised; and
- would be developed in a manner that incorporates community engagement, with a wide range of stakeholders consulted through the preparation of this Modification Report (Section 5).

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

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

(1) Matters for consideration—general

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

- (a) *the provisions of—*
 - (i) *any environmental planning instrument, and*
 - (ii) *any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and*

- (iii) *any development control plan, and*
- (iiia) *any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and*
- (iv) *the regulations (to the extent that they prescribe matters for the purposes of this paragraph),*
- ...
- that apply to the land to which the development application relates,*
- (b) *the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,*
- (c) *the suitability of the site for the development,*
- (d) *any submissions made in accordance with this Act or the regulations,*
- (e) *the public interest.*

This Modification Report has been prepared to address the matters in section 4.15(1) of the EP&A Act, as follows:

- Consideration of the requirements of relevant environmental planning instruments is provided in Section 4.3.
- Clause 2.10 of the *State Environmental Planning Policy (Planning Systems) 2021* states that development control plans do not apply to State Significant Developments.
- This Modification Report has been prepared in consideration of the relevant provisions of the EP&A Regulation.
- A description of the existing environment, an assessment of the potential environmental impacts associated with the Modification, and a description of the potential measures to avoid, mitigate, rehabilitate, remediate, monitor and/or offset the potential impacts of the Modification are described in Section 6 and Appendices A to I.
- The suitability of the proposed site for the Modification has been considered in Section 6 and Appendices A to I.
- Consideration of whether, on evaluation, the Modification is considered to be in the public interest is provided in Section 7.

4.2 OTHER RELEVANT NSW LEGISLATION

In addition to the EP&A Act, other NSW legislation may be applicable to the Wambo Coal Mine incorporating the Modification:

- WM Act;
- *Biodiversity Conservation Act 2016* (BC Act);
- *Mining Act 1992*;
- *National Parks and Wildlife Act 1974* (NPW Act);
- *Protection of the Environment Operations Act 1997* (PoEO Act); and
- *Crown Lands Management Act 2016*.

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

Additional details on the likely requirements of key acts are provided in the sub-sections below.

4.2.1 Water Management Act 2000

The WM Act contains provisions for the licensing, allocation, capture and use of water resources.

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

WCPL would continue to obtain and hold licences required under the WM Act for licensable take.

4.2.2 Biodiversity Conservation Act 2016

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

Section 6.7 considers the potential biodiversity impacts associated with the Modification.

As described in Section 6.7, with reference to clause 30A, sections 1(a) and 2(c) of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*, the Modification would not result in a net increase to impacts on biodiversity values and therefore, it is considered that a Biodiversity Development Assessment Report (BDAR) is not required.

4.2.3 Mining Act 1992

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

The proposed Modification activities at the Wambo Coal Mine (i.e. development of Longwalls 24 to 26) would be located partially within ML 1572, ML 1806 and AUTH 444.

A new Mining Lease would be required for the Modification activities within AUTH 444 under the *Mining Act 1992*.

WCPL would review and revise the Mining Operations Plan/Rehabilitation Management Plan (or equivalent) to incorporate the Modification.

4.2.4 National Parks and Wildlife Act 1974

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

Relevant to the Modification area, WCPL holds Aboriginal Heritage Impact Permit (AHIP) #2222 and AHIP #C0003213 issued under the NPW Act for the Wambo Coal Mine.

An Aboriginal Cultural Heritage Assessment (ACHA) has been undertaken for the Modification by South East Archaeology Pty Ltd (SEA) (2022) to assess the potential impacts of the Modification on Aboriginal cultural heritage (Appendix D).

WCPL would consult with Heritage NSW regarding the need to seek a new area based AHIP under section 90 of the NPW Act due to potential indirect impacts to Aboriginal cultural heritage outside the areas covered by AHIP #2222 and AHIP #C0003213.

For portions of the Modification area within the AHIP #2222 and AHIP #C0003213 boundaries, WCPL will continue to manage Aboriginal cultural heritage in accordance with the approved Wambo Coal Mine Heritage Management Plan and AHIPs granted under the NPW Act.

4.2.5 Protection of the Environment Operations Act 1997

The PoEO Act and the *Protection of the Environment Operations (General) Regulation 2021* set out the general obligations for environmental protection for industry in NSW, which is regulated by the NSW Environment Protection Authority (EPA).

Operations and monitoring at the Wambo Coal Mine are currently undertaken in accordance with the current Environment Protection Licence (EPL) 529 held by WCPL issued under the PoEO Act.

EPL 529 would be varied to incorporate the Modification area within the premises boundary.

4.2.6 Crown Land Management Act 2016

The *Crown Land Management Act 2016* provides for the management of Crown land in NSW.

For all relevant Crown land directly affected by the modified Project, WCPL would enter into necessary leases or licences under the Crown Land Management Act 2016 and/or reach agreements under section 265 of the *Mining Act 1992* to allow Modification activities to occur.

WCPL has consulted with the Department of Planning and Environment (DPE) – Crown Lands regarding the Modification (Section 5).

4.3 ENVIRONMENTAL PLANNING INSTRUMENTS

Detail on potential Modification requirements under the key environmental planning instruments is included in the statutory compliance table provided in Attachment 2.

4.4 COMMONWEALTH LEGISLATION

4.4.1 Environment Protection and Biodiversity Conservation Act 1999

The objective of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance (MNES).

Proposals that are likely to have a significant impact on a MNES are defined as a controlled action under the EPBC Act. A proposal that is, or may be, a controlled action is required to be referred to the Commonwealth Department of Climate Change, Energy, the Environment and Water to determine whether or not the action is a controlled action.

The current South Bates Extension Underground Mine is approved to be undertaken in accordance with Approval Decision (EPBC 2016/7816) granted on 4 May 2018 (and varied by notice on 3 December 2019) under the Commonwealth EPBC Act.

The potential impacts of the Modification on flora and fauna have been assessed in the Biodiversity Review (Appendix F) and summarised in Section 6.7.

The potential impacts of the Modification on water resources have been assessed in the Groundwater Assessment (Appendix B) and Surface Water Assessment (Appendix C) and summarised in Sections 6.3 and 6.4, respectively.

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

4.4.2 National Greenhouse and Energy Reporting Act 2007

The Commonwealth *National Greenhouse and Energy Reporting Act 2007* (NGER Act) introduced a single national reporting framework for the reporting and dissemination of corporations’ greenhouse gas emissions and energy use.

WCPL would account for the greenhouse gas emissions associated with the Modification in its annual NGER Act report.

5 ENGAGEMENT

This section provides an overview of the engagement undertaken during the preparation of this Modification Report, the key issues raised during this engagement, and any changes to the approved Wambo Coal Mine engagement that would be required as a result of the Modification.

5.1 ENGAGEMENT APPROACH

The engagement undertaken during preparation of this Modification Report is in accordance with WCPL's Scoping Letter for the Modification and has been undertaken with consideration of the requirements of *Undertaking Engagement Guidelines for State Significant Projects* (DPIE, 2021c).

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

- engage with key government and public stakeholders about the Modification;
- seek input from key stakeholders on elements of the Modification; and
- continue the ongoing dialogue between WCPL and key stakeholders regarding the development of the Wambo Coal Mine.

It is anticipated that consultation will continue during the public exhibition of this Modification Report and the assessment of the Modification by the NSW Government.

5.2 NSW GOVERNMENT AGENCIES

NSW Department of Planning and Environment

WCPL held a meeting with DPE on 29 October 2021 to provide an overview of the Modification, the supporting environmental assessments to be undertaken, and the proposed approval process and timing. Feedback provided by DPE during this meeting has been considered in this Modification Report.

On 13 December 2021, WCPL submitted a scoping letter to DPE providing an overview of the Modification, proposed approval pathway and the proposed scope of the environmental assessment.

DPE representatives undertook a site inspection of the Wambo Coal Mine (including the Modification area) on 27 July 2022.

The matters raised by DPE during this consultation have been considered in this Modification Report.

Other NSW Government Agencies

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

- Biodiversity, Conservation and Science Directorate;
- Heritage NSW and NSW Heritage Council;
- Department of Regional NSW – Mining, Exploration and Geoscience (MEG);
- NSW Resource Regulator;
- DPE Water and Natural Resources Access Regulator (NRAR);
- EPA; and
- DPE – Crown Lands.

WCPL met with MEG on 30 November 2021 to provide an overview of the Modification and details of the resource, resource recovery and economics. No particular matters requiring attention in the Modification Report were raised in the meeting.

A meeting was held with DPE Water and NRAR on 1 July 2022 to discuss the Modification, and the Groundwater Assessment and Surface Water Assessment approach. DPE Water and NRAR outlined relevant technical aspects to be considered in the Groundwater Assessment and Surface Water Assessment for the Modification and these have been addressed in the Groundwater Assessment (Appendix B) and Surface Water Assessment (Appendix C).

5.3 LOCAL COUNCIL

The Wambo Coal Mine is located within the Singleton Local Government Area (LGA) (Figure 1).

WCPL provided a briefing letter to the Singleton Council in June 2022 to provide an overview of the Modification.

WCPL offered to meet with the Singleton Council to discuss the details of the proposed Modification, and invited the Singleton Council to provide any comments or feedback on the proposal.

Representatives of the Singleton Council are also members of the Community Consultative Committee (CCC) for the Wambo Coal Mine (Section 5.5).

5.4 UNITED COLLIERIES

WCPL and United Collieries have formed a joint venture over the tenements adjoining the Modification area in relation to the United Wambo Open Cut Coal Mine Project (Section 1.1).

Consultation with United Collieries regarding this Modification is ongoing. During this consultation, the interactions between this Modification and existing and future infrastructure and assessment of cumulative impacts were discussed.

5.5 COMMUNITY ENGAGEMENT

Community Consultative Committee

A CCC for the Wambo Coal Mine is in place and provides a mechanism for ongoing communication between WCPL and the local community.

WCPL provided a briefing regarding the Modification, including an overview of the Modification and proposed scope of environmental assessment, at the CCC meetings in February and May 2022.

WCPL will provide an update on the Modification during the next CCC meeting in August 2022.

In addition, WCPL attended the United Wambo Open Cut Coal Mine Community Information Evening held 15 March 2022. Posters were displayed outlining the Modification and WCPL staff were on hand to discuss current Wambo Coal Mine operations and the Modification. A Newsletter outlining the Modification was also distributed.

Minutes for the Wambo Coal Mine CCC meetings and a copy of the Newsletter are made publicly available on the Peabody Energy Australia Pty Limited website.

Aboriginal Stakeholders

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

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

Public Consultation

The WCPL's website provides regular updates on the Wambo Coal Mine, and provides access to relevant environment and community information, including compliance reports and approval documents.

The Wambo Coal Mine community line (02 6570 2245) allows members of the public to contact WCPL with enquiries or complaints.

A copy of this Modification Report will be made available on WCPL's website.

6 ASSESSMENT OF IMPACTS

6.1 IDENTIFICATION OF THE KEY ISSUES

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

The key potential environmental impacts of the Modification are related to reorientation of Longwalls 24 and 25 and the addition of Longwall 26 associated with the South Bates Extension Underground Mine (referred to as the “Modification longwalls”) and the associated subsidence impacts and consequences.

The “Modification area” is defined as the extent of predicted measurable vertical subsidence for the Modification longwalls (Figure 5).

A discussion of the predicted subsidence effects and impacts is provided in Section 6.2. An assessment of the potential consequences of the predicted subsidence impacts is provided in Sections 6.2 to 6.9 and the relevant appendices for:

- natural and built features;
- groundwater;
- surface water;
- Aboriginal cultural heritage;
- historic heritage;
- biodiversity; and
- land resources and agriculture production.

In addition, an assessment of potential changes to greenhouse gas emissions due to the Modification is provided in Section 6.9 and Appendix I.

Sections 6.2 to 6.9 and the relevant appendices include a description of the existing environment, an assessment of the potential impacts of the Modification and, where relevant, a description of measures that would be implemented to avoid, minimise and/or mitigate the potential impacts.

Section 6.10 discusses the potential environmental impacts of the Modification on other aspects, including amenity (i.e. noise and air quality), visual, road transport, socio-economic outcomes and hazards and risk.

6.2 SUBSIDENCE

6.2.1 Methodology

A Subsidence Assessment has been prepared by Mine Subsidence Engineering Consultants (MSEC) (2022) for the Modification and is provided in Appendix A.

The Subsidence Assessment:

- identifies the natural and built features located above and in the vicinity of the Modification area;
- provides subsidence predictions for the Modification longwalls and the approved longwalls in the Whybrow Seam at the South Bates Extension Underground Mine;
- compares the subsidence predictions with the approved mine layout at the South Bates Extension Underground Mine; and
- assesses the likely subsidence impacts on natural and built features in consideration of the predicted subsidence effects and existing performance measures.

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

6.2.2 Background

Previous Assessments

MSEC (2017) assessed the currently approved South Bates Extension Underground Mine layout and concluded that the level of impact on natural and built features can be managed by the preparation and implementation of appropriate management strategies.

Subsidence Impact Performance Measures

Conditions B1 and B4, Schedule 2 of Development Consent (DA 305-7-2003) provide subsidence impact performance measures for natural and built features relevant to underground mining in the Modification area (Table 2).

Extraction Plan

Condition B7, Schedule 2 of Development Consent (DA 305-7-2003) requires WCPL to prepare an Extraction Plan for second workings prior to extraction.

Table 2
Subsidence Impact Performance Measures

Feature	Subsidence Impact Performance Measure
Natural and Heritage Features	
Wollombi Brook	Negligible subsidence impacts. Negligible environmental consequences. Controlled release of excess site water only in accordance with EPL 529 requirements.
Low Level Cliffs within the South Bates Extension Area	Minor environmental consequences (that is occasional rockfalls, displacement or dislodgement of boulders or slabs, or fracturing that in total do not impact more than 5% of the total face area of such features)
Wollemi National Park	Negligible subsidence impacts. Negligible environmental consequences.
Warkworth Sands Woodland Community	Minor cracking and ponding of the land surface or other subsidence impact. Negligible environmental consequences.
White Box - Yellow Box - Blakely's Red Gum Woodland/Grassy White Box Woodland Community	Minor cracking and ponding of the land surface or other subsidence impact. Negligible environmental consequences.
Central Hunter Valley Eucalypt Forest and Woodland Ecological Community	Minor cracking and ponding of the land surface or other subsidence impact. Negligible environmental consequences.
Conservation Areas (including the proposed SSD 7142 offset area)	Negligible reduction to previously identified biodiversity credits.
Wambo Homestead Complex	Negligible impact on heritage values, unless approval has been granted by Heritage NSW and/or the Minister.
Built Features	
All built features	Always safe. Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. Damage must be fully repairable, and must be fully repaired or else replaced or fully compensated.
Public Safety	
Public safety	Negligible additional risk.

Source: Conditions B1 and B4, Schedule 2 of Development Consent (DA 305-7-2003).

6.2.3 Prediction of the Subsidence Effects

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

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

Prediction Methodology

MSEC (2022) has assessed the predicted subsidence effects associated with the Modification.

The Modification longwalls are located in an area that has not previously been mined, and therefore represents single-seam mining conditions.

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

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

The predicted subsidence effects for the Modification have been assessed for both the Modification longwalls as well as combined with the existing and operating South Bates Extension Underground Mine longwalls 17 to 23 (i.e. “Modified Layout”). The “Approved Layout” predicted subsidence effects are based on MSEC (2017).

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

Maximum Conventional Subsidence Effects

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

Table 3 presents a comparison of the maximum predicted subsidence effects from the approved and modified South Bates Extension Underground Mine layouts.

The maximum predicted total vertical subsidence for the Modified Layout is the same as the Approved Layout (Table 3).

The maximum predicted total tilt for the Modified Layout is less than the Approved Layout (Table 3). The reason for this decrease in tilt is the increased minimum depth of cover for the Modified Layout (Appendix A).

The maximum predicted hogging curvature and sagging curvature for the Modified Layout are the same as the Approved Layout (Table 3).

Prediction of Non-conventional Subsidence Effects

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

Non-conventional subsidence movements have been included for the Modification.

Potential impacts and consequences of predicted non-conventional subsidence movements are discussed below and in Appendix A.

6.2.4 Subsidence Impacts

Subsidence impacts are the physical changes to the ground and its surface caused by the subsidence effects described above in Section 6.2.3.

**Table 3
Comparison of Predicted Subsidence Effects for the Approved and Modified
South Bates Extension Underground Mine Layouts**

South Bates Extension Underground Mine Layout	Maximum Predicted Total Subsidence (mm)	Maximum Predicted Total Tilt (mm/m)	Maximum Predicted Hogging Curvature (km ⁻¹)	Maximum Predicted Sagging Curvature (km ⁻¹)
Approved Layout				
Longwalls 17 to 25	1,950	90	> 3	> 3
Modified Layout				
Longwalls 24 to 26	1,950	75	> 3	> 3
Combined (Maximum) Longwalls 17 to 26	1,950	80	> 3	> 3

Source: Appendix A.

mm = millimetre.

mm/m = millimetre per metre.

km⁻¹ = per kilometre.

Potential subsidence impacts associated with the Modification include:

- surface cracking;
- changes in stream bed gradients;
- ponding and changes in stream alignment;
- slope instability, erosion and rock fall; and
- depressurisation of groundwater aquifers.

The type and magnitude of predicted subsidence effects for the Modified Layout are generally similar to or less than those of the Approved Layout (Appendix A).

It is therefore expected that the potential subsidence impacts above the Modification longwalls would be similar to those observed and managed to date at the South Bates Extension Underground Mine (Appendix A).

The Subsidence Assessment (Appendix A) includes detailed subsidence predictions and assessment for key natural and built features across the Modification area. Potential environmental consequences of subsidence on key natural and built features are summarised in Section 6.2.5 below.

6.2.5 Potential Environmental Consequences on Key Natural and Built Features

The Modification longwalls have been designed to be consistent with the subsidence impact performance measures in Development Consent (DA 305-7-2003) (Table 2).

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

Natural Features

Wollombi Brook

Wollombi Brook is located more than 4 km from the Modification longwalls (Figure 3) and would not be affected by subsidence associated with the Modification.

North Wambo Creek

North Wambo Creek has been previously affected by subsidence from the North Wambo Underground Mine, downstream of the Modification area.

In addition, a section of North Wambo Creek has been diverted (i.e. redesigned) around open cut operations and replaced with a constructed channel (the North Wambo Creek Diversion).

An approximate 2.7 km section of North Wambo Creek upstream of the North Wambo Creek Diversion is located above the approved South Bates Extension Underground Mine footprint (Figure 6). The length of North Wambo Creek located above the Modified Layout would be approximately 2.1 km shorter than the Approved Layout of the South Bates Extension Underground Mine (Appendix A).

Subsidence impacts on North Wambo Creek include changes in grade and surface cracking. Potential subsidence impacts and environmental consequences on North Wambo Creek are described in Section 6.4 and Appendix C.

North Wambo Creek Diversion

The North Wambo Creek Diversion has been directly undermined by longwalls in the Whybrow Seam at the approved South Bates Underground Mine and South Bates Extension Underground Mine.

The North Wambo Creek Diversion is located at least 600 m from the Modification longwalls (Figure 6) and would not be affected by subsidence associated with the Modification.

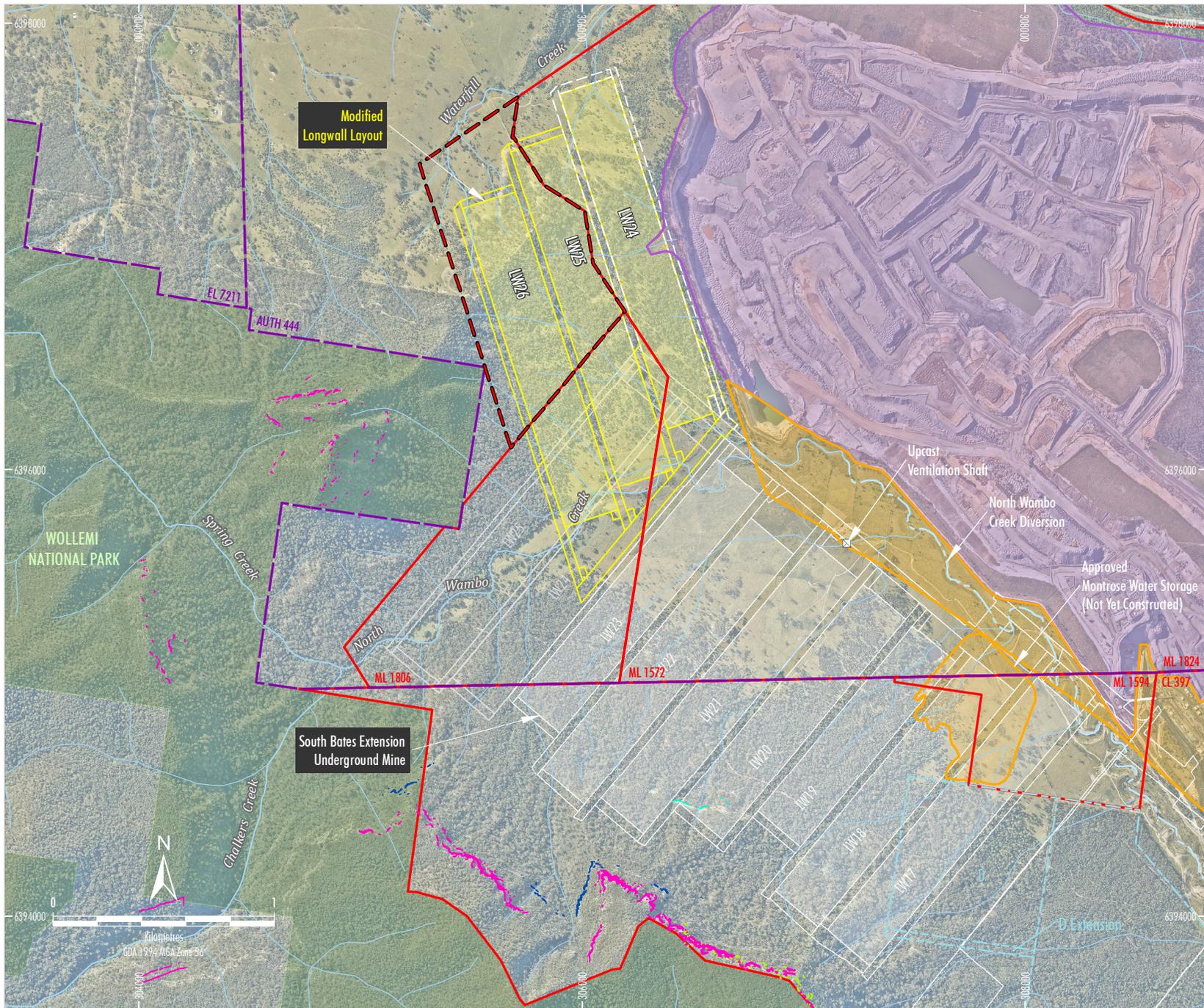
Waterfall Creek

Waterfall Creek is located outside the approved South Bates Extension Underground Mine mining area. Approximately 200 m of Waterfall Creek would be located above the Modification longwalls (Figure 6).

Subsidence impacts on Waterfall Creek would include changes in grade and surface cracking. Potential subsidence impacts and environmental consequences on Waterfall Creek are described in Section 6.4 and Appendix C.

Alluvial Aquifers

Alluvium associated with North Wambo Creek is located above the Modification longwalls. The potential impacts of the Modification on the alluvium are discussed in Section 6.3 and Appendix B.



- LEGEND**
- National Park
 - SSD 7142 Operational Area #
 - Wambo Coal Mine
 - Exploration Licence Boundary (AUTH, EL)
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 - Remnant Woodland Enhancement Program (RWEF) Area
 - Existing/Approved Wambo Coal Mine Surface Development Area
 - Ventilation Shaft
 - Existing/Approved Underground Development
 - Approved Orientation of Longwalls 24 and 25
 - Existing/Approved Underground Development (First Workings only)
 - Modification 19
 - Modified Longwall Layout
 - Cliffs associated with Wollemi National Park Escarpment
 - Intermediate Level Cliffs
 - Lower Level Cliffs
 - Minor Cliffs

Under Phase 2 of mining at Wambo Coal Mine (commenced 1 December 2020), this area is operated by United Collieries Pty Ltd under the United Wambo Joint Venture Project.

Source: South East Archaeology (2022); WCPL (2022); MSEC (2017)
 NSW Spatial Services (2022)
 Orthophoto: WCPL (May 2022)

Peabody

W A M B O C O A L M I N E

Natural Features within and adjacent to the Modification Area

Figure 6

Cliffs

Cliffs are defined as a continuous rock face, including overhangs, having a minimum length of 20 m, a minimum height of 10 m and a minimum slope of 2 to 1. Minor cliffs are defined as continuous rock faces, including overhangs, having a minimum length of 20 m, heights between 5 m and 10 m and a minimum slope of 2 to 1; or a rock face having a maximum length of 20 m and a minimum height of 10 m.

Cliffs and minor cliffs in the vicinity of the Modification area were identified by MSEC (2022) using Light Detection and Ranging survey data and detailed site investigations (Figure 6).

No cliffs were identified above or adjacent to the Modification area. The closest cliffs to the Modification area are located approximately 760 m to the west within the Wollemi National Park escarpment (Figure 6) (Appendix A).

Cliffs Associated with the Wollemi Escarpment

Cliffs associated with the Wollemi National Park escarpment are the higher level cliffs located along the boundary of the Wollemi National Park (Figure 6).

These cliffs are located approximately 760 m from the 26.5° angle of draw associated with the Modification longwalls.

The Modification would not increase the predicted subsidence effects on the cliffs associated with the Wollemi National Park escarpment. MSEC (2022) concludes these cliffs are not predicted to experience measurable conventional tilts, curvatures or strains.

While the cliffs associated with the Wollemi National Park escarpment could experience low level far-field horizontal movements, it is unlikely that the cliffs would be adversely impacted (Appendix A).

Intermediate Level Cliffs

Intermediate level cliffs are located part way down the steep slopes beneath the Wollemi National Park escarpment to the south of the approved South Bates Extension Underground Mine, outside of the Modification area (Figure 6). The intermediate level cliffs have heights varying between 10 and 20 m and continuous lengths up to approximately 50 m.

The Modification would not increase the predicted subsidence effects on the intermediate level cliffs (Appendix A). MSEC (2022) considers it is unlikely the intermediate level cliffs would be adversely impacted due to the Modification.

Lower Level Cliffs

The larger lower level cliffs are located above approved Longwalls 20 and 21 in the South Bates Extension Underground Mine, outside of the Modification area (Figure 6). These cliffs are discontinuous and are separated with sections of minor cliffs and rock outcrops with a total length of approximately 150 m (Appendix A).

The Modification would not change the predicted subsidence effects on the lower level cliffs (Appendix A). MSEC (2022) considers it is unlikely the lower level cliffs would be adversely impacted due to the Modification.

Rock Features

Isolated pagodas have been identified in the vicinity of the Wollemi National Park escarpment, with none identified directly above the Modification longwalls. MSEC (2022) considers it is unlikely the isolated pagodas would be adversely impacted due to the Modification.

Steep Slopes

Steep slopes (where the natural gradient is between 1 in 3 and 2 in 1) occur in the Modification area above Longwalls 25 and 26 (Figure 6) (Appendix A).

The maximum predicted total tilt for these steep slopes of 40 mm/m (i.e. 4.0% or 1 in 25) is small when compared to the natural surface grades, which are greater than 1 in 3 (i.e. 33%) (Appendix A). Therefore, MSEC (2022) concludes it is unlikely that mining-induced tilts would result in any adverse impact on the stability of these steep slopes.

Potential impacts on steep slopes would generally result from the downslope movement of the ground, resulting in tension cracks appearing at the tops of the steep slopes and compression ridges forming at the bottoms of the steep slopes. Remediation of surface cracking is described in Section 6.8.2.

Wollemi National Park

The Wollemi National Park is located approximately 115 m south-west of the Modification longwalls at the closest point (Figure 6). The Modification was designed to maintain WCPL's commitment to maintain an offset equivalent to a 26.5° angle of draw from the base of the Wollemi National Park escarpment, which effectively mitigates subsidence risk to the escarpment.

Land within the Wollemi National Park is predicted to experience very low levels (i.e. less than 20 mm) of vertical subsidence and no measurable tilts, curvatures or strains from the Modification longwalls. The magnitude of the predicted vertical subsidence is similar to the natural movements that occur due to the wetting and drying of the surface soils (Appendix A).

It is therefore considered unlikely the Wollemi National Park would be adversely impacted by subsidence movements from the Modification (Appendix A).

Aboriginal Cultural Heritage

Potential consequences on Aboriginal cultural heritage sites as a result of subsidence impacts from the Modification are described in Section 6.5 and Appendix D.

Historic Heritage

Potential consequences on historic heritage as a result of subsidence impacts from the Modification are discussed in Section 6.6 and Appendix E.

Biodiversity

Potential consequences on threatened species, threatened populations and endangered ecological communities as a result of subsidence impacts from the Modification are discussed in Section 6.7 and Appendix F.

Land Use and Land Resources

Potential consequences on land use and land resources as a result of subsidence impacts from the Modification are described in Section 6.8 and Appendix G.

Built Features

The potential impacts of subsidence effects on built features are assessed in Appendix A. Built features located within the Modification area and immediate vicinity include:

- unsealed roads and tracks across and adjacent to WCPL-owned land;
- rural structures, fences and farm dams used for grazing on WCPL-owned land; and
- WCPL-owned exploration boreholes.

The Subsidence Assessment (Appendix A) indicates that the predicted levels of impact on built features can be managed through the preparation and implementation of the appropriate management strategies, as part of the Extraction Plan process, to maintain items in a safe and serviceable condition.

Public Safety

Surface cracking, erosion and ponding have the potential to pose a safety hazard.

The Modification area is WCPL-owned. Potential safety issues resulting from the extraction of the Modification longwalls could include:

- potential safety hazards for users of existing unsealed roads and tracks in active subsidence areas; and
- potential safety hazards to agistees accessing active subsidence areas to manage stock.

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

Performance Measures

The existing subsidence performance measures in Development Consent (DA 305-7-2003) (Table 2) are considered to be appropriate for the Modification as the subsidence impacts associated with the Modification longwalls are similar to the approved South Bates Extension Underground Mine.

The Subsidence Assessment indicates that the levels of impact on natural and built features can be managed by the preparation and implementation of the appropriate mitigation strategies (Appendix A). Monitoring and mitigation measures are described in Section 6.2.6 below.

6.2.6 Mitigation Measures, Management and Monitoring

Mitigation and management measures for potential consequences on groundwater, surface water, Aboriginal cultural heritage, historic heritage, biodiversity and land resources are described in Sections 6.3 to 6.8.

Extraction Plan

Development Consent (DA 305-7-2003) requires WCPL to prepare an Extraction Plan prior to the commencement of second workings for the Modification longwalls to:

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

WCPL would implement adaptive management in accordance with Condition D4, Schedule 2 of Development Consent (DA 305-7-2003) so that subsidence impact performance measures (Table 2) are achieved for the Modification longwalls.

In the event that a subsidence impact or environmental consequence exceeds a performance measure WCPL would be required to remediate the impact in accordance with Development Consent (DA 305-7-2003).

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

The mitigation measures and monitoring in the Extraction Plan is anticipated to be similar to the measures implemented at the existing approved South Bates Extension Underground Mine, with the implementation of any improvements identified through WCPL's adaptive management approach.

Built Features

Measures to manage the impacts of subsidence on built features would be developed as a component of the relevant Extraction Plan, and would be consistent with the requirements of Development Consent (DA 305-7-2003).

Public Safety

The Extraction Plan that would be developed for the Modification longwalls would include a Public Safety Management Plan as required under Condition B7, Schedule 2 of the Development Consent (DA 305-7-2003).

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

6.3 GROUNDWATER

6.3.1 Methodology

A Groundwater Assessment has been prepared by SLR Consulting Australia Pty Ltd (SLR) (2022a) for the Modification and is provided in Appendix B.

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

- WM Act and relevant water sharing plans;
- *NSW Aquifer Interference Policy (AIP)* (NSW Government, 2012a);
- *Australian Groundwater Modelling Guidelines* (Barnett *et al.*, 2012);
- *Groundwater assessment toolbox for major projects in NSW – Overview document* (DPE, 2022);
- PoEO Act; and
- EPBC Act, including the:
 - *Significant impact guidelines 1.3: Coal seam gas and large coal mining developments – impacts on water resources* (Commonwealth Department of the Environment, 2013); and
 - *Information Guidelines for the Independent Expert Scientific Committee advice on coal seam gas and large coal mining development proposals* (Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development, 2018).

6.3.2 Existing Environment

Previous Assessments

A number of groundwater investigations, assessments and reviews have been undertaken to assess the potential impacts of the approved Wambo Coal Mine.

The most recent assessment for the Wambo Coal Mine was prepared by HydroSimulations (2017) for the approved South Bates Extension Modification.

Groundwater Management and Monitoring

Groundwater management and monitoring at the Wambo Coal Mine is conducted in accordance with the approved Water Management Plan, including the Groundwater Management Plan, prepared in accordance with Condition B66, Schedule 2 of the Development Consent (DA 305-7-2003).

Furthermore, the management of potential groundwater impacts associated with the second workings of the South Bates Extension Underground Mine is undertaken in accordance with a separate Water Management Plan prepared as part of the Extraction Plan in accordance with Condition B7, Schedule 2 of the Development Consent (DA 305-7-2003).

A comprehensive groundwater monitoring network has been established at the Wambo Coal Mine and the locations of groundwater monitoring sites are shown on Figure 7.

Groundwater levels and quality are generally monitored at the groundwater monitoring sites (Figure 7) and results are reported in the Annual Review.

Hydrogeological Regime

The hydrogeological regime at the Wambo Coal Mine and surrounds comprises two main water bearing systems (Appendix B):

- Quaternary alluvial groundwater within channel fill deposits associated with North Wambo Creek, Wambo Creek, Wollombi Brook and the Hunter River.
- Permian coal measures comprising stratified sequences of sandstone, siltstone and claystone (interburden) and coal. The coal seams are the groundwater bearing units, with the low permeability interburden generally confining the individual seams.

Alluvial Aquifers

The alluvium in the vicinity of the Modification area is associated with North Wambo Creek and has been disconnected from the regional alluvial system due to the removal of alluvium downstream across the full width of the channel by the adjacent open cut operations (and associated construction of the North Wambo Creek Diversion) (Figure 8) (Appendix B).

Recharge to the North Wambo Creek alluvium occurs via diffuse infiltration from North Wambo Creek following rainfall events of sufficient intensity to generate flows. The alluvium does not however remain saturated for long periods of time following flow events, with water percolating laterally or through to the underlying regolith (Appendix B).

This is reflected in the groundwater levels observed in the monitoring bores located along North Wambo Creek in the vicinity of the Modification area which were generally dry during 2017 to early 2020 when rainfall was below average rainfall levels. Since early 2020, above average rainfall has resulted in several flow events in North Wambo Creek with recharge to the alluvium occurring due to creek flow losses and direct infiltration (Appendix B).

Permian Aquifers

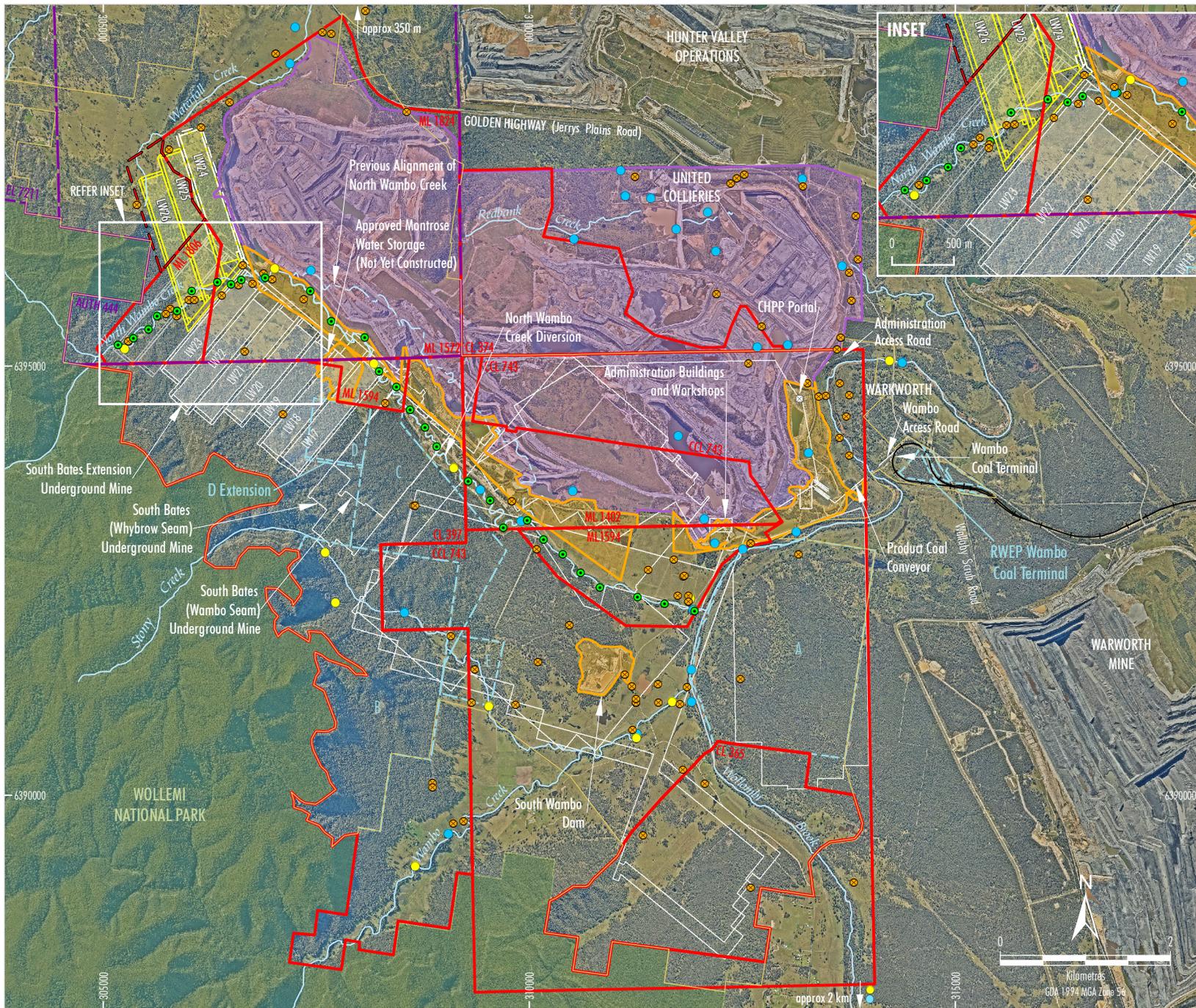
Groundwater within the Permian coal measures is confined to semi-confined with the coal measures. Groundwater flow largely follows the regional topography, flowing in a north-easterly direction (Appendix B).

Mining activities at the Wambo Coal Mine and adjoining mining operations has created a drawdown within the Permian coal measures (Appendix B).

Groundwater Use

There are 27 bores registered for irrigation, domestic and/or stock use, and 16 bores of unknown use within 4 km of the Wambo Coal Mine and the United Wambo Open Cut Operations. There are also 41 monitoring/test bores within WCPL's mining tenement boundaries and a further 15 mine/dewatering/exploration bores (Appendix B).

There are no bores used for irrigation, domestic and/or stock use within the Modification area (Appendix B).



LEGEND

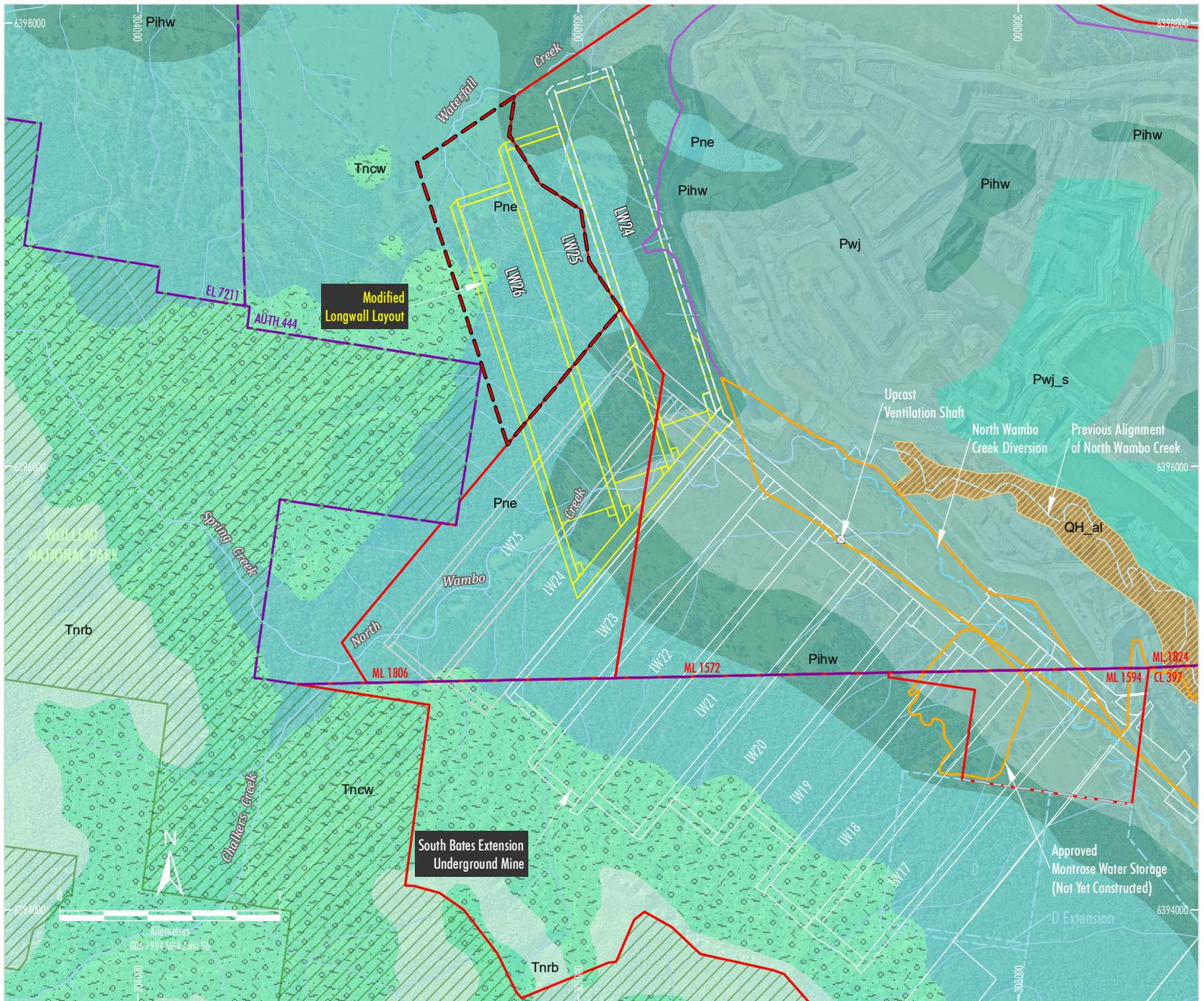
- National Park
- SSD 7142 Operational Area #
- WCPL Owned Land
- Wambo Coal Mine
- Exploration Licence Boundary (AUTH, EL)
- Mining and Coal Lease Boundary (ML, CL, CCL)
- Proposed Mining Lease Application Area
- Remnant Woodland Enhancement Program (RWEP) Area
- Existing/Approved Wambo Coal Mine Surface Development Area
- Existing/Approved Underground Development
- Approved Orientation of Longwalls 24 and 25
- Existing/Approved Underground Development (First Workings only)
- Modification 19
- Modified Longwall Layout
- Monitoring Sites**
- Groundwater Monitoring Site
- Surface Water Flow Monitoring Site
- Surface Water Quality Monitoring Site
- Diversion and Subsidence Monitoring Site

Under Phase 2 of mining at Wambo Coal Mine (commenced 1 December 2020), this area is operated by United Collieries Pty Ltd under the United Wambo Joint Venture Project.

Source: WCPL (2022); NSW Spatial Services (2022)
 Orthophoto: WCPL (May 2022)

Peabody
 W A M B O C O A L M I N E
 Locations of Surface Water and
 Groundwater Monitoring Sites

Figure 7



- LEGEND**
- National Park
 - SSD 7142 Operational Area #
 - Wambo Coal Mine
 - Exploration Licence Boundary (AUTH, EL)
 - Mining and Coal Lease Boundary (ML, CL, CCL)
 - Proposed Mining Lease Application Area
 - Remnant Woodland Enhancement Program (RWEPP) Area
 - Existing/Approved Wambo Coal Mine Surface Development Area
 - Ventilation Shaft
 - Existing/Approved Underground Development
 - Approved Orientation of Longwalls 24 and 25
 - Existing/Approved Underground Development (First Workings only)
 - Modification 19
 - Modified Longwall Layout
 - SURFACE GEOLOGY MAPPING**
 - Cenozoic Sedimentary Province**
 - QH_al Alluvial levee/overbank deposits
 - Removed by Open Cut Operations
 - Permo-Triassic Basins**
 - Pihw Watts Sandstone
 - Pihw_s Watts Sandstone - quartz-lithic sandstone
 - Pne Newcastle Coal Measures
 - Pwj Jerrys Plains Subgroup
 - Pwj_s Jerrys Plains Subgroup - sandstone
 - Tna_q Narrabeen Group - quartz sandstone
 - Tncw Widden Brook Conglomerate
 - Tnrw Banks Wall Sandstone

Under Phase 2 of mining at Wambo Coal Mine (commenced 1 December 2020), this area is operated by United Collieries Pty Ltd under the United Wambo Joint Venture Project.

Source: WCPL (2022); NSW Spatial Services (2022); State of New South Wales through Regional NSW (2021) Orthophoto: WCPL (May 2022)

Figure 8

Groundwater Dependent Ecosystems

Groundwater dependent ecosystems (GDEs) are ecosystems that rely upon groundwater for their continued existence.

The *Groundwater Dependent Ecosystem Atlas* (GDE Atlas) was developed by the Bureau of Meteorology (BoM) as a national dataset of Australian GDEs to inform groundwater planning and management (BoM, 2018).

Parts of the Modification area and the approved Longwalls 24 and 25 are identified as low potential terrestrial GDEs based on the BoM GDE Atlas (Appendix B).

High potential GDEs located outside the Modification area based on the BoM GDE Atlas are located on North Wambo Creek, Waterfall Creek, Redmanvale Creek and Hunter River (Appendix B).

Eco Logical Australia (ELA) (Appendix F) identified high potential GDEs associated with North Wambo Creek and Waterfall Creek (Figure 5).

6.3.3 Potential Impacts

Numerical modelling has been undertaken to inform the Groundwater Assessment (Appendix B) for the Modification and to quantify the likelihood and magnitude of potential impacts.

The potential incremental impacts of the Modification on groundwater have been assessed by comparing model outputs for the approved South Bates Extension Underground Mine layout and the Modification layout. Neighbouring mines and other influences (e.g. rainfall recharge) are the same in both models.

Details of the development and calibration of the numerical groundwater model is provided in Appendix B.

The main potential impacts on the groundwater regime due to the Modification are as a result of:

- subsurface fracturing and shearing of sedimentary strata above the proposed longwalls resulting in changes in bulk rock mass permeability and storage capacity; and
- dewatering of groundwater that enters underground mining areas as a result of the above.

The potential impacts of the Modification on the groundwater system as a result of these mechanisms are summarised below.

Groundwater Inflows

The maximum predicted groundwater inflow to the South Bates Extension Underground Mine is not expected to change as a result of the Modification. In addition, the predicted groundwater inflows are similar to those predicted in HydroSimulations (2017) (Appendix B).

While there is no increase in maximum predicted groundwater inflows to the South Bates Extension Underground Mine, the Modification is expected to result in a small increase in the predicted groundwater inflows to the South Wambo Underground Mine due to the increased period that longwall mining occurs concurrently in the Woodlands Hill Seam and Arrowfield Seam at the South Wambo Underground Mine. The maximum predicted groundwater inflows to the South Wambo Underground Mine are lower than those predicted in HydroSimulations (2017) (Appendix B).

Permian Aquifers

Depressurisation of the Permian strata within the mine footprint has occurred as part of the approved South Bates Extension Underground Mine and adjacent open cut mining operations. The Permian coal measures within the Modification area are predicted to be essentially dewatered during mining of the target Whybrow seam (Appendix B).

The Modification would result in additional drawdown of the Permian coal measures above and to the north of the Modification area (Appendix B).

The Modification would not however have a significant impact on water levels in the Permian coal measures from a regional perspective due to the regional zone of depressurisation within the Permian coal measures created by historical and ongoing open cut and underground mining (Appendix B). This is consistent with the conclusions of HydroSimulations (2017).

Alluvial Aquifers

The Modification would reduce the area of North Wambo Creek alluvium that is directly undermined by the South Bates Extension Underground Mine and therefore impacts on the alluvium are expected to reduce relative to the approved Wambo Coal Mine (Appendix B).

SLR (2022a) concluded there is no predicted change in the maximum drawdown in alluvial aquifers between the approved Wambo and Wambo incorporating the Modification.

There would be negligible impact on the Wollombi Brook or Hunter River alluvium as a result of the Modification (Appendix B).

Groundwater Quality

The Modification would not result in any incremental groundwater quality impacts (Appendix B).

Groundwater Users

SLR (2022a) predicts there would be no additional privately-owned registered groundwater users affected as a result of the Modification.

The influence on groundwater levels due to the Modification would be localised above and directly to the north of the Modification longwalls (Appendix B).

Groundwater Dependent Ecosystems

The Modification is not expected to result impacts to the GDEs identified on North Wambo Creek, Waterfall Creek, Redmanvale Creek and Hunter River (Appendix B).

The modified South Bates Extension Underground Mine would reduce the area of high potential GDEs associated with the North Wambo Creek that would be undermined by approximately 4.9 hectares (ha) (Appendix F).

NSW Aquifer Interference Policy

An assessment of the Modification against the minimal impact considerations in the AIP (NSW Government, 2012a) has been conducted as part of the Groundwater Assessment (Appendix B). SLR (2022a) concluded that the Modification is within the 'Level 1' minimal impact considerations outlined in the AIP.

Groundwater Licensing

The predicted annual groundwater volumes required to be licensed over the life of the Wambo Coal Mine are summarised in Table 4. WCPL holds sufficient licences to account for the take from each water source (Appendix B).

WCPL would continue to obtain and hold relevant licences under the WM Act to account for the take of water associated with the Wambo Coal Mine, including the Modification.

Detailed groundwater licensing requirements are described in Appendix B.

**Table 4
Summary of Groundwater Licensing Requirements**

Water Sharing Plan	Management Zone/ Groundwater Source	Existing WCPL Entitlements	Predicted Licensing Requirement (ML/year)		
			Approved		Modified
			HydroSimulations (2017)	SLR (2022a)	SLR (2022a)
<i>Hunter Unregulated and Alluvial Water Sources Water Sharing Plan 2009</i>	Lower Wollombi Brook	420	69	128	128
<i>Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016</i>	Sydney Basin – North Coast Groundwater Source	1,647	1,072	590	657

Source: Appendix B.

ML/year: million litres per year.

6.3.4 Mitigation Measures, Management and Monitoring

Relevant monitoring, mitigation and contingency measures to manage potential groundwater impacts at the Wambo Coal Mine include:

- Ongoing monitoring of groundwater levels and quality at the Wambo Coal Mine in accordance with the Groundwater Management Plan, which includes:
 - groundwater performance criteria, including trigger levels for identifying and investigating any potentially adverse impacts on regional and local aquifers, groundwater users and GDEs;
 - a plan to respond to any exceedances of the groundwater performance criteria, and repair, mitigate, compensate and/or offset any adverse groundwater impacts;
 - a process to deal with a complaint received in relation to loss of groundwater supply; and
 - a program to periodically validate the groundwater model, including an independent review of the model every 3 years, and comparison of monitoring results with modelled predictions; and
- Monitoring and reporting groundwater extraction as required under the WM Act.

Groundwater monitoring and management measures outlined in the approved Groundwater Management Plan would continue to be conducted for the Wambo Coal Mine (incorporating the Modification).

As part of the Modification, WCPL would expand the existing groundwater monitoring program to include new monitoring sites (bores) to the north and west of the Modification area. The Groundwater Management Plan would be reviewed and, where necessary, updated to incorporate the Modification (including the proposed groundwater monitoring sites).

Furthermore, the management of potential groundwater impacts associated with the second workings of the South Bates Extension Underground Mine would be undertaken in accordance with a separate Water Management Plan prepared as part of the Extraction Plan for the modified South Bates Extension Underground Mine in accordance with Condition B7, Schedule 2 of the Development Consent (DA 305-7-2003).

WCPL considers that no specific or additional mitigation measures, management or monitoring of groundwater are required for the Modification.

6.4 SURFACE WATER

6.4.1 Methodology

A Surface Water Assessment for the Modification was prepared by Alluvium Consulting (2022) and is presented in Appendix C.

6.4.2 Existing Environment

Previous Assessments

A number of surface water assessments and reviews have been undertaken to assess the potential impacts of the approved Wambo Coal Mine.

The most recent assessment was prepared by Advisian (2017) for the approved South Bates Extension Modification.

Site Water Management and Monitoring

Site water management and monitoring at the Wambo Coal Mine is conducted in accordance with the approved Water Management Plan, including the Site Water Balance, Erosion and Sediment Control Plan and Surface Water Management Plan, prepared in accordance with Condition B66, Schedule 2 of the Development Consent (DA 305-7-2003).

Furthermore, the management of potential surface impacts associated with the second workings of the South Bates Extension Underground Mine is undertaken in accordance with a separate Water Management Plan prepared as part of the Extraction Plan in accordance with Condition B7, Schedule 2 of the Development Consent (DA 305-7-2003).

A comprehensive surface water monitoring network has been established at the Wambo Coal Mine and the locations of surface water monitoring sites are shown on Figure 7.

Surface water flows and quality are generally monitored at the Wambo Coal Mine (Figure 7) and results are reported in the Annual Review.

Regional Hydrology

The Wambo Coal Mine is situated adjacent to Wollombi Brook, south-west of its confluence with the Hunter River. Wollombi Brook drains an area of approximately 1,950 square kilometres and joins the Hunter River some 5 km north-east of the Wambo Coal Mine. The Wollombi Brook sub-catchment is bound by the Myall Range to the south-east, Doyles Range to the west, the Hunter Range to the south-west and Broken Back Range to the north-east (Hunter Catchment Management Trust, 2002).

The majority of lands within WCPL mining tenements drain via Wambo, Stony, North Wambo and Redbank Creeks to Wollombi Brook, while Waterfall Creek drains directly to the Hunter River (Figure 3).

Local Hydrology

The Modification area is located within the North Wambo Creek and Waterfall Creek catchments (Figure 6).

North Wambo Creek and a number of ephemeral unnamed drainage lines are within the Modification area. The ephemeral unnamed drainage lines typically transition from steep deeply incised gullies to broader gullies before flowing into North Wambo Creek. North Wambo Creek becomes progressively less defined in the Modification area as it becomes alluvial (Appendix C).

A section of North Wambo Creek downstream of the Modification area has been diverted to avoid approved United Wambo Open Cut Mine operations (Figure 6).

A number of ephemeral unnamed tributaries of Waterfall Creek are located in the northern extent of the Modification area (Figure 6). These tributaries have steep and relatively incised gullies. Further downstream of the Modification area, the Waterfall Creek tributaries broaden out while maintaining an incised main channel (Appendix C).

6.4.3 Potential Impacts

The following sub-sections describe the potential impacts of the Modification on surface water resources.

North Wambo Creek

The magnitude of the predicted subsidence effects on North Wambo Creek from the Modification longwalls would generally remain unchanged from the approved South Bates Extension Underground Mine. The length of North Wambo Creek that would be undermined would however reduce from approximately 2.7 km to 0.6 km (i.e. an approximate 2.1 km reduction) (Appendix A).

As such, the extent, severity and duration of impacts to North Wambo Creek approved for the South Bates Extension Underground Mine would be greatly reduced (Appendix C).

Residual ponding impacts in North Wambo Creek would also be significantly reduced for the Modification compared to the approved South Bates Extension Underground Mine (Appendix C).

Waterfall Creek

The Modification would result in the undermining of approximately 0.2 km of Waterfall Creek tributaries (Figure 6). The potential impacts on these Waterfall Creek tributaries would however be minor due to the small area that would be undermined with only small changes in alignment expected (Appendix C).

The Modification would result in a slight increase in ponding within the Waterfall Creek tributaries (Appendix C).

Stream Flows

The Modification would result in a reduction in potential stream flow losses associated with ponding in North Wambo Creek compared to the approved South Bates Extension Underground Mine (Appendix C).

Potential stream flows reductions in Waterfall Creek as a result of the Modification would be minor given the minor ponding predicted (Appendix C).

The Modification is not expected to result in additional stream flow impacts at the Wollombi Brook or the Hunter River (Appendix C).

Surface Water Quality

The Modification would result in a reduction in potential North Wambo Creek water quality impacts compared to the approved South Bates Extension Underground Mine (Appendix C).

An increase in suspended sediments may result in Waterfall Creek due to increased erosion as a result of the subsidence caused by the Modification longwalls. These potential water quality impacts are expected to be managed using existing management techniques (Appendix C).

The Modification is not expected to result in additional water quality impacts at the Wollombi Brook or the Hunter River (Appendix C).

Site Water Balance

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

- No additional surface development required for the Modification.
- The annual underground water demand would not change as there would be no change to the approved rate of mining.
- The predicted groundwater inflows at the Wambo Coal Mine would not significantly increase as a result of the Modification (Appendix B).

6.4.4 Mitigation Measures, Management and Monitoring

Relevant monitoring, mitigation and contingency measures to manage potential surface water impacts at the Wambo Coal Mine is conducted in accordance with the approved Surface Water Management Plan, which includes:

- surface water performance criteria, including trigger levels for identifying and investigating any potentially adverse impacts on:
 - downstream surface water flows and quality, channel stability;
 - stream and riparian vegetation health;
 - water supply for other water users; and
 - post-mining water impacts from rehabilitated areas of the site;

- a program to monitor:
 - compliance with the relevant performance measures and the performance criteria
 - controlled and uncontrolled discharges and seepage/leachate from the site;
 - impacts on water supply for other water users;
 - surface water inflows, outflows and storage volumes to inform the Site Water Balance; and
 - the effectiveness of the surface water management system;
- a plan to respond to any exceedances of the surface water performance criteria, and repair, mitigate, compensate and/or offset any adverse surface water impacts; and
- a process to deal with a complaint received in relation to loss of surface water supply.

Surface water monitoring and management measures outlined in the approved Surface Water Management Plan would continue to be conducted for the Wambo Coal Mine (incorporating the Modification).

Subsidence Monitoring, Mitigation and Remediation

The management of potential surface water impacts associated with the second workings of the South Bates Extension Underground Mine would be undertaken in accordance with a separate Water Management Plan prepared as part of the Extraction Plan for the modified South Bates Extension Underground Mine in accordance with Condition B7, Schedule 2 of the Development Consent (DA 305-7-2003).

The approved Water Management Plan includes the following monitoring components:

- visual inspections of North Wambo Creek and associated tributaries (ponding, cracking, erosion);
- surface water flow and quality;
- groundwater levels and quality; and
- inflows to underground workings.

Management measures outlined in the approved Water Management Plan include:

- Remediation of surface cracks² along North Wambo Creek and in other areas where practicable using conventional earthmoving equipment (e.g. a backhoe) including:
 - infilling of surface cracks with soil or other suitable materials; or
 - locally re-grading and re-compacting the surface.
- Stabilisation of any areas of surface cracking or erosion using erosion protection measures (e.g. vegetation planting).
- Review of remediation measures and implementation of additional measures if required.

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

Site Water Balance

A Site Water Balance for the Wambo Coal Mine is prepared in accordance with Condition B66, Schedule 2 of the Development Consent (DA 305-7-2003).

The Site Water Balance would be updated to for the Wambo Coal Mine (incorporating the Modification).

6.5 ABORIGINAL CULTURAL HERITAGE

6.5.1 Methodology

An ACHA was prepared for the Modification by SEA (2022) and is presented in Appendix D.

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

- Clause 60 of the *National Parks and Wildlife Regulation 2019*;
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a);

- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b);
- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011); and
- *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia International Council on Monuments and Sites [ICOMOS], 2013).

6.5.2 Existing Environment

Previous Assessments

A number of Aboriginal cultural heritage surveys and assessments have previously been undertaken across the Modification area and surrounds.

A comprehensive survey and assessment was undertaken by White (2003) in the area to the east of the Wambo and Jerrys Plains ridgelines (including some of the Modification area).

White (2003) concluded that Wambo Ridge may have formed an access route from the lower valleys of Wambo, Stony and North Wambo Creeks and Wollombi Brook, into the higher sandstone country to the west.

A due diligence assessment was undertaken by SEA (2016) for a proposed soil investigation program in the Modification area.

An ACHA was also undertaken by SEA (2017) for the South Bates Extension Modification. Surveys and assessment for this ACHA included the southern portion of the Modification area.

Generally, in the Wambo Coal Mine area, artefact occurrences tend mostly to be identified near watercourses, particularly on level or gently inclined landform units and close to higher order streams (Appendix D).

A detailed description of previous archaeological assessments and surveys undertaken at the Wambo Coal Mine and surrounds is provided in Appendix D.

² Minor cracks that develop are not expected to require remediation as geomorphologic processes would result in natural filling of these cracks over time.

Aboriginal Cultural Heritage Management

Management of Aboriginal cultural heritage at the Wambo Coal Mine is conducted in accordance with AHIP #2222, AHIP #C0001474, AHIP #C0002000 and AHIP #C0003213 issued under section 90 of the NPW Act. These AHIPs reference approved methodologies for the salvage of sites within the AHIP areas.

These existing consents cover some of the Modification area. WCPL would consult with Heritage NSW regarding the need to seek a new area based AHIP under section 90 of the NPW Act due to potential indirect impacts to Aboriginal cultural heritage outside the areas covered by these existing consents

Furthermore, the management of potential Aboriginal heritage impacts is undertaken in accordance with a Heritage Management Plan prepared as part of the Extraction Plan in accordance with Condition B7, Schedule 2 of the Development Consent (DA 305-7-2003).

Aboriginal Cultural Heritage Assessment

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

- results from extensive field work and investigations previously undertaken by archaeologists and representatives of the Aboriginal community;
- search results from the Aboriginal Heritage Information Management System (AHIMS) database and other heritage registers;
- results of archaeological and cultural surveys conducted by archaeologists and representatives of the Aboriginal community for the Modification in February 2022;
- a consultation program undertaken for the Modification; and
- the outcomes of extensive consultation with the Aboriginal community regarding archaeological and cultural heritage values as part of the ACHA, as well as previous investigations.

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

Aboriginal Community Consultation

The ACHA included consultation with 70 Registered Aboriginal Parties (RAPs) in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a), the NPW Act and Condition B87 of Development Consent (DA 305-7-2003).

Table 5 summarises the main stages of the Aboriginal cultural heritage consultation process undertaken for the Modification.

A detailed account of the consultation process (including consultation recorded and a detailed consultation log) for the ACHA is provided in Appendix D.

Desktop Review

AHIMS searches were undertaken in November and December 2021 (Appendix D) for the Modification area and surrounds.

Based on the AHIMS search and the Wambo Coal Mine Aboriginal site database, 24 previously recorded Aboriginal cultural heritage sites are located directly within the Modification area (all open artefact sites) (Appendix D).

Of these 24 previously mentioned sites, 19 are located within the area covered by AHIP #C0003213. As a result, nine sites have been subject to total salvage and three sites have been partially salvaged (Appendix D).

Archaeological Survey Methodology

Archaeological field surveys for the Modification were undertaken by suitably qualified archaeologists and accompanied by representatives of the RAPs between 14 to 17 February and 21 to 23 February 2022.

Participation of RAPs in the field surveys was in accordance with the established Wambo Coal Mine fieldwork roster system, with invitations also extended to the Wanaruah Local Aboriginal Land Council and the registered Native Title Claimant organisation.

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

Date	Consultation Conducted
Notification of Project, Registrations and Proposed Methodology	
9 November 2021	A letter was sent to Heritage NSW requesting names of Aboriginal parties which may hold cultural knowledge relevant to the Modification area.
24 November 2021	Letters were sent to the existing RAPs for the Wambo Coal Mine to advise them of the Modification and notify them that they have been automatically registered as RAPs for the Modification. Letters were also sent to the Aboriginal parties identified by Heritage NSW seeking registrations of interest for the Modification ACHA consultation process.
14 December 2021	The Proposed Methodology for undertaking the ACHA was also distributed to the RAPs for review and comment.
Field Surveys	
14 to 17 and 21 to 23 February 2022	Aboriginal cultural heritage survey was conducted by archaeologists from SEA accompanied by representatives of the RAPs.
Draft ACHA Review	
7 and 8 April 2022	A copy of the draft ACHA was provided to all RAPs for their review and comment. The draft ACHA included survey results, archaeological and cultural significance assessment (based on feedback received during consultation and fieldwork), potential impacts and proposed mitigation and management measures. All comments provided by the RAPs during the consultation period have been incorporated into the final ACHA.

Source: After Appendix D.

During the survey and throughout the consultation process, representatives of the RAPs were asked to identify any areas of cultural significance within the Modification area and surrounds or any cultural values relevant to the area. All cultural comments relating to the Modification area and/or wider region were recorded and are included in Appendix D.

Summary of Archaeological Findings

Fourteen new Aboriginal cultural heritage sites were identified during the field surveys for the Modification, all open artefact sites (i.e. artefact scatters and isolated artefacts).

The locations of the Aboriginal cultural heritage sites are shown on Figure 9 with a detailed description of all the sites provided in Appendix D.

One new Aboriginal cultural heritage site has been assessed as being of moderate archaeological significance. All other new Aboriginal cultural heritage sites within the Modification area have been assessed as being of a low or low-moderate archaeological significance (Appendix D).

Notwithstanding the outcomes of the ACHA and classification of the identified archaeological sites and objects as having low or low-moderate archaeological significance, WCPL acknowledges that this assessment in no way diminishes the recognition or significance of Aboriginal peoples past occupation and use of the land and its resources in the vicinity of the Wambo Coal Mine.

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

6.5.3 Potential Impacts

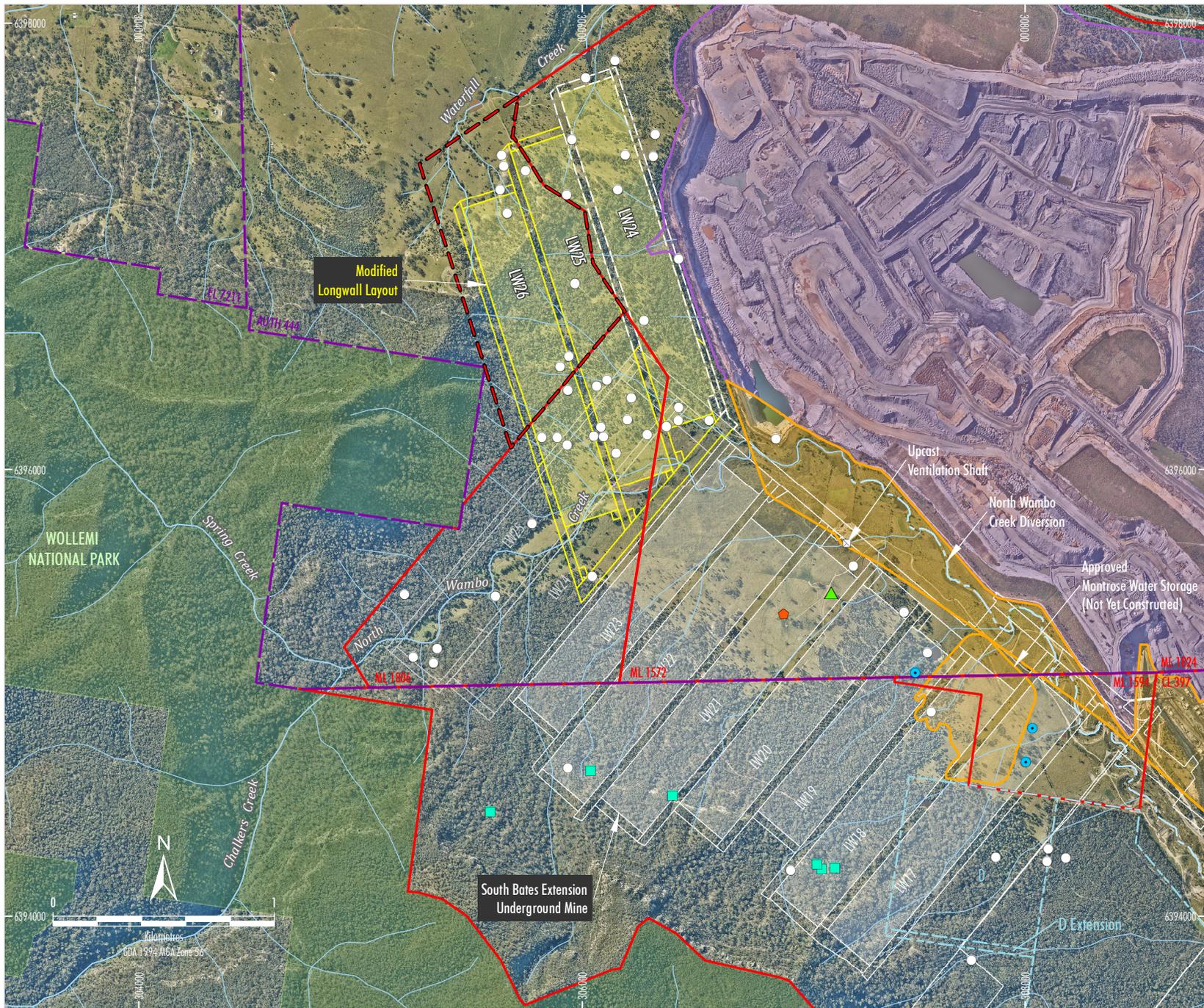
Potential Impacts from Surface Development

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

Potential Impacts from Subsidence Effects

Potential subsidence effects from underground mining operations in the Modification area are discussed in detail in Section 6.2 and Appendix A. The potential impact of these effects on Aboriginal cultural heritage is summarised below and described further in Appendix D.

Nineteen sites above the Modification longwalls are located within an area already approved for subsidence impacts for the South Bates Extension Underground Mine. It is also noted a number of additional sites above the approved Longwalls 24 and 25, which are no longer proposed to be mined, would not be subject to subsidence impacts (i.e. a reduction in impact as a result of the Modification).



- LEGEND**
- National Park
 - SSD 7142 Operational Area #
 - Wambo Coal Mine
 - Exploration Licence Boundary (AUTH, EL)
 - Mining and Coal Lease Boundary (ML, CL, CCL)
 - Proposed Mining Lease Application Area
 - Remnant Woodland Enhancement Program (RWEF) Area
 - Whynot Homestead
 - Existing/Approved Wambo Coal Mine Surface Development Area
 - Ventilation Shaft
 - Existing/Approved Underground Development
 - Approved Orientation of Longwalls 24 and 25
 - Existing/Approved Underground Development (First Workings only)
 - Modification 19
 - Modified Longwall Layout
 - Aboriginal Heritage Sites
 - Open Artefact Site
 - Open PAD
 - Rock shelter with PAD
 - Scarred Tree

Under Phase 2 of mining at Wambo Coal Mine (commenced 1 December 2020), this area is operated by United Collieries Pty Ltd under the United Wambo Joint Venture Project.

Source: South East Archaeology (2022); WCPL (2022); NSW Spatial Services (2022)
Orthophoto: WCPL (May 2022)

Peabody
WAMBO COAL MINE
Heritage Sites
within the Modification Area and
South Bates Extension Underground Mine Area

Figure 9

No Aboriginal site types have been identified in the Modification area that may be susceptible to subsidence impacts. However, potential subsidence impacts from the Modification would have a very low to negligible potential to occur (Appendix D).

Although minor cracking of soil may occur, any effects would be short term, minimal in extent and confined to the context of the site rather than direct impacts to the artefacts themselves (Appendix D).

Cumulative Impacts

A consideration of the potential cumulative impacts associated with the Modification has been undertaken and is presented in Appendix D. SEA (2022) concluded the cumulative impact of the Modification within a regional context (in combination with other mining projects in the region) is considered to be negligible.

6.5.4 Mitigation Measures, Management and Monitoring

WCPL would implement the management and mitigation measures described in Appendix D, which are consistent with the protocols of the approved Heritage Management Plan prepared in accordance with Condition B7, Schedule 2 of the Development Consent (DA 305-7-2003).

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

WCPL would consult with Heritage NSW regarding the need to seek a new area based AHIP under section 90 of the NPW Act due to potential indirect impacts to Aboriginal cultural heritage outside the areas covered by AHIP #2222, AHIP #C0001474, AHIP #C0002000 and AHIP #C0003213.

6.6 HISTORIC HERITAGE

6.6.1 Methodology

A Historic Heritage Assessment (Statement of Heritage Impact) was prepared for the Modification by EJE Heritage (2022) and is presented in Appendix E.

The assessment was undertaken in accordance with the following guidelines and regulations relevant to historic heritage:

- *NSW Heritage Manual* (Heritage Office and Department of Urban Affairs and Planning, 1996a);
- *Statements of Heritage Impact* (Heritage Office and Department of Urban Affairs and Planning, 1996b); and
- The Burra Charter (Australia ICOMOS, 2013).

6.6.2 Existing Environment

Previously Recorded Historic Heritage Sites

EJE Heritage assessed the potential historic heritage impacts of the Wambo Coal Mine in 2003 (EJE Town Planning, 2003). The assessment included surveys of lands in the vicinity of the Wambo Coal Mine and an assessment of the heritage significance of sites identified during these surveys.

The Wambo Homestead Complex is the only item of historic heritage significance in the vicinity of the Wambo Coal Mine (EJE Town Planning, 2003). The Wambo Homestead Complex is listed on the State Heritage Register of NSW.

The Whynot Property, which includes a homestead, outbuildings and fenced yards, is located approximately 1 km south-east of the Modification area (Figure 9). EJE Heritage (2017) considered the Whynot Property for the South Bates Extension Modification, and concluded the Property has limited significance within a local context and there would be no detrimental impact due to subsidence from the South Bates Extension Underground Mine.

Historic Heritage Management

Furthermore, the management of potential historic heritage impacts is undertaken in accordance with a Heritage Management Plan prepared as part of the Extraction Plan in accordance with Condition B7, Schedule 2 of the Development Consent (DA 305-7-2003).

Field Survey and Results

A field survey for the Modification area was undertaken by EJE Heritage (2022).

No historic heritage sites were identified in the field surveys (Appendix E). A number of remnant buildings and structures were identified within the Modification area, however these were not considered by EJE Heritage (2022) to have any significance or to meet the threshold for heritage protection.

6.6.3 Potential Impacts

The Wambo Homestead Complex and remnant structures of the Whynot Property lie outside the Modification area and would therefore not be directly or indirectly impacted by the Modification (Appendix E).

Other structures identified in the Modification area may become unsafe due to subsidence movements in their current condition. Should the structures become unstable due to subsidence and present an ongoing safety concern, WCPL may consider demolition of the structures (Appendix E).

The Statement of Heritage Impact (Appendix E) concluded that the predicted effects of subsidence are acceptable from a historic heritage perspective.

6.6.4 Mitigation Measures, Management and Monitoring

The approved Wambo Coal Mine operates in accordance with an approved Heritage Management Plan prepared in accordance with Condition B7, Schedule 2 of the Development Consent (DA 305-7-2003).

WCPL considers that no specific or additional mitigation measures, management or monitoring of historic heritage are required for the Modification.

Notwithstanding the above, the approved Heritage Management Plan would be reviewed and updated to incorporate the Modification.

The management of subsidence impacts on structures and potential risks to public safety during subsidence are described in Section 6.2.6.

6.7 BIODIVERSITY

6.7.1 Methodology

A Biodiversity Review for the Modification was undertaken by ELA (2022) in accordance with the requirements of clause 30A(2)(c) of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017* and is presented in Appendix F.

The Study Area for the Biodiversity Review covers approximately 306 ha and includes the following (Figure 10):

- Modified Underground Mining Area (118 ha) – the component of the modified Longwalls 24 to 26 located outside the approved South Bates Extension Underground Mine mining area.
- Approved Underground Mining Area No Longer Required (145 ha) – the component of the approved South Bates Extension Underground Mine area that would no longer be undermined.

6.7.2 Existing Environment

Previous Assessments

The Modification area and surrounds has been surveyed extensively as part of previous ecological surveys for the Wambo Coal Mine, including the South Bates Extension Underground Mine (FloraSearch, 2017; ELA, 2017, 2020).

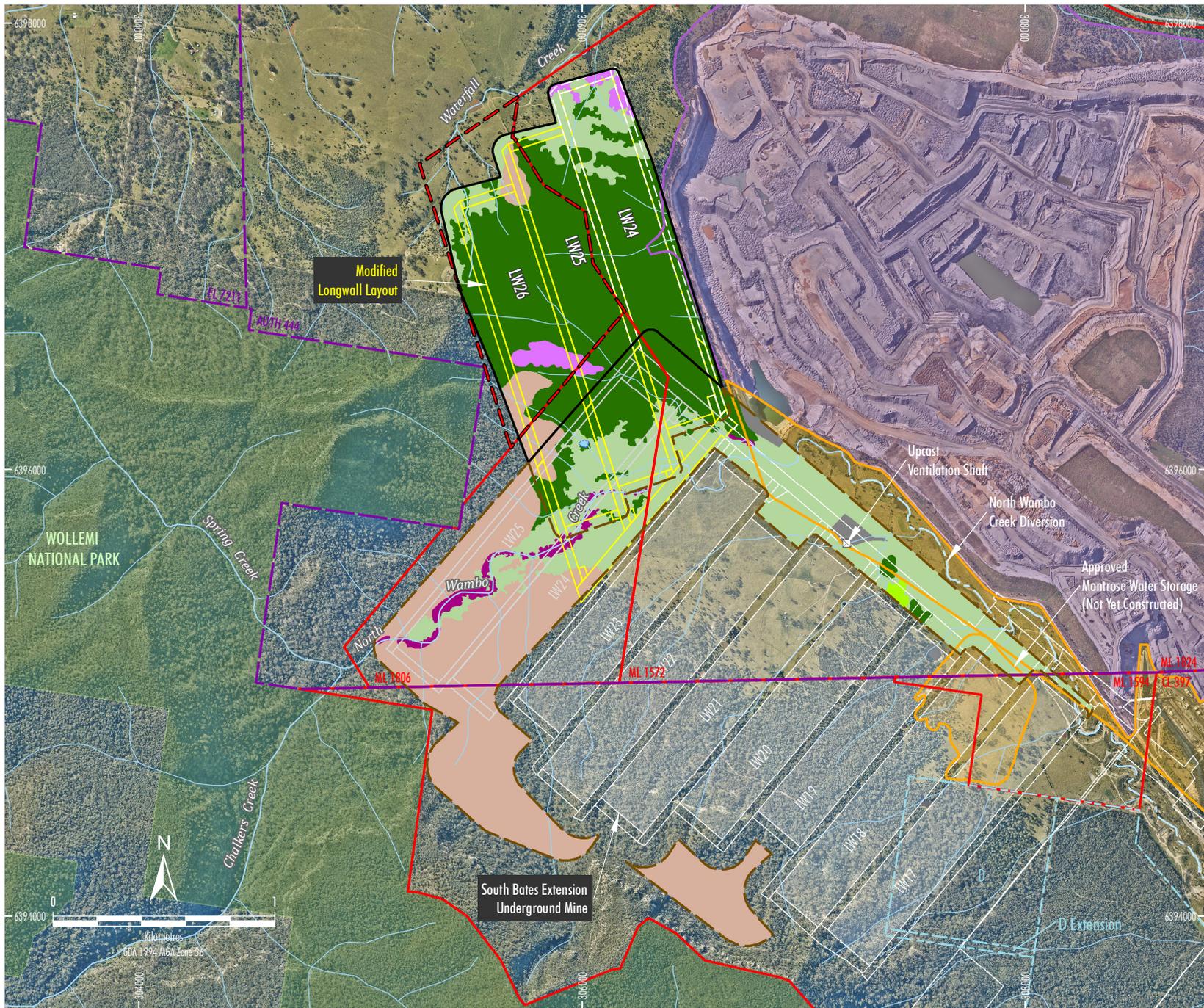
Biodiversity Management

Biodiversity management and monitoring at the Wambo Coal Mine is conducted in accordance with the approved Biodiversity Management Plan prepared in accordance with Condition B75, Schedule 2 of the Development Consent (DA 305-7-2003).

Furthermore, the management of potential biodiversity impacts associated with the second workings of the South Bates Extension Underground Mine is undertaken in accordance with a separate Biodiversity Management Plan prepared as part of the Extraction Plan in accordance with Condition B7, Schedule 2 of the Development Consent (DA 305-7-2003).

Field Surveys

Additional ecological surveys of the Study Area were carried out in March and April 2022 by ELA. The surveys involved vegetation assessments in accordance with the *Biodiversity Assessment Method* (DPIE, 2020b), habitat assessments and mapping of Plant Community Types (PCTs) (Appendix F).



- LEGEND**
- National Park
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 - Wambo Coal Mine
 - Exploration Licence Boundary (AUTH, EL)
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 - Proposed Mining Lease Application Area
 - Remnant Woodland Enhancement Program (RWEF) Area
 - Existing/Approved Wambo Coal Mine Surface Development Area
 - Ventilation Shaft
 - Existing/Approved Underground Development
 - Approved Orientation of Longwalls 24 and 25
 - Existing/Approved Underground Development (First Workings only)
 - Modification 19
 - Modified Longwall Layout
 - Modified Mining Area
 - Approved Mining Area No Longer Required
 - Vegetation Communities**
 - Weeping Myall - Coobah - Scrub Wilga shrubland of the Hunter Valley (PCT 116)
 - Melaleuca decora* low forest of the Central Hunter Valley Sydney Basin Bioregion (PCT 922)
 - Slaty Box - Grey Gum shrubby woodland on footslopes of the upper Hunter Valley Sydney Basin Bioregion (PCT 1176)
 - Forest Red Gum grassy open forest on floodplains of the lower Hunter (PCT 1598)
 - Narrow-leaved Ironbark - Bull Oak - Grey Box shrub-grass open forest of the central and lower Hunter (PCT 603)
 - Derived Native Grassland
 - Dam
 - Disturbed/Cleared
- # Under Phase 2 of mining at Wambo Coal Mine (commenced 1 December 2020), this area is operated by United Collieries Pty Ltd under the United Wambo Joint Venture Project.

Source: Eco Logical Australia (2022); WCPL (2022); NSW Spatial Services (2022); Orthophoto: WCPL (May 2022)

Figure 10

Native Vegetation and Threatened Ecological Communities

The PCTs identified in the Approved Underground Mining Area No Longer Required and Modified Underground Mining Areas are listed in Table 6 and shown on Figure 10. A detailed description of these communities is provided in Appendix F.

Four Threatened Ecological Communities (TECs) listed under the BC Act occur within the Study Area (Figure 11):

- Hunter Valley Weeping Myall Woodland in the Sydney Basin Bioregion Critically Endangered Ecological Community (equivalent to PCT 116).
- Central Hunter Ironbark—Spotted Gum—Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions Endangered Ecological Community (EEC) (equivalent to PCT 922).
- Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions EEC (equivalent to PCT 1598).
- Central Hunter Ironbark—Spotted Gum—Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions EEC (equivalent to PCT 1603).

One TEC listed as critically endangered under the EPBC Act occurs within the Study Area, namely the Central Hunter Valley Eucalypt Forest and Woodland (Appendix F).

Groundwater Dependent Ecosystems

There are no potential GDEs within the Modified Underground Mining Area. The Approved Underground Mining Area No Longer Required contains 4.9 ha of high potential GDEs associated with the North Wambo Creek (Appendix F).

As a result, the Modification would result in 4.9 ha less undermining of high potential GDEs.

Threatened Flora Species and Endangered Populations

No threatened flora species listed under the BC Act or EPBC Act were recorded or are considered likely to occur within the Modified Underground Mining Area (Appendix F).

No additional endangered flora populations are likely to occur in the Modified Underground Mining Area compared to the Approved Underground Mining Area No Longer Required (Appendix F).

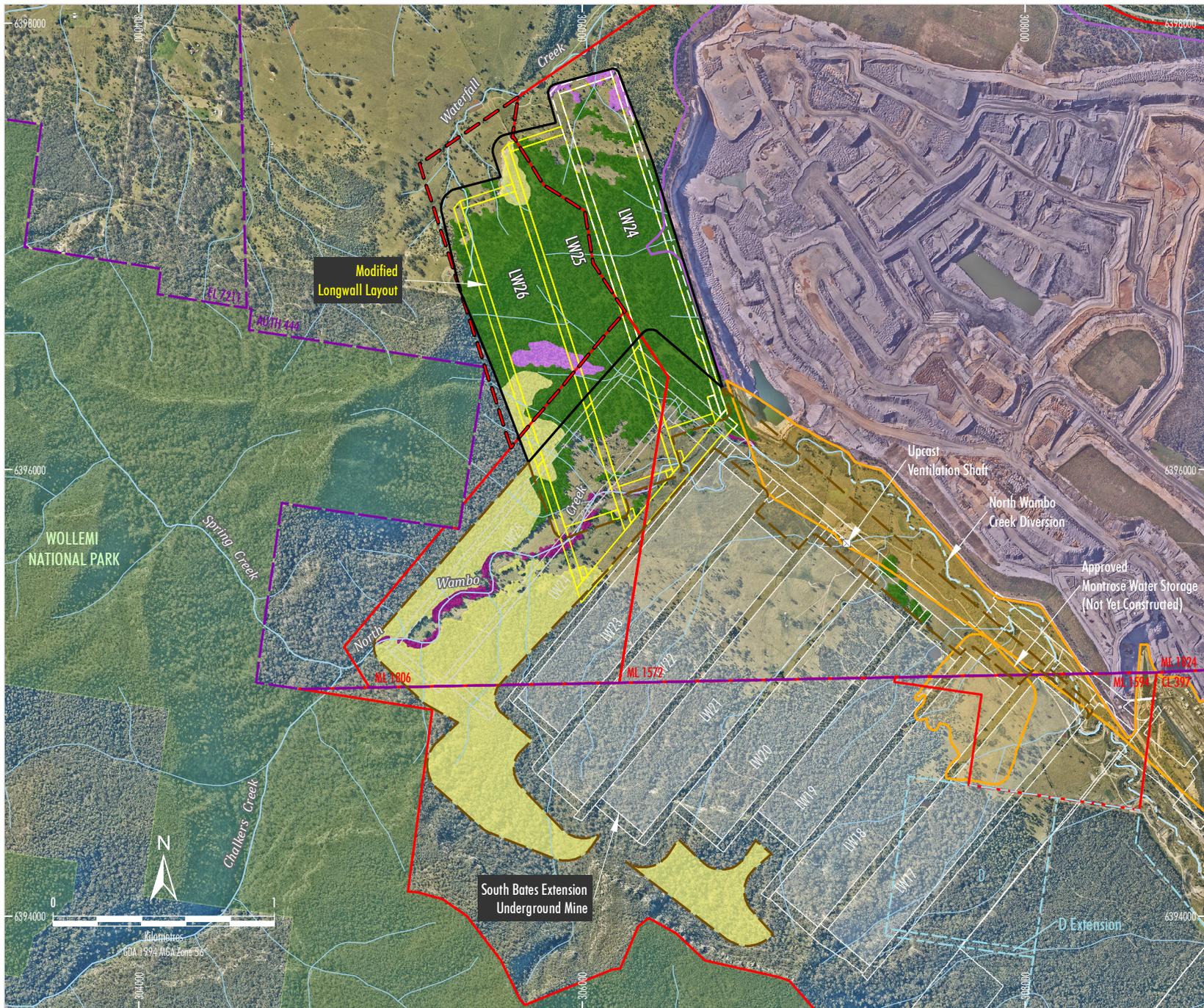
Threatened Fauna Species and Habitat

No additional threatened fauna species are likely to occur in the Modified Underground Mining Area compared to the No Approved Underground Mining Area Longer Required (Appendix F) (Figure 12).

Table 6
Approved Underground Mining Area No Longer Required and Modified Underground Mining Areas – Plant Community Types

Vegetation Zone	PCT	PCT Name	Area (ha)		Change
			Approved Underground Mining Area No Longer Required	Modified Underground Mining Area	
1	116	Weeping Myall – Coobah – Scrub Wilga shrubland of the Hunter Valley	0	5.5	+ 5.5
2	922	Melaleuca decora low forest of the central Hunter Valley, Sydney Basin Bioregion	0.8	0	- 0.8
3	1176	Slaty Box – Grey Gum shrubby woodland on footslopes of the upper Hunter Valley, Sydney Basin Bioregion	81.2	7.5	- 73.7
4	1598	Forest Red Gum grassy open forest on floodplains of the lower Hunter	4.1	0	- 4.1
5	1603	Narrow-leaved Ironbark – Bull Oak – Grey Box shrub – grass open forest of the central and lower Hunter	3.8	89.2	+ 85.4
6		Derived native grassland	51.2	15.6	- 35.6
Total			141.1	117.8	- 23.3

Source: Appendix F



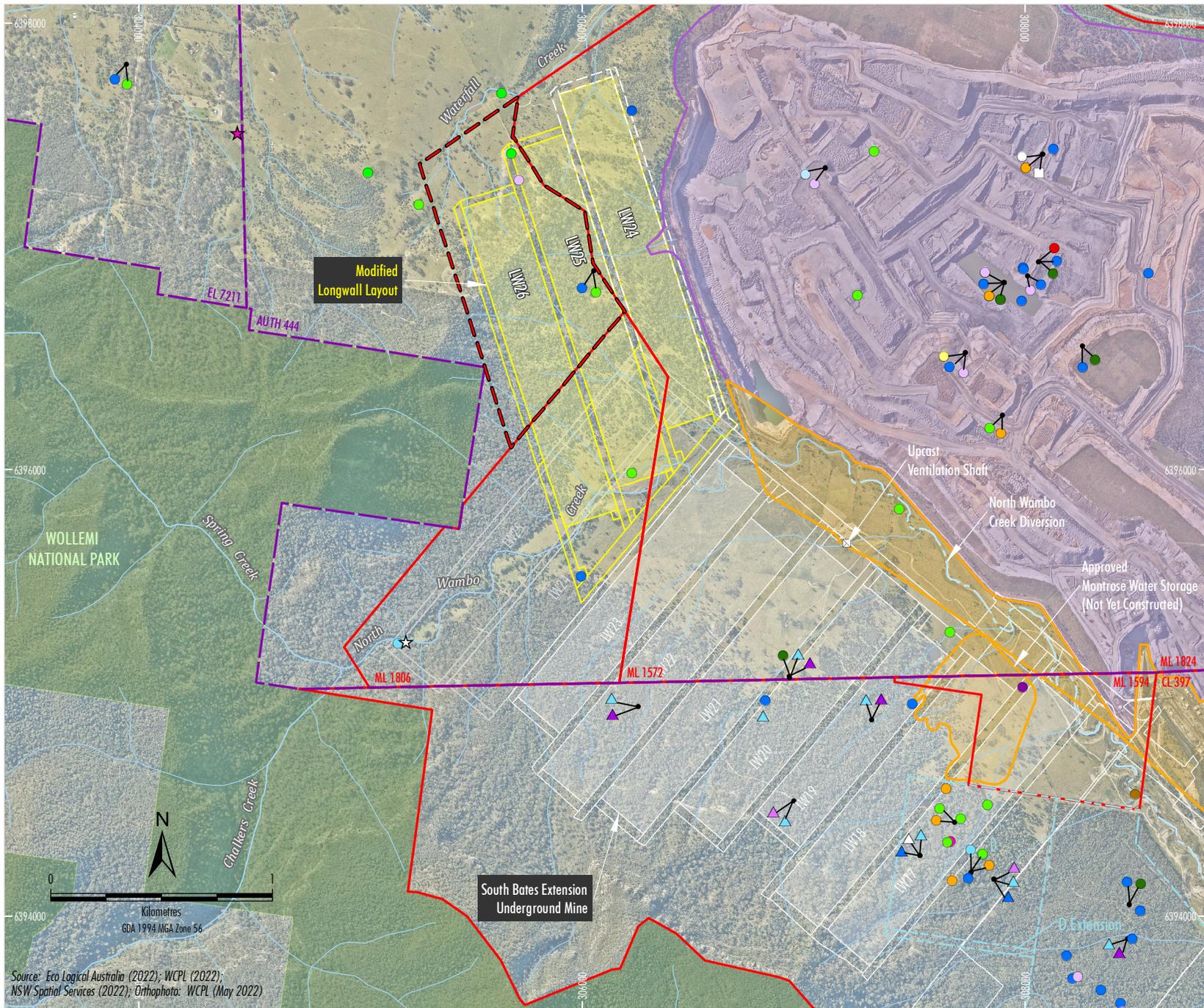
- LEGEND**
- National Park
 - SSD 7142 Operational Area #
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 - Exploration Licence Boundary (AUTH, EL)
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 - Proposed Mining Lease Application Area
 - Remnant Woodland Enhancement Program (RWEF) Area
 - Existing/Approved Wambo Coal Mine Surface Development Area
 - Ventilation Shaft
 - Existing/Approved Underground Development
 - Approved Orientation of Longwalls 24 and 25
 - Existing/Approved Underground Development (First Workings only)
 - Modification 19
 - Modified Longwall Layout
 - Modified Mining Area
 - Approved Mining Area No Longer Required
 - Threatened Ecological Communities**
 - Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions (Endangered - BC Act)
 - Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions (Endangered - BC Act)
 - Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion (Vulnerable - BC Act)
 - Hunter Valley Weeping Myall Woodland in the Sydney Basin Bioregion (Critically Endangered - BC Act)

Under Phase 2 of mining at Wambo Coal Mine (commenced 1 December 2020), this area is operated by United Collieries Pty Ltd under the United Wambo Joint Venture Project.

Source: Eco Logical Australia (2022); WCPL (2022); NSW Spatial Services (2022)
 Orthophoto: WCPL (May 2022)

Peabody
 W A M B O C O A L M I N E
 Threatened Ecological Communities

Figure 11



- LEGEND**
- National Park
 - SSD 7142 Operational Area #
 - Wambo Coal Mine
 - Exploration Licence Boundary (AUTH, EL)
 - Mining and Coal Lease Boundary (ML, CL, CCL)
 - Proposed Mining Lease Application Area
 - Remnant Woodland Enhancement Program (RWEPP) Area
 - Existing/Approved Wambo Coal Mine Surface Development Area
 - Ventilation Shaft
 - Existing/Approved Underground Development
 - Approved Orientation of Longwalls 24 and 25
 - Existing/Approved Underground Development (First Workings only)
 - Modification 19
 - Modified Longwall Layout
 - Threatened Species Records
 - Brown Treecreeper (eastern subspecies)
 - Diamond Firetail
 - Dusky Woodswallow
 - Gang-gang Cockatoo
 - Glossy Black-Cockatoo
 - Grey-crowned Babbler (eastern subspecies)
 - Hooded Robin (south-eastern form)
 - Little Eagle
 - Little Lorikeet
 - Speckled Warbler
 - Spotted Harrier
 - Turquoise Parrot
 - Varied Sittella
 - Squirrel Glider
 - Eastern Coastal Free-tailed Bat
 - Large-eared Pied Bat
 - Little Bent-winged Bat
 - Large Bent-winged Bat
 - Yellow-bellied Shearwater
 - Scant Pomaderis
 - Cymbidium canaliculatum

Under Phase 2 of mining at Wambo Coal Mine (commenced 1 December 2020), this area is operated by United Collieries Pty Ltd under the United Wambo Joint Venture Project.

Peabody
W A M B O C O A L M I N E
Threatened Species Records

Figure 12

Source: Eco Logical Australia (2022); WCPL (2022); NSW Spatial Services (2022); Orthophoto: WCPL (May 2022)

Cliff line habitat associated with the Brush-tailed Rock Wallaby (*Petrogale penicillata*), Large-eared Pied Bat (*Chalinolobus dwyeri*) and Eastern Cave Bat (*Vespadelus troughtoni*) (which occurs within the Approved Underground Mining Area No Longer Required) is not present in the Modified Underground Mining Area (Appendix F).

6.7.3 Potential Impacts

The potential biodiversity impacts of the Modification on biodiversity would be associated with the subsidence impacts associated with the reorientation of the approved Longwall 24 and Longwall 25, and the addition of Longwall 26 (i.e. in the Modified Underground Mining Area of the Study Area – Section 6.7.1) (Appendix F).

There would be no direct impacts to biodiversity as there is no additional surface development than approved for the existing Wambo Coal Mine (Appendix F).

Subsidence Impacts

The predicted subsidence effects above the Modification longwalls are similar to those predicted for the existing/approved South Bates Extension Underground Mine. Therefore, the potential impacts to natural vegetation in the Modification area would be similar to the existing/approved South Bates Extension Underground Mine (MSEC, 2022).

In addition, the Modification would result in 23.3 ha less undermining of native vegetation overall (Table 6).

On this basis, ELA (2022) considers that any subsidence impacts to vegetation and threatened fauna habitat in the Modification area are likely to be negligible, consistent with the approved impacts to the South Bates Extension Underground Mine area.

Overall Assessment

In general, the vegetation condition and habitat values identified within the Modified Underground Mining Area and Approved Underground Mining Area No Longer Required are considered largely consistent in composition, structure and function of vegetation (Appendix F).

Table 7 provides an assessment of the impacts of the Modification on biodiversity values as defined in the BC Act and *Biodiversity Conservation Regulation 2017* (BC Regulation). In summary, the Modification would not increase impacts on vegetation abundance, vegetation integrity, water sustainability, habitat suitability, threatened species abundance, habitat connectivity, threatened species movement or flight path integrity.

As the Modification would not result in a net increase to impacts on biodiversity values, it is considered that a BDAR is not required (Appendix F).

Cumulative Impacts

Given that the Modification would not result in an increased impact on biodiversity values, it is considered that the Modification would not increase cumulative biodiversity impacts in the region.

6.7.4 Mitigation Measures, Management and Monitoring

Biodiversity management and monitoring at the Wambo Coal Mine is conducted in accordance with the approved Biodiversity Management Plan prepared in accordance with Condition B75, Schedule 2 of the Development Consent (DA 305-7-2003).

Furthermore, the management of potential biodiversity impacts associated with the second workings of the South Bates Extension Underground Mine is undertaken in accordance with a separate Biodiversity Management Plan prepared as part of the Extraction Plan in accordance with Condition B7, Schedule 2 of the Development Consent (DA 305-7-2003).

Given the Modification would not result in an increased impact on biodiversity values, there would be no change to the approved mitigation, management and monitoring measures for the existing Wambo Coal Mine.

Remediation of subsidence impacts on watercourses is described in Section 6.4.

WCPL considers that no specific or additional mitigation measures, management or monitoring of biodiversity are required for the Modification.

Table 7
Impacts of the Modification on Biodiversity Values

Biodiversity Value	Meaning	Explanation
<i>Vegetation abundance</i> 1.4(b) BC Regulation	<i>Occurrence and abundance of vegetation at a particular site</i>	The Modification would not result in an increased impact on vegetation abundance. The Modification would result in 23.3 ha less undermining of native vegetation overall (Table 6).
<i>Vegetation integrity</i> 1.5(2)(a) BC Act	<i>Degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state</i>	The Modification would not result in an increased impact on vegetation integrity. The vegetation communities within the Modified Underground Mining Area and Approved Underground Mining Area No Longer Required are largely consistent in composition, structure and function of vegetation.
<i>Water sustainability</i> 1.4(f) BC Regulation	<i>Degree to which water quality, water bodies and hydrological processes sustain threatened species and threatened ecological communities at a particular site</i>	The Modification would not result in an increased impact on water quality, water bodies or hydrological processes that are known to sustain a threatened species or threatened ecological community. The Modification significantly reduces the portion of North Wambo Creek which is undermined and would result in 4.9 ha less undermining of high potential GDEs.
<i>Habitat suitability</i> 1.5(2)(b) BC Act	<i>Degree to which the habitat needs of threatened species are present at a particular site</i>	The Modification would not result in an increased impact on habitat suitability. The vegetation communities present in both the Modified Underground Mining Area and the Approved Underground Mining Area No Longer Required provide suitable habitat for threatened fauna (e.g. Grey-crowned Babbler). The Modification would not result in any additional direct surface development and therefore no impacts to threatened fauna habitat is expected. No threatened flora species were recorded in the Modified Underground Mining Area and the vegetation communities present represent a low potential for threatened flora. The Modification would not result in any additional direct surface development and therefore any potential threatened flora habitat would be retained. The Modification would not impact the escarpment and cliff habitat.
<i>Threatened species abundance</i> 1.4(a) BC Regulation	<i>Occurrence and abundance of threatened species or threatened ecological communities, or their habitat, at a particular site</i>	The Modification would not impact the occurrence and abundance of threatened species, or their habitat, in the locality. The Modified Underground Mining Area and Approved Underground Mining Area No Longer Required both contain similar species habitat and connectivity.
<i>Habitat connectivity</i> 1.4(c) BC Regulation	<i>Degree to which a particular site connects different areas of habitat of threatened species to facilitate the movement of those species across their range</i>	The Modification would not result in an increased impact on habitat connectivity. The Modification would not result in any additional direct surface development than approved for the existing Wambo Coal Mine.
<i>Threatened species movement</i> 1.4(d) BC Regulation	<i>Degree to which a particular site contributes to the movement of threatened species to maintain their lifecycle</i>	The Modification would not result in an increased contribution to the movement of threatened species. The Modified Underground Mining Area and Approved Underground Mining Area No Longer Required both contain similar species habitat and connectivity. As described above, the Modification would not result in any additional direct surface impacts than approved for the existing Wambo Coal Mine. The Modification would also result in 23.3 ha less undermining of native vegetation overall (Table 6).
<i>Flight path integrity</i> 1.4(e) BC Regulation	<i>Degree to which the flight paths of protected animals over a particular site are free from interference</i>	The Modification would not result in interference of any flight paths of protected animals. As described above, the Modification would not result in any additional direct surface impacts than approved for the existing Wambo Coal Mine.

Source: Appendix F.

6.8 LAND RESOURCES AND AGRICULTURE PRODUCTION

6.8.1 Methodology

An Agricultural Resource Assessment was prepared by SLR (2022b) and is presented in Appendix G. The Agricultural Resource Assessment was informed by soil surveys in the Modification area and surrounds.

6.8.2 Existing Environment

Landforms and Topography

Local topography in the Upper Hunter Valley region is characterised by gently sloping floodplains associated with the Hunter River and the undulating foothills, ridges and escarpments of the Mount Royal Range and Great Dividing Range. To the west of the Wambo Coal Mine is steeper land with elevations up to approximately 650 m Australian Height Datum (AHD) within the Wollemi National Park.

Elevations in the Modification area range from approximately 115 m AHD on the alluvial flats near North Wambo Creek in the south-east to approximately 250 m AHD at a series of ridgelines in the north.

Land Use

Land uses in the broader vicinity of the Wambo Coal Mine includes a combination of coal mining operations, nature conservation areas (including the Wollemi National Park) and agriculture.

Land uses within and immediately surrounding the Modification area include coal mining operations (i.e. the approved South Bates Extension Underground Mine), remnant native vegetation and agriculture (i.e. agistment of beef cattle). North Wambo Creek and Waterfall Creek also intersect the Modification area.

Soils

Regional soil landscape units mapped in the vicinity of the Modification area include Bulga, Lees Pinch, Jerrys Plains and Benjang soils (Kovac and Lawrie, 1991).

Soil map units in the Modification area identified during the soil survey undertaken by SLR (2022b), mapped according to the dominant Australian Soil Classification soil type, included:

- Eutrophic Brown Dermosol;
- Eutrophic Brown Chromosol;
- Epipedal Black Vertosol; and
- Subnatic Brown Sodosol.

Land and Soil Capability

The Land and Soil Capability classification system is used to give an indication of the land management practices that can be applied to a parcel of agricultural land. Agricultural land is classified by evaluating biophysical features of the land and soil including landform position, slope gradient, drainage, climate, soil type and soil characteristics to derive detailed rating tables for a range of land and soil hazards (OEH, 2012).

The majority of the Modification area is identified as having a Land and Soil Capability Class of 4 (70%), Class 6 (20%) and Class 3 (10%) (Appendix G).

Class 4 land is of moderate-low to moderate capability with limitations for high impact land uses such as cropping, high intensity grazing and horticulture. Class 6 land is of low capability and is restricted to low-impact uses such as grazing, forestry and nature conservation. Class 3 land is of high capability with moderate limitations for cultivation activities.

Strategic Agricultural Land

The *State Environmental Planning Policy (Resource and Energy) 2021* includes mapping of lands identified as Biophysical Strategic Agricultural Land (BSAL).

The closest mapped BSAL to the Wambo Coal Mine is associated with the Hunter River and is located approximately 1 km to north of the Modification area (Figure 13) (Appendix G).

The Modification would not have any impacts on mapped Viticulture Critical Industry Cluster as it is well outside the predicted extent of conventional subsidence (Figure 13) (Appendix G).

Soil surveys of the Modification area outside existing mining tenements were undertaken by SLR 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 15 July 2022 verified the Modification area outside existing mining tenements is not BSAL.

Land Contamination

A Land Contamination Assessment was undertaken for the portion of the Modification area outside existing mining tenements by GHD Pty Ltd (2022) in the form of a Preliminary Site Investigation and is provided as Appendix H.

The Land Contamination Assessment was prepared in accordance with the *State Environmental Planning Policy (Resilience and Hazards) 2021* and *Consultants reporting on contaminated land – Contaminated Land Guidelines* (EPA, 2020).

On the basis of the outcomes of the Preliminary Site Investigation, the Modification area is considered to be suitable for the proposed development (underground mining) (Appendix H).

6.8.3 Potential Impacts

Potential impacts of the Modification on land resources and agricultural production would primarily relate to subsidence-related impacts as no additional surface development is proposed.

Therefore, there is no land which would be permanently removed from agriculture as a result of the Modification (Appendix G).

Subsidence-Related Impacts

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

- impacts on the integrity of agricultural infrastructure (e.g. fences and dams);
- surface cracking;
- slope instability;
- ponding and changes in stream alignment; and
- moderately less ponding in poorly drained areas.

The maximum predicted vertical subsidence, tilt and curvatures for the Modification longwalls are similar to those predicted for the approved South Bates Extension Underground Mine (Appendix A).

Therefore, any impacts to land resources and agricultural productivity in the Modification area would be similar to the approved South Bates Extension Underground Mine and are predicted to be negligible (Appendix G).

Cumulative Impacts

As described above, impacts from subsidence due to the Modification longwalls would be negligible and readily managed through application of appropriate mitigation measures and management strategies. As a result, any cumulative impacts on agricultural resources and enterprises are expected to be minor and readily mitigated (Appendix G).

6.8.4 Mitigation Measures, Management and Monitoring

Agricultural land resource management would include the following key components:

- minimisation of disturbance to agricultural lands, where practicable;
- continued use of adjoining WCPL-owned land for agricultural uses, where practicable;
- management of soil resources so they can be used for rehabilitation; and
- inclusion of agricultural lands in the Wambo rehabilitation strategy.

Potential subsidence impacts on agricultural activities would be managed in accordance with an approved Land Management Plan as part of the Extraction Plan process in accordance with Condition B7 of Development Consent (DA 305-7-2003). These management plans will likely be similar to those prepared for the approved South Bates Extension Underground Mine.

6.9 GREENHOUSE GAS EMISSIONS

6.9.1 Methodology

An assessment of the potential greenhouse gas emissions of the Modification has been undertaken by Todoroski Air Sciences (TAS) (2022) and is provided in Appendix I. A summary of the assessment is provided below.

6.9.2 Background

A number of greenhouse gas investigations, assessments and reviews have been undertaken to estimate the greenhouse gas emissions associated with the approved Wambo Coal Mine. The most recent review was prepared by TAS (2016) for the approved South Bates Extension Underground Mine.

The management and monitoring of greenhouse gas emissions at the Wambo Coal Mine is conducted in accordance with the approved Air Quality Management Plan prepared in accordance with Condition B46, Schedule 2 of the Development Consent (DA 305-7-2003).

6.9.3 Quantitative Assessment of Potential Greenhouse Gas Emissions

Greenhouse Gas Emission Sources

Consistent with the key greenhouse gas emission sources for the approved South Bates Extension Underground Mine, key sources of greenhouse gas emissions generated by the Modification would include (Appendix I):

- fugitive emissions from exposed coal (Scope 1);
- on-site combustion of diesel (Scope 1);
- on-site consumption of electricity (Scope 2); and
- combustion of product coal by third parties (Scope 3).

Greenhouse Gas Estimation Methodology

TAS (2022) estimated the total and incremental greenhouse gas emissions of the Modification based on the ROM coal production schedule for both the approved South Bates Extension Underground Mine and the Modification.

Fugitive emissions were estimated using a site-specific factor which has been developed based on gas monitoring conducted at the South Bates Extension Underground Mine to date (Advitech Environmental, 2021).

In addition, diesel and electricity consumption have been calculated based on actual usage data for the last six months of operations at the South Bates Extension Underground Mine (Appendix I).

Modification Greenhouse Gas Emissions

TAS (2022) predicted the annual Scope 1 and 2 greenhouse gas emissions for the Modification would be lower than the approved South Bates Extension Underground Mine would range from 0.08 to 0.17 million tonnes of and carbon dioxide equivalent (Mt CO₂-e) per year compared to 0.25 to 0.37 Mt CO₂-e (Appendix I).

Overall, the Modification is not expected to significantly change the existing amount of greenhouse gas emissions generated from the Wambo Coal Mine (Appendix I).

6.9.4 Greenhouse Gas Management Measures and Monitoring

WCPL implements a number of management measures to minimise, to the greatest extent practicable, greenhouse gas emissions from the Wambo Coal Mine in accordance with the approved Air Quality Management Plan, including:

- Maximising energy efficiency as a key consideration in the development of the mine plan.
- Participation in the Commonwealth Energy Efficiency Opportunities program.
- Monitoring the consumption of fuel and regular maintenance of equipment and plant.
- Sealing finished longwall panels to reduce fugitive methane emissions.
- Real-time gas monitoring and regular maintenance of ventilation shafts and fans.
- Avoidance of unnecessary energy use from the conveyer and lighting.
- Ongoing monitoring and investigation of methods to minimise site electricity consumption.

The greenhouse gas management measures and monitoring described in the approved Air Quality Management Plan would continue for the Modification, where relevant.

In addition, reporting of energy consumption and Scope 1 and 2 greenhouse gas emissions would continue in accordance with the National Greenhouse and Energy Reporting Scheme.

6.10 OTHER ENVIRONMENTAL ASPECTS

6.10.1 Amenity

The existing South Bates Extension Underground Mine support facilities, access roads and utilities currently would continue to be used for the Modification without the need for additional surface infrastructure (Section 3.5.3).

The Modification would not change the operational hours, ROM coal production rate, equipment and mining fleet, coal handling or processing, management of reject material and overall mine life of the approved Wambo Coal Mine.

In consideration of the above, there would be no change in noise and air quality impacts due to the Modification compared to the existing and approved Wambo Coal Mine.

Noise and air quality management at the Wambo Coal Mine would continue to be conducted in accordance with the approved Noise Management Plan and Air Quality Management Plan prepared in accordance with Conditions B17 and B46, Schedule 2 of the Development Consent (DA 305-7-2003), respectively.

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

6.10.2 Visual

There are a number of approved open cut and underground coal mining operations in the vicinity of the Wambo Coal Mine, including Hunter Valley Operations, The United Wambo Open Cut Coal Mine and the Mt Thorley Warkworth operation.

Components of the Wambo Coal Mine can be seen from some sections of the Golden Highway. However, there is significant existing vegetation along the Golden Highway which obscures views of the Wambo Coal Mine along the majority of the road.

The Modification does not involve any additional surface infrastructure.

As described in Section 6.2, the type and magnitude of predicted subsidence effects for the Modification longwalls are generally similar to or less than those of the approved and operating South Bates Extension Underground Mine. Subsidence impacts from the Modification longwalls would be restricted to WCPL owned-land.

Given the undulating terrain in the vicinity of the Modification area and the existing Wambo Coal Mine, the impact of subsidence on the landscape and visual amenity would be negligible.

Given the above, there would be no material change to the visual landscape due to the Modification and no specific management or mitigation measures are considered to be warranted.

6.10.3 Road Transport

The Modification would not change the peak workforce, approved mine life or access to the currently approved Wambo Coal Mine (via the Wambo Access Road or Administration Access Road which intersects the Golden Highway near Warkworth).

As such, the Modification would not result in any additional road transport impacts than the existing Wambo Coal Mine and no specific management or mitigation measures are considered to be warranted.

6.10.4 Socio-Economic

The Modification would allow for continued operations at the South Bates Extension Underground Mine (within the approved life of the Wambo Coal Mine), offset reduced coal recovery and utilise existing approved infrastructure and services (Section 3).

The Modification would not change the peak workforce or operational hours at the Wambo Coal Mine. As such, no additional demand for services (e.g. housing and health services) in the region is expected.

The Wambo Coal Mine including the Modification would continue to comply with existing amenity limits in Development Consent (DA 305-7-2003).

WCPL would continue to support local and regional businesses and make continued contributions to the local community through ongoing support for community initiatives.

6.10.5 Hazard and Risk

A Preliminary Hazard Analysis (PHA) was conducted in 2003 to assess the potential hazards and risk associated with the approved Wambo Coal Mine.

It is considered that the Modification would not change the existing potential risk areas identified in the PHA conducted for the approved Wambo Coal Mine, as the proposed activities associated with the Modification (e.g. underground mining operations) are consistent with the activities assessed in the PHA.

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

7 JUSTIFICATION OF THE MODIFIED PROJECT

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

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

- the engagement undertaken for the Modification (Section 7.1);
- key environmental assessment outcomes including the potential impacts of the Modification (Section 7.2);
- the relevant planning and policy objectives (Section 7.3); and
- the benefits of the Modification and the Wambo Coal Mine (Section 7.4).

7.1 STAKEHOLDER ENGAGEMENT OVERVIEW

WCPL has consulted with a number of stakeholders during the development of this Modification report, including:

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

Key comments and issues raised during consultation have been considered and addressed in the preparation of this Modification Report.

7.2 CONSOLIDATED SUMMARY OF ASSESSMENT OF IMPACTS

WCPL has undertaken a review of the potential environmental impacts of the Modification and the key potential environmental impacts are related to the reorientated Longwalls 24 and 25, as well as additional Longwall 26, and the associated subsidence impacts and consequences (Section 6).

It is concluded that the existing subsidence performance measures in Development Consent (DA 305-7-2003) (Table 2) are considered to be appropriate for the Modification as the subsidence impacts associated with the Modification longwalls are similar to the approved South Bates Extension Underground Mine.

The Modification would involve minimal additional environmental impact compared to the approved Wambo Coal Mine.

7.3 COMPLIANCE WITH RELEVANT STATUTORY AND POLICY REQUIREMENTS

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

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

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

A detailed statutory compliance table for the Wambo Coal Mine incorporating the Modification that identifies all the relevant statutory requirements and the relevant sections in this Modification Report that address these requirements is provided in Attachment 2.

7.4 JUSTIFICATION FOR THE MODIFICATION

The Modification includes the following changes to the approved Wambo Coal Mine (Section 3):

- reorienting Longwalls 24 and 25 of the South Bates Extension Underground Mine;
- an additional longwall panel (i.e. Longwall 26);
- processing of ROM coal from Longwalls 24 to 26 at the existing on-site CHPP;
- an overall reduction in the approved area of overlying land predicted to experience potential subsidence impacts (relative to the layout assessed and approved by Modification 17); and
- an additional mining lease over a component of AUTH 444.

The Modification is being pursued as an alternative to the original approved mine layout for the South Bates Extension Underground Mine which was developed in 2016. The results of additional exploration activities and experience gained during mining of Longwalls 17 to 21 of the South Bates Extension Underground Mine have led to the development of the revised mine plan including reorientation of Longwalls 24 and 25, and the addition of Longwall 26.

The Modification would not extend the approved overall life of the Wambo Coal Mine, but would allow for continued operations at the South Bates Extension Underground Mine for a further three years (as the approved Longwalls 24 and 25 would not be mined in their current arrangement).

No other changes to the approved Wambo Coal Mine (including surface development area) would be required for the Modification (Section 3.7).

The Modification would also not require changes to the Wambo Coal Terminal Development Consent (DA 177-8-2004) or to the United Wambo Open Cut Coal Mine Development Consent (SSD 7142).

The Modification would:

- Contribute to the financial resilience of the Wambo Coal Mine, which would be achieved through the logical and efficient development of the viable coal resources adjacent to the approved underground mining area with no change to the existing infrastructure.
- Avoid geological features and other technical issues, which have required the previously completed longwalls in the South Bates Extension Underground Mine to be shortened at both the commencing (south-western) and finishing (north-eastern) ends.
- Facilitate ESD, as economic efficiencies can be achieved with no change to the currently accepted environmental performance measures, use of existing mining, coal handling and processing infrastructure and associated support facilities and no increase in the duration of existing impacts of the Wambo Coal Mine.
- Be consistent with the NSW Government's Strategic Statement on Coal Exploration and Mining, which outlines that the NSW Government will act in four areas, including *"supporting responsible coal production in areas deemed suitable for mining"*.

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

7.5 CONCLUSION

The Wambo Coal Mine, incorporating the Modification, would be substantially the same development as was last modified under section 75W of the EP&A Act (i.e. Modification 16), inclusive of consideration of the changes arising from previously approved modifications.

The Wambo Coal Mine (as modified) would continue to comply with existing criteria, performance measures and limits described in Development Consent (DA 305-7-2003).

WCPL would continue to operate the Wambo Coal Mine (as modified) in accordance with the existing environmental management plans and environmental monitoring programs.

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

8 REFERENCES

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ATTACHMENT 1
REVISED SCHEDULE OF LANDS

DEVELOPMENT CONSENT (DA 305-7-2003) DEVELOPMENT APPLICATION AREA

Lot Number	Deposited Plan Number	Tenure Type
1	DP110084	Freehold
1	DP1089682	Freehold
1	DP114970	Freehold
1	DP709722	Freehold
1	DP720705	Freehold
1	DP241316	Freehold
1	DP616303	Freehold
1	DP1177768	Freehold
1	DP1174490	Freehold
100	DP753792	Freehold
101	DP753792	Freehold
103	DP753792	Freehold
104	DP753792	Freehold
109	DP753792	Freehold
110	DP753792	Freehold
111	DP753792	Freehold
112	DP753792	Freehold
113	DP753817	Freehold
118	DP753792	Freehold
129	DP755267	Freehold
131	DP1089157	Freehold
160	DP753817	Freehold
161	DP753817	Freehold
170	DP823775	Crown
175	DP823775	Crown
18	DP753817	Freehold
2	DP1085145	Freehold
2	DP110084	Freehold
2	DP709722	Freehold
2	DP616303	Freehold
2	DP617852	Freehold
2	DP720705	Freehold
2	DP1174490	Freehold
208	DP753817	Freehold
22	DP753817	Freehold
220	DP1135537	Freehold
23	DP3030	Freehold
3	DP720705	Freehold
3	DP1177768	Freehold
3	DP1085145	Freehold
38	DP753792	Freehold
39	DP753792	Freehold
4	DP1085145	Freehold
4	DP542226	Freehold

Lot Number	Deposited Plan Number	Tenure Type
4	DP720705	Freehold
45	DP753792	Freehold
46	DP753792	Freehold
49	DP753792	Freehold
5	DP542226	Freehold
5	DP1085145	Freehold
50	DP753792	Freehold
51	DP753792	Freehold
52	DP753792	Freehold
55	DP753792	Freehold
57	DP1074788	Freehold
58	DP753792	Freehold
60	DP753792	Freehold
61	DP753792	Freehold
62	DP753792	Freehold
63	DP753792	Freehold
64	DP753792	Freehold
66	DP753817	Freehold
67	DP753817	Freehold
7	DP3030	Freehold
71	DP753817	Freehold
73	DP753817	Freehold
79	DP1074787	Freehold
79	DP753821	Freehold
82	DP548749	Freehold
83	DP548749	Freehold
92	DP755267	Freehold
95	DP753792	Freehold
A	DP33149	Freehold
B	DP33149	Freehold
C	DP33149	Freehold
1	DP732501	Freehold
2	DP732501	Freehold
3	DP732501	Freehold
4	DP732501	Freehold
5	DP732501	Freehold
6	DP732501	Freehold
3	DP753817	Freehold
10	DP753817	Freehold
149	DP753792	Freehold
16	DP755267	Freehold
4	DP753817	Freehold
5	DP753817	Freehold
6	DP753817	Freehold
Any Unidentified historical Title Resides located within, between or adjacent to the above Parcels of Land		Freehold/Crown

Roads

1. Wambo Mine Road.
2. Road within Lot 1 DP 616303.
3. Road bounded by Lot 220 DP1135537, Lot 83 DP548749, Lot 23 DP3030, Lot 129 DP 755267, Lot 1 DP110084, Lot 1089682 and Lot 1 DP114970.
4. Bounded by Lots 92 & 129 DP 755267.
5. Bounded by Lots 4 & 5 DP542226, Lot 2 DP616303, Lots 2 & 3 DP720705 and Lot 3 1177768.
6. Bounded by Lot 2 DP616303, Lot 5 DP542226, Lot 4 DP720705 and Lots 45 & 46 DP753792.
7. Bounded by Lot 1 DP1174490, Lots 2, 3 & 4 DP1085145 and Lot 175 DP823775.
8. Bounded by Lots 62, 63, 64, 95 & 118 DP753792, Lot 1 DP 1177768 and Lot 2 DP1174490.
9. Bounded by Lot 79 DP1074487, Lot 170 DP823775, Lots 49-51, 58, 118 DP753792, Lot 2 DP1085145 and Lot 2 DP1174490.
10. Bounded by Lot 79 DP1074487, Lots 18, 160 & 161 DP753817 and Lots 49, 50 & 52 DP753792.
11. Bounded by Lot A DP33149, Lots 22, 66 & 71 DP753817 and Lot 2 DP 1174490.
12. Adjoining to the East and North of Lot 79 DP753821.
13. Wambo Road.
14. Road within Lot 208 DP753817.
15. Bounded by Lot A DP33149 and Lots 3,4,5,6 & 113 DP753817.
16. Adjoining to the West and South of Lot 22 DP753817.
17. For Lot 1 DP1174490, the Tenure Type is States as Local Government Area LGA (consent has classified as "Freehold").
18. Consent has the DP number wrong for Lot 92 DP755267 (Consent has Lot 92 DP548749).

Wollombi Brook

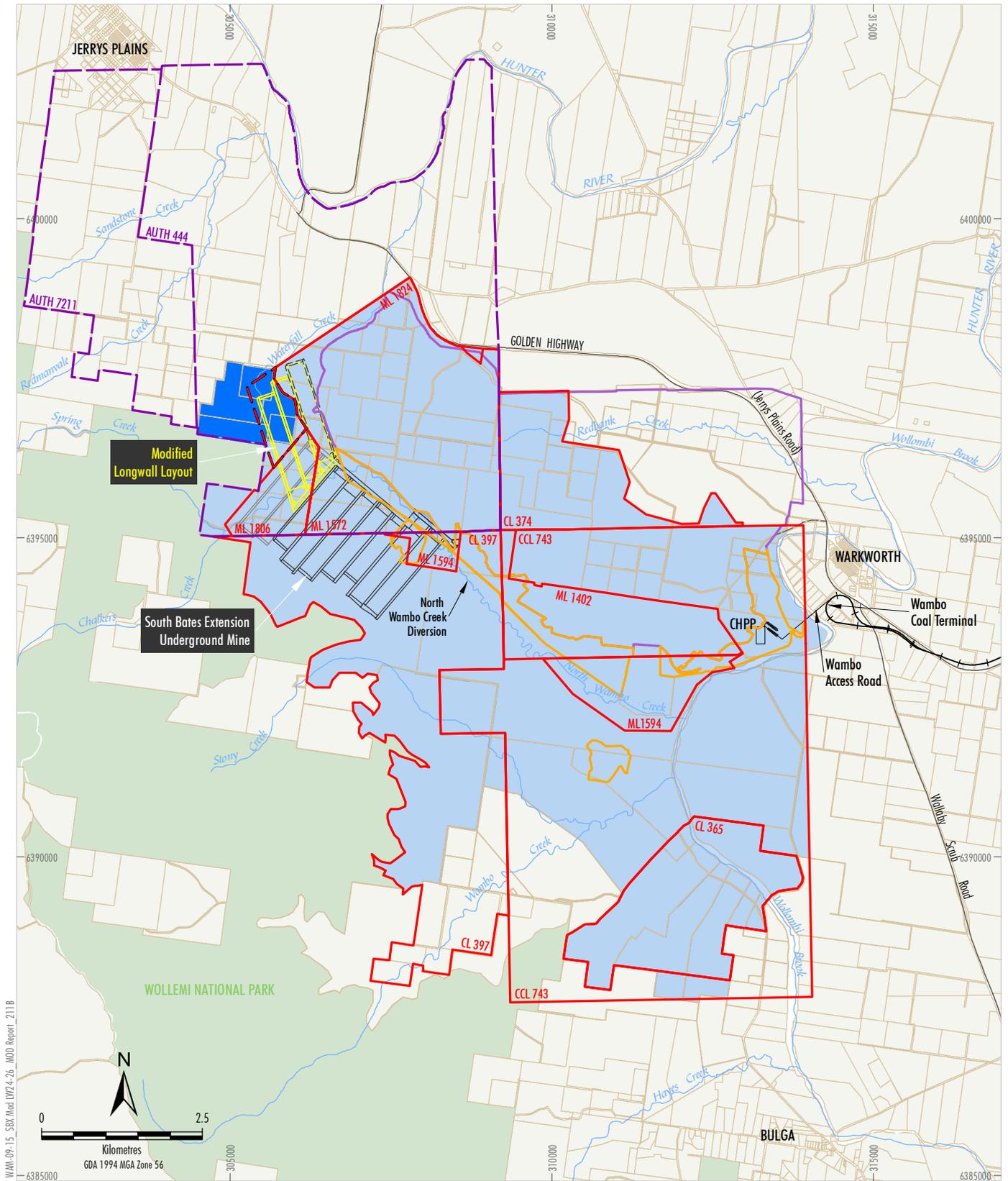
1. Bounded by Lot 220 DP1135537, Lot 83 DP548749, Lot1 DP110084, Lot 1 DP241316 and Lot 7 DP3030.
2. Bounded by Lot 1 DP1089682 and Lots 1, 2, 3, 4, 5 & 6 DP732501.

PROPOSED EXTENSION TO THE DEVELOPMENT APPLICATION AREA

Lot Number	Deposited Plan Number	Tenure Type
11	753817	Freehold
68	753817	Freehold
72	753817	Freehold
166	753817	Freehold

Roads

1. Bounded by Lots 68, 13 and 18 DP753817.
2. Road within the Lot 71 DP753817.
3. Bounded by Lots 11, 22 and 3 DP753817.



Source: WCPL (2022); NSW Spatial Services (2022)

LEGEND

- Cadastral Boundary
- National Park
- SSD 7142 Operational Area #
- Exploration Licence Boundary (AUTH, EL)
- Mining and Coal Lease Boundary (ML, CL, CCL)
- Proposed Mining Lease Application Area
- Existing/Approved Wambo Coal Mine
- Surface Development Area
- Existing/Approved Underground Development
- Approved Orientation of Longwalls 24 and 25
- Existing/Approved Underground Development (First Workings only)
- Modified Longwall Layout
- Land to which DA 305-7-2003 Applies
- Proposed Extension to the Development Application Area

Under Phase 2 of mining at Wambo Coal Mine (commenced 1 December 2020), this area is operated by United Collieries Pty Ltd under the United Wambo Joint Venture Project.

Peabody

W A M B O C O A L M I N E

Development Application Area

Figure A1-1

ATTACHMENT 2
DETAILED STATUTORY COMPLIANCE RECONCILIATION TABLE

**Table A2-1
Summary Statutory Compliance for State Legislation**

Relevant Legislation or Instrument	Mandatory Consideration	Relevant Section in the Wambo Coal Project EIS or Modification EA	Relevant Section in Modification Report	Modified Project Compliance Status
<i>NSW Environmental Planning and Assessment Act 1979</i>				
section 1.3	Relevant objects of the EP&A Act: <ul style="list-style-type: none"> • Promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources. • Facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment. • Promote the orderly and economic use and development of land. • Protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats. • Promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage). • Promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State. • Provide increased opportunity for community participation in environmental planning and assessment. 	Section 5.2 and Attachment 4 of the Wambo Coal Mine Modification 17 Environmental Assessment (the MOD 17 EA)	Section 4.1.1	✓

Table A2-1 (Continued)
Summary Statutory Compliance for State Legislation

Relevant Legislation or Instrument	Mandatory Consideration	Relevant Section in the Wambo Coal Project EIS or Modification EA	Relevant Section in Modification Report	Modified Project Compliance Status
<i>NSW Environmental Planning and Assessment Act 1979 (continued)</i>				
section 4.15	<p>Relevant environmental planning instruments:</p> <ul style="list-style-type: none"> • <i>State Environmental Planning Policy (Planning Systems) 2021</i> • <i>State Environmental Planning Policy (Resources and Energy) 2021</i> • <i>State Environmental Planning Policy (Resilience and Hazards) 2021</i> • <i>Singleton Local Environmental Plan 2013</i> (Singleton LEP). • Any planning agreement or draft planning agreement that a developer has entered into under section 7.4 of the EP&A Act. • The <i>Environmental Planning and Assessment Regulation 2021</i> (EP&A Regulation). <p>The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality; the suitability of the site for the development; any submissions made in accordance with the EP&A Act or the EP&A Regulation; the public interest.</p>	Section 5.2 and Attachment 4 of the MOD 17 EA	Table A2-2	✓
<i>NSW Environmental Planning and Assessment Regulation 2021</i>				
clause 98	<p>Clause 98 provides for the circumstances in which a modification application may be made.</p> <p>In accordance with the requirements of clause 98(4), WCPL will give notice of the Modification application via newspaper no later than 14 days after the Modification application is made.</p> <p>With respect to clause 98(6), the Wambo Coal Mine incorporating the Modification does not relate to land owned by a Local Aboriginal Land Council.</p>	-	Table A2-1	✓

Table A2-1 (Continued)
Summary Statutory Compliance for State Legislation

Relevant Legislation or Instrument	Mandatory Consideration	Relevant Section in the Wambo Coal Project EIS or Modification EA	Relevant Section in Modification Report	Modified Project Compliance Status
<i>NSW Environmental Planning and Assessment Regulation 2021 (continued)</i>				
clauses 99 and 100	<p>Clauses 99 and 100 of the EP&A Regulation provide for the making and content of a modification application. With respect to these two clauses, this Modification Application:</p> <ul style="list-style-type: none"> contains the information required by the EP&A Act and EP&A Regulation; has been prepared in consideration of the guideline <i>Preparing a Modification Report</i> (DPIE, 2021a); contains the information required by clause 100(1)(a) to (c) and a description of the Modification and its expected impacts; and is not accompanied by a Biodiversity Development Assessment Report. 	-	<p>Sections 1 to 8 Section 4.1 Section 4.2.2 and 6.7.</p>	✓
clause 103	<p>Clause 103 of the EP&A Regulation concerns applications to modify a development consent that relates to "mining or petroleum development" on certain land.</p> <p>The proposed Modification activities at the Wambo Coal Mine would be located partially within ML 1572, ML 1806 and AUTH 444. A new Mining Lease would be required for the Modification activities within AUTH 444 under the <i>Mining Act 1992</i> and therefore a portion of the Modification area would be subject to a Site Verification Certificate.</p> <p>A Site Verification Certificate issued on 15 July 2022 verified the Modification area outside existing mining tenements is not BSAL.</p>	-	Section 4.2.3	✓
clause 106	<p>Division 2 of Part 5 of the EP&A Regulation provides for the public notification of modification applications. The consent authority is required to attend to the relevant public notice requirements in this Division. In this regard, clause 106 applies to a section 4.55(2) modification application if the original development application was for SSD and clause 107 applies to a section 4.55(2) modification application to which clause 106 does not apply.</p>	-	No change.	✓
<i>NSW Biodiversity Conservation Act 2016</i>				
section 7.14(2)	<p>The consent authority is to take into consideration the likely impact of the proposed development on biodiversity values as assessed in the Biodiversity Review.</p> <p>The Modification does not require additional surface development beyond the approved areas and would therefore not increase the impact on biodiversity values, including threatened species and ecological communities.</p>	-	Sections 4.2.2 and 6.7	✓

Table A2-1 (Continued)
Summary Statutory Compliance for State Legislation

Relevant Legislation or Instrument	Mandatory Consideration	Relevant Section in the Wambo Coal Project EIS or Modification EA	Relevant Section in Modification Report	Modified Project Compliance Status
<i>NSW Biodiversity Conservation Act 2016 (continued)</i>				
section 7.16(3)	<p>If the consent authority is of the opinion that the Wambo Coal Mine (as modified) is likely to have serious and irreversible impacts on biodiversity values, the consent authority is required to:</p> <ul style="list-style-type: none"> take those impacts into consideration; and determine whether there are any additional and appropriate measures that will minimise those impacts if consent or approval is to be granted. 	-	Sections 4.2.2 and 6.7	✓
<i>NSW Mining Act 1992</i>				
section 380AA	An application for development consent to mine for coal cannot be made or determined unless the applicant is the holder of an authority that is in force in respect of coal for the relevant land, or the applicant has the written consent of the holder of such an authority to make the application.	-	Section 4.2.3	✓
<i>NSW National Parks and Wildlife Act 1974 (NPW Act)</i>				
section 90	<p>The Modification does not seek to change the approved surface development extent for the Wambo Coal Mine. The Modification would increase subsidence impacts/consequences, and therefore would involve additional potential impacts on Aboriginal cultural heritage to those previously assessed.</p> <p>WCPL would consult with Heritage NSW regarding the need to seek a new area based AHIP under section 90 of the NPW Act due to potential indirect impacts to Aboriginal cultural heritage outside the areas covered by AHIP #2222 and AHIP #C0003213.</p> <p>For portions of the Modification area within the AHIP #2222 and AHIP #C0003213 boundaries, WCPL will continue to manage Aboriginal cultural heritage in accordance with the approved Wambo Coal Mine Heritage Management Plan and AHIPs granted under the NPW Act.</p>	Section 4.6 of the MOD 17 EA	Sections 4.2.4 and 6.5	✓
<i>NSW Protection of the Environment Operations Act 1997 (PoEO Act)</i>				
section 43	<p>The Wambo Coal Mine currently operates under EPL 529, granted under the PoEO Act, which allows for coal works and mining for coal as scheduled activities. The EPL contains conditions that relate to emission and discharge limits, environmental monitoring and reporting.</p> <p>EPL 529 would be varied to incorporate the full Modification area within the premises boundary.</p>	Section 1.3.5 of the Wambo Development Project 2003 EIS (the 2003 EIS)	Section 4.2.5	✓

Table A2-1 (Continued)
Summary Statutory Compliance for State Legislation

Relevant Legislation or Instrument	Mandatory Consideration	Relevant Section in the Wambo Coal Project EIS or Modification EA	Relevant Section in Modification Report	Modified Project Compliance Status
<i>NSW Water Management Act 2000</i>				
sections 89, 90 and 91	WCPL holds appropriate licences under the WM Act for the existing activities at the Wambo Coal Mine. Appropriate licences under the WM Act would continue to be held and where necessary obtained via purchase or trade according to the operating rules of the water market.	-	Sections 4.2.1 and 6.3	✓
<i>NSW Coal Mine Subsidence Compensation Act 2017 (CMSC Act)</i>				
section 8	At all times while the Wambo Coal Mine is an active mine, WCPL (or the relevant proprietor) would be liable to pay compensation in relation to damage caused by subsidence arising from the Wambo Coal Mine on improvement or goods under Part 2 of the CMSC Act. Any claims for compensation under the CMSC Act would be lodged with Subsidence Advisory NSW. The Wambo Coal Mine is not located within a Mine Subsidence District declared under section 20 of the CMSC Act, and in the regulations made under the CMSC Act.	Section 4.2.4 of the 2003 EIS	No change.	✓
<i>NSW Heritage Act 1977</i>				
section 139	No items of historic heritage would be directly disturbed by the underground mining at the Wambo Coal Mine (as modified) as there would be no additional surface development beyond the approved areas or increased subsidence impacts.	-	No change.	✓
<i>NSW Crown Land Management Act 2016</i>				
section 5.30	For all relevant Crown land directly affected by the Modification, WCPL would enter into necessary leases or licences under the <i>Crown Land Management Act 2016</i> and/or reach agreements under section 265 of the <i>Mining Act 1992</i> to allow Modification activities to occur.	-	No change.	✓

Table A2-2
Summary Statutory Compliance for Environmental Planning Instruments

Relevant Legislation or Instrument	Mandatory Consideration	Relevant Section in the Wambo Coal Project EIS or Modification EA	Relevant Section in Modification Report	Modified Project Compliance Status
<i>State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP)</i>				
Part 2.2	The Planning Systems SEPP provides for the declaration of SSD. In this respect, the approved Wambo Coal Mine development was declared to be SSD under clause 6 of Schedule 2 to the <i>Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017</i> .	-	Table A2-2	✓
clause 2.7	Clause 2.7(1) relevantly provides for the Independent Planning Commission to be the declared consent authority for certain applications to modify a development consent for SSD, if the application is made by a person who has disclosed a "reportable political donation" under section 10.4 of the EP&A Act in connection with the modification application. In this respect, this Modification Application is not made by a person who has disclosed a reportable political donation.	-	Table A2-2	✓
clause 2.10	Under clause 2.10, development control plans do not apply to SSD.	-	Table A2-2	✓
<i>State Environmental Planning Policy (Resources and Energy) 2021 (Resources and Energy SEPP)</i>				
clause 2.1	Clause 2 of Chapter 2 (Mining, petroleum and extractive industries) of the Resources and Energy SEPP relevantly states that the aims of the Policy are, in recognition of the importance to New South Wales of mining, petroleum production and extractive industries: <ul style="list-style-type: none"> to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State; to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources; to promote the development of significant mineral resources; and to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources. The consent authority can be satisfied that the Modification is consistent with the relevant aims of the Resources and Energy SEPP for the reasons given in Section 4.1.2 with respect to the objects of the EP&A Act.		Section 4.1.2 Table A2-2	✓
clause 2.9	Clause 2.9 states that development for the purpose of mining may be carried out (with consent) on land where agriculture or industry may be carried out (with or without development consent). The Wambo Coal Mine including the Modification is entirely within land that is zoned for primary production, for which development for the purpose of agriculture or industry may be carried out (with or without consent) under the Singleton LEP.		Table A2-2	✓

Table A2-2 (Continued)
Summary Statutory Compliance for Environmental Planning Instruments

Relevant Legislation or Instrument	Mandatory Consideration	Relevant Section in the Wambo Coal Project EIS or Modification EA	Relevant Section in Modification Report	Modified Project Compliance Status
Resources and Energy SEPP (continued)				
clause 2.16	<p>Clause 2.16 provides various non-discretionary development standards for mining. In this regard, it is noted that:</p> <ul style="list-style-type: none"> ■ The Modification would not increase any potential impacts on cumulative noise level, cumulative air quality level, airblast overpressure, or ground vibration (i.e. the non-discretionary development standards listed under clause 2.16[1] to [6]). ■ The minimal impact considerations in the AIP (NSW Government, 2012) were considered in the Groundwater Assessment (Appendix B). 	-	Section 6 Table A2-2	✓
clause 2.17	<p>Before determining an application for consent for the purposes of mining the consent authority must:</p> <p>(a) consider –</p> <p>(i) <i>the existing uses and approved uses of land in the vicinity of the development, and</i></p> <p>(ii) <i>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</i></p> <p>(iii) <i>any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses, and</i></p> <p>(b) <i>evaluate and compare the respective public benefits of the development and the land uses referred to in paragraph (a)(i) and (ii), and</i></p> <p>(c) <i>evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a)(iii).</i></p> <p>Land use in the vicinity of the Wambo Coal Mine is characterised by a combination of agricultural land uses, industrial and residential areas in the village of Jerrys Plains. The Modification would be wholly within the existing Wambo Coal Mine mining and exploration leases and requires no new surface development.</p> <p>Accordingly, the Wambo Coal Mine incorporating the Modification is considered to be compatible with existing and approved uses of land, namely an open cut and underground coal mine rehabilitated to conservation and agriculture final land uses.</p>	-	Table A2-2	✓

Table A2-2 (Continued)
Summary Statutory Compliance for Environmental Planning Instruments

Relevant Legislation or Instrument	Mandatory Consideration	Relevant Section in the Wambo Coal Project EIS or Modification EA	Relevant Section in Modification Report	Modified Project Compliance Status
Resources and Energy SEPP (continued)				
clause 2.19	<p>Before determining an application for development in the vicinity of mining, petroleum or extractive industry, the consent authority must (among other things) consider whether or not the development is likely to have a significant impact on current or future extraction or recovery of minerals, petroleum or extractive materials (including by limiting access to, or impeding assessment of, those resources), and any ways in which the development may be incompatible with any of those existing or approved uses or that current or future extraction or recovery.</p> <p>In this regard, the Wambo Coal Mine incorporating the Modification would continue to progress in accordance with approved mine plans until the target coal resource is fully extracted. Further, the development as modified is not expected to have a significant impact on current or future extraction or recovery of minerals, petroleum or extractive materials.</p> <p>As such, no additional measures to avoid or minimise incompatibility with existing and approved surrounding land uses are considered to be required.</p>	-	Table A2-2	✓

Table A2-2 (Continued)
Summary Statutory Compliance for Environmental Planning Instruments

Relevant Legislation or Instrument	Mandatory Consideration	Relevant Section in the Wambo Coal Project EIS or Modification EA	Relevant Section in Modification Report	Modified Project Compliance Status
Resources and Energy SEPP (continued)				
clause 2.20	<p>Clause 2.20(1) of the Resource and Energy 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 consent 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:</p> <ul style="list-style-type: none"> (a) <i>that impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable,</i> (b) <i>that impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest extent practicable,</i> (c) <i>that greenhouse gas emissions are minimised to the greatest extent practicable.</i> <p>In addition, clause 2.20(2) requires that, without limiting clause 2.20(1), in determining a development application for development for the purposes of mining petroleum production or extractive industry, the consent authority must consider an assessment of the greenhouse gas emissions (including downstream emissions) of the development, and must do so having regard to any applicable State or national policies, programs or guidelines concerning greenhouse gas emissions.</p> <p>The potential impact of the Modification on water resources has been assessed in the Groundwater Assessment (Appendix B) and Surface Water Assessment (Appendix C) and summarised in Sections 6.3 and 6.4, respectively. Appendices A and B indicate that there would be no significant impact on water resources as a result of the Modification.</p> <p>The Modification does not seek to change the approved surface development extent and, therefore, would not involve additional potential impacts on threatened species and biodiversity to those previously assessed.</p> <p>In addition, the Modification does not seek to change any operational components of the Wambo Coal Mine.</p>	-	Table A2-2	✓
Clause 2.21	<p>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, and 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.</p> <p>In this regard, the Wambo Coal Mine incorporating the Modification would continue to progress in accordance with approved mine plans until the target coal resource is fully extracted.</p> <p>The Modification allows for timely closure of the mine and a sustainable post-mining land use to be achieved.</p>	-	Section 3 Table A2-2	✓

Table A2-2 (Continued)
Summary Statutory Compliance for Environmental Planning Instruments

Relevant Legislation or Instrument	Mandatory Consideration	Relevant Section in the Wambo Coal Project EIS or Modification EA	Relevant Section in Modification Report	Modified Project Compliance Status
Resources and Energy SEPP (continued)				
clause 2.23	<p>Clause 2.23 of the Resource and Energy 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 consent 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:</p> <ul style="list-style-type: none"> (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 clause 3 of Schedule 6 to 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. <p>WCPL would continue to progressively rehabilitate the Wambo Coal Mine in accordance with existing approvals. WCPL would review and revise the Mining Operations Plan/Rehabilitation Management Plan (or equivalent) to incorporate the Modification.</p>	-	Table A2-2	✓

Table A2-2 (Continued)
Summary Statutory Compliance for Environmental Planning Instruments

Relevant Legislation or Instrument	Mandatory Consideration	Relevant Section in the Wambo Coal Project EIS or Modification EA	Relevant Section in Modification Report	Modified Project Compliance Status
Resources and Energy SEPP (continued)				
Part 2.4	<p>Part 2.4 of the Resource and Energy SEPP concerns "mining or petroleum development", which is defined under clause 17A to mean:</p> <p>(1) <i>In this Part, mining or petroleum development means—</i></p> <p>(a) <i>development specified in clause 5 (Mining) of Schedule 1 to State Environmental Planning Policy (State and Regional Development) 2011, but only if—</i></p> <p>(i) <i>a mining lease under the Mining Act 1992 is required to be issued to enable the development to be carried out because—</i></p> <p>(A) <i>the development is proposed to be carried out outside the mining area of an existing mining lease, or</i></p> <p>(B) <i>there is no current mining lease in relation to the proposed development, or</i></p> <p>(ii) <i>the development is for the purposes of extracting a bulk sample as part of resource appraisal or a trial mine comprising the extraction of more than 20,000 tonnes of coal or of any mineral ore, or</i></p> <p>...</p> <p>(2) <i>However, mining or petroleum development does not include development carried out on land that is outside—</i></p> <p>(a) <i>the mining area of a proposed mining lease, or</i></p> <p>(b) <i>the area of a proposed production lease.</i></p> <p>With respect to Part 2.4, the Modification Application involves "mining or petroleum development" as a mining lease under the <i>Mining Act 1992</i> is required to enable the development (as modified) to be carried out.</p> <p>The proposed Modification activities at the Wambo Coal Mine would be located partially within ML 1572, ML 1806 and AUTH 444. A new Mining Lease would be required for the Modification activities within AUTH 444 under the <i>Mining Act 1992</i> and therefore a portion of the Modification area would be subject to a Site Verification Certificate.</p> <p>A Site Verification Certificate issued on 15 July 2022 verified the Modification area outside existing mining tenements is not BSAL.</p>	-	Table A2-2	✓

Table A2-2 (Continued)
Summary Statutory Compliance for Environmental Planning Instruments

Relevant Legislation or Instrument	Mandatory Consideration	Relevant Section in the Wambo Coal Project EIS or Modification EA	Relevant Section in Modification Report	Modified Project Compliance Status
<i>State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP)</i>				
clause 4.6	<p>Chapter 4 (Remediation of Land) of the Resilience and Hazards SEPP is concerned with the remediation of contaminated land. Relevantly, clause 4.6(1) and (2) state:</p> <p>(1) <i>A consent authority must not consent to the carrying out of any development on land unless—</i></p> <p>(a) <i>it has considered whether the land is contaminated, and</i></p> <p>(b) <i>if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and</i></p> <p>(c) <i>if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.</i></p> <p>(2) <i>Before determining an application for consent to carry out development that would involve a change of use on any of the land specified in subclause (4), 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</i></p> <p>The component of the Modification located within the boundary of Development Consent (DA 305-7-2003) does not involve any change of use of any of the land specified in clause 4.6(4) because the modified Wambo Coal Mine would involve the continued development of an underground and open cut coal mine and associated activities within this area.</p> <p>A Land Contamination Assessment has been undertaken for the portion of the Modification outside the Development Consent (DA 305-7-2003) boundary, including a Stage 1 (or Preliminary Investigation) in accordance with the <i>Guidelines for Consultants Reporting on Contaminated Sites</i> (Office of Environment and Heritage [OEH], 2011).</p> <p>On the basis of the Stage 1 (or Preliminary Investigation) Land Contamination Assessment, the Modification area outside the Development Consent (DA 305-7-2003) boundary is suitable for the land use proposed by the Modification (Section 6.8 and Appendix I).</p>	-	Section 6.8 Table A2-2	✓
clause 3.12	<p>A consent authority must consider current circulars or guidelines published by the DPE relating to hazardous or offensive development, whether to consult with relevant public authorities regarding any environmental or land use safety requirements, a preliminary hazard analysis prepared by the applicant, feasible alternatives to the development and likely future use of surrounding land.</p> <p>To the extent that clause 13 is relevant to the Modification Application, the consent authority can be satisfied that the development as modified will be carried out appropriately to manage potential hazards and pollution.</p> <p>The Modification would not involve the use of any additional hazardous materials and would not change the approved development extent or operations of the Wambo Coal Mine. Hazardous materials would continue to be managed in accordance with the Project Approval and approved management plans.</p>	-	Table A2-2	✓

Table A2-2 (Continued)
Summary Statutory Compliance for Environmental Planning Instruments

Relevant Legislation or Instrument	Mandatory Consideration	Relevant Section in the Wambo Coal Project EIS or Modification EA	Relevant Section in Modification Report	Modified Project Compliance Status
<i>Singleton LEP</i>				
clause 2.3	A consent authority must have regard to the objectives for development in a zone when determining a development application in respect of land within that zone.	Section 5.2 and Attachment 4 of the MOD 17 EA	No change.	✓
clause 5.10(4)	If applicable, a consent authority must, before granting consent under clause 5.10 in respect of a heritage item of heritage conservation area, consider the effect of the proposed development on the heritage significance of the item or area concerned.	Appendix C of the 2003 EIS	No change.	✓
clause 5.10(8)	If applicable, a consent authority must, before granting consent under clause 5.10 to the carrying out of development in an Aboriginal place of heritage significance, consider the effect of a proposed development on the heritage significance of the place and any Aboriginal object known or reasonably likely to be located at the place by means of an adequate investigation and assessment.	Section 4.13 and Appendix D of the 2003 EIS and Section 4.6 and Appendix F of the MOD 17 EA	No change.	✓
clause 7.6	If applicable, a consent authority must, before granting development consent for earthworks, consider the effect of proposed earthworks on drainage patterns, soil stability, quality of fill, likely amenity impacts, likelihood of disturbing relics and proximity to and potential impacts on water courses.	Section 4 of the 2003 EIS and Section 4 of the MOD 17 EA	No change.	✓