

20 December 2017

**NSW Planning Assessment Commission Determination Report
Wambo Coal Mine (DA 305-7-2003 MOD 17)**

1. INTRODUCTION

On 14 November 2017, the Planning Assessment Commission (the Commission) received from the Department of Planning and Environment (the Department) a request from Wambo Coal Pty Ltd (the proponent), a subsidiary of Peabody Energy Australia Pty Limited, to modify the existing approval for underground mining at the Wambo Coal Mine (the mine).

The Department has referred the modification to the Commission for determination in accordance with the Minister for Planning's delegation of 14 September 2011 because the Department received more than 25 submissions from the public in the nature of objections.

Ms Lynelle Briggs AO, Chair of the Commission, nominated Mr Gordon Kirkby (chair), Ms Annelise Tuor, and Mr Tony Pearson to constitute the Commission to determine the modification request.

1.1 Summary of modification

The modification applies to DA 305-7-2003, and proposes to modify the Consent to:

- develop nine additional longwall panels 17-25 in the Whybrow Seam, recovering an additional 18 million tonnes (Mt) of run-of-mine (ROM) coal, within existing approved annual limits;
- process 3.7Mt of coarse rejects and 2.1Mt of tailings within the existing tailings storage facilities;
- extend the life of the consent by 7 years and 10 months until 2039;
- construct two additional ventilation shafts and surface infrastructure to support the shafts, on already cleared land, including:
 - o roads;
 - o fencing;
 - o electrical; and
 - o water management infrastructure;
- construct up to two gas drainage boreholes for each gateroad and a new centralised gas flaring plant within the approved surface development area, on already cleared land; and
- install minor upgrades to existing surface facilities and infrastructure within the existing surface development area, including:
 - o conveyor belts/drives;
 - o electrical and communication infrastructure;
 - o water and flood management infrastructure;
 - o service pipelines; and
 - o bores.

The mine will maintain the existing approved annual ROM coal production limit of 14.7 million tonnes per annum (Mtpa).

The proposed modified mine layout for MOD 17 is shown in **Figure 1**.

1.2 Background

Mining operations commenced within the site in 1969. Current operations at the mine exist under the following development consents:

1. Development Application (DA) 305-7-2003 – open cut and underground mining operations, granted consent on 4 February 2004 (the Consent); and
2. DA 177-8-2004 – associated rail loading facility and operations, granted consent on 16 December 2004.

The mine's operations have been subject to a number of modifications determined to date. DA 305-7-2003 has been modified 12 times and DA 177-8-2004 has been modified twice.

The proponent is currently mining in the South Bates Underground mining area. The proponent is currently extracting from approved longwall panels in the Wambo seam in the South Bates Underground mining area, having recently completed extraction of the Whybrow seam. **Table 1** provides a summary of the status of activities at the site.

<i>Mining area</i>	<i>Coal seam/s</i>	<i>Operational status</i>
North Wambo Underground	Wambo Seam	Completed
South Bates Underground	Wambo and Whybrow Seams	Currently active, anticipated to commence mining of the Wambo Seam in June 2017
South Wambo Underground	Arrowfield Seam and Woodlands Hill Seams	Commencement on completion of South Bates Underground
Open Cut	Whybrow, Redbank Creek, Wambo and Whynot Seams	Currently active, however approved open cut mining operations expire in 2020, subject to approval of the United Wambo Open Cut Mine proposal

Table 1: Approved mining areas (Source: Department's assessment report, November 2017)

A separate development application (SSD 7142) has been submitted by United Collieries Pty Ltd (United Collieries), a 95% owned subsidiary of Glencore Coal Pty Ltd, and the proponent for the United Wambo Open Cut Coal Mine Project. SSD 7142 has been submitted as a joint venture partnership between United Collieries and the proponent to integrate the existing open cut operations at the Wambo Coal Mine with a proposed new open cut mine at the United Collieries' site. Two modification applications are currently being considered by the Department, one relates to DA 305-7-2003 (Modification 16) and the other relates to DA 177-8-2004 (Modification 3). Both modifications have been submitted to support the proposed United Wambo Open Cut Coal Mine Project. SSD 7142 and Modifications 3 and 16 do not form part of this determination report.

1.3 Rationale for modification

The proponent's Environmental Assessment (EA) states that the modification area is within existing mining and exploration licence tenements held by the proponent, and would enable the continued use of existing Wambo Coal Mine infrastructure and workforce, allowing for the more efficient and economic recovery of in-situ coal resources.

The EA notes that the longwall panels that are the subject of this modification are unlikely to be economically viable as a standalone resource and may not be recovered in the future without the use of the existing South Bates Underground Mine infrastructure. The proposed longwalls are adjacent to the approved South Bates Underground mining area. The viability of the proposed modification is reliant on the ability of the proponent to use the same infrastructure and workforce to extract from the Whybrow seam adjacent to the current workings.

In order to utilise the existing South Bates Underground Mine infrastructure, the proponent proposes to alter the current mine schedule to delay mining in the South Wambo Underground Mine until mining of the proposed longwalls at South Bates Underground Mine is complete.

The proponent considers that the proposed modification would result in substantial economic and social benefits associated with continuation of the underground operations.

2. DEPARTMENT'S ASSESSMENT REPORT

The Department's assessment report identified subsidence and subsidence related impacts to surface water, groundwater and biodiversity as the key impacts associated with the proposal. The Department's assessment report concluded that the modification can be undertaken with limited and acceptable environmental impacts, subject to certain amendments to existing conditions, several new conditions, the proponent's proposed mitigation measures, and amendments to existing management plans.

2.1 Statutory context – section 75W

DA 305-7-2003 was approved pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Department has provided advice that section 75W provides the statutory context to modify the approval, in accordance with clause 8J(8) of the *Environmental Planning and Assessment Regulation 2000* and the transitional arrangements of Schedule 6A of the EP&A Act.

Unlike section 96 of the EP&A Act, section 75W does not require a modified development to be "substantially the same" as the originally approved development. The Part 3A modification provisions require consideration of the proposed modification against the development currently approved, as most recently modified under Modification 12.

In the Commission's view, the proposed changes are within the scope of section 75W as it applies to the development, and therefore the request to modify may be considered under section 75W.

3. COMMISSION'S MEETINGS AND SITE VISIT

As part of its assessment of the proposal, the Commission met with the Department, the proponent, and visited the site. Notes from these meetings and the site inspection are provided in **Appendix 1**. The Commission also conducted a public meeting. Notes from the public meeting are provided in **Appendices 2 and 3**.

3.1 Briefing from the Department

On 4 December 2017, the Department briefed the Commission on the proposed modification, including, but not limited to, subsidence and water impacts, biodiversity, and conditions of consent.

3.2 Briefing from the Proponent and Site Visit

On 6 December 2017, the Commission met with the proponent at the Wambo Coal Mine Complex. The proponent briefed the Commission on existing site operations, the proposed modification, and adjustments to the proposed sequence of mining as a result of the proposed modification. The proponent showed drone footage of the site, including:

- existing open cut operations;
- areas subject to underground mining operations;
- North Wambo Creek and diversion;

- low level cliffs within the modification area; and
- areas subject to rehabilitation.

The briefing was followed by an inspection of the Wambo Coal Mine Complex and included:

- part of the area subject to the proposed modification;
- North Wambo Creek to the extent of the proposed longwall extension and including potential Groundwater Dependent Ecosystem areas;
- areas that have been the subject of longwall extraction and associated subsidence impacts, including subsidence impacts in cleared areas, areas with tree canopy, and the North Wambo Creek; and
- inspection of the current open cut and underground mining operations.

3.3 Meeting with Singleton Council

The Commission offered to meet with Singleton Shire Council as part of the determination process but this offer was declined by Council.

3.4 Public Meeting

The Commission held a public meeting at the Singleton Civic Centre Auditorium, Queen Street Singleton on 7 December 2017 to hear the public's views on the proposal. A list of the 14 speakers that presented to the Commission is provided in **Appendix 2**. A summary of the key issues raised by the speakers and provided in written comments is provided in **Appendix 3**.

4. ADDITIONAL INFORMATION

The Commission sought clarification from the Department on 11 December 2017 regarding the following issues:

- comparison of predicted subsidence impacts against monitored subsidence impacts from the extraction of longwalls within the Whybrow Seam in the adjacent South Bates Underground mining area, which is adjacent to the proposed modification area;
- extent of area surveyed for the Aboriginal cultural heritage assessment and status of condition 55(b) in relation to Aboriginal pathways;
- clarification regarding the recommended performance measure for impacts on low level cliffs;
- economic benefits of the proposal;
- conditions of consent;
- cumulative impacts; and
- scope of the proposal and its characterisation as a modification pursuant to section 75W.

This information was received between 11 and 15 December 2017.

The Commission sought clarification from the proponent on 11 December 2017 in relation to the commencement of additional groundwater monitoring along North Wambo Creek above longwalls 23-25, the extent of area surveyed for the Aboriginal cultural heritage assessment and made comments on the recommended performance measures for low level cliffs.

This information was received on 12 and 13 December 2017

These issues are considered below in **Section 5**.

5. COMMISSION'S CONSIDERATION

In its determination of the modification, the Commission has carefully considered, inter alia, the following:

- information submitted by the proponent as part of the modification including additional information;
- the Department's assessment report;

- advice and recommendations from government agencies; and
- all written and verbal comments and submissions.

The Commission has reviewed and accepts the Department's assessment and recommendations in respect of matters including biodiversity, noise, air quality and greenhouse gas emissions, rehabilitation, historic heritage, surface infrastructure, and waste materials. The Commission is satisfied with the completeness of the assessment and supports the Department's conclusions, subject to the conditions.

The key matters considered further by the Commission and addressed in **Section 5** include:

- subsidence generated impacts;
- groundwater dependent ecosystems;
- surface water;
- groundwater; and
- economic benefits of the proposal.

The Commission considered other relevant matters including Aboriginal cultural heritage and cumulative impacts. These matters are addressed in **Section 5.5**.

5.1 Subsidence

The Commission received a number of comments raising concerns in relation to potential subsidence impacts, including:

- surface subsidence;
- impacts to cliffs associated with Wollemi National Park; and
- impacts to Aboriginal rock shelters.

Other subsidence related impacts associated with surface water, groundwater and potential groundwater dependent ecosystems are addressed separately in the report.

5.1.1 Surface subsidence

The proponent's EA was accompanied by a Subsidence Assessment prepared by Mine Subsidence Engineering Consultants (MSEC). The MSEC assessment defined the study area as: *"the surface area enclosed by a 26.5° angle of draw line from the extents of secondary extraction and by the predicted total 20mm subsidence contour resulting from the proposed longwalls. Other features which could be subjected to far-field or valley related movements and could be sensitive to such movements have also been assessed."*

Table 2 presents the predicted total conventional subsidence effects over the proposed modification area compared to predictions for the approved South Bates Underground Mine project. The figures show that the maximum predicted subsidence resulting from the proposed mining of the Whybrow seam is 1,950mm and is significantly less than the maximum predicted for the approved longwalls currently being mined in the South Bates Underground Mine area (4,150mm). The maximum predicted subsidence in the South Bates Underground Mine area is greater due to the mining of two seams, namely the Whybrow and Wambo seams, whereas underground mining in the proposed modification only involves the mining of one seam, namely the Whybrow seam.

Layout	Maximum Predicted Total Conventional Subsidence (mm)	Maximum Predicted Total Conventional Tilt (mm/m)	Maximum Predicted Total Conventional Hogging Curvature (km ⁻¹)	Maximum Predicted Total Conventional Sagging Curvature (km ⁻¹)
Approved WYLW11 to WYLW13 and WMLW14 to WMLW16	4,150	100	> 3.0	> 3.0
Proposed WYLW17 to WYLW25	1,950	90	>3.0	>3.0

Table 2: Comparison of maximum predicted total subsidence parameters based on approved and proposed layouts to existing mining at South Bates and proposed South Bates Extension (MSEC Report, January 2017)

The Department confirmed that it was satisfied that the MSEC assessment was based on conservative assumptions and that the model is calibrated to local conditions with natural variations built in. The Department considers that it provides a sound basis for assessing potential subsidence effects and subsequent environmental impacts.

The Independent Expert Scientific Committee (IESC) noted that the magnitude of potential impacts associated with the modification are likely to be small, relative to the impacts caused by mining operations that have already taken place. The IESC requested information to be included in the Subsidence Assessment, including the potential for interactions between underground and open cut operations to affect subsidence predictions. The proponent's Response to Submissions (RtS) identifies how these issues were addressed in the MSEC assessment and confirms that the modification longwalls are located well outside of the extent of open cut mining operations. Accordingly, the open cut is not expected to materially affect subsidence movements from the modification longwalls.

The Department notes that in accordance with standard practice for managing mine subsidence, the mine is subject to existing conditions of consent that specify, among other matters, key subsidence performance measures (Condition 22), and the approval by the Secretary of detailed Extraction Plans to manage the mining of approved longwall panels (Condition 22C).

The Commission requested clarification from the Department regarding the outcomes of predicted modelling versus monitored surface impacts associated with previous longwall mining in the South Bates Underground mining area within the Whybrow Seam. **Table 3** provides a comparison of previously mined longwalls in the Whybrow Seam, which are considered by the Commission to be a relevant comparison, as these were extracted in single seam conditions, are located in the same seam and comprise similar geometry.

Monitoring Line	Predicted S ^{max} (mm) ¹	Actual S ^{max} (mm)	Difference (mm)	Consistent with Predicted Range
South Bates Underground Long Wall 11 ¹				
7XL 1	1,825	1,613	-212	Y
CL11B-Line	1,850	1,887	37	Y
South Bates Underground Longwall 12 ²				
XL	1,950	1,648	-302	Y

1. South Bates Underground Mine Subsidence Review Report for South Bates WYLW11 (Mine Subsidence Engineering Consultants [MSEC], 2016)
2. South Bates Underground Mine Subsidence Review Report for South Bates WYLW12 (MSEC, 2017)

Table 3: Subsidence monitoring – actual versus predicted for South Bates Underground Longwalls 11 and 12 (Source: Wambo Coal Mine Annual Review, 2016)

Based on the evidence submitted, the Commission finds that the predicted subsidence impacts associated with the proposed modification are acceptable and that the conditions of consent requiring the proponent to limit and monitor subsidence impacts as part of the Extraction Plan process are appropriate.

5.1.2 Cliffs

The MSEC assessment considered subsidence related impacts on cliffs within the study area. Cliffs are categorised into three groups, including:

- *Cliffs associated with the Wollemi Escarpment*, located along the boundary of the Wollemi National Park, cliffs are discontinuous and separated by sections of minor cliffs and rocky outcrops, each having overall heights ranging between 10 and 40m;
- *Intermediate level cliffs*, located part way down the steep slopes beneath the Wollemi Escarpment to the southwest of the proposed longwalls, with continuous lengths up to approximately 50m and heights varying between 10 and 20m; and
- *Low level cliffs*, located near the bottom of the steep slopes above the south-western ends of the proposed longwalls, with continuous lengths up to approximately 50m each and heights varying between 10 and 15m.

Cliffs associated with the Wollemi Escarpment are located outside of the 26.5° angle of draw and predicted to experience less than 20mm vertical subsidence. Intermediate level cliffs are located outside of the proposed longwalls and predicted to experience subsidence up to 30mm.

The Department considered that cliffs associated with the Wollemi Escarpment and intermediate level cliffs have the potential to experience far-field horizontal movements, however, these tend to be bodily movements towards the extracted longwalls and measurable strains are not predicted to develop. The scale of these impacts is such that the cliffs associated with the Wollemi Escarpment and intermediate level cliffs are unlikely to be significantly impacted by far-field horizontal movements.

There are no performance measures in the conditions of consent for cliffs associated with the Wollemi Escarpment or intermediate level cliffs, given that these features are outside of the angle of draw and any potential subsidence impacts are anticipated to be minimal. The proponent's RtS notes that monitoring of cliff lines is currently conducted in accordance with their Extraction Plan for the South Bates Underground Mine.

The Department provided the Commission with a Subsidence Review Report, for the South Bates Underground Mine longwall panel 13 (November 2017). As identified above, longwall 13 provides a relevant comparison, as it was extracted in the same single seam conditions. The Subsidence Review Report assessed the potential for impacts to cliffs associated with the Wollemi Escarpment, and found that no impacts were expected or reported as the cliffs were located outside of the angle of draw.

The Commission agrees with the Department's assessment that the proposed longwalls would be unlikely to adversely impact on cliffs associated with the Wollemi Escarpment and intermediate level cliffs. The Commission finds that further consideration would be given to these cliffs during preparation of the Land Management Plan required as part of the Extraction Plan process.

The low-level cliffs are within the angle of draw, and located above the heading between proposed longwalls 20 and 21. These cliffs are discontinuous and separated with sections of minor cliffs and rock outcrops. The MSEC assessment predicts that 7 to 10% of the total length, or approximately 3 to 5% of the total face area of cliffs located directly above the proposed longwalls could be impacted as a result of potential additional strain. The MSEC assessment confirms: *"This equates to a length of disturbance of approximately 15m, or a face area of approximately 100m². This represents a very small percentage (i.e. less than 1 %) of the total length and face area of the cliffs located within the Study Area"*. The Commission also notes that the low-level cliffs are largely hidden from view by the existing tree canopy and are not visible from areas outside the ownership of the proponent.

Given the level of impact is predicted to be more than negligible, the Department recommended an additional performance measure for low level cliffs of ‘minor environmental consequences’, being occasional rockfalls, displacement or dislodgement of boulders, or fracturing, that in total does not impact more than 5% of the total face area of such features within the extension area (Condition 22 Table 14A). The Commission requested clarification from the Department regarding how the performance measure was developed. The Department confirmed that the measure is appropriate for managing potential impacts and is consistent with the approach taken for other mine sites. The Commission accepts the Department’s position on the performance measure.

The proponent proposes ongoing periodic visual monitoring of all cliff categories during and after extraction of the longwalls, which is supported by the Department and the Office of Environment and Heritage (OEH).

Based on the evidence submitted, the Commission finds that impacts on cliffs would be minor. However, it considers the performance measure for low level cliffs necessary to manage potential impacts, should rockfalls, cliff instabilities or dislodgement of boulders occur as a result of undermining. In addition, any Extraction Plan for this area would consider potential impacts to cliffs as part of the approval required to commence longwall extraction.

5.1.3 Rock shelters

The MSEC assessment identified six rock shelters with potential archaeological deposits (PADs) within the modification area. The assessment acknowledges that rock shelters directly above the proposed longwalls could be adversely affected by subsidence. The proponent proposes monitoring of these sites after undermining has occurred to assess and document any impacts. In its submission to the Department, OEH noted that it was concerned with the significance attributed to the rock shelters and that excavation of the PADs was not warranted. The OEH supports inclusion of identified Aboriginal sites into the mine’s existing management framework and recommended a number of cultural heritage conditions of consent.

In its RtS, the proponent proposed to continue managing Aboriginal cultural heritage in accordance with the conditions of applicable Aboriginal Heritage Impact Permits (AHIPs) and that a new AHIP would be required to cover the residual area not currently covered by existing AHIPs. The Department confirmed that OEH’s recommended conditions are already addressed by existing conditions. OEH made no further comment.

Based on the evidence submitted, the Commission finds the conditions relating to Aboriginal cultural heritage to be adequate and management measures for newly identified sites would require ongoing consultation with the Aboriginal community (see **Section 5.4**).

5.2 Groundwater Dependent Ecosystems

The Commission received a number of comments raising concerns regarding the impacts to potential groundwater dependant ecosystems (GDEs) as a result of subsidence from the proposed modification.

The EA notes that the closest ‘high priority’ GDE is Parnell Spring, which likely flows from the Triassic-age Narrabeen Group, which is located approximately 11km south-southwest of the proposed longwalls. The Triassic Group experiences negligible drawdown from the operations at the Wambo Coal Mine Complex.

In relation to GDEs, the EA states *“Groundwater depth exceeds 10m across most of the Modification area, and is only within 2m of the surface in very small areas associated with North Wambo Creek.... Most of the remnant woodland and forest vegetation is positioned high in the landscape on footslopes and ridges remote from groundwater sources.”* On this basis, the proponent’s EA concluded that none of the plant communities within the modification area are groundwater dependant.

The Department notes that an area of *Hunter Lowland Redgum Forest*, an Endangered Ecological Community (EEC), is located adjacent to a section of North Wambo Creek above proposed longwalls 23, 24 and 25. This area is:

- disturbed and in a fragmented condition;
- is mostly 5 to 10m above the water table; and
- is likely to depend entirely on surface flows.

The Department considers that while it is possible that this vegetation may access groundwater, the vegetation is not decidedly different from vegetation in nearby areas where the water table depth is greater.

In its submission on the EA, the Department of Primary Industries (DPI) (which included the views of NSW Department of Industry – Crown Lands and Water Division (CLWD) referred to as CLWD hereon) raised a number of concerns with the mapping of GDEs, made recommendations for further investigations to determine groundwater dependence of the EEC, and recommended changes to longwall layout to reduce the risk of impact. The proponent addressed some of the issues raised by CLWD within its RtS, however, CLWD continued to question the adequacy of the information provided to conclude that the riparian *Hunter Lowland Redgum Forest* EEC is not a GDE or that the proposed modification would not have a significant impact on this community.

The IESC raised similar concerns, particularly in relation to the *Central Hunter Valley Eucalypt Forest, Woodland Critically Endangered Ecological Community*, and other riparian vegetation. The IESC also recommended further investigations and monitoring be undertaken to address concerns and to determine whether GDEs are present.

The Department acknowledged the concerns of CLWD and IESC, noting that while the proponent has data on which it has formed conclusions, the information is based on a single borehole. The Department does not consider a change in mine plan design to be necessary, but due to the limited data currently available, considers that further investigations and monitoring would allow a better understanding of any current or former groundwater dependency and whether previous open cut and underground mining has impacted these communities.

To address the limited availability of monitoring data, the Department recommended Condition 36A, which requires the proponent to commission a GDE study, and Condition 36B which requires the findings of any GDE study to be taken into account in the preparation of any Extraction Plan for the South Bates Extension Area. Neither condition stipulated a minimum timeframe for monitoring, which was proposed by CLWD as a minimum two-year period. The Commission supports the CLWD recommendation to require a minimum timeframe for establishing groundwater conditions. Accordingly, the Commission has amended Condition 36B to reflect the minimum two-year monitoring period and to specify that the monitoring results must be taken into account in the preparation of the GDE study and in any Extraction Plan for longwalls 23-25.

In the event that GDEs are identified within the study area, the Commission found that the relevant performance measure to address potential impacts required clarification and strengthening. The Commission amended Table 14A of Condition 22 to broaden the categorisation of ‘threatened species, populations or communities’, to specify: *Other species, populations or communities as listed under the Biodiversity Conservation Act 2016 or the Environment Protection Biodiversity Conservation Act 1999*, alongside performance measure: *Minor cracking and ponding of the land surface or other impact. Negligible environmental consequences*. The Commission finds that the amendment reduces uncertainty and is appropriate should GDEs be identified. In addition, Condition 22 requires suitable offsets to be provided in the event that the performance measures set out in Table 14A are exceeded.

The Department also recommends that the existing Groundwater Monitoring Program be revised in consultation with CLWD to include the installation of clustered monitoring bores for the South Bates Extension Area. These bores are to be located in proximity to the *Hunter Lowland Redgum Forest* along North Wambo Creek. In addition, the Commission has amended Condition 36A to require data collected from the revised Groundwater Monitoring Program to be adopted in any GDE study undertaken for the modification area.

During the site inspection, the proponent identified recently commissioned investigative drilling and the installation of piezometers (bores) in the vicinity of North Wambo Creek. On 13 December 2017, the proponent submitted information to the Commission confirming that the program comprised 12 bores at 10 sites, four of which (at two sites) were constructed as permanent monitoring bores. The drilling was completed on 21 November 2017. The aim of the program was to measure groundwater levels in the unconsolidated sediments. The bores measured the standing groundwater level and logged the nature of material encountered. The constructed monitoring bores will allow the long-term monitoring of groundwater levels in the vicinity of North Wambo Creek (see **Figure 2**).

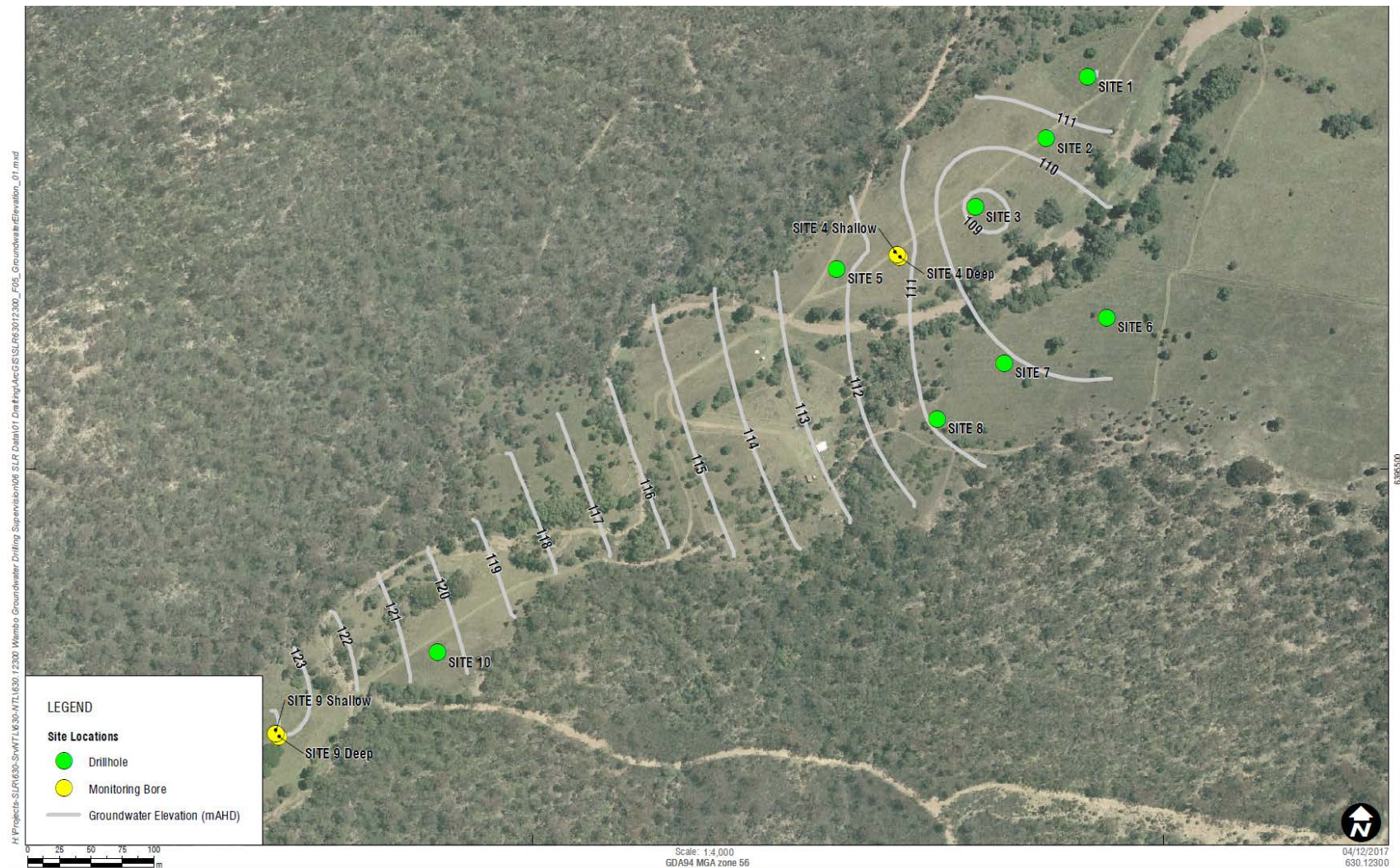


Figure 2: Plan and bore logs of recent bores drilled adjacent to North Wambo Creek (Source: Wambo Coal Pty Ltd)

The proponent confirms it consulted CLWD on the monitoring locations and is working to address CLWD's monitoring requirements, including the installation of additional piezometers in 2018. CLWD supported the proposed bore locations and requested an additional 9 to 12 bores. The proponent proposes to undertake the additional drilling in early 2018.

The Commission finds that the presence and subsequent significance of GDEs is inconclusive, given the limited availability of monitoring data. Based on the information submitted, the Commission finds that the approach of additional monitoring to determine groundwater levels is appropriate and amendments to Condition 36B would require a minimum of two-years of data being collected. This would allow for the satisfactory assessment of groundwater dependability prior to any Extraction Plan being submitted for longwalls 23-25. The amendment to Table 14A, Condition 22 provides clarification as to the relevant performance measure should GDEs be identified.

5.3 Water resources

The Commission received a number of comments raising concerns regarding:

- potential impacts on surface water and groundwater;
- the potential for impacts on the wider Hunter River catchment;
- cracking and further subsidence of North Wambo Creek and impact on flows; and
- the adequacy of sufficient baseline data and assessment of these impacts.

5.3.1 Surface water

The proponent's EA states that the proposed modification would result in surface cracking, stream grade, erosion and potential ponding along North Wambo Creek. North Wambo Creek is located directly above proposed longwalls 23 to 25. The EA states that the modification is not predicted to have a significant impact on surface water surrounding the area of the modification and with the implementation of monitoring and remediation measures, to be set out in the relevant Extraction Plans, no significant change is predicted.

The Department notes that North Wambo Creek is a fifth order ephemeral stream, with some standing pools along the lower reaches, draining toward Wollombi Brook, located to the south-east of the modification area. The riparian canopy cover decreases as the creek flows towards the finishing ends of the proposed longwalls and the banks and surrounding floodplains have been historically cleared, with erosion present along the creek alignment. The ephemeral nature of the creeks within the modification area means that water only flows for short periods following a significant rainfall event.

The Department considers that stream flow may be affected by subsidence and subsequent surface cracking could occur. Changes to surface gradients and ponding along sections of the North Wambo Creek may also result. The extent of ponding is dependent on the flow of the creek and, given the ephemeral nature of the creek, pools would likely be dry for extended periods. Generally, there are 10 days per year where flow in the creek is 1 ML/day or greater. The cumulative effect of the increased number and size of pools would reduce this to one day per year on average.

CLWD raised concerns regarding the potential for erosion impacts as a result of subsidence under North Wambo Creek. CLWD recommended revising the Surface Water Monitoring Program, to require additional surface water flow monitoring of North Wambo Creek. Condition 33A requires the monitoring program to be revised within three months of the approval of the modification.

The Department concludes that the proposed modification would result in new impacts to an area of North Wambo Creek and associated drainage lines. The predicted impacts are less than those already approved for other areas of the mine. However, it may be necessary to remediate some sections of the ephemeral drainage lines at completion of mining, particularly where depths of cover are shallowest.

The Department provided clarification as to the existing surface water monitoring programs, confirming that Condition 33 requires a program to monitor vegetation in riparian zones adjacent to North Wambo Creek. This condition would also apply to the proposed modification area. The Department recommended Condition 33A, which requires installation of an up-stream flow gauge in North Wambo Creek. Existing Condition 33 also requires a program to monitor bank and bed stability in North Wambo Creek. The Department confirmed that the condition encompasses the section of North Wambo Creek that falls within the modification area. In addition, the proponent confirmed that it currently operates nine continuous flow gauging stations, located along North Wambo Creek, Stony Creek and Wambo Creek, the monitoring of which would be used to inform the relevant Extraction Plans.

The Commission acknowledges the potential for surface water impacts as a result of the proposed modification. The Commission sought further information on the status of monitoring in the modification area and is satisfied with the regime adopted and current monitoring locations. Based on the information provided, the Commission is satisfied with the data used to inform the assessment of surface water impacts and finds that potential impacts would be managed through existing and new conditions of consent.

5.3.2 Groundwater

The proponent's EA states there would be negligible additional drawdown along the highly productive Wollombi Brook or Hunter River alluvium, and no discernible impact on stream baseflow or natural river leakage for Wollombi Brook, North Wambo Creek, Wambo Creek or Stony Creek as a result of the proposed modification. The proponent concludes that the proposed modification is consistent with the *Aquifer Interference Policy* (AIP) and adequate licences are available to account for the potential take of water associated with the proposed modification.

The Commission sought clarification on the status of baseline monitoring for groundwater, as required under existing Condition 34, and its relationship to the proposed modification area. The Department confirmed there are three groundwater monitoring bores within the proposed modification area and that the groundwater assessment considered data collected from these locations. In its 15 December 2017 response to the Commission, the Department confirmed that the proponent has established permanent monitoring bores to allow long term recording of groundwater levels around North Wambo Creek. The Department considers this would provide an even longer period of baseline data within the modification area.

As highlighted above, the Department recommends that the Groundwater Monitoring Program be revised within three months of approval of the modification. As set out in Condition 34B, revision to the monitoring program is to include installation of additional monitoring bores and piezometers and must include establishing a program for continual monitoring of the bores, within 12 months of approval of the modification.

The Commission is satisfied with the approach to revise the Groundwater Monitoring Program to determine the presence and extent of groundwater, including a program to continually monitor the bores and piezometers ahead of mining in this location. A separate study is also proposed, which would be based on a minimum of two-years monitoring data, as required under Condition 36B, to determine whether GDEs exist in the modification area (see **Section 5.2**).

The Commission finds the approach to additional monitoring to determine groundwater levels is appropriate and is satisfied with the data used to inform the assessment of groundwater impacts for, noting the additional monitoring that will be required to inform preparation of the relevant Extraction Plans.

5.4 Economic analysis

The Commission sought clarification from the Department regarding the economic benefits of the proposed modification. The Department confirmed that the proposal would recover an additional 18Mt of ROM coal that might otherwise be sterilised if mining of the South Bates Underground Mine is limited to the existing approval. The existing Wambo Coal Mine workforce would continue to be employed for an additional 7 years and 10 months, and flow-on effects would continue to benefit local and regional economies.

A Resource Assessment provided by Department of Resources and Geosciences (DRG) considered the economic benefits of the proposed modification assuming product coal is sold on the export thermal coal market, the value of coal produced is estimated at \$1.1 billion in current dollars (estimated by DRG at a net present value of \$0.8 billion).

DRG estimates that the proposed modification would generate approximately \$20 million/year, and \$73 million in total (\$56 million at net present value), in additional royalties over the life of the modification.

The Commission finds that the proposed modification would generate continued significant economic benefits, through direct employment of workforce at the mine complex and through flow-on contributions to the local, regional, State and National economies.

5.5 Other Relevant Issues

Other issues raised by members of the community have been addressed in the Department's assessment report and conditions of consent. Notwithstanding, the Commission has considered the following other relevant issues.

Aboriginal cultural heritage

The Department's assessment report notes that a total area of 508 hectares was surveyed to inform the Aboriginal cultural heritage assessment, which equates to 93% of the total investigation area. During the site inspection, the Commission requested clarification as to the extent of survey and exclusion of 7% of the modification area.

The proponent clarified that the investigation area was subject to systematic archaeological survey sampling, confirming that an area of approximately 34 hectares could not be sampled due to logistical constraints at the time the surveys were undertaken. Surveys of the remaining area were completed by an archaeologist and representatives of the Aboriginal community on 27 and 28 June and 24 July 2017. The proponent confirmed that the sites identified during these surveys (artefacts and potential archaeological deposits) were consistent with the predictive model and of the same type and significance as sites identified across the modification area. The results of the supplementary surveys were included in an application for an AHIP made to OEH in October 2017. The proponent confirmed that the management measures proposed for the newly identified sites are consistent with the management measures agreed with the Aboriginal community for these site types, and that the conditions of any AHIP are likely to require ongoing consultation with the Aboriginal community regarding management of these sites.

The Commission requested clarification from the Department regarding the status of Condition 55(b) which relates to possible Aboriginal pathways. The significance of the pathways was described in the Aboriginal Cultural Heritage Assessment, which concluded that the overall impacts of the modification on these cultural values would be low within a regional context, given the limited surface disturbance and the nature of the predicted subsidence impacts. The Department confirmed investigations into these pathways is ongoing as part of continued consultation with Aboriginal parties in the area. The Department also confirmed that a significant area of these pathways has been protected from future open cut mining and large-scale surface disturbance as part of the designated Remnant Woodland Enhancement Program (RWEP) areas.

The Commission finds the approach to the Aboriginal cultural assessment to be appropriate and that ongoing consultation with registered Aboriginal parties would be required regarding management of these sites. The Commission also accepts the Department's position and finds that any potential impacts on cultural values associated with these pathways would be low and notes the ongoing investigations to better understand these pathways.

Cumulative impact

The Commission sought clarification as to the cumulative impacts of the proposed modification. The Department clarified that, as the modification is for underground mining, there are no discernible changes to noise or air quality emissions above those already approved. The Department, considers therefore that cumulatively, there is no change to the existing level of impact.

The Department considers that water and subsidence impacts are largely limited to the footprint of the Wambo Mine Complex and would not increase above those already approved. Overall, the Department has considered the cumulative impacts of subsidence, (including on water resources) and noise and air quality emissions associated with the proposed modification and is satisfied that the impacts are either negligible or can be reduced to an acceptable level through mitigation.

The Commission accepts the Department's assessment of cumulative impacts and considers impacts would be limited to the footprint of the mine. The Commission finds that the existing and new conditions of consent are adequate for managing potential impacts.

6. COMMISSION'S FINDINGS AND DETERMINATION

The Commission has carefully considered the proponent's modification proposal, the Department's assessment report and the relevant matters for consideration under the EP&A Act. The Commission has noted the advice and recommendations from government agencies including the Office of Environment and Heritage, Department of Primary Industries, and the Crown Lands and Water Division. Finally, the Commission has heard from members of the community about their views on the proposal during the public meeting in Singleton.

Having sought clarification from the Department and the proponent, and consistent with its view, the Commission considers the proposed modification is within the scope of section 75W of the EP&A Act.

The Commission acknowledges that the viability of the proposed modification relies on the ability of the proponent to use its existing infrastructure and workforce adjacent to the current workings to extract coal from the Whybrow seam.

The Commission finds that subsidence impacts, including potential impacts to cliffs and rock shelters will be addressed through performance measures and conditions of consent that require the proponent to limit and monitor subsidence impacts. The proponent is required to develop a detailed Extraction Plan, for approval by the Secretary, to govern the mining of approved longwall panels. Based on the evidence provided, the Commission finds potential subsidence impacts are acceptable.

The Commission acknowledges the Department's assessment of GDEs and the need for further monitoring data to verify if vegetation along North Wambo Creek is groundwater dependent. Accordingly, the Commission supports the condition to require a study to determine whether GDEs are present within the modification area, and the application of performance measures if GDEs are identified. The Commission has considered the concerns expressed by CLWD and amended Condition 36B to require a minimum of two-years of monitoring to be incorporated in any Extraction Plan for longwalls 23-25.

The Commission finds that potential impacts to surface water, groundwater and Aboriginal cultural heritage would be managed through existing conditions of consent and revised management and monitoring programs.

The Commission acknowledges the economic benefits of the proposed modification and finds that the proposal would utilise the existing Wambo Coal Mine workforce and benefit the local economy through direct employment at the mine and through flow-on contributions to the local, regional, State and National economies.

The Commission has responded to concerns expressed by speakers at the public meeting, while noting that a number of those issues relate to aspects of the proposal that have already been approved and were not the subject of this proposed modification.

For the reasons set out above, the Commission has determined to grant consent to the proposed modification subject to the conditions set out in the Notice of Modification instrument.



Gordon Kirkby (Chair)
Member of the Commission



Annelise Tuor
Member of the Commission



Tony Pearson
Member of the Commission

**APPENDIX 1
RECORDS OF COMMISSION MEETINGS**

Notes of Briefing from the Department

This meeting is part of the Determination process.		
Meeting note taken by Alana Jelfs	Date: 4 December 2017	Time: 10am
Project: Wambo Coal Mine – MOD 17		
Meeting place: PAC Office		
Attendees: Commission Members: Gordon Kirkby (Chair), Annelise Tuor, Tony Pearson Commission Secretariat: Alana Jelfs (Senior Planning Officer), David Koppers (Team Leader) Department of Planning and Environment: Howard Reed (Director Resource Assessments), Melanie Hollis (Senior Environmental Assessment Officer)		
The purpose of the meeting: For the Department to brief the Commission on the proposed MOD		
Meeting notes: <u>MOD 17</u> - Wambo is multi seam, open cut and underground mine complex. - Proposes 9 new longwall (LW) panels in the north-western area of the site. Panels would be extracted before moving onto previously approved workings. - Land increases in height towards Wollemi National Park, with 50m depth of cover. - LW panel void widths in the Whybrow seam are 260m and inter-panel pillars narrow at 29m. 4-6 weeks to transfer from one panel to another and up to 18 months to extract the full LW panel. - No submission made by Singleton Council. <u>United Wambo Project</u> - Under a joint venture arrangement, the companies propose expansion of open cut mining and consent for the ongoing mining of approved Wambo Open Cut. The United Wambo Project application (SSD 7142) is currently being assessed by the Department, it proposes extraction of up to 150 million tonnes of run-of-mine (ROM) coal to 2039. - If approved, the United Wambo Project consent would absorb relevant consents and underground/open cut operations consolidated under one consent. <u>Subsidence</u> - Subsidence issues are most prevalent at the end of LW panels. No significant tilts and compressive strains are predicted. - The Department tabled a comparison of actual and predicted subsidence impacts for previous workings in the multi-seam North Wambo Underground (Wambo Annual Report). Predictions are conservative, resulting in less impact over time than what had been modelled and assessed. The Department noted an error in the figures, which it will check and reissue. - Performance measures included for low level cliffs, no more than 5% of face area to be impacted. Low level cliffs are approximately 10-15m high. Cliffs within Wollemi National Park and not predicted to be impacted. - Nearly all intermediate level cliffs are outside the line of LW panels. - Impacts are measured across a single LW domain over a period of time. Extraction plans are prepared in LW panel sequence. Mining of the first LW panels will measure total subsidence including tilts and strains and data to better inform next workings.		

Water resources

- Submission made the Department note impacts to watercourses and overall Hunter system.
- North Wambo Creek is ephemeral and has been impacted by previous mining activity in the area. The Department is satisfied that the works are sufficiently setback from Wollemi National Park.
- North Wambo Creek line runs through the north-western area of proposed LW panels 23-25.
- LW panels 23-25 are approximately 4-5 years from extraction, which would allow sufficient time to gather monitoring data, to inform management plans and Extraction Plan, which require approval by Department.
- Condition recommended requiring a study to determine the likely level of groundwater dependence of vegetation within the proposed study area (GDE), required to commence within 12 months of obtaining approval. The outcome of the study will inform the need for further offsets or mitigation.

Biodiversity

- Office of Environment and Heritage (OEH) raised concern over the potential for impacts on Biodiversity Offset Area D which crosses over existing workings and proposed workings. The Department considers there would be minimal impact on woodland areas as a result of underground mining.

Independent Environment Scientific Committee (IESC)

- Department satisfied IESC comments have been addressed. Issues addressed in Table 10 of the assessment report.

Economic benefit

- The Commission asked what the economic benefits are of MOD 17 and how this fits in with the overall economic benefit given it extends the life of the project by over 7 years.
- The Department confirmed the project would not generate a new workforce. The Mod relies on existing equipment and workforce to carry out the works. The Department to provide some additional detail regarding the economic benefit including royalties generated.

Extension of mine life

- The Commission raised concern that no overall assessment of impacts to account for the extension in the life of the mine by 7 years had not been included in the report. Department to provide advice in this regard.

Aboriginal heritage

- The Department's report states that 34 ha of study area was not surveyed and 35 sites have been identified outside that area.
- The Department confirmed the area would be resurveyed as part of preparation of the Extraction Plan.
- The Commission queried whether the requirements of Condition 55 have been satisfied. The Department to confirm.

Outcomes/Agreed Actions: Department to provide information on subsidence predictions, conditions, assessment of extension to mine and economic benefits.

Meeting closed at 11:30am

Notes of Briefing from the Proponent

This meeting is part of the Determination process.		
Meeting note taken by Alana Jelfs	Date: 6 December 2017	Time: 12pm
Project: Wambo Coal Mine – MOD 17		
Meeting place: Wambo Mine,		
Attendees: Commission Members: Gordon Kirkby (Chair), Annelise Tuor, Tony Pearson Commission Secretariat: Alana Jelfs (Senior Planning Officer), David Koppers (Team Leader) Wambo Mine: Michael Alexander (Director Projects & Portfolio Management NSW), Albert Scheepers (Wambo Coal General Manager), Steven Peart (Manager: Environment & Community), Murray Wood (Underground Mine Manager), Joanna Hincks (Resource Strategies), Joshua Hunt (Resource Strategies)		
The purpose of the meeting: For the proponent to brief the Commission on the proposed MOD		
Meeting notes: <u>Overview</u> • The proponent provided an overview of company safety initiatives. • The proponent operates mines in Queensland and NSW with a workforce of over 3600 people. • Wambo operating since 1969. Acquired by Peabody in 2006. • Coal is railed to Newcastle Port and exported to Asian markets (China, Korea, Japan). • 102 hectares (ha) rehabilitation completed in 2016 and 55 ha in 2017. • Underground equipment would move from LW panel 16 to 17 under the proposed MOD. Mining in this location would not otherwise be viable. • Mining 4 seam groups -seams mined from OC till becomes too expensive then start underground from that position – with LW system • Approval obtained in MOD 12 to mine Arrowfield and Bowfield seams. The proposed modification would delay commencement of mining these seams till 2022. • Wambo open cut finishing at the end of 2018. • Wambo underground currently mining LW panel 14 in the Wambo seam. Ready to commence LW panel 15 and moving from LW panel 15-16 by July/August 2018, then proposing to transition to MOD 17 LW panels. • Proposal includes extending the life of the mine by 7 years. <u>MOD 17 components</u> • Continued use of South Bates underground coal handling infrastructure located in South Bates pit. • Two additional ventilation shafts proposed. • Gas drainage boreholes restricted to grassland. • Delay in commencement of South Wambo Underground to allow access to the resource. • No change to maximum production rates or coal handling rates. <u>Subsidence</u> • Subsidence assessed with a 26.5 degree angle of draw from edge of panel to surface. • Approved dam site, to be constructed following extraction of LWs. • Potential impacts would be managed in accordance with performance measures in conditions of consent and through extraction plan process, which requires further data and assessment to be provided prior to extraction.		

- Location of low level cliffs over proposed LWs 20-21.

Water resources

- Proponent is confident with the prediction modelling, which is provided to the Department as required by conditions of consent.
- Groundwater assessment numerical model calibrated against all data since 2003.
- Incremental impacts confined to extent of modification LWs
- North Wambo Creek is a key feature in the modification area and previously undermined.
- Old Creek line runs through the open cut. Diversion now in place.
- Ephemeral creek flows approximately 50 times a year.
- The catchment of North Wambo Creek is approximately 2% of the catchment area of Wollombi Brook.
- No water used for domestic or stock along length of the creek and no privately owned land along its length.
- CLWD (former DPI Water) classified creek as 'less productive'.
- Impacts anticipated to be similar to other areas on site. Any cracking/changes of grade would be monitored and repaired under the current conditions of consent.
- No permanent pools in the section that would be undermined by LWs 23-25.
- Hunter Lowland Redgum Forest, not considered to be groundwater dependent by Dr Colin Bower.
- Recent drilling in area showed depth to groundwater between 4.8m and 13.8m.
- Groundwater table is generally in consolidated bedrock colluvium and not suitable for rooting.
- Riparian vegetation classified Endangered Ecological Community (EEC). Conditions require performance measures to be satisfied, and failure to meet the measures is a non-compliance and would require offset.
- Extraction plan process must provide more details and how measures will be met and performance assessed.

Justification

- Utilisation of existing workforce
- Facilitate continuity of underground operations - 230 personnel.
- Economic recovery of resource that would not otherwise be recovered.
- Additional royalties in the order of \$66 million NPV (over the 7 years and 10 months).
- No contributions paid to Singleton Council. An agreement would be made with council for the United Wambo Project (SSD).
- Social and economic benefits to region associated with ongoing employment expenditure.

Discussion

- Performance measure relating to 5% cliff face. The proponent raise concern with the performance measure and potential difficulty in measuring effects, given natural occurring rockfalls the over escarpment.
- Current model indicates a less than 5% movement across cliff face.
- Low level cliffs inspected by archaeologist identified 3 potential areas that could be shelters. Detailed survey to be done as part of the extraction plan process.
- The proponent is strongly of the view that the area is not GDE as area is not permanently wet. Piezometers in place already, if monitoring shows there is GDEs an offset strategy would be developed to comply with OEH guidelines.

The briefing was followed by a site inspection and inspection of the underground operations.

Meeting closed at 6pm

**APPENDIX 2
LIST OF SPEAKERS**

**Planning Assessment Commission
Wambo Coal Mine MOD 17**

Date and Time: Thursday 7 December 2017, 9:30pm

Place: Singleton Civic Centre, 12 Queen Street, Singleton NSW 2330

List of Speakers

1. Deidre Olofsson
2. Bev Smiles (Hunter Communities Network)
3. Jan Davis (Hunter Environment Lobby)
4. Ron Fenwick
5. Steve Philipps (Lock the Gate Alliance)
6. Jan Fenwick
7. Robert McLaughlin (Bulga Milbrodale Progress Association)
8. Janet Fenwick (Rivers SOS)
9. Anne-Maree McLaughlin
10. Mick Schofield
11. Kevin Taggart
12. Jorge Taskal
13. Robert McLaughlin
14. Dan Boyd

APPENDIX 3

SUMMARY OF ISSUES FROM WRITTEN AND VERBAL SUBMISSIONS TO THE PUBLIC MEETING

The following issues were raised:

Subsidence

- Hydraulic connectivity and fracturing to the surface is predicted above 40-50% of the area above the proposed longwalls.
- Modelling presented does not contribute to the understanding of impacts from subsidence and cracking.
- Subsidence impact groundwater flows Prior to 1969 – mining causes subsidence, changes in groundwater flows.
- Crack and holes appearing in landscape due to subsidence.
- Subsidence impacts on Wollemi National Park.
- Subsidence on property, machinery and stock is significant.
- Escarpment protection around base of cliffs is inadequate.

Water resources

- Destruction of water systems as a result of mining.
- Water drawdown and lack of information of cumulative information and assessment.
- Impacts to Wollemi Brook.
- Proponent maintains that the alluvial system is now highly modified and further assessment not warranted, an admission of significant impact on environmental assets.
- IESC issues raised not addressed including impacts to groundwater drawdown,
- Changes to surface water flows in North Wambo Creek, water quality and subsidence impacts on the geomorphology and hydrology of North Wambo Creek not adequately assessed.
- Creek flow into channels not fully assessed.
- Increased ponding, cracking greatly disturb the natural values of North Wambo Creek.
- Too many unanswered questions about water impacts of the project.
- Insufficient baseline data for water resources which is required under the AIP.
- Wambo agreed to remediate the creek on the private property. Reasonable steps need to be made to ensure creek functionality.
- Regional zone of depressurization and lowered groundwater levels, causing water drawdown.
- Expansion will cause further subsidence along North Wambo Creek.
- No confidence with water quality monitoring and validity.

Inadequate modelling, baseline data and impact assessment

- Insufficient baseline data and flow records of creeks.
- Cumulative impacts not adequately assessed including the consideration of other mines in the region.
- Concerns over delaying the currently approved southern longwalls (modification 12).
- Agency comments not adequately addressed.
- Bores on property have not been monitored adequately.
- Do support consideration of the modification as a section 75W modification.
- The proposal is not minor. It extends the mine footprint, and years of operation.

Biodiversity

- IESC comments not addressed. Subsidence is a key impact to biodiversity.
- Impacts associated with proximity to Wollemi National Park and habitat.

Aboriginal cultural heritage

- Impacts to culturally significant sites.
- Inadequate assessment of cultural Aboriginal heritage sites.
- Not acceptable that 34 hectares of the area of impact has not been surveyed for Aboriginal Cultural Heritage sites

Health

- Impacts to health as a result of mining.
- No impact on health or EPA guidelines considered in relation to health.

Rehabilitation

- Lack of information on rehabilitation post mining.
- No confidence in the proponent meeting its rehabilitation commitments.
- Poor compliance record and evidence of rehabilitation.

Greenhouse gas emissions increase coal and emission production

- Concerns raised over gas and flaring
- Increased greenhouse gas emissions resulting from the operation.
- Volatile source of methane must be left undisturbed.

Economic and social issues

- Peabody financial state.
- Social dislocation and changing sense of place as a result of mining in the region.
- Small towns and villages significantly impacted and people moving away.

Property impacts

- Impacts to private residents, water quality and impacts on property.
- Subsidence property impacts.

Mitigation

- Proposed mitigation measures are unacceptable across the project.
- Mitigation should be strengthened.

Support

- Mining benefits the community through employment and indirect benefits, including employment of contractors and local services etc.
- Removing mining forces young people to move away from the area to seek employment elsewhere.
- The mine supports local families.