UNITED AND WAMBO OPEN CUT COAL MINE PROJECT

Preliminary Environmental Assessment

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
United Collieries Pty Limited

Project Director: John Merrell
Project Manager: Kirsty Davies
Report No. 3509/R02/FINAL
Date: June 2015

Newcastle
75 York Street
Teralba NSW 2284
Ph. 02 4950 5322
www.umwelt.com.au

This report was prepared using Umwelt’s ISO 9001 certified Quality Management System.
# Table of Contents

## 1.0 Introduction

1.1 Background  
1.2 Project Overview  
1.3 The Proponent  
1.4 Purpose of the Document  

## 2.0 Existing Operations

2.1 Existing United Operations  
2.1.1 Existing Development Approvals  
2.2 Existing Wambo Operations  
2.2.1 Existing Development Approvals  

## 3.0 Proposed Project

3.1 Key Design Considerations  
3.2 Key Project Details  
3.3 Interaction With Wambo  
3.4 Geology and Resource Description  
3.5 Conceptual Mine Plan  
3.6 Mining Infrastructure  
3.6.1 Rejects and Tailing Management  
3.7 Rehabilitation and Final Landform  
3.8 Site Access  
3.9 Golden Highway Realignment  
3.10 Transmission Line Relocations  
3.11 Construction  
3.12 Mine Workforce and Hours of Operation  
3.13 Alternatives and Justification  
3.13.1 Project Alternatives  
3.13.2 Project Justification  

## 4.0 Stakeholder Consultation

4.1 Authority Consultation  
4.2 Community and Other Stakeholder Engagement  

## 5.0 Planning Considerations

5.1 NSW Approval Process  
5.1.1 Permissibility  
5.1.2 Gateway Process  
5.1.3 Other State approvals  
5.1.4 Commonwealth Approval Process
6.0 Preliminary Environmental Assessment 38
6.1 Environmental and Community Context 38
6.1.1 Topography and Drainage 38
6.1.2 Soils 38
6.1.3 Land Ownership 40
6.1.4 Land Use 40
6.2 Preliminary Environmental Risk Analysis 43

7.0 Key Environmental and Social Issues 44
7.1 Socio Impact and Opportunities Assessment 44
7.2 Noise 45
7.3 Blasting 46
7.4 Air Quality 46
7.5 Surface Water 47
7.6 Groundwater 50
7.7 Ecology 50
7.7.1 Existing Environment 50
7.7.2 Assessment Approach 57
7.8 Agriculture 57
7.9 Aboriginal Cultural Heritage and Archaeology 58
7.10 Historic Heritage 59
7.11 Traffic and Transport 60
7.12 Visual Amenity 61
7.13 Greenhouse Gas Emissions 61
7.14 Economic Impacts 62
7.15 Mine Closure and Rehabilitation 62

8.0 Project Schedule 64

9.0 References 65
Figures

Figure 1.1  Existing Mining and Exploration Lease Titles  3
Figure 1.2  Locality Map  4
Figure 1.3  The Project  6
Figure 2.1  Existing United Operations  9
Figure 2.2  Existing Wambo Operations  13
Figure 3.1  Typical Stratigraphic Section and Strata Entitlements  17
Figure 3.2  Conceptual Mine Plan Year 2  20
Figure 3.3  Conceptual Mine Plan Year 5  21
Figure 3.4  Conceptual Mine Plan Year 11  22
Figure 3.5  Conceptual Mine Plan Year 16  23
Figure 3.6  Conceptual Mine Final Landform  24
Figure 3.7  Existing Road Network  27
Figure 6.1  Soil Landscape Mapping Units  39
Figure 6.2  Land Ownership  41
Figure 6.3  Land Use  42
Figure 7.1  Catchment Areas and Drainage Lines  49
Figure 7.2  Flora Survey Effort  52
Figure 7.3  Fauna Survey Effort  53
Figure 7.4  Vegetation Communities  54
Figure 7.5  Threatened Species Records  55

Tables

Table 2.1  United Development Consents  10
Table 2.2  Wambo Development Consents  11
Table 3.1  Summary of Key Project Details  15
Table 7.1  Listed Threatened Species  56

Appendices

Appendix 1  Schedule of Lands
Appendix 2  Preliminary Environment Risk Analysis
1.0 Introduction

In November 2014 a 50:50 Joint Venture between United Collieries Pty Limited (United Collieries) and Wambo Coal Pty Limited (Wambo Coal) was announced which combines the extraction and exploration rights for a number of mining tenements at the existing United Mine (United) and the existing Wambo Mine (Wambo) (refer to Figure 1.1). The Joint Venture will look to develop the United and Wambo Open Cut Project (the Project) that combines the existing open cut operations at Wambo with a proposed new open cut coal mine at United. This Preliminary Environmental Assessment provides details on the Project and the program of environment and community assessment planned to seek approval for the Project.

United is owned 95% by Glencore Coal Assets Australia (Glencore) and 5% by the Construction, Forestry, Mining and Energy Union (CFMEU) and is managed by Glencore. Wambo is an existing coal mining operation and is a neighbour operation to United. Wambo Coal is a subsidiary of Peabody Energy Australia Pty Limited (Peabody).

United and Wambo coal mining operations are situated approximately 16 kilometres (km) west of Singleton in the Hunter Valley of New South Wales (NSW) (refer to Figure 1.2). The village of Warkworth is located approximately 1 km to the south east of the Project Area. The villages of Jerry’s Plains and Bulga are located approximately 6 km north west, and 7km to the south, respectively, of the Project Area. The rural area of Maison Dieu is located approximately 4 km to the north east of the Project Area.

1.1 Background

The United and Wambo coal mining operations were established in 1989 and the late 1960’s, respectively. There have been a range of underground and open cut coal mining operations at both of these adjoining coal mines since that time, with a number of agreements entered into by United Collieries and Wambo Coal over time in relation to access to underground and open cut coal reserves within mining titles held by each company.

Whilst open cut coal mining has previously been undertaken at United, over the last two decades the focus has been on underground mining. Underground longwall mining operations were approved to provide up to 2.95 million tonnes per annum (Mtpa) of saleable coal. Operations were suspended at United in March 2010 with the mine entering a period of care and maintenance. At this time, exploration and pre-feasibility works were commenced to determine the potential for future mining activities within United’s mining lease CCL775 (refer to Figure 1.1). Ongoing exploration within CCL775 has identified substantial reserves of coal suitable for open cut mining and the Joint Venture will seek approval to extract these additional resources as part of the Project.

The current existing and approved Wambo open cut coal mine adjoins the United operations, and was planned to produce up to 8 Mtpa of run of mine (ROM) coal up to 2017. The combined Wambo underground and open cut operations, have approval to extract up to 14.7 Mtpa run of mine (ROM) coal, and to transport up to 15 Mtpa product coal via the approved train loading facility until 2025.
Currently, a number of lease boundaries and depth limits (stratified leases) restrict access to some coal reserved within the footprint of the existing operations (refer to Figure 1.1). The Joint Venture will combine the management and operation of exploration and mining within the Joint Venture tenements, being Exploration Lease (EL) 7211, Authorisation (A) 444, Mining Lease (ML) 1572, Coal Lease (CL) 374 (which is stratified and exists below CCL775) and CCL775. For this Project, open cut coal mining within these leases will enable optimised coal recovery in a new open cut mine on the existing United mining lease CCL775 (the United Open Cut) with modified operation of the existing, approved Wambo open cut coal mine. This will enable integrated operation of mining within the two adjoining open cut mining areas.
1.2 Project Overview

The Project includes open cut mining operations in two areas, the proposed United Open Cut and modified operations in the approved Wambo open cut mining area (Wambo Open Cut) (refer to Figure 1.3). The Project will maximise resource recovery by removing constraints from surface lease boundaries and stratified leases, enabling extraction of approximately an additional 149 million tonnes (Mt) of ROM coal over approximately 21 years. The Project will provide continued employment for the existing Wambo open cut workforce and create additional employment from the development of the Project.

The Project is a State Significant Development as defined under State Environmental Planning Policy (State and Regional Development) 2011 and will require development consent under Division 4.1 of Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The Project will also require a modification to the existing Wambo development consents under section 75W of the EP&A Act (refer to Section 5.1).

The existing Wambo Open Cut has approval for continued open cut mining until 2017. The Project seeks to modify the approved mine plan for the Wambo Open Cut to access additional resources from within existing mining and exploration tenements held below the Wambo Open Cut.

The Joint Venture is anticipated to deliver up to 10 Mtpa of ROM coal production in total from the combined management of the United Open Cut and Wambo Open Cut mines.

In addition to seeking approval for integrated mining of the United Open Cut and Wambo Open Cut mines, the Project will require a number of changes to the layout of existing mining and public infrastructure within the Project Area. These proposed modifications are described in detail in Section 3.0 and in summary include:

- use of a temporary workshop during construction at the United Open Cut;
- upgrades within the existing Wambo Mining Infrastructure Area (MIA) to accommodate the proposed mining fleet and increased workforce numbers;
- realignment of a 2 kilometre section of the Golden Highway and the relocation of a section of 330 kV and 66 kV transmission lines to maximise coal recovery from the United pit; and
- changes to the existing mine water management system and other ancillary infrastructure and services to provide for the Project.

The existing development consents for Wambo Coal Mine (DA 305-7-2003) and Wambo train loading infrastructure (DA 177-8-2004) will remain in place and will be modified to harmonise approved operations with the Project (refer to Section 5.1). The existing Wambo underground mining operations will not be modified as part of this application.

The existing Wambo Coal Handling and Preparation Plant (CHPP) will be utilised for the Project, with no change proposed to the CHPP’s approved annual throughput of 14.7 Mtpa ROM coal feed. The Wambo CHPP will also continue to receive coal from the ongoing Wambo underground mine (that is not the subject of this Project). The Project will transport product coal to the Port of Newcastle via the existing Wambo rail loop with no changes required to the existing infrastructure or approved rail throughput of 15 Mtpa of product coal.
FIGURE 1.3
The Project
The full integration of the United and Wambo open cut mining operations provides a number of key benefits including:

- maximising efficient recovery of the State’s coal resources;
- providing for a fully integrated rehabilitation program and final landform for the adjoining open cut mining areas; and
- consolidating the environmental management for the open cut mining complex, providing better outcomes through a consistent approach and ‘whole of complex’ management of all open cut mining operations.

Further detail about the Project is contained in Section 3.0.

1.3 The Proponent

The Project will be managed by United Collieries (majority owned by Glencore) on behalf of the Joint Venture, and operated by a wholly owned subsidiary of Glencore Coal Pty Ltd. The proponent for the Project will be United Collieries.

1.4 Purpose of the Document

This Preliminary Environmental Assessment (PEA) has been prepared by Umwelt (Australia) Pty Limited (Umwelt) on behalf of United Collieries in order to brief relevant government agencies, the community and other stakeholders about the proposed Project. This PEA is provided in support of United Collieries’ application for the Secretary’s Environmental Assessment Requirements (SEARs) as required for State Significant Development (SSD) in accordance with Division 4.1 of Part 4 of the Environmental Planning & Assessment Act 1979.

This PEA provides an overview of the Project and identifies the key issues and planned approach for the environmental and social studies to be undertaken as part of the Environmental Impact Statement (EIS) for the Project.
2.0 Existing Operations

2.1 Existing United Operations

An Authorisation to prospect was granted over the area in 1980. Development Consent for mining within mining lease CL257 (now consolidated into CCL775) was granted in the early 1980s, with mining operations commencing in 1989.

From July 1989 until July 1992, United comprised an open cut and auger mining operation extracting from the Whynot and Wambo seams. In 1991, a lease exchange was effected with the neighbouring Wambo mine, enabling Wambo Coal to secure greater open cut reserves and United Collieries to secure greater underground reserves.

Underground mining operations commenced at United in January 1992 within the Woodlands Hill seam using a continuous miner with shuttle cars, and in May 1994, bord and pillar development was introduced. Changes to mining equipment and techniques over the following years resulted in increased production with longwall mining implemented at United in May 2002, increasing the approved production capacity at United to 2.95 million tonnes of saleable coal per annum. The majority of United’s previous underground mining operations are located beneath Wambo’s open cut operations and within CCL775.

United has a Coal Handling and Preparation Plant (CHPP) at the site which washed ROM coal from the underground operation for delivery to the export market. From 1989 until 2006, product coal was transported from United by road along the Golden Highway to the Mount Thorley Coal Loader. With the construction of the Wambo rail spur and loop in 2006, product coal from United was transported to the Wambo train loading facility initially via the Golden Highway until an internal private haul road was completed in December 2007. The product coal from United was then transported to and stockpiled at the Wambo CHPP and loaded onto trains bound for the Port of Newcastle for export.

United’s current Development Consent, granted in November 2003, allowed for underground mining until the end of 2012. However, in 2009 the then Xstrata Coal (now Glencore) announced that United would mine the last of the currently approved economically recoverable underground reserves in the Woodlands Hill Seam within CCL775 following the completion of Longwall 10. In March 2010, the United site entered into a period of care and maintenance and subsequently commenced exploration and pre-feasibility works for future mining potential.

The previous mining operations and approved site infrastructure at United are shown on Figure 2.1.

2.1.1 Existing Development Approvals

As discussed in Section 1.0, United operated within CCL775 and most recently in accordance with Development Consent DA-410-11-2002. A list of existing development consents applicable to United are presented in Table 2.1 below.
### Table 2.1 United Development Consents

<table>
<thead>
<tr>
<th>Number</th>
<th>Approval Name</th>
<th>Date Granted</th>
<th>Expiry Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>DA 410-11-2002</td>
<td>Original consent for underground mining operations</td>
<td>21/11/2003</td>
<td>31/12/2012</td>
</tr>
<tr>
<td>MOD 1</td>
<td>Modification to allow for extension of longwall mining</td>
<td>10/03/2004</td>
<td>31/12/2012</td>
</tr>
<tr>
<td>MOD 2</td>
<td>Modification for the haul road intersection and ancillary surface infrastructure</td>
<td>20/01/2006</td>
<td>31/12/2012</td>
</tr>
<tr>
<td>MOD 3</td>
<td>Modification for the realignment of the internal haul road</td>
<td>16/03/2006</td>
<td>31/12/2012</td>
</tr>
<tr>
<td>MOD 4</td>
<td>Extension of temporary haulage of coal on public roads to allow the use of the Wambo Coal Loader</td>
<td>11/02/2007</td>
<td>31/12/2012</td>
</tr>
<tr>
<td>MOD 5</td>
<td>Modification for mining of longwall panels 10 and 11</td>
<td>16/09/2008</td>
<td>31/12/2012</td>
</tr>
<tr>
<td>MOD 6</td>
<td>Modification of consent to extend coal haulage to the Wambo Coal Loader</td>
<td>8/08/2007</td>
<td>31/12/2012</td>
</tr>
<tr>
<td>MOD 7</td>
<td>Modification to longwall panel 7</td>
<td>6/11/2007</td>
<td>31/12/2012</td>
</tr>
<tr>
<td>MOD 8</td>
<td>Modification for mining of longwall panel 23 and mine development areas</td>
<td>3/12/2009</td>
<td>31/12/2012</td>
</tr>
</tbody>
</table>

### 2.2 Existing Wambo Operations

A range of open cut and underground mining operations have been conducted at Wambo since mining operations commenced in 1969. Mining under Development Consent DA 305-7-2003 commenced in 2004 and current open cut and underground operations are conducted under this consent. The approved ROM coal production rate is 14.7 Mtpa of ROM coal from the complex (open cut and underground operations combined) and product coal is transported from Wambo by rail, with an approved rail capacity of 15 Mtpa of product coal.

The current approved Wambo Open Cut is authorised to produce up to 8 Mtpa of ROM coal from the Whybrow, Redbank Creek, Wambo and Whynot coal seams. The open cut is bounded by United and the Golden Highway to the east and north, Wollombi Brook to the east and south, and Wollemi National Park to the west.
Wambo has four approved underground mining operations, being:

- North Wambo Underground Mine;
- South Bates Underground Mine;
- Arrowfield Underground Mine; and
- Bowfield Underground Mine.


ROM coal from the Wambo mining operations is hauled to the Wambo CHPP for processing. ROM coal is crushed and washed in the CHPP. The Wambo CHPP has approved capacity for processing up to 14.7 Mtpa of ROM coal.

Product coal from Wambo’s operations is conveyed from the CHPP to the Wambo train loading facility which operates up to 24 hours per day, 7 days per week. An average of four trains are loaded each day, with a maximum of six trains per day being loaded during peak coal transport periods.

The existing Wambo operations are shown on Figure 2.2.

### 2.2.1 Existing Development Approvals

A list of existing development consents applicable to Wambo are presented in Table 2.2 below.

<table>
<thead>
<tr>
<th>Number</th>
<th>Approval Name</th>
<th>Date Granted</th>
<th>Expiry Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>DA 305-7-2003</td>
<td>Expansion of open cut and underground mining operations</td>
<td>04/02/2004</td>
<td>04/02/2025</td>
</tr>
<tr>
<td>DA 305-7-2003 MOD 1</td>
<td>Modification to allow DA No. 108/91 to remain active</td>
<td>2004</td>
<td>04/02/2025</td>
</tr>
<tr>
<td>DA 305-7-2003 MOD 2</td>
<td>Re-orientation of the North Wambo Underground Mine longwall panels</td>
<td>04/05/2005</td>
<td>04/02/2025</td>
</tr>
<tr>
<td>DA 305-7-2003 MOD 3</td>
<td>Upgrade of open cut workshop and underground surface facilities</td>
<td>10/01/2006</td>
<td>04/02/2025</td>
</tr>
<tr>
<td>DA 305-7-2003 MOD 4</td>
<td>Extraction of the Wollemi remnants</td>
<td>19/04/2006</td>
<td>04/02/2025</td>
</tr>
<tr>
<td>DA 305-7-2003 MOD 5</td>
<td>Construction of a temporary bypass of North Wambo Creek</td>
<td>20/10/2006</td>
<td>04/02/2025</td>
</tr>
<tr>
<td>Number</td>
<td>Approval Name</td>
<td>Date Granted</td>
<td>Expiry Date</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------------------------------------------------------</td>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>DA 305-7-2003 MOD 6</td>
<td>Construction of the North Wambo Creek Diversion in a staged manner and construction of gas and dewatering wells</td>
<td>25/01/2007</td>
<td>04/02/2025</td>
</tr>
<tr>
<td>DA 305-7-2003 MOD 7</td>
<td>Construction of internal water storage dam</td>
<td>22/06/2009</td>
<td>04/02/2025</td>
</tr>
<tr>
<td>DA 305-7-2003 MOD 8</td>
<td>Construction of internal water storage dam</td>
<td>27/08/2009</td>
<td>04/02/2025</td>
</tr>
<tr>
<td>DA 305-7-2003 MOD 11</td>
<td>Wambo Montrose Water Storage Modification</td>
<td>18/01/2013</td>
<td>04/02/2025</td>
</tr>
<tr>
<td>DA 305-7-2003 MOD 12</td>
<td>South Wambo Underground Mine (relocation and extension/relocation of Arrowfield and Bowfield longwall panels)</td>
<td>DGRs issued</td>
<td></td>
</tr>
<tr>
<td>DA 305-7-2003 MOD 13</td>
<td>North Wambo Underground Mine Modification (Longwalls 9 and 10)</td>
<td>8/07/2013</td>
<td>04/02/2025</td>
</tr>
<tr>
<td>DA 305-7-2003 MOD 14</td>
<td>North Wambo Underground Mine Modification (Longwall 10A)</td>
<td>10/04/2015</td>
<td>04/02/2025</td>
</tr>
<tr>
<td>DA 117-8-2004 MOD 1</td>
<td>Wambo train loading infrastructure (altered alignment of rail loop)</td>
<td>16/12/2004</td>
<td>16/12/2025</td>
</tr>
<tr>
<td>DA 117-8-2004 MOD 2</td>
<td>Upgrade of Wallaby Scrub Road / Golden Hwy Intersection</td>
<td>15/12/2006</td>
<td>16/12/2025</td>
</tr>
<tr>
<td>DA 117-8-2004 MOD 2</td>
<td>Establishment of a locomotive provisioning facility adjacent to Wambo train loading facility</td>
<td>12/02/2012</td>
<td>16/12/2025</td>
</tr>
</tbody>
</table>

Note: MOD 9 and MOD 10 have been withdrawn

Wambo Coal has also been granted an approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (EPBC 2003/1138). The approval allows for the expansion of the open cut and underground mining operations and the development and operations of train loading facilities. EPBC 2003/1138 has effect until 31 December 2029.
3.0 Proposed Project

3.1 Key Design Considerations

The Project has been designed to maximise resource recovery and operational efficiencies between the proposed United Open Cut and the existing Wambo Open Cut whilst aiming to minimise environmental and social impacts.

The stratified lease arrangement across the United and Wambo mining titles is complex, and places significant constraints on both operations. Several mine plan options have been considered by both Glencore and Peabody in order to realise resource recovery across the two operations. This has included consideration of both open cut and underground mining methods and standalone mining options by both parties. The Joint Venture provides a unique opportunity for the adjoining mining operations to integrate operations to efficiently extract the mineable resources as a single mining operation.

The Project will allow for significant operational efficiencies and improved resource utilisation. The Project Area, in particular the United Open Cut in CCL775 (refer to Figure 1.1), is constrained due to the proximity of neighbouring mining operations, natural features (e.g. Wollombi Brook) and public infrastructure. As a standalone mine, the United Open Cut would have been heavily constrained, limiting mining methods, resource recovery and the ability of the mine to generate a suitable final landform.

The Project proposes to fully utilise the approved capacity within the existing Wambo CHPP and train loading facilities. Due to the constrained nature of the United Open Cut area, the modification or construction of new infrastructure facilities would have sterilised coal resources under a standalone option. By entering the Joint Venture, a number of the constraints are removed resulting in a more efficient and economic development. In addition, the full utilisation of the approved capacity within the existing Wambo CHPP and train loading facilities provides an improved environmental and community outcome by avoiding duplication of such facilities.

A significant advantage derived from forming the Joint Venture and integrating the United Open Cut and Wambo Open Cut operations is providing an improved final landform outcome. As discussed above, Wambo and United are both constrained by existing operations, infrastructure and natural features. As single entities, the overburden emplacement areas would be significantly restricted and would have resulted in the need for higher emplacement areas for the United Open Cut which would have been more challenging to accommodate in designing an appropriate final landform. The integrated approach will result in an improved final landform, most notably at United, and will allow for a significantly improved conceptual final landform design.

An integrated environmental management approach will be adopted for the two open cut operations, including integrated mine design and management to minimise dust, noise, blasting and visual impacts, improved water management and an enhanced ability to respond to any issues or community concerns that arise.
3.2 Key Project Details

The Project includes open cut mining operations for a period of approximately 21 years incorporating the approved Wambo Open Cut, with the proposed realignment and modification to the depth of coal recovery in the Wambo Open Cut, in addition to the proposed United Open Cut. The Project requires a number of changes to the layout of existing mining, public and private infrastructure within the Project Area. The key aspects of the Project are shown on Figure 1.3 and a summary of the key Project details is provided in Table 3.1. A more detailed description of the Project is provided in the following sections.

Table 3.1 Summary of Key Project Details

<table>
<thead>
<tr>
<th>Key Project Components/Aspects</th>
<th>Proposed Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key feature of the Project</td>
<td>The operation of a multi-seam open cut mining operation integrating the existing and approved Wambo Open Cut under a modified mine plan and the proposed United Open Cut.</td>
</tr>
<tr>
<td>Total Economically Recoverable Reserve</td>
<td>Approximately 110 million tonne (Mt) of ROM coal from the United Open Cut. In total, approximately 66 Mt of ROM coal from the Wambo Open Cut, including an additional 39MT accessed from the depth of mining modification.</td>
</tr>
<tr>
<td>Extraction Rates</td>
<td>Up to 10 million tonne per annum (Mtpa) ROM coal.</td>
</tr>
<tr>
<td>Life-of-Mine</td>
<td>Approximately 21 years from granting of approval.</td>
</tr>
<tr>
<td>Operating Hours</td>
<td>24 hours per day, 7 days per week.</td>
</tr>
<tr>
<td>Number of Employees</td>
<td>Approximately 400 total operational employees.</td>
</tr>
<tr>
<td>Mining Methods</td>
<td>Open cut mining using a truck and excavator fleet.</td>
</tr>
<tr>
<td>Extent of Mining Areas</td>
<td>Refer to Figure 1.3. The Project proposes realignment of the Wambo Open Cut boundary to maximise resource recovery. The realignment would result in approximately 5 hectares of additional disturbance for the Wambo Open Cut mine.</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Initial use of existing United mine infrastructure area prior to its decommissioning and removal due to the progression of the United Open Cut. Construction of temporary facilities in the construction phase in the mining infrastructure area within United lease CCL775. Expand and upgrade Wambo Mining Infrastructure Area. Use of existing Wambo CHPP, coal handling facilities and train loading facility (refer to Figure 2.2).</td>
</tr>
</tbody>
</table>
### Key Project Components/Aspects vs. Proposed Operations

| **Tailings and Rejects Strategy** | Decommissioning and capping of existing tailings storage facilities located in areas proposed for overburden emplacement and ongoing use of existing tailings storage facilities and other mine voids as required. Coarse rejects from coal preparation to be transported by truck to the open cut overburden areas for emplacement and subsequent covering by overburden material. Coarse rejects will continue to be co-disposed within the open cut overburden areas for the life of operations. |
| **External Coal Transport** | Product coal will continue to be transported off site via rail from the existing Wambo train loading facility. |
| **Roads** | Realignment of a 2 kilometre section of the Golden Highway to accommodate the proposed United Open Cut. The main entrance to the Project will be via the current entrance to Wambo. The existing United access road will be used in the initial phase for construction and ancillary services with limited ongoing use as a property access point. |
| **Power Infrastructure** | An existing 330 kV transmission line which traverses CCL775 is proposed to be relocated as part of the Project (refer to Figure 1.3). Several other 66 kV and 11kV power lines will also require relocation outside of proposed mining areas. |
| **Water Management** | Construction of mine water management controls. Use of the United underground mining voids for water storage. |
Legend

- Project Area
- Proposed Conceptual Wamben Open Cut Realignment Boundary
- Proposed United Conceptual Open Cut Pit


File Name [A1]: R02/3509_042.dgn
20150630 11:14
3.3 Interaction With Wambo

As discussed in Section 2.1.1, Wambo Coal (subsidiary of Peabody) currently operates the Wambo open cut and underground operations. Under the Joint Venture, it is proposed that United Collieries (majority owned by Glencore) will manage and, a wholly owned subsidiary of Glencore Coal Pty Ltd will operate, the Wambo Open Cut in conjunction with the proposed United Open Cut upon receiving the required State and Federal approvals for the Project.

The Project will use available approved capacity in Wambo’s existing CHPP and train loading facilities. Wambo will continue to own and operate these facilities in accordance with the approved throughput provided by its current approvals, with the Joint Venture delivering ROM coal to these facilities for coal washing, handling and loading coal onto trains for transportation. United Collieries as manager of the Project will have no operational control over these facilities as they will be managed and operated by Wambo Coal.

The Wambo underground operations do not form part of the Joint Venture and will continue to be owned and managed by Wambo Coal.

3.4 Geology and Resource Description

The United mining and exploration leases are held on behalf of United by the CFMEU. United’s surface mining lease area within CCL775 is the focus for open cut coal extraction. The extent of CCL775 and surrounding lease areas are illustrated on Figure 1.1.

The Wambo mining and exploration leases are held by Wambo Coal. The existing Wambo Open Cut operates within these leases. The proposed Wambo Open Cut will continue to operate within these mining leases but will also require access to A444.

Certain areas of the resource within the Project Area are currently stratified between United and Wambo, dividing access to seams within the existing mining tenements. This is illustrated in Figure 3.1 and is summarised below:

- **Area 1** – United holds a mining lease from the surface to five metres above the Bayswater seam. Land in this area is predominantly owned by the CFMEU as a result of its existing interest in United; and

- **Area 2** - United has access to seams from below the Whynot seam to five metres above the Bayswater seam under CCL775. As a result of a lease swap between United Collieries and Wambo Coal in the 1990’s, Wambo Coal holds mining lease CCL743 from the surface down to and including the Whynot seam within this area. Wambo has mined the majority of the seams in this lease and the area is currently being used by Wambo for overburden emplacement and rehabilitation activities. Land within this area is predominantly owned by the CFMEU.

United Collieries and Wambo Coal also jointly hold A444 (refer to Figure 3.1). Coal resources within A444 are currently shared on a strata title basis on the same terms as noted in Area 2 above.

As a result of the Joint Venture between United Collieries and Wambo Coal, the mineral rights under the Joint Venture tenements will be consolidated and the stratification of the resources will be removed, with the result being that United Collieries and Wambo Coal will each own 50% of the combined resource. It is this consolidation that makes the Project feasible.
Three Coal Measure sequences occur in the Hunter Coalfields. From recent to oldest they are:

- Newcastle/Wittingham Coal Measures – Late Permian; and
- Greta Coal Measures – Early to Mid Permian.

Strata and coal seams outcropping in the United area comprise Late Permian Wittingham Coal Measures. The Wittingham Coal Measures are divided into two important coal bearing sub groups, the lower Vane Subgroup and the overlying Jerrys Plains Subgroup. The Joint Venture proposes to extract coal from the Jerrys Plains Subgroup.

In the north eastern corner of CCL775, the Jerrys Plains Subgroup strata dips toward the south west at 3-5°. The uppermost seams of the Jerrys Plains Subgroup (Whybrow, Redbank Ck, Wambo, Whynot) that are mined in the Wambo open cut operations, subcrop to the south and west of the proposed United Open Cut mining area and have limited representation in the United Open Cut.

**Figure 3.1** shows the typical stratigraphy within the Project Area.

The definition of the coal resource in the Project Area is being continually refined based on ongoing exploration and geological modelling. The coal resources proposed to be recovered by the Project are those that are economically recoverable by open cut mining methods and are estimated at approximately 176 Mt ROM (including both the United Open Cut mining area and Wambo Open Cut mining area).

### 3.5 Conceptual Mine Plan

The proposed United Open Cut mine is situated to the east of the existing Wambo operations and south of Coal and Allied’s Hunter Valley Operations (HVO) South open cut (refer to **Figure 1.3**).

The Project is seeking approval for open cut mining at a maximum extraction rate of 10 Mtpa of ROM coal, using truck and excavator methods for a period of approximately 21 years from granting of development consent. As discussed in Section 1.2, the Project will integrate the mining of the existing approved Wambo Open Cut with the proposed United Open Cut.

The conceptual staged mine plans are shown on **Figure 3.2 to Figure 3.6**.

In the United Open Cut, it is currently proposed that mining will commence in the south eastern end of the proposed mining area and proceed in a north westerly direction. By approximately Year 5 of the operation, the pit will reach the existing United mine infrastructure area and CHPP, which will be decommissioned and removed and the area mined through as the open cut pit proceeds further west.

The approved Wambo Open Cut is currently progressing in a north westerly direction until it reaches the limit of approval in ML1572 (refer to **Figure 1.1**) from which point it will progress in a south easterly direction. Under the Project, mining within the Wambo Open Cut will be undertaken at a reduced rate than previously approved.

There will be some minor changes to the disturbance footprint of the Wambo Open Cut mining area as part of the Project (refer to **Figure 1.3**), including a realignment to part of the northern boundary of the Wambo Open Cut. This realignment is primarily designed to enable the Wambo Open Cut access to coal seams below its approved mining area which are subject to United mining tenements. Access to the coal seams subject to United mining tenements have been made available as a consequence of the Joint Venture. The realignment and step down to deeper seams will maximise resource recovery within ML1572 and below from A444.
The overburden emplacement areas resulting from the two open cut mines will be combined to provide an integrated final landform across the Project open cut mining area. In the early phases of mining in the United Open Cut overburden from the pit will be emplaced over previous open cut mining areas at Wambo. After approximately Year 5 onwards, overburden will be placed back into the United Open Cut void as mining progresses. Further details on rehabilitation and final landform are provided in Section 7.15.

The conceptual mine plan has also considered potential noise and dust impacts from the proposed mining activities which has influenced the preliminary configuration of mining areas and mining rates. The concept mine plan for the Project will continue to be refined through an iterative process taking into account the findings of the detailed environmental and social impact assessments and stakeholder feedback.

3.6 Mining Infrastructure

The Project will utilise the existing Wambo CHPP and coal handling infrastructure (conveyors, stockpiles and train loading facilities) for the washing and transport of coal. No change is proposed to the currently approved operating capacity of the Wambo CHPP and Wambo train loading facility of up to 14.7 Mtpa ROM coal and 15 Mtpa of saleable coal, respectively. Both infrastructure facilities will continue to operate seven days a week. ROM coal from the Project will be hauled via internal haul roads to the CHPP.

The existing United mine infrastructure area may be used in the early years of the Project prior to their decommissioning and removal to allow for open cut mining of this area.

The Project will require modification of the existing approved surface facilities at Wambo and United, including upgrades and installation of new facilities to accommodate the proposed fleet and increased workforce numbers. The potential new or modified infrastructure required for the Project may include:

- a temporary workshop facility during Project construction phase;
- upgrades to the existing Wambo washbays, workshop capacity, fuel farm and stores areas;
- upgrades to the administration, car parking and bathhouse facilities in the existing Wambo MIA; and
- other upgrades or modifications to ancillary infrastructure and services including power and water reticulation systems.

Further designs are currently progressing to confirm the concept details for each of the above items. A key focus of the design process is locating new or modified infrastructure within the existing disturbance footprints for both sites where practicable, to minimise additional surface disturbance.

3.6.1 Rejects and Tailing Management

The previous mining operations at United utilised a tailings storage facility located on the southern boundary of CCL775 (refer to Figure 2.1). The existing tailings storage facility will be decommissioned and capped as part of the Project. The Project proposes to utilise existing and proposed tailings storage facilities at Wambo (refer to Figure 2.2). These facilities have sufficient capacity for the life of the Project.

Coarse rejects from coal preparation will be transported by truck to the open cut overburden emplacement areas for emplacement and subsequent covering by overburden material.
3.7 Rehabilitation and Final Landform

Topsoil removed from areas disturbed as a result of the Project will be stockpiled for use in rehabilitation, with overburden emplacement areas progressively rehabilitated as the emplacement areas are completed. It is planned to design the emplacement areas using natural landform principles where practicable, consistent with the approach taken for other recent Glencore projects. There are no known geochemical constraints to rehabilitation, with further studies to be carried out as part of the EIS.

A conceptual final landform and potential final land uses for the site will be identified in the EIS. As part of the community consultation process for the Project, United Collieries plans to engage with the local community to review and identify potential uses of the land at the end of the Project and obtain feedback on landform principles. The process of determining the final landform and land use for the Project will also consider sustainability principles including the outcomes of the ecological assessment, social and commercial considerations. Mine closure issues including landform, land use and groundwater/surface water relationships will be assessed in the EIS.

The integration of the United and Wambo open cut mining operations will result in an improved final landform including reduced overall overburden emplacement heights where practicable, and improved final landform shaping. This integrated outcome would have been difficult to achieve if the operations were to proceed as single entities.

3.8 Site Access

United currently has two site access roads off the Golden Highway, the existing main site access road (refer to Figure 3.7) and the former coal haulage truck access road. The main entrance for the Project will be via the current entrance to Wambo. The existing United access road will be used in the initial phase for construction and ancillary services with limited ongoing use as a property access point.

No change to the location or configuration of current site access roads is proposed as a result of the Project, subject to further traffic assessment.

3.9 Golden Highway Realignment

The proposed United Open Cut will necessitate the realignment of a section of the Golden Highway. The realignment is proposed to maximise resource recovery from the pit and provide improved mining conditions. It is proposed that an approximate 2 kilometre section of the Golden Highway will be diverted east around the open cut mine in the location shown on Figure 1.3. The realignment of the highway will also necessitate realignment of the Comleroi Road intersection with the Golden Highway.

The proposed diversion will have minimal impact on travel distances whilst also retaining the current road speed limit of 100km/hr. United Collieries has commenced discussions regarding the proposed realignment and design requirements with RMS.

The realigned section of the Golden Highway will be fully constructed, other than the junction with the existing Golden Highway, prior to it being commissioned to minimise disruptions to traffic.
3.10 Transmission Line Relocations

As illustrated on Figure 1.3, an existing 330 kV transmission line crosses the proposed United Open Cut and will need to be relocated as part of the Project. The proposed realignment is to the north of the proposed United Open Cut pit, re-joining the current alignment south-east of proposed United Open Cut.

United has undertaken preliminary consultation on previous conceptual designs with Transgrid in relation to the relocation of the 330 kV transmission line and further consultation will be undertaken as planning for the Project progresses.

Other 66 kV and 11 kV transmission and distribution lines will also need to be relocated as part of the Project.

3.11 Construction

The Project has been designed to maximise the use of existing infrastructure, however as outlined in the previous sections some public infrastructure will need to be relocated and some upgrades are required to mining infrastructure. Most changes to infrastructure will be required by the end of Year 5 of the Project.

The construction workforce on site at any one time will vary depending on the timing of construction of the various components of the Project. The average construction workforce over years one to three when the majority of the construction activity will take place will be approximately 150 employees.

3.12 Mine Workforce and Hours of Operation

Once at full operation, the Project will provide employment for a total workforce of approximately 400 employees, including approximately 150 additional operational positions. The Joint Venture’s workforce will include existing Enterprise Agreement employees at the Wambo open cut operation and it is anticipated that additional mine worker positions will be created as the Joint Venture operations are developed.

Mining operations will be undertaken 24 hours per day, seven days per week.

3.13 Alternatives and Justification

3.13.1 Project Alternatives

United has undertaken detailed studies which considered numerous alternative mine and infrastructure plans. A key alternative to the Joint Venture was to develop the United Open Cut as a standalone mining operation. A standalone mining operation for the United Open Cut would have resulted in an open cut operation without sufficient scale to justify developing as infrastructure and overburden emplacement areas would have competed with mining areas in the CCL775 project area. As discussed throughout this PEA, the formation of the Joint Venture and integration of the two open cut mining operations provides significant resource recovery and mining efficiency, in addition to commercial benefits, and is therefore the preferred approach.

Utilising existing infrastructure where possible, minimising environmental and community impacts and maximising economic resource recovery have been the key sustainable development considerations in the evaluation of alternative options.
Some of the alternative options considered and the reason for exclusion include:

**Alternative Mine Plans**

- alternative mining methods and recovery options, including underground mining of suitable seams - underground mining options were excluded due to uneconomic results and geotechnical and geological issues;

- alternative open cut mine plans, such as the proposed United Open Cut mining areas being developed as a standalone entity – alternative standalone open cut mine plans for the United Open Cut were excluded due to uneconomic results;

- alternative mining direction and final void location of the United Open Cut. For example, an alternative mining direction starting in the north west was investigated and would have resulted in the final void being located adjacent to the Wollombi Brook. This was less desirable as it would have required more overburden being placed in emplacement areas outside of the mine void footprint resulting in higher ex-pit emplacement areas and a much greater final void. In addition, the proximity of the final void adjacent to the Wollombi Brook may have resulted in greater potential connectivity interaction between the final void and the Wollombi Brook;

- alternative overburden emplacement designs, including designs that restricted emplacement to within the United surface holdings - this was less desirable as it would result in a less desirable final landform with steeper slopes that would not blend in well with the surrounding landscape and would result in sterilisation of the coal resource; and

- alternative options for reinstatement of Redbank Creek, including designs that separated the out of pit and in-pit overburden emplacements areas by a dedicated creek diversion area. This was less desirable as it would result in a less desirable final landform with higher emplacement areas that would not blend in well with the surrounding landscape.

**Alternative Coal Processing and Transport Options**

- alternative coal processing options, including construction of new onsite CHPP and associated facilities – onsite processing at United was less desirable due to the available capacity at Wambo, the potential for additional noise impacts, physical site constraints, sterilisation of resources, duplication and inefficient use of existing resources; and

- alternative coal transport options, including construction of a dedicated rail loop to the United site – a dedicated rail loop was less desirable due to potential impacts on significant ecological species, sterilisation of coal resources, potential noise impacts, and duplication and inefficient use of existing resources where there is available approved capacity at the Wambo train loading facility.

**Alternative Infrastructure Locations**

- alternative options for the relocation of the Golden Highway including the option of not relocating it and reducing the mine footprint. This option was less desirable as it would have resulted in constrained mining conditions and resource sterilisation;

- alternative options for the relocation of the 330 kV transmission line, including an option where the line would be relocated to the very north eastern corner of the CCL775 lease area, This was dismissed as it would impede take-off and landing access for the Glider Club; and
• alternative site access arrangements with alternative access locations excluded due to inadequate sight distances, impacts on mine design, the sterilisation of coal resources and the ability to maximise resource efficiency by using the existing infrastructure.

The alternative of not proceeding was also considered by the Joint Venture parties, however this option is not proposed as it will result in significant lost economic benefit, including reduced employment opportunities, taxes and flow on employment and economic benefits, as well as the failure to maximise recovery of a significant and economically viable coal resource.

Detailed discussion of these and any further alternatives considered will be provided in the EIS.

3.13.2 Project Justification

The Project will provide the following key benefits:

• maximising the coal resource recovery from the existing disturbed mining footprint and adjoining areas, utilising the existing disturbed landscape and infrastructure, whilst minimising environmental and social impacts;

• ongoing employment for the Wambo Open Cut workforce for the life of the Project whilst adding approximately 150 operational positions at peak production, with resultant flow on effects to the local and regional economy;

• recovery of an approximate additional 145 million tonnes of ROM coal;

• an ongoing contribution to the local, regional and State economies from two existing and well established mining operations;

• payment of significant royalties to the State of New South Wales; and

• significant export earnings for Australia.

The Project provides for significant synergies to be achieved through the integration of the United and Wambo open cut mining operations, allowing for the economic recovery of coal resources while reducing the environmental and social impacts to below those that would likely occur with two stand-alone mining operations. The Project also provides significant advantages in providing an integrated final landform design across both open cut pits.

The Department of Trade and Investment, Division of Resources and Energy (DRE) has confirmed in a letter dated 29 June 2015 that the resource is considered a significant coal resource, stating:

The Division considered the coal deposit a significant coal resource which will continue to bring economic benefits to the State and the region. The Division supports the proposed Project as a responsible utilisation of the State’s valuable coal resources and supports the project proceeding through the State’s comprehensive development assessment and approval process.

Further detailed justification for the Project will be provided in the EIS, considering the potential environmental, social and economic impacts and benefits.
4.0 Stakeholder Consultation

4.1 Authority Consultation

The consultation process for the Project has commenced with initial briefing meetings held with relevant government agencies. These meetings introduced the Project, discussed the approvals process and sought feedback on relevant issues to be considered in the EIS. The following NSW Government agencies have been briefed on the Project:

- Department of Planning and Environment (DPE);
- Department of Trade and Investment, Division of Resources and Energy (DRE); and
- Singleton Council.

A Conceptual Project Development Plan (CPDP) meeting was held with DRE on 25 March 2015. A letter was received from DRE on 29 June 2015 confirming that the Division considered the coal deposit a significant coal resource and provided comment on issues to be considered in the EIS.

There has also been consultation with the Office of Environment and Heritage (OEH) in relation to the biodiversity assessment, as discussed in Section 7.7.

The next phase of the consultation process is the lodgement of this PEA with DPE. Following the lodgement of the PEA, DPE will provide United with the Secretary’s Environmental Assessment Requirements (SEARs) for the Project.

Further key agencies to be consulted for this Project will include:

- Environment Protection Authority (EPA);
- OEH, including the Heritage Branch;
- NSW Office of Water (NOW);
- Mine Subsidence Board (MSB);
- Roads and Maritime Service (RMS);
- Department of Primary Industries including Agriculture NSW and Fisheries NSW;
- Crown Lands; and
- Commonwealth Department of the Environment (DoE).

Consultation with each of these key agencies will be undertaken throughout the preparation of the EIS.
4.2 Community and Other Stakeholder Engagement

A comprehensive stakeholder engagement strategy has been developed for the Project. The strategy identifies the stakeholders relevant to the Project, the methods of engagement to be used to most effectively engage with these stakeholders, the timing of consultation and the feedback mechanisms required.

In consulting with stakeholders, United Collieries as Project proponent aims to:

- be proactive in its engagement with the community;
- be transparent and honest in dealings with the community; and
- utilise a range of consultation methods so that all stakeholder interests are considered and addressed in a timely manner.

The stakeholders relevant to the Project will continue to evolve as the Project and assessment process progress, with some of the key initial stakeholders to be involved including:

- local landholders – including rural landholders and residents of the villages within the local area, being Warkworth, Jerrys Plains, Bulga Village and Maison Dieu (refer to Section 6.1.3);
- community groups – including the United Community Consultative Committee (UCCC) and Wambo Community Consultative Committee (WCCC);
- Hunter Valley Gliding Club, located adjacent to the north east boundary of the Project Area;
- environmental groups;
- Aboriginal stakeholder groups;
- other mining operations – including Coal and Allied; and
- service providers and infrastructure owners – TransGrid, Ausgrid, Australian Rail Track Corporation (ARTC), Telstra and RMS.

The consultation process for the Project will be undertaken in stages which align with the key milestones of the environmental assessment process. The key stages of the consultation process for the Project are outlined below:

- **Stage 1** is complete and involved preliminary contact with the local community via a newsletter providing an overview of the United and Wambo Joint Venture. This newsletter provided Project personnel contact details for community stakeholders interested in holding further discussions with United and Wambo. This newsletter was distributed to local communities including Warkworth, Jerrys Plains and Bulga.
- **Stage 2** includes consultation during the refinement of the concept mine plan and early phases of the preparation of the EIS for the Project. The main purpose of this stage of consultation is to inform stakeholders of the Project and the proposed environmental assessment process, to identify the issues that the stakeholders would like addressed in the refinement of the mine plan and development of the EIS and to identify how they would like to be engaged regarding the Project. Both Stage 1 and 2 have sought stakeholder feedback on aspects of the Project design, including input on the communities preferred final land use for the Project Area. Stage 2 consultation has included one-on-one meetings with landholders surrounding the Project Area, a community information session held at the Jerrys Plains Community Hall and the distribution of a second community newsletter.

- **Stage 3** will involve consultation with stakeholders following the substantial completion of the concept mine plan studies and the environmental studies for the EIS. The main purpose of this stage of the consultation program is to update stakeholders on the status of the Project, provide feedback on the results of the environmental studies and to provide for stakeholder input into the formulation of management and mitigation measures.

- **Stage 4** is the final stage of consultation and will involve consultation during the EIS public exhibition phase and subsequent assessment and approval process. The main purpose of this stage of consultation will be to respond to issues raised during the public exhibition phase.
5.0 Planning Considerations

5.1 NSW Approval Process

There are a number of legislative instruments in NSW which regulate the environmental impact of development. The primary instrument is the EP&A Act which regulates the environmental assessment and approval process for development in the State.

The Project will require development consent under Division 4.1 of Part 4 of the EP&A Act. Being development for the purpose of coal mining, the Project is declared to be a State Significant Development (SSD) under the provisions of the State Environmental Planning Policy (State and Regional Development) 2011 and the Minister for Planning will be the consent authority for the Project. An EIS will be prepared for the Project, as part of the SSD requirements, covering the Project described in Section 3.0 and specifically:

- the United Open Cut;
- continued mining in the existing Wambo Open Cut, together with a minor realignment to the boundary of the open cut, and deeper mining into the coal seams held below the current boundary of ML1572 (i.e. mining seams subject to mining tenements currently held by United but which become available for extraction by the Joint Venture as a result of removing the historical stratification of the mining titles); and
- integration of all aspects of open cut mining including overburden emplacements, reject and tailings management and progressive rehabilitation and final landform.

In addition the EIS will support applications to modify existing development consents for Wambo Coal Mine (DA 305-7-2003) and Wambo train loading facility (DA 177-8-2004) to harmonise these approvals with the Project. Specifically, modifications under section 75W of the EP&A Act to account for the changes proposed as part of the Project will include:

- an extension to the project life for the approved Wambo Open Cut, CHPP and train loading facilities so that they will continue to apply for approximately 21 years from the date of approval;
- approval for the CHPP to receive and process coal from the Project;
- suspension of existing conditions relating to the approved Wambo Open Cut to provide for integrated, contemporary conditions for the Project’s operations; and
- other ancillary infrastructure and service upgrades for integration with the Project, as described in Section 3.0.

The existing Wambo underground mining operations will not be modified as part of this application.
Part 3 of the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (the Mining SEPP) prescribes specific matters that must be considered by the consent authority (in this case the Minister for Planning or the PAC under delegation of the Minister) when determining development applications for mining projects. Clause 12AA of the Mining SEPP requires the consent authority to consider the significance of the resource that is the subject of the application. This assessment must have regard to the following matters:

- the economic benefits, both to the State and the region in which the development is proposed to be carried out, of developing the resource, and
- any advice by the Deputy Secretary, Resources and Energy of DRE as to the relative significance of the resource in comparison with other mineral resources across the State.

As described in Section 3.13.2, the Project will optimise recovery of a significant coal resource, in a manner which efficiently utilises existing infrastructure, provides substantial ongoing employment benefits, improves final rehabilitation outcomes, and minimises environmental impacts. During preparation of the EIS, advice will be sought from DRE on the relative significance of the resource, and a detailed economic assessment will be prepared to assess the economic benefits to the State and region.

5.1.1 Permissibility

As SSD, development consent for the Project may be granted under Division 4.1 provided it is not wholly prohibited by an environmental planning instrument.

The Project Area is zoned RU1 Primary Production and SP2 Infrastructure under the provisions of the Singleton Local Environmental Plan 2013 (LEP). Open cut mining is a permissible land use with development consent in RU1 Primary Production but is prohibited within land zoned SP2 Infrastructure.

Clause 7(1)(b)(i) of the State Environmental Planning Policy (Mining, Petroleum and Extractive Industries 2007 (Mining SEPP) provides that mining is permissible with development consent on land where development for the purpose of agriculture is also permissible under the provisions of an environmental planning instrument. Agriculture is a permissible land use within land zoned SP2 Infrastructure. Clause 5(3) of the Mining SEPP gives it primacy where there is any inconsistency between the provisions in the Mining SEPP and the provisions in any other environmental planning instrument (subject to limited exceptions not relevant here). The effect of clause 7(1)(b)(i), in conjunction with the operation of clause 5(3) of the Mining SEPP, is that notwithstanding any prohibition in the LEP, development for the purpose of open cut mining may be carried out with development consent in the Project Area.

5.1.2 Gateway Process

Part 4AA of the Mining SEPP together with Clause 50A of the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) provides for the implementation of the NSW Government’s Strategic Regional Land Use Plans (SRLUPs). The ‘gateway process’ applies to Projects located on biophysical strategic agricultural land (BSAL) and critical industry cluster land (CIC land) (as defined by the regional mapping presented in the Mining SEPP) outside of existing mining lease areas. A project that triggers the gateway process must obtain a Gateway Certificate to inform the Secretary’s Environmental Assessment Requirements (SEARs).
The gateway process has not previously been triggered in respect of United or Wambo. The Project Area covers small portions of land within CCL775 that United does not hold relevant surface mining leases, and as a result the need for a gateway certificate requires assessment. Further, the deeper mining below ML1572 will require assessment, given a new mining lease is required for this activity and despite the fact that it is simply going deeper in an already disturbed area.

The Project Area does not include any land identified by the relevant maps in the Mining SEPP as CIC land.

A review of the relevant Mining SEPP maps has identified that approximately 31 hectares of land is mapped as BSAL within the Project Area (northern extent of ML1572). This mapped area is located within an existing Wambo surface mining lease and therefore does not require assessment in this process.

As part of this process the remainder of the site (that is not mapped as BSAL) will be verified as to whether or not the land meets the criteria for BSAL. If it does not, the proposal can proceed directly to the development application stage. If the land meets the criteria for BSAL, then the proposal will be subject to the gateway process.

A site verification process is currently being undertaken for those components of the Project Area that require a new mining lease and are therefore potentially subject to the gateway process. DPE will be advised of the outcomes of the site verification process when complete.

5.1.3 Other State approvals

Other approvals that will be or are likely to be required for the Project include:

- a Mining Lease under the Mining Act 1992, noting that mining leases are already held by the Joint Venture parties over the vast majority of the Project Area, with new exploration licences and surface mining leases required over small areas of land including the current alignment of the Golden Highway and additional mining titles for access to the deeper seams within A444;

- a Mining Operations Plan (MOP) under the Mining Act 1992;

- an Environment Protection Licence under the Protection of the Environment Operations Act 1997 (POEO Act) (note that licences are already held by United Collieries and Wambo Coal for the existing mining operations);

- consent under section 138 of the Roads Act 1993 (Roads Act) for works associated with the proposed Golden Highway realignment;

- an approval for aquifer interference under the Water Management Act 2000 (WM Act); and

- licensing of water allocations under the WM Act and Water Act 1912 (Water Act) (note that licences are already held by United Collieries and Wambo Coal for the existing mining operations).

5.1.4 Commonwealth Approval Process

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) prescribes the Commonwealth’s role in the environmental assessment of impact, management and protection of areas of national environmental significance and biodiversity conservation. The EPBC Act is administered by DoE.
Under the EPBC Act the approval of the Commonwealth Minister for the Environment is required for any action that may have a significant impact on matters of national environmental significance. The matters of national environmental significance are:

- World Heritage property;
- National heritage place;
- wetlands of international importance (listed under the Ramsar Convention);
- threatened species and communities listed under the EPBC Act;
- migratory species listed under the EPBC Act;
- nuclear actions;
- marine areas or reserves;
- a water resource, in relation to coal seam gas development and large coal mining development; and
- Commonwealth land.

The Project is a coal mining development that will interact with water resources and listed threatened species and communities occur or have the potential to occur at the site. It is therefore likely that the Project will be referred to the DoE for a decision on whether or not it is a controlled action that requires approval under the EPBC Act.

As noted in Section 2.2.1, Wambo Coal has an existing approval granted under the EPBC Act (EPBC 2003/1138). This approval covers the approved Wambo Open Cut, and relevant Wambo surface facilities, including train loading facilities. Any EPBC referral for the Project will cover those elements of the Project that are not already approved under the current Wambo EPBC approval. A subsequent modification to EPBC 2003/1138 will also be required to extend the term of the approval from 31 December 2029, to the approved life of the Project.

A Strategic Assessment under Part 10 of the EPBC Act for relevant Wambo and United Open Cut operations is currently nearing completion as part of the Upper Hunter Strategic Assessment (UHSA). This is a joint Commonwealth and State assessment under Part 10 of the EPBC Act that will fulfil the ecological impact assessment requirements of the Project should the UHSA be finalised in time to include this Project. Recent consultation with OEH and DoE indicates that it is likely that the UHSA will be an approval pathway available for this Project (refer to Section 7.7.2).
6.0 Preliminary Environmental Assessment

6.1 Environmental and Community Context

The Project Area is dominated by existing mining areas including the previous United underground mining infrastructure located within United’s CCL775, the existing Wambo open cut mine along with areas of rehabilitated land and native vegetation (refer to Figure 2.1).

The land to the north east of the Project Area is occupied by Coal and Allied’s Hunter Valley Operations (HVO South), and further to the north by agricultural land. The area south of the Project Area is occupied by Wambo Coal owned grazing land. Land to the east of the Project Area is privately owned by the Hunter Valley Gliding Club, surrounded by Coal and Allied owned mining buffer land. To the immediate west of the Project Area is Wambo Coal owned buffer land which is utilised for grazing.

The village of Warkworth is located approximately 1 km to the south east of the Project Area. As discussed in Section 6.1.3, a substantial portion of Warkworth Village is owned by mining companies. The village of Jerrys Plains is located approximately 6 km north west of the Project Area. The village of Bulga is located approximately 7 km to the south of the Project Area. The rural area of Maison Dieu is located approximately 4 km to the north east of the Project Area.

The following sections provide further detail on the environmental and community context in which the Project is proposed to be developed. Further discussion of the existing environment is also contained in the discussion of key environment and community issues in Section 7.0.

6.1.1 Topography and Drainage

The topography of the Project Area is characterised by an undulating and hilly landscape with lower topographic areas associated with the drainage lines. Approximately 0.5 kilometres to the west of the Wambo Open Cut lie the foothills of the Wollemi National Park which form the dominant landscape feature of the land surrounding the Project Area.

A notable local topographical feature is a ridgeline to the north west of the Project Area which extends to a height of approximately 200 mAHD. This ridgeline provides a topographic barrier between the area proposed for the open cut operations and the private land to the north west, including Jerrys Plains. The remaining surrounding topography is characterised by gently sloping alluvial plains and undulating hills.

The Project Area is located within the catchments of Redbank Creek, Wollombi Brook, North Wambo Creek, Hunter River and Waterfall Creek, as described in Section 7.5.

6.1.2 Soils

The soils types occurring within the Project Area are mapped on the Singleton 1:250,000 Soil Landscapes Map Sheet and described in Kovac and Lowrie (1991). Six soil landcapes occur within the Project Area. The Jerrys Plains soil landscape unit is the dominant soil type, followed by the Bulga soil landscape unit and the Benjang soil landscape unit. The Warkworth soil landscape unit, the Wollombi soil landscape unit and the Hunter soil landscape unit are present in small patches. The soil landcapes mapped to occur in the Project Area and surrounding areas are shown in Figure 6.1. The majority of the Project Area is covered by soils that have a very high susceptibility to erosion and poor fertility. Detailed soils assessment for the Project is included as part of the Agricultural Land Assessment described in Section 7.8.
6.1.3 Land Ownership

Land ownership in the Project Area and surrounds is shown on Figure 6.2. The land immediately surrounding and including the Project Area is dominated by mining operations which are major landholders within the area. United Collieries’ land interests in the area are held by the CFMEU on behalf of United Collieries. United Collieries and Wambo Coal own the majority of freehold land within the Project Area other than road reserves, some small parcels of land owned by Coal and Allied, and two small parcels of land at the intersection of the Golden Highway and Comleroi Road.

Warkworth Village is located approximately 1 kilometre south-east of the Project Area. There is one privately owned residences and 12 mine owned residences within the village of Warkworth. There is also additional privately owned vacant land within Warkworth Village. All privately owned residences within Warkworth Village have current acquisition rights under Wambo’s existing development consents.

The Schedule of Lands for the Project is provided in Appendix 1.

6.1.4 Land Use

The land use within and surrounding the Project Area is shown in Figure 6.3.

The Project Area is surrounded predominantly by the existing mining activities of Wambo’s open cut and underground operations, Coal and Allied’s HVO including Carrington, North Pit, Cheshunt, Riverview and South Lemington Pits and their associated buffer lands. A number of mines are located further south including Mt Thorley Warkworth and Bulga Coal.

Prior to the establishment of mining operations, the primary land use in the Project Area had a long history of agricultural land uses, such as grazing and cultivation. Grazing and dairy operations are still wide spread throughout the surrounding area, occurring at a number of properties along the Golden Highway and the outskirts of Jerrys Plains. Irrigated agriculture is currently being undertaken along the alluvial floodplains of the Hunter River to the north of the Golden Highway. A small number of olive groves and vineyards are also located south of Jerrys Plains.

As described in Section 6.1.3, residential land use within 10 km of the Project Area includes the township of Jerrys Plains, Warkworth village, Bulga village and the rural area of Maison Dieu.

An equine Critical Industry Cluster (CIC) is mapped approximately 6 kilometres north west of the Project Area. The Coolmore horse stud is located to the north west of Jerrys Plains, approximately 14 kilometres from the Project Area. Coolmore stud is visually separated from the Project Area by intervening topography.

Beyond Coolmore stud is the Hollydene Estate situated on the Arrowfield vineyard.

The closest viticulture CIC is located in the Bulga area approximately 5 km south of the Project Area boundary.

The Wollemi National Park is located approximately 0.5 kilometres west of the Project at its closest point to the western boundary of the Project Area. Wollemi National Park and the adjacent Yengo National Park provide a large expanse of conservation land stretching south to the west of Sydney.
6.2 Preliminary Environmental Risk Analysis

To assist in identifying the key environmental and community issues that require detailed assessment as part of the EIS, a preliminary environmental risk analysis has been completed for the Project (refer to Appendix 2). The preliminary environmental risk analysis has been undertaken in accordance with Glencore Coal Assets Australia Risk Management Standard, which is consistent with the principles outlined in Australian Standard AS/NZS 4360:2004 Risk Management (Standards Australia, 2004). Consistent with the Glencore Coal Assets Australia risk assessment matrix, environmental risks have been categorised as low to high.

It is expected that with the completion of further studies and assessment as outlined in Section 7.0 that the risk rating of most of these risks will be reduced due to the better definition of potential impacts and identification and effective implementation of avoidance, management and mitigation measures through the project design process.

The potential key environment and community issues identified based on consultation to date, preliminary studies and the risk assessment for the Project are:

- noise;
- blasting;
- air quality;
- Aboriginal cultural heritage and archaeology;
- social impacts;
- economic impacts:
  - ecology;
  - water resources;
- traffic;
- visual amenity;
- greenhouse gas emissions;
- historic heritage;
- agricultural impacts; and
- rehabilitation and mine closure.

The scope of the further assessment to be completed for these issues as part of the EIS is discussed in Section 7.0.
7.0 Key Environmental and Social Issues

The key environmental and social issues for the Project have been determined through the preliminary
environmental risk analysis discussed in Section 6.2 and through the initial stages of the stakeholder
engagement program. These issues are discussed in Section 7.1 to 7.15 including a description of the
proposed assessment methodology. The detailed assessment of these issues will be included in the EIS
prepared for the Project.

It is important to note that a substantial part of the proposed open cut operations are already approved as
part of the approved Wambo Open Cut. A full integrated assessment of all future open cut operations and
associated activities for the Project will be conducted for the EIS, and where relevant, this assessment will
take into account that part of the proposed future operations that is already approved. For example, in
relation to proposed future land disturbance, most of the proposed Wambo Open Cut footprint is already
approved for disturbance.

7.1 Socio Impact and Opportunities Assessment

A Social Impact and Opportunities Assessment (SIOA) will assess and predict the likely consequences and
opportunities of the Project in social terms. A detailed SIOA will be undertaken as part of the EIS.

There are a number of key phases in the SIOA which will aim to:

- profile the key communities;
- scope and assess the relevant issues and opportunities associated with the Project; and
- develop strategies to address the identified issues and opportunities and monitoring and management
  through the development of a socio-economic monitoring and evaluation program.

The approach to the SIOA will include:

- **Profiling** to ensure the social context of the Project is well understood – including analysis of post
  impact/historical studies, relevant stakeholders, social indicators, media releases, secondary data and
  employee/contractor profiles.

- **Scoping** to identify the issues that need to be assessed – including personal meetings, stakeholder
  briefings, project presentations, community surveys, stakeholder/community information sessions,
  workshops and planning processes as described in Section 4.2.

- **Impact Assessment** to assess the impacts of the Project and identify opportunities for positive
  outcomes – including consideration of the economic assessment and sensitivity analysis, social impact
  assessment and evaluation and population impact project modelling.

- **Strategy Development** including development of appropriate strategies to address the identified issues
  and the engagement of relevant stakeholders on agreed strategies.

- **Monitoring and Management** - incorporation of strategies into community plans, environmental
  management plans and operations methods and development of a socio-economic monitoring and
  evaluation program.
The SIOA process will focus particularly on the neighbouring Warkworth Village, Jerrys Plains, Bulga area, Maison Dieu and also the broader Hunter region.

7.2 Noise

The impact on amenity as a result of noise from mining operations is a key community concern within the Upper Hunter Valley region generally, and more specifically, in the local area surrounding the Project. Minimisation of noise impacts has been a key consideration in the design of the concept mine plan, with both the design of the mine and equipment selection including measures to minimise noise. The increased operational flexibility achieved through combining the open cut operations at Wambo and United into a single operation provides potential benefits in terms of integrated noise management.

A comprehensive noise impact assessment will be undertaken for the EIS in accordance with the NSW Industrial Noise Policy (EPA, 2000). The noise impact assessment will include:

- a review of noise monitoring data and previous noise assessments undertaken at Wambo and United;
- measuring and determining existing background and ambient noise levels in the locality of the Project;
- determination of the Project-specific Noise Levels based on the existing intrusive and amenity noise levels;
- preparation of predictive noise models of the proposed development using Environmental Noise Model (ENM) software. Iterative noise modelling is currently being conducted to minimise noise impacts as part of the refinement of the concept Project design;
- processing of model results into suitable contour plots and summary tables including any predicted exceedance data;
- assessment of modifying factors related to low frequency and tonal noise, and assessment of potential for sleep disturbance;
- consideration of feasible and reasonable noise mitigation strategies;
- an overview of the cumulative noise impacts from the Project and other relevant adjacent mining and nearby industrial operations, including the approved Wambo underground and surface facilities;
- an assessment of the additional construction noise impact of the Project in accordance with relevant assessment procedures; and
- an assessment of the road traffic noise impact in accordance with relevant assessment procedures based on the traffic movements associated with the Project.

The noise impact assessment will consider noise associated with the construction, operation and decommissioning of the Project, including associated road traffic noise. The results of the noise impact assessment will be used to refine the design of the Project and guide noise management practices.
7.3 Blasting

It is proposed that blasting will be undertaken on a regular basis for both overburden removal and coal extraction. A comprehensive blast assessment will be undertaken as part of the EIS to assess blasting impacts and confirm the management measures required to be implemented so that relevant criteria are satisfied.

The EPA sets guidelines for blasting based on human comfort levels. The guidelines have been adapted from the Australian and New Zealand Environment and Conservation Council (ANZECC) Guidelines *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (ANZECC 1990). As the ANZECC guidelines are based on human comfort levels they are more stringent than those based on the potential for damage to structures. The fundamental criteria are that at any residence or other sensitive location:

- the maximum overpressure due to blasting should not exceed 115 dB for more than 5 per cent of blasts in any one year, and should not exceed 120 dB for any blast; and
- the maximum peak particle ground velocity (PPV) should not exceed 5 mm/s for more than 5 per cent of blasts in any one year, and should not exceed 10 mm/s for any blast.

Further to the ANZECC guidelines, vibration criteria are also required for infrastructure within the surrounding area so that potential impacts can be managed. The relevant criteria for blasting vibration on infrastructure such as power lines, bridges and roads will be determined in consultation with relevant agencies and/or the infrastructure owner and by reference to relevant Australian and International Standards.

Modelling of blasting impacts (vibration and overpressure) will be undertaken to identify any potential impacts on surrounding residences, existing and proposed infrastructure and any sensitive environmental features and heritage items. This modelling will be used to develop site blasting rules to provide for blasting impacts to be appropriately managed over the life of the Project.

7.4 Air Quality

Potential air quality impacts will be a key issue for the Project and are a key issue of focus by the broader community within the Hunter region. A detailed air quality impact assessment will be completed as part of the EIS in accordance with current EPA guidelines, including the *Approved Methods of the Modelling and Assessment of Air Pollutants in New South Wales* (DEC, 2005).

The air quality assessment will utilise the CALMET/CALPUFF suite of models to best represent the complex meteorology across the modelling domain. These models simulate the complex meteorological patterns which exist in a particular region, including taking into account the effects of local topography and changes in land surface characteristics.

The air quality impact assessment will include:

- a review of air quality monitoring data for Wambo and United;
- identification of all sources of dust/air pollution such as processing, handling, storage, transport operations or rehabilitation;
- development of a detailed meteorological CALMET/CALPUFF model using existing meteorological data;
• preparation of predictive models to reflect the proposed conceptual mine plans and production rates to assess the impact on local and regional ambient air quality, including the level of impact, potential exceedance levels and frequency having regard to standards and limits. This will be undertaken by:
  o preparing dust emissions inventories for each staged mine plan;
  o CALPUFF computer based dispersion modelling of emissions, using local meteorological data for each staged mine plan;
  o processing of model results into suitable contour plots and summary tables including frequency of exceedance data;
  o comparing model results to EPA air quality assessment criteria at nearest sensitive receptors, including consideration of potential cumulative impacts;
• determine the Project specific air quality levels;
• assessment of cumulative air quality impacts of the Project, including cumulative emissions of TSP, PM10 (including 24 hour PM10) and depositional dust from the Project, other approved Wambo operations, and other approved surrounding mines and power stations;
• potential PM2.5 emissions will also be considered in accordance with relevant National Environment Protection Measures (NEPM) advisory guidance;
• consideration of other potential air quality pollutants including nitrous oxides (NOx);
• development of appropriate air quality mitigation and management measures; and
• development of an appropriate air quality monitoring program to determine the effectiveness of mitigation and to verify predictions.

7.5 Surface Water

The proposed United Open Cut is located within the catchments of Redbank Creek and Wollombi Brook (refer to Figure 7.1), with the approved Wambo Open Cut located in the catchments of North Wambo Creek, Waterfall Creek, Wollombi Brook and the Hunter River. Wollombi Brook is a tributary of the Hunter River and flows in an easterly direction to the south and east of the Project Area.

United has a licensed extraction point on the Hunter River, a licensed extraction point on Wollombi Brook and a licensed water supply dam located on Redbank Creek. Wambo has one licensed discharge point on Wollombi Brook.

The Project will impact on existing water resources through alterations to existing natural catchments mainly through the further development of open cut mining and overburden emplacement areas. The potential surface water impacts that will be considered for the Project include:
• changes to downstream flow regimes, flood extents and flood behaviour as a result of the capture of runoff from natural catchment areas;
• impacts on downstream water quality from disturbed areas;
• impacts on Redbank Creek, North Wambo Creek, Wollombi Brook, Hunter River and Waterfall Creek; and
• water management associated with the open cut final voids and landform.

A detailed surface water assessment will be prepared as part of the EIS and will include the following:

• likely surface water impacts as a result of open cut mining including catchment changes and the potential implications of these impacts on mine water management, downstream watercourses, water users and water licensing;

• required surface water control measures, including diversion drains and mine water management controls;

• potential for changes to surface water quality and potential erosion and sediment control measures required;

• an assessment of the potential impacts on downstream water users, environments and watercourse stability;

• potential changes on the flooding regime due to the Project;

• assessment of post mining surface water impacts;

• cumulative surface water impacts due to the Project and other existing and approved developments;

• a review of the Project against NSW State water policies and regulations; and

• identification and description of impact mitigation measures required for the Project.

As part of the assessment, a detailed mine site water balance will be prepared which will include consideration of any external water supply or discharge requirements. The water balance will:

• account for available water sources;

• account for the water demand for the Project;

• assess demand and supply requirements and storage requirements under a range of rainfall/evaporation, groundwater make and production conditions;

• identify any potential shortfalls in water supply and water sourcing options;

• identify any need for controlled discharge via the Hunter River Salinity Trading Scheme (HRSTS);

• identify the risk and quantities of any predicted discharge from water storages into the environment;

• include a salt balance for the Project; and

• include a final void water and salt balance.
7.6 **Groundwater**

Coal seams are aquifers and the proposed open cut mining will therefore intercept groundwater. The local groundwater regime is affected by past and ongoing mining including the United and Wambo underground mines, and the Wambo and HVO South open cut operations. There is also an alluvial aquifer associated with Wollombi Brook and this has been considered in the development of the concept mine plan with a buffer maintained between the United Open Cut and the alluvial zone to reduce the potential for impact.

A detailed groundwater impact assessment will be undertaken for the Project in accordance with the requirements of the NSW Aquifer Interference Policy, guidelines released by the Independent Expert Scientific Committee (IESC) on Coal Seam Gas and Large Coal Mining Developments and Australian Groundwater Modelling Guidelines. The groundwater impact assessment will include the following:

- development of a conceptual hydrogeological model to replicate the impact of the Project on the groundwater regime, thus enabling assessment of the potential environmental impacts resulting from the Project;
- groundwater inflow to the open cut pits;
- the area of influence of dewatering and the level and rate of drawdown at specific locations;
- potential impact on the alluvial aquifer and from baseflow in surface drainage systems;
- any change in water levels in private water bores surrounding the Project;
- areas of potential risk where groundwater impact mitigation/control measures may be necessary;
- cumulative impacts of the Project combined with other approved Wambo underground operations and surrounding mining operations; and
- identification and assessment of potential post mining ground water impacts.

The groundwater impact assessment will identify any necessary measures relating to the management of the groundwater resource and groundwater flow.

7.7 **Ecology**

The Project will require the clearing of native vegetation and will impact on ecological values within the Project Area. The proposed realigned Wambo Open Cut is predominantly within the approved Wambo surface disturbance area. Areas within the proposed realigned Wambo Open Cut that are not covered by the approved Wambo surface disturbance area will be addressed within the Ecological Impact Assessment. Further details on the existing ecological environment and assessment approach are included in the following sections.

7.7.1 **Existing Environment**

The Project Area has been largely impacted by a combination of past mining operations, associated mining infrastructure, infrastructure corridors and past agricultural clearing. Substantial areas of regenerating remnant vegetation are also present within the Project Area.

Wollemi National Park is the closest conservation reserve, approximately 0.5 kilometres at its closest point to the western boundary of the Project Area.
The Project Area has been the subject of considerable previous ecological survey for both the current Project and previous development applications. The survey effort undertaken to date for the Project is illustrated in Figure 7.2 and Figure 7.3.

Four Threatened Ecological Communities (TECs) listed under the NSW Threatened Species Conservation Act 1995 (TSC Act) have been recorded within the Project Area (refer to Figure 7.4). These include:

- Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions Endangered Ecological Community (EEC) (Hunter Floodplain Red Gum EEC);
- Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions EEC (Box – Ironbark EEC);
- Central Hunter Ironbark – Spotted Gum – Grey Box Forest in the NSW North Coast and Sydney Basin Bioregion EEC (Ironbark – Spotted Gum EEC); and

One TEC listed under the EPBC Act is present within the Project Area being the Central Hunter Valley Eucalypt Forest and Woodland Critically Endangered Ecological Community.

No threatened flora species have been recorded in the United Open Cut or more broadly in CCL775 or the additional disturbance area associated with the Wambo Open Cut, during the surveys completed to date. Additionally, there were no records of threatened flora species within CCL775 or the additional Wambo disturbance area in the Atlas of NSW Wildlife Database.

The threatened fauna species known or with potential to occur within the United Open Cut or the additional Wambo Open Cut disturbance area were specifically targeted as part of the ecological surveys for the Project. A total of 18 threatened fauna species have been recorded within the CCL775 and the additional Wambo disturbance area (refer to Figure 7.5) during current and previous ecological surveys including seven bird species and 11 mammals listed under the TSC Act of which five are also listed under the EPBC Act (refer to Table 7.1).
Table 7.1  Listed Threatened Species

<table>
<thead>
<tr>
<th>Species</th>
<th>NSW TSC Act</th>
<th>Commonwealth EPBC Act</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Birds</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown treecreeper (eastern subspecies) <em>(Climacteris picumnus victoriae)</em></td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>Diamond firetail <em>(Stagonopleura sagittata)</em></td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>Eastern osprey <em>(Pandion cristatus)</em></td>
<td>V</td>
<td>MIG</td>
</tr>
<tr>
<td>Grey-crowned babbler <em>(Pomatostomus temporalis temporalis)</em></td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>Scarlet robin <em>(Petroica boodang)</em></td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>Speckled warbler <em>(Chthonicola sagittata)</em></td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>Varied sittella <em>(Daphoenositta chrysoptera)</em></td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td><strong>Mammals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern bentwing bat <em>(Miniopterus schreibersii oceanensis)</em></td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>Eastern cave bat <em>(Vespadelus troughtoni)</em></td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>Eastern freetail bat <em>(Mormopterus norfolkensis)</em></td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>Greater broad-nosed bat <em>(Scoteanax ruepellii)</em></td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>Grey-headed flying fox <em>(Pteropus poliocephalus)</em></td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>Koala <em>(Phascolarctos cinereus)</em></td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>Large-eared pied bat <em>(Chalinolobus dwyeri)</em></td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>Little bentwing bat <em>(Miniopterus australis)</em></td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>Southern myotis <em>(Myotis macropus)</em></td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>Spotted-tailed quoll <em>(Dasyurus maculatus maculatus)</em></td>
<td>V</td>
<td>E</td>
</tr>
<tr>
<td>Yellow-bellied sheath-tailed bat <em>(Saccolaimus flaviventris)</em></td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>Brown treecreeper (eastern subspecies) <em>(Climacteris picumnus victoriae)</em></td>
<td>V</td>
<td>-</td>
</tr>
</tbody>
</table>

**Key**

V  vulnerable  
E  endangered  
MIG  migratory
7.7.2 Assessment Approach

There are currently two potential ecological assessment pathways available to the Project. The first being, the Upper Hunter Strategic Assessment (UHSA), which is a joint assessment under Part 10 of the EPBC Act that will fulfil the ecological impact assessment requirements of the Project subject, to the UHSA being finalised.

Umwelt undertook the flora and fauna surveys and prepared an ecological assessment for the UHSA – United Biodiversity Certification Assessment Report (Umwelt, 2015) for areas that United has identified as potential areas for future mining activities. This report has been reviewed by OEH and approved. The UHSA boundary covers the entire CCL775 area and is currently being updated to include the additional Wambo disturbance area.

The second available assessment approach is the NSW Biodiversity Offset Policy for Major Projects (OEH, 2014). This is a whole of NSW government policy, which uses the Framework for Biodiversity Assessment (FBA) to assess impacts and identify offsetting requirements. This policy was released in late 2014 and is in an 18 month transitional phase.

The UHSA pathway is the preferred option for the Project. It is anticipated that the UHSA should be formally endorsed by the NSW State government and the Commonwealth government in a timeframe that will make this pathway available for the Project.

7.8 Agriculture

An Agricultural Impact Statement (AIS) is required as part of any EIS that is submitted for a mining project that is a SSD. The NSW Government has prepared guidelines to facilitate the preparation of an AIS in NSW and to assist applicants and others to understand the information required to enable an assessment of the agricultural impacts of mining and other resource extraction proposals.

There is presently no agricultural land use occurring on any of the land to be directly affected by the Project as all land is currently used for mining land uses. There is also a significant area of buffer land surrounding the existing and proposed mining operations where no or very limited agricultural activities occur. There is substantial privately owned agricultural land north east of the Project Area around Jerrys Plains, north west around Maison Dieu, east around Long Point and Wylies Flat near the Hunter River and south along Wollombi Brook and around Bulga.

As discussed in Section 5.1.2, an application for a site verification certificate is currently being prepared to confirm the absence of BSAL within the Project Area for areas not currently covered by a mining lease.

An AIS will be prepared for the Project to assess the potential interactions of the Project with agricultural land uses and on land with potential agricultural value. As discussed in Section 5.1.2, there is an approximately 31 ha area of mapped BSAL within the Project Area, located in the northern extent of ML1572. The assessment will be prepared following the AIS guidelines and will include:

- identification of potential impacts of the Project on agricultural resources within the proposed disturbance area and the surrounding locality;
- identification of any potential impact to agricultural productivity within the proposed disturbance area and the surrounding locality;
- identification of any other risks to agriculture such as water availability, weed management, noise, air quality and socio-economic based on the outcomes of each relevant specialist study;
identification of the total area of land that is to be disturbed as a direct result of the Project including the identification of the land class, agricultural suitability, soil type and carrying/cropping capacity of this land;

identification of opportunities for agricultural land uses as part of the final land use for the Project Area;

review of the potential socio-economic impacts, specifically as they may relate to agricultural support services within the locality of the Project Area. This will be incorporated into the broader social impact and opportunities assessment and economic assessment for the Project (refer to Sections 7.1 and 7.14 respectively); and

analysis of potential cumulative impacts to agriculture.

Any required mitigation and management measures will also be identified as part of this assessment process.

### 7.9 Aboriginal Cultural Heritage and Archaeology

The proposed United Open Cut will result in disturbance of some previously undisturbed areas, including areas known to contain Aboriginal sites due to archaeological survey work undertaken at the site. There are minor changes proposed to the disturbance footprint of the approved Wambo Open Cut. The proposed additional disturbance areas will be assessed as part of the Project.

United Collieries has commenced a detailed consultation, engagement and survey process with the Registered Aboriginal Parties and Knowledge Holders for the Project to identify the cultural significance of the proposed disturbance area. This process is being undertaken in accordance with *National Parks and Wildlife Act 1974 (NSW)* and the following guidelines to facilitate the development of an Aboriginal Cultural Heritage Assessment Report (ACHAR):

- *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation*;
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010);
- *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010a);
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b); and

The preparation of the Aboriginal Cultural Heritage Assessment (ACHA) being facilitated by an anthropologist will also include an Aboriginal archaeological values assessment for inclusion in the EIS.

The Project has the potential to impact both known Aboriginal sites and unidentified Aboriginal sites and areas of cultural heritage value. Potential impacts will be identified and addressed as part of the Aboriginal archaeological and cultural heritage assessments, in consultation with the Registered Aboriginal Parties.

As part of the archaeological and cultural heritage study a comprehensive field survey is being completed by archaeologists, including field assistance by Aboriginal stakeholders to provide data to augment the extensive data held for the area from previous surveys.
The ACHAR will be compiled with detailed input from each Knowledge Holder group and in consultation with the Registered Aboriginal Parties. The assessment will outline areas and places of cultural significance in addition to any potential impacts associated with the Project. The archaeological assessment report will be integrated with the cultural heritage assessment report, both of which will outline mitigation and management measures proposed to be implemented on site, in addition to a consideration of cultural heritage conservation outcomes. Any sensitive information identified by the Knowledge Holders will be provided as separate confidential information with distribution restricted to United Collieries and OEH.

7.10 Historic Heritage

Historic heritage is commonly used to describe heritage that is not Aboriginal heritage (although many historical heritage places have Aboriginal associations) and can include buildings, structures, archaeological sites/relics, works (roads, bridges etc.), precincts/conservation areas, rural landscapes and movable items.

The potential impacts of the Project on historical heritage items will be considered as part of the EIS. Based on existing knowledge of the area and the current layout of the Project, any as yet unidentified potential heritage items that may be present within the Project Area are likely to be of local significance only and it is unlikely that any significant heritage items will be impacted by the Project.

There are some known items of historical heritage value in the area surrounding the Project Area such as Wambo Homestead and the Warkworth Airfield (owned by the Hunter Valley Glider Club). These areas will not be subject to any direct impact due to the Project, however, the assessment will consider the potential for indirect impacts and any required management measures.

The historical heritage assessment for the Project will be prepared in accordance with the relevant professional standards and guidelines, including the NSW Heritage Manual 1996, Archaeological Assessments and Assessing Heritage Significance and with consideration of the principles contained in the Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance. The assessment will include the following:

- historical research focusing on any areas identified with potential historical heritage or archaeological significance. The research may include archival research in the State Library of NSW, State Records, Regional Libraries, a review of Singleton Council records and maps (if available) and a review of any available air photographs and parish maps;
- consultation with local historical societies where appropriate;
- targeted historical land title searches to identify any areas of high historical heritage or archaeological potential;
- targeted inspection of the proposed disturbance area to identify any potential historical heritage items;
- preparation of a detailed historical and archaeological context, in which to assess the significance of any potential historical archaeological resource or heritage item present within the proposed disturbance area;
- preparation of an assessment of the significance of any identified sites in the proposed disturbance area, according to established significance assessment criteria outlined by the Heritage Branch, OEH Assessing Heritage Significance guidelines; and
• preparation of a Statement of Heritage Impact indicating the likely effect of proposed works on any potential historical archaeological resource or heritage item identified or previously known within the proposed disturbance area and whether further management/investigation is warranted.

7.11 Traffic and Transport

The local road network within the vicinity of the Project Area includes the Golden Highway, Wallaby Scrub Road, Lemington Road and Comleroi Road (refer to Figure 3.3). The traffic associated with the previous United operations accessed the site via a dedicated access road from the Golden Highway. Wambo is also accessed via the Golden Highway and both mine entries are expected to be used for the Project. The Golden Highway also provides access to several existing mining operations surrounding the Project Area.

As discussed in Section 3.9, the Project includes a realignment of an approximately 2 kilometre section of the Golden Highway, including changes to the Comleroi Road intersection, to accommodate the proposed United Open Cut. It is also anticipated that the Project will result in an increase of employees for both the construction and operational phases, resulting in additional traffic movements compared to the present. A comprehensive traffic impact assessment will be completed as part of the EIS for the Project to assess the impacts of these changes.

The traffic impact assessment will include:

• a review of existing traffic count data for the nearby or potentially affected road network;

• an assessment of the existing road network that will be used in the construction and operation phases. This will include road widths, intersection treatments, compliance with current standards, existing traffic volumes and vehicle classification using the road network;

• an assessment of the adequacy of intersections and the general traffic routes to accommodate the proposed increase in vehicle numbers during construction; and

• assessment of the traffic and transport impacts during both the construction and operational phases of the Project including:

• level of service on the road network;

• impacts of the Project on the road network, including the proposed realignment of the Golden Highway;

• physical condition of the roads related to the Project including capacity of the networks;

• potential road safety issues;

• potential cumulative impacts associated with any other approved mining and/or other projects in the area; and

• identification of any impact mitigation measures required.

As discussed in Section 3.6, the Project will not result in any changes to the approved capacity of the Wambo train loading facility or changes to the approved volume of coal moved through this facility. Therefore, no assessment of rail movement impacts is required for the Project.
7.12 Visual Amenity

The visual character of the upper Hunter Valley region is typified by contrasting landscapes from the native vegetation areas on the slopes bordering the valley, to cleared grazing land, areas of intensive agriculture along the alluvial river flats, residential areas, major industrial developments and coal mining areas. The industrial nature of some sections the Upper Hunter Valley is highly apparent from the Golden Highway, which contrasts this with views of productive agricultural land and views of the Hunter River. Conveyors, mined surfaces and high voltage power lines contribute to the visual environment of the immediate region surrounding the United and Wambo coal mining operations.

In general, due to the locality of the proposed United Open Cut and the surrounding topography, most private residences are expected to have either low or limited visual impact from the Project, with primarily long distance views. However, elements, such as overburden emplacement areas and associated infrastructure will be visible from some viewing locations, including the Golden Highway. The Wambo Open Cut will have ongoing visibility for some residences, with these impacts being previously assessed and approved. The changes to these views associated with the Project (e.g. realignment of Wambo Open Cut and changes to overburden emplacement areas) will be subject of further detailed assessment.

A detailed visual assessment will be undertaken using a combination of digital terrain modelling, view-shed analysis and the preparation of photomontages to determine potential viewing locations and assessment of the potential impacts at these locations as a result of the Project. The photomontages will include an image of the current view from pre-determined viewing locations and an image representing what the view will be from each viewing location at various stages of the Project.

Where impacts are identified, visual management and mitigation measures will be identified. Key mitigation measures will include progressive rehabilitation and development of an appropriate landform that incorporates natural design principles.

7.13 Greenhouse Gas Emissions

A Greenhouse Gas and Energy Assessment (GHGEA) will be undertaken as part of the EIS to determine the projected energy consumption and greenhouse gas (GHG) emissions as a direct result of the Project. The GHGEA will include:

- estimation of scope 1, 2 and 3 emissions associated with the construction of the Project. Greenhouse gas emissions will be calculated from data relating to the energy and materials required for the proposed construction activities;
- estimation of scope 1 and 2 life of mine (LOM) emissions generated by the operations. Emission sources will include fugitive emissions and energy use;
- estimation of scope 3 LOM emissions associated with the operation of the Project. Emission sources will include product transport and product use;
- estimation of scope 1, 2 and 3 emissions associated with the decommissioning and closure of the Project. Emission sources will include the energy required to reshape and rehabilitate the mine footprint at the cessation of mining;
- assessing the impact of the Project’s emissions on the environment;
- evaluation of the impact of the Project’s emissions on state, national and international greenhouse gas emission targets where appropriate; and
• assessment of the relevant reasonable and feasible mitigation measures to reduce the impact of the Project.

7.14 Economic Impacts

There are a range of potential economic impacts associated with the Project which will be assessed as part of the EIS. These include an assessment of the economic impacts of the Project on a regional and State scale, including consideration of the benefits and costs associated with the Project.

From an economic perspective, there are two important aspects of the Project, being:

• the economic efficiency of the Project (i.e. consideration of economic costs and benefits); and
• the economic impacts of the Project (i.e. the economic activity that the Project would provide to the regional and State economy).

A detailed Economic Impact Assessment will be undertaken as part of the EIS, and will include:

• a benefit cost analysis (threshold value analysis) in accordance with the Draft Guideline for the use of Cost benefit analysis in mining and coal seam gas proposals (2012) or any updated guidelines relevant at the time of EIS preparation;
• an economic impact assessment of the construction and operation of the Project; and
• consideration of the environmental and community impacts of the Project.

7.15 Mine Closure and Rehabilitation

A mine closure assessment will be prepared for the Project. The assessment will draw together the assessment of soils, land capability, agricultural land use, rehabilitation and decommissioning. The assessment will include:

• development of conceptual closure criteria that will drive rehabilitation and closure outcomes;
• the use of landform design methodologies to develop a conceptual final landform based on stable natural slopes in the local environment applicable to the materials being used in the rehabilitation;
• development of a conceptual final land use strategy with consideration given to surrounding land uses, existing agricultural suitability of the Project Area and potential future uses of the Project Area;
• development of a rehabilitation strategy for the mine, including a selection of ecological rehabilitation measures appropriate to the diversity of habitat to be formed by the landform development where appropriate; and
• identification of the measures proposed to manage any identified risks to the successful rehabilitation and closure of the mine.
The final landform will be designed in consideration of the rehabilitation objectives and requirements of the relevant government agencies, in particular the requirements of the DRE.

The rehabilitation strategy will include the identification of preliminary rehabilitation criteria, landuse options and closure objectives. The rehabilitation strategy will be developed as part of the design phase of the Project, in consideration of the findings of the ecological assessment and of any feedback on this issue from the stakeholder engagement program.
8.0 Project Schedule

Based on current project timing, United intends to lodge the EIS for the proposed Project in the first quarter of 2016. Approval for the proposed Project is sought by Q1 2017, allowing the commencement of project related development in 2017.
9.0 References


Department of Environment, Climate Change and Water (DECCW) 2010b. Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW.

Environment Protection Authority. 2000. NSW Industrial Noise Policy.


Office of Environment and Heritage (OEH), 2014. NSW Biodiversity Offset Policy for Major Projects.


APPENDIX 1

Schedule of Lands
<table>
<thead>
<tr>
<th>Lot Sec DP</th>
<th>Hectares</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1//1174490</td>
<td>2.46</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>1//1177768</td>
<td>19.33</td>
<td>CFMEU</td>
</tr>
<tr>
<td>1//241316</td>
<td>2.31</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>1//300990</td>
<td>3.03</td>
<td>CFMEU</td>
</tr>
<tr>
<td>1//583524</td>
<td>2.95</td>
<td>Coal and Allied</td>
</tr>
<tr>
<td>1//616303</td>
<td>326.11</td>
<td>CFMEU</td>
</tr>
<tr>
<td>1//709722</td>
<td>56.79</td>
<td>CFMEU</td>
</tr>
<tr>
<td>1//720683</td>
<td>0.40</td>
<td>Coal and Allied</td>
</tr>
<tr>
<td>1//720705</td>
<td>2.34</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>1//783484</td>
<td>21.84</td>
<td>Coal and Allied</td>
</tr>
<tr>
<td>1//857021</td>
<td>21.60</td>
<td>Coal and Allied</td>
</tr>
<tr>
<td>100//753792</td>
<td>15.97</td>
<td>CFMEU</td>
</tr>
<tr>
<td>101//753792</td>
<td>16.86</td>
<td>CFMEU</td>
</tr>
<tr>
<td>103//753792</td>
<td>16.72</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>104//753792</td>
<td>16.03</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>109//753792</td>
<td>15.39</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>11//843432</td>
<td>40.82</td>
<td>Coal and Allied</td>
</tr>
<tr>
<td>110//753792</td>
<td>14.90</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>111//753792</td>
<td>16.24</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>112//753792</td>
<td>15.61</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>113//753817</td>
<td>534.46</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>118//753792</td>
<td>50.04</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>131//1089157</td>
<td>0.49</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>134//566275</td>
<td>8.19</td>
<td>CFMEU</td>
</tr>
<tr>
<td>134//753792</td>
<td>31.93</td>
<td>CFMEU</td>
</tr>
<tr>
<td>135//753792</td>
<td>16.01</td>
<td>CFMEU</td>
</tr>
<tr>
<td>147//753792</td>
<td>0.26</td>
<td>Johnson Woods &amp; Co</td>
</tr>
<tr>
<td>148//753792</td>
<td>3.26</td>
<td>CFMEU</td>
</tr>
<tr>
<td>149//753792</td>
<td>27.20</td>
<td>CFMEU</td>
</tr>
<tr>
<td>160//753817</td>
<td>71.23</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>161//753817</td>
<td>16.67</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>170//823775</td>
<td>21.90</td>
<td>State of NSW</td>
</tr>
<tr>
<td>175//823775</td>
<td>32.34</td>
<td>State of NSW</td>
</tr>
<tr>
<td>179//823775</td>
<td>386.66</td>
<td>Coal and Allied</td>
</tr>
<tr>
<td>18//753817</td>
<td>59.31</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>2//1085145</td>
<td>66.32</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>2//1174490</td>
<td>4.21</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>2//1177768</td>
<td>0.22</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>2//300990</td>
<td>13.72</td>
<td>CFMEU</td>
</tr>
<tr>
<td>2//583524</td>
<td>5.37</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>2//616303</td>
<td>167.93</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>2//617852</td>
<td>90.46</td>
<td>CFMEU</td>
</tr>
<tr>
<td>2//709722</td>
<td>208.88</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>2//720705</td>
<td>3.57</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>2//783484</td>
<td>89.30</td>
<td>Coal and Allied</td>
</tr>
<tr>
<td>22//753817</td>
<td>16.83</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>3//1085145</td>
<td>82.35</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>3//1177768</td>
<td>0.73</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>3//720705</td>
<td>0.57</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>38//753792</td>
<td>41.06</td>
<td>CFMEU</td>
</tr>
<tr>
<td>39//753792</td>
<td>32.62</td>
<td>CFMEU</td>
</tr>
<tr>
<td>4//1085145</td>
<td>10.49</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>4//542226</td>
<td>14.26</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>4//635392</td>
<td>4.75</td>
<td>CFMEU</td>
</tr>
<tr>
<td>4//720705</td>
<td>1.66</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>43//753792</td>
<td>16.13</td>
<td>CFMEU</td>
</tr>
<tr>
<td>45//753792</td>
<td>18.88</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>46//753792</td>
<td>18.31</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>49//753792</td>
<td>15.86</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>5//1085145</td>
<td>136.65</td>
<td>Coal and Allied</td>
</tr>
<tr>
<td>5//247239</td>
<td>10.75</td>
<td>CFMEU</td>
</tr>
<tr>
<td>5//542226</td>
<td>51.75</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>50//753792</td>
<td>15.87</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>51//753792</td>
<td>15.64</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>52//753792</td>
<td>38.89</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>53//753792</td>
<td>16.47</td>
<td>CFMEU</td>
</tr>
<tr>
<td>54//753792</td>
<td>15.88</td>
<td>CFMEU</td>
</tr>
<tr>
<td>55//753792</td>
<td>16.04</td>
<td>CFMEU</td>
</tr>
<tr>
<td>56//753792</td>
<td>40.86</td>
<td>CFMEU</td>
</tr>
<tr>
<td>57//1074788</td>
<td>123.82</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>58//753792</td>
<td>40.38</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>6//247239</td>
<td>10.89</td>
<td>CFMEU</td>
</tr>
<tr>
<td>60//753792</td>
<td>65.39</td>
<td>CFMEU</td>
</tr>
<tr>
<td>61//753792</td>
<td>16.29</td>
<td>CFMEU</td>
</tr>
<tr>
<td>62//753792</td>
<td>16.38</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>63//753792</td>
<td>16.20</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>64//753792</td>
<td>16.06</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>66//753817</td>
<td>40.06</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>67//753817</td>
<td>19.79</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>7//247239</td>
<td>10.22</td>
<td>CFMEU</td>
</tr>
<tr>
<td>7//3030</td>
<td>79.96</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>7//753792</td>
<td>16.21</td>
<td>CFMEU</td>
</tr>
<tr>
<td>71//753817</td>
<td>49.49</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>79//1074787</td>
<td>39.51</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>8//247239</td>
<td>12.68</td>
<td>CFMEU</td>
</tr>
<tr>
<td>83//548749</td>
<td>1150.32</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>9//835812</td>
<td>40.48</td>
<td>CFMEU</td>
</tr>
<tr>
<td>91//733895</td>
<td>6.74</td>
<td>Coal and Allied</td>
</tr>
<tr>
<td>95//753792</td>
<td>10.56</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>A//33149</td>
<td>64.08</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>B//33149</td>
<td>32.55</td>
<td>Wambo Coal</td>
</tr>
<tr>
<td>C//33149</td>
<td>171.07</td>
<td>Wambo Coal</td>
</tr>
</tbody>
</table>

Road reserves
APPENDIX 2

Preliminary Environment Risk Analysis
Preliminary Environmental Risk Analysis

To assist in identifying the key environment and community issues that require detailed assessment as part of the Environmental Impact Statement (EIS), a preliminary environmental risk analysis has been completed for the Project. The preliminary environmental risk analysis has been undertaken in accordance with Glencore Coal Risk Management Standard, which is consistent with the principles outlined in Australian Standard AS/NZS 4360:2004 Risk Management (Standards Australia 2004) and Australian Standard AS/NZS ISO 31000:2009. In accordance with the Glencore Coal Assets Australia Risk Matrix, environmental risks have been categorised with a Risk Ranking of 1 to 25.
<table>
<thead>
<tr>
<th>Health &amp; Safety</th>
<th>Environment</th>
<th>Financial Impact</th>
<th>Image &amp; Reputation / Community</th>
<th>Legal &amp; Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5 Catastrophic</strong></td>
<td>• Multiple fatalities</td>
<td>• $60-600M investment return</td>
<td>• Negative media coverage at national level</td>
<td>• Major litigation / prosecution at Division level</td>
</tr>
<tr>
<td></td>
<td>• Multiple cases of permanent total disability / health effects</td>
<td>• Long-term (2 to 10 years) impact</td>
<td>• $20-100M operating profit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Requires major remediation</td>
<td>• $2-20M operating profit</td>
<td>• Loss of community support</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• $2-20M property damage</td>
<td>• Significant negative impact on the share price</td>
<td></td>
</tr>
<tr>
<td><strong>4 Major</strong></td>
<td>• Fatality or permanent incapacity / health effects</td>
<td>• Medium-term (~&lt;2 years) impact</td>
<td>• Negative media coverage at local / regional level</td>
<td>• Major litigation / prosecution at Operation level</td>
</tr>
<tr>
<td></td>
<td>• Requires significant remediation</td>
<td>• $6-60M investment return</td>
<td>• Complaint from a “final” customer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• $2-20M operating profit</td>
<td>• Off-spec product</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• $200K-2M property damage</td>
<td>• Community complaint resulting in social issue</td>
<td></td>
</tr>
<tr>
<td><strong>3 Moderate</strong></td>
<td>• Lost time / disabling injury / occupational health effects / multiple medical treatments</td>
<td>• Short-term impact</td>
<td>• Complaint received from stakeholder or community</td>
<td>• Regulation breaches resulting in fine or litigation</td>
</tr>
<tr>
<td></td>
<td>• Requires moderate remediation</td>
<td>• $600K-6M investment return</td>
<td>• Negative local media coverage</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• $200K-2M operating profit</td>
<td>• Regulation breaches without fine or litigation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• $10-200K property damage</td>
<td>• Negligible media coverage</td>
<td></td>
</tr>
<tr>
<td><strong>2 Minor</strong></td>
<td>• Medical Treatment Injury (MTI) / occupational health effects / Restricted Work Injury (RWI)</td>
<td>• No lasting environmental damage or effect</td>
<td>• Negligible media coverage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Requires minor remediation</td>
<td>• $600K investment return</td>
<td>• Regulation breaches without fine or litigation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• $200K operating profit</td>
<td>• Negligible media coverage</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• $10K property damage</td>
<td>• Regulation breaches without fine or litigation</td>
<td></td>
</tr>
<tr>
<td><strong>1 Negligible</strong></td>
<td>• First Aid Injury (FAI) / illness</td>
<td>• No lasting environmental damage or effect</td>
<td>• Negligible media coverage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Requires minor or no remediation</td>
<td>• $600K investment return</td>
<td>• Regulation breaches without fine or litigation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• $200K operating profit</td>
<td>• Negligible media coverage</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• $10K property damage</td>
<td>• Regulation breaches without fine or litigation</td>
<td></td>
</tr>
</tbody>
</table>
### Table 2 – Likelihood Criteria and Risk Matrix

<table>
<thead>
<tr>
<th>Basis of Rating</th>
<th>E - Rare</th>
<th>D - Unlikely</th>
<th>C - Possible</th>
<th>B - Likely</th>
<th>A – Almost Certain</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIFETIME OR PROJECT OR TRIAL OR FIXED TIME PERIOD OR NEW PROCESS / PLANT / R&amp;D</td>
<td>Unlikely to occur during a lifetime OR Very unlikely to occur OR No known occurrences in broader worldwide industry</td>
<td>Could occur about once during a lifetime OR More likely NOT to occur than to occur OR Has occurred at least once in broader worldwide industry</td>
<td>Could occur more than once during a lifetime OR As likely to occur as not to occur OR Has occurred at least once in the mining / commodities trading industries</td>
<td>May occur about once per year OR More likely to occur than not occur OR Has occurred at least once within Glencore</td>
<td>May occur several times per year OR Expected to occur OR Has occurred several times within Glencore</td>
</tr>
<tr>
<td>5 Catastrophic</td>
<td>15 (M)</td>
<td>19 (H)</td>
<td>22 (H)</td>
<td>24 (H)</td>
<td>25 (H)</td>
</tr>
<tr>
<td>4 Major</td>
<td>10 (M)</td>
<td>14 (M)</td>
<td>18 (H)</td>
<td>21 (H)</td>
<td>23 (H)</td>
</tr>
<tr>
<td>3 Moderate</td>
<td>6 (L)</td>
<td>9 (M)</td>
<td>13 (M)</td>
<td>17 (H)</td>
<td>20 (H)</td>
</tr>
<tr>
<td>2 Minor</td>
<td>3 (L)</td>
<td>5 (L)</td>
<td>8 (M)</td>
<td>12 (M)</td>
<td>16 (M)</td>
</tr>
<tr>
<td>1 Negligible</td>
<td>1 (L)</td>
<td>2 (L)</td>
<td>4 (L)</td>
<td>7 (M)</td>
<td>11 (M)</td>
</tr>
</tbody>
</table>
### Table 3 – Preliminary Environmental Risk Analysis

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Potential Impact</th>
<th>Status and Proposed Control</th>
<th>Risk Assessment</th>
<th>Further Assessment Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise generation</td>
<td>Degradation of noise amenity (including cumulative impacts).</td>
<td>Risk that the proposed open cut operations may result in degradation of noise amenity at surrounding private residences, including Warkworth Village. Controls included as part of the Project to reduce noise impacts include mine design and fleet management to minimise noise generation.</td>
<td>3</td>
<td>A</td>
</tr>
<tr>
<td>Blasting</td>
<td>Potential visual and health impacts from blast plume. Vibration impacts on structures and other sensitive receivers. Potential impacts from overpressure.</td>
<td>Risk that the proposed open cut operations may impact some sensitive receivers. Controls to be included as part of the Project includes the use of blast design and monitoring procedures, controlled timing and frequency of blasting and notification of blasting times to surrounding residences.</td>
<td>2</td>
<td>B 12 (M)</td>
</tr>
<tr>
<td>Aspect</td>
<td>Potential Impact</td>
<td>Status and Proposed Control</td>
<td>Risk Assessment</td>
<td>Further Assess. Required</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Dust generation</td>
<td>Increased dust emissions resulting in degraded air quality and potential impacts on health and amenity, including cumulative impacts.</td>
<td>The proposed open cut operations may result in degradation of local air quality through exposure and handling of coal and overburden. In addition cumulative dust impacts associated with the operation of other mines in the Hunter Valley is a key issue. Dust impacts will be controlled through measures including mine design, haul road management (including watering), progressive rehabilitation and restricting or ceasing dust-generating activities during adverse meteorological conditions.</td>
<td>2</td>
<td>A</td>
</tr>
<tr>
<td>Aspect</td>
<td>Potential Impact</td>
<td>Status and Proposed Control</td>
<td>Risk Assessment</td>
<td>Further Assess. Required</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Water Resources</td>
<td>Potential impact to surface water quality and quantity, including flooding damage to infrastructure. Interactions and potential impacts on aquifers.</td>
<td>The proposed open cut operations will interact with and potentially impact on surface waters through changes to the mine water management system, water usage and catchment area changes. The proposed mining activities will intercept groundwater and may potentially result in impacts to groundwater users and flows. A range of water management measures will be incorporated into the project design and will be discussed as part of the detailed surface and groundwater assessments for the EIS.</td>
<td>B 17 (H)</td>
<td>Yes</td>
</tr>
<tr>
<td>Aspect</td>
<td>Potential Impact</td>
<td>Status and Proposed Control</td>
<td>Risk Assessment</td>
<td>Further Assess. Required</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Agricultural Lands</td>
<td>Potential impacts to agricultural land</td>
<td>Disturbance of potential agricultural land. Land within the Project Area is currently contained within mining lease areas.</td>
<td>2 C 8 (M)</td>
<td>Yes</td>
</tr>
<tr>
<td>Ecology</td>
<td>Impact to flora and fauna including potential impacts on threatened species, communities and populations</td>
<td>The Project will require areas of additional disturbance which has the potential for some areas of ecological value to be impacted. Ecological survey has been completed within the Project Area focussing on the proposed disturbance area. The mining area will be progressively rehabilitated throughout the duration of mining. Detailed consideration of mitigation and offset requirements will be included in the assessment</td>
<td>3 B 17 (H)</td>
<td>Yes</td>
</tr>
<tr>
<td>Aboriginal Archaeology and Cultural Heritage</td>
<td>Potential impact to Aboriginal Heritage sites and Cultural Heritage values.</td>
<td>The Project will require areas of additional disturbance which has the potential for some areas of Aboriginal and Cultural Heritage to be impacted. A detailed Aboriginal Cultural Heritage assessment is being completed for the Project in partnership with the Registered Aboriginal Parties and Knowledge Holder groups.</td>
<td>3 B 17 (H)</td>
<td>Yes</td>
</tr>
<tr>
<td>Aspect</td>
<td>Potential Impact</td>
<td>Status and Proposed Control</td>
<td>Risk Assessment</td>
<td>Further Assess. Required</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Historic heritage</td>
<td>Potential impacts to historical heritage features</td>
<td>The Project will require areas of additional disturbance which has the potential for some areas of local historic heritage value to be impacted. Potential for impacts on historic heritage values or sites as a result of blasting. Blast management controls are in place to minimise impacts from blasting.</td>
<td>2 C 8 (M)</td>
<td>Yes</td>
</tr>
<tr>
<td>Visual Amenity</td>
<td>Potential impacts to visual amenity as a result of mining operations and associated infrastructure.</td>
<td>Mine design has been undertaken in consideration of visual amenity requirements. Aspects of the mine and proposed infrastructure will be visible from public viewing points therefore these aspects of the Project will also be included in the visual assessment. Progressive rehabilitation is proposed to minimise the duration of visual impacts. United is seeking to design and implement a final landform that will provide natural slopes and features to reduce lasting visual impacts.</td>
<td>2 A 16 (M)</td>
<td>Yes</td>
</tr>
<tr>
<td>Aspect</td>
<td>Potential Impact</td>
<td>Status and Proposed Control</td>
<td>Risk Assessment</td>
<td>Further Assess. Required</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Greenhouse Gas</td>
<td>Emission of greenhouse gases from the proposed mining operations and infrastructure construction contributing to climate change.</td>
<td>Mining equipment will require use of electricity, diesel and petrol. In addition there will be fugitive emissions from the Project. Scope 3 emissions as a result of burning product coal are also a source of greenhouse gas emissions. The construction works associated with the Project will result in energy use and the generation of greenhouse gas emissions. Glencore implements greenhouse gas management measures at all of its sites that identify key greenhouse gas reduction measures.</td>
<td>2 A 16 (M)</td>
<td>Yes</td>
</tr>
<tr>
<td>Aspect</td>
<td>Potential Impact</td>
<td>Status and Proposed Control</td>
<td>Risk Assessment</td>
<td>Further Assess. Required</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Traffic</td>
<td>Additional traffic associated with the construction and ongoing operation of the Project may impact on the road network and other road users.</td>
<td>Additional traffic associated with an increase in workforce numbers associated with the construction and ongoing operation of the Project. Relocation of approximately 2km of the Golden Highway may result in minor delays to motorists during construction. Traffic impacts will be assessed as part of the Project and management controls for the construction and operational phases of the Project will be implemented.</td>
<td>C 2 L 12 (M)</td>
<td>Yes</td>
</tr>
<tr>
<td>Aspect</td>
<td>Potential Impact</td>
<td>Status and Proposed Control</td>
<td>Risk Assessment</td>
<td>Further Assess. Required</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Socio-economic</td>
<td>The Project has the potential to result in a range of social and economic impacts, both positive and negative.</td>
<td>The Project will result in an overall increase to operational staff and will also result in additional employment during the construction phase. An extensive stakeholder engagement program is being undertaken as part of the Project. Socio economic impacts will be identified and management measures will be proposed to minimise negative impacts and enhance positive impacts as appropriate.</td>
<td>3 B 17 (H)</td>
<td>Yes</td>
</tr>
<tr>
<td>Rehabilitation and Mine Closure</td>
<td>Impact on the landscape and future landuse from the final landform and rehabilitation.</td>
<td>United is seeking to design and implement a final landform that will provide stable natural slopes and features and minimise the extent of final voids. A detailed rehabilitation strategy will be prepared for the Project, including areas of native vegetation.</td>
<td>4 C 18 (H)</td>
<td>Yes</td>
</tr>
<tr>
<td>Waste (excluding overburden, rejects and tailings)</td>
<td>Impacts of waste management and disposal on the surrounding environment.</td>
<td>Glencore implements comprehensive waste management strategies at each of its NSW mining operations, including the Project. This includes strategies to minimise, reuse and recycle wastes.</td>
<td>2 D 5 (L)</td>
<td>Yes</td>
</tr>
<tr>
<td>Aspect</td>
<td>Potential Impact</td>
<td>Status and Proposed Control</td>
<td>Risk Assessment</td>
<td>Further Assess. Required</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Hazard</td>
<td>Bushfire hazard associated with mining activities and land management activities. Hazards associated with the use of various materials as part of the mining operation.</td>
<td>Existing bushfire management strategies are in place at the United and Wambo sites. These will be updated as part of the Project. A hazard screening assessment following the requirements of SEPP 33 will be completed for the Project.</td>
<td>2 C 8 (M)</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Newcastle
75 York Street
Teralba NSW 2284
Ph. 02 4950 5322
www.umwelt.com.au

Perth
PO Box 8177
Subiaco East WA 6008
33 Ventnor Avenue
West Perth WA 6005
Ph. 08 6260 0700

Canberra
PO Box 6135
56 Bluebell Street
O’Connor ACT 2602
Ph. 02 6262 9484

Sydney
50 York Street
Sydney NSW 2000
Ph. 02 1300 793 267

Brisbane
GPO Box 459
Brisbane QLD 4001
Ph. 1300 793 267