

WAMBO COAL PTY LIMITED



SOUTH BATES UNDERGROUND MINE

EXTRACTION PLAN LONGWALLS 11 TO 16

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DOCUMENT CONTROL

Applicant	Wambo Coal Pty Limited
Mine	Wambo Coal Mine – South Bates Underground Mine
Document No.	EP 11-16
Title	Extraction Plan for South Bates Underground Mine Longwalls 11 to 16
General Description	Management of potential subsidence effects, subsidence impacts and environmental consequences from mining of Longwalls 11 to 16 at the South Bates Underground Mine
Key Support Documents	Wambo Coal Environmental Management System Wambo Coal Health and Safety Management System
Development Consent	DA 305-7-2003 (as modified)
Mining Leases	CL 397, ML 1594

Revisions

Rev No	Date	Description	By	Checked
A	October 2015	Final for Submission	WCPL and Resource Strategies	-
B	January 2016	Incorporation of Addendum	WCPL and Resource Strategies	S. Peart
C	January 2017	Revised to include Longwalls 14 to 16	WCPL and Resource Strategies	P. Jaeger/ T. Britten

Approvals

	Name	Position	Signed	Date
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Checked	T. Britten	Technical Services Manager		10/01/2017
Confirmed	M. Wood	Mining Engineering Manager (Underground Mine Manager)		10/01/2017

The nominated Coordinator for this document is	Environment and Community Manager
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OVERVIEW AND SUMMARY OF COMMITMENTS

This document is an Extraction Plan that outlines the proposed management, mitigation, monitoring and reporting of potential subsidence impacts and environmental consequences from the secondary extraction of Longwalls 11 to 16 at the South Bates Underground Mine.

The table on page iii summarises the key monitoring, management and reporting commitments in this Extraction Plan.

Wambo Coal Pty Limited (WCPL) commits to updating the Inrush Management Plan (as part of the notification under clause 33 of the *Work Health and Safety (Mines and Petroleum Sites) Regulation, 2014*) to incorporate this revision of the Extraction Plan.

The Trigger Action Response Plans (TARPs) provided in the component management plans will be developed further as this Extraction Plan is reviewed and revised. **Table 20** of this Extraction Plan is designed to support the TARPs in the component management plans and clearly outline actions and levels of responsibility within WCPL.

In accordance with of the Development Consent, WCPL must ensure that there is no exceedance of the subsidence impact performance measures outlined below. This Extraction Plan has been developed to meet these subsidence impact performance measures.

Subsidence Impact Performance Measures

Feature	Performance Measure
Wollombi Brook	Negligible subsidence impacts. Negligible environmental consequences. Controlled release of excess site water only in accordance with Environment Protection Licence requirements.
Wollemi National Park	Negligible subsidence impacts. Negligible environmental consequences.
Warkworth Sands Woodland Community	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences.
White Box, Yellow Box, Blakely's Red Gum Woodland/Grassy White Box Woodland Community	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences.
Other threatened species, populations or communities	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences.
Wambo Homestead Complex (WHC)	Negligible impact on heritage values, unless approval has been granted by the Heritage Branch and/or the Minister.
All Built Features	Always safe. Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. Damage must be fully repairable, and must be fully repaired or else replaced or fully compensated.
Public Safety	No additional risk.

Source: After Tables 14A and 14B of the Development Consent (DA 305-7-2003).

Summary of Monitoring, Management and Reporting Commitments

Component	Monitoring	Management	Reference
North Wambo Creek Diversion	<ul style="list-style-type: none"> Monitoring of subsidence in accordance with the Subsidence Monitoring Program (Appendix H). Monitoring in accordance with the Surface Water Monitoring Program, including the subsidence and diversion monitoring program. Monitoring in accordance with the Groundwater Monitoring Program. Daily visual inspections when extraction is occurring directly beneath North Wambo Creek Diversion. Visual inspection of surface areas which required remediation in accordance with the Land Management Plan (Appendix B). 	<ul style="list-style-type: none"> Stockpile sufficient materials and make equipment and necessary resources available for remediation prior to extraction under the North Wambo Creek Diversion. Remediation of all visible surface cracks in the low flow channel as soon as practicable (nominally within two weeks). Installation of scour protection works in areas that may be vulnerable to scour. Construction of new batter chutes to manage overland flow entry to the North Wambo Creek Diversion. Review of remediation measures and implementation of additional measures if required. Implementation of the Surface and Groundwater Response Plan. 	Section 3.1 and Appendix A
Stony Creek and Other Ephemeral Drainage Lines	<ul style="list-style-type: none"> Monitoring of subsidence in accordance with the Subsidence Monitoring Program (Appendix H). Visual inspection of drainage line flow paths for evidence of erosion or channelization following significant rainfall events. Monitoring in accordance with the Surface Water Monitoring Program, including bed and bank stability monitoring and surface water quality and flow monitoring. Monitoring in accordance with the Groundwater Monitoring Program. 	<ul style="list-style-type: none"> Implementation of the Surface and Groundwater Response Plan. Post-subsidence assessment of impacts to Stony Creek and drainage lines and implementation of any minor remedial works. 	
Permian Aquifers	<ul style="list-style-type: none"> Monitoring in accordance with the Groundwater Monitoring Program. 	<ul style="list-style-type: none"> Implementation of the Surface and Groundwater Response Plan. 	

Summary of Monitoring and Management Commitments (Continued)

Component	Monitoring	Management	Reference
Land in General	<ul style="list-style-type: none"> Monitoring of subsidence in accordance with the Subsidence Monitoring Program. Visual observations of fences. Visual observations of the ground surface. Visual observations of cliffs for signs of recent rock fall and/or instability (high definition video/photos recorded via an unmanned aerial vehicle) 	<ul style="list-style-type: none"> Notification to agistees of areas of longwall mining and active subsidence, and exclusion of agistment grazing from areas where surface cracking presents a reasonable risk to people and/or livestock. Remediation of surface cracks¹ where practicable using conventional earthmoving equipment (e.g. a backhoe) including: <ul style="list-style-type: none"> infilling of surface cracks with soil or other suitable materials; or locally regrading and re-compacting the surface. Stabilisation of any areas of surface cracking using erosion protection measures (e.g. vegetation planting). Drainage works and rehabilitation of subsidence troughs (i.e. areas of induced ponding) as necessary. Repair of fences prior to allowing access for agistment grazing. Measures to stabilise/mitigate impacts to rock faces/cliffs if considered beneficial and practicable in consultation with relevant regulatory agencies (e.g. artificial rock support, standing supports, dislodgement of remaining loose rock etc.). Management measures in accordance with the Erosion and Sediment Control Plan. 	Section 3.2 and Appendix B
Biodiversity	<ul style="list-style-type: none"> Monitoring of subsidence in accordance with the Subsidence Monitoring Program. Monitoring in accordance with the Biodiversity Management Plan. Visual observations to record Wollemi National Park escarpment cliff stability (including photographic record). 	<ul style="list-style-type: none"> Vegetation Clearance Protocol, described in the Biodiversity Management Plan. Threatened Species Management Protocol, described in the Biodiversity Management Plan. Management measures for the Remnant Woodland Enhancement Program areas, described in the Biodiversity Management Plan. Rehabilitation as described in the Mining Operations Plan. 	Section 3.3 and Appendix C

Summary of Monitoring and Management Commitments (Continued)

Component	Monitoring	Management	Reference
Aboriginal Cultural Heritage	<ul style="list-style-type: none"> Surface cracks and/or erosion in the vicinity of artefact scatters or isolated finds. 	<ul style="list-style-type: none"> If subsidence monitoring identifies cracking or erosion proximal to a site, artefacts will be salvaged in accordance with the protocols in the Heritage Management Plan. WCPL will maintain a database of site locations and locate any surface activities to avoid impacts to Aboriginal sites where practicable. 	Section 3.4 and Appendix D
WCPL Assets	<ul style="list-style-type: none"> Visual observations to record the general condition of WCPL assets including safety and serviceability. Visual observations to record condition of roads and access tracks, including surface cracks, buckling and general safety. Monitoring of pipeline integrity at fixed points. Monitoring to detect abnormal changes in flow in pipelines. 	<ul style="list-style-type: none"> Assessment of WCPL assets to identify modifications potentially required prior to subsidence. Assessment of bores and decommissioning and sealing prior to extraction if required (dependent on condition). Maintenance of safe access to WCPL assets. Implementation of communication protocols to ensure internal WCPL stakeholders are aware of the longwall progression. Posting of warning signs at suitable locations on roads and site access tracks and updating warning signs if a change to the WCPL asset is identified during monitoring. Provision of a 15 metre separation barrier around the Bates South pit walls. Structural assessment of WCPL assets and subsidence assessment post-Longwalls 11 to 16 extraction. Repair of WCPL assets in accordance with associated standards and procedures. 	Section 3.5 and Appendix E

Summary of Monitoring and Management Commitments (Continued)

Component	Monitoring	Management	Reference
Public Safety	<ul style="list-style-type: none"> Monitoring of subsidence in accordance with the Subsidence Monitoring Program. Visual observations of fences. Visual observations of warning signs (e.g. legibility). Visual observations of integrity of cliffs and steep slopes. Visual inspections per standard measures in the Health and Safety Management System (e.g. security, site staff around site). 	<ul style="list-style-type: none"> Restricted access (i.e. the general public are not allowed on WCPL owned land used for mining purposes). Permanent signage located at the entrance to WCPL owned land will be maintained. All personnel and visitors accessing the Wambo site are subject to Health and Safety Management System requirements. Notification to agistees of areas of longwall mining and active subsidence, and exclusion of agistment grazing from areas where surface cracking presents a reasonable risk to people and/or livestock. Posting and maintenance of warning signs at suitable locations on property boundaries, fences and access tracks. The signs will indicate that underground mining (with surface subsidence) is being undertaken on WCPL owned land and will prohibit entry by unauthorised persons. Management of surface cracking, areas of subsidence troughs and potential cliff or steep slope instability in accordance with the Land Management Plan. Repair of fences in accordance with the Land Management Plan. All safety incidents will be handled in accordance with the Health and Safety Management System. Following mining, review of warning sign placement and removal if no longer required. 	Section 3.6 and Appendix F
Reporting	<p>The following mechanisms will report the outcomes of the monitoring and management measures:</p> <ul style="list-style-type: none"> Incident Reporting. Subsidence Management Status Reports. Six Monthly Report (for the period 1 January to 30 June). Annual Reviews (for the period 1 January to 31 December). 		Section 4.2

¹ Minor cracks that develop are not expected to require remediation as geomorphologic process will result in natural filling of these cracks over time.

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Appendix C	Biodiversity Management Plan
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Report 3	Surface Water Assessment Review
Report 4	Subsidence Risk Assessment

1 OVERVIEW OF THE EXTRACTION PLAN

The Wambo Coal Mine is an open cut and underground coal mining operation located approximately 15 kilometres (km) west of Singleton, near the village of Warkworth, New South Wales (NSW) (**Figure 1**). The Wambo Coal Mine is owned and operated by Wambo Coal Pty Limited (WCPL), a subsidiary of Peabody Energy Australia Pty Limited.

The South Bates Underground Mine is a component of the approved Wambo Coal Mine. The South Bates Underground Mine commenced in Longwall 11 in February 2016 and involves extraction of coal by longwall mining methods from the Whybrow Seam and Wambo Seam within Coal Lease (CL) 397 and Mining Lease (ML) 1594 (**Figure 2**).

The potential environmental impacts of the existing Wambo Coal Mine (including the approved South Bates [Whybrow Seam] Underground Mine) were assessed in the *Wambo Development Project Environmental Impact Statement* (the Wambo Development Project EIS) (WCPL, 2003). Development Consent DA 305-7-2003 for the Wambo Coal Mine was granted on 4 February 2004 by the then NSW Minister for Urban Affairs and Planning under Part 4 of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act).

An application to modify the Development Consent (DA 305-7-2003 MOD 15) was lodged in July 2015 to allow an extension to the South Bates Underground Mine to include three additional longwalls (Longwalls 14 to 16) in the Wambo Seam and was approved on 10 November 2015. The application was accompanied by the *South Bates (Wambo Seam) Underground Mine Modification Environmental Assessment* (WCPL, 2015) (South Bates [Wambo Seam] Modification EA).

An Extraction Plan for Longwalls 11 to 13 was approved by the NSW Department of Planning and Environment (DP&E) on 9 February 2016. The approved Extraction Plan for Longwalls 11 to 13 has been revised to include Longwalls 14 to 16 within the South Bates Underground Mine for a consolidated Extraction Plan for Longwalls 11 to 16. This Extraction Plan has been developed to satisfy the conditions of the Development Consent DA 305-7-2003.

1.1 PURPOSE AND SCOPE

This document is an Extraction Plan that outlines the proposed management, mitigation, monitoring and reporting of potential subsidence impacts and environmental consequences from the secondary extraction of Longwalls 11 to 16 at the South Bates Underground Mine.

This Extraction Plan has been prepared in consideration of the Draft *Guidelines for the Preparation of Extraction Plans Required under Conditions of Development Consents, Project Approvals and Mining Lease Conditions for Underground Coal Mining* (Version 5) (Draft Extraction Plan Guidelines) (DP&E and NSW Trade & Investment – Division of Resources and Energy [DRE], 2015).

The objectives of this Extraction Plan are to:

- provide detailed plans of Longwalls 11 to 16;
- outline potential subsidence effects, subsidence impacts and environmental consequences of Longwalls 11 to 16;
- describe the measures that will be implemented to ensure compliance with the subsidence impact performance measures and mitigate, manage and remediate potential subsidence impacts and environmental consequences; and
- detail a monitoring and contingency plan for potential subsidence impacts and environmental consequences, including detailed performance indicators for subsidence impact performance measures.

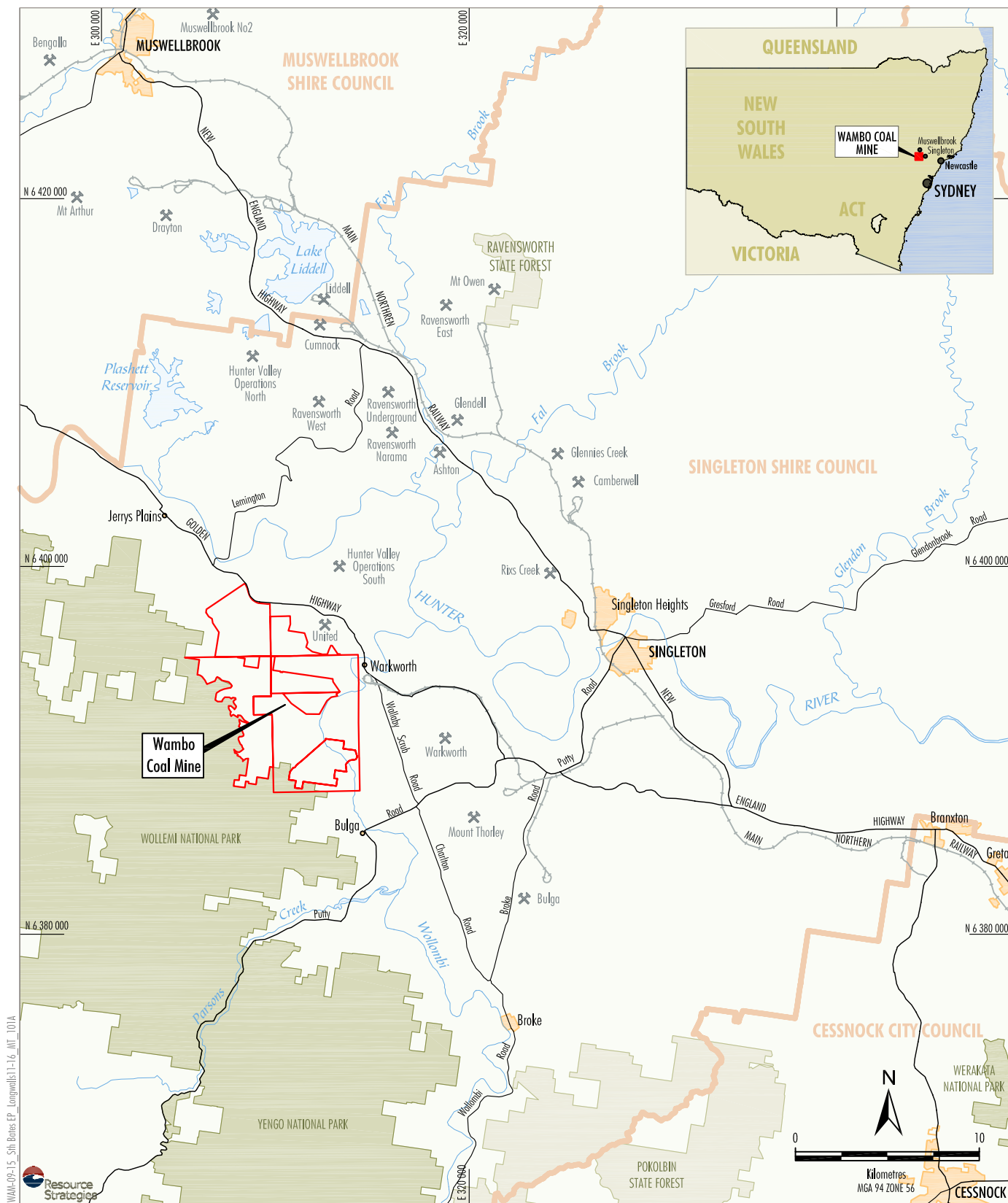


Figure 1

Longwalls 11 to 16 are located at the South Bates Underground Mine, and includes three longwalls in the Whybrow Seam (Longwalls 11 to 13) and three longwalls in the Wambo Seam (Longwalls 14 to 16). The Extraction Plan Application Area for Longwalls 11 to 16 (Longwalls 11 to 16 Application Area) is based on a 26.5 degree (°) angle of draw and is shown on **Figure 3**. Extraction of Longwall 11 was completed in July 2016 and extraction of Longwall 12 was completed in December 2016. Pending the approval of this revised Extraction Plan, secondary extraction of Longwalls 14 to 16 is scheduled to commence in June 2017.

This Extraction Plan has been prepared by WCPL, with assistance from Mine Subsidence Engineering Consultants (MSEC), HydroSimulations, Alluvium, South East Archaeology and Resource Strategies. The appointment of the team of suitably qualified and experienced persons has been endorsed by the Secretary of the DP&E.

This Extraction Plan forms part of WCPL's Environmental Management System for the Wambo Coal Mine. The relationship of this Extraction Plan to the Wambo Coal Mine Environmental Management System is shown on **Figure 4**.

1.1.1 Statutory Requirements

This Extraction Plan has been prepared in accordance with the conditions of the Development Consent (DA 305-7-2003) and in consideration of the Draft Extraction Plan Guidelines (DP&E and DRE, 2015).

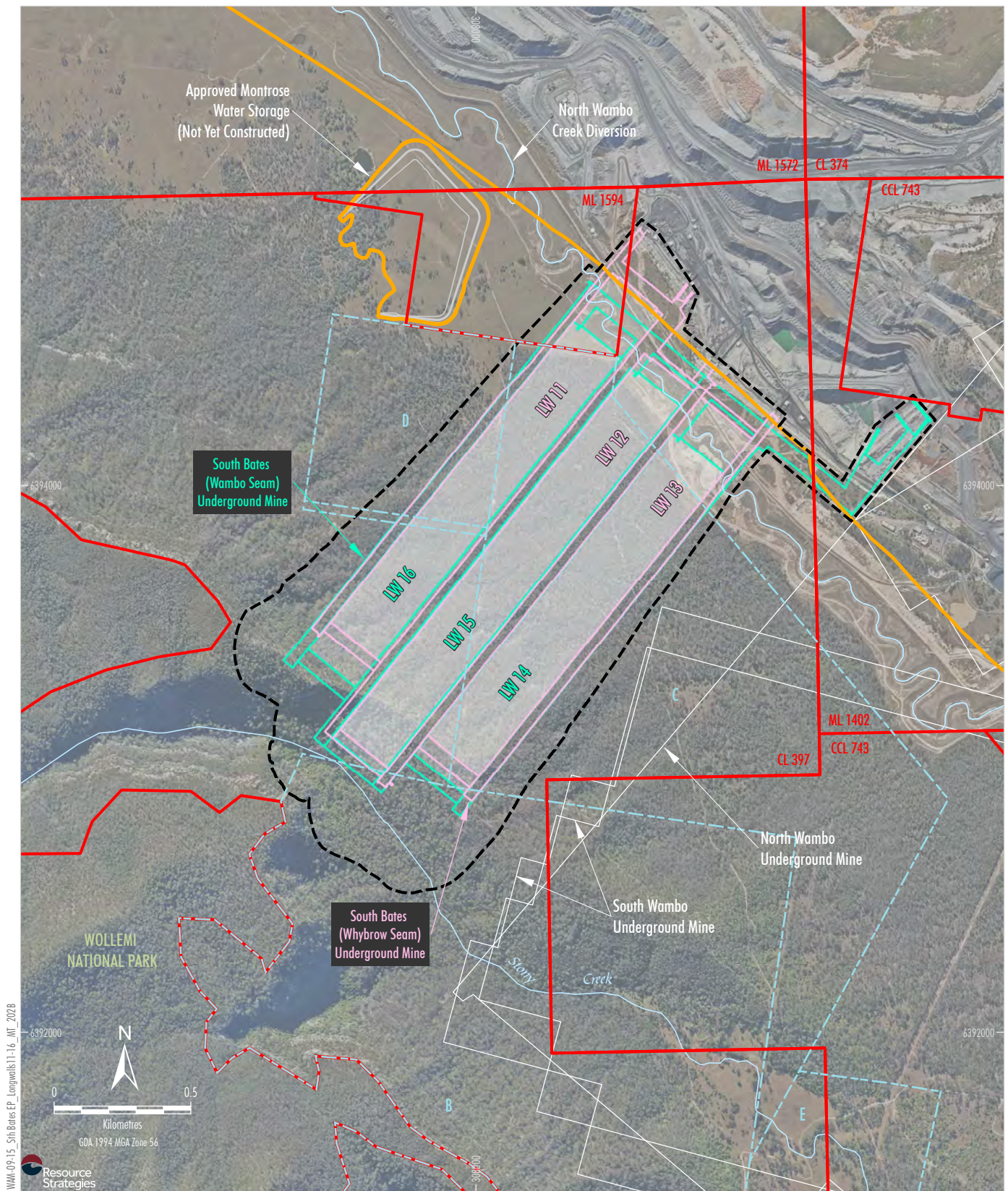
The statutory requirements relevant to this Extraction Plan are summarised below.

Development Consent (DA 305-7-2003)

This Extraction Plan has been prepared in accordance with Condition 22C of Schedule 4 of the Development Consent (DA 305-7-2003). The requirements of Condition 22C of Schedule 4 are summarised in **Table 1**, along with the relevant section of this Extraction Plan in which the requirements are addressed.

Table 1
Extraction Plan Requirements

Development Consent (DA 305-7-2003) Condition	Extraction Plan Reference
Condition 22C of Schedule 4 22C. The Applicant must prepare and implement an Extraction Plan for the second workings within each seam to be mined to the satisfaction of the Secretary. Each Extraction Plan must: <ul style="list-style-type: none"> a) be prepared by a team of suitably qualified persons whose appointment has been endorsed by the Secretary; b) be approved by the Secretary before the Applicant carries out any of the second workings covered by the plan; c) include detailed plans of the proposed first and second workings and any associated surface development; d) included detailed performance indicators for each of the performance measures in Tables 14A and 14B; e) provide revised predictions of potential subsidence effects, subsidence impacts and environmental consequences of the proposed second workings, incorporating any relevant information obtained since this consent; f) describe the measures that would be implemented to ensure compliance with the performance measures in Tables 14A and 14B, and manage or remediate any impacts and/or environmental consequences; 	This document Section 1.1 and Attachment 2 Section 1.3 and Appendix G Section 3 and Appendices A, C, D, E and F Section 2.1 and Technical Reports 1 to 4 Section 3 and Appendices A, B, C, D, E, F, H and I



- LEGEND**
- Mining and Coal Lease Boundary
 - Existing/Approved Surface Development Area
 - South Bates (Whybrow Seam) Underground Mine
 - South Bates (Wambo Seam) Underground Mine
 - Other Approved Underground Development
 - Extraction Plan Application Area
 - Remnant Woodland Enhancement Program (RWEF) Area

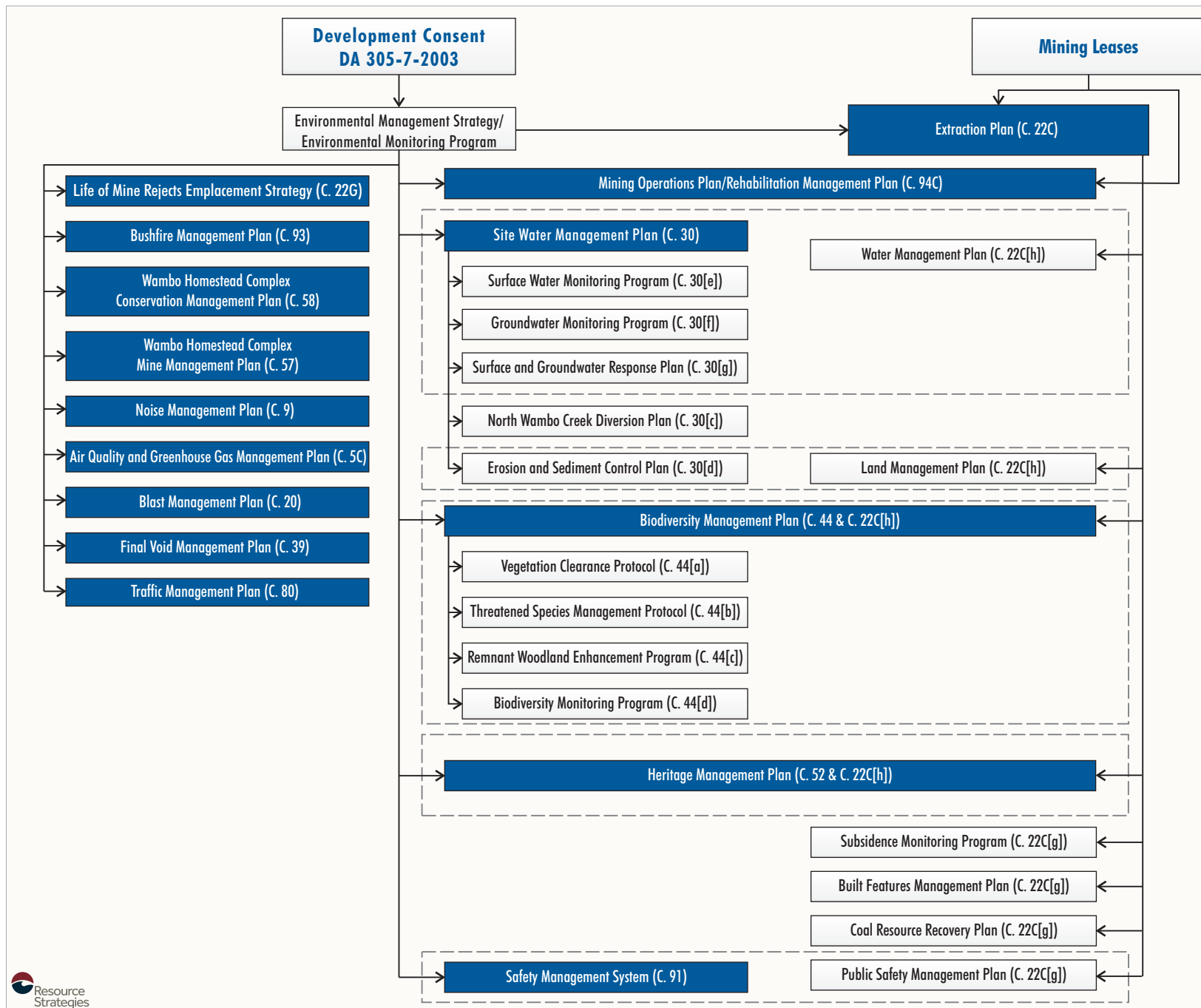


Table 1 (Continued)
Extraction Plan Requirements

Development Consent (DA 305-7-2003) Condition	Extraction Plan Reference
g) include the following to the satisfaction of the DRE: <ul style="list-style-type: none"> • a coal resource recovery plan... • a subsidence monitoring program... • a Built Features Management Plan... • a Public Safety Management Plan... • appropriate revisions to the Rehabilitation Management Plan... h) include a: <ul style="list-style-type: none"> • Water Management Plan... • Biodiversity Management Plan... • Land Management Plan... • Heritage Management Plan... i) include a program to collect sufficient baseline data for future Extraction Plans.	Appendix G Appendix H Appendix E Appendix F Section 3.7 Appendix A Appendix C Appendix B Appendix D Attachment 3

Further detail on the requirements of the Development Consent (DA 305-7-2003) is provided in **Attachment 1**.

Mining Lease Conditions

Longwalls 11 to 16 are located within CL 397 and ML 1594 (**Figure 3**). Under the conditions of the mining leases, WCPL must not undertake underground mining operations that may cause subsidence other than in accordance with an approved Extraction Plan. The approved Extraction Plan must provide for the effective management of risks associated with any subsidence resulting from mining operations.

The requirements of the conditions of the mining leases are summarised in **Attachment 1**, along with the relevant section of this Extraction Plan where the requirements are addressed.

Other Statutory Requirements

In addition to the Development Consent (DA 305-7-2003) and mining leases, all activities at or in association with the South Bates Underground Mine will be undertaken in accordance with the following licences, permits and leases:

- *Wambo Coal Mine Mining Operations Plan 2015 – 2020* (MOP) approved under the conditions of the mining leases, and any approved amendment or replacement MOP.
- Environment Protection Licence (EPL) 529 issued under the *NSW Protection of the Environment Operations Act, 1997*, and any subsequent variations.
- Consent #2222 and Aboriginal Heritage Impact Permit (AHIP) #C0001474 issued under section 90 of the *NSW National Parks and Wildlife Act, 1974* (NPW Act) and any additional AHIP issued under section 90 of the NPW Act.
- Water access licences and approvals issued under the *NSW Water Management Act, 2000*.
- Mining and occupational health and safety related approvals granted by DRE and WorkCover NSW.

1.2 STRUCTURE OF THE EXTRACTION PLAN

This Extraction Plan comprises a main text component and supporting management plans and studies, which include Appendices A through I and Technical Reports 1 through 4. An overview of the main text sections of the Extraction Plan is presented below:

- Section 1** Provides an introduction to the Extraction Plan, including the purpose and scope of the Extraction Plan and a summary of the mine plan and design, subsidence predictions, subsidence impact performance measures and subsidence management approach.
- Section 2** Describes the process of development of the Extraction Plan, including: the process of reviewing and updating the predictions of subsidence effects, subsidence impacts and environmental consequences; the risk assessment process for identifying key subsidence management issues; and consultation undertaken by the mine with affected agencies and other key stakeholders.
- Section 3** Describes the measures that will be implemented to mitigate, manage, remediate and monitor potential subsidence impacts and environmental consequences on natural and built features.
- Section 4** Addresses key elements of how the plan is going to be implemented, including an adaptive management approach, reporting, regular review and key responsibilities.
- Section 5** Lists the documents referred to in **Sections 1 to 4** of this Extraction Plan.
- Section 6** Defines abbreviations, acronyms and terms used in **Sections 1 to 4** of this Extraction Plan.
- Attachment 1** Outlines the relevant requirements under the Development Consent (DA 305-7-2003), Draft Extraction Plan Guidelines (DP&E and DRE, 2015) and mining leases, and provides the relevant section of this Extraction Plan where the requirements are addressed.
- Attachment 2** Provides evidence of WCPL's consultation process for the Extraction Plan.
- Attachment 3** Provides details of a program to collect sufficient baseline data for future Extraction Plans.
- Attachment 4** Provides a consolidated list of key stakeholder contact information.

Appendices A to I contain component management and monitoring plans of the Extraction Plan:

- Appendix A** Water Management Plan for Longwalls 11 to 16 (WMP).
- Appendix B** Land Management Plan for Longwalls 11 to 16 (LMP).
- Appendix C** Wambo Coal Biodiversity Management Plan (BMP) (addressing the requirement for a Biodiversity Management Plan for Longwalls 11 to 16).
- Appendix D** Wambo Coal Heritage Management Plan (HMP) (addressing the requirement for a Heritage Management Plan for Longwalls 11 to 16).
- Appendix E** Built Features Management Plan for Longwalls 11 to 16 (BFMP).
- Appendix F** Public Safety Management Plan for Longwalls 11 to 16 (PSMP).
- Appendix G** Coal Resource Recovery Plan for Longwalls 11 to 16 (CRRP).
- Appendix H** Subsidence Monitoring Program.
- Appendix I** MOP (satisfying the requirements of a Rehabilitation Management Plan).

This Extraction Plan is also supported by a series of technical reports, prepared by relevant specialists, which contain a review of predictions of subsidence effects, subsidence impacts and environmental consequences. A facilitated risk assessment workshop, incorporating the relevant technical specialists, was also conducted. These technical reports are contained in **Technical Reports 1 to 4**:

- Report 1** Subsidence Predictions and Impact Assessments.
Report 2 Groundwater Assessment Review.
Report 3 Surface Water Assessment Review.
Report 4 Subsidence Risk Assessment.

1.3 MINE PLAN AND SCHEDULE

The approved orientation and footprint of the South Bates Underground Mine was assessed as part of the Wambo Development Project EIS (WCPL, 2003) and the South Bates [Wambo Seam] Modification EA (WCPL, 2015).

Further detail on the mine plan and schedule is provided in the subsections below.

1.3.1 Mine Plan

Longwalls 11 to 16 will be extracted using retreating longwall mining methods for secondary extraction of panels ranging between 233 metres (m) and 251 m wide (void width). Construction of development main headings, maingates and tailgates are undertaken using continuous miners.

The Longwalls 11 to 16 Application Area and proposed mine plan is shown in **Figure 3** and key dimensions summarised in **Table 2**.

Table 2
Key Mining Parameters

Dimension	Longwall 11	Longwall 12	Longwall 13	Longwall 14	Longwall 15	Longwall 16
ROM Coal Extracted (Mt)	1.72	1.86	2.08	1.38	1.70	1.48
Gate Road Width (m)	5.4					
Gate Road Height (m)	2.5 – 2.8					
MG Chain Pillar Width (m)	26.6	24.6	26.2	29.3	33.2	22.5
TG Chain Pillar Width (m)	29.1	26.6	24.6	22.7	29.3	33.2
Longwall Void Width (m)	248	238	251	251	238	233
Longwall Void Length (m)	1,653	1,784	1,599	1,521	1,749	1,557
Extraction Height (m)	3.0			2.1		
Depth of Cover (m)	55 – 375			130 – 480		

ROM = run-of-mine.
Mt = million tonnes.

MG = maingate.
TG = tailgate.

Detailed mine layout drawings are provided in **Appendix G** (Coal Resource Recovery Plan). **Appendix G** also provides justification of the mining layout, including a description of resource recovery and effects on future resource recovery.

Geology and Stratigraphy

The Wambo Coal Mine is situated within the Hunter Coalfield subdivision of the Sydney Basin, which forms the southern part of the Sydney-Gunnedah-Bowen Basin (WCPL, 2003). The coal bearing rocks of the Sydney Basin are Permian in age and are typically associated with low-lying gentle topography (WCPL, 2003). The overlying rocks of Triassic age cover large parts of the Sydney Basin and tend to form prominent escarpments where they outcrop (WCPL, 2003).

Mining activities at the Wambo Coal Mine include both open cut and underground mining of several coal seams from the Wittingham Coal Measures, which combine with the Newcastle Coal Measures to form the Singleton Supergroup (**Figure 5**). A summary of the coal measure stratigraphy underlying the Wambo Coal Mine area is provided in **Figure 5**.

Wittingham Coal Measures are divided into the Jerrys Plains Subgroup, Vane Subgroup, Denman Formation and Archerfield Sandstone (WCPL, 2003). The Jerrys Plains Subgroup contains eight formations with 15 named coal seams (WCPL, 2003). The Jerrys Plains Subgroup is up to 800 m thick and generally consists of relatively coarse clastic sediments (NSW Department of Mineral Resources [DMR], 1993). The sedimentary rock layers above and between coal seams are typically lithic sandstone, siltstone and conglomerate, while minor carbonaceous claystone and tuff occurs throughout the sequence (WCPL, 2003).

Coal seams previously, currently and approved to be mined at the Wambo Coal Mine include (**Figure 5**):

- Whybrow Seam;
- Redbank Creek Seam;
- Wambo Seam;
- Whynot Seam;
- Woodlands Hill Seam; and
- Arrowfield Seam.

These seams dip gently to the south-west at approximately 2° to 3° with minor local variations due to varying thicknesses of inter-seam sediments and fault zones (WCPL, 2003). Faulting usually trends north or north-east to south-west with normal throws of up to 10 m with some low angle thrusts (i.e. reverse faults) of variable throw (MineConsult, 2001).

There is a series of north-northeast to south-southwest trending faults within and adjacent to the mining area with throws between 0.5 m and 1 m. Some larger faults have been identified to the north-west and to the south-east of the longwalls with throws between 3 m and 12 m (**Technical Report 1**).

The South Bates Underground Mine mines the Whybrow Seam and Wambo Seam which produce a low ash thermal coal. ROM coal is crushed and washed at the Wambo coal handling and preparation plant. Product coal from the South Bates Underground Mine is considered suitable for export and domestic markets.

SUPERGROUP	GROUP	SUBGROUP	FORMATION	SEAM	
SINGLETON SUPERGROUP	NARRABEEN GROUP	WIDDEN BROOK CONGLOMERATE			
	NEWCASTLE COAL MEASURES ¹	GLEN GALLIC SUBGROUP	Greigs Creek Coal		
			Redmanvale Creek Formation		
			Dights Creek Coal		
		DOYLES CREEK SUBGROUP	Waterfall Gully Formation		
			Pinegrove Formation		
		HORSESHOE CREEK SUBGROUP	Lucernia Coal		
			Strathmore Formation		
			Alcheringa Coal		
			Clifford Formation		
		APPLETREE FLAT SUBGROUP	Charlton Formation		
			Abbey Green Coal		
		WATTS SANDSTONE			
	WITTINGHAM COAL MEASURES	DENMAN FORMATION			
		JERRYS PLAINS SUBGROUP	Mount Leonard Formation	Whybrow Seam ²	
			Althorpe Formation		
			Malabar Formation	Redbank Creek Seam ²	
				Wambo Seam ²	
				Whynot Seam ²	
				Blakefield Seam	
			Mount Ogilvie Formation	Glen Munro Seam	
				Woodlands Hill Seam ²	
			Milbrodale Formation		
			Mount Thorley Formation	Arrowfield Seam ²	
				Bowfield Seam ³	
				Warkworth Seam ³	
			Fairford Formation		
			Burnamwood Formation	Mount Arthur Seam ³	
				Piercefield Seam ³	
				Vaux Seam ³	
				Broonie Seam	
				Bayswater Seam	
		ARCHERFIELD SANDSTONE			
		VANE SUBGROUP	Bulga Formation		
			Foybrook Formation		
			Saltwater Creek Formation		

¹ Previously known as the Wollombi Coal Measures.

² Coal reserves currently approved to be mined at the Wambo Coal Mine.

³ Coal reserves proposed to be mined by the United Wambo Open Cut Coal Mine Project (SSD 7142).

The overburden of the Longwalls 11 to 16 Application Area consists of gently, south-west dipping sedimentary strata comprising medium strength thin to medium interbedded sandstone and siltstone with some thickly bedded sandstone units (**Technical Report 1**).

Previous and Future Mining

Previous and future workings in the vicinity of Longwalls 11 to 16 are shown on **Figure 6**. In addition to the approved South Bates Underground Mine, the Development Consent (DA 305-7-2003) provides consent for underground mining by longwall methods in the Arrowfield and Woodlands Hill Seams (**Figure 2**). The approved future workings in the Arrowfield and Woodlands Hill Seams are located approximately than 100 m south-east of Longwalls 11 to 16 (**Figures 2 and 6**). The approved future underground longwall workings are described in the *South Wambo Underground Mine Modification Environmental Assessment* (WCPL, 2016) and will be the subject of a future Extraction Plan.

WCPL is also planning to seek approval for additional longwalls in the Whybrow Seam to the north-west of the South Bates Underground Mine. These longwalls would be subject to assessment and approval under the EP&A Act and, if approved, would be the subject of a future Extraction Plan.

Further to underground mining activities, the Development Consent (DA 305-7-2003) provides consent for open cut mining. The seams currently approved for open cut mining include the Whybrow, Redbank Creek, Wambo and Whynot Seams.

An application to modify the Development Consent (DA 305-7-2003 MOD 16) was lodged in November 2016 to support the proposed United Wambo Open Cut Coal Mine Project. The Modification would allow integrated open cut mining at the United Coal Mine and Wambo Coal Mine.

1.3.2 Mine Schedule

WCPL operates its mines seven days per week, 24 hours per day on a rotating shift basis. WCPL is currently mining at the South Bates Underground Mine with the extraction of Longwall 13.

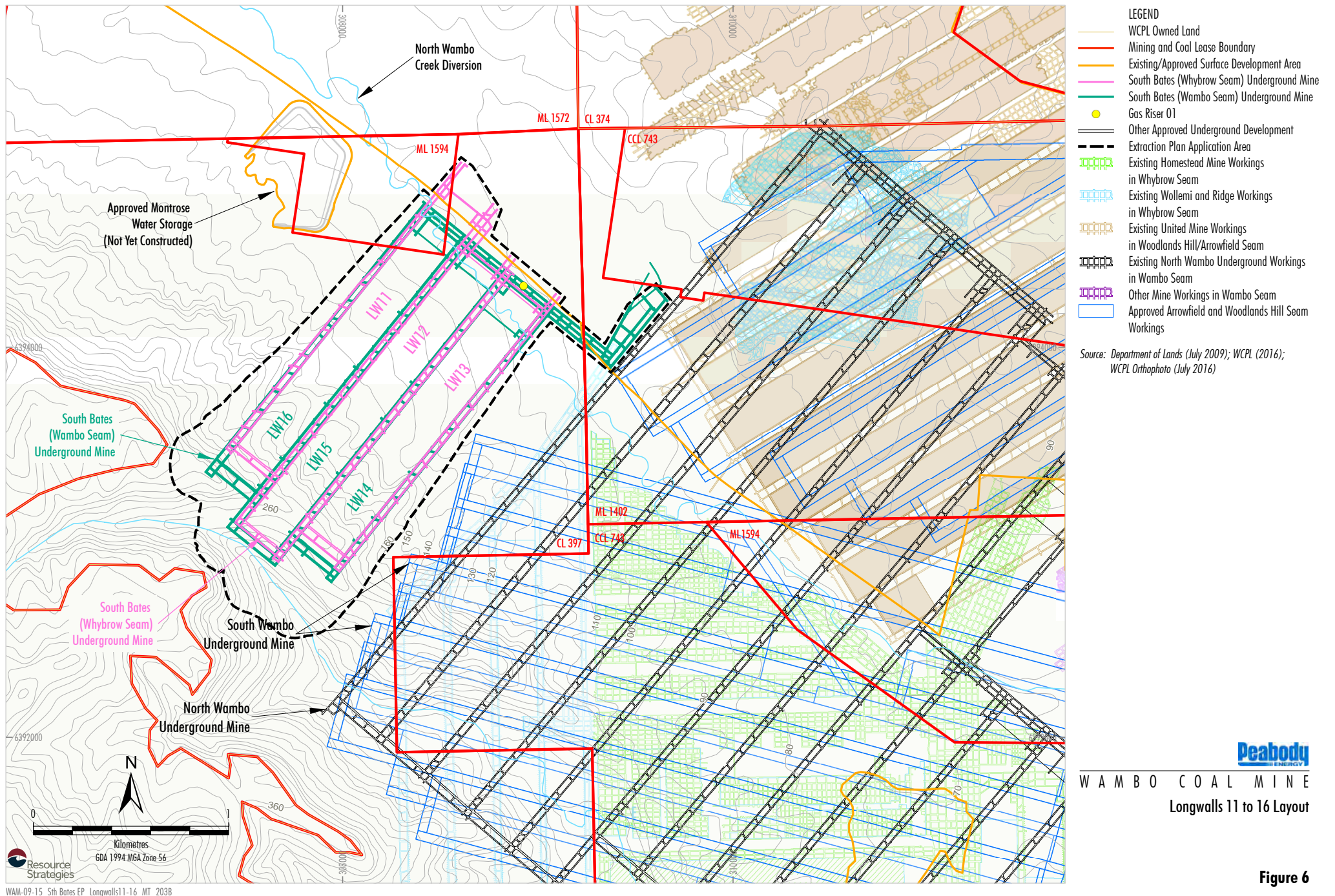
The proposed sequence of mining for Longwalls 11 to 16 at the South Bates Underground Mine under the Extraction Plan and anticipated/actual start and completion dates are summarised in **Table 3**.

Table 3
Proposed Mining Schedule (Secondary Extraction)

Longwall	Estimated Start Date	Estimated Duration	Estimated Completion Date
Longwall 11	17 February 2016 (actual)	5 months	2 July 2016 (actual)
Longwall 12	4 August 2016 (actual)	5 months	19 December 2016 (actual)
Longwall 13	January 2017	5 months	May 2017
Longwall 14	June 2017	5 months	October 2017
Longwall 15	November 2017	5 months	March 2018
Longwall 16	April 2018	4 months	July 2018

1.3.3 Associated Surface Development

A drill hole (Gas Riser 01) has been installed to drain and flare gas from the Wambo Seam for safety purposes (i.e. to maintain gas composition in the underground mine at safe levels). The location of Gas Riser 01 is shown on **Figure 6** and is installed between the B and C headings of the S5 Mains (8 cut-through) and outside the expected extent of subsidence.



Gas Riser 01 consists of an 18 inch hole drilled from the surface to the Wambo Seam and will operate with up to 3 flares operating at approximately 1,200 litres per second. The development was installed in an area previously cleared of remnant vegetation within a fenced area of approximately 50 x 50 m. Following the completion of mining in Longwall 16, the drill hole will be sealed to the surface.

1.4 SUBSIDENCE PREDICTIONS

Predictions of subsidence effects for Longwalls 11 to 16 are provided by MSEC (**Technical Report 1**). The process for the development of these predictions is described in **Section 2.1.1**.

Predicted Conventional Subsidence Movements

The maximum subsidence, tilts and curvatures predicted by MSEC (2017) for Longwalls 11 to 16 are summarised in **Table 4**. **Figure 7** provides subsidence contours for Longwalls 11 to 16 at the South Bates Underground Mine.

Table 4
Maximum Predicted Subsidence, Tilts and Curvatures for Longwalls 11 to 16

Subsidence Parameter	Maximum Above Longwalls	Depth of Cover >~135 m to Whybrow Seam	Depth of Cover >~225 m to Whybrow Seam
Maximum Subsidence (mm)	4,150	4,050	3,950
Maximum Tilt (mm/m)	100	55	40
Maximum Hogging Curvature (km ⁻¹)	> 3.0	1.2	0.8
Maximum Sagging Curvature (km ⁻¹)	> 3.0	1.4	1.2

After: MSEC (2017).

mm = millimetre.

mm/m = millimetre per metre.

km⁻¹ = per kilometre.

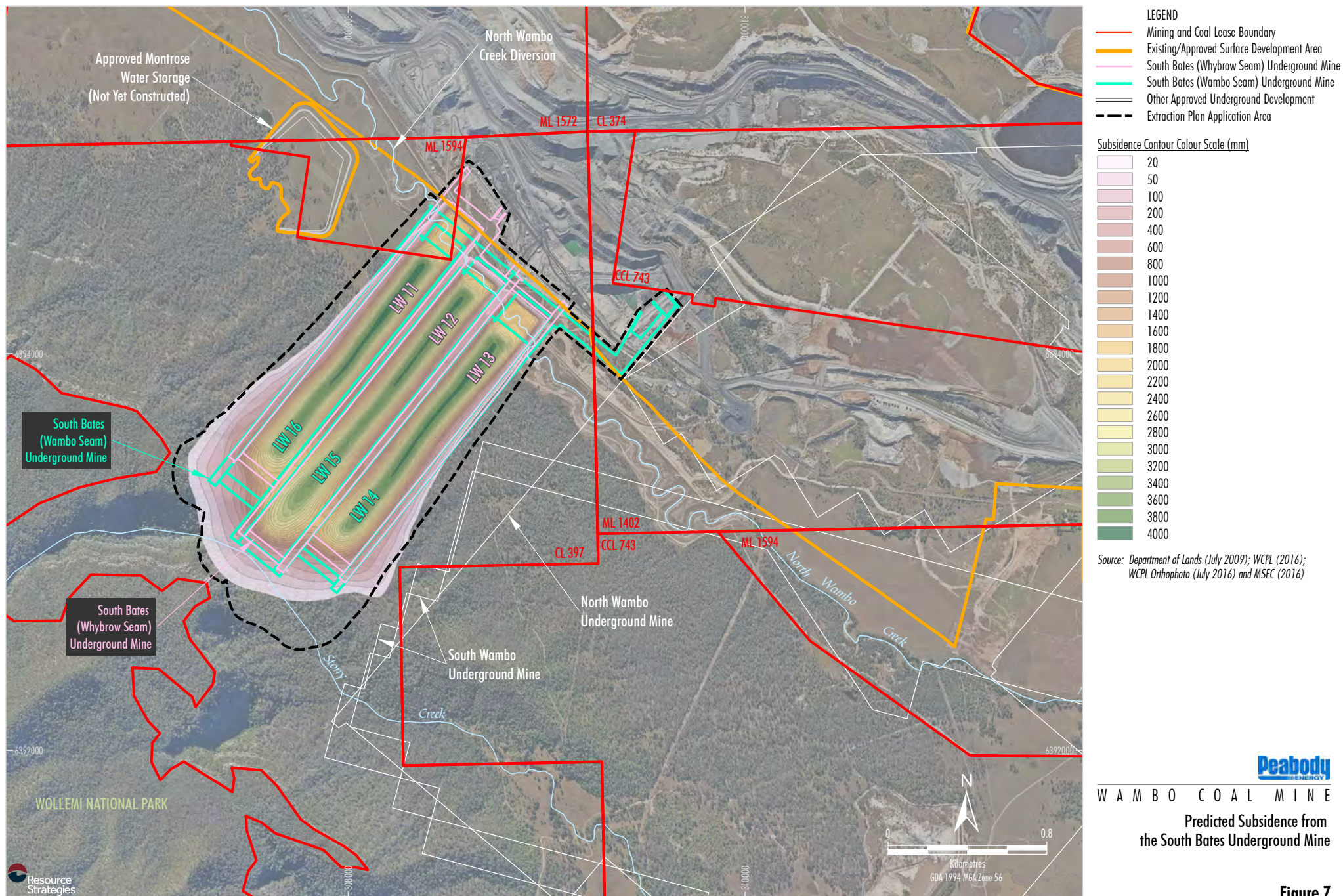
Non-Conventional Ground Movements

MSEC (**Technical Report 1**) considers it is likely non-conventional ground movements will occur due to near surface geological features and shallow depths of cover, which are often accompanied by elevated tilts, curvatures and strains. Valley related movements may also occur in the upper reaches of Stony Creek, which are located within an incised valley (**Technical Report 1**).

In most cases, it is not possible to predict the exact locations or magnitudes of the non-conventional anomalous movements due to near surface geological conditions. For this reason, the strain predictions provided in **Technical Report 1** are based on a statistical analysis of measured strains, including both conventional and non-conventional anomalous strains.

For single-seam conditions, at the commencing ends of Longwalls 11 to 13, the 95 percent (%) confidence levels for maximum strains above areas with similar mining geometry was 4 mm/m tensile and compressive (**Technical Report 1**). At the finishing ends of Longwalls 11 to 13, the 95% confidence levels for maximum strains above areas with similar mining geometry was 10 mm/m tensile and 13 mm/m compressive (**Technical Report 1**).

For multi-seam conditions, the 95% confidence levels for maximum strains above areas with similar mining geometry was 7 mm/m tensile and 9 mm/m compressive (**Technical Report 1**). This is slightly less than the strains that may be expected above the finishing ends of Longwalls 11 to 13 at the shallowest depths of cover.



Predicted Far-Field Displacement Movements

An empirical database of observed incremental far-field horizontal movements from monitoring data from the NSW Coalfields indicates that the 90% confidence level for measurable far-field movements (i.e. nominally greater than 25 mm) is within 1,500 m from the active longwall (**Technical Report 1**).

MSEC (**Technical Report 1**) predicts the potential impacts of far-field horizontal movements on the natural and built features within the vicinity of the proposed longwalls are not expected to be significant. Therefore, MSEC (**Technical Report 1**) considers it is not necessary to establish monitoring to measure the far-field horizontal movements resulting from Longwalls 11 to 16.

Timing and Duration of Subsidence Impacts

Surface cracking has been typically observed to close up as the longwall face retreats, and natural filling of minor remnant cracking usually occurs within 6 to 12 months. Conditions at South Bates Underground Mine in areas of high depth of cover are expected to be similar.

1.5 SUBSIDENCE IMPACT PERFORMANCE MEASURES

The statutory requirements relevant to this Extraction Plan are summarised in **Section 1.1.1**. In accordance with the Development Consent (DA 305-7-2003) (Condition 22 and 22A, Schedule 4), WCPL must ensure that there is no exceedance of the subsidence impact performance measures outlined in **Table 5**. This Extraction Plan has been developed to meet these performance measures.

Table 5
Subsidence Impact Performance Measures

Feature	Performance Measure
Wollombi Brook	Negligible subsidence impacts. Negligible environmental consequences. Controlled release of excess site water only in accordance with EPL requirements.
Wollemi National Park	Negligible subsidence impacts. Negligible environmental consequences.
Warkworth Sands Woodland Community	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences.
White Box, Yellow Box, Blakely's Red Gum Woodland/Grassy White Box Woodland Community	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences.
Other threatened species, populations or communities	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences.
Wambo Homestead Complex	Negligible impact on heritage values, unless approval has been granted by the Heritage Branch and/or the Minister.
All Built Features	Always safe. Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. Damage must be fully repairable, and must be fully repaired or else replaced or fully compensated.
Public Safety	No additional risk.

Source: After Tables 14A and 14B of the Development Consent (DA 305-7-2003).

The Wambo Homestead Complex is located approximately 2.8 km south-east of the Longwalls 11 to 16 Application Area and will experience no measurable subsidence from the South Bates Underground Mine. Monitoring of consequences against performance indicators and measures relating to the Wambo Homestead Complex is not considered necessary for Longwalls 11 to 16. Monitoring and management measures for the Wambo Homestead Complex were addressed in previous Extraction Plans for the North Wambo Underground Mine.

1.6 SUBSIDENCE MANAGEMENT APPROACH

Potential environmental consequences from mining of Longwalls 11 to 16 will be managed in accordance with the relevant requirements of the Development Consent (DA 305-7-2003) and other approvals, through:

- **Mine Design** – Longwalls 11 to 16 have been designed to meet the subsidence impact performance measures for the Wollemi National Park (**Section 1.6.1**).
- **Subsidence Monitoring** – visual and survey monitoring and reporting will be conducted to confirm predictions of subsidence effects and detect subsidence impacts and environmental consequences (**Section 3.8**).
- **Remediation** – remediation will be conducted of any subsidence impacts or environmental consequences detected by subsidence monitoring, where required in consideration of: the potential impacts of the unmitigated impact (including potential risks to safety and the potential for self-healing or long-term degradation); and the potential impacts of the remediation (**Sections 3.1 to 3.7**).
- **Contingency Response** – a contingency response will be implemented where a potential exceedance of a subsidence impact performance measure or an unexpected impact is detected (**Section 4.1**), including consideration of identified potential contingency measures (**Sections 3.1, 3.3 and 3.5**).
- **Adaptive Management and Review** – WCPL will implement an adaptive management approach by reviewing and evaluating the effectiveness of management strategies, and adjusting management strategies to improve performance, particularly following an exceedance of a subsidence impact performance measure or detection of an unexpected impact (**Sections 4.1 to 4.5**).

1.6.1 Wollemi National Park Escarpment Offset

The Wambo Development Project EIS (WCPL, 2003) stated “*The Wollemi National park escarpment would not be subsided by the extraction of Project longwall panels*”.

The length of Longwalls 11 to 16 has been limited such that the base of the cliffs associated with the Wollemi National Park escarpment is located outside of a 26.5° angle of draw from Longwalls 11 to 16. Longwalls 11 to 16 would meet the performance measures of negligible subsidence impacts and negligible environmental consequences for the Wollemi National Park.

The predicted vertical subsidence for cliffs associated with the Wollemi National Park escarpment are all less than 20 mm. Vertical movements of these magnitudes are in the order of those which naturally occur due to wetting and drying of the surface soils (**Technical Report 1**). Any low level far-field horizontal movements are not expected to impact the cliffs associated with the Wollemi National Park escarpment (**Technical Report 1**).

2 DEVELOPMENT OF THE EXTRACTION PLAN

2.1 REVIEW OF PREDICTIONS

The predicted subsidence effects, subsidence impacts and environmental consequences of the South Bates Underground Mine have been assessed in the Wambo Development Project EIS (WCPL, 2003) and the South Bates (Wambo Seam) Modification EA (WCPL, 2015), and by MSEC (2017), HydroSimulations (2017) and Alluvium (2016) (**Technical Reports 1 to 3**). This section describes the process of reviewing and updating these predictions.

2.1.1 Predicted Subsidence Effects and Subsidence Impacts

A detailed subsidence assessment for Longwalls 11 to 16 has been prepared in support of this Extraction Plan, with the outcomes of this assessment incorporated into the management plans in **Appendices A to F**.

Review of Subsidence Prediction Methodology

The predictions of subsidence effects were developed by MSEC using the Incremental Profile Method (**Technical Report 1**) calibrated using local monitoring data from Longwall 11 at the South Bates Underground Mine, the North Wambo Underground Mine, as well as from other nearby collieries in the Hunter Coalfield.

MSEC compared the observed and back-predicted mine subsidence movements along a number of monitoring lines at the North Wambo Underground Mine and nearby collieries in the Hunter Coalfield. It was found that the observed profiles of subsidence, tilt and curvature for these monitoring lines reasonably matched those back-predicted using the standard Incremental Profile Method. However, there were small differences between the predicted and back-calculated values which demonstrates the difficulty in predicting tilts and curvatures at a specific point, especially at shallow depths of cover or in multi-seam mining conditions.

Ground movements measured along the 7XL-Line and the CL11B-Line above Longwall 11 at the South Bates Underground Mine were also considered by MSEC (**Technical Report 1**). The observed profiles of subsidence, tilt and curvature along the 7XL-Line and the CL11B-Line reasonably match those predicted using the standard Incremental Profile Method for the Hunter Coalfield. The observed maximum values are similar to the predicted maxima. Some small irregular ground movements can be observed in the monitoring data along the CL11B-Line due to the shallow depth of cover at this location.

Based on the comparisons, it was found that the standard Incremental Profile Method for the Hunter Coalfield provides reasonable predictions of subsidence, tilt and curvature, for single-seam and multi-seam mining conditions for the longwall conditions at the South Bates Underground Mine (**Technical Report 1**).

Comparison with Previous Predictions of Subsidence Effects

Predicted subsidence parameters for Longwalls 11 to 16 were provided in the subsidence assessment prepared by MSEC (2015a) in the South Bates (Wambo Seam) Modification EA (WCPL, 2015) and MSEC (2015b; 2015c) in the previous Extraction Plan for Longwalls 11 to 13.

MSEC has prepared revised subsidence predictions for the Extraction Plan as described in **Technical Report 1** and shown on **Figure 7**. These predictions are based on the actual layout presented in this Extraction Plan, which incorporates the following changes in layout compared to previous assessments:

- the longwalls in the Wambo Seam are proposed to be extracted in reverse order, from the south-eastern most longwall to the north-western most longwall;
- the commencing end of Longwall 12 has been shortened by 79 m;
- the commencing end of Longwall 13 has been shortened by 378 m;
- the commencing end of Longwall 14 has been shortened by 243 m;
- the finishing end of Longwall 14 has been slightly lengthened by 23 m; and
- the commencing end of Longwall 16 has been slightly shortened by 13 m.

The maximum vertical subsidence predicted by MSEC (**Technical Report 1**) is 4,150 mm, which is the same as the maxima presented in the South Bates (Wambo Seam) Modification EA (WCPL, 2015). The maximum tilt predicted by MSEC (**Technical Report 1**) is also the same as the maxima presented in the South Bates (Wambo Seam) Modification EA (WCPL, 2015), at 100 mm/m.

The changes in the longwall layout result in a reduction in subsidence effects at the following natural features (**Technical Report 1**):

- Stony Creek;
- steep slopes beneath the Wollemi National Park escarpment; and
- the lower levels of cliffline and the cliffs along the spur to the south-west of Longwalls 11 to 16.

Predicted Subsidence Impacts

Subsidence impacts predicted by MSEC (2017) above Longwalls 11 to 16 include:

- ground cracking above the longwalls with the greatest extent of cracking expected over the shallowest sections of the Whybrow and Wambo Seam workings;
- potential for localised erosion of the ground surface depending on ground conditions, with the effects more prevalent in steeper terrain and along drainage flow paths; and
- alteration of existing surface drainage patterns with isolated ponding potentially occurring in low-lying areas overlying the longwalls.

The revised subsidence impacts predicted by MSEC (**Technical Report 1**) are consistent with, or less than, the predictions presented in the South Bates (Wambo Seam) Modification EA (WCPL, 2015).

2.1.2 Potential Environmental Consequences

Detailed discussion of potential environmental consequences is provided in the component management plans in **Appendices A to F** and summarised in **Section 3**.

Review of Potential Environmental Consequences to Groundwater

A groundwater assessment review, supported by numerical modelling, was prepared by HydroSimulations (2017) as part of the Extraction Plan for Longwalls 11 to 16 (**Technical Report 2**).

The groundwater assessment review considered the cumulative impacts on groundwater, as the drawdown caused by Longwalls 11 to 16 is difficult to assess in isolation due to groundwater responses being affected significantly by adjacent open cut and longwall mining (**Technical Report 2**).

Following a review of monitoring data, HydroSimulations (**Technical Report 2**) concluded revision of the potential cumulative environmental consequences for groundwater is not required. Of note to Longwalls 11 to 16, HydroSimulations (**Technical Report 2**) concluded:

- Shallow drawdowns in alluvium and regolith from the commencement to the completion of Longwalls 11 to 16 are expected to reach approximately 10 m at the north-eastern end of the longwalls, in the vicinity of the North Wambo Creek Diversion.
- Shallow groundwater associated with the North Wambo Creek Diversion is expected to experience freshwater recharge at a rate higher than occurred pre-mining.
- Negligible drawdown is anticipated over the western half of Longwalls 11 to 16 and in the vicinity of Stony Creek.
- There are no private registered bores that would be likely to be affected by 2 m drawdown or more if Longwalls 11 to 16 were to occur in isolation.

Review of Potential Environmental Consequences to Surface Water

Stony Creek

In regard to potential environmental consequences on Stony Creek, Appendix A of the South Bates (Wambo Seam) Modification EA stated:

Mining can potentially result in increased levels of ponding in locations where the mining induced tilts oppose and are greater than the natural stream gradients that exist before mining.

...Cracking in the beds of the streams would only be visible at the surface where the depths of the surface soils are shallow, or where the bedrock is exposed.

Some sections of Stony Creek and the upper reaches of ephemeral drainage lines have exposed bedrock which has formed into small cascades with isolated pools. Fracturing of the exposed bedrock could result in spalling or dislodgement of rocks.

The predicted subsidence effects and impacts on Stony Creek have reduced compared to previous assessments as a result of shortening the commencing ends of Longwalls 13 and 14 (**Technical Report 1**).

Consistent with approved potential impacts, some minor cracking in the bed of Stony Creek may occur and would only be visible at the surface where the depths of the surface soils are shallow, or where the bedrock is exposed. Fracturing of exposed bedrock could result in spalling or dislodgement of rocks (**Technical Report 1**).

North Wambo Creek Diversion

The potential environmental consequences to the North Wambo Creek Diversion described in the South Bates (Wambo Seam) Modification EA included:

- in-channel ponding up to 1.4 m deep and up to 250 m long;
- potential for increased scour (and associated suspended solids) prior to the implementation of scour protection works; and
- potential for increased leakage from the North Wambo Creek Diversion prior to crack remediation works.

A review of potential environmental consequences to the North Wambo Creek Diversion by Alluvium (**Technical Report 3**) based on detailed modelling identified the following consequences that are generally consistent with those described in the South Bates (Wambo Seam) Modification EA:

- an increase of in-channel storage (i.e. through topographical depressions and ponding) compared to the existing channel that would have minimal impacts on flows in North Wambo Creek;
- potential for surficial and subsurface erosion responses as a result of unremediated subsidence cracking;
- potential for increased bed and bank erosion upstream of Longwalls 11 and 16 in response to the steepening of the channel longitudinal profile;
- erosion of the elevated section of channel bed that would form over the pillar between Longwalls 11 and 12;
- potential for an increase in suspended sediments from increased bed and bank erosion and erosion from overland flow entry; and
- changes in baseflow conditions due to the effects of underground mining.

Alluvium (2016) considers that management measures can be put in place to reduce the risk of an increase in suspended sediments in the North Wambo Creek Diversion to negligible.

WCPL proposes to maintain the predicted in-channel ponding, as it results in minimal impacts of flows in North Wambo Creek and works to allow free drainage of the pools would require significant disturbance of the North Wambo Creek Diversion.

HydroSimulations (**Technical Report 2**) estimates that increased leakage from the North Wambo Creek Diversion to the underground workings could conservatively be up to 12.5 megalitres per day (ML/day) prior to remediation during periods of flow (reducing significantly following remediation). No increase in groundwater inflows to the workings following rainfall events has been observed as part of the experience from Longwall 11 to date.

Management and remediation measures to mitigate the risk of scour and leakage associated with Longwalls 11 to 16 are summarised in **Section 3.1**.

2.2 RISK ASSESSMENT

A Subsidence Risk Assessment has been undertaken to identify subsidence impacts with high risk levels and/or potentially severe consequences.

A risk assessment workshop was conducted in October 2014 for Longwalls 11 to 13, and was facilitated by a risk assessment specialist and attended by relevant WCPL personnel and technical specialists (Operational Risk Mentoring, 2015). A second risk assessment workshop was conducted in October 2016 to review the potential aspects and impacts of including Longwalls 14 to 16 (Operational Risk Mentoring, 2016).

With the implementation of the proposed risk treatment measures, the team consensus was that subsidence related impacts over Longwalls 11 to 16 could be managed at a tolerable level of risk (**Technical Report 4**).

A summary of the key potential consequences/hazards associated with Longwalls 11 to 16, as identified in the risk assessment workshops, is provided in **Table 6**. The table also provides a cross-reference to where these key potential consequences/hazards have been addressed in the Extraction Plan.

Table 6
Key Potential Consequences/Hazards Identified by the Subsidence Risk Assessment

Subject Area	Potential Consequence/Hazard	Extraction Plan Reference
Natural Features	Failure of the monitoring program to detect and respond to an impact on the groundwater system.	Section 3.1 and WMP (Appendix A)
	Induced leakage from North Wambo Creek Diversion due to subsidence.	
	Subsidence effects on Stony Creek, including cracking of stream bed and loss of flow.	
	Environmental consequences associated with water flow and quality changes in Stony Creek (including changes to channel stability) resulting from subsidence impacts.	
	North Wambo Creek Diversion damaged by subsidence resulting in reduced flow affecting downstream water quality.	
	A change in flood regimes or extent of potential inundation due to subsidence resulting from the extraction of Longwalls 11 to 16.	
	Boundary faults result in differences between modelled and observed groundwater drawdown (possibly conservative at a distance, but inaccurate locally).	
	Mine subsidence impacts due to the extraction of Longwalls 11 to 16 on riparian vegetation of Stony Creek resulting in environmental consequences.	Sections 3.1 and 3.3, WMP (Appendix A) and BMP (Appendix C)
	Mine subsidence impacts resulting in impacts on vegetation along the North Wambo Creek Diversion.	
	Creation of subsidence monitoring tracks affects the conservation values of the Remnant Woodland Enhancement Program (RWEP) areas.	Section 3.3 and BMP (Appendix C)
	Subsidence impacts on RWEP areas reducing biodiversity values.	
	Subsidence impacts resulting in instability or rock fall of major or minor cliff lines and associated environmental consequence (i.e. lower level cliff lines and spur).	Section 3.2 and LMP (Appendix B)

Table 6 (Continued)
Key Potential Consequences/Hazards Identified by the Subsidence Risk Assessment

Subject Area	Potential Consequence/Hazard	Extraction Plan Reference
Heritage	Mine subsidence impacts on items of known Aboriginal heritage.	Section 3.4 and HMP (Appendix D)
Mine Infrastructure	Structural damage to wells and bores close to the mine footprint, in particular monitoring bores and Gas Riser 01.	Section 3.5 and BFMP (Appendix E)
	Subsidence impacts on access tracks restrict access for monitoring/remediation.	
	Ingress of oxygen into mine workings as a result of subsidence cracking and subsequent spontaneous combustion events.	
	North Wambo Creek Diversion damaged by subsidence (surface cracking along diversion directly above Longwalls 11 to 16) resulting in inflow to workings and delay to operations.	
	Impact on stability/serviceability of levee bank between North Wambo Creek and the open cut void leading to water flows into the Bates South pit.	
Other	Subsidence impacts resulting in injury to livestock.	Section 3.2 and LMP (Appendix B)

Source: After Operational Risk Mentoring (**Technical Report 4**).

2.3 CONSULTATION

Consultation is being conducted for the Extraction Plan in accordance with the requirements of the Development Consent (DA 305-7-2003) and in consideration of the Draft Extraction Plan Guidelines. Consultation with relevant stakeholders is described further below.

Evidence of WCPL's consultation process for the Extraction Plan is provided in **Attachment 2**.

2.3.1 Government Agencies

A summary of the consultation with government agencies and the key issues raised is provided in **Table 7**. Draft management plans were distributed for comment as summarised in **Table 8**. There are no 'affected public authorities' relevant to the Longwalls 11 to 16 Application Area, therefore the LMP was not distributed for comment.

Table 7
Summary of Consultation with Government Agencies

Agency	Consultation Conducted	Key Issues Raised
DP&E	<ul style="list-style-type: none"> 10 August 2015 – endorsement of Extraction Plan team for Longwalls 11 to 13. 11 August 2015 – review of Audit under Condition 37, Schedule 4. 27 August 2015 – draft BMP and HMP provided. September 2015 – briefing on Extraction Plan. October 2015 – provided with a copy of the Extraction Plan for Longwalls 11 to 13. 13 September 2016 – endorsement of Extraction Plan team for Longwalls 11 to 16. 28 October 2016 – draft BMP provided. 9 December 2016 – draft HMP provided. 	<ul style="list-style-type: none"> No issues raised to date.

Table 7 (Continued)
Summary of Consultation with Government Agencies

Agency	Consultation Conducted	Key Issues Raised
DRE	<ul style="list-style-type: none"> September 2014 – consultation on first workings for Longwalls 11 to 13. 4 June 2015 – approval of MOP including Longwalls 11 to 13. October 2015 – provided with a copy of the Extraction Plan for Longwalls 11 to 13. January 2016 – MOP amended to reflect approval of Longwalls 14 to 16 (DA 305-7-2003 MOD 15). December 2016 – information provided on upcoming Extraction Plan. 	<ul style="list-style-type: none"> Comments previously made in relation to rehabilitation commitments in the MOP (Appendix I).
NSW Environment Protection Authority (EPA)	<ul style="list-style-type: none"> 30 June 2015 – briefing email on Longwalls 11 to 13 and invitation to meet. October 2015 – provided with a copy of the Extraction Plan for Longwalls 11 to 13. 23 December 2016 – draft WMP provided. 	<ul style="list-style-type: none"> No issues raised to date.
NSW Office of Environment and Heritage (OEH)	<ul style="list-style-type: none"> 29 June 2015 – briefing email on Longwalls 11 to 13 and invitation to meet. 27 August 2015 – draft BMP and HMP provided. 2 September 2015 – comments provided on draft HMP. 22 September 2015 – comments provided on draft BMP. October 2015 – provided with a copy of the Extraction Plan for Longwalls 11 to 13. 28 October 2016 – draft BMP provided. 1 November 2016 – OEH advised it would not be providing further comments on the BMP. 9 December 2016 – draft HMP provided. 21 December 2016 – comments provided on draft HMP. 	<ul style="list-style-type: none"> No comments on HMP (satisfied that management measures are adequate and appropriate). Comments made on previous BMP for Longwalls 11 to 13 (incorporated into document).
Heritage Division, within OEH	<ul style="list-style-type: none"> 27 August 2015 – draft HMP provided. 2 September 2015 – comments provided on draft HMP. October 2015 – provided with a copy of the Extraction Plan for Longwalls 11 to 13. 9 December 2016 – draft HMP provided. 	<ul style="list-style-type: none"> In relation to Longwalls 11 to 13, comments on Wambo Homestead Complex (Appendix D and Section 3.4).
Department of Primary Industries – Water (DPI Water)	<ul style="list-style-type: none"> 6 July 2015 – briefing email on Longwalls 11 to 13 and invitation to meet. October 2015 – provided with a copy of the Extraction Plan for Longwalls 11 to 13. 23 December 2016 – draft WMP provided. 	<ul style="list-style-type: none"> Comments previously provided on Groundwater Monitoring Program (Appendix A).
Department of Primary Industries – Fisheries (DPI Fisheries)	<ul style="list-style-type: none"> October 2015 – provided with a copy of the Extraction Plan for Longwalls 11 to 13. 	<ul style="list-style-type: none"> No issues raised to date.

Table 7 (Continued)
Summary of Consultation with Government Agencies

Agency	Consultation Conducted	Key Issues Raised
Subsidence Advisory NSW (formerly NSW Mine Subsidence Board [MSB])	<ul style="list-style-type: none"> October 2015 – provided with a copy of the Extraction Plan for Longwalls 11 to 13. 23 December 2016 – briefing email provided on the Extraction Plan application. 	<ul style="list-style-type: none"> No issues raised to date.
Singleton Shire Council	<ul style="list-style-type: none"> 6 July 2015 – briefing email and invitation to meet. October 2015 – provided with a copy of the Extraction Plan for Longwalls 11 to 13. January 2017 – briefing on the Extraction Plan application. 	<ul style="list-style-type: none"> No issues raised to date.

Table 8
Management Plans Distributed for Comment

Management Plan	Agencies	Date Distributed
Water Management Plan (WMP)	DP&E, DPI Water, EPA DPI Water, EPA DP&E, DPI Water, EPA	October 2015 (Longwalls 11 to 13) 23 December 2016 (Longwalls 11 to 16) January 2017 (Longwalls 11 to 16)
Biodiversity Management Plan (BMP)	DP&E, OEH DP&E, OEH DP&E, OEH DP&E, OEH	27 August 2015 (Longwalls 11 to 13) October 2015 (Longwalls 11 to 13) 28 October 2016 (Longwalls 11 to 16) January 2017 (Longwalls 11 to 16)
Heritage Management Plan (HMP)	DP&E, OEH, Heritage Division (OEH), Aboriginal stakeholders DP&E, OEH, Heritage Division (OEH) DP&E, OEH, Heritage Division (OEH) DP&E, OEH, Heritage Division (OEH), Aboriginal stakeholders	27 August 2015 (Longwalls 11 to 13) October 2015 (Longwalls 11 to 13) 9 December 2016 (Longwalls 11 to 16) January 2017 (Longwalls 11 to 16)
Subsidence Monitoring Program	DRE DRE	October 2015 (Longwalls 11 to 13) January 2017 (Longwalls 11 to 16)

2.3.2 Infrastructure Owners

All infrastructure within the Longwalls 11 to 16 Application Area is owned by WCPL and there are no other relevant infrastructure owners.

2.3.3 Public Consultation

The consultation approach for the Extraction Plan reflects that the Application Area is wholly within WCPL owned land.

The Community Consultative Committee (CCC) was briefed on the Extraction Plan at the meetings held in June 2015 and September 2015 in relation to Longwalls 11 to 13 and notified of the update to include Longwalls 14 at 16 via correspondence in August 2016.

An electronic copy of the Extraction Plan will be distributed to the members of the CCC for consultation purposes and the final Extraction Plan will be placed on the WCPL website.

2.3.4 Consultation with Aboriginal Stakeholders

A draft HMP for Longwalls 11 to 13 was provided to Aboriginal parties registered at the Wambo Coal Mine in August 2015 for their review and comment on the management of Aboriginal sites in the Longwalls 11 to 13 Application Area (**Appendix D**).

Lower Hunter Aboriginal Incorporated members noted they agreed and supported the HMP. The Wanaruah Local Aboriginal Land Council provided comments on the draft HMP that were considered in the finalisation of this document. No other comments from Aboriginal parties were received.

Aboriginal stakeholders were consulted on the management of Aboriginal sites associated with Longwalls 14 to 16 through the preparation of a Cultural Heritage Impact Assessment that accompanied the South Bates (Wambo Seam) Modification EA (DA 305-7-2003 MOD 15) and associated application for an AHIP. Consultation was conducted in accordance with the OEH policy *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (NSW Department of Environment, Climate Change and Water [DECCW], 2010) and Condition 56A, Schedule 4 of the Development Consent DA 305-7-2003.

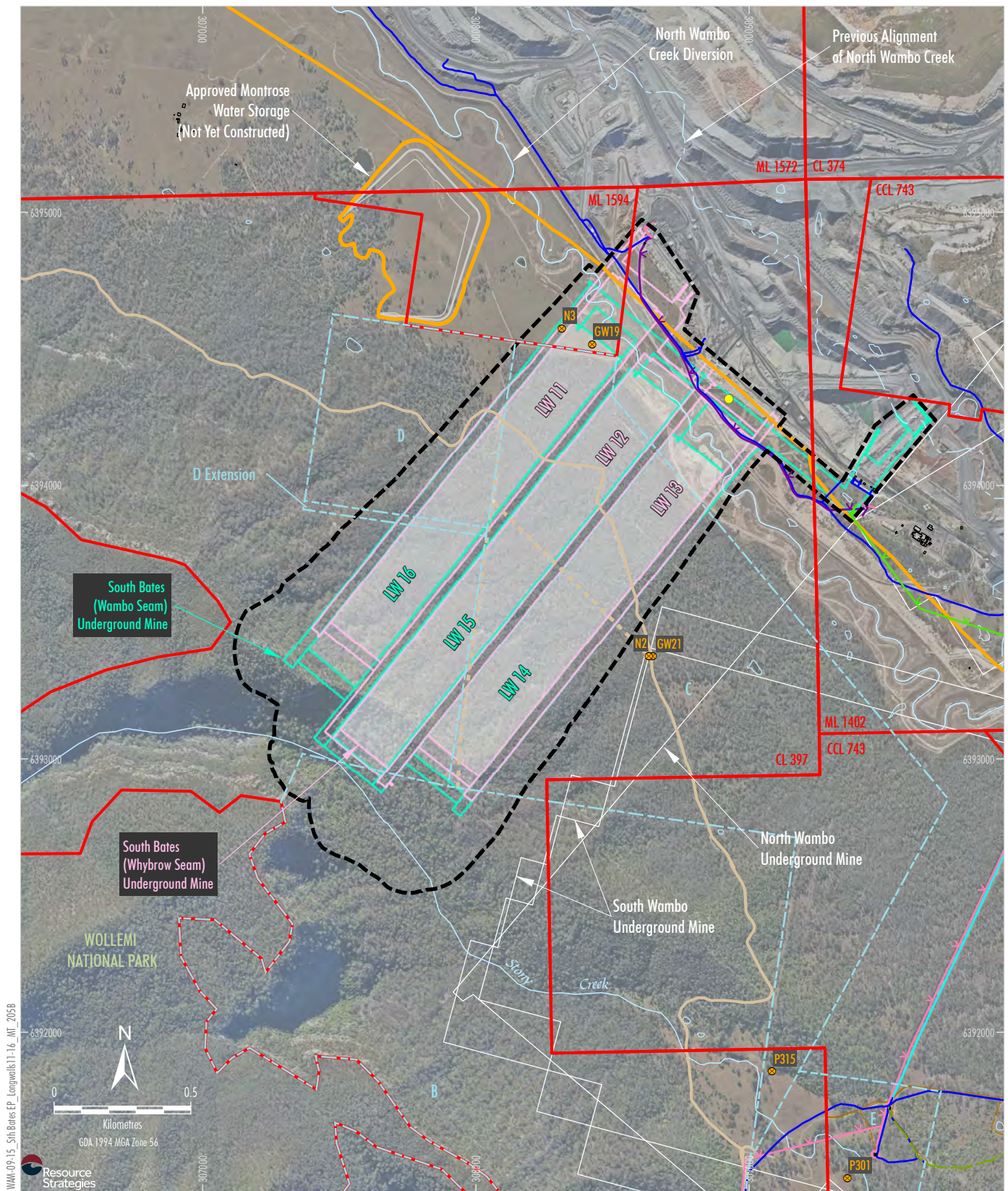
3 SUBSIDENCE MANAGEMENT AND MONITORING

Surface and sub-surface features within the Application Area are listed in **Table 9**. These features may be potentially impacted by the secondary extraction of Longwalls 11 to 16. The location of built features is shown in **Figure 8** and environmental features are shown in **Figures 3 and 10**. Descriptions of each of these features are contained within the relevant management plan referenced in **Table 9**.

The Application Area is located wholly within the Patrick Plains Mine Subsidence District (proclaimed 2 July 1980). Fences, gates, and tracks are the only man-made structures in the Application Area known to have been constructed prior to declaration of the Mine Subsidence District.

Table 9
Surface and Sub-surface Features

Feature	Section/Management Plan Reference
Natural Features	
Stony Creek	Section 3.1 and WMP (Appendix A)
Other ephemeral drainage lines	
Permian aquifers	
Threatened and protected species	Section 3.3 and BMP (Appendix C)
Natural vegetation	
Cliffs	Section 3.2 and LMP (Appendix B)
Steep slopes	
Farm Land and Facilities	
Use of WCPL land for agistment	Section 3.2 and LMP (Appendix B)
Fences and gates	
Mine Infrastructure	
North Wambo Creek Diversion	Section 3.1 and WMP (Appendix A)
Buried 11 kilovolt (kV) powerlines, telecommunication and fibre optic cables	Section 3.5 and BFMP (Appendix E)
Water supply pipelines and associated pumps and ancillary infrastructure	
Groundwater monitoring bores	
Bates South pit walls	
Exploration drill holes	
Fences	
Gas Riser 01	
Unsealed roads	
Site access tracks	
Other unsealed tracks	
Exploration plant that may be located in the Application Area	
Drainage culverts	
Areas of Archaeological and/or Heritage Significance	
Aboriginal cultural heritage sites (artefact scatters, isolated finds)	Section 3.4 and HMP (Appendix D)



LEGEND

- | | |
|--|--|
| --- Remnant Woodland Enhancement Program (RWEF) Area | --- 11 kV Power Line |
| --- Mining and Coal Lease Boundary | --- 11 kV Power Line Buried |
| --- Existing/Approved Surface Development Area | --- 66 kV Power Line and Fibre Optic Cable |
| --- South Bates (Whybrow Seam) Underground Mine | --- Surface Water Supply/Dewatering Pipeline |
| --- South Bates (Wambo Seam) Underground Mine | --- Buried Water Supply/Dewatering Pipeline |
| --- Other Approved Underground Development | Buildings |
| --- Extraction Plan Application Area | --- Dams |
| --- Fire Trail | ● Groundwater Monitoring Site |
| --- Access Track | ● Gas Riser 01 |

Peabody
ENERGY

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

Location of Built Features

Source: Department of Lands (July 2009); MSEC (2013); WCPL (2016); WCPL Orthophoto (July 2016)

Figure 8

The Application Area is wholly within WCPL owned land and there are no relevant proposed developments within the Application Area proposed by other parties.

Wollemi National Park (and its escarpment) may be considered an area of environmental sensitivity. Longwalls 11 to 16 would meet the performance measures of negligible subsidence impacts and negligible environmental consequences for the Wollemi National Park.

Subsidence predictions and impacts to surface and sub-surface features have been provided in **Technical Report 1**. Management and monitoring actions for each feature are included in each of the management plans as indicated in **Table 9** and summarised in **Sections 3.1 to 3.7**.

The component management plans to this Extraction Plan form part of WCPL's Environmental Management System for the Wambo Coal Mine as shown on **Figure 4**. In order to avoid duplication of existing Environmental Management Plans these management plans reference components of the following existing plans:

- Site Water Management Plan, including:
 - Surface Water Monitoring Program (SWMP) (revisions to this plan proposed as part of this Extraction Plan);
 - Groundwater Monitoring Program (GWMP);
 - Surface and Groundwater Response Plan (SGWRP)¹; and
 - Erosion and Sediment Control Plan (ESCP)².
- Biodiversity Management Plan (BMP) (complex-wide consolidated plan)³.
- Health Safety Management System (HSMS) as summarised in the HSMS Overview.

A summary of the proposed monitoring for the Extraction Plan is provided in **Section 3.8**.

3.1 WATER MANAGEMENT

3.1.1 Overview

The WMP is provided in **Appendix A**. The purpose and scope of the WMP are summarised below:

Purpose: Management of potential environmental consequences of the proposed secondary workings described in the Extraction Plan on water resources.

Scope: Surface water resources, groundwater resources and flooding within the Longwalls 11 to 16 Application Area (**Figure 3**).

The WMP references components of the SWMP, GWMP and SGWRP.

3.1.2 Key Water Issues, Monitoring and Management Measures

The key issues relating to subsidence impacts on surface water resources, groundwater resources and flooding described in the WMP and the relevant monitoring and management measures are summarised in **Table 10**.

The WMP addresses monitoring and management measures for Stony Creek and other ephemeral drainage lines in the Longwalls 11 to 16 Application Area.

¹ Version 10 submitted to DP&E in May 2016 awaiting approval.

² Version 8 submitted to DP&E in April 2016 awaiting approval.

³ Version 11 submitted to DP&E in October 2016 awaiting approval.

Table 10
Water Management Issues Associated with the Extraction of Longwalls 11 to 16

Issue	Approved Impact	Revised Impact	Monitoring	Management
Surface Water				
North Wambo Creek Diversion	<ul style="list-style-type: none"> In-channel ponding up to 1.4 m deep and up to 250 m long.¹ Potential for increased scour (and associated suspended solids) prior to the implementation of scour protection works.¹ Potential for increased leakage from the North Wambo Creek Diversion prior to crack remediation works.¹ 	<ul style="list-style-type: none"> Impacts resulting from the extraction of Longwalls 11 to 16 will be consistent with those presented in the South Bates (Wambo Seam) Modification EA, including: <ul style="list-style-type: none"> an increase of in-channel storage compared to the existing channel that would have minimal impacts on flows in North Wambo Creek; potential for erosion as a result of unremediated subsidence cracking; potential for increased bed and bank erosion upstream of Longwalls 11 and 16; erosion of the elevated section of channel bed that would form over the pillar between Longwalls 11 and 12; potential for an increase in suspended sediments from increased bed and bank erosion and erosion from overland flow entry; and changes in baseflow conditions due to the effects of underground mining.² 	<ul style="list-style-type: none"> Monitoring of subsidence in accordance with the Subsidence Monitoring Program (Appendix H). Subsidence and diversion monitoring program in accordance with the SWMP, including: <ul style="list-style-type: none"> surface water quality and flow monitoring; monitoring of the Index of Diversion Condition (IDC); Landscape Function Analysis (LFA) monitoring; riparian vegetation assessment; aerial photography analysis; analysis of long and cross-section surveys; and reviews of the geomorphic condition and assessment of efficacy of subsidence management or rehabilitation works. Monitoring in accordance with the GWMP, including inflows to underground workings. Daily visual inspections when extraction is occurring directly beneath North Wambo Creek Diversion. Visual inspection of surface areas which required remediation in accordance with the LMP (Appendix B). 	<ul style="list-style-type: none"> Stockpile sufficient materials and make equipment and necessary resources available for remediation prior to extraction under the North Wambo Creek Diversion. Remediation of all visible surface cracks in the low flow channel as soon as practicable (nominally within two weeks). Installation of scour protection works in areas that may be vulnerable to scour. Construction of new batter chutes to manage overland flow entry to the North Wambo Creek Diversion. Stabilisation of any areas of surface cracking or erosion using erosion protection measures (e.g. vegetation planting). Review of remediation measures and implementation of additional measures if required. Implementation of the SGWRP.

Table 10 (Continued)
Water Management Issues Associated with the Extraction of Longwalls 11 to 16

Issue	Approved Impact	Revised Impact	Monitoring	Management
Stony Creek	<ul style="list-style-type: none"> No adverse changes in the level of ponding or scouring.¹ Visible cracking may occur in the bed of Stony Creek.¹ No significant pH impacts and no changes in suspended solids or salinity.¹ 	<ul style="list-style-type: none"> Predicted subsidence effects and impacts on Stony Creek have reduced compared to previous assessments as a result of shortening the commencing ends of Longwalls 13 and 14.³ Impacts resulting from the extraction of Longwalls 11 to 16 will be consistent with, or less than, those presented in the South Bates (Wambo Seam) Modification EA. 	<ul style="list-style-type: none"> Monitoring of subsidence in accordance with the Subsidence Monitoring Program (Appendix H). Monitoring in accordance with the SWMP, including bed and bank stability monitoring and surface water quality and flow monitoring. Monitoring in accordance with the GWMP. 	<ul style="list-style-type: none"> Post-subsidence assessment of impacts to Stony Creek and implementation of any minor remedial works. Implementation of the SGWRP.
Other Ephemeral Drainage Lines	<ul style="list-style-type: none"> Localised increased ponding and surface cracking.¹ 	<ul style="list-style-type: none"> Impacts resulting from the extraction of Longwalls 11 to 16 will be consistent with those presented in the South Bates (Wambo Seam) Modification EA. 	<ul style="list-style-type: none"> Visual inspection of drainage line flow paths for evidence of erosion or channelization following a rainfall event of greater than 40 mm in 24 hours.⁵ 	<ul style="list-style-type: none"> Post-subsidence assessment of impacts to drainage lines and implementation of any minor remedial works. Implementation of the SGWRP.
Groundwater				
Permian Aquifers	<ul style="list-style-type: none"> Dewatering of the Permian aquifer and lowering of groundwater levels.¹ Impact on Permian water quality through mining will not be detrimental to the area.¹ 	<ul style="list-style-type: none"> No revision of the potential environmental consequences is required.⁴ 	<ul style="list-style-type: none"> Monitoring in accordance with the GWMP. 	<ul style="list-style-type: none"> Implementation of the SGWRP.

¹ After the Wambo Development Project EIS (WCPL, 2003) and the South Bates (Wambo Seam) Modification EA (WCPL, 2015).

² After Alluvium (**Technical Report 3**).

³ After MSEC (**Technical Report 1**).

⁴ After HydroSimulations (**Technical Report 2**).

⁵ Inspection to occur once access is practically available following the rainfall event. Inspections would not occur for subsequent rainfall events within 7 days of previous inspection.

The WMP also address monitoring and management measures for the North Wambo Creek Diversion, a constructed water control structure for the Wambo Coal Mine. A summary of potential impacts on the North Wambo Creek Diversion is provided in **Section 2.1.2**, with further detail provided by Alluvium (**Technical Report 3**).

3.1.3 Assessment of Performance Indicators and Measures

Performance indicators developed for the subsidence impact performance measures relating to water are presented in the WMP and are summarised in **Table 11**. Monitoring conducted to inform the assessment of the extraction of Longwalls 11 to 16 against these performance indicators is summarised in **Section 3.8** and **Appendix H**.

The procedure followed to assess the extraction of Longwalls 11 to 16 against the performance indicators and performance measures is outlined in **Figure 9** and described in detail in **Appendix A**.

3.1.4 Contingency Plan

In the event that the subsidence impact performance measures relating to water summarised in **Table 11** are considered to have been exceeded or are likely to be exceeded, WCPL will implement a Contingency Plan as described in **Section 4.1**. Potential contingency measures for the performance measures relating to water are outlined in **Table 11**.

3.2 LAND MANAGEMENT

3.2.1 Overview

The LMP is provided in **Appendix B**. The purpose and scope of the LMP are summarised below:

Purpose: Management of potential environmental consequences of the proposed secondary workings described in the Extraction Plan on land in general.

Scope: Land in general within the Longwalls 11 to 16 Application Area (**Figure 3**).

The LMP references components of the ESCP.

3.2.2 Key Land Issues, Monitoring and Management Measures

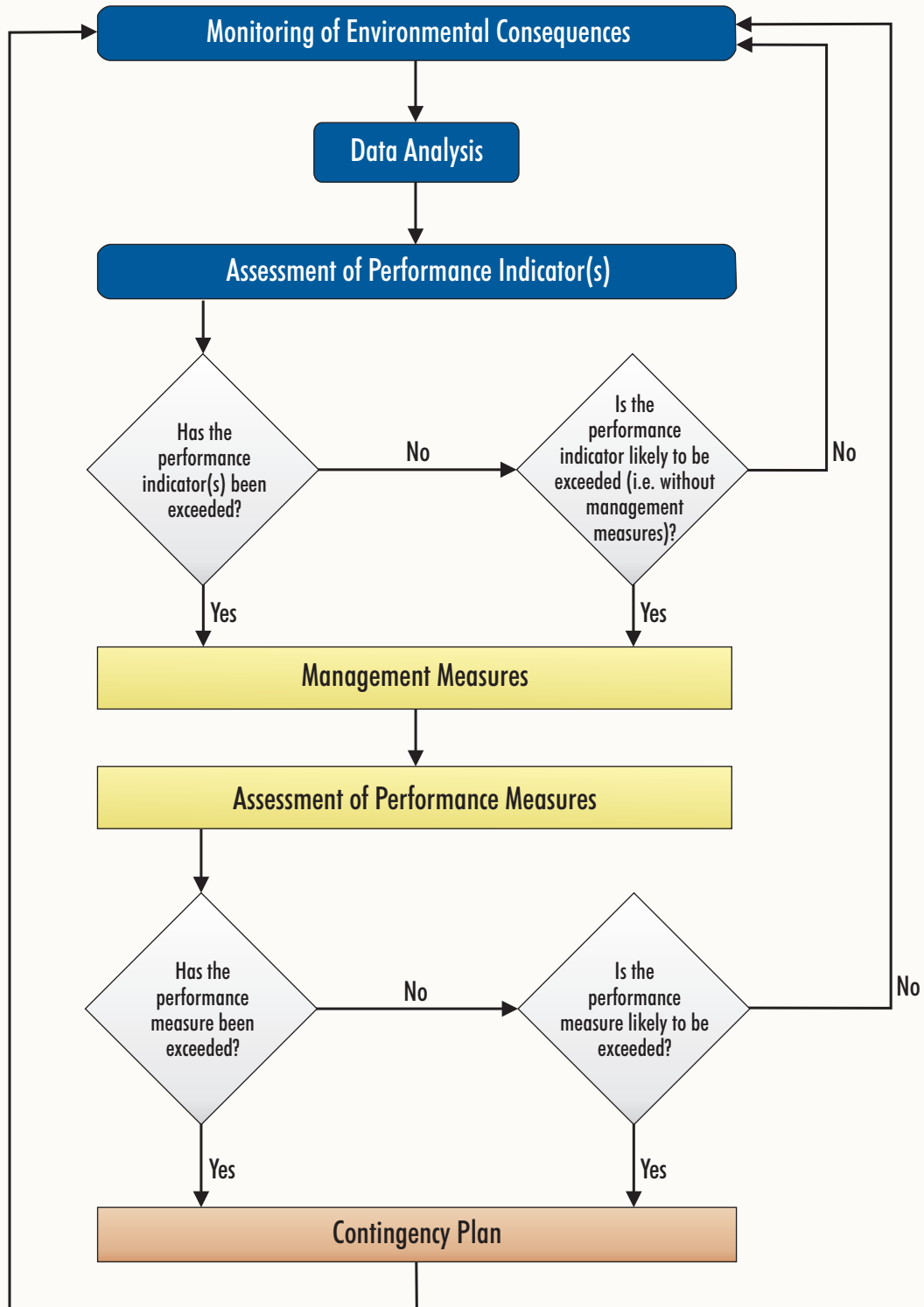
The Longwalls 11 to 16 Application Area is wholly located on WCPL owned land and land uses include the North Wambo Creek Diversion, RWEF areas and occasionally the agistment of stock.

MSEC (**Technical Report 1**) identified cliffs near the Wollemi National Park escarpment and over the Longwalls 11 to 16 Application Area using Light Detection and Ranging (LiDAR) and separated them into three categories to assess the effects of subsidence on each separately: cliffs associated with the Wollemi National Park escarpment, the lower levels of cliffline and the cliffs along the spur to the south-west of Longwalls 11 to 16. The location of these cliffs is shown on **Figure 10**.

Table 11
Water Performance Measures, Performance Indicators and Contingency Measures for Longwalls 11 to 16

Performance Measure	Performance Indicator(s)	Relevant Management and Contingency Measures
<p>Negligible subsidence impacts.</p> <p>Negligible environmental consequences.</p>	<ul style="list-style-type: none"> The performance indicators will be considered to have been exceeded if the surface water quality in Wollombi Brook exceeds the surface water quality criteria in the SWMP. The performance indicators will be considered to have been exceeded if the groundwater levels in alluvial bores exceed the groundwater level criteria in the GWMP. The performance indicators will be considered to have been exceeded if the groundwater quality in alluvial bores exceeds the groundwater quality criteria in the GWMP. The performance indicators will be considered to have been exceeded if zero flow is recorded at the Warkworth gauging station (FM10) and measurable flow is recorded at the Bulga gauging station (FM11). 	<ul style="list-style-type: none"> Consider whether the performance measure has been exceeded based on subsidence, groundwater and surface water monitoring data and hydrological and/or hydrogeological analysis. If the performance measure has been exceeded, implement a Contingency Plan, which may include: <ul style="list-style-type: none"> Implementation of stream flow loss remediation techniques (e.g. injection grouting or installation of a geomembrane). Provision of offsets (i.e. retirement of an equivalent volume of water licence). Implementation of erosion and sediment control measures and stabilisation techniques. Additional monitoring (e.g. increase in monitoring frequency). Consideration of changes to longwall extraction geometry in consultation with relevant regulatory authorities.

CONTINGENCY MANAGEMENT



MSEC (**Technical Report 1**) notes that it is difficult to assess the likelihood of cliff instabilities based upon predicted subsidence effects, as the likelihood of a cliff being unstable is dependent on a number of factors which are difficult to fully quantify.

Therefore, MSEC based its assessment on case studies where longwalls have been extracted directly beneath cliffs having similar mine subsidence parameters (i.e. similar depths of cover, similar cliff sizes and proximities, etc.). It is expected that:

- the cliffs associated with the Wollemi National Park escarpment will be unlikely to experience any adverse impacts;
- one cliff above Longwalls 12 and 15 (CL-SP1) could experience cliff instability, however the impact would represent a very small percentage of the total length or total face area of the cliffs along the spur; and
- the other cliffs along the spur and the lower level cliffs could possibly experience isolated and minor rock falls, however no large scale cliff failures are expected (MSEC, 2017).

Potential impacts on agricultural activities within the Longwalls 11 to 16 Application Area include:

- possible injury to persons undertaking agricultural activities;
- possible injury to livestock caused by surface cracking; and
- loss of integrity of stock fences.

The key issues relating to subsidence impacts on land in general described in the LMP and the relevant monitoring and management measures are summarised in **Table 12**.

3.2.3 Assessment of Performance Indicators and Measures

No subsidence impact performance measures specifically relate to land in general. Subsidence impact performance measures relating to the Wollemi National Park and associated escarpment are addressed in the BMP (**Section 3.3**).

3.2.4 Contingency Plan

In the event that subsidence impacts to land in general have occurred and are not effectively mitigated by the management measures summarised in **Table 12**, WCPL will implement a Contingency Plan as described in **Section 4.1**.

Table 12
Management Issues for Land in General Associated with the Extraction of Longwalls 11 to 16

Issue	Approved Impact	Revised Impact	Monitoring	Management
Land Use	<ul style="list-style-type: none"> • Surface cracking.¹ • Increased erosion.¹ • Ponding of surface water in areas where isolated depressions form.¹ • Increased depth and duration of inundation during flood events.¹ 	<ul style="list-style-type: none"> • Impacts resulting from the extraction of Longwalls 11 to 16 will be consistent with, or less than, those presented in the South Bates (Wambo Seam) Modification EA. 	<ul style="list-style-type: none"> • Monitoring of subsidence in accordance with the Subsidence Monitoring Program (Appendix H). • Visual observations of fences. • Visual observations of the ground surface. • Visual observations of low lying areas (i.e. the North Wambo Creek Diversion) following significant rainfall events. 	<ul style="list-style-type: none"> • Notification to agistees of areas of longwall mining and active subsidence, and exclusion of agistment grazing from areas where surface cracking presents a reasonable risk to people and/or livestock. • Remediation of surface cracks² where practicable using conventional earthmoving equipment (e.g. a backhoe) including: <ul style="list-style-type: none"> – infilling of surface cracks with soil or other suitable materials; or – locally re-grading and re-compacting the surface. • Stabilisation of any areas of surface cracking using erosion protection measures (e.g. vegetation planting). • Drainage works and rehabilitation of subsidence troughs (i.e. areas of induced ponding) as necessary. • Repair of fences prior to allowing access for agistment grazing. • Management measures in accordance with the ESCP.
Land Capability				
Steep Slopes				

Table 12 (Continued)
Management Issues for Land in General Associated with the Extraction of Longwalls 11 to 16

Issue	Approved Impact	Revised Impact	Monitoring	Management
Wollemi National Park Escarpment	<ul style="list-style-type: none"> No material subsidence to the Wollemi National Park.¹ 	<ul style="list-style-type: none"> The predicted subsidence effects for the cliffs associated with the Wollemi National Park escarpment are less than 20 mm (i.e. “no” vertical subsidence).³ 	<ul style="list-style-type: none"> Visual observations of cliffs for signs of recent rock fall and/or instability (high definition video/photos recorded via an unmanned aerial vehicle [UAV]). 	<ul style="list-style-type: none"> Relevant management and contingency measures if the performance measure has been exceeded are addressed in the BMP (Section 3.3).
Lower Level Cliffs and Cliffs along the Spur	<ul style="list-style-type: none"> Cliffs along the spur will likely experience impacts along some sections of the cliffs (predicted to be less than 5% of their total lengths).¹ Lower level cliffs could possibly experience isolated and minor rock falls.¹ 	<ul style="list-style-type: none"> One cliff along the spur above Longwalls 12 and 15 could experience cliff instability.³ Other cliffs along the spur and the lower level cliffs could possibly experience isolated and minor rock falls.³ 	<ul style="list-style-type: none"> Visual observations of cliffs for signs of recent rock fall and/or instability (high definition video/photos recorded via an UAV). 	<ul style="list-style-type: none"> Measures to stabilise/mitigate impacts to rock faces/cliffs if considered beneficial and practicable in consultation with DP&E and DRE (e.g. artificial rock support, standing supports, dislodgement of remaining loose rock etc.).
Surface Water	<ul style="list-style-type: none"> Addressed in the WMP (Section 3.1). 	<ul style="list-style-type: none"> Addressed in the WMP (Section 3.1). 	<ul style="list-style-type: none"> Addressed in the WMP (Section 3.1). 	<ul style="list-style-type: none"> Addressed in the WMP (Section 3.1).

¹ After the Wambo Development Project EIS (WCPL, 2003) and the South Bates (Wambo Seam) Modification EA (WCPL, 2015).

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

³ After MSEC (**Technical Report 1**).

3.3 BIODIVERSITY MANAGEMENT

3.3.1 Overview

The BMP is provided in **Appendix C**. The purpose and scope of the BMP are summarised below:

Purpose: Management strategies, procedures, controls and monitoring programs required to manage flora and fauna at the Wambo Coal Mine, including management of potential environmental consequences of the proposed secondary workings described in this Extraction Plan.

Scope: All activities undertaken within WCPL's mining authorisations and approved mining areas that may impact on biodiversity (including the Longwalls 11 to 16 Application Area) as well as biodiversity in WCPL's RWEPP areas and open cut revegetation areas.

3.3.2 Key Biodiversity Issues, Monitoring and Management Measures

The key issues relating to subsidence impacts on biodiversity are described in the BMP and the relevant monitoring and management measures are summarised in **Table 13**.

FloraSearch (2015) recorded one endangered ecological community (EEC) listed under the NSW *Threatened Species Conservation Act, 1995* in the Longwalls 11 to 16 Application Area, namely the *Central Hunter Grey Box – Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions* EEC.

3.3.3 Assessment of Performance Indicators and Measures

Performance indicators developed for the subsidence impact performance measures relating to biodiversity relevant to the extraction of Longwalls 11 to 16 are presented in the BMP and are summarised in **Table 14**. Monitoring conducted to inform the assessment of the extraction of Longwalls 11 to 16 against these performance indicators is summarised in **Section 3.8** and **Appendix H**.

The procedure followed to assess the extraction of Longwalls 11 to 16 against the performance indicators and performance measures is outlined in **Figure 9** and described in detail in **Appendix C**.

As described in **Appendix C**, monitoring of environmental consequences against performance indicators and measures relating to the Warkworth Sands Woodland EEC and the *White Box, Yellow Box, Blakely's Red Gum Woodland/Grassy White Box Woodland* EEC/Critically Endangered Ecological Community is not considered necessary for Longwalls 11 to 16. Monitoring relevant to these communities will be addressed in subsequent Extraction Plans.

3.3.4 Contingency Plan

In the event that the subsidence impact performance measures relating to biodiversity summarised in **Table 14** are considered to have been exceeded or are likely to be exceeded, WCPL will implement a Contingency Plan as described in **Section 4.1**. Potential contingency measures for the performance measures relating to biodiversity relevant to the extraction of Longwalls 11 to 16 are outlined in **Table 14**.

Table 13
Biodiversity Management Issues Associated with the Extraction of Longwalls 11 to 16

Issue	Approved Impact	Revised Impact	Monitoring	Management
Flora	<ul style="list-style-type: none"> Ponding of surface water in areas where isolated depressions form.¹ A change in flora species composition and structure expected to occur as a result of increased ponding, which is likely to occur along and adjacent to the North Wambo Creek Diversion (where remnant vegetation is absent).¹ Impacts are unlikely to place any threatened flora species, populations, ecological communities, or their habitats at risk of extinction.¹ 	<ul style="list-style-type: none"> Impacts resulting from the extraction of Longwalls 11 to 16 will be consistent with those presented in the South Bates (Wambo Seam) Modification EA. 	<ul style="list-style-type: none"> Monitoring of subsidence in accordance with the Subsidence Monitoring Program (Appendix H). Monitoring in accordance with the BMP. This monitoring includes: <ul style="list-style-type: none"> – monitoring of revegetation of disturbance areas (including areas subject to subsidence from underground mining); – monitoring of the RWEF areas; and – riparian zone monitoring transects. Visual inspections as described in Section 3.8, the BMP and the Subsidence Monitoring Program (Appendix H). 	<ul style="list-style-type: none"> The Vegetation Clearance Protocol (VCP), described in the BMP. The Threatened Species Management Protocol (TSMP), described in the BMP. Management measures for the RWEF areas, described in the BMP. Rehabilitation as described in the MOP.
Fauna	<ul style="list-style-type: none"> Impacts are unlikely to affect any threatened fauna species to the extent of undermining the viability of a local population of that species.¹ 	<ul style="list-style-type: none"> Impacts resulting from the extraction of Longwalls 11 to 16 will be consistent with those presented in the South Bates (Wambo Seam) Modification EA. 		
Aquatic Ecosystems	<ul style="list-style-type: none"> Alterations to aquatic habitat due to the approved operations are unlikely to significantly alter the macroinvertebrate or fish community composition, or the conservation values of North Wambo Creek and Stony Creek.¹ 	<ul style="list-style-type: none"> Maximum predicted subsidence parameters and the potential for environmental consequences for Stony Creek have reduced.² Environmental consequences on aquatic ecosystems would be generally consistent with or less than those presented in the South Bates (Wambo Seam) Modification EA. 		

Table 13 (Continued)
Biodiversity Management Issues Associated with the Extraction of Longwalls 11 to 16

Issue	Approved Impact	Revised Impact	Monitoring	Management
Wollemi National Park	<ul style="list-style-type: none"> No material subsidence to the Wollemi National Park.¹ 	<ul style="list-style-type: none"> Impacts resulting from the extraction of Longwalls 11 to 16 will be consistent with those presented in the South Bates (Wambo Seam) Modification EA.² 	<ul style="list-style-type: none"> Visual observations of cliffs for signs of recent rock fall and/or instability (high definition video/photos recorded via an UAV). 	<ul style="list-style-type: none"> If monitoring detects impacts resulting from the extraction of Longwalls 11 to 16, relevant management and contingency measures presented in the BMP and summarised in Table 14 will be implemented.

¹ After the Wambo Development Project EIS (WCPL, 2003) and the South Bates (Wambo Seam) Modification EA (WCPL, 2015).

² After MSEC (**Technical Report 1**).

Table 14
Biodiversity Performance Measures, Performance Indicators and Contingency Measures for Longwalls 11 to 16

Performance Measure	Performance Indicator(s)	Relevant Management and Contingency Measures
Wollemi National Park Negligible subsidence impacts. Negligible environmental consequences.	<ul style="list-style-type: none"> The performance indicators will be considered to have been exceeded if conventional vertical subsidence exceeds 20 mm or the limit of survey accuracy (whichever is greater) at the base of the Wollemi National Park escarpment. The performance indicators will be considered to have been exceeded if visual inspections identify cliff or rock face instability at the Wollemi National Park escarpment. 	<ul style="list-style-type: none"> Consider whether the performance measure has been exceeded. If the performance measure has been exceeded, implement a Contingency Plan, which may include: <ul style="list-style-type: none"> Implementation of erosion and sediment control measures and stabilisation techniques. Scaling/dislodgement/removal of remaining loose rock. Measures to improve the aesthetic values if cliff instability occurs (e.g. planting of endemic native vegetation at the base of the escarpment). Additional monitoring (e.g. increase in monitoring frequency). Consideration of changes to longwall extraction geometry in consultation with relevant regulatory authorities. Offset in accordance with Condition 22, Schedule 4 of the Development Consent (DA 305-7-2003).
Other threatened species, populations or communities Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences.	<ul style="list-style-type: none"> The performance indicator will be considered to have been exceeded if annual monitoring at flora monitoring sites V6-B1c and V11-B1 or bird monitoring sites above Longwalls 11 to 16 indicate a statistically significant downward trend or change between monitoring periods not observed at analogue/reference sites. 	<ul style="list-style-type: none"> Consider whether the performance measure has been exceeded. If the performance measure has been exceeded, implement a Contingency Plan, which may include: <ul style="list-style-type: none"> Filling of minor cracks with appropriate material (e.g. soil or mulch) to avoid the creation of drainage channels. Re-grading of isolated depressions or highpoints and revegetation. Re-grading of slopes to minimise the potential for erosion. Remediation of creek beds to minimise bank and headwater erosion. Revegetation with monitoring in accordance with the MOP. Additional monitoring (e.g. increase in monitoring frequency). Offset in accordance with Condition 22, Schedule 4 of the Development Consent (DA 305-7-2003).

3.4 HERITAGE MANAGEMENT

3.4.1 Overview

The HMP is provided in **Appendix D**. The purpose and scope of the HMP are summarised below:

Purpose: Consolidated description of the management of Aboriginal heritage and historic heritage at the Wambo Coal Mine, incorporating the requirements of the existing AHIPs #2222 and #C0001474 and Development Consent (DA 305-7-2003), including management of potential environmental consequences of the proposed secondary workings described in the Extraction Plan on heritage sites or values.

Scope: The extent of the Development Application area of the Development Consent (DA 305-7-2003).

3.4.2 Key Heritage Issues, Monitoring and Management Measures

There are no listed heritage items in the Longwalls 11 to 16 Application Area under: the Australian Heritage Database (which incorporates the National Heritage List, the Register of the National Estate and the Commonwealth Heritage List); the NSW Heritage Inventory; or the *Singleton Local Environmental Plan 2013*.

No non-Aboriginal heritage items have been identified in the Longwalls 11 to 16 Application Area by other studies at the Wambo Coal Mine (EJE Town Planning, 2003; RPS Australia East Pty Limited, 2015).

Aboriginal sites located by surveys are identified in WCPL's Aboriginal heritage site database and shown in the HMP.

The key issues relating to subsidence impacts on heritage sites and values described in the HMP and the relevant monitoring and management measures are summarised in **Table 15**.

3.4.3 Assessment of Performance Indicators and Measures

The Wambo Homestead Complex is located approximately 2.8 km south-east of the Longwalls 11 to 16 Application Area and will experience no measurable subsidence from the South Bates Underground Mine. Monitoring of consequences against performance indicators and measures relating to the Wambo Homestead Complex is not considered necessary for Longwalls 11 to 16. Monitoring and management measures for the Wambo Homestead Complex were addressed in previous Extraction Plans for the North Wambo Underground Mine.

Performance indicators developed for heritage sites and values relevant to the extraction of Longwalls 11 to 16 are presented in the HMP and are summarised in **Table 15**. Monitoring conducted to inform the assessment of the extraction of Longwalls 11 to 16 against the performance indicators is summarised in **Section 3.8** and **Appendix H**.

The procedure followed to assess the extraction of Longwalls 11 to 16 against the performance indicators and performance measures is outlined in **Figure 9** and described in detail in **Appendix D**.

3.4.4 Contingency Plan

In the event that the impacts relating to Aboriginal cultural heritage summarised in **Table 15** are considered to have been exceeded or are likely to be exceeded, WCPL will implement a Contingency Plan as described in **Section 4.1**.

Table 15
Heritage Management Issues Associated with the Extraction of Longwalls 11 to 16

Issue	Approved Impact	Revised Impact	Monitoring	Management
Aboriginal Cultural Heritage	<ul style="list-style-type: none"> Potential for surface cracking in the vicinity of surface artefacts, although unlikely that the artefact scatters or isolated finds themselves would be adversely impacted.¹ Potential for impacts to grinding groove sites recorded above Longwalls 11 to 16.¹ Consent to damage or destroy all Aboriginal cultural heritage sites within the extent of AHIP #2222 and #C0001474. 	<ul style="list-style-type: none"> Impacts to surface artefacts resulting from the extraction of Longwalls 11 to 16 will be consistent with those presented in the South Bates (Wambo Seam) Modification EA. Following their initial recording, the grinding groove sites were re-assessed by a suitably qualified archaeologist and determined not to be of Aboriginal origin (South East Archaeology, 2016a, 2016b).² 	<ul style="list-style-type: none"> Monthly during extraction of longwall panels in immediate proximity to surface artefact sites. 	<ul style="list-style-type: none"> If subsidence monitoring identifies cracking or erosion proximal to a site, artefacts will be salvaged in accordance with the protocols in the HMP. WCPL will maintain a database of site locations and locate any surface activities to avoid impacts to Aboriginal sites where practicable.

¹ After the South Bates (Wambo Seam) Modification EA (WCPL, 2015).

² Copies of these reports were provided to all Aboriginal parties registered at the Wambo Coal Mine and to the OEH.

3.5 BUILT FEATURES MANAGEMENT

3.5.1 Overview

The BFMP is provided in **Appendix E**. The purpose and scope of the BFMP are summarised below:

Purpose: Management of all public infrastructure and all classes of other built features for the proposed secondary workings described in the Extraction Plan.

Scope: All public infrastructure and all other classes of built features within the Longwalls 11 to 16 Application Area (**Figure 8**).

The BFMP comprises one component plan, the WCPL Asset Management Plan (WAMP), which provides further detail on the management of WCPL assets.

3.5.2 Key Built Features Issues, Monitoring and Management Measures

Built features within the Longwalls 11 to 16 Application Area consist of a number of WCPL owned assets (as described in **Table 9** and the WAMP) (**Figure 8**).

The key issues relating to management of these built features in regard to subsidence impacts is described in the WAMP. A summary of the relevant monitoring and management measures for these built features is provided in **Table 16**.

The Longwalls 11 to 16 Application Area does not intersect the Notification Area of any Prescribed Dam gazetted under the *Dams Safety Act, 1978*.

3.5.3 Assessment of Performance Indicators and Measures

Performance indicators developed for the subsidence impact performance measures relating to built features relevant to the extraction of Longwalls 11 to 16 are presented in the WAMP and summarised in **Table 17**. Monitoring conducted to inform the assessment of the extraction of Longwalls 11 to 16 against these performance indicators is summarised in **Section 3.8** and **Appendix H**.

The procedure followed to assess the extraction of Longwalls 11 to 16 against the performance indicators and performance measures is outlined in **Figure 9** and described in detail in **Appendix E**.

3.5.4 Contingency Plan

In the event that the subsidence impact performance measures relating to built features summarised in **Table 17** are considered to have been exceeded or are likely to be exceeded, WCPL will implement a Contingency Plan as described in **Section 4.1**.

Table 16
Built Feature Management Issues Associated with the Extraction of Longwalls 11 to 16

Issue	Monitoring	Management
WCPL assets	<ul style="list-style-type: none"> Monitoring of subsidence in accordance with the Subsidence Monitoring Program (Appendix H). Visual inspections as described in Section 3.8 and the Subsidence Monitoring Program (Appendix H). 	<ul style="list-style-type: none"> Structural assessment of WCPL assets to identify modifications potentially required prior to subsidence. Posting of warning signs at suitable locations on unsealed roads and site access tracks and updating warning signs if a change to the WCPL asset is identified during monitoring. Assessment of water pipelines and provision of sufficient slack in pipelines for subsidence. Assessment of bores and decommissioning and sealing prior to extraction if required (dependent on condition). Maintenance of safe access to WCPL assets such that WCPL personnel are able to undertake routine maintenance and remediation works as required. Implementation of communication protocols, including the provision of WCPL internal longwall panel status reports, to ensure internal WCPL stakeholders are aware of the longwall progression and are able to provide sufficient notification to relevant WCPL personnel regarding potential subsidence to WCPL assets. Provision of a 15 m separation barrier around the Bates South pit walls. Structural assessment of WCPL assets post-Longwalls 11 to 16 extraction. Repair of WCPL assets in accordance with associated standards and procedures.

Table 17
Built Feature Performance Measures, Performance Indicators and Contingency Measures for Longwalls 11 to 16

Performance Measure	Performance Indicator(s)	Relevant Management and Contingency Measures
<p>For all built features:</p> <ul style="list-style-type: none"> • Ensure built features are always safe. • Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. • Damage must be fully repairable, and must be fully repaired or else replaced or fully compensated. 	<p>The performance indicators developed for WCPL assets will be considered to have been exceeded if:</p> <ul style="list-style-type: none"> • the structural integrity of any WCPL assets is assessed to have been compromised; • the functionality of any WCPL powerlines, cables or pipelines is compromised; or • the integrity of access roads required for the serviceability of WCPL assets is not maintained. 	<p>Contingency measures will be developed as required on a case-by-case basis in consultation with the relevant WCPL stakeholders and government agencies.</p>

3.6 PUBLIC SAFETY MANAGEMENT

3.6.1 Overview

The PSMP is provided in **Appendix F**. The purpose and scope of the PSMP and the primary hazards and risks addressed by the PSMP are summarised below:

Purpose: Management of potential risks to public safety resulting from the proposed secondary workings described in the Extraction Plan for Longwalls 11 to 16.

Scope: Risks to public safety associated with extraction of Longwalls 11 to 16 at the South Bates Underground Mine (**Figure 3**).

Hazards: The primary hazards associated with the extraction of Longwalls 11 to 16 include:

- surface cracking;
- cliff instability;
- ground deformations; and
- damaged infrastructure (e.g. powerlines, roads and access tracks).

Risks: Members of the general public potentially at risk due to the extraction of Longwalls 11 to 16 are limited to those accessing WCPL owned land.

The PSMP references components of the existing HSMS as summarised in the HSMS Overview.

3.6.2 Key Public Safety Issues, Monitoring and Management Measures

The key issues relating to potential risks to public safety resulting from the extraction of Longwalls 11 to 16 described in the PSMP and the relevant monitoring and management measures are summarised in **Table 18**. The location of predicted subsidence is presented in **Figure 7**.

A subsidence risk assessment was undertaken as part of the Extraction Plan process for Longwalls 11 to 16 (**Technical Report 4**).

The subsidence risk assessment did not identify any public safety issues in addition to those summarised in **Table 18**.

3.6.3 Assessment of Performance Indicators and Measures

The performance indicator for the subsidence impact performance measures relating to public safety (**Table 5**) will be considered to have been exceeded if a hazard to the general public arising from subsidence effects, not previously identified and mitigated accordingly, becomes evident.

Monitoring conducted to inform the assessment of the extraction of Longwalls 11 to 16 against this performance indicator is summarised in **Section 3.8** and **Appendix H**.

The procedure followed to assess the extraction of Longwalls 11 to 16 against the performance indicators and performance measures is outlined in **Figure 9** and described in detail in **Appendix F**.

3.6.4 Contingency Plan

In the event that the subsidence impact performance measure relating to public safety summarised in **Section 3.6.3** is considered to have been exceeded or is likely to be exceeded, WCPL will implement a Contingency Plan as described in **Section 4.1**.

Table 18
Public Safety Management Issues Associated with the Extraction of Longwalls 11 to 16

Issue	Approved Impact	Revised Impact	Monitoring	Management
Agistees accessing the Longwalls 11 to 16 Application Area to manage stock.	Subsidence impacts, which may be considered to pose a safety hazard, currently approved include: <ul style="list-style-type: none"> • surface cracking;¹ • erosion;¹ and • ponding.¹ 	<ul style="list-style-type: none"> • Impacts resulting from the extraction of Longwalls 11 to 16 will be consistent with those presented in the Wambo Development Project EIS and South Bates (Wambo Seam) Modification EA. 	<ul style="list-style-type: none"> • Monitoring of subsidence in accordance with the Subsidence Monitoring Program (Appendix H). • Visual inspection of the integrity of fences. • Visual assessment of the effectiveness of warning signs (e.g. legibility). • Visual inspection of integrity of cliffs and steep slopes. 	<ul style="list-style-type: none"> • Restricted access (i.e. the general public are not allowed on WCPL owned land used for mining purposes). Permanent signage located at the entrance to WCPL owned land will be maintained. • All personnel and visitors accessing the Wambo site are subject to the requirements of: <ul style="list-style-type: none"> – WA-TRG-MP-302 Wambo Training and Competency Management Plan; and – WA-SAH-MP-315 Site Introduction of Personnel. • Notification to agistees of areas of longwall mining and active subsidence, and exclusion of agistment grazing from areas where surface cracking presents a reasonable risk to people and/or livestock. • Posting and maintenance of warning signs at suitable locations on property boundaries, fences and access tracks. The signs will indicate that underground mining (with surface subsidence) is being undertaken on WCPL owned land and will prohibit entry by unauthorised persons. • Management of surface cracking and areas of subsidence troughs in accordance with the LMP (Table 12). • Management of potential cliff or slope instability in accordance with the LMP (Table 12). • Repair of fences in accordance with the LMP (Table 12). • All safety incidents will be handled in accordance with the HSMS. • Following mining, review of warning sign placement and removal if no longer required.
Unauthorised access to the Longwalls 11 to 16 Application Area (e.g. looking for firewood, hunting or horse riding).				
Members of the Rural Fire Service accessing the Longwalls 11 to 16 Application Area.				

¹ After the Wambo Development Project EIS (WCPL, 2003) and the South Bates (Wambo Seam) Modification EA (WCPL, 2015).

3.7 REHABILITATION MANAGEMENT

The *Wambo Coal Mine Mining Operations Plan 2015 – 2020* (MOP) was approved by the DRE on 4 June 2015 and has been subsequently amended on four occasions. The DRE approved the MOP as addressing the requirements of a Rehabilitation Management Plan under Condition 94C, Schedule 4 of the Development Consent DA 305-7-2003 and covers Longwalls 11 to 16.

Rehabilitation associated with subsidence impacts from the extraction of Longwalls 11 to 16 will be undertaken in accordance with the approved MOP (in particular Section 3.3.4 of the MOP) and the management and mitigation measures outlined in this Extraction Plan and the relevant component plans (e.g. the LMP).

A Subsidence Risk Assessment has been undertaken, which included consideration of subsidence impacts to public safety, livestock and wildlife. The Subsidence Risk Assessment is provided in **Technical Report 4** and summarised in **Section 2.2**. Observed subsidence features and potential risks to public safety, livestock and wildlife will be reported through incident reports, subsidence management status reports and Annual Reviews described in **Section 4.2**.

A number of potential management measures are available to mitigate/remediate subsidence impacts on land in general resulting from the extraction of Longwalls 11 to 16. The requirement and methodology for any subsidence remediation techniques will be determined in consideration of:

- Potential impacts of the unmitigated impact, including potential risks to public safety and the potential for self-healing or long-term degradation.
- Potential impacts of the remediation technique, including site accessibility.

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

Remediation of typical surface cracks (generally in the order of 25 mm to 50 mm, but up to approximately 150 mm) will use conventional earthmoving equipment (e.g. a backhoe) and will include:

- infilling of surface cracks with soil or other suitable materials; or
- locally regrading and re-compacting the surface.

Areas of surface cracking will be stabilised using erosion protection measures (e.g. vegetation planting). Drainage works and rehabilitation of subsidence troughs (i.e. areas of induced ponding) will be conducted as necessary and may include stabilisation of banks subject to soil slumping.

If surface crack remediation works are required in remnant vegetation areas, compact mobile equipment will be utilised, where practicable, to minimise damage to surrounding vegetation. If the remediation work requires clearing of remnant vegetation to an extent that would exceed the benefit of the remediation, the requirement for remediation will be revised. Vegetation that requires clearance will be subject to the VCP (Vegetation Clearance Protocol, in the BMP in **Appendix C**).

A summary of subsidence monitoring is provided in **Section 3.8**, including cross references to components of the Extraction Plan with further detail.

Visual monitoring of remediated subsidence areas will be conducted monthly to identify any requirement for maintenance measures and/or remedial works in accordance with the MOP (**Appendix I**).

Any installed sediment control structures will be inspected on a monthly basis, or following rainfall events of equal to or greater than 20 mm per day (midnight to midnight) as recorded by the Wambo Meteorological Station. The sediment control structures will be inspected for capacity, structural integrity and effectiveness in accordance with the ESCP.

3.8 MONITORING PROGRAM SUMMARY

The various monitoring programs presented in each of the management plans described in **Sections 3.1 to 3.6** are summarised in **Table 19** and the location of environmental monitoring sites included in WCPL's various environmental monitoring programs are presented in **Figures 11 to 13**.

Figure 11 presents the locations of air quality, noise and dust monitoring sites. **Figure 12** presents the location of surface water and groundwater monitoring sites. **Figure 13** presents the location of biodiversity monitoring sites. As described in **Table 19**, visual observation of cliffs and the Wollemi National Park escarpment will be undertaken as part of the LMP monitoring program.

Details of any subsidence impacts observed will be recorded in the Subsidence Impact Register with visual observations documented in the Subsidence Impact Register Assessment Form as provided in Attachment 2 of the Subsidence Monitoring Program (**Appendix H**). Visual inspections will be undertaken in accordance with the inspection checklist provided in Attachment 2 of the Subsidence Monitoring Program (**Appendix H**). The Subsidence Impact Register will be maintained as an electronic spreadsheet on-site, with hard copies of assessment forms filed in a folder.

Table 19
Longwalls 11 to 16 Monitoring Program Summary

Management Plan	Monitoring Component	Parameter	Frequency
Water Management Plan	Bed and bank stability.	<ul style="list-style-type: none"> Monitoring to distinguish between erosion from mine subsidence instability and erosion from other causes along North Wambo Creek Diversion and Stony Creek. 	<ul style="list-style-type: none"> In accordance with the SWMP.
	Monitoring of surface water quality and flow monitoring sites.	<ul style="list-style-type: none"> Monitoring of surface water flow and quality along North Wambo Creek Diversion, Stony Creek and Wollombi Brook in accordance with the SWMP. 	<ul style="list-style-type: none"> In accordance with the SWMP.
	Monitoring of groundwater level and quality.	<ul style="list-style-type: none"> Monitoring of groundwater level and quality within the vicinity of the Wambo Coal Mine. 	<ul style="list-style-type: none"> In accordance with the GWMP.
	Inflows to underground workings.	<ul style="list-style-type: none"> Dewatering volumes and underground water levels in accordance with the GWMP. 	<ul style="list-style-type: none"> In accordance with the SWMP.
	Diversion and subsidence monitoring program for the North Wambo Creek Diversion.	<ul style="list-style-type: none"> As outlined in the SWMP, including: monitoring of IDC; LFA; riparian vegetation; aerial photography; long and cross-section surveys (extracted from LiDAR); and geomorphic condition and efficacy of subsidence management or rehabilitation works. 	<ul style="list-style-type: none"> In accordance with the SWMP.
	Visual inspection of the North Wambo Creek Diversion.	<ul style="list-style-type: none"> Inspections for surface cracking and/or surface ponding. 	<ul style="list-style-type: none"> Daily inspections when extraction is occurring directly beneath North Wambo Creek Diversion.
Land Management Plan	Fences.	<ul style="list-style-type: none"> Visual observation to record the initial condition of fences. Visual observation to record the condition of fences following extraction of Longwalls 11 to 16. 	<ul style="list-style-type: none"> Prior to secondary extraction of Longwalls 11 to 16. Following completion of secondary extraction of Longwalls 11 to 16.

Table 19 (Continued)
Longwalls 11 to 16 Monitoring Program Summary

Management Plan	Monitoring Component	Parameter	Frequency
Land Management Plan (Cont.)	Ground surface.	<ul style="list-style-type: none"> Visual observation to record the initial condition of the ground surface. Visual observations of the ground surface behind the longwall face to identify potential surface cracks. Visual observations of low lying areas (i.e. the North Wambo Creek Diversion) to identify potential surface ponding. Visual observations of the ground surface to identify stabilisation of erosion and groundcover. 	<ul style="list-style-type: none"> Prior to secondary extraction of Longwalls 11 to 16. Monthly inspections during secondary extraction of Longwalls 11 to 16, increased to weekly inspections during extraction within 100 m of the North Wambo Creek Diversion. Following a significant rainfall event (i.e. 40 mm within 24 hours).¹ Monthly inspections until stabilisation of erosion and groundcover is >60%.
	Cliffs.	<ul style="list-style-type: none"> Visual observations of cliffs for signs of recent rock fall and/or instability (high definition video/photos recorded via an UAV). 	<ul style="list-style-type: none"> Prior to, and following completion of, secondary extraction of each of Longwalls 11 to 16.
Biodiversity Management Plan	General monitoring of flora, fauna and aquatic ecosystems.	<ul style="list-style-type: none"> Monitoring in accordance with the BMP. 	<ul style="list-style-type: none"> In accordance with the BMP.
	Subsidence impacts to Wollemi National Park escarpment.	<ul style="list-style-type: none"> Visual observations of the Wollemi National Park escarpment for signs of recent rock fall and/or instability (high definition video/photos recorded via an UAV). 	<ul style="list-style-type: none"> Prior to and following completion of each longwall in accordance with the LMP.

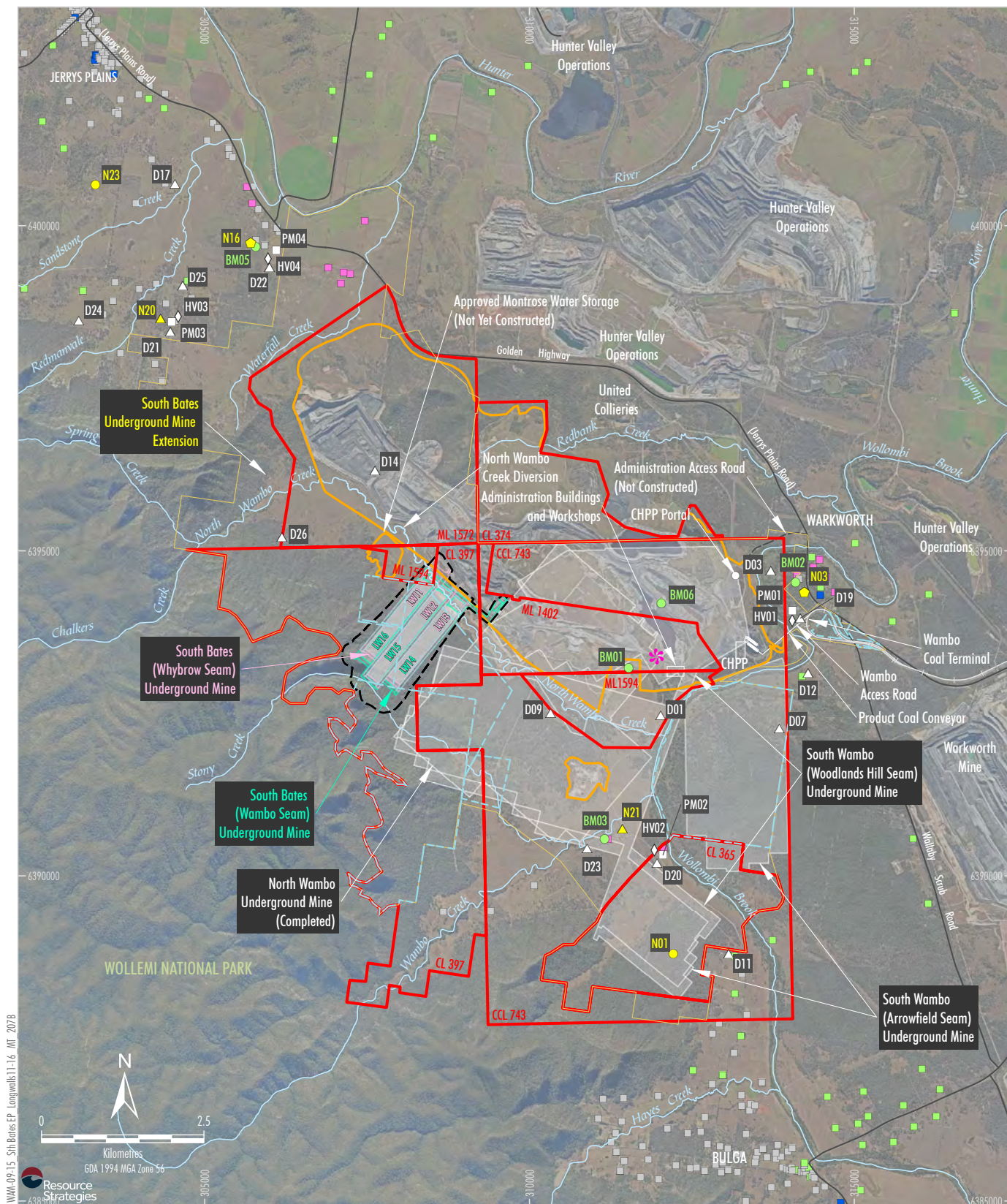
Table 19 (Continued)
Longwalls 11 to 16 Monitoring Program Summary

Management Plan	Monitoring Component	Parameter	Frequency
Heritage Management Plan	Artefact scatters and isolated finds.	<ul style="list-style-type: none"> Surface cracks and/or erosion in the vicinity of artefact scatters or isolated finds. 	<ul style="list-style-type: none"> In accordance with the HMP (monthly during extraction of longwall panels in immediate proximity to a site).
Built Features Management Plan – WCPL Asset Management Plan	All built features.	<ul style="list-style-type: none"> Visual observations to record the general condition of WCPL assets including safety and serviceability. 	<ul style="list-style-type: none"> Monthly inspection during secondary extraction of Longwalls 11 to 16.
	Active service lines.	<ul style="list-style-type: none"> Visual observations to record the general condition of WCPL active service lines including safety and serviceability. 	<ul style="list-style-type: none"> Daily inspections commencing when secondary extraction is within 100 m of WCPL active service lines and undertaken until the active mining face is 100 m past the line.
	Culverts.	<ul style="list-style-type: none"> Visual observations to record cracking of concrete culverts or grade reversal. 	<ul style="list-style-type: none"> Prior to secondary extraction within 100 m of culverts and undertaken at 50 m intervals until the active mining face is 100 m past the culverts.
	Roads and tracks.	<ul style="list-style-type: none"> Visual observations to record condition of roads and tracks, including surface cracks, buckling and general safety. 	<ul style="list-style-type: none"> Prior to secondary extraction within 100 m of any WCPL asset and undertaken at 50 m intervals until the active mining face is 100 m past the WCPL asset.
	Mine dewatering and water supply pipelines.	<ul style="list-style-type: none"> Monitoring of pipeline integrity at fixed points. Monitoring to detect abnormal changes in flow. 	<ul style="list-style-type: none"> Daily inspections commencing when secondary extraction is within 100 m of WCPL active service lines and undertaken until the active mining face is 100 m past the pipeline. Continuous (SCADA) monitoring of pump and pipeline conditions.

Table 19 (Continued)
Longwalls 11 to 16 Monitoring Program Summary

Management Plan	Monitoring Component	Parameter	Frequency
Public Safety Management Plan	Fences.	<ul style="list-style-type: none"> Visual observation to record the initial condition of fences. Visual observations to record the condition of fences during extraction of Longwalls 11 to 16. Visual observations to record the condition of fences following extraction of Longwalls 11 to 16. 	<ul style="list-style-type: none"> Prior to secondary extraction of Longwalls 11 to 16. Monthly inspections during secondary extraction of Longwalls 11 to 16. Following completion of secondary extraction of Longwalls 11 to 16.
	Warning signs.	<ul style="list-style-type: none"> Visual observation to record the initial condition of existing warning signs (e.g. legibility). Visual observations to record the condition of warning signs (e.g. legibility) during extraction of Longwalls 11 to 16. 	<ul style="list-style-type: none"> Prior to secondary extraction of Longwalls Longwalls 11 to 16. Monthly inspections during secondary extraction of Longwalls Longwalls 11 to 16.
Rehabilitation Management Plan (MOP)	Remediated subsidence areas.	<ul style="list-style-type: none"> Visual monitoring to identify any requirement for maintenance measures and/or remedial works. 	<ul style="list-style-type: none"> Monthly inspections until monitoring confirms stabilisations of erosion and groundcover is >60%.
	Installed sediment control structures.	<ul style="list-style-type: none"> Inspected of capacity, structural integrity and effectiveness in accordance with the ESCP. 	<ul style="list-style-type: none"> Monthly and/or following a significant rainfall event (i.e. 20 mm within 24 hours, midnight to midnight).

¹ Inspection to occur once access is practically available following the rainfall event. Inspections would not occur for subsequent rainfall events within 7 days of previous inspection.



WMA-09-15 Sh Bates EP, Longwalls 11-16, NT, 2078
 GDA 1994 MGA Zone 56
 Resource Strategies

- LEGEND**
- Mining and Coal Lease Boundary
 - WCPL Owned Land
 - Existing/Approved Surface Development Area
 - South Bates (Whybrow Seam) Underground Mine
 - South Bates (Wambo Seam) Underground Mine
 - Other Approved Underground Development
 - Remnant Woodland Enhancement Program (RWEP) Area
 - Extraction Plan Application Area

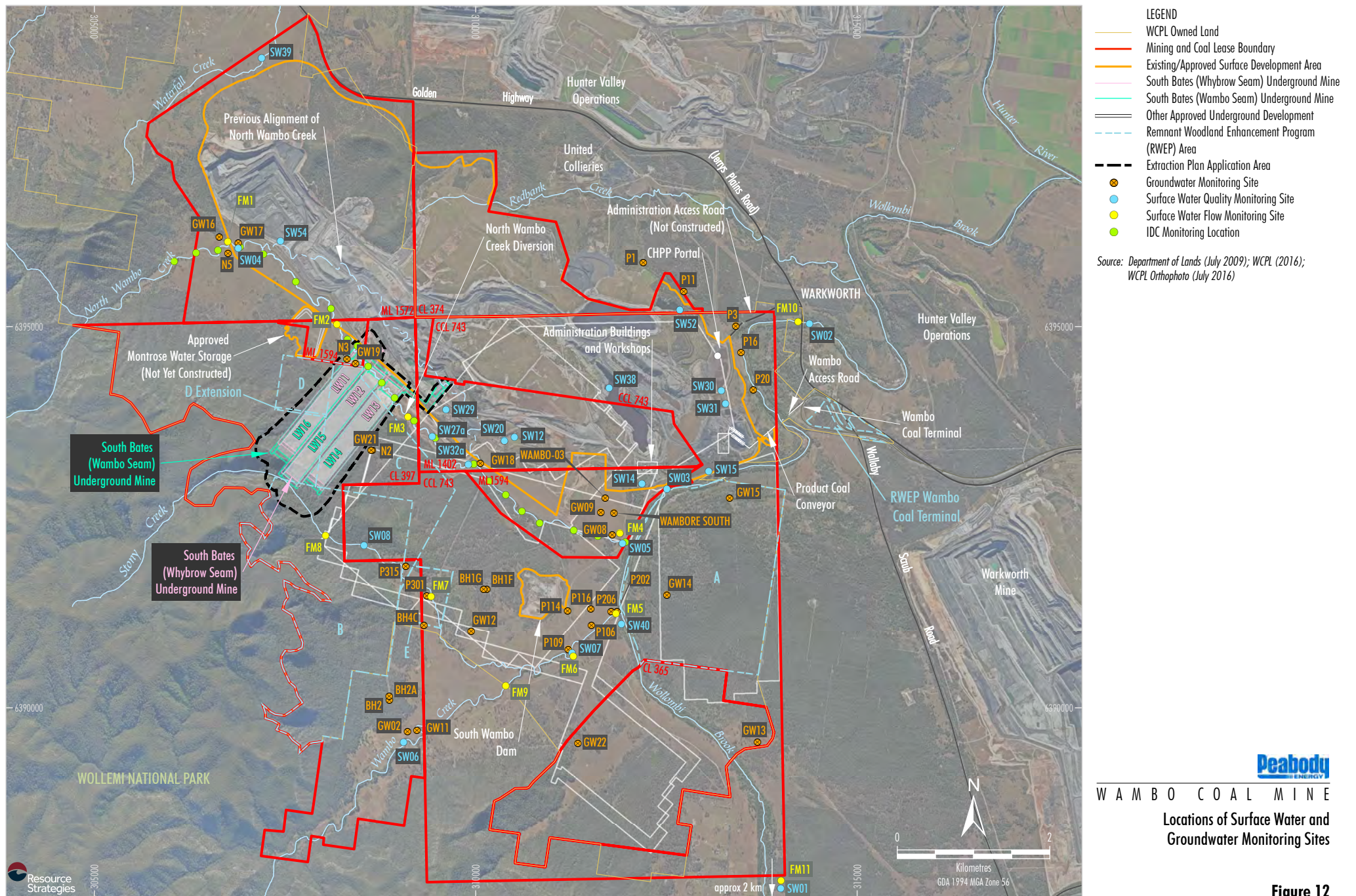
- Monitoring Sites**
- Noise Monitoring Site (Attended and Real-time)
 - ★ Meteorological Station
 - △ Dust Deposition Gauge
 - ◇ High Volume Air Sampler
 - TEOM
 - Noise Monitoring Site (Attended)
 - ▲ Noise Monitoring Site (Real-time)
 - Blast Monitoring Site

- Residences**
- Wambo Owned
 - Other Resource Company Owned
 - Government Owned
 - Private

Peabody
 ENERGY
WAMBO COAL MINE
 Locations of Air Quality,
 Noise and Blast Monitoring Sites

Source: Department of Lands (July 2009); WCPL (2016); WCPL Orthophoto (July 2016)

Figure 11



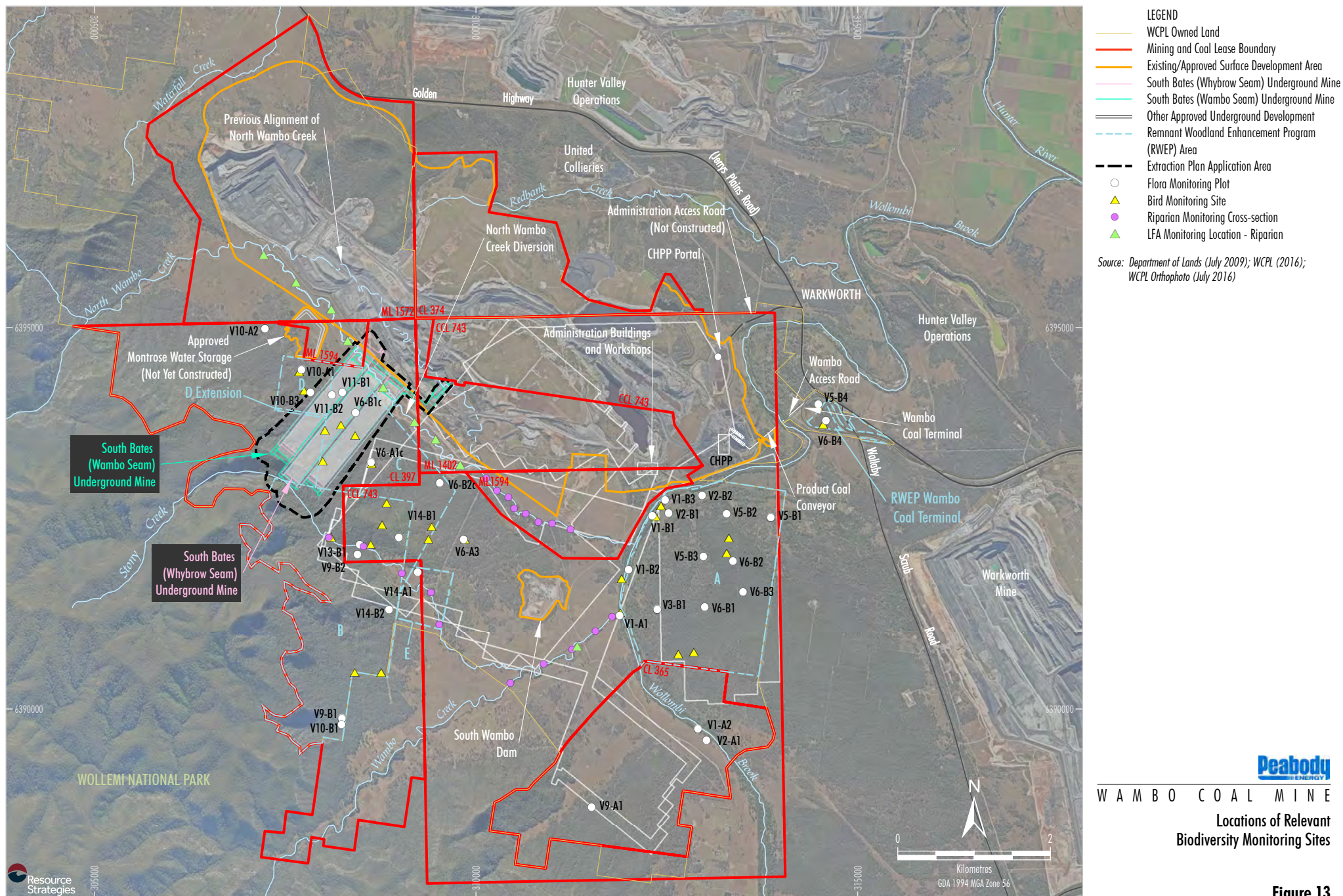


Figure 13

4 IMPLEMENTATION

4.1 ADAPTIVE MANAGEMENT AND CONTINGENCY RESPONSE

4.1.1 Adaptive Management

WCPL will implement an adaptive management approach to ensure subsidence impact performance measures (**Table 5**) are achieved at the South Bates Underground Mine. Adaptive management will involve:

- **Planning** – developing management strategies to meet performance measures; identifying performance indicators to assess performance; and establishing monitoring programs to monitor against the performance measures.
- **Implementation** – implementing management strategies and monitoring impacts against performance indicators.
- **Review** – reviewing and evaluating the effectiveness of management strategies by analysis of monitoring data against predicted impacts, performance indicators and performance measures in accordance with the schematic presented in **Figure 9**.
- **Contingency Response** – implementing contingency plans where a potential exceedance of a subsidence impact performance measures or an unexpected impact is detected (**Section 4.1.2**).
- **Adjustment** – adjusting management strategies to improve performance, particularly following an exceedance of a subsidence impact performance measure or detection of an unexpected impact.

4.1.2 Contingency Response

In the event the performance measures in **Table 5** are considered to have been exceeded or are likely to be exceeded, WCPL will implement the Contingency Plan outlined further below.

Responsibilities during contingency response are outlined in **Table 20**, which is designed to clearly outline actions, levels of responsibility within WCPL and reporting requirements where monitoring results indicate that impacts are exceeding (or likely to exceed) predicted or approved limits. This table is designed to support the Trigger Action Response Plans (TARPs) provided in the component management plans (**Appendices A to F**). These TARPs will be developed further as this Extraction Plan is reviewed and revised.

Relevant management and contingency measures are summarised in **Section 3** and outlined in the component management plans (**Appendices A to F**). WCPL will consider changes to longwall extraction geometry (in consultation with relevant regulatory authorities) if the following is confirmed to have occurred:

- Greater than negligible subsidence impact or environmental consequences to Wollemi National Park.
- Greater than negligible subsidence impact or environmental consequences to Wollombi Brook (other than the controlled release of excess site water in accordance with EPL requirements).

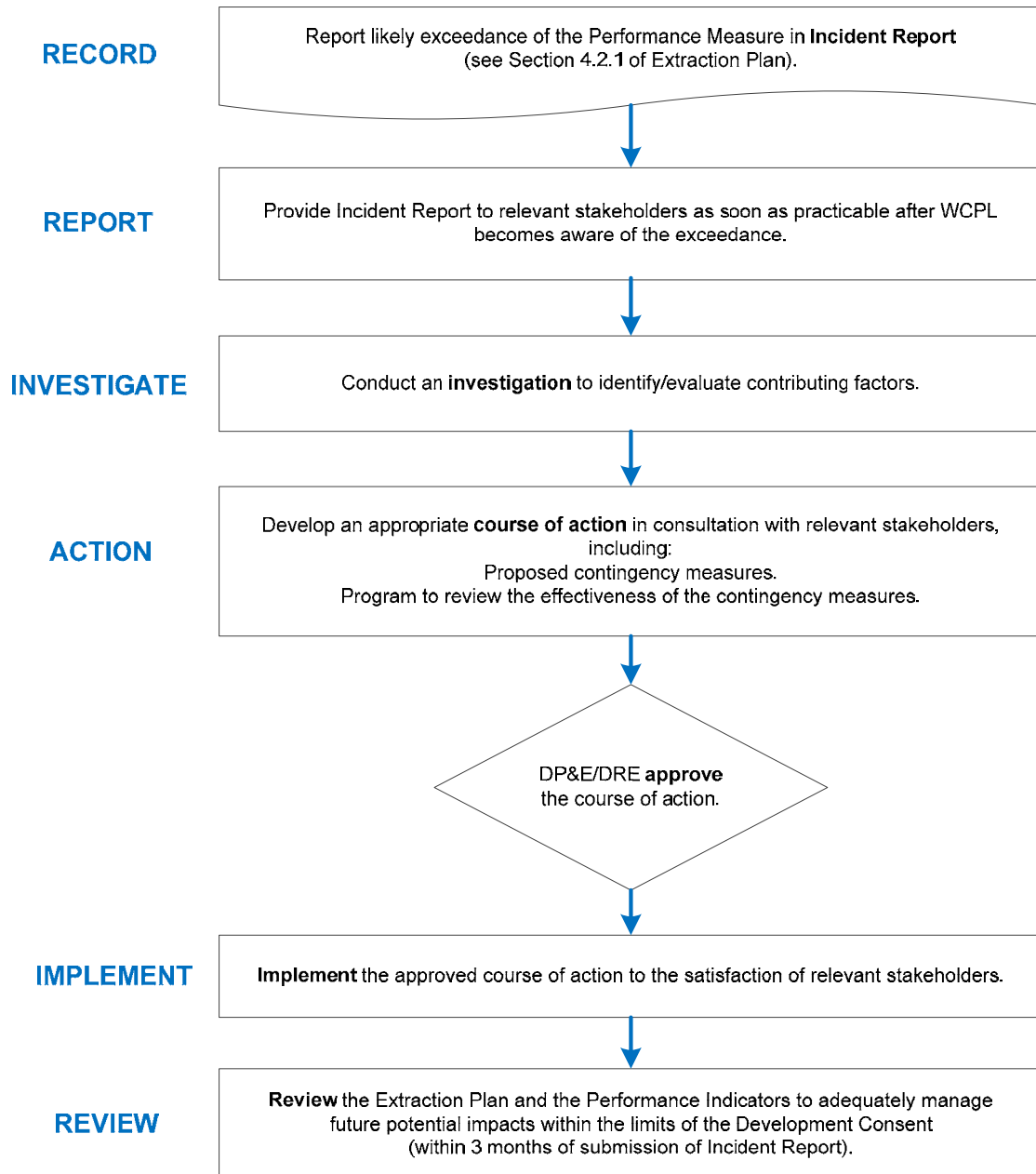
Changes to longwall geometry would be implemented through WCPL's internal Mine Plan Design Alteration procedure (SWP 9004) administered by the Mine Surveyor.

Table 20
Contingency Plan Responsibilities

Condition	Normal	Level 1	Level 2
	Predicted Impacts	Implement Management Measures	Contingency Phase
Mine Surveyor	<p>Work to continue as normal in accordance with:</p> <ul style="list-style-type: none"> Extraction Plan and component plans; Development Consent; and mining lease conditions. 	<ul style="list-style-type: none"> Complete Subsidence Impact Register. Report to TSM, UME and ECM. Additional survey of area to confirm subsidence impacts and effects, where required. 	<ul style="list-style-type: none"> As per Level 1, but respond immediately.
Underground Mining Engineer (UME)		<ul style="list-style-type: none"> Where related to built features or public safety, investigate area and advise of additional works or remediation, where required. Increase monitoring frequency in immediate vicinity, where required. Consult with external expert(s) for advice where appropriate. Report findings and recommendations to TSM. 	<ul style="list-style-type: none"> As per Level 1, and immediately report findings to TSM (may include recommendation to stop mining).
Environment and Community Manager (ECM)		<ul style="list-style-type: none"> Where related to environmental impact, investigate area and advise of additional works or remediation, where required. Increase monitoring frequency in immediate vicinity, where required. Consult with external expert(s) for advice where appropriate. Review information and approve and instruct implementation of remediation/corrective action/compensation, if necessary. Report findings/recommendations to TSM, MME and/or GM where required. Report impact and response in Annual Review, where required. 	<ul style="list-style-type: none"> As per Level 1, but respond immediately. As soon as practical, lodge Incident Report, with DP&E and relevant agencies (e.g. OEH, DRE, DPI Water) and report on corrective actions. Within 3 months, review this Extraction Plan.
Technical Services Manager (TSM)		<ul style="list-style-type: none"> Review investigation(s). Review information and approve and instruct implementation of remediation/corrective action/ compensation, if necessary. Report findings/recommendations to ECM, MME and/or GM where required. Report impact/response in Subsidence Management Status Report. 	<ul style="list-style-type: none"> As per Level 1, but respond immediately. In making recommendations, review need to stop mining (including safety implications). Consult with external expert(s) for advice where appropriate. As soon as practical, notify DRE and MSB on corrective actions. As soon as practical notify relevant infrastructure owners of impacts.
Mining Engineering Manager (Underground Mine Manager) (MME)		<ul style="list-style-type: none"> Ensure adequate resources are available for implementation of remediation/corrective actions. Report to GM, where required. 	<ul style="list-style-type: none"> As per Level 1, but respond immediately. If recommended, direct operations to stop in a safe manner.
General Manager (GM)		<ul style="list-style-type: none"> Review information and approve and instruct implementation of remediation/corrective action/ compensation, if necessary. 	<ul style="list-style-type: none"> As per Level 1, but respond immediately.

As noted in the Contingency Plan, within 3 months of submission of an Incident Report, the relevant components of the Extraction Plan will be review and revised, where necessary. The process of review is outlined in **Section 4.3**.

Contingency Plan



4.2 REPORTING FRAMEWORK

WCPL has developed a reporting framework for the Extraction Plan based on the Draft Extraction Plan Guidelines (DP&E and DRE, 2015).

Table 21 provides a summary of the reporting framework, including which stakeholders will receive copies of each report and the distribution method. The subsections below provide further detail on the contents of each reporting mechanism.

The proposed reporting framework for the South Bates Underground Mine is considered adequate as the Application Area is wholly within WCPL owned land and Longwalls 11 to 16 are not predicted to have greater than negligible impact on items of environmental sensitivity.

4.2.1 Incident Report

WCPL will notify the relevant agencies (**Table 21**) of a subsidence incident as soon as practicable after the WCPL becomes aware of the incident. Within **7 days** of the date of the incident, WCPL will provide the relevant agencies with a detailed Incident Report.

A subsidence incident includes any of the following:

- a potential exceedance of a subsidence impact performance measure or an unexpected impact is detected, including impacts to the natural environment or impacts that may be adverse to the serviceability and/or safety of built features;
- detection of any significant unpredicted and/or higher-than-predicted subsidence and/or abnormalities in subsidence development in any surface areas that may be affected by longwall mining;
- detection of an incident caused by subsidence which has a potential to expose any person to health and safety risks;
- detection of significant deviation from the predicted nature, magnitude, distribution, timing and duration of subsidence effects, and of the potential impacts and consequences of those deviations on built features and the health and safety of any person;
- significant failure or malfunction of a monitoring device or risk control measure set out in the Extraction Plan addressing built features, public safety or subsidence monitoring;
- reports of any adverse subsidence impacts by any relevant stakeholder; or
- any other subsidence related incident requiring prompt notification.

An Incident Report will include the following:

- details on the nature of the incident (including survey results, photographs and date of the incident);
- results of investigation(s) to identify/evaluate the contributing factors to the incident;
- proposed course of action to remedy the incident, including proposed contingency measures and a program to review the effectiveness of the contingency measures; and
- relevant WCPL contact details to obtain further information on the incident.

Table 21
Summary of Reporting Framework

Report	Frequency	Distribution ¹	Distribution Method ¹	Responsibility for Data Collation and Preparation	Responsibility for Submission
Incident Report	As required – see Section 4.2.1	DP&E (Manager – Mining Projects) DRE (Subsidence Executive Officer) MSB (District Manager) Other regulators as specified in management plans	Email	Environment and Community Manager	General Manager
Subsidence Management Status Report	To be updated fortnightly. Must be submitted if new impacts are identified or upon request.	DP&E (Manager, Mining Projects) DRE (Subsidence Executive Officer) OEH (National Parks and Wildlife Service)	Email	Technical Services Manager Environment and Community Manager	Technical Services Manager (in consultation Mining Engineering Manager and Environment and Community Manager)
Six Monthly Report	Annual (for the period 1 January to 30 June)	DP&E (Manager, Mining Projects) DRE (Subsidence Executive Officer) MSB (District Manager) OEH/EPA (General Contact/National Parks and Wildlife Service) DPI Water (Manager Strategic Stakeholder Liaison)	Email	Environment and Community Manager	General Manager
Annual Review	Annual (for the period 1 January to 31 December)	DP&E (Manager, Mining Projects) DRE (Subsidence Executive Officer) DRE (Director – Environmental Sustainability) MSB (District Manager) OEH/EPA (General Contact/National Parks and Wildlife Service) DPI Water (Manager Strategic Stakeholder Liaison) Singleton Shire Council (General Manager) CCC Members	Email and Post	Environment and Community Manager	General Manager

¹ See **Attachment 4** for distribution details.

4.2.2 Subsidence Management Status Report

The Subsidence Management Status Report will include the following:

- Current face position of the longwall panel being extracted and a note on the current location of development.
- Summary of any comments, advice and feedback from consultation with stakeholders in relation to subsidence management undertaken in the month and a summary of WCPL's responses.
- Summary of observed and/or reported subsidence impacts, including a full description and good photos of the impact.
- Summary of any observed and/or reported incidents, service difficulties, asset owner complaints or community complaints related to subsidence and a summary of WCPL's response to these issues.
- Report on any unusual subsidence development (to facilitate early detection of potential subsidence impacts).

The Subsidence Management Status Report will be updated regularly on site and submitted if new impacts are identified or upon request from DP&E or DRE.

4.2.3 Six Monthly Report

A Six Monthly Report will be prepared to summarise monitoring results for the period 1 January to 30 June. The Six Monthly Report will include:

- Current face position of the longwall panel being extracted and a note on the current location of development.
- Summary of any comments, advice and feedback from consultation with stakeholders in relation to subsidence management undertaken in the reporting period and a summary of WCPL's responses.
- Summary of all observed and/or reported impacts (where monitoring has been undertaken within the six month period).
- Any management measures or contingency responses proposed or implemented.
- Update on the effectiveness of the contingency measures outlined in any Incident Report submitted (**Section 4.2.1**).
- Summary of all quantitative and qualitative environmental monitoring results (summarised in **Section 3.8**) (noting that monitoring conducted on an annual basis will be summarised in the Annual Review).
- Assessment of compliance against performance indicators and performance measures.
- Summary of subsidence development based on monitoring information compared with any defined triggers and/or the predicted subsidence (to facilitate early detection of potential subsidence impacts).
- Statement regarding any additional and/or outstanding management actions to be undertaken or the need for early responses or emergency procedures to ensure adequate management of any potential subsidence impacts due to longwall mining.

4.2.4 Annual Review

The Annual Review will be prepared and submitted in accordance with Condition 5 of Schedule 6 of the Development Consent (DA 305-7-2003).

Annual Reviews will include:

- summary of subsidence effects monitoring results and a comparison to predicted subsidence effects; and
- summary of all environmental and subsidence monitoring results and a comparison of actual impacts with predicted subsidence impacts and the subsidence impact performance measures.

4.3 REVIEW OF THE EXTRACTION PLAN

This Extraction Plan and its component management plans will be reviewed in detail, and revised if necessary, in the following circumstances:

- within 3 months of the submission of an **Incident Report** relating to a subsidence impact (**Section 4.2.1**) taking into consideration any contingency response implemented following submission of the Incident Report (**Section 4.1.2**); and/or
- where there is a significant change in operation that may affect the environment or the community.

In addition to the above, this Extraction Plan will also be reviewed within 3 months of:

- the submission of an Annual Review;
- the submission of an audit report; or
- any modification to the conditions of the Development Consent (DA 305-7-2003).

The component management plans of this Extraction Plan reference components of a number of existing Environmental Management Plans to avoid duplication (**Section 3**). If these Environmental Management Plans are revised separately in accordance with the Development Consent (DA 305-7-2003) the management plans will be updated accordingly.

4.4 REVIEW OF OTHER MANAGEMENT PLANS

WCPL commits to updating the Inrush Management Plan (as part of the notification under clause 33 of the *Work Health and Safety (Mines and Petroleum Sites) Regulation, 2014*) to incorporate this revision of the Extraction Plan.

This Extraction Plan references the following management plans awaiting approval:

- SGWRP (Version 10) submitted to DP&E in May 2016;
- ESCP (Version 8) submitted to DP&E in April 2016; and
- BMP (Version 11) (complex-wide consolidated plan) submitted to DP&E in October 2016.

4.5 KEY RESPONSIBILITIES

Key responsibilities under this Extraction Plan are summarised in **Table 22**. The component management plans provide additional responsibilities under the plans. A summary WCPL organisation structure is provided in **Figure 14**.

Table 22
Key Extraction Plan Responsibilities

Responsibility	Task
General Manager	<ul style="list-style-type: none"> • Ensure resources are available to WCPL personnel to facilitate the completion of responsibilities under this Extraction Plan. • Ensure the safety of WCPL employees and the public in relation to WCPL operations. • Approve and instruct implementation of remediation/corrective action/compensation, if necessary.
Mining Engineering Manager (Underground Mine Manager)	<ul style="list-style-type: none"> • Ensure the safety of WCPL employees and the public in relation to WCPL operations. • Ensure adequate resources are available for implementation of remediation/corrective actions.
Technical Services Manager	<ul style="list-style-type: none"> • Liaise with relevant stakeholders regarding subsidence impact management and related public safety hazards.
Environment and Community Manager	<ul style="list-style-type: none"> • Liaise with relevant stakeholders regarding environmental management. • Ensure monitoring and reporting required in accordance with this Extraction Plan are carried out within specified timeframes, are adequately checked and processed and are prepared to the required standard. • Ensure that any Incident Reports are lodged in accordance with regulatory requirements with all available information. • Ensure that reviews of this Extraction Plan and other plans are conducted as described in Sections 4.3 and 4.4.
Underground Mining Engineer	<ul style="list-style-type: none"> • Undertake relevant monitoring and implementation of management measures summarised in Section 3.
Mine Surveyor	<ul style="list-style-type: none"> • Undertake all subsidence monitoring to the required standard within the specified timeframes and ensure data are adequately checked, processed and recorded. • Record and maintain observations of subsidence impacts in the Subsidence Impact Register.

LEGEND
 Key personnel responsible for implementation of the Extraction Plan

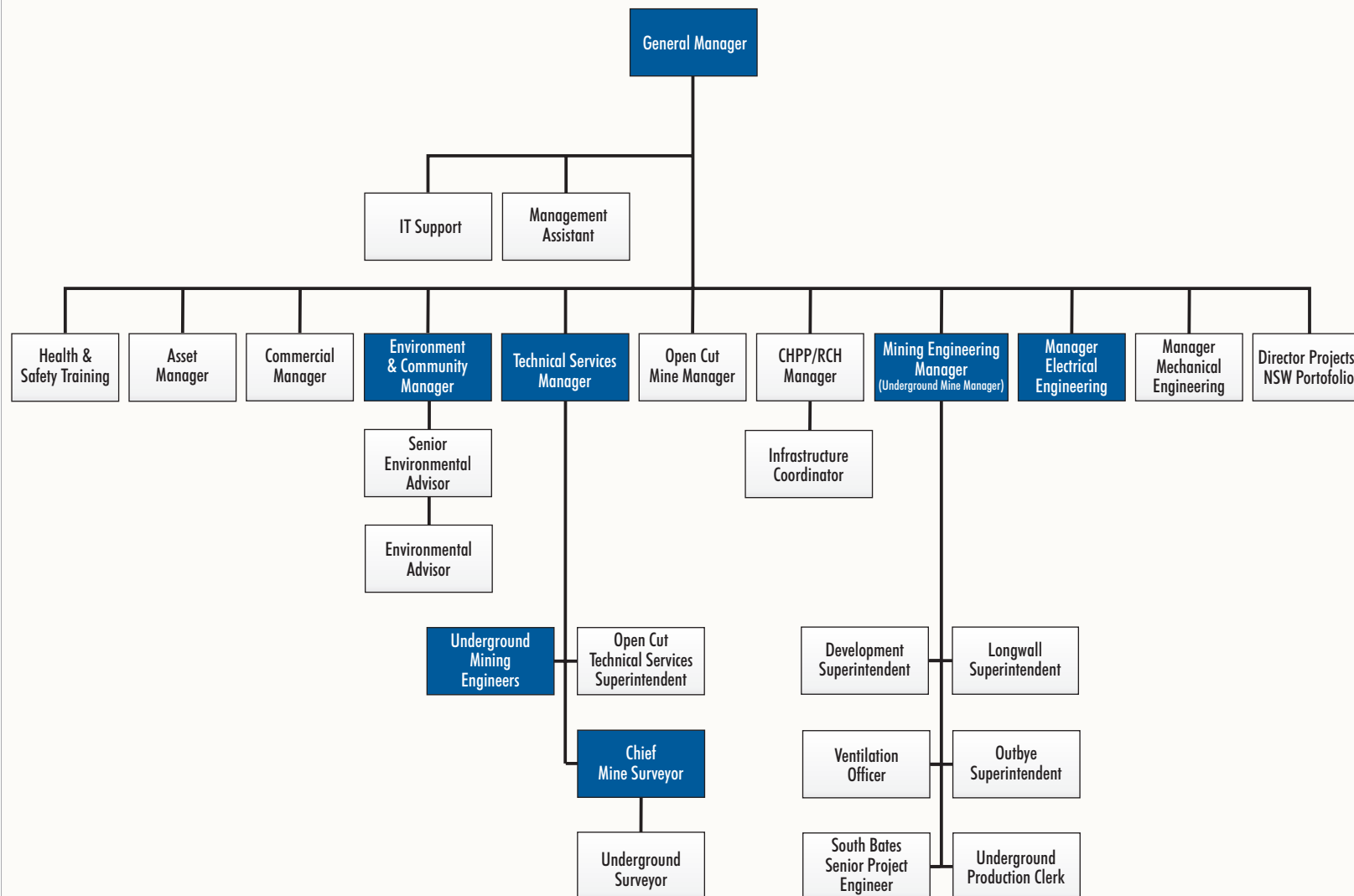


Figure 14

5 REFERENCES

- Alluvium (2016) *Surface Water Technical Report for the South Bates Underground Mine (Longwalls 11-16)*. Report prepared for Wambo Coal Pty Limited.
- Department of Environment, Climate Change and Water (2010) *Aboriginal Cultural Heritage Consultation Requirements for Proponents*.
- Department of Mineral Resources (1993) *Hunter Coalfield Regional Geology 1:100 000 Sheet*. New South Wales.
- Department of Planning and Environment and NSW Trade & Investment – Division of Resources and Energy (2015) *Guidelines for the Preparation of Extraction Plans Required under Conditions of Development Consents, Project Approvals and Mining Lease Conditions for Underground Coal Mining*. Version 5. Draft.
- EJE Town Planning (2003) *Non-Aboriginal Heritage Impact Statement*. Prepared for Wambo Coal Pty Limited.
- FloraSearch (2015) *South Bates Underground Mine (Wambo Seam) Modification – Flora Assessment*. Report prepared for Wambo Coal Pty Limited.
- HydroSimulations (2017) *South Bates Underground Mine Longwalls 11 to 16 Extraction Plan – Groundwater Assessment Review*. Report HS2016/64 prepared for Wambo Coal Pty Limited.
- MineConsult (2001) *Wambo Strategic Mine Plan Vol 1*. Report prepared for Wambo Mining Corporation Ltd.
- Mine Subsidence Engineering Consultants (2015a) *South Bates (Wambo Seam) Subsidence Assessment*. Report MSEC693 prepared for Wambo Coal Pty Limited.
- Mine Subsidence Engineering Consultants (2015b) *South Bates (Whybrow Seam) Subsidence Assessment*. Report MSEC692 prepared for Wambo Coal Pty Limited.
- Mine Subsidence Engineering Consultants (2015c) *Addendum to South Bates (Whybrow Seam) Subsidence Assessment*. Report MSEC804 prepared for Wambo Coal Pty Limited.
- Mine Subsidence Engineering Consultants (2017) *South Bates Underground Mine Subsidence Assessment – Subsidence Predictions and Impact Assessments for the Natural and Built Features in Support of the Extraction Plan for WYLW11 to WYLW13 in the Whybrow Seam and WMLW14 to WMLW16 in the Wambo Seam*. Report MSEC 855 prepared for Wambo Coal Pty Limited.
- Operational Risk Mentoring (2015) *South Bates (Whybrow Seam) Underground Mine – Longwalls 11 to 13 Subsidence Risk Assessment Report*. Report prepared for Wambo Coal Pty Limited.
- Operational Risk Mentoring (2016) *South Bates Underground Mine – Longwalls 11 to 16 Subsidence Risk Assessment Report*. Report prepared for Wambo Coal Pty Limited.
- RPS Australia East Pty Limited (2015) *Cultural Heritage Impact Assessment: South Bates (Wambo Seam) Underground Mine Modification*. Report prepared for Wambo Coal Pty Limited.
- South East Archaeology (2016a) *Wambo Coal Mine, Hunter Valley, New South Wales: Reassessment of Previously Reported Grinding Groove Locations*.

South East Archaeology (2016b) *Wambo Coal Mine, Hunter Valley, New South Wales: Reassessment of Previously Reported Grinding Groove Locations – Supplementary Report in Relation to Wambo Sites 117 and 473.*

Wambo Coal Pty Limited (2003) *Wambo Development Project Environmental Impact Statement.*

Wambo Coal Pty Limited (2015) *South Bates (Wambo Seam) Underground Mine Modification – Environmental Assessment.*

Wambo Coal Pty Limited (2016) *South Wambo Underground Mine Modification – Environmental Assessment.*

6 ABBREVIATIONS, ACRONYMS AND GLOSSARY

6.1 ABBREVIATIONS AND ACRONYMS

AHIP	Aboriginal Heritage Impact Permit	HMP	Heritage Management Plan
BFMP	Built Features Management Plan	IDC	Index of Diversion Condition
BMP	Biodiversity Management Plan	km	kilometre
CCC	Community Consultative Committee	km ⁻¹	per kilometre
CL	Coal Lease	kV	kilovolt
CRRP	Coal Resource Recovery Plan	LiDAR	Light Detection and Ranging
DMR	NSW Department of Mineral Resources (now DRE)	LFA	Landscape Function Analysis
DP&E	NSW Department of Planning and Environment	LMP	Land Management Plan
DPI	NSW Department of Primary Industries	m	metre
Draft Extraction Plan Guidelines	<i>Guidelines for the Preparation of Extraction Plans Required under Conditions of Development Consents, Project Approvals and Mining Lease Conditions for Underground Coal Mining (Department of Planning and Environment and NSW Trade & Investment – Division of Resources and Energy, 2015).</i>	MG	maingate
DRE	Division of Resources and Energy	ML	Mining Lease
EEC	endangered ecological community	ML/day	megalitre per day
the Wambo Development Project EIS	<i>Wambo Development Project Environmental Impact Statement</i>	mm	millimetre
EPA	NSW Environment Protection Authority	mm/m	millimetre per metre
EP&A Act	<i>NSW Environmental Planning and Assessment Act, 1979</i>	MOP	Mining Operations Plan
EPL	Environment Protection Licence	MSB	Mine Subsidence Board
ESCP	Erosion and Sediment Control Plan	MSEC	Mine Subsidence Engineering Consultants
GWMP	Groundwater Monitoring Program	Mt	million tonne
HSMS	Health Safety Management System	NPW Act	<i>NSW National Parks and Wildlife Act, 1974</i>
		NSW	New South Wales
		NSW Trade & Investment	NSW Department of Trade and Investment, Regional Infrastructure and Services
		OEH	NSW Office of Environment and Heritage
		PSMP	Public Safety Management Plan
		ROM	Run-of-mine
		RWEP	Remnant Woodland Enhancement Program
		SGWRP	Surface and Groundwater Response Plan
		South Bates (Wambo Seam) Modification EA	<i>South Bates (Wambo Seam) Underground Mine Modification Environmental Assessment</i>
		SWMP	Surface Water Monitoring Program
		TARP	Trigger Action Response Plan

TG	tailgate	WAMP	WCPL Asset Management Plan
TSMP	Threatened Species Management Plan	WCPL	Wambo Coal Pty Limited
		WMP	Water Management Plan
UAV	unmanned aerial vehicle	°	degree
VCP	Vegetation Clearance Protocol	%	percent

6.2 GLOSSARY

Note: Terms in bold are defined in the Development Consent (DA 305-7-2003).

Adaptive Management	Adaptive management includes monitoring subsidence impacts and subsidence effects and, based on the results, modifying the mining plan as mining proceeds to ensure that the effects, impacts and/or associated environmental consequences remain within predicted and designated ranges and in compliance with the conditions of the Development Consent.
Alluvial	A general term for clay, silt, sand and gravel transported by water and deposited, on the bed of a floodplain, river or stream.
Angle of Draw	The angle between the vertical and the line joining the edge of the mining void with the limit of vertical subsidence, usually taken as 20 mm.
Aquifer	A sub-surface rock formation containing water in recoverable quantities.
Baseflow	The discharge of sub-surface water into a stream (i.e. groundwater seepages).
Built Features	Includes any building or work erected or constructed on land, and includes dwellings and infrastructure such as any formed road, street, path, walk, or driveway; any pipeline, water, sewer, telephone, gas or other service main.
Cumulative Subsidence	The total subsidence effects resulting from all seams mined up to and including the Wambo Seam (i.e. future workings not included in this Extraction Plan are not included in the cumulative subsidence prediction).
Development Consent	Development Consent DA 305-7-2003 for the Wambo Coal Mine was granted on 4 February 2004 by the then NSW Minister for Urban Affairs and Planning under Part 4 of the NSW <i>Environmental Planning and Assessment Act, 1974</i> .
Environmental Consequence	The environmental consequences of subsidence impacts, including: damage to infrastructure, buildings and residential dwellings; loss of surface flows to the subsurface; loss of standing pools; adverse water quality impacts; development of iron bacterial mats; cliff falls; rock falls; damage to Aboriginal heritage sites; impacts on aquatic ecology; ponding.
Fault	Major fracture of the earth's crust caused by the relative movement of the rock masses on either side.
First Workings	Underground workings which establish access to the coal resource area.
Geological Structures	Geological structures are faults, igneous intrusions, joints or any other significant type of discontinuity or disturbances within the rock strata.
Goaf	The mined-out area into which the immediate roof strata break.

Incremental Subsidence	The subsidence effects resulting from mining in the Wambo Seam only, including goaf reactivation of the previous workings in the Whybrow Seam (i.e. not including any subsidence already completed as a result of mining in the Whybrow Seam and/or Woodlands Hill/Arrowfield Seam).
Mitigation	Activities associated with reducing the impacts of the development prior to or during those impacts occurring.
Remediation	Activities associated with partially or fully repairing or rehabilitating the impacts of the development or controlling the environmental consequences of this impact.
Risk	The chance of something happening that will have an impact upon objectives. It is measured in terms of consequence and likelihood.
Safe, Serviceable and Repairable	Safe means no danger to users who are present, serviceable means available for its intended use, and repairable means damaged components can be repaired economically.
Second Workings	Extraction of coal by longwall mining or pillar extraction that may result in surface subsidence.
Strain	The change in the horizontal distance between two points at the surface and is typically expressed in units of mm/m. <i>Tensile strain</i> is an increase in the distance between two points (i.e. stretching) and <i>compressive strain</i> is a decrease in distance (i.e. squeezing).
Subsidence	The totality of subsidence effects, subsidence impacts and environmental consequences of subsidence impacts.
Subsidence Effect	Deformation of the ground mass due to mining, including all mining-induced ground movements, such as vertical and horizontal displacement, tilt, strain and curvature.
Subsidence Impact	Physical changes to the ground and its surface caused by subsidence effects, including tensile and shear cracking of the rock mass, localised buckling of strata caused by valley closure and upsidence and surface depressions or troughs.
Tilt	The change in the slope of a land surface as a result of differential subsidence and is expressed in units of millimetres per metre (mm/m) or a change in grade where 1 mm/m = 0.1%.
Upsidence	Relative vertical upward movements of the ground surface associated with subsidence.
Vertical subsidence	Vertical downward movements of the ground surface caused by underground coal mining.
Wollombi Brook Protected Land	Within 40 metres of Wollombi Brook as defined by the former <i>Rivers and Foreshore Improvement Act, 1948</i> . Mining of longwall panels in the vicinity of Wollombi Brook would be constrained to an angle of 26.5° from the vertical to “Protected Land”.

WAMBO COAL PTY LIMITED



SOUTH BATES UNDERGROUND MINE

EXTRACTION PLAN LONGWALLS 11 TO 16

ATTACHMENT 1 STATUTORY REQUIREMENTS

Attachment 1

Statutory Requirements

This Attachment outlines relevant statutory and guideline requirements and provides the relevant section of the Extraction Plan where the requirements are addressed. This Attachment considers the statutory instruments and guidelines in **Table A1-1**.

Table A1-1
Relevant Statutory Instruments and Guidelines

Statutory Instrument or Guideline	Attachment 1 Reference
Development Consent (DA 305-7-2003)	Table A1-2
Draft <i>Guidelines for the Preparation of Extraction Plans Required under Conditions of Development Consents, Project Approvals and Mining Lease Conditions for Underground Coal Mining</i> (Version 5) (Draft Extraction Plan Guidelines) (DP&E and DRE, 2015)	Table A1-3
Mining Lease Conditions	Table A1-4

Table A1-2
Development Consent DA 305-7-2003 Requirements

Condition Number (Schedule 4)	Condition	Document Reference/Comment																		
Performance Measures – Natural and Heritage Features, etc																				
22.	<p>The Applicant must ensure that the development does not cause any exceedances of the performance measures in Table 14A, to the satisfaction of the Secretary.</p> <p>Table 14A: Subsidence Impact Performance Measures</p> <table><tr><td colspan="2">Water</td></tr><tr><td>Wollombi Brook</td><td>Negligible subsidence impacts. Negligible environmental consequences. Controlled release of excess site water only in accordance with EPL requirements</td></tr><tr><td colspan="2">Biodiversity</td></tr><tr><td>Wollemi National Park</td><td>Negligible subsidence impacts. Negligible environmental consequences</td></tr><tr><td>Warkworth Sands Woodland Community</td><td>Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences</td></tr><tr><td>White Box, Yellow Box, Blakely's Red Gum Woodland/Grassy White Box Woodland Community</td><td>Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences</td></tr><tr><td>Other threatened species, populations or communities</td><td>Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences</td></tr><tr><td colspan="2">Heritage</td></tr><tr><td>Wambo Homestead Complex</td><td>Negligible impact on heritage values, unless approval has been granted by the Heritage Branch and/or the Minister</td></tr></table>	Water		Wollombi Brook	Negligible subsidence impacts. Negligible environmental consequences. Controlled release of excess site water only in accordance with EPL requirements	Biodiversity		Wollemi National Park	Negligible subsidence impacts. Negligible environmental consequences	Warkworth Sands Woodland Community	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences	White Box, Yellow Box, Blakely's Red Gum Woodland/Grassy White Box Woodland Community	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences	Other threatened species, populations or communities	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences	Heritage		Wambo Homestead Complex	Negligible impact on heritage values, unless approval has been granted by the Heritage Branch and/or the Minister	<p>This Extraction Plan has been developed to meet the subsidence impact performance measures.</p> <p>Section 3.1 and Appendix A (Water Management Plan).</p> <p>Section 3.3 and Appendix C (Biodiversity Management Plan).</p> <p>Section 3.4 and Appendix D (Heritage Management Plan).</p>
Water																				
Wollombi Brook	Negligible subsidence impacts. Negligible environmental consequences. Controlled release of excess site water only in accordance with EPL requirements																			
Biodiversity																				
Wollemi National Park	Negligible subsidence impacts. Negligible environmental consequences																			
Warkworth Sands Woodland Community	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences																			
White Box, Yellow Box, Blakely's Red Gum Woodland/Grassy White Box Woodland Community	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences																			
Other threatened species, populations or communities	Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences																			
Heritage																				
Wambo Homestead Complex	Negligible impact on heritage values, unless approval has been granted by the Heritage Branch and/or the Minister																			

Table A1-2 (Continued)
Development Consent DA 305-7-2003 Requirements

Condition Number (Schedule 4)	Condition	Document Reference/Comment								
Performance Measures – Built Features										
22A.	<p>The Applicant must ensure that the development does not cause any exceedances of the performance measures in Table 14B, to the satisfaction of the DRE.</p> <p>Table 14B: Subsidence Impact Performance Measures</p> <table><tr><td colspan="2">Built Features</td></tr><tr><td>All built features</td><td>Always safe. Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. Damage must be fully repairable, and must be fully repaired or else replaced or fully compensated.</td></tr><tr><td colspan="2">Public Safety</td></tr><tr><td>Public Safety</td><td>No additional risk</td></tr></table>	Built Features		All built features	Always safe. Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. Damage must be fully repairable, and must be fully repaired or else replaced or fully compensated.	Public Safety		Public Safety	No additional risk	<p>This Extraction Plan has been developed to meet the subsidence impact performance measures.</p> <p>Section 3.5 and Appendix E (Built Features Management Plan).</p> <p>Section 3.6 and Appendix F (Public Safety Management Plan).</p>
Built Features										
All built features	Always safe. Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. Damage must be fully repairable, and must be fully repaired or else replaced or fully compensated.									
Public Safety										
Public Safety	No additional risk									
22B.	<p>Any dispute between the Applicant and the owner of any built feature over the interpretation, application or implementation of the performance measures in Table 14B is to be settled by DRE. DRE may seek the advice of the MSB on the matter. Any decision by DRE shall be final and not subject to further dispute resolution under this consent.</p>	<p>The Longwalls 11 to 16 Application Area is located entirely within WCPL owned land.</p> <p>All built features are to be managed in accordance with Section 3.5 and the Built Features Management Plan (Appendix E).</p>								

Table A1-2 (Continued)
Development Consent DA 305-7-2003 Requirements

Condition Number (Schedule 4)	Condition	Document Reference/Comment
Extraction Plan		
22C.	The Applicant must prepare and implement an Extraction Plan for the second workings within each seam to be mined to the satisfaction of the Secretary. Each Extraction Plan must:	
	(a) be prepared by a team of suitably qualified and experienced persons whose appointment has been endorsed by the Secretary;	Section 1.1 and Attachment 2.
	(b) be approved by the Secretary before the Applicant carries out any of the second workings covered by the plan;	This application.
	(c) include detailed plans of the proposed first and second workings and any associated surface development;	Section 1.3 and Appendix G (Coal Resource Recovery Plan).
	(d) include detailed performance indicators for each of the performance measures in Tables 14A and 14B;	Section 3 and Appendices A, C, E and F.
	(e) provide revised predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed second workings, incorporating any relevant information obtained since this consent;	Section 2.1 and Technical Reports 1 to 3.
	(f) describe the measures that would be implemented to ensure compliance with the performance measures in Tables 14A and 14B, and manage or remediate any impacts and/or environmental consequences;	Section 3 and Appendices A to F, H and I.
	(g) include the following to the satisfaction of DRE: <ul style="list-style-type: none"> a coal resource recovery plan that demonstrates effective recovery of the available resource; a subsidence monitoring program to: <ul style="list-style-type: none"> provide data to assist with the management of the risks associated with subsidence; validate the subsidence predictions; and analyse the relationship between the subsidence effects and impacts under the plan and any ensuing environmental consequences; 	Appendix G (Coal Resource Recovery Plan). Section 3.8 and Appendix H (Subsidence Monitoring Program).

Table A1-2 (Continued)
Development Consent DA 305-7-2003 Requirements

Condition Number (Schedule 4)	Condition	Document Reference/Comment
22C. (Cont.)	<ul style="list-style-type: none"> a Built Features Management Plan to manage the potential subsidence impacts and/or environmental consequences of the proposed second workings, and which: <ul style="list-style-type: none"> addresses in appropriate detail all items of public infrastructure and all classes of other built features; and has been prepared following appropriate consultation with the owner/s of potentially affected feature/s; 	Section 3.5 and Appendix E (Built Features Management Plan). There is no public infrastructure in the Longwalls 11 to 16 Application Area.
	<ul style="list-style-type: none"> a Public Safety Management Plan to ensure public safety in the mining area; and 	Section 3.6 and Appendix F (Public Safety Management Plan).
	<ul style="list-style-type: none"> appropriate revisions to the Rehabilitation Management Plan required under condition 94C; and 	<p>The Rehabilitation Management Plan, in the form of the approved Mining Operations Plan (MOP), is provided in Appendix I.</p> <p>The MOP was approved by the DRE on 4 June 2015 as addressing the requirements of a Rehabilitation Management Plan.</p>
	<p>(h) include a:</p> <ul style="list-style-type: none"> Water Management Plan, which has been prepared in consultation with EPA and NOW, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on surface water resources, groundwater resources and flooding, and which includes: <ul style="list-style-type: none"> surface and groundwater impact assessment criteria, including trigger levels for investigating any potentially adverse impacts on water resources or water quality; a program to monitor and report groundwater inflows to underground workings; and a program to manage and monitor impacts on groundwater bores on privately-owned land; 	<p>Section 3.1 and Appendix A (Water Management Plan).</p> <p>The Environment Protection Authority and the Department of Primary Industries - Water have been provided with a copy of the previous version of this Extraction Plan, including the Water Management Plan. A draft of the revised Water Management Plan for this application was provided to the Environment Protection Authority and the Department of Primary Industries – Water on 23 December 2016.</p>

Table A1-2 (Continued)
Development Consent DA 305-7-2003 Requirements

Condition Number (Schedule 4)	Condition	Document Reference/Comment
22C. (Cont.)	<ul style="list-style-type: none"> Biodiversity Management Plan, which has been prepared in consultation with the OEH, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on flora and fauna; 	Section 3.3 and Appendix C (Biodiversity Management Plan). A draft of the Biodiversity Management Plan was provided to the Office of Environment and Heritage on 28 October 2016.
	<ul style="list-style-type: none"> Land Management Plan, which has been prepared in consultation with any affected public authorities, to manage the potential impacts and/or environmental consequences of the proposed second workings on land in general; 	Section 3.2 and Appendix B (Land Management Plan). There are no 'affected public authorities' relevant to the Longwalls 11 to 16 Application Area. Therefore, the Land Management Plan was not distributed for comment.
	<ul style="list-style-type: none"> Heritage Management Plan, which has been prepared in consultation with OEH and relevant stakeholders for Aboriginal and non-Aboriginal heritage, to manage the potential environmental consequences of the proposed second workings on heritage sites or values; and 	Section 3.4 and Appendix D (Heritage Management Plan). A draft of the Heritage Management Plan was provided to the Office of Environment and Heritage and the Heritage Branch on 9 December 2016. Aboriginal parties registered at the Wambo Coal Mine were consulted on the previous version of this Extraction Plan and through the preparation of a Cultural Heritage Impact Assessment that accompanied DA 305-7-2003 MOD 15 and associated application for an Aboriginal Heritage Impact Permit.
	(i) include a program to collect sufficient baseline data for future Extraction Plans.	Attachment 3.
	The Applicant must implement the approved management plan as approved from time to time by the Secretary.	-
22D.	<p>The Applicant must ensure that the management plans required under condition 22C(h) above include:</p> <ul style="list-style-type: none"> (a) an assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this consent; (b) a detailed description of the measures that would be implemented to remediate predicted impacts; and (c) a contingency plan that expressly provides for adaptive management. 	Appendices A to D.

Table A1-2 (Continued)
Development Consent DA 305-7-2003 Requirements

Condition Number (Schedule 4)	Condition	Document Reference/Comment
First Workings		
22E.	The applicant may carry out first workings within the underground mining area, other than in accordance with an approved extraction plan, provided that DRE is satisfied that the first workings are designed to remain stable and non-subsiding in the long term, except insofar as they may be impacted by approved second workings.	<p>Confirmation from the Division of Resources and Energy was provided on 30 September 2014 that the proposed first workings for Longwalls 11 to 13 satisfied the requirements of Condition 22E, Schedule 4 of the Development Consent (DA 305-7-2003), subject to the Mine Manager undertaking adequate monitoring of the stability of the first workings and implementing appropriate ground support of the roadways in accordance with the results of the monitoring.</p> <p>Confirmation from the Division of Resources and Energy was provided on 22 December 2015 that the proposed first workings for Longwalls 14 to 16 satisfied the requirements of Condition 22E, Schedule 4 of the Development Consent (DA 305-7-2003), subject to the Mine Manager undertaking adequate monitoring of the stability of the first workings and implementing appropriate ground support of the roadways in accordance with the results of the monitoring.</p> <p>The above monitoring requirements are undertaken in accordance with the Strata Failure Management Plan.</p>

Table A1-3
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
Structure		
-	<p>The high-level structure for the required elements of an Extraction Plan should be as follows:</p> <ul style="list-style-type: none"> • Title block; • Development of the Plan; • Overview; • Six key component plans: <ul style="list-style-type: none"> - Water Management Plan; - Land Management Plan; - Biodiversity Management Plan; - Built Features Management Plan; - Heritage Management Plan; and - Public Safety Management Plan. • Subsidence Monitoring Program; • Implementation; • Graphical Plans; and • Attachments. 	<p>The Extraction Plan has been structured as follows:</p> <ul style="list-style-type: none"> • Overview and Summary of Commitments. • Section 1 – Overview of the Extraction Plan. • Section 2 – Development of the Extraction Plan. • Section 3 – Subsidence Management and Monitoring. Summarises the monitoring and management measures in the component management plans. Section 3.8 provides an overview of subsidence monitoring. • Section 4 – Implementation. • Section 5 – References. • Section 6 – Abbreviations, Acronyms and Glossary. • Attachments 1 to 4. • Appendices A to I (component management plans). Graphical plans are provided in Appendix G (Coal Resource Recovery Plan). • Technical Reports 1 to 4.

Table A1-3
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
Title Block		
1	<p>A title block should be included at the beginning of the Extraction Plan, which contains the:</p> <ul style="list-style-type: none"> • name of the applicant company; • name of mine; • development consent and mining lease reference numbers; • Extraction Plan title, date and reference number; • the signature(s) of person(s) taking responsibility for the accuracy and comprehensiveness of the information contained within the plan, including an authorised representative of the lease holder and the mine manager (for the purposes of relevant safety legislation). 	Document Control page.
Development		
2	Most importantly, this section should address consultation undertaken by the Applicant with affected agencies and other key stakeholders , such as the owners and/or operators of both publicly and privately-owned infrastructure and the mine's Community Consultative Committee.	Section 2.3
	Mines are encouraged to provide draft copies of the Extraction Plan and/or some of its component plans (see Section 4 below) to key regulators for review and feedback.	Table 8.
	Owners of both publicly and privately-owned infrastructure that may be impacted by subsidence should also be consulted.	Section 2.3.3. All assets within the Longwalls 11 to 16 Application Area are WCPL owned.
	Landowners (whether public or private) may also need to be consulted.	The Longwalls 11 to 16 Application Area is located entirely within WCPL owned land.
	Where conditions of consent <i>require</i> consultation with affected agencies, then evidence of the Applicant's consultative process should be appended to the Extraction Plan, or else provided separately. This evidence should address who was consulted and when, and whether and to what degree their feedback has been incorporated into the Plan.	Attachment 2.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
2 (Cont.)	<p>This section should also describe the <i>process of reviewing and updating the predictions of subsidence effects, subsidence impacts and environmental consequences</i> used in previous environmental impact assessment or environmental management plan documentation relied upon by the Applicant (eg the predictions in any previous Environmental Impact Statement and/or the predictions in any previous Extraction Plan or SMP).</p> <p>Essentially, this sub-section should provide assurance that previous predictions either remain current (perhaps because this is the first Extraction Plan to be approved following grant of development consent), or that they have been recently revised to take into account monitoring undertaken since the last set of detailed predictions were developed. For guidance, all predictions of subsidence effects, subsidence impacts and environmental consequences should normally take into account the monitored results of the last complete longwall extraction, or all results of monitoring more than six months prior to the date of submission in the case of other types of extraction panels.</p>	Section 2.1 and Technical Reports 1 to 3
Overview		
3	<p>The overview section is an essential introduction to the Extraction Plan. It should accurately describe:</p> <ul style="list-style-type: none"> mine planning and design, including: <ul style="list-style-type: none"> area covered by the Plan and proposed mine layout, described in both text and figures and/or graphical plans. The Plans should also describe and depict all key landscape features, heritage sites and environmental values; area of underground mining domains (both extracted and approved) for the mine as a whole, showing in context the area covered by the Plan and proposed mine layout, described in text, figures and graphical plans; all key proposed mining parameters (described in text, figures and graphical plans) such as proposed mining methods, seam thickness, panel and void widths, chain pillar width, mining height, depth of cover, mining rate, extraction stages and sequencing, resource recovery; 	<p>Section 1.3.</p> <p>Section 1.1 and Figures 2 and 3.</p> <p>Figures 2, 3 and 6.</p> <p>Table 2 and Figure 6.</p> <p>Further detail is provided in the Coal Resource Recovery Plan (Appendix G).</p>

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
3 (Cont.)	<ul style="list-style-type: none"> - all key existing mining parameters (described in text, figures and graphical plans) such as existing workings (including abandoned workings), whether in the proposed extraction seam or in overlying or underlying seams, and the distribution, geometry and stability of significant voids, standing pillars or remnants which may interact with any proposed workings; and - any special features such as proposed and/or existing multi-seam mining, unusual roof and/or floor conditions, and any conditions that may cause elevated or abnormal subsidence or the formation of sinkholes; • subsidence predictions, including: <ul style="list-style-type: none"> - all key currently-predicted subsidence parameters (for each proposed longwall or other extraction panel) in both text and figures and/or plans; such as vertical subsidence, tilts, compressive and tensile strains, upsidence and valley closure, relevant far-field movements, including (where relevant) the timing and duration of these parameters; • performance objectives and other regulatory requirements, including: <ul style="list-style-type: none"> - what is required to be achieved by the Applicant under the conditions of development consent that establish the requirement for the Extraction Plan and other relevant conditions, including all performance measures listed in the consent; and - what is required to be achieved by the Applicant under other regulatory requirements, including the mining lease, relevant safety legislation, environment protection licence and other required approvals, and limitations and other key requirements of these statutes and approvals; • subsidence management, strategies and measures, ie the means by which the requirements of the conditions of consent and other approvals and statutes are going to be achieved by the Applicant, through: <ul style="list-style-type: none"> - selection of mine design elements and best practice methods (ie avoidance and mitigation strategies); - remediation strategies and measures proposed to be implemented in response to predicted subsidence impacts and/or environmental consequences; 	<p>Section 1.3.1 and Coal Resource Recovery Plan (Appendix G).</p> <p>Section 1.3.1 and Coal Resource Recovery Plan (Appendix G).</p> <p>Section 1.4.</p> <p>Table 5.</p> <p>Section 1.5 and this Attachment.</p> <p>Section 1.6.</p> <p>Further detail is provided in Section 1.6.1.</p> <p>Further detail is provided in Sections 3.1 to 3.7.</p>

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
3 (Cont.)	<ul style="list-style-type: none"> - monitoring of subsidence effects, subsidence impacts and environmental consequences (including plans showing all proposed monitoring points); - adaptive management to avoid repetition of any unpredicted subsidence impacts and/or environmental consequences, including capacity to detect early warning of and respond to deviations from required performance measures; - procedures for investigations of incidents (including all exceedances of performance measures) and appropriate response; and - procedures for quality assurance and review of the management system. 	<p>Further detail is provided in Section 3.8.</p> <p>Further detail is provided in Section 4.1.</p> <p>Further detail is provided in Section 4.1.2.</p> <p>Further detail is provided in Sections 4.1 to 4.4.</p>
Key Component Plans		
4	<p>The main body of the Extraction Plan primarily comprises a set of six key component plans. It is appropriate that these are presented in a particular order, even if some of the later plans deserve a particular priority due to local circumstances (eg the Built Features or Heritage Management Plans). The preferred order for these component plans is as follows:</p> <ul style="list-style-type: none"> • Water Management Plan; • Land Management Plan; • Biodiversity Management Plan; • Heritage Management Plan; • Built Features Management Plan; and • Public Safety Management Plan. 	<p>Section 3 summarises the monitoring and management measures in the following component management plans:</p> <ul style="list-style-type: none"> • Appendix A – Water Management Plan; • Appendix B – Land Management Plan; • Appendix C – Biodiversity Management Plan; • Appendix D – Heritage Management Plan; • Appendix E – Built Features Management Plan; and • Appendix F – Public Safety Management Plan.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
4 (Cont.)	Each of these key component plans should follow the structure of:	
	<ul style="list-style-type: none"> overview of all landscape features, heritage sites, environmental values, built features or other values to be managed under the component plan; 	Table 2 and Section 1.1 of Appendix A, Section 1.1 of Appendix B, Section 1 of Appendix C, Section 1 of Appendix D, Sections 1.1 and 2 of Appendix E and Section 1.1 of Appendix F.
	<ul style="list-style-type: none"> setting out all performance measures included in the development consent relevant to the features or values to be managed under the component plan; 	Section 2 of Appendix A, Section 5.4 of Appendix C, Section 5.2 of Appendix D, Section 3 of Appendix E and Section 2 of Appendix F.
	<ul style="list-style-type: none"> setting out clear objectives to ensure the delivery of the performance measures and all other relevant statutory requirements (including relevant safety legislation); 	Section 2 of Appendix A, Section 5.4 of Appendix C, Section 3 of Appendix E and Section 2 of Appendix F.
	<ul style="list-style-type: none"> proposing performance indicators to establish compliance with these performance measures and statutory requirements; 	Section 6 of Appendix A, Section 5.4 of Appendix C, Attachment 1 of Appendix E and Section 6 of Appendix F.
	<ul style="list-style-type: none"> describing the landscape features, heritage sites and environmental values to be managed under the component plan, and their significance. It should be noted that a full description of such features, sites and values would commonly have been provided and considered in a recent environmental impact assessment. Consequently, this section can be relatively brief, and focus on the presentation of appropriate figures and/or graphical plans; 	Table 2 and Section 3 of Appendix A, Section 3 of Appendix B, Section 3 and Appendix L of Appendix C, Sections 2 and 5 of Appendix D, Table 1 of Appendix E and Section 3 of Appendix F.
	<ul style="list-style-type: none"> fully describing all currently-predicted subsidence impacts and environmental consequences relevant to the features, sites and values to be managed under the component plan; 	Section 3 of Appendix A, Section 3 of Appendix B, Appendix L of Appendix C, Appendix C of Appendix D, Section 5 and Attachment 1 of Appendix E and Section 3 of Appendix F.
	<ul style="list-style-type: none"> fully describing all measures planned to remediate these impacts and/or consequences, including any measures proposed to ensure that impacts and/or consequences comply with performance measures and/or the Applicant's commitments; 	Table 2 and Section 5 of Appendix A, Section 5 of Appendix B, Section 6.2 of Appendix C, Section 4.7 of Appendix D, Attachment 1 of Appendix E and Section 5 of Appendix F.
	<ul style="list-style-type: none"> describing the existing baseline monitoring network and the current baseline monitoring results, including pre-subsidence photographic surveys of key landscape features and key heritage sites which may be subject to significant subsidence impacts (such as significant watercourses, swamps and Aboriginal heritage sites); 	Table 2 of Appendix A, Section 3 and Table 2 of Appendix B, Section 3 of Appendix C and Sections 2, 3 and 5 of Appendix D.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
4 (Cont.)	<ul style="list-style-type: none"> fully describing the proposed monitoring of subsidence impacts and environmental consequences; 	Section 4 and Table 2 of Appendix A, Section 4 of Appendix B, Section 7.1 of Appendix C, Section 4.7 of Appendix D, Attachment 1 of Appendix E and Section 4 of Appendix F.
	<ul style="list-style-type: none"> describing the proposed monitoring of the success of remediation measures following implementation; 	Section 6 of Appendix A, Section 6 of Appendix B, Attachment 1 of Appendix E and Section 6 of Appendix F.
	<ul style="list-style-type: none"> fully describing adaptive management proposed to avoid repetition of unpredicted subsidence impacts and/or environmental consequences; 	Section 6 of Appendix A, Section 6 of Appendix B, Section 8 of Appendix C, Section 9.1 of Appendix D, Attachment 1 of Appendix E and Section 6 of Appendix F.
	<ul style="list-style-type: none"> fully describing contingency plans proposed to prevent, mitigate or remediate subsidence impacts and/or environmental consequences which substantially exceed predictions or which exceed performance measures; 	Sections 6 and 7 of Appendix A, Sections 6 and 7 of Appendix B, Section 8 of Appendix C, Section 9 of Appendix D, Attachment 1 of Appendix E and Sections 6 and 7 of Appendix F.
	<ul style="list-style-type: none"> listing responsibilities for implementation of the plan; and 	Table 2 of Appendix A, Section 8 of Appendix B, Section 12 of Appendix C, Section 10 of Appendix D, Attachment 1 of Appendix E and Section 8 of Appendix F.
	<ul style="list-style-type: none"> an attached Trigger, Action, Response Plan (effectively a tabular summary of most of the above). 	Attachment 1 of Appendices A to B, Section 8.2 of Appendix C and Attachment 1 of Appendices E and F.
	<p>All six key component plans should give appropriate consideration to risk assessment and risk management.</p> <p>This is particularly the case for Public Safety Management Plans and Built Features Management Plans. These two plans should include:</p> <ul style="list-style-type: none"> the results of risk assessment conducted by a competent person in accordance with relevant standards and guidelines; description of the investigation and analysis methods used in determining the risk control measures and procedures, carried out by a competent person; description of all risk control measures and procedures, including a statement of the feasibility to manage identified risks; and a proposed program for implementation of the proposed risk control measures and procedures. 	<p>Technical Report 4 and reflected in Appendices A to F.</p> <p>Technical Report 4, Section 6 of Appendix E and Section 3 of Appendix F.</p>

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
4 (Cont.)	<p>The Public Safety Management Plan must address all potential safety hazards to the public. The scope of the Plan should include management of health and safety risks due to:</p> <ul style="list-style-type: none"> • potential subsidence impacts on built features; • potential instability of cliff formations or steep slopes caused by subsidence; • deformations or fracturing of any land caused by subsidence, and • any other impacts of subsidence. <p>This Plan should address management measures such as:</p> <ul style="list-style-type: none"> • monitoring of areas posing safety risks; • erection of warning signs and possible entry or use restrictions; • backfilling of surface cracks and/or re-profiling of humps and swales on tracks and roads; • infilling of pot holes; • securing of potentially unstable structures and rock masses; • identification of potential flood-related impacts that may pose a risk to public safety; and • provision of regular updates regarding mining progress to the community where management of public safety is a significant issue. 	<p>Sections 1.1 and 3 of Appendix F.</p> <p>Section 4 of Appendix F. Section 5 of Appendix F. Section 5 of Appendix F and Appendix B. Section 5 of Appendix F and Appendix B. Section 5 of Appendix F and Appendix B. Not applicable. Not applicable (WCPL owned land).</p>
	It may be appropriate that owners of either land or infrastructure are compensated in some manner for damage, disturbance, access requirements or other inconvenience associated with mining and mine subsidence. Such compensation may reflect the requirements of the <i>Mine Subsidence Compensation Act 1961</i> , Part 13 of the <i>Mining Act 1992</i> and/or conditions of development consent.	<p>The Longwalls 11 to 16 Application Area is located entirely within WCPL owned land.</p> <p>All assets within the Longwalls 11 to 16 Application Area are WCPL owned.</p>

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
Subsidence Monitoring Program		
5	<p>The key component plans should be followed by a Subsidence Monitoring Program.</p> <p>This program should address two purposes. The first is to set out the program for monitoring the <i>subsidence effects</i> associated with the proposed coal extraction.</p> <p>The second is to summarise and consolidate the various environmental monitoring programs presented in each of the key component plans.</p> <p><u><i>Subsidence Effects Monitoring Program</i></u></p> <p>The Subsidence Effects Monitoring Program must provide sufficient information on subsidence effects to fully support implementation of the Extraction Plan. It should have clearly stated objective(s) and address the following:</p> <ul style="list-style-type: none"> • proposed subsidence monitoring activities (individually specified); • information or subsidence parameters to be obtained from each monitoring activity; • proposed locations and/or extents where each monitoring activity will be undertaken, in particular, the proposed layout and/or locations of instrumentation, monitoring points or inspections (including graphical plans); • proposed timing, frequency and duration of each monitoring activity; • proposed monitoring methods, technologies, industry standards (eg ICSM Standards (SP1) Version 2.0) or Codes of Practice to be applied in undertaking each monitoring activity; • proposed measures and procedures for quality assurance and competence of personnel undertaking monitoring activities; • proposed procedures to record monitoring results; • proposed reporting monitoring results, including the frequency of reporting. The primary recipient of reports is DRE, and required reporting frequency will depend on the significance of features which are subject to risk of subsidence impact and consequence, and the scale of that risk; and • capacity of the program to detect early warning of deviations from the defined performance measures and associated performance indicators. 	<p>Section 3.8 and Appendix H (Subsidence Monitoring Program).</p> <p>Section 3 of Appendix H.</p> <p>Section 4 of Appendix H.</p> <p>Section 3 and Table 1 of Appendix H.</p> <p>Table 1 of Appendix H.</p> <p>Table 1 and Attachment 1 of Appendix H.</p> <p>Table 1 of Appendix H.</p> <p>Table 1 of Appendix H.</p> <p>Section 3 of Appendix H.</p> <p>Section 3.3 of Appendix H.</p> <p>Section 3.3 of Appendix H.</p> <p>Section 3 of Appendix H.</p>

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
5 (Cont.)	<p><u><i>Environmental Monitoring Program Summary</i></u></p> <p>The Subsidence Effects Monitoring Program must summarise and consolidate the various monitoring programs presented in each of the key component plans, including the Built Features and Public Safety Management Plans. These environmental monitoring programs should be directed towards <i>monitoring the subsidence impacts and environmental consequences</i> of mine subsidence.</p> <p>It should contain figures showing the monitoring sites for each of the various monitoring programs, as well as a consolidated figure or figures showing all monitoring sites.</p> <p>It should be noted that the purpose of this summary is not to <i>repeat</i> the monitoring programs which are in themselves important elements of each of the key component plans. Instead the purpose is to present a consolidated overview of the six monitoring programs, enabling ready review of the overall monitoring program. As such, clear figures and tabulated information are critical.</p>	<p>Section 3.8, and Section 4 of Appendix H.</p> <p>Figure 1 and 2 of Appendix H.</p>
Implementation		
6	<p>This section of the Extraction Plan should address all key elements of how the plan is going to be implemented, including reporting, regular review and key responsibilities. This section should follow the structure set out below:</p> <ul style="list-style-type: none"> • Reporting Framework; • Review of the Extraction Plan; • Review of other Management Plans; and • Key Responsibilities. 	<p>Section 4 has been structured as follows:</p> <ul style="list-style-type: none"> • Section 4.1 – Adaptive Management and Contingency Response. • Section 4.2 – Reporting Framework. • Section 4.3 – Review of the Extraction Plan. • Section 4.4 – Review of Other Management Plans. • Section 4.5 – Key Responsibilities.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
6 (Cont.)	<p>The reporting framework is a critical section of the Extraction Plan. DPE and DRE both consider that there is value in developing and applying a standard reporting framework for all mines which are operating under an Extraction Plan approved after 30 September 2014. The required elements of this framework are:</p> <ul style="list-style-type: none"> • incident reporting, following any occasion of incident, in accordance with the conditions of consent and/or environment protection licence and/or any requirements in the TARP(s); • bi-monthly subsidence impact reporting, following regular monthly inspections, but only if any new impact is identified. Impacts should be clearly distinguished between those which are within predictions, those which exceed predictions but remain within performance measures and/or performance indicators, and those which exceed performance measures and/or performance indicators. Impact reporting must include a full description, location identification using aerial photos with longwall layout superimposed, good photos of the impact, and preliminary characterisation of the impact in accordance with the relevant TARP(s); • six-monthly reporting of all impacts and environmental monitoring results, including: <ul style="list-style-type: none"> - a comprehensive summary of all impacts, including a revised characterisation according to the relevant TARP(s); - any proposed actions resulting from Triggers being met in the TARP, or other actions; - assessment of compliance with all relevant performance measures and indicators; - a comprehensive summary of all quantitative and qualitative environmental monitoring results, including landscape monitoring, water quality data, water flow and pool level data, piezometer readings, etc; and • Annual Review (or Annual Environmental Management Report) reporting, to be based on each two successive six-monthly reports of impacts and environmental monitoring results. A summary of subsidence effects monitoring results should also be included. <p>DPE and/or DRE may agree to a lesser frequency for the bi-monthly and six-monthly reporting set out above, where subsidence impacts and environmental consequences at the mine are relatively rare and benign in character.</p> <p>This section of the Extraction Plan should also set out, clearly and in tabular fashion, which agencies will receive copies of each of the types of reports discussed above. The means of submission should also be set out. DPE and DRE's preferred method of submission for all reports provided at less than annual frequency is by email.</p>	Table 21 presents the proposed reporting framework for Longwalls 11 to 16.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
6 (Cont.)	Processes for the future review of the Extraction Plan should also be set out in detail. Such reviews should take place in the following circumstances: <ul style="list-style-type: none"> as required under consent conditions (see below); where unpredicted subsidence impacts and/or environmental consequences have required the implementation of contingency plans; and when preparing a subsequent Extraction Plan. 	Section 4.3.
	Where unpredicted subsidence impacts and/or environmental consequences have occurred, adaptive management requires the implementation of previously approved processes to consider and implement measures to prevent their re-occurrence. However, in certain circumstances (ie where the exceedances are particularly significant and/or are continuing to occur), adaptive management may require a more fundamental review of the Extraction Plan. The Extraction Plan should set out the circumstances in which it is considered that the Plan itself (or any of its key elements) would be reviewed.	Section 4.1.2.
	Development of an Extraction Plan may require review of other management plans . For example, conditions of consent regarding Extraction Plans require that the Extraction Plan include any consequential revisions for the mine's Rehabilitation Management Plan. Other plans may also need to be reviewed (eg management plans applying more broadly to the whole minesite, such as DRE's Mine Operations Plan). This section of the Extraction Plan should set out the process for such review, but not the proposed revisions themselves. The proposed revisions should be separately forwarded, as a proposed amendment to the relevant plan.	Management plans proposed to be reviewed to incorporate Longwalls 11 to 16 are identified in Section 4.4.
	The Implementation section of the plan should also set out in detail who is responsible for implementing its various requirements (key responsibilities). This sub-section should clearly identify which officers of the Applicant (or consultancy) have key responsibility for ensuring the implementation of the overall Extraction Plan, its key component plans and other elements, who has responsibility for incident and other reporting, who is responsible for decisions to activate TARPs, who is responsible for various elements of the plan's future review, etc.	Section 4.5.

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
Graphical Plans		
7	The following plans are required as part of the application. Plan 1 Plan 5 Plan 2 Plan 6 Plan 3 Plan 7 Plan 4	Plans 1 to 7 in Coal Resource Recovery Plan (Appendix G).
	<i>Notes to all Plans:</i> <i>(i) While the plans need not be in the exact format set out above, all the requested information must be supplied.</i> <i>(ii) All plans need to be clear, uncluttered and legible.</i> <i>(iii) All plans should be of the same scale and size and cover the same area so that they can be compared to assess surface and underground features.</i> <i>(iv) A copy of coloured aerial photography of the Extraction Plan application area and its immediate surroundings with an outline of existing and proposed workings should be included, where available. Aerial photography of an adequate scale to show significant surface features should be used.</i> <i>(v) The preferred sheet size is A0. The plans should be contained within a border. There should be a title block on the plans containing:</i> <ul style="list-style-type: none"><i>• name of the Applicant;</i><i>• name of mine;</i><i>• Extraction Plan title;</i><i>• graphical plan title and reference number;</i><i>• scale;</i><i>• date of last revision; and</i><i>• Mine Manager's signature and date of signing to testify to the Manager's acceptance of the information shown on the plans.</i>	Plans 1 to 7 in Coal Resource Recovery Plan (Appendix G).

Table A1-3 (Continued)
Requirements of the Draft Extraction Plan Guideline

Guideline Section	Requirement	Document Reference/Comment
Attachments to the Extraction Plan		
8	Any required <i>Coal Resource Recovery Plan</i> should also be included as an attachment.	Coal Resource Recovery Plan (Appendix G).
	Extraction Plans are also required to include details of a program to collect sufficient baseline data for any necessary future Extraction Plans. Details regarding the program to gather baseline data to support future plans should also be included as an attachment.	Attachment 3.

**Table A1-4
Mining Lease Requirements**

Condition Number	Condition	Document Reference/Comment
Mining Lease 1594		
4	(b) The lease holder must not undertake any underground mining operations that may cause subsidence except in accordance with an approved Extraction Plan.	This application.
	(c) The lease holder must ensure that the approved Extraction Plan provides for the effective management of risks associated with any subsidence resulting from mining operations carried out under this lease.	Technical Report 4 and Appendices A to F.
	(d) The lease holder must notify the Secretary within 48 hours of any: <ul style="list-style-type: none"> (i) incident caused by subsidence which has a potential to expose any person to health and safety risks; (ii) significant deviation from the predicted nature, magnitude, distribution, timing and duration of subsidence effects, and of the potential impacts and consequences of those deviations on built features and the health and safety of any person; or (iii) significant failure or malfunction of a monitoring device or risk control measure set out in the approved Extraction Plan addressing: <ul style="list-style-type: none"> A. built features; B. public safety; or C. subsidence monitoring. 	Section 4.2.
12	Operations must be carried out in a manner that ensures the safety of persons or stock in the vicinity of the operations. All drill holes shafts and excavations must be appropriately protected, to the satisfaction of the Director General, to ensure that access to them by persons and stock is restricted. Abandoned shafts and excavations opened up or used by the lease landholder must be filled in or otherwise rendered safe to a standard acceptable to the Director-General.	Appendix F (Public Safety Management Plan).
13	(a) Land disturbed must be rehabilitated to a stable and permanent form suitable for a subsequent land use acceptable to the Director-General and in accordance with the Mining Operations Plan so that:- <ul style="list-style-type: none"> • there is no adverse environmental effect outside the disturbed area and that the land is properly drained and protected from soil erosion. • the state of the land is compatible with the surrounding land and land-use requirements. • the landforms, soils, hydrology and flora require no greater maintenance than that in the surrounding land. 	Appendix I (Rehabilitation Management Plan).

Table A1-4 (Continued)
Mining Lease Requirements

Condition Number	Condition	Document Reference/Comment
13 (cont.)	<ul style="list-style-type: none"> in cases where revegetation is required and native vegetation has been removed or damaged, the original species must be re-established with close reference to the flora survey included in the Mining Operations Plan. If the original vegetation was not native, any re-established vegetation must be appropriate to the area and at an acceptable density. the land does not pose a threat to public safety. <p>(b) Any topsoil that is removed must be stored and maintained in a manner acceptable to the Director-General.</p>	<p>Appendix I (Rehabilitation Management Plan).</p> <p>Appendix F (Public Safety Management Plan).</p> <p>Appendix I (Rehabilitation Management Plan).</p>
16	Operations must be carried out in a manner that does not cause or aggravate air pollution, water pollution (including sedimentation) or soil contamination or erosion, unless otherwise authorised by a relevant approval, and in accordance with an accepted Mining Operations Plan. For the purpose of this condition, water shall be taken to include any watercourse, waterbody or groundwaters. The lease holder must observe and perform any instructions given by the Director-General in this regard.	Appendix A (Water Management Plan) and Appendix B (Land Management Plan).
17	Operations must not interfere with or impair the stability or efficiency of any transmission line, communication line, pipeline or any other utility on the lease area without prior written approval of the Director-General and subject to any conditions he may stipulate.	Appendix E (Built Features Management Plan) All assets within the Longwalls 11 to 16 Application Area are WCPL owned.
18	(a) Activities on the lease must not interfere with or damage fences without the prior written approval of the owner thereof or the Minister and subject to any conditions the Minister may stipulate.	Appendix B (Land Management Plan) All fences within the Longwalls 11 to 16 Application Area are WCPL owned.
19	(a) Operations must not affect any road unless in accordance with an accepted Mining Operations Plan or with the prior written approval of the Director-General and subject to any conditions he may stipulate.	Appendix B (Land Management Plan) and Appendix E (Built Features Management Plan) All roads and tracks within the Longwalls 11 to 16 Application Area are WCPL owned.
27	(A) Notwithstanding any Mining Operations Plan, the leaseholder must not mine within any part of the lease area which is within the notification area of the Wambo Tailings Dam without the prior written approval of the Minister and subject to any conditions that he may stipulate.	The Longwalls 11 to 16 Application Area does not intersect the Notification Area of any Prescribed Dams (Appendix E [Built Features Management Plan]).
Annexure A (12/11/2013)	(a) Notwithstanding any Mining Operations Plan, the leaseholder must not mine within any part of the lease area which is within the notification area of the Wambo South Water Dam without the prior written approval of the Minister and subject to any conditions that he may stipulate.	The Longwalls 11 to 16 Application Area does not intersect the Notification Area of any Prescribed Dams (Appendix E [Built Features Management Plan]).

Table A1-4 (Continued)
Mining Lease Requirements

Condition Number	Condition	Document Reference/Comment
Coal Lease 397		
1	(d) Where the registered holder desires to commence and to carry out underground mining operations within the subject area or where the Minister notifies the registered holder that he proposes to issue a direction pursuant to paragraph (c) of this condition the registered holder shall furnish to the Minister a plan showing the proposed workings in the section of land to be so mined together with such other details as the Minister may require.	Workings which are the subject of this application are shown on Plan 7 of Appendix G (Coal Resource Recovery Plan).
26	The registered holder shall not interfere in any way with any fences on or adjacent to the subject area unless with the prior written approval of the owner thereof of the Minister and subject to such conditions as the Minister may stipulate.	Appendix B (Land Management Plan) and Appendix E (Built Features Management Plan). All fences within the Longwalls 11 to 16 Application Area are WCPL owned.
27	The registered holder shall observe any instruction given or which may be given by the Minister with a view to minimising or preventing public inconvenience or damage to public or private property.	Appendix E (Built Features Management Plan). All assets within the Longwalls 11 to 16 Application Area are WCPL owned.
30	Subject to any specific condition of this lease providing for rehabilitation of any particular part of the subject area affected by mining or activities associated therewith, the registered holder shall; (a) reinstate, level, regrass, reforest and contour to the satisfaction of the Minister, any part of the subject area that may in the opinion of the Minister have been damaged or deleteriously affected by mining operations; and (b) fill in, seal or fence, to the satisfaction of the Minister, any excavation within the subject area.	Appendix I (Rehabilitation Management Plan).
31	If requested so to do by the Minister and within such time as may be stipulated by the Minister the registered holder shall carry out to the satisfaction of the Minister surveys of structures, buildings and pipelines on adjacent landholdings to determine the effect of operations on any such structures, buildings and pipelines.	Pre-mining inspections are outlined in Appendix E (Built Features Management Plan). All assets within the Longwalls 11 to 16 Application Area are WCPL-owned.
33	If so directed by the Minister the registered holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the subject area which may have been disturbed by the operations hereby authorised.	Appendix I (Rehabilitation Management Plan).
36	If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the subject area which may have been disturbed by mining or prospecting operations whether such operations were or were not carried out by the lease holder.	Appendix I (Rehabilitation Management Plan).

Table A1-4 (Continued)
Mining Lease Requirements

Condition Number	Condition	Document Reference/Comment
40	The lease holder shall provide and maintain to the satisfaction of the Minister efficient means to prevent contamination, pollution, erosion or siltation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area or any undue interference to fish or their environment and shall observe any instruction given or which may be given by the Minister with a view to preventing or minimising the contamination, pollution, erosion or siltation of any river stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area or any undue interference to fish or their environment.	Appendix A (Water Management Plan), Appendix B (Land Management Plan) and Appendix C (Biodiversity Management Plan).
46	Operations shall be carried out in such a manner as to interfere as little as possible with natural flora and fauna and the registered holder shall comply with any direction given or which may be given in this regard by the Minister or the Director-General.	Appendix B (Land Management Plan) and Appendix C (Biodiversity Management Plan).
52	The lease holder shall conduct operations in such a manner as to not cause or aggravate soil erosion and the lease holder shall observe and perform any instructions given or which may be given by the Minister with a view to minimising or preventing soil erosion.	Appendix B (Land Management Plan) and Appendix I (Rehabilitation Management Plan).
59	In the event of operations being conducted on the surface of any road, track or firetrail traversing the subject area or in the event of such operations causing damage to or interference with any such road, track or firetrail the lease holder, at his own expense, shall if directed to do so by the Minister provide to the satisfaction of the Minister an alternate road, track or firetrail in a position as required by the Minister and shall allow free and uninterrupted access along such alternate road, track or firetrail and, if required to do so by the Minister, the lease holder shall upon completion of operations rehabilitate the surface of the original road, track or firetrail to a condition satisfactory to the Minister.	Appendix B (Land Management Plan) and Appendix D (Built Features Management Plan) All roads and tracks within the Longwalls 11 to 16 Application Area are WCPL owned.
68	(a) The marks in connection with any trigonometrical station erected on or near the subject area shall not be interfered with and the unrestricted right of access to such station by authorised persons and also the right to clear sight lines to surrounding stations is reserved at all times.	There are no active trigonometrical stations within the Longwalls 11 to 16 Application Area. There are state survey control marks located more than 1.5 km from the longwalls. Any far-field movements to survey control marks would be managed in accordance with this condition.
73	(a) The registered holder shall as far as is practicable so conduct operations as not to interfere with or impair the stability of any:- (i) telephone line; (ii) power transmission line; (iii) pipeline traversing the subject area.	Appendix E (Built Features Management Plan). All assets within the Longwalls 11 to 16 Application Area are WCPL owned.

Table A1-4 (Continued)
Mining Lease Requirements

Condition Number	Condition	Document Reference/Comment
Schedule A	(b) The lease holder must not undertake any underground mining operations that may cause subsidence except in accordance with an approved Extraction Plan.	This application.
	(c) The lease holder must ensure that the approved Extraction Plan provides for the effective management of risks associated with any subsidence resulting from mining operations carried out under this lease.	Technical Report 4 and Appendices A to F.
	(d) The lease holder must notify the Secretary within 48 hours of any: <ul style="list-style-type: none"> (i) incident caused by subsidence which has a potential to expose any person to health and safety risks; (ii) significant deviation from the predicted nature, magnitude, distribution, timing and duration of subsidence effects, and of the potential impacts and consequences of those deviations on built features and the health and safety of any person; or (iii) significant failure or malfunction of a monitoring device or risk control measure set out in the approved Extraction Plan addressing: <ul style="list-style-type: none"> A. built features; B. public safety; or C. subsidence monitoring. 	Section 4.2.

WAMBO COAL PTY LIMITED



SOUTH BATES UNDERGROUND MINE

EXTRACTION PLAN LONGWALLS 11 TO 16

ATTACHMENT 2 RELEVANT CONSULTATION RECORDS



**Office of
Environment
& Heritage**

Your reference: HMP South Bates Underground Mine (Long walls 11-13).
Our reference: DOC15 334096-01
Contact: Nicole Davis, 4927 3156

Mr Steven Peart
Manager - Environmental and Community
Wambo Coal Pty Ltd
PMB 1
SINGLETON NSW 2330

Dear Mr Peart,

REVIEW OF WAMBO COAL PTY LTD, SOUTH BEATES (WHYBROW SEAM) UNDERGROUND MINE, EXTRACTION PLAN, LONGWALLS 11 TO 13 - HERITAGE MANAGEMENT PLAN (DA 305-7-2003) AUGUST 2015.

Thank you for your correspondence to the Office of Environment and Heritage (OEH) on the 27 August 2015 requesting comments on the Heritage Management Plan for Wambo Coal Pty Ltd, South Bates (Whybrow Seam) Underground Mine, Extraction Plan, Longwalls 11 to 13, August 2015 (DA 305-7-2003).

Heritage Management Plans provide a useful tool for companies such as Wambo Coal Pty Ltd to use to help ensure that they meet their statutory requirements and that the management strategies for the protection of Aboriginal cultural heritage are clearly identified. OEH has reviewed the Heritage Management Plan for "Wambo Coal Pty Ltd, South Bates (Whybrow Seam) Underground Mine, Extraction Plan, Longwalls 11 to 13". Based on this review OEH is satisfied that the management measures proposed are adequate and appropriate given the nature of the archaeological record and the range of activities to be undertaken within operational footprint of the mine. OEH has no additional concerns with respect to Aboriginal cultural heritage management.

If you require any further information regarding this matter please contact Nicole Davis, Archaeologist, on 4927 3156.

Yours sincerely

1 SEP 2015

Ziggy Andersons
A/Senior Team Leader Planning, Hunter Central Coast Region
Regional Operations

From: Peart, Steven D [SPeart@peabodyenergy.com]
Sent: Friday, 9 December 2016 1:27 PM
To: Richard.Bath@environment.nsw.gov.au; Nicole.Davis@environment.nsw.gov.au;
info@environment.nsw.gov.au
Cc: Josh Peters
Subject: Wambo Coal Mine - Longwalls 11-16 Heritage Management Plan
Attachments: ltr - OEH - LW 11-16 HMP.pdf

Hi Richard and Nicole,

WCPL is currently preparing an Extraction Plan for the approved Longwalls 11 to 16 at the South Bates Underground Mine.

In this regard, please find attached correspondence from Wambo Coal Pty Ltd. Below is a link where a copy of the Heritage Management Plan can be downloaded:

<https://resourcestrategies.sharefile.com/d-sf1f31eea9064051a>

Please don't hesitate to call should you wish to discuss.

Regards,

Steven Peart

Manager: Environment & Community – [Peabody Energy](#)

Wambo Coal

PMB 1, Singleton NSW 2330

Office: +61 (0) 2 6570 2209 | Mobile: +61 (0) 448 082 987 | speart@peabodyenergy.com

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From: Peart, Steven D [SPeart@peabodyenergy.com]
Sent: Friday, 9 December 2016 1:29 PM
To: heritage@heritage.nsw.gov.au
Cc: Josh Peters
Subject: Wambo Coal Mine - Longwalls 11-16 Heritage Management Plan
Attachments: ltr - Heritage Division - LW 11-16 HMP.pdf

Importance: High

Hi Rajeev,

WCPL is currently preparing an Extraction Plan for the approved Longwalls 11 to 16 at the South Bates Underground Mine.

In this regard, please find attached correspondence from Wambo Coal Pty Ltd. Below is a link where a copy of the Heritage Management Plan can be downloaded:

<https://resourcestrategies.sharefile.com/d-sf1f31eea9064051a>

Please don't hesitate to call should you wish to discuss.

Regards,

Steven Peart

Manager: Environment & Community – [Peabody Energy](#)

Wambo Coal

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From: Peart, Steven D
Sent: Friday, 9 December 2016 2:26 PM
To: 'Howard.Reed@planning.nsw.gov.au'; Matthew Sprott (matthew.sprott@planning.nsw.gov.au)
Subject: Wambo Coal Mine - Longwalls 11-16 Heritage Management Plan

Hi Howard and Matthew

WCPL is currently preparing an Extraction Plan for the approved Longwalls 11 to 16 at the South Bates Underground Mine.

In this regard, please find attached correspondence from Wambo Coal Pty Ltd. Below is a link where a copy of the Heritage Management Plan can be downloaded:

<https://resourcestrategies.sharefile.com/d-sf1f31eea9064051a>

Please don't hesitate to call should you wish to discuss.

Regards,

Steven Peart

Manager: Environment & Community – [Peabody Energy](#)

Wambo Coal

PMB 1, Singleton NSW 2330

Office: +61 (0) 2 6570 2209 | Mobile: +61 (0) 448 082 987 | speart@peabodyenergy.com

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WAMBO COAL PTY LTD

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Australia
Tel + 61 (0) 2 6570 2200
Fax+ 61 (0) 2 6570 2290

23 December 2016

Environment Protection Authority
Hunter Region
PO Box 488G
Newcastle NSW 2300

Attention: Mr Michael Howat

Dear Mr Howat

RE: WAMBO COAL MINE – SOUTH BATES UNDERGROUND MINE

Wambo Coal Pty Limited (WCPL), a subsidiary of Peabody Energy Australia, would like to take the opportunity to provide you with an update on its ongoing South Bates Underground Mine and an upcoming proposed Modification 17 to the Development Consent (DA 305-7-2003) for the Wambo Coal Mine. Wambo Coal Mine is situated approximately 15 kilometres west of Singleton, near the village of Warkworth, NSW.

Overview of Approved South Bates Underground Mine

The South Bates Underground Mine is a component of the approved Wambo Coal Mine.

The South Bates Underground Mine commenced in Longwall 11 in February 2016 and involves extraction of coal by longwall mining methods from the Whybrow Seam and Wambo Seam.

The approved South Bates Underground Mine comprises three longwalls in the Whybrow Seam (Longwalls 11 to 13) and three longwalls in the underlying Wambo Seam (Longwalls 14 to 16).

Overview of Approved South Bates Underground Mine Extraction Plan

An Extraction Plan for Longwalls 11 to 13 was approved by the NSW Department of Planning and Environment on 9 February 2016. The approved Extraction Plan for Longwalls 11 to 13 is being revised to include Longwalls 14 to 16 for a consolidated Extraction Plan for Longwalls 11 to 16. This Extraction Plan will build upon the experience to date at the South Bates Underground Mine and other completed mining operations at Wambo.

The Extraction Plan for Longwalls 11 to 16 is schedule for lodgement with the NSW Department of Planning and Environment in mid-January 2017.

Please find enclosed an advance copy of the Water Management Plan component of the Extraction Plan. This Water Management Plan has been prepared to address Schedule 4 Condition 22C(h) of the Development Consent (DA 305-7-2003).

The Water Management Plan includes:

- a revision to the approved Surface Water Monitoring Program (SWMP) under Condition 34 of Schedule 4 of the Development Consent (DA 305-7-2003) to include additional detail on monitoring of the North Wambo Creek Diversion (see Section 4.1.7);
- the approved Groundwater Monitoring Program (GWMP) under Condition 34 of Schedule 4 of the Development Consent (DA 305-7-2003); and
- Surface and Groundwater Response Plan (SGWRP) under Condition 35 of Schedule 4 of the Development Consent (DA 305-7-2003).

Note that this Water Management Plan is in relation to the South Bates Underground Mine. Additional monitoring in the vicinity of South Wambo Dam and above the future South Wambo Underground Mine will form part of a revision to the GWMP planned for 2017.

Overview of Modification 17

A viable coal resource in the Whybrow Seam to the north-west of the approved South Bates Underground Mine has been identified based on recent exploration results and geotechnical investigations as well as successful mining in the current South Bates Underground Mine.

On this basis, WCPL is proposing an extension to its South Bates Underground Mine to mine additional longwall panels in the Whybrow Seam (referred to as MOD 17 of DA 305-7-2003).

MOD 17 would primarily involve use of the existing approved infrastructure at the South Bates Underground Mine, however MOD 17 would also involve the construction of new ventilation shafts, gas drainage infrastructure and other ancillary infrastructure.

The layout of the longwall panels proposed as part of MOD 17 is shown on the enclosed figure.

The application for MOD 17 will be supported by an Environmental Assessment including specialist subsidence assessment, groundwater assessment, surface water assessment, heritage impact assessments, ecology assessments and other environmental reviews.

The anticipated date of lodgement of the Environmental Assessment is early 2017.

Further Consultation

WCPL would appreciate any advance comments on the Water Management Plan.

Once finalised, WCPL will provide a copy of the Extraction Plan for Longwalls 11 to 16 and the Environmental Assessment for MOD 17 to the EPA.

Please do not hesitate to contact Peter Jaeger (Senior Environmental Advisor) on (02) 6570 2206 if you have any queries in regard to the enclosed or require additional information.

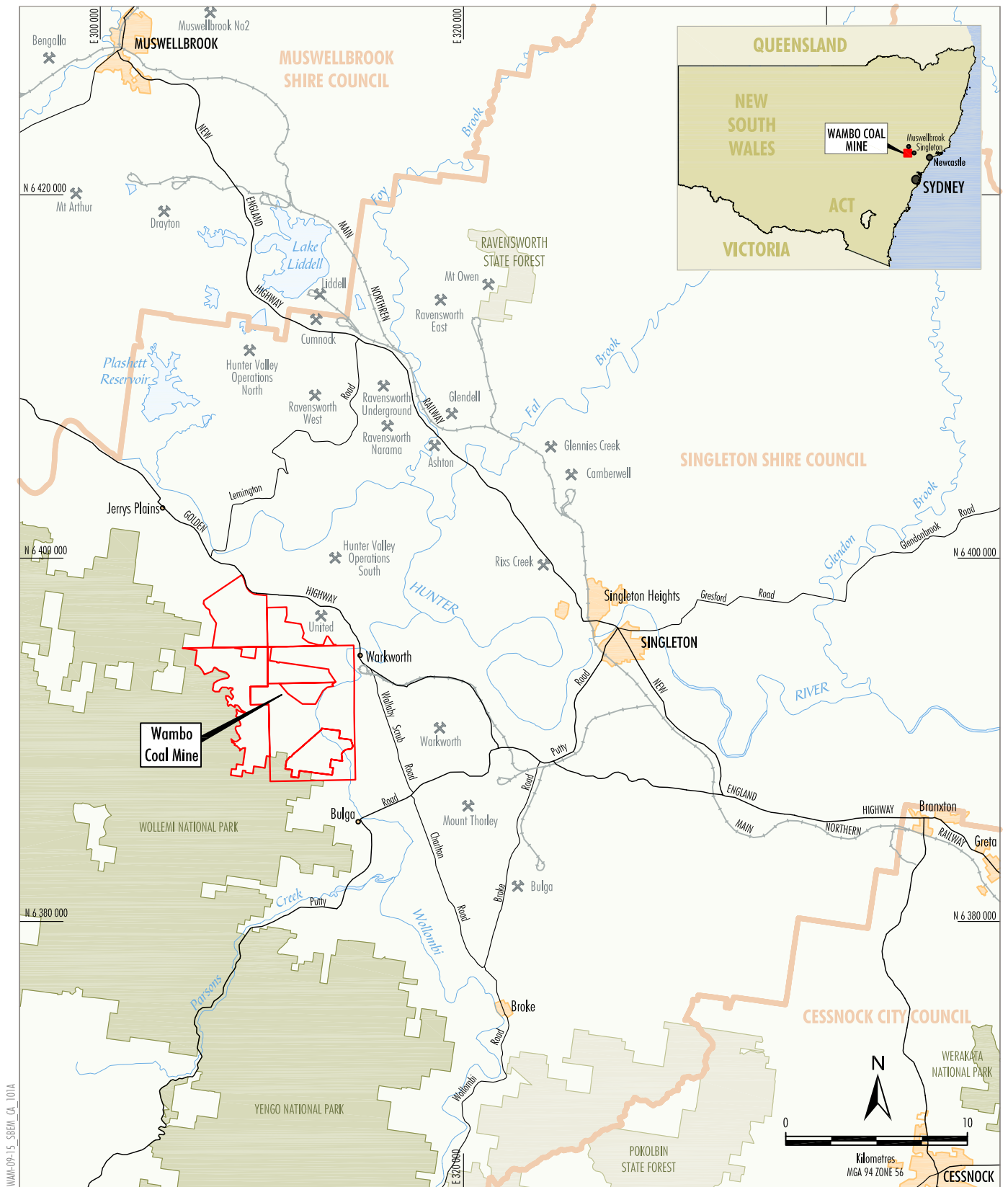
Yours faithfully



Steve Peart
Environment and Community Manager
WAMBO COAL PTY LTD

Enclosures (2)

FIGURES PROVIDING AN OVERVIEW OF MOD 17



SOUTH BATES UNDERGROUND MINE
WATER MANAGEMENT PLAN
LONGWALLS 11 – 16

Available at: <https://resourcestrategies.sharefile.com/d-s1080f8cfec4187b>



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23 December 2016

Water Regulation
NSW Department of Primary Industries – Water
PO Box 2213
Dangar NSW 2309

Dear Sir/Madam

RE: WAMBO COAL MINE – SOUTH BATES UNDERGROUND MINE

Wambo Coal Pty Limited (WCPL), a subsidiary of Peabody Energy Australia, would like to take the opportunity to provide you with an update on its ongoing South Bates Underground Mine and an upcoming proposed Modification 17 to the Development Consent (DA 305-7-2003) for the Wambo Coal Mine. Wambo Coal Mine is situated approximately 15 kilometres west of Singleton, near the village of Warkworth, NSW.

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Please find enclosed an advance copy of the Water Management Plan component of the Extraction Plan. This Water Management Plan has been prepared to address Schedule 4 Condition 22C(h) of the Development Consent (DA 305-7-2003).

The Water Management Plan includes:

- a revision to the approved Surface Water Monitoring Program (SWMP) under Condition 34 of Schedule 4 of the Development Consent (DA 305-7-2003) to include additional detail on monitoring of the North Wambo Creek Diversion (see Section 4.1.7);
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- Surface and Groundwater Response Plan (SGWRP) under Condition 35 of Schedule 4 of the Development Consent (DA 305-7-2003).

Note that this Water Management Plan is in relation to the South Bates Underground Mine. Additional monitoring in the vicinity of South Wambo Dam and above the future South Wambo Underground Mine will form part of a revision to the GWMP planned for 2017.

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On this basis, WCPL is proposing an extension to its South Bates Underground Mine to mine additional longwall panels in the Whybrow Seam (referred to as MOD 17 of DA 305-7-2003).

MOD 17 would primarily involve use of the existing approved infrastructure at the South Bates Underground Mine, however MOD 17 would also involve the construction of new ventilation shafts, gas drainage infrastructure and other ancillary infrastructure.

The layout of the longwall panels proposed as part of MOD 17 is shown on the enclosed figure.

The application for MOD 17 will be supported by an Environmental Assessment including specialist subsidence assessment, groundwater assessment, surface water assessment, heritage impact assessments, ecology assessments and other environmental reviews.

The anticipated date of lodgement of the Environmental Assessment is early 2017.

Further Consultation

WCPL would appreciate any advance comments on the Water Management Plan.

Once finalised, WCPL will provide a copy of the Extraction Plan for Longwalls 11 to 16 and the Environmental Assessment for MOD 17 to DPI Water.

Please do not hesitate to contact Peter Jaeger (Senior Environmental Advisor) on (02) 6570 2206 if you have any queries in regard to the enclosed or require additional information.

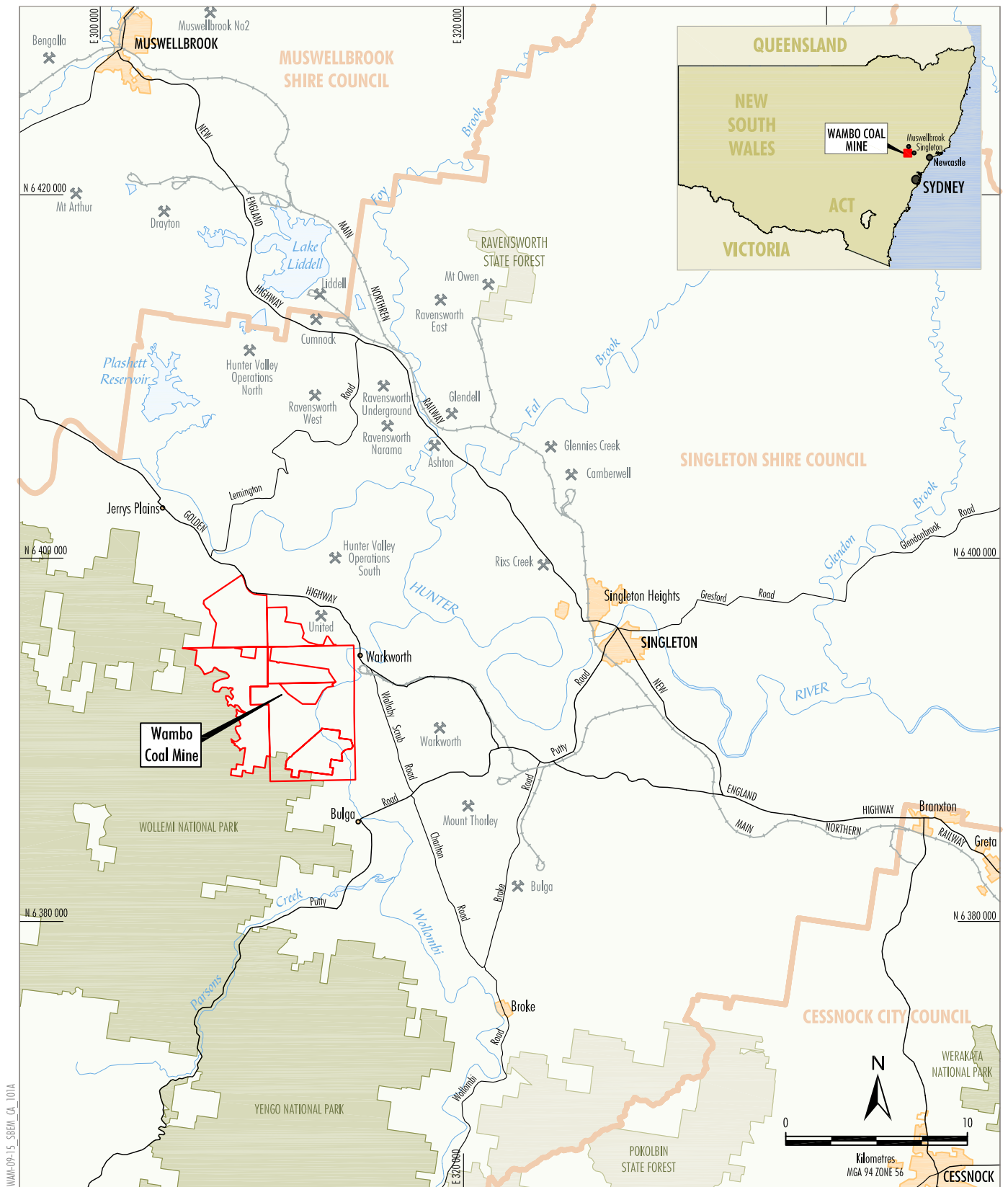
Yours faithfully

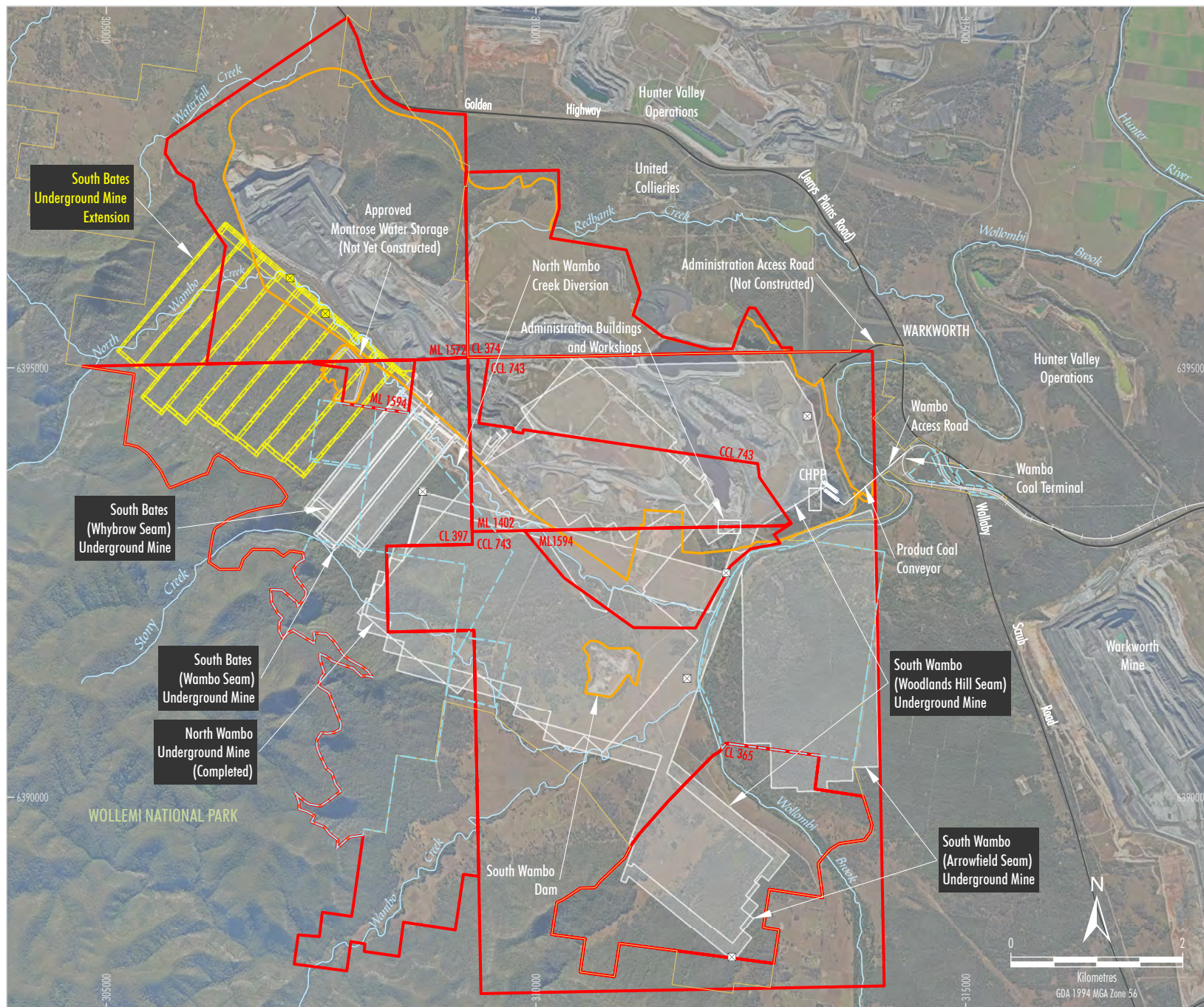


Steve Peart
Environment and Community Manager
WAMBO COAL PTY LTD

Enclosures (2)

FIGURES PROVIDING AN OVERVIEW OF MOD 17





- LEGEND**
- Mining and Coal Lease Boundary
 - WCPL Owned Land
 - Existing/Approved Surface Development Area
 - Approved Underground Development #
 - Modified Underground Development
 - ⊠ Approved Ventilation Shaft #
 - ⊠ Modified Ventilation Shaft
 - Remnant Woodland Enhancement Program (RWEP) Area

Incorporating MOD12 of DA 305-7-2003

Source: Department of Lands (July 2009); WCPL (2016); WCPL Orthophoto (July 2016)

SOUTH BATES UNDERGROUND MINE
WATER MANAGEMENT PLAN
LONGWALLS 11 – 16

Available at: <https://resourcestrategies.sharefile.com/d-s1080f8cfec4187b>

From: Richard Bath [<mailto:Richard.Bath@environment.nsw.gov.au>]
Sent: Tuesday, 1 November 2016 2:46 PM
To: Egan, Harry D.
Subject: RE: Wambo Coal Pty. Ltd. Biodiversity Management Plan (Rev 12)

Hi Harry

Thank you for providing the latest revision of the Biodiversity Management Plan. It is noted that this revision of the BMP incorporates the changes made to address the OEH's comments provided on 22 July 2016 and includes additional changes to the description of subsidence management and monitoring. Due to current workloads OEH will not be providing additional comments on this latest version of the plan.

Regards

Richard Bath
Senior Team Leader Planning
Hunter Central Coast Region
Regional Operations Group
Office of Environment and Heritage
Locked Bag 1002 Dangar NSW 2309
(Level 4/26 Honeysuckle Drive Newcastle)
T: 4927 3152
M: 0408 266 986
W: www.environment.nsw.gov.au

From: Steve Lewer
Sent: Friday, 28 October 2016 3:00 PM
To: Richard Bath <Richard.Bath@environment.nsw.gov.au>
Subject: FW: Wambo Coal Pty. Ltd. Biodiversity Management Plan (Rev 12)

From: Egan, Harry D. [<mailto:HEgan@peabodyenergy.com>]
Sent: Friday, 28 October 2016 2:20 PM
To: Steve Lewer <Steve.Lewer@environment.nsw.gov.au>
Cc: Peart, Steven D <SPeart@peabodyenergy.com>
Subject: Wambo Coal Pty. Ltd. Biodiversity Management Plan (Rev 12)

Steve,

Please find attached the Wambo Coal Pty. Ltd. Biodiversity Management Plan (Rev 12) for the Office of Environment and Heritage's review and comment.

If you have any queries with the attached please contact Steve Peart (Manager: Environment and Community) on 6570 2209.

Harry Egan
Environmental Advisor – Peabody Energy
Wambo Coal
Jerry's Plain Rd, Warkworth Via Singleton, NSW, 2330



Mr Steve Peart
Manager Environment and Community
Wambo Coal Pty Ltd
PMB 1
SINGLETON NSW 2330

Steve
Dear Mr Peart

**South Bates Underground Mine
Longwalls 14 – 16 Extraction Plan**

I refer to your letter dated 3 June 2016, seeking the Secretary's approval to not undertake an independent audit prior to submission of an Extraction Plan (EP) for Longwalls 14 - 16, as otherwise required under condition 37 of Schedule 4 of the Wambo Coal Mine consent (DA 305-7-2003).

I note Wambo Coal Pty Limited's (WCPL's) view that the independent audit would not provide additional benefit for the preparation of the EP as there has been substantial review of the impacts of the Wambo Coal Mine over the past 2 years. This review includes an:

- independent environmental audit (dated January 2015) undertaken in accordance with condition 7 of Schedule 6;
- Environmental Assessment (dated July 2015) submitted in support of Modification 15;
- independent audit (dated 7 August 2015) undertaken in accordance with condition 37 of Schedule 4 prior to submission of an EP for Longwalls 11 - 13; and
- EP for Longwalls 11 – 13 (dated October 2015).

I also note that WCPL is not planning to submit an EP for Longwalls 14 – 16 until late 2016 or early 2017.

Subject to the EP for Longwalls 14 – 16 being submitted to the Department prior to March 2017, the Secretary has approved the proposal to not undertake a further audit prior to submission of the EP for Longwalls 14 – 16.

Should you have any enquiries in relation to this matter, please contact Hamish Aiken on 9228 6373.

Yours sincerely

Howard Reed

Howard Reed
Director
Resource Assessments
As nominee for the Secretary



Mr Steve Peart
Environment and Community Manager
Wambo Coal Pty Ltd
PMB 1
Singleton NSW 2330

Dear Mr ^{Steve} Peart

**Wambo Coal Mine (DA 305-7-2003)
Longwalls 14-16 Extraction Plan**

I refer to your letter of 12 September 2016, requesting approval of a team to prepare the Extraction Plan for Longwalls 14 -16 at the South Bates Underground Mine, in accordance with condition 22C of Schedule 4 of the above consent.

The Department has reviewed the information you have provided and considers that the proposed experts are suitably qualified and experienced to prepare the Extraction Plan.

The Secretary has accordingly approved the following personnel to prepare the plan:

- Mr Joshua Hunt (Resource Strategies) - Extraction Plan preparation;
- Mr Arthur Waddington (Mine Subsidence Engineering Consultants) - Subsidence;
- Mr Rohan Lucas (Alluvium) - Surface Water;
- Dr Noel Merrick (HydroSimulations) - Groundwater;
- Mr Peter Kuskie (South East Archaeology) - Aboriginal cultural heritage; and
- Mr James Gleeson (Resource Strategies) - Flora and Fauna.

If you wish to discuss the matter further, please contact Jessie Evans on 9228 6419.

Yours sincerely

Howard Reed

13.9.16

A/Executive Director

Resource Assessments and Compliance

As nominee of the Secretary



OUT15/35340

Mr Murray Wood
Mining Engineering Manager
North Wambo Underground Mine
Private Mail Bag 1
SINGLETON NSW 2330

Dear Mr Wood

**Requirements under Condition 22E, Schedule 4 of North Wambo
Underground Mine Development Consent (DA 305-7-2003 as modified)**

I refer to your letter of 8 December 2015 to the Division of Resources and Energy subject "Re: North Wambo Underground Mine (Wambo Seam) – Longwalls 14-16 First Workings".

The Division of Resources and Energy is satisfied that the Leaseholder can achieve the required outcomes of the first workings condition of the Development Consent (DA 305-7-2003 condition 22E of Schedule 4) subject to the following condition:

"The Mine Manager must undertake adequate monitoring of the stability of first workings in the subject area and to implement appropriate ground support of the roadways in accordance with the results of the said monitoring, to ensure compliance with the outcome requirements of DA 305-7-2003 condition 22E of Schedule 4"

The subject workings are outlined by a thick red dashed line, labelled 'First Workings Application Area' on Drawing No. 1715 Revision No. A-07/12/15 signed by the Mining Engineering Manager on 8 December 2015.

If you have any further enquiries do not hesitate to contact Mr Paul Langley, Subsidence Executive Officer on 02 4931 6448.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'D. Revette'.

**Douglas Revette
Acting Deputy Secretary
Resources & Energy**



Mr Micheal Alexander
Director Projects and Technical Services
Wambo Coal Pty Ltd
PMB 1
SINGLETON NSW 2330

Our ref: 10/16005-11

Michael
Dear Mr Alexander

**South Bates Underground Mine
Extraction Plan Approval
Longwalls 11 - 13**

I refer to the Extraction Plan, dated October 2015 and as revised in December 2015, for Longwalls 11 - 13 at the South Bates Underground Mine, submitted in accordance with condition 22C of Schedule 4 of the Wambo Coal Mine (Wambo) consent (DA 305-7-2003).

The Extraction Plan includes the following components:

- Water Management Plan;
- Biodiversity Management Plan;
- Land Management Plan;
- Heritage Management Plan;
- Built Features Management Plan;
- Public Safety Management Plan;
- Subsidence Monitoring Program;
- Coal Resource Recovery Plan; and
- Revised Rehabilitation Management Plan.

The Department has reviewed the Extraction Plan and has consulted with a number of other relevant agencies regarding its content. I note that under condition 22C(g) of Schedule 4 of the consent, the last five of the above components must be prepared to the satisfaction of the Division of Resources and Energy (DRE) of the Department of Industry. DRE has advised the Department the above documents, with the exception of the revised Rehabilitation Management Plan, meet the requirements of the consent subject to Wambo's compliance with Work Health and Safety laws. The Department notes that the Rehabilitation Management Plan component of the Extraction Plan is currently being finalised by Peabody, in consultation with the Environmental Sustainability Unit within DRE. The Department understands that this

matter is ongoing and is being managed by DRE under its Mining Operations Plan requirements.

The Department also notes that the NSW Department of Primary Industries Water (DPI-Water) raised concerns with the Ground Water Monitoring Program required under condition 34 of Schedule 4 of the consent, upon which the Water Management Plan component of the Extraction Plan is reliant. DPI-Water also identified that the groundwater conceptualisation and numerical models require updating to acknowledge the recent identification of increased hydraulic connection in the North Wambo Creek and connected alluvial aquifer systems and provide a more accurate estimate of the take of water.

The Department notes your correspondence of 22 January 2016 stating that the residual matters raised by DPI-Water are unrelated to the Extraction Plan for Longwalls 11 to 13 and notes Wambo's commitments to reviewing the groundwater monitoring network and the groundwater models for South Wambo Underground Mine Modification 12 in response to DPI-Water's comments. The Department also considers that these issues should be finalised prior to the lodgement of an Environmental Assessment for Modification 12. The Department requests that the Ground Water Monitoring Program is resubmitted for review and approval should significant changes to any component of the Water Management Plan be required, as also requested in previous Departmental correspondence from Scott Brooks, dated 27 November 2015.

The Department also notes Wambo's intention to revise the Flora and Fauna Management Plan in 2016 following OEH's review of the Extraction Plan. The Department requests that the Flora and Fauna Management Plan is revised in consultation with OEH.

Subject to the above requirements being satisfactorily met, the Secretary grants approval for the Extraction Plan as revised in December 2015 and you may commence activity under the plan.

Please note the requirement under condition 12 of Schedule 6 to make copies of all approved plans, programs and strategies publicly available. If you require any more information, please call Hamish Aiken on 9228 6373.

Yours sincerely



Howard Reed

Director

Resource Assessments

As nominee for the Secretary

9.2.16



Job no. Doc15/335436

Steven Peart
Environment and Community Manager
Wambo Coal Pty Ltd
PMB1, Singleton NSW 2330

Dear Steve

**Heritage Management Plan
Wambo Coal Mine – Longwalls 11 – 13 extraction plan**

Thank you for your letter dated 28 August 2015 inviting the Heritage Council of NSW to comment on the *South Bates (Whybrow Seam) Underground Mine Extraction Plan Longwalls 11 to 13: Heritage Management Plan* August 2015. The Heritage Division, Office of Environment and Heritage (OEH), on behalf of the Heritage Council of NSW, has reviewed the information and would like to provide the following comments. Please note, these comments are in relation to non-Aboriginal heritage, comments on Aboriginal Heritage are provided by a separate section of OEH.

To ensure robustness, the 2015 *South Bates (Whybrow Seam) Underground Mine Extraction Plan Longwalls 11 to 13: Heritage Management Plan* (HMP) should incorporate a discussion on the Wambo Homestead, listed under the NSW Heritage Act on the State Heritage Register (SHR) as item number 00200. This discussion should include: a history of the place; significance values; and a current statement of significance. It will also be appropriate to include the listing of Wambo Homestead by the local councils & shires and state government agencies; and a location plan.

The HMP states that the Wambo Homestead Complex 'will experience no measurable subsidence from the South Bates (Whybrow Seam) Underground Mine' (s6). The Wambo Homestead Conservation Management Plan (CMP) 2006 identifies that the homestead buildings are generally in a fragile state. As a result, a section that identifies potential risks and outlines measures to reduce the potential for damage to the heritage item during the works should be provided in the HMP, or as a standalone Temporary Protection Plan.

Further to the above, it would also be appropriate to address how the proposed works comply with the objectives of the CMP.

If you have any queries, please contact Carole-Lynne Kerrigan, Heritage Assessment Officer of OEH on (02) 9873 8519 or at Carole-Lynn.Kerrigan@environment.nsw.gov.au.

Yours sincerely



Adrian Hohenzollern
Senior Team Leader, State Heritage Assessments
Heritage Division, Office of Environment and Heritage
23 September 2015



**Office of
Environment
& Heritage**

Your reference: HMP South Bates Underground Mine (Long walls 11-13).
Our reference: DOC15 334096-01
Contact: Nicole Davis, 4927 3156

Mr Steven Peart
Manager - Environmental and Community
Wambo Coal Pty Ltd
PMB 1
SINGLETON NSW 2330

Dear Mr Peart,

REVIEW OF WAMBO COAL PTY LTD, SOUTH BEATES (WHYBROW SEAM) UNDERGROUND MINE, EXTRACTION PLAN, LONGWALLS 11 TO 13 - HERITAGE MANAGEMENT PLAN (DA 305-7-2003) AUGUST 2015.

Thank you for your correspondence to the Office of Environment and Heritage (OEH) on the 27 August 2015 requesting comments on the Heritage Management Plan for Wambo Coal Pty Ltd, South Bates (Whybrow Seam) Underground Mine, Extraction Plan, Longwalls 11 to 13, August 2015 (DA 305-7-2003).

Heritage Management Plans provide a useful tool for companies such as Wambo Coal Pty Ltd to use to help ensure that they meet their statutory requirements and that the management strategies for the protection of Aboriginal cultural heritage are clearly identified. OEH has reviewed the Heritage Management Plan for "Wambo Coal Pty Ltd, South Bates (Whybrow Seam) Underground Mine, Extraction Plan, Longwalls 11 to 13". Based on this review OEH is satisfied that the management measures proposed are adequate and appropriate given the nature of the archaeological record and the range of activities to be undertaken within operational footprint of the mine. OEH has no additional concerns with respect to Aboriginal cultural heritage management.

If you require any further information regarding this matter please contact Nicole Davis, Archaeologist, on 4927 3156.

Yours sincerely

1 SEP 2015

Ziggy Andersons
A/Senior Team Leader Planning, Hunter Central Coast Region
Regional Operations



Office of
Environment
& Heritage

Your reference: DA 305-7-2003
Our reference: DOC15/334094-1
Contact: Robert Gibson, 4927 3154

Mr Steven Peart
Manager, Environment & Community
Wambo Coal Pty Ltd
PMB 1
SINGLETON NSW 2330

Dear Mr Peart

**RE: REVIEW OF WAMBO COAL - SOUTH BATES (WHYBROW SEAM) UNDERGROUND MINE
EXTRACTION PLAN LONGWALLS 11 TO 13: BIODIVERSITY MANAGEMENT PLAN**

I refer to your email dated 27 August 2015 requesting comment on the Biodiversity Management Plan (BMP) for the South Bates (Whybrow Seam) Underground Mine (longwall panels 11 to 13). The Office of Environment and Heritage (OEH) understands that this BMP has been prepared to comply with Schedule 4 Condition 22C(h) of the Wambo Development Consent (DA 305-7-2003) issued on February 2011 (MOD 9).

OEH encourages the development of such plans to ensure that proponents have determined how they will meet their statutory obligations and designated environmental objectives. However, OEH does not approve or endorse these documents as our role is to set environmental objectives for environmental/conservation management, not to be directly involved in the development of strategies to achieve those objectives. In this instance, OEH provides some advice in relation to proposed outcomes of the Biodiversity Management Plan and also recommends that some details are updated. These comments are provided in **Attachment A**.

If you require any further information regarding this matter please contact Robert Gibson, Regional Biodiversity Conservation Officer, on 4927 3154.

Yours sincerely



22 SEP 2015

RICHARD BATH
Senior Team Leader Planning, Hunter Central Coast Region
Regional Operations

Enclosure: Attachment A

ATTACHMENT A: OEH REVIEW OF WAMBO COAL: SOUTH BATES (WHYBROW SEAM) UNDERGROUND MINE EXTRACTION PLAN LONGWALLS 11 TO 13: BIODIVERSITY MANAGEMENT PLAN

The Office of Environment and Heritage (OEH) has reviewed the Biodiversity Management Plan (BMP) for approved longwall panels 11 to 13 in the Whybrow Seam of the South Bates Underground Mine. Comments are also provided on the current Flora and Fauna Management Plan (FFMP) that is provided as Attachment 2 to the BMP. Detailed comments are provided below.

BIODIVERSITY MANAGEMENT PLAN

OEH has reviewed the draft BMP dated August 2015, for this project as requested by Wambo Coal. OEH identified a number of sections that appeared either incomplete, outdated or needed further details. The following recommendations and comments are provided for your consideration:

- **Section 3.1.2 Potential Subsidence Impacts and Environmental Consequences**

Changes to surface and subsurface hydrology in vegetation areas due to mine subsidence are likely to lead to immediate and obvious impacts to native vegetation only where trees are physically damaged by cracking or tilting, or where ponding causes inundation of otherwise free-draining sites. OEH remains concerned by possible long-term changes in vegetation composition and structure due to subsidence impacts that change the likelihood of species recruiting. For example, some plant species require episodic periods with sodden to saturated soils to trigger germination, then prolonged moist conditions for seedlings to become established, or conversely have seedlings or saplings that are killed by prolonged periods of saturated soil. Where subsidence leads to local areas of increased drainage, or ponding then it is likely that changes in plant composition and structure will occur. This will likely occur over a time scale of decades, as currently living plants above the long wall panels die and are replaced by a suite of plants adapted to the new soil hydrology regime. Thus it is not surprising that observations of vegetation made to date over undermined land has not detected any obvious changes, particularly where minimal composition and structure data has been collected. It is the responsibility of the proponent to gather sufficient information to demonstrate that mine subsidence is not causing harm.

- **Section 3.17 Threatened Species**

In relation to the consideration of threatened species, the plan again focused on the possibility of 'significant impact' rather than the implementation of the current state-wide biodiversity offsetting policy (OEH 2014a, 2004b). In this instance, based on available records, OEH acknowledges that no currently-listed threatened species have been recorded above or immediately adjacent to Longwalls 11 to 13. However, plants of *Dillwynia tenuifolia* and (tentatively identified) *Grevillea parviflora* subsp. *parviflora* occur on the Broken Back Range adjacent to the project area. If any of these plants are harmed due to this project by unexpected subsidence impacts then OEH expects that they would be offset in accordance with current biodiversity offsetting policy and suggests that this is clarified in the BMP.

- **Section 3.4 Wollemi National Park**

OEH does not accept any harm to be acceptable to Wollemi National Park, which forms part of the Greater Blue Mountains World heritage Area (Figure 6 of the BMP). OEH notes that the area of subsidence for Longwall panels 11 to 13 in the Whybrow Seam only just extend into the national park. However, if longwall mining in the underlying Wambo Seam is approved, then a greater area of Wollemi National Park will be affected. OEH recommends that monitoring results of the Wollemi National Park escarpment are made readily and regularly available to the National Parks and Wildlife Service.

- **Section 4 Flora and Fauna Monitoring**

OEH does not consider the current flora and fauna monitoring approach to be rigorous or reliable enough to detect and measure changes to biodiversity, to provide early warnings of deleterious changes, or to be feed data into a process of adaptive management for the mine site. OEH supports

the use of permanent flora quadrats inside the mine affected areas and comparisons with appropriate reference sites and thus the current system could be improved by ensuring that data is gathered in a rigorous and consistent way (particularly following 'Module 2' of the field sheet in the 'Native Vegetation Interim Type Standard' (Siversten, 2009; pp. 59-65)). Appropriate statistical analysis of the gathered data can then be used to help identify trends before they become obvious and can then feed into adaptive management. OEH recommends that this approach is included in the BMP.

- **Section 5 'negligible environmental consequences' threshold (as per Table 14 A in the consent - part of Schedule 4 Consent Condition 22).**

Consent Condition 22C(d) required the proponent to provide more specific performance criteria. OEH notes that these have been provided in Section 5 of the BMP. It is apparent that some confusion exists that biodiversity offsets under the *NSW Biodiversity Offsets Policy for Major Projects* (OEH, 20-14a) are only required where harm to threatened biodiversity is 'significant' (e.g. Section 3.1.5 of the BMP). This is not the case. The threshold for offsetting is defined in Section 9 of the *Framework for Biodiversity Assessment* (OEH, 2014b). OEH recommends that the BMP is updated to reflect this situation. OEH also recommends that at least one representative from the National Parks and Wildlife Service is invited to assess possible impacts on the Wollemi National Park escarpment, and that implementation of this condition is tightened to make it clearer how changes in the escarpment due to natural processes can be most readily differentiated from any changes due to mine subsidence. OEH suggests that for transparency, and for confidence in the regulatory system that all statistical analysis of flora analysis is made available on the mine's webpage, along with data and underlying assumptions so that this process can be reviewed by external parties.

FLORA AND FAUNA MANAGEMENT PLAN (Amendment A. June 2014)

The Flora and Fauna Management Plan (FFMP) has several sections that contain incomplete or outdated information. These details may underestimate the threatened biodiversity values of parts of the Wambo mining lease lands. Thus the FFMP if implemented as written could lead to inadvertent harm to threatened biodiversity. This matter, and several others are described in the text below:

- **Section 1.5.4 Threatened Species Conservation Act 1995**

OEH recommends that future revisions of the FFMP updates the list of threatened biodiversity on the Wambo Mine Lease to reflect the currently-listed entities rather than those that were listed at the time of earlier surveys. This would better reflect biodiversity values of the site.

Section 2.6 Flora

This section of the FFMP currently states that no threatened plants or endangered plant populations are known from the vicinity of the Wambo Coal Mine. However, OEH understands that Weeping Myall (*Acacia pendula*) woodland mapped as Vegetation Community 15 and meets the definition of both the *Acacia pendula* endangered population in the Hunter Catchment and, as one of the largest single stands of this species in the region, also conforms to the Hunter Valley weeping Myall Woodland of the Sydney Basin Bioregion endangered ecological community. OEH also notes that the Tiger Orchid (*Cymbidium canaliculatum*) plants found near Montrose and in Area 'A' of the Remnant Woodland Enhancement Programme form part of the *Cymbidium canaliculatum* endangered population in the Hunter Catchment. During recent survey work for MOD 5 of the Wambo consent one or two threatened plants were found: *Dillwynia tenuifolia* and (possibly) *Grevillea parviflora* subsp. *Parviflora*. The latter has yet to be confirmed by the National Herbarium of New South Wales, therefore, OEH recommends that this section is updated next time this document is revised to reflect what is now known.

- **Section 2.7 Fauna**

OEH recommends that this section is updated to reflect the findings of surveys done since 2003.

- **Section 3.1.1 Delineation of Disturbance Areas**

Table 7 in this section requires updating so that Vegetation Community 15 is now described as *Acacia pendula*.

- **Section 3.3.2 Potential Expansion of RWEF Areas**

Wambo's plans to propagate and thus expand the extent of *Acacia pendula* on its lands, particularly Vegetation Community 15 will be made more challenging by the putative sterility of the Hunter Valley form of Weeping Myall (Bell *et al.*, 2007). Other means of propagation may be required.

- **Section 3.3.3 RWEF Enhancement Strategies**

The November 2013 deadline to place conservation agreements over the Remnant Woodland Enhancement Programme lands has now passed. Thus it would be informative to update the FFMP to reflect the current situation of the security of those lands.

- **Section 3.3.4 Subsidence Management**

The final determination of Subsidence due to longwall mining as a 'Key threatening process' under Schedule 3 of the *Threatened Species Conservation Act 1995* on 15 July 2005 (New South Wales Scientific Committee, 2005). OEH therefore recommends that this section of the FFMP is updated to cite the final determination.

- **Section 3.4.3 Revegetation**

The Synoptic Plan for Coal Mine Rehabilitation in the Hunter Valley of New South Wales is becoming increasingly dated. It has some useful information and discussion but the maps of recommended corridors are no longer possible, due to new coal projects not foreseen when the report was prepared, and also ideas on which species to use in revegetation have also changed. OEH understands that a new synoptic plan is being proposed.

- **Section 3.4.4 Maintenance and Monitoring**

OEH recommends that data of sufficient robustness is collected at a fine enough scale to be able to measure and define changes. OEH therefore has concerns if Ecosystem Function Analysis is the main type of data collected for it will not capture details of floristic composition and structure to enable on-ground vegetation to be sufficiently well-defined to measure changes nor match it with certainty to existing vegetation communities (see the discussion on section 4 in the BMP for OEH's recommended approach).

Ecosystem function analysis is prone to error caused by even small changes in where measurements are made along a transect. Thus even where transects are fixed and resampled each year, small changes in the sample point location can add a lot of noise to the data collected.

- **Section 4.1.1 Visual Monitoring**

Proposed visual monitoring of vegetation may be fast and inexpensive but it does not capture data, cannot quantify changes, can miss changes in composition, and is likely to be very subjective. Visual monitoring can be made more effective if accompanied by photos taken periodically of the same field of view and combined with periodic data collection, such as following Sivertsen (2009).

- **4.2.1 Flora**

This section does not describe the features that are being measured in relation to species diversity and abundance, landform physiology, soil characteristics, disturbance and vegetation community structure. As discussed previously, OEH recommends that the proponent use the field data sheet in Sivertsen (2009) which presents a consistent and robust data format.

- **5.0 Reporting**

OEH supports the provision of monitoring data in the Annual Environmental Management Report (AEMR). OEH recommends that the raw monitoring data, any statistical analysis and the assumptions behind them are included in the AEMR and on the company's webpage where they are publically accessible.

Please note that OEH has not conducted a comprehensive review of the current BMP, and the comments provided above are intended as general guidance only. And all records of threatened flora and fauna observed during survey work for this project will need to be submitted to OEH as required by the consent conditions of the scientific licences issued under section 132C of the *National Parks and Wildlife Act 1974* under which the work was conducted. This applies to observations made during annual monitoring programmes.

References:

Bell, S.; Peake, T.; and Driscoll, C. (2007) Dealing with taxonomic uncertainty in Weeping Myall *Acacia pendula* from the Hunter Catchment, New South Wales. *Australasian Plant Conservation*. **16**(1): 14-16

OEH (2014a) NSW Biodiversity Offsets Policy for Major Projects. September 2014. NSW Office of Environment and Heritage, Sydney. www.environment.nsw.gov.au/resources/biodiversity/140672biopolicy.pdf

OEH (2014b) Framework for Biodiversity Assessment. September 2014. NSW Office of Environment and Heritage, Sydney. www.environment.nsw.gov.au/resources/biodiversity/140675fba.pdf

NSW Scientific Committee (2005) *Alteration of habitat following subsidence due to longwall mining - key threatening process determination - final*. 15 July 2005. New South Wales Scientific Committee, Sydney. www.environment.nsw.gov.au/determinations/LongwallMiningKtp.htm

Sivertsen, D. (2009) *Native Vegetation Interim Standard*. January 2010. NSW Office of Environment and Heritage, Sydney. www.environment.nsw.gov.au/resources/nativeveg/10060nvinttypestand.pdf

27 August 2015

Mr Howard Reed
Director, Resource Assessments
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Dear Mr Reed,

RE: WAMBO COAL MINE – LONGWALLS 11 TO 13 EXTRACTION PLAN

The South Bates (Whybrow Seam) Underground Mine is a component of the approved Wambo Coal Mine. The South Bates (Whybrow Seam) Underground Mine is scheduled to commence in February 2016 and involves extraction of coal by longwall mining methods from the Whybrow Seam within Coal Lease 397 and Mining Lease 1594.

Wambo Coal Pty Limited (WCPL) is currently preparing an Extraction Plan for the approved Longwalls 11 to 13 at the South Bates (Whybrow Seam) Underground Mine (Extraction Plan for Longwalls 11 to 13).

Condition 22C(h) of Schedule 4 of the Development Consent (DA 305-7-2003) requires WCPL to prepare a Biodiversity Management Plan to manage the potential impacts and/or environmental consequences of Longwalls 11 to 13 on flora and fauna, in consultation with the NSW Office of Environment and Heritage.

Please find enclosed the draft Biodiversity Management Plan that has been provided for consultation to the Office of Environment and Heritage. A copy of this correspondence is enclosed for your records.

The Biodiversity Management Plan includes the existing Flora and Fauna Management Plan which was prepared in accordance with Conditions 44 to 48 of Schedule 4 of the Development Consent (DA 305-7-2003).

WCPL has kindly requested the Office of Environment and Heritage provide any comments on the draft Biodiversity Management Plan by 18 September 2015. WCPL will provide the Department of Planning and Environment with the outcomes of any consultation with the agencies with the final Biodiversity Management Plan for the Department's consideration.

WCPL would appreciate any input from the Department of Planning & Environment on the draft Biodiversity Management Plan during the consultation period and invites you to contact us with any queries.

Yours faithfully,



Steve Peart
Environment and Community Manager
WAMBO COAL PTY LTD



WAMBO COAL PTY LTD

ABN: 13 000 668 057

Level 13, BOQ Centre
259 Queen Street
Brisbane, Queensland 4000
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Singleton, NSW 2330
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Fax + 61 (0) 2 6570 2290

27 August 2015

Mr Richard Bath
Head Hunter Planning Unit, Conservation and Regulation, North East
Office of Environment and Heritage
PO Box 488G
NEWCASTLE NSW 2300

Dear Mr Bath,

RE: WAMBO COAL MINE – LONGWALLS 11 TO 13 EXTRACTION PLAN

The South Bates (Whybrow Seam) Underground Mine is a component of the approved Wambo Coal Mine. The South Bates (Whybrow Seam) Underground Mine is scheduled to commence in February 2016 and involves extraction of coal by longwall mining methods from the Whybrow Seam within Coal Lease 397 and Mining Lease 1594.

Wambo Coal Pty Limited (WCPL) is currently preparing an Extraction Plan for the approved Longwalls 11 to 13 at the South Bates (Whybrow Seam) Underground Mine (Extraction Plan for Longwalls 11 to 13).

Condition 22C(h) of Schedule 4 of the Development Consent (DA 305-7-2003) requires WCPL to prepare a Biodiversity Management Plan to manage the potential impacts and/or environmental consequences of Longwalls 11 to 13 on flora and fauna, in consultation with the NSW Office of Environment and Heritage.

Please find enclosed the Biodiversity Management Plan that is being provided for the Office of Environment and Heritage's review and comment.

The Biodiversity Management Plan includes the existing Flora and Fauna Management Plan which was prepared in accordance with Conditions 44 to 48 of Schedule 4 of the Development Consent (DA 305-7-2003).

WCPL would be happy to meet with the Office of Environment and Heritage to present the approach we have taken to the Biodiversity Management Plan. Could you please advise a date and time that would be suitable to the Office of Environment and Heritage, at your earliest convenience.

WCPL would appreciate if you would kindly provide any comments on the Biodiversity Management Plan to us by **Friday 18 September 2015** via the contact details provided below. WCPL looks forward to your input and invite you to contact us with any queries.

Steven Peart
Environment and Community Manager
Wambo Coal Pty Ltd
PMB1, Singleton NSW 2330
Phone: (02) 6570 2209
Email: speart@peabodyenergy.com

If you have any queries or comments regarding the Extraction Plan, please don't hesitate to contact me.

Yours faithfully,

A handwritten signature in blue ink, appearing to read 'Steve Peart', with a large circular flourish on the left side.

Steve Peart
Environment and Community Manager
WAMBO COAL PTY LTD

cc: Mr Howard Reed, Director, Resources Assessment, Department of Planning and Environment



WAMBO COAL PTY LTD

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27 August 2015

Mr Howard Reed
Director, Resource Assessments
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Dear Mr Reed,

RE: WAMBO COAL MINE – LONGWALLS 11 TO 13 EXTRACTION PLAN

The South Bates (Whybrow Seam) Underground Mine is a component of the approved Wambo Coal Mine. The South Bates (Whybrow Seam) Underground Mine is scheduled to commence in February 2016 and involves extraction of coal by longwall mining methods from the Whybrow Seam within Coal Lease 397 and Mining Lease 1594.

Wambo Coal Pty Limited (WCPL) is currently preparing an Extraction Plan for the approved Longwalls 11 to 13 at the South Bates (Whybrow Seam) Underground Mine (Extraction Plan for Longwalls 11 to 13).

Condition 22C(h) of Schedule 4 of the Development Consent (DA 305-7-2003) requires WCPL to prepare a Heritage Management Plan to manage the potential impacts and/or environmental consequences of the proposed second workings on heritage sites and values, in consultation with the NSW Office of Environment and Heritage, the NSW Heritage Division, and relevant stakeholders for Aboriginal and non-Aboriginal heritage.

Please find enclosed the Heritage Management Plan that has been provided for consultation to the Office of Environment and Heritage, the NSW Heritage Division, and all Aboriginal parties registered at the Wambo Coal Mine. A copy of the correspondence to the Office of Environment and Heritage and the NSW Heritage Division is enclosed for your records.

The Heritage Management Plan includes the existing approved Wambo Coal Mine Salvage and Management Programme which was prepared in accordance with Condition 52 of Schedule 4 of the Development Consent (DA 305-7-2003). The Wambo Coal Mine Salvage and Management Program was prepared in consultation with the relevant stakeholders for Aboriginal heritage as part of the application under sections 87 and 90 of the *NSW National Parks and Wildlife Act, 1974*.

WCPL has kindly requested the Office of Environment and Heritage, the NSW Heritage Division, and Aboriginal parties registered at the Wambo Coal Mine provide any comments on the Heritage Management Plan by 25 September 2015. WCPL will provide the Department of Planning and Environment with the outcomes of any consultation with the agencies with the final Heritage Management Plan for the Department's consideration.

WCPL would appreciate any input from the Department of Planning & Environment on the Heritage Management Plan during the consultation period and invites you to contact us with any queries.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Steve Peart', with a large, loopy flourish at the end.

Steve Peart
Environment and Community Manager
WAMBO COAL PTY LTD



WAMBO COAL PTY LTD

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27 August 2015

Mr Richard Bath
Head Hunter Planning Unit, Conservation and Regulation, North East
Office of Environment and Heritage
PO Box 488G
NEWCASTLE NSW 2300

Attention: Nicole Davis, Archaeologist – Planning

Dear Mr Bath,

RE: WAMBO COAL MINE – LONGWALLS 11 TO 13 EXTRACTION PLAN

The Wambo Coal Mine is situated approximately 15 kilometres west of Singleton, near the village of Warkworth, New South Wales (NSW). The Wambo Coal Mine is owned and operated by Wambo Coal Pty Limited (WCPL), a subsidiary of Peabody Energy Australia Pty Limited.

The South Bates (Whybrow Seam) Underground Mine is a component of the approved Wambo Coal Mine. The South Bates (Whybrow Seam) Underground Mine is scheduled to commence in February 2016 and involves extraction of coal by longwall mining methods from the Whybrow Seam within Coal Lease 397 and Mining Lease 1594.

Please find enclosed for your review a copy of the Heritage Management Plan prepared as a component of the Extraction Plan for the approved Longwalls 11 to 13 at the South Bates (Whybrow Seam) Underground Mine.

Condition 22C(h) of Schedule 4 of the Development Consent (DA 305-7-2003) requires WCPL to prepare a Heritage Management Plan to manage the potential impacts and/or environmental consequences of the proposed second workings on heritage sites and values, in consultation with the NSW Office of Environment and Heritage, the NSW Heritage Division, and relevant stakeholders for Aboriginal and non-Aboriginal heritage.

Please note that a copy of the Heritage Management Plan has also been provided for consultation to the NSW Heritage Division and all Aboriginal parties registered at the Wambo Coal Mine.

The Heritage Management Plan includes the existing approved Wambo Coal Mine Salvage and Management Programme which was prepared in accordance with Condition 52 of Schedule 4 of the Development Consent (DA 305-7-2003). The Wambo Coal Mine Salvage and Management Program was prepared in consultation with the relevant stakeholders for Aboriginal heritage as part of the application under sections 87 and 90 of the *NSW National Parks and Wildlife Act, 1974*.

WCPL would be happy to meet with the Office of Environment and Heritage to present the approach we have taken to the Heritage Management Plan. Could you please advise a date and time that would be suitable to the Office of Environment and Heritage, at your earliest convenience.

WCPL would appreciate if you would kindly provide any comments on the Heritage Management Plan to us by **Friday 25 September 2015** via the contact details provided below. WCPL looks forward to your input and invite you to contact us with any queries.

Steven Peart
Environment and Community Manager
Wambo Coal Pty Ltd
PMB1, Singleton NSW 2330
Phone: (02) 6570 2209
Email: speart@peabodyenergy.com

If you have any queries or comments regarding the Extraction Plan, please don't hesitate to contact me.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Steve Peart', with a large circular flourish on the left side.

Steve Peart
Environment and Community Manager
WAMBO COAL PTY LTD



WAMBO COAL PTY LTD

ABN: 13 000 668 057

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27 August 2015

NSW Heritage Division
Office of Environment and Heritage
3 Marist Place
PARRAMATTA NSW 2150

Attention: Rochelle Johnston

Dear Ms Johnston,

RE: WAMBO COAL MINE – LONGWALLS 11 TO 13 EXTRACTION PLAN

The Wambo Coal Mine is situated approximately 15 kilometres west of Singleton, near the village of Warkworth, New South Wales (NSW). The Wambo Coal Mine is owned and operated by Wambo Coal Pty Limited (WCPL), a subsidiary of Peabody Energy Australia Pty Limited.

The South Bates (Whybrow Seam) Underground Mine is a component of the approved Wambo Coal Mine. The South Bates (Whybrow Seam) Underground Mine is scheduled to commence in February 2016 and involves extraction of coal by longwall mining methods from the Whybrow Seam within Coal Lease 397 and Mining Lease 1594.

Please find enclosed for your review a copy of the Heritage Management Plan prepared as a component of the Extraction Plan for the approved Longwalls 11 to 13 at the South Bates (Whybrow Seam) Underground Mine.

Condition 22C(h) of Schedule 4 of the Development Consent (DA 305-7-2003) requires WCPL to prepare a Heritage Management Plan to manage the potential impacts and/or environmental consequences of the proposed second workings on heritage sites and values, in consultation with the NSW Office of Environment and Heritage, the NSW Heritage Division, and relevant stakeholders for Aboriginal and non-Aboriginal heritage.

Please note that a copy of the Heritage Management Plan has also been provided for consultation to the NSW Office of Environment and Heritage and all Aboriginal parties registered at the Wambo Coal Mine.

There are no items of non-Aboriginal heritage significance in the vicinity of Longwalls 11 to 13 at the South Bates (Whybrow Seam) Underground Mine. It is noted that the Wambo Homestead Complex would not be impacted by mining at the South Bates (Whybrow Seam) Underground Mine.

WCPL would appreciate if you would kindly provide any comments on the Heritage Management Plan to us by **Friday 25 September 2015** via the contact details provided below. WCPL looks forward to your input and invite you to contact us with any queries.

Steven Peart
Environment and Community Manager
Wambo Coal Pty Ltd
PMB1, Singleton NSW 2330
Phone: (02) 6570 2209
Email: speart@peabodyenergy.com

If you have any queries or comments regarding the Extraction Plan, please don't hesitate to contact me.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Steve Peart', with a large circular flourish on the left side.

Steve Peart
Environment and Community Manager
WAMBO COAL PTY LTD



Steve Peart
Environment and Community Manager
Wambo Coal Pty Ltd
PMB 1
Singleton NSW 2330

Dear Mr Peart

**Wambo Coal Mine (DA 305-7-2003)
Independent Environmental Audit – Surface and Groundwater**


I refer to the Independent Environmental Audit dated 7 August 2015 for Wambo Coal Mine submitted to the Department of Planning and Environment in accordance with condition 37 of Schedule 4 of the above consent. The Department has reviewed the Audit report and Wambo Coal Mine's response to its recommendations and is generally satisfied with the report's form, content and presentation.

The Department notes that the Audit reviewed information relating to recent groundwater level and quality changes at bores GW08 and GW09, concluding that these changes may be due to underground mining and that (if this is the case) the impacts observed would be in excess of those predicted. The Audit recommended that Wambo Coal Mine investigate the cause of the changes and recommend response actions if required. The Department notes Wambo Coal Mine's response that an investigation into the changes has been initiated and that a preliminary investigation report will be provided to the Department by 30 September 2015.

The Department will assess the investigation report once submitted and determine compliance with condition 38 of Schedule 4 at that time. Further, the Department recommends that the findings of the investigation are used to inform the development of the Extraction Plan for the South Bates Underground Mine Plan, if appropriate.

If you wish to discuss the matter further, please contact Hamish Aiken on 9228 6373.

Yours sincerely


Howard Reed 11.8.15
Director Resource Assessments
as the Secretary's nominee



Michael Alexander
Director Projects and Technical Services
Wambo Coal Pty Ltd
PMB 1
Singleton NSW 2330

Dear Mr Alexander

**Wambo Coal Mine (DA 305-7-2003)
Longwalls 11-13 Extraction Plan**

I refer to your letter of 5 August 2015, requesting approval of the proposed team for the preparation of an Extraction Plan for Longwalls 11-13 at the South Bates Underground Mine, in accordance with condition 22C of Schedule 4 of the above consent.

The Department has reviewed the information you have provided and considers that the proposed experts are suitably qualified and experienced to prepare the Extraction Plan.

The Secretary has accordingly approved the following personnel to prepare the plan:

- Mr Joshua Hunt (Resource Strategies) - Extraction Plan preparation;
- Mr Arthur Waddington (Mine Subsidence Engineering Consultants) - Subsidence;
- Dr Steve Perrens (Advisian) - Surface Water;
- Dr Noel Merrick (HydroSimulations) - Groundwater;
- Ms Gillian Goode and Mr Darrell Rigby (RPS Australia Asia Pacific) - Aboriginal cultural heritage; and
- Mr James Gleeson (Resource Strategies) - Flora and Fauna.

If you wish to discuss the matter further, please contact Hamish Aiken on 9228 6373.

Yours sincerely

Howard Reed

Director, Resource Assessments
as the Secretary's nominee

OUT14/31784
File: 14/2771

Mr Michael Lerch
Manager of Mining Engineering
North Wambo Underground Mine
Private Mail Bag 1
SINGLETON NSW 2330

Dear Mr Lerch

**Requirements under Condition 22E, Schedule 4 of North Wambo
Underground Mine Development Consent (DA 305-7-2003 as modified)**

I refer to your letter of 17 September 2014 to the Division of Resources & Energy regarding "Re: North Wambo Underground Mine (Whybrow Seam) – Longwalls 11-13 First Workings".

The Division of Resources and Energy is satisfied that the leaseholder can achieve the required outcomes of the first workings condition of the Development Consent (DA 305-7-2003 condition 22E of Schedule 4), subject to the following condition:

"The Mine Manager must undertake adequate monitoring of the stability of first workings in the subject area and to implement appropriate ground support of the roadways in accordance with the results of the said monitoring, to ensure compliance with the outcome requirements of DA 305-7-2003 condition 22E of Schedule 4".

The subject workings are outlined by a red dashed line, labelled 'First Workings Application Area', on Drawing No. 1316 Revision No. A-16/9/2014, signed by the Manager of Mining Engineering on 17 September 2014.

If you have any further enquiries, do not hesitate to contact Mr Paul Langley, Subsidence Executive Officer, on 02 4931 6448.

Yours sincerely



30.9.14

Kylie Hargreaves
Deputy Secretary
Resources & Energy

WAMBO COAL PTY LIMITED



SOUTH BATES UNDERGROUND MINE

EXTRACTION PLAN LONGWALLS 11 TO 16

ATTACHMENT 3 PROGRAM TO COLLECT BASELINE DATA FOR FUTURE EXTRACTION PLANS

Attachment 3

Program to Collect Baseline Data for Future Extraction Plans

In addition to the current North Wambo Underground Mine and the approved South Bates Underground Mine, the Development Consent (DA 305-7-2003) provides consent for underground mining by longwall methods in the Woodlands Hill and Arrowfield Seams (known as the South Wambo Underground Mine).

The monitoring proposed to be undertaken to collect baseline data for future Extraction Plans is summarised in **Table A3-1**. WCPL considers that the current monitoring with the augmentations described below is adequate to collect sufficient baseline data for use in future Extraction Plans.

Table A3-1
Program to Collect Baseline Data for Future Extraction Plans

Aspect of Future Extraction Plan	Proposed Monitoring
Subsidence	<ul style="list-style-type: none"> • Subsidence monitoring undertaken in accordance with the Subsidence Monitoring Program. • The subsidence monitoring data collected during extraction of Longwalls 11 to 16 will be used to validate revised subsidence predictions for future Extraction Plans. • It is considered that the proposed subsidence monitoring is adequate to collect sufficient subsidence data for use in future Extraction Plans.
Groundwater	<ul style="list-style-type: none"> • Groundwater monitoring (groundwater level and quality) undertaken in accordance with the GWMP (Figure 12 of the Extraction Plan). • The groundwater monitoring data collected will be used to validate predicted environmental consequences on groundwater resources for future Extraction Plans. If this validation finds environmental consequences have exceeded those predicted, the groundwater monitoring data will be used to provide revised predictions of environmental consequences. • The GWMP will be revised in accordance with Condition 34A, Schedule 4 of the Development Consent (DA 305-7-2003) prior to submission of an Extraction Plan for the South Wambo Underground Mine to include the installation of paired monitoring bores in the vicinity of South Wambo Dam.
Surface Water	<ul style="list-style-type: none"> • Surface water monitoring (flow, quality and bed and bank stability) undertaken in accordance with the SWMP (Figure 12 of the Extraction Plan) along North Wambo Creek, Wambo Creek and Stony Creek. • The surface water monitoring data collected will be used to validate predicted environmental consequences on surface water resources for future Extraction Plans. If this validation finds environmental consequences have exceeded those predicted, the surface water monitoring data will be used to provide revised predictions of environmental consequences. • It is considered that the proposed surface water monitoring is adequate to collect sufficient baseline surface water data for use in future Extraction Plans.

Table A3-1 (Continued)
Program to Collect Baseline Data for Future Extraction Plans

Aspect of Future Extraction Plan	Proposed Monitoring
Land	<ul style="list-style-type: none"> Monitoring of impacts to land in general in accordance with the LMP, including high resolution photographic recording of cliffs. The monitoring conducted in accordance with the LMP will be used in the review of observed subsidence impacts for future Extraction Plans.
Biodiversity	<ul style="list-style-type: none"> Monitoring of biodiversity in accordance with the BMP (Figure 13 of the Extraction Plan), including: <ul style="list-style-type: none"> Annual vegetation monitoring in the Remnant Woodland Enhancement Program areas. Annual riparian monitoring (including transects along the North Wambo Creek Diversion, North Wambo Creek, Wambo Creek and Stony Creek). Annual Bird Surveys including specific surveys for Swift Parrot and Regent Honeyeater. Biodiversity monitoring data collected will be used to validate predicted environmental consequences on biodiversity for future Extraction Plans. If this validation finds environmental consequences have exceeded those predicted, the monitoring data would be used to provide revised predictions of environmental consequences.
Aboriginal Heritage	<ul style="list-style-type: none"> Maintenance of an Aboriginal heritage sites database.
Non-Aboriginal Heritage	<ul style="list-style-type: none"> The Wambo Homestead Complex is the only non-Aboriginal heritage site considered of heritage significance in accordance with the <i>NSW Heritage Manual</i>. Other non-Aboriginal heritage sites of significance identified in the Wambo Development Project EIS were not considered to be directly affected by the Wambo Coal Mine. Monitoring data has been collected in accordance with previous Extraction Plans. This monitoring data would be used to predict impacts to the Wambo Homestead Complex for future Extraction Plans.

Note: GWMP refers to the Wambo Coal Pty Ltd Groundwater Monitoring Program.
SWMP refers to the Wambo Coal Pty Ltd Surface Water Monitoring Program.
LMP refers to the Land Management Plan for Longwalls 11 to 16.
BMP refers to the Wambo Coal Pty Ltd Biodiversity Management Plan.

WAMBO COAL PTY LIMITED



SOUTH BATES UNDERGROUND MINE

EXTRACTION PLAN LONGWALLS 11 TO 16

ATTACHMENT 4 KEY CONTACT REGISTER

Contact Details to be Reviewed Annually by the Environment and Community Manager**Table A4-1
Emergency Contacts**

Organisation	Phone Number
Emergency Services (Police, Fire, Ambulance)	000
Environment Protection Authority	131 555
State Emergency Services	132 500
WorkCover Authority	13 10 50
Subsidence Advisory NSW (24 hour Emergency Service)	1800 248 083
Singleton Shire Council	(02) 6578 7290 (Mon-Fri) (02) 6572 1400 (After Hours)

**Table A4-2
Internal WCPL Contact Details**

Position	Contact Name	Phone Number	Mobile
Environment and Community Manager	Steven Peart (24 hours)	(02) 6570 2209	0448 082 987
Community Hotline	-	(02) 6570 2245	
Control Room (24 hours)	-	(02) 6570 2240	
Health and Safety Manager	TBA	(02) 6570 2309	
General Manager	Albert Scheepers	(02) 6570 2330	
Mining Engineering Manager (Underground Mine Manager)	Murray Wood		
Technical Services Manager	Tim Britten		

Table A4-3
Stakeholder Contact Details

Organisation	Position	Contact Name	Contact Phone Number/Email	Postal Address
Department of Planning & Environment	Director, Resources Assessment	Howard Reed	Howard.Reed@planning.nsw.gov.au	GPO Box 39 Sydney NSW 2001
Division of Resources and Energy, Department of Industry, Skills and Regional Development	Manager Northern Region, Environmental Sustainability Unit	Monique Meyer	monique.meyer@industry.nsw.gov.au	PO Box 344 Hunter Region MC NSW 2310
	Manager Royalties and Advisory Services	Zane West	industry.coordination@industry.nsw.gov.au	
Subsidence Advisory NSW	Singleton District Office	Richard Pickles (Manager)	r.pickles@minesub.nsw.gov.au District Office – (02) 6572 4344	PO Box 488G Newcastle NSW 2300 PO Box 524 Singleton NSW 2330
Department of Primary Industries - Water	-	-	water.referrals@dpi.nsw.gov.au	PO Box 3720 Parramatta NSW 2124
Office of Environment and Heritage	Head Hunter Planning Unit	Richard Bath	info@environment.nsw.gov.au Richard.Bath@environment.nsw.gov.au	PO Box 488G Newcastle NSW 2300
Environment Protection Authority	Hunter Region	Michael Howat	hunter.region@epa.nsw.gov.au	
Heritage Branch, OEH	Acting Manager, Conservation	Rajeev Maini	heritage@heritage.nsw.gov.au	Locked Bag 5020 Parramatta NSW 2124
Singleton Shire Council	General Manager	Jason Linnane	ssc@singleton.nsw.gov.au gm@singleton.nsw.gov.au	PO Box 314 Singleton NSW 2330