APPENDIX B – COPY OF EA SUBMISSIONS

Refer to the Department's website:
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5586

NSW GOVERNMENT | Department of Primary Industries

OUT16/19655

Jessie Evans
Resource Assessment and Compliance
NSW Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Jessie.evans@planning.nsw.gov.au

Dear Jessie

DPI response to request for comment on proposed Modification 12 to Wambo Coal Mine (DA 305-7-2003)

I refer to your email dated 26 April 2016 to the Department of Primary Industries in respect to the above matter. Comment has been sought from relevant divisions of DPI. Any further referrals to DPI can be sent by email to landuse.enquiries@dpi.nsw.gov.au.

DPI has reviewed the request and provides the following recommendations with further detailed comments by DPI Water at **Attachment A**:

- The proposal should be assessed against the NSW Aquifer Interference Policy (AIP), considering the guidelines at **Attachment B**.
- Consistent with earlier DPI Water requests, the proponent should carry forward bore water level trigger values in Australian Height Datum (AHD) and not as depth.
- Consistent with previous DPI Water requests, when the proponent completes the updated Water Management Plan (WMP) augmentation, paired observation bores should be established within the interburden aquifer at sites P114 and P116.
- The proponent should advise on whether the investigation report into whether the increased electrical conductivity (EC) in shallow bore P114 is a result of a possible leakage from Wambo South Water Dam and potential remediation/mitigation measures was completed and submitted as stated in the WMP (October 2015). A copy of the report should be made available to DPI Water and the EPA.
- The proponent should provide a copy of the monitoring bore construction and lithology logs to DPI Water.
- The proponent should assess the project with respect to the AIP minimal impact consideration regarding 'No mining activity to be below the natural ground surface within 200m laterally from the top of high bank or 100m vertically beneath (or the three dimensional extent of the alluvial water source - whichever is the lesser distance) of a highly connected surface water source that is defined as a "reliable water supply".

- The proponent should present their strategy to account for any water taken beyond the life of the operation of the project.

- The proponent should advise how measurement and monitoring of volumetric take of water from each water source will be achieved.

- Crown land is present within the project boundary. DPI Lands & Natural Resources manage or administer the State's Crown land and Crown roads predominantly under the provisions of the Crown Lands Act 1989 and the Roads Act 1993 respectively. The proponent should note that the relevant legislation and that DPI Lands & Natural Resources is the agency responsible for administering Crown land.

- The EIS should include a description of land tenure & ownership and, where Crown land is involved, details of any lease, licence and/or reservation. DPI Lands & Natural Resources recommends that the proponent undertake a full status search with this agency to accurately determine affected Crown lands. The proponent must also identify any Crown land outside the project boundary that is subject to an activity associated with the proposal, including for example haulage roads, biodiversity offsets, buffers, water pipelines, electricity lines and drainage detention basins. For information on DPI Lands & Natural Resources status see information on website: http://www.crownland.nsw.gov.au/crown_lands/searches

- The proponent should assess the impacts of the proposal on all Crown land and clearly identify Crown land that may be significantly affected by the proposal:

    - Crown land significantly affected by the proposal should be identified and the proponent will need to obtain DPI Lands & Natural Resources' agreement to sell the affected Crown land. Where DPI Lands & Natural Resources agrees to sell the affected Crown land Transfer of Title should be completed prior to commencement of a modified consent for DA 305-7-2003 Mod 12..

    - Crown roads required as part of the development should be identified and either:
        - Closed and purchased by the Proponent; or
        - Transferred to Singleton Shire Council if the road is required to remain open as public roads.

Yours sincerely

Mitchell Isaacs
Director, Planning Policy & Assessment Advice
26/5/2016

Attachment A

Wambo Coal Mine (DA 305-7-2003 MOD 12)

Detailed comments – DPI Water

General Overview

The primary risk associated with the proposal is that a shift from mining the deeper Bowfield Seam to an intermediate depth Woodlands Seam would exacerbate the fracture interconnection up to the overlying mined Wambo Seam, which similarly has a certain degree of fracture connection up to the mined Whybrow Seam, and ultimately continues up to Wambo Creek alluvial and surface water systems historically noted to fractured to surface. Understanding the long term ramifications under this project, including the water quality aspects, is complex. Considering that as a fracture doubles in width, the potential flow volume is cubed, so the ability to transmit saline water could increase exponentially where minimal fracturing existed in the pre-mining environment.

Goaf fracturing and the resulting increased surface area contact between water and Permian rock could potentially expedite the release of additional soluble salts previously held tight within the low permeability interburden material. This is an issue for DPI Water consideration and is further complicated by the potential for subsidence and fracturing beneath and extending to the highly connected alluvial systems.

To evaluate such a complex issue DPI Water are predominantly guided by the groundwater modelling outputs which have been interpreted and presented by the proponent to indicate only minor incremental increases to that already approved under the existing development consent. This is demonstrated as part of the AIP assessment.

The groundwater model component of the Groundwater Assessment report has been independently reviewed by Dr F Kalf from Kalf and Associates Pty Ltd. Dr Kalf finds the model and report to be 'fit for purpose' with the majority of criteria for assessing a model being categorised as 'very good'. Dr Kalf identified some limitations with the model and assessment, which included the uncertainty analysis and time horizon for prediction compared with the calibration period. There are no objections to Dr Kalf's conclusion that the model having adhered with the available modelling guideline documents (NWC 2012, MDBC 2001) would be categorised as being 'fit for purpose'.

Residual Issues

A brief review of the past two Wambo Mine modifications is warranted as it influences part of this assessment.

During the proponent's previous mine modifications for the inclusion of Wambo Seam LW 10A, and the Wambo South Bates (Whybrow Seam) Underground Mine Extraction Plan Longwalls 11-13 DPI Water (formerly NOW), made a number of recommendations for inclusion in the Water Management Plan (WMP). These recommendations were for the purpose of improved monitoring and evaluation of modelled predictions.

Wambo Coal Pty Ltd (WCPL) submitted versions of the WMP to NSW Government in May and October 2015 for comment. DPI Water provided a review and response to the WMP, along with response to submissions (RtS) in May 2015, November 2015 and January 2016. Particular issues flagged by DPI Water included: (i) the need to have the groundwater triggers in AHD (to overcome the issue of subsidence); and (ii) the need for additional observation points to be nested with alluvial monitoring bores.

WCPL's response to DPI Water RtS of November 2015 advised that: (a) Table 9 has been modified to report groundwater triggers in AHD levels; and (b) additional paired observation bores would be considered as part of South Wambo Mine Mod 12, the subject of this EIS (see Table 1).

Table 1: Wambo Coal Pty Ltd Response to Submissions (6th Nov 2015)

21	DPI Water noted that groundwater trigger levels in the GWMP are not referenced in Australian Height Datum (AHD)	Table 9 of the GWMP has been amended include absolute trigger levels in m AHD

No.	Comment	Response
22	DPI Water requested that P114 and P116 of the Wambo Creek alluvial trigger bores within the subsided area be nested or paired with deeper interburden bores to assess the direction of flow between Permian and alluvial aquifers during the post mining period.	Longwalls 11 to 13 are over 3 kilometres from Wambo Creek and therefore this particular issue is not related to the Extraction Plan. It is noted that the GWMP has been approved by the DP&E after no additional comments were received from DPI Water for over 5 months The comprehensive approved groundwater monitoring program at the Wambo Coal Mine includes monitoring at 34 locations As noted by DPI Water, P206 (also known as P203) and P202 are nearby interburden bores (within approximately 500 metres). It is considered that these nearby bores should be sufficient to assess the direction of flow between the Permian and alluvial aquifers. DPI Water's request will be given further consideration when reviewing the groundwater monitoring network for the upcoming South Wambo Underground Mine Modification (MOD 12 for the Wambo Coal Mine).

The Groundwater Assessment for the EIS under review states "*In the latest approved GWMP (WCPL, 2015a), 14 alluvial locations have nominated groundwater trigger levels as listed in* ***Table 6***". (reproduced below as Table 2.) DPI Water notes that the water level triggers are not presented in AHD levels. These triggers should be presented as AHD levels, as previously agreed.

Table 2: Shallow Bore Water Level Trigger Values (ref Table 6 - Groundwater Assessment, March 2016)

	Depth to Groundwater (mBTOC)[1]	
Bore	Minimum (10th percentile)	Maximum (90th percentile)
P106	6.6	10.7
P109	4.6	6.7
P114	5.4	7.6
P116	4.8	7.3
P202	7.8	9.6
P203 (also known as P206)	16.1	21.6

- **It is recommended the proponent carry forward water level value triggers in AHD as previously accepted.**

With respect to the previous request for additional targeted observation points DPI Water notes that Section 6 of the Groundwater Assessment states "*It is recommended that the approved GWMP is augmented following approval to include the installation of additional groundwater monitoring sites above the southern longwall area.*" There is no clear indication of where these sites would be located. DPI Water will address this issue further when the opportunity presents to comment on the WMP augmentation.

- **It is recommended that when the WMP augmentation is developed paired observation bores into interburden be established at sites P114 and P116, consistent with previous DPI Water requests.**

In May 2015, DPI Water highlighted a concern with the water quality changes detected at observation bore P114 located on the Wambo Creek Alluvium and overlying LW10A. This bore is the closest bore to South Dam and between February 2011 and June 2014, the EC at P114 increased from below 1000 µS/cm to almost 7000 µS/cm. The average EC in the South Dam was 7350 µS/cm. No further analysis or investigation was being triggered under the proposed extraction plan. Noting that this water quality change conflicts with the Objects of the WMA (2000), DPI Water recommended trigger levels with regard to salinity be set to investigate and determine if remediation is required.

WCPL's WMP (October 2015) outlined *"An investigation into the increased EC in shallow bore P114 has been initiated to further investigate the potential for impacts on this bore as a result of possible leakage from Wambo South Water Dam and potential remediation/mitigation measures.* " It was stated that this report would be submitted by November 30th 2015. A Groundwater Assessment Review document (dated 2nd October 2015, ref H2015/36) was submitted as part of the review of the Extraction Plan for Longwalls 11 to 13. That document did not make any reference to P114 salinity or South Dam. DPI Water is not aware if the investigation report into the drivers for salinity increase at P114 was ever submitted. There is minimal detail on this issue or reference to a completed investigation in the current EIS.

- **It is recommended WCPL advise whether the investigation report into the increased EC in shallow bore P114 as a result of possible leakage from Wambo South Water Dam and potential remediation/mitigation measures was completed and submitted as stated in the WMP (October 2015). A copy of the report should be made available to DPI Water and EPA.**

The bore log construction details have not been not made available and this limits DPI Water's assessment capability.

- **It is recommended a copy of the monitoring bore construction and lithology logs be made available to DPI Water.**

Aquifer Interference Policy

A copy of the assessment against the Aquifer Interference Policy checklist is provided in Attachment B.

Points noted as part of the assessment is that minimal impact consideration level 2 criteria are triggered with 4 bores impacted beyond AIP 2m drawdown threshold, one within the alluvium and three in porous rocks . The outlined mitigation is to implement the Surface and Groundwater Response Plan (WCPL, 2015b) in the event a complaint is received in relation to loss of groundwater supply.

Assessment has not been undertaken for the longwall panels beneath Wollombi Brook against the AIP Level 1 minimal impact consideration which states *that 'No mining activity to be below the natural ground surface within 200m laterally from the top of high bank or 100m vertically beneath (or the three dimensional extent of the alluvial water source - whichever is the lesser distance) of a highly connected surface water source that is defined as a "reliable water supply"* in order for the impact to be classified as Level 1.

- **WCPL should undertake an assessment against the AIP minimal impact consideration regarding *'No mining activity to be below the natural ground surface within 200m laterally from the top of high bank or 100m vertically beneath (or the three dimensional extent of the alluvial water source - whichever is the lesser distance) of a highly connected surface water source that is defined as a "reliable water supply"***

Section 5.5 of the Groundwater Assessment describes the licence requirements during active mine life. A strategy to account for any water taken beyond the life of the operation of the project has not been presented.

- **It is recommended WCPL present their strategy to account for any water taken beyond the life of the operation of the project.**

Recommendations

- Consistent with earlier DPI Water requests and previously accepted by WCPL, the proponent carry forward bore water level trigger values in AHD and not as depth.
- Consistent with previous DPI Water requests, when WCPL complete the updated WMP augmentation, paired observation bores are to be established within the interburden aquifer at sites P114 and P116.

- WCPL advise on whether the investigation report into the increased EC in shallow bore P114 is result of a possible leakage from Wambo South Water Dam and potential remediation/mitigation measures was completed and submitted as stated in the WMP (October 2015). A copy of the report should be made available to DPI Water and EPA.
- It is recommended a copy of the monitoring bore construction and lithology logs be made available to DPI Water.
- WCPL should state whether or not the project adheres with the AIP minimal impact consideration regarding 'No mining activity to be below the natural ground surface within 200m laterally from the top of high bank or 100m vertically beneath (or the three dimensional extent of the alluvial water source - whichever is the lesser distance) of a highly connected surface water source that is defined as a "reliable water supply".
- WCPL present their strategy to account for any water taken beyond the life of the operation of the project.
- WCPL advise how it will measure and monitor volumetric take.

For further information please contact Hemantha De Silva, Senior Water Regulation Officer, 02 4904 2525, hemantha.desilva@dpi.nsw.gov.au

End Attachment A

Attachment B

Wambo Coal Mine (DA 305-7-2003 MOD 12)

Assessing a proposal against the NSW Aquifer Interference Policy

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DISCLAIMER
This is a document produced to aid interpretation and application of the NSW Aquifer Interference Policy (2012). All information in this document is drawn from that policy, and where there is any inconsistency, the policy prevails over anything contained in this document.

Any omissions from this framework do not remove the need to meet any other requirements listed under the Policy.

Assessing a proposal against the NSW Aquifer Interference Policy

Note for proponents:
This is the basic framework against which the NSW Office of Water uses to assess project proposals against the NSW Aquifer Interference Policy (AIP).

While you are not required to use this framework, you may find it a useful tool to aid the development of a proposal or an EIS.

We suggest that you summarise your response to each AIP requirement in the table below, and provide a reference to the section of your EIS that addresses that particular requirement. Using this tool can help to ensure that all necessary factors are considered, and will help to understand what the requirements of the AIP are.

Step by step guide to assessing a proposal against the AIP:

Table 1: Does the activity require detailed assessment under the AIP?

	Consideration	Response
1	Is the activity defined as an aquifer interference activity?	If **NO**, then assessment is complete. No assessment is required under the AIP. If **YES**, continue to 2.
2	Is the activity a defined minimal impact aquifer interference activity according to section 3.3 of the AIP?	If **YES**, then no further assessment against this policy is required. Volumetric licensing still required for any water taken, unless exempt. See the implementation manual for a more detailed discussion. If **NO**, then continue on for a full assessment of the activity.

Section 3.2 of the AIP defines the framework for assessing impacts. These are addressed here under the following headings:

1. Accounting for, or preventing the take of water
2. Addressing the minimal impact considerations
3. Proposed remedial actions where impacts are greater than predicted.

1. Accounting for, or preventing the take of water

Where a proposed activity will take water, adequate arrangements must be in place to account for this water. It is the proponent's responsibility to ensure that the necessary licences are held. These requirements are detailed in Section 2 of the AIP, with the specific considerations in Section 2.1 addressed systematically below.

Where a proponent is unable to demonstrate that they will be able to meet the requirements for the licensing of the take of water, consideration should be given to modification of the proposal to prevent the take of water.

Table 2: Has the proponent:

	AIP Requirement	Proponent response	DPI Water Comment
1	Described the water source (s) the activity will take water from?	Alluvial aquifers in the vicinity of Wambo are managed as the Lower Wollombi Brook Alluvial Water Source, within the *Hunter Unregulated and Alluvial Water Sources WSP 2009*. The alluvium along Wollombi Brook and a small portion of alluvium on Wambo Creek are classified as a 'Highly Productive' groundwater source by DPI Water; the remaining alluvial aquifers are classified as 'Less Productive'. The Permian and Triassic hard-rock units will be managed as the Sydney Basin - North Coast Groundwater Source within the *WSP for the North Coast Fractured and Porous Rock Groundwater Sources*. This WSP is in Draft form on exhibition from 8 February 2016 until 20 March 2016. Until then the Porous Rock groundwater source is being managed under the *Water Act 1912*. This is classified as a 'Less Productive' groundwater source by DPI Water.	Defined appropriately.
2	Predicted the total amount of water that will be taken from each connected groundwater or surface	Table 20. **Lower Wollombi Brook Water Source Max 36 ML**	Accepted

	AIP Requirement	Proponent response	DPI Water Comment
	water source on an annual basis as a result of the activity?	**Porous Rock – total Max. 1,293**	
3	Predicted the total amount of water that will be taken from each connected groundwater or surface water source after the closure of the activity?	Blank	Not described.
4	Made these predictions in accordance with Section 3.2.3 of the AIP? (refer to Table 2, below)		Yes, calibrated numerical groundwater model on long term data set, calibration targets achieved well within guideline values and independently reviewed as 'fit for purpose'.
5	Described how and in what proportions this take will be assigned to the affected aquifers and connected surface water sources?	Table 20. **Lower Wollombi Brook Water Source Max 36 ML** **Porous Rock – total Max. 1,293**	Accepted
6	Described how any licence exemptions might apply?	Blank	No exemptions
7	Described the characteristics of the water requirements?	Blank	Water requirements not covered in Groundwater Assessment. Water Balance shows 4.52 ML/d mine inflow. (1650 ML/yr). Note this volume exceeds combined total shown in Table 20 but encapsulates greater model area, thus mines too. Figures 48 and 49 show UG inflow at approx. 3.5ML/d (1277 ML/yr)
8	Determined if there are sufficient water entitlements and water allocations that are able to be obtained for the activity?	Table 2 list of licences held by WCPL. This constitutes total entitlement, for all Wambo mine operations, of 70 ML/a from the Lower Wollombi Brook Water Source and 1,647 ML/a from the Porous Rock Water Source.	Licences exceed max volumes of predicted take.
9	Considered the rules of the relevant water sharing plan and if it can meet these rules?	Blank	No known additional constraints.
10	Determined how it will obtain the required water?	Not required	Accepted
11	Considered the effect that activation of existing entitlement may have on future available water determinations?	Blank	Unregulated system. Additional water would need to be purchased if AWD was less than 50% for Lower Wollombi Brook Source.
12	Considered actions required both during and post-closure	Blank	Modification relates to underground works only, not

	AIP Requirement	Proponent response	DPI Water Comment
	to minimize the risk of inflows to a mine void as a result of flooding?		applicable.
13	Developed a strategy to account for any water taken beyond the life of the operation of the project?	Blank As stated in Section 1.6, WCPL currently has licensed entitlements of 70 ML/a for the Lower Wollombi Brook Water Source and 1,647 ML/a for groundwater derived from the Porous Rock source. The current groundwater licences are therefore sufficient to cover the predicted water extraction shown in **Table 20** for all approved underground mine plans and the Modification for the duration of the South Wambo Underground Mine.	**Only describes active mine. Licence surrender would be required consistent with AIP.**
	Will uncertainty in the predicted inflows have a significant impact on the environment or other authorized water users? *Items 14-16 must be addressed if so.*		Uncertainty Analysis identified by independent review as a model limitation. Fracture Zone Sensitivity Analysis looked potential changes of inflow to individual seams from the approved to modification.
14	Considered any potential for causing or enhancing hydraulic connections, and quantified the risk?	Section 3.6 Fracture Zone Implementation, Section 4.8 Fracture Zone Sensitivity Analysis. Attachment D	See comments in general overview and guided by model outputs. Adequately defined but ongoing monitoring needs to be complimentary to the risk.
15	Quantified any other uncertainties in the groundwater or surface water impact modeling conducted for the activity?		Discussion on long term salinity risks.
16	Considered strategies for monitoring actual and reassessing any predicted take of water throughout the life of the project, and how these requirements will be accounted for?		Managed as part of the Extraction Plan

Table 3: Determining water predictions in accordance with Section 3.2.3
(complete one row only – consider both during and following completion of activity)

	AIP Requirement	Proponent response	DPI Water Comment
1	For the *Gateway* process: Is the	Blank	N/A

	AIP Requirement	Proponent response	DPI Water Comment
	estimate based on a simple modelling platform, using suitable baseline data, that is fit-for-purpose?		
2	For *SSD* or *mining* or *CSG production*, is the estimate based on a complex modelling platform that is: • Calibrated against suitable baseline data, and in the case of a *reliable water source*, over at least two years? • Consistent with the Australian Modelling Guidelines? • Independently reviewed, robust and reliable, and deemed fit-for-purpose?		Yes, calibrated numerical groundwater model on long term data set, calibration targets achieved well within guideline values and independently reviewed as 'fit for purpose'.
3	In all other processes, estimated based on a desk-top analysis that is: • Developed using the available baseline data that has been collected at an appropriate frequency and scale; and • Fit-for-purpose?		N/A

Other requirements to be reported on under Section 3.2.3

Table 4: Has the proponent provided details on:

	AIP Requirement	Proponent response	DPI Water Comment
1	Establishment of baseline groundwater conditions?	Section 2.5 Groundwater Monitoring	Extensive baseline data available, further sites recommended for on-going assessment. See comments in main text.
2	A strategy for complying with any water access rules?	Blank	Unregulated system. Additional water would need to be purchased if AWD was less than 50% for Lower Wollombi Brook Source.
3	Potential water level, quality or pressure drawdown impacts on nearby basic landholder rights water users?	No basic rights bores identified.	Noted.
4	Potential water level, quality or pressure drawdown impacts on nearby licensed water users in connected groundwater and surface water sources?	Table 21. Cumulative impact on 20WA208559 is 2.2m, Cumulative Impact on three private wells in hardrock of 20+ m	**Level 2 impact to 4 bores**
5	Potential water level, quality	There is a single High Priority	No section in the Groundwater

	AIP Requirement	Proponent response	DPI Water Comment
	or pressure drawdown impacts on groundwater dependent ecosystems?	Groundwater Dependent Ecosystem near to Wambo. Parnell Spring, which likely flows from the Triassic-age Narrabeen Formation and feeds Milbrodale Creek, is located about 9 km south-southwest of the Modification longwall panels. This feature is therefore located outside of the active model domain. Wambo mining would result in negligible drawdown at Parnell Spring.	Assessment dedicated to GDEs, One GDE referenced in Topography and Drainage section and listed in Table 22 AIP Impact Consideration Assessment. 9km distance to an elevated GDE is likely have negligible impact as presented.
6	Potential for increased saline or contaminated water inflows to aquifers and highly connected river systems?	Section 5.2 Groundwater discharge from deeper, hard rock to alluvial flats would have been limited due to the low vertical hydraulic conductivity of the Permian strata, but it is known that over long periods of time (millennia) salinity can build up along the edges of these sediments. During and post mining these salinity accessions have been and would be arrested as a result of mine drawdown propagation. Section 5.7 This proposed Modification could not be considered to have a significant effect on the quality of groundwater or surface water around Wambo. The modelling shows no potential for increased flux of more saline water, due to the Modification, from the Permian strata to the alluvium for a period of at least 100 years, and only minor zones of enhanced upflow to alluvium after 200 years along the central part of North Wambo Creek and along Stony Creek near its confluence with Wambo Creek. The groundwater levels across the footprint of the South Wambo Underground Mine are expected to settle at about 15 m below initial conditions	Comment on this issue is provided in the main text highlighting DPI Water considerations. Previous LW10A modification resulted in further testing increases in vertical hydraulic conductivity which when modelled indicated only minor changes in impact. DPI Water accepted the model had met best practices and independently deemed 'fit for purpose' which adheres with the level considered acceptable by NSW Gov't. As the risks are increased under the subject modification, then the monitoring program needs to be commensurate to the risk: ie increased risk equals increased monitoring & management. This monitoring is addressed in the main text and recommendations.

	AIP Requirement	Proponent response	DPI Water Comment
		due to permanent changes in hydraulic conductivity and storage where subsidence would occur.	
7	Potential to cause or enhance hydraulic connection between aquifers?	As above	As above
8	Potential for river bank instability, or high wall instability or failure to occur?	Blank	Underground Mine
9	Details of the method for disposing of extracted activities (for CSG activities)?	Blank	N/A

2. Addressing the minimal impact considerations

Section 3.2.1 of the AIP describes how aquifer impact assessment should be undertaken.

1. Identify all water sources that will be impacted, referring to the water sources defined in the relevant water sharing plan(s). Assessment against the minimal impact considerations of the AIP should be undertaken for each ground water source.
2. Determine if each water source is defined as "highly productive" or "less productive". If the water source is named in the register of highly productive water sources, then it is defined as highly productive, all other water sources are defined as less productive.
3. With reference to pages 13-14 of the AIP, determine the sub-grouping of each water source (eg alluvial, porous rock, fractured rock, coastal sands).
4. Determine whether the predicted impacts fall within level 1 or level 2 of the minimal impact considerations defined in Table 1 of the AIP, for each water source, for each of water table, water pressure, and water quality attributes. The tables below may assist with the assessment. There is a separate table for each sub-grouping of water source – only use the tables that apply to the water source(s) you are assessing, and delete the others.
5. If unable to determine any of these impacts, identify what further information will be required to make this assessment.
6. Where the assessment determines that the impacts fall within the Level 1 impacts, the assessment should be "Level 1 – Acceptable"
7. Where the assessment falls outside the Level 1 impacts, the assessment should be "Level 2". The assessment should further note the reasons the assessment is Level 2, and any additional requirements that are triggered by falling into Level 2.
8. If water table or water pressure assessment is not applicable due to the nature of the water source, the assessment should be recorded as "N/A – *reason for N/A*".

Table 5: Minimal impact considerations – example tables

Aquifer	Alluvial aquifer

Category	Highly Productive
Level 1 Minimal Impact Consideration	**Assessment**
Water Table Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic "post-water sharing plan" variations, 40 m from any: (a) high priority groundwater dependent ecosystem; or (b) high priority culturally significant site; listed in the schedule of the relevant water sharing plan. **OR** A maximum of a 2 m water table decline cumulatively at any water supply work.	**Level 2** The only High Priority Groundwater Dependent Ecosystem near Wambo is Parnell Spring. Parnell Spring likely flows from the Triassic-age Narrabeen Formation and is located 9 km south-south-west of the Modification longwall panels (Section 2.2). Wambo mining would result in negligible drawdown at Parnell Spring. There are no High Priority Culturally Significant Sites listed in the Hunter Unregulated and Alluvial Water Sources Water Sharing Plan. A cumulative drawdown of more than 2 m is predicted at one privately owned water supply work in the mapped 'highly productive' alluvial aquifer on Wambo Creek. The Modification would result in additional drawdown at this bore of approximately 0.1 m. WCPL would continue to implement the Surface and Groundwater Response Plan (WCPL, 2015b) in the event a complaint is received in relation to loss of groundwater supply.
Water pressure A cumulative pressure head decline of not more than 40% of the "post-water sharing plan" pressure head above the base of the water source to a maximum of a 2m decline, at any water supply work. **OR**, for the Lower Murrumbidgee Deep Groundwater Source: A cumulative pressure head decline of not more than 40% of the "post-water sharing plan" pressure head above the top of the relevant aquifer to a maximum of a 3m decline, at any water supply work.	A cumulative drawdown of more than 2 m is predicted at one privately owned water supply work in the mapped 'highly productive' alluvial aquifer on Wambo Creek. The Modification would result in additional drawdown at this bore of approximately 0.1 m. WCPL would continue to implement the Surface and Groundwater Response Plan (WCPL, 2015b) in the event a complaint is received in relation to loss of groundwater supply.
Water quality Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 m from the activity. No increase of more than 1% per activity in long-term average salinity in a highly connected surface water source at the nearest point to the activity. No mining activity to be below the natural ground	There are no simulated risks of reduced beneficial uses of the alluvium as a result of the Modification (Section 5.7). The Modification would have no discernible or negligible effect on stream baseflow or natural river leakage for Wambo Creek, North Wambo Creek, or Stony Creek stream systems, beyond the effects of approved mining. It is anticipated that the Modification would not increase the long-term salinity of North Wambo Creek, Stony Creek or Wambo Creek. The Modification would not increase the long-term

Aquifer	Alluvial aquifer
Category	Highly Productive

Level 1 Minimal Impact Consideration	**Assessment**
surface within 200m laterally from the top of high bank or 100m vertically beneath (or the three dimensional extent of the alluvial water source - whichever is the lesser distance) of a highly connected surface water source that is defined as a "reliable water supply". Not more than 10% cumulatively of the three dimensional extent of the alluvial material in this water source to be excavated by mining activities beyond 200m laterally from the top of high bank and 100m vertically beneath a highly connected surface water source that is defined as a "reliable water supply".	salinity of North Wambo Creek, Stony Creek or Wambo Creek. **Long wall panels beneath Wollombi Brook should be assessed against the distance from the highly connected surface water source.**

Aquifer	Porous rock or fractured rock
Category	Less productive

Level 1 Minimal Impact Consideration	**Assessment**
<u>Water Table</u> Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic "post-water sharing plan" variations, 40 m from any: (a) high priority groundwater dependent ecosystem; or (b) high priority culturally significant site; listed in the schedule of the relevant water sharing plan. **OR** A maximum of a 2 m water table decline cumulatively at any water supply work.	The existing project includes Level 2 impacts. There is currently no Water Sharing Plan relevant to this porous rock aquifer. Limited information is available on three privately owned bores in the vicinity of Wambo. Depending on the depth from which these bores pump, these bores may experience more than 2 m cumulative drawdown (not attributable to the Modification, but rather through cumulative impact of existing approvals). WCPL would continue to implement the Surface and Groundwater Response Plan (WCPL, 2015b) in the event a complaint is received in relation to loss of groundwater supply.
<u>Water pressure</u> A cumulative pressure head decline of not more than a 2m decline, at any water supply work.	The existing project includes Level 2 impacts. Limited information is available on three privately owned bores in the vicinity of Wambo. Depending on the extraction depth, these bores may experience more than 2 m cumulative drawdown (not attributable to the Modification, but rather through cumulative impact of existing approvals). WCPL would continue to implement the Surface

Aquifer	Porous rock or fractured rock
Category	Less productive

Level 1 Minimal Impact Consideration	**Assessment**
	and Groundwater Response Plan (WCPL, 2015b) in the event a complaint is received in relation to loss of groundwater supply.
Water quality Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40m from the activity.	**Level 1** There is not expected to be a migration of groundwater away from the Wambo areas in the Permian system either during mining or following completion of mining activities. On this basis, Wambo would not lower the beneficial use category of the groundwater within the Permian system.

3. Proposed remedial actions where impacts are greater than predicted

Point 3 of section 3.2 of the AIP provides a basic framework for considerations to consider when assessing a proponent's proposed remedial actions.

Table 5: Has the proponent:

	AIP Requirement	Proponent response	DPI Water Comment
1	Considered types, scale, and likelihood of unforeseen impacts *during operation*?	See points 4 and 5 below	
2	Considered types, scale, and likelihood of unforeseen impacts *post closure*?	This proposed Modification could not be considered to have a significant effect on the quality of groundwater or surface water around Wambo. The modelling shows no potential for increased flux of more saline water, due to the Modification, from the Permian strata to the alluvium for the full recovery simulation of 200 years. The groundwater levels across the footprint of the South Wambo Underground Mine are expected to settle at about 15 m below initial conditions.	Guided by the model outputs.
3	Proposed mitigation, prevention or avoidance strategies for each of these potential impacts?	See points 4 and 5 below	See points 4 and 5 below
4	Proposed remedial actions should the risk minimization strategies fail?	Consistent with the currently approved *Surface and Groundwater Response Plan* (WCPL, 2015b), in the event that a groundwater quality or level trigger level specified in the GWMP is exceeded, an investigation should be conducted in accordance with the *Surface and Groundwater Response*	Subject to Government acceptance of the Extraction Plan.

AIP Requirement		Proponent response	DPI Water Comment
		Plan. Consistent with the *Aquifer Interference Policy* (NSW Government, 2012), management measures that may be implemented as a result of the investigation described above could include relinquishment of an equivalent portion of water access licences as a direct offset for potential groundwater inflows into the underground.	
5	Considered what further mitigation, prevention, avoidance or remedial actions might be required?	No additional groundwater impact mitigation measures are proposed for the Modification. Groundwater levels and quality should continue to be monitored at Wambo in accordance with a GWMP approved under the Development Consent.	Noted.
6	Considered what conditions might be appropriate?	It is recommended that the approved GWMP is augmented following approval to include the installation of additional groundwater monitoring sites above the southern longwall area.	Additional observation points required

4. Other considerations

These considerations are not included in the assessment framework outlined within the AIP, however are discussed elsewhere in the document and are useful considerations when assessing a proposal.

Table 6: Has the proponent:

AIP Requirement		Proponent response	DPI Water Comment
1	Addressed how it will measure and monitor volumetric take? (page 4)		**Not described in Groundwater Assessment**
2	Outlined a reporting framework for volumetric take? (page 4)	Annual Report	Noted.

End Attachment B

NSW GOVERNMENT | Office of Environment & Heritage

DOC16/202661-3
DA 305-7-2003 MOD12

Ms Jessie Evans
Team Leader
Planning Services, Resource Assessment & Compliance
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Dear Ms Evans

RE: SOUTH WAMBO UNDERGROUND MINE MODIFICATION – ENVIRONMENTAL ASSESSMENT (DA 305-7-2003 MOD 12)

I refer to your email dated 26 April 2016 seeking comment on the above modification. The Office of Environment and Heritage (OEH) understands that this project is a modification to a nominal and residual Part 3A project (DA 305-7-2003) under the now-repealed Part 3A of the *Environmental Planning and Assessment Act 1979*.

OEH has undertaken a review of the relevant sections of the Environmental Assessment (EA) for the South Wambo underground Mine Development Consent Modification, prepared by Peabody Energy (dated April 2016). The review focused on possible impacts of the proposed changes on Aboriginal cultural heritage, and threatened biodiversity. The proponent is offering a biodiversity offset of 41.6 hectares to compensate the loss of 7.9 hectares of native vegetation using the 13 biodiversity offsetting principles. An assessment of the proposal with recommended conditions of consent are provided in **Attachment 1**.

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

Yours sincerely

13 MAY 2016

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

Enclosure: Attachment 1

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ATTACHMENT 1: REVIEW OF THE ENVIRONMENTAL ASSESSMENT FOR THE SOUTH WAMBO UNDERGROUND MINE MODIFICATION (DA 305-7-2003 MOD 12) WITH RECOMMENDED CONDITIONS OF APPROVAL

OEH has undertaken a review of the Environmental Assessment (EA) titled '*South Wambo Underground Mine Modification, Environmental assessment, for the Modification of DA 305-7-2003 (MOD 12) The Realignment and Extension/Relocation of the Approved South Wambo Underground Mine*', April 2016, prepared by Peabody Energy. The review of the EA was in relation to possible impacts of the proposed development on Aboriginal cultural heritage and threatened biodiversity. OEH's comments and recommended conditions of consent are provided below:

ABORIGINAL CULTURAL HERITAGE ASSESSMENT

OEH has reviewed the '*Cultural Heritage Impact Assessment, South Wambo Underground Mine Modification, Prepared by RPS East Pty Ltd, Prepared for Wambo Coal Pty Limited, March 2016*' and makes the following recommendations and comments with respect to Aboriginal cultural heritage.

The Cultural Heritage Impact Assessment (CHIA) addresses the potential impacts to Aboriginal cultural heritage, specifically Aboriginal sites that that are within the additional activity footprint for the modification to Development Consent (DA 305-7-2003) for the Wambo Coal Mine. The CHIA considers the archaeological context of the Modification Project Area, results from a search of the Aboriginal Heritage Information Management System (AHIMS) database, the development of a predictive model, comments from the Registered Aboriginal Parties (RAPs) regarding cultural heritage significance and the results of archaeological and cultural surveys of the Modification Project Area.

The CHIA notes that an application for an AHIP (or a variation to an existing consent) may be required for any Aboriginal sites that may be impacted by the proposed Modification that lie outside of the approved Consent 2222 boundary and the approved AHIP C0001474 boundary but within the Modification Project Area. OEH advises that a new AHIP application will be required for any Aboriginal sites that will be impacted by the proposed modification that are located outside the two current AHIP's, and that an AHIP Variation will not be possible. All sites within the existing Consent 2222 and AHIP C0001474 boundaries are to be managed consistent with the existing requirements of these consents. OEH concurs that all sites within existing consent are to be managed consistent those AHIP conditions. Searches of the AHIMS database indicated there are 35 registered AHIMS sites previously recorded within the Modification Project Area.

An archaeological investigation of the wider Study Area using archaeological pedestrian survey methods was undertaken over a period of eight days in October 2015 by RPS archaeologists with representatives from the RAPs. During the fieldwork a total of 83 previously unrecorded Aboriginal sites were identified within the Study Area, of which there were 52 previously unrecorded sites in the Modification Project Area. Including previously registered AHIMS sites and sites identified as a result of the survey, the total Aboriginal sites in the Modification Project Area is 87. The RAPs indicated during the consultation process that all Aboriginal sites and objects are of cultural significance and that confirmed and possible scarred tree sites, grinding grooves and grinding surfaces and earth mounds are of high cultural significance. The RAPs present during the field surveys recommended that artefact scatters and isolated finds not be moved/salvaged unless required. They considered that if any potential impacts to specific Aboriginal sites were likely, then those Aboriginal sites should be salvaged under an appropriate permit. OEH supports this management strategy.

OEH notes that the CHIA makes 11 recommendations, all of which are directly related to the management of Aboriginal cultural heritage, except for number 7 which relates to historic heritage. OEH supports all 10 recommendations proposed. OEH has no further concerns with respect to Aboriginal cultural heritage and the proposed development modification proceeding.

THREATENED BIODIVERSITY ASSESSMENT

OEH has reviewed the EA in relation likely impacts on threatened biodiversity by this project, particularly the flora (FloraSearch, 2016) and fauna (EcoLogical, 2016) assessment which were presented in Appendix D and E of the EA. OEH provided recommended input for Director Generals Requirements for this project in 2012. However, due to unforeseeable delays the Secretary's Environmental Assessment Requirements (SEARs) were not issued until 3 March 2016. Given the longevity of this consent, this modification has been assessed in accordance with OEH's principles for the use of biodiversity offsets in NSW (OEH, 2016).

According to the EA, the proposed development would clear about 7.9 hectares (ha) of native vegetation, of which 4.5 ha is derived native grassland. The proposed offset has an area of 41.6 ha, of which about 15.2 ha is derived native grassland. The vegetation communities are summarised in **Table 1**. There are no records of any threatened plant of animal in the development or offset areas. Of the threatened vegetation communities affected by the development the offset provides more than 20 times the area of Forest Red Gum Lowland forest Endangered Ecological Community than that affected and more than five times the area of Slaty Box Woodland Vulnerable Ecological Community than that in the development footprint. Overall the offset is more than five times the area of the impact area.

Table 1. Summary of vegetation communities in the proposed development footprint and offset site (based on date in the EA).

No.*	Vegetation Community (and)	TSC Act equivalent	Development Area (ha)	Offset Area (ha)
2	Forest Red Gum Lowland Forest	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions Endangered Ecological Community (EEC)	0.4	9.1
3	River Red Gum woodland	Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions EEC	0.2	0
6	Narrow-leaved Ironbark – Grey Box Woodland	Central Hunter Ironbark – Spotted Gum – Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions EEC	0	1.1
6a	Narrow-leaved Ironbark – Grey Box Woodland Derived Native Grassland	n/a	0	11.9
7	Bull Oak Grassy Woodland	n/a	1.8	0
10	*Melaleuca decora* Low Forest	n/a	0.1	0
11	Grey Box – Slaty Box Woodland	Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion Vulnerable Ecological Community (VEC)	0.9	5
13	Derived Native Grassland	n/a	4.5	14.5
	TOTAL		**7.9**	**41.6**
	TOTAL TSC Act-covered		1.5	15.2

* Vegetation Community Number as per Appendix 6 of the EA.

The proposed offset is adjacent to existing 'Habitat Management Areas' that have been established to mitigate the impacts of previously-issued consents for the Wambo Mining complex. Those existing Habitat Management Areas are in the process of being conserved under Conservation Agreements under Part 4, Division 12 of the *National Parks and Wildlife Act 1974*. The proponent is offering to also secure the offset for this proposed Modification under a Conservation Agreement.

The proposed offset was compared against the impact using the 13 biodiversity offsetting principles. OEH notes that while an exact like-for-like match is not provided for all threatened entities to be affected (i.e. Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions EEC), the offset package includes a much larger area of other affected threatened vegetation communities affected, that it contains habitat for the range of threatened species affected by the

proposed works, and that it is contiguous with a larger area of vegetated land that is also being managed for conservation. Therefore, OEH is satisfied that the proposed offset meets the 'like-for-like or better' requirement of Offset principle 6. OEH recommends that if this proposal is approved it includes the following conditions of consent provided below.

Recommended Conditions of Approval for Threatened Biodiversity:

1. That the proponent provide a biodiversity offset package as described in Appendix D (FloraSearch Pty Ltd) of the Environmental Assessment (Peabody Energy, 2016); and
2. That if any unexpected harm to threatened species, populations, or communities occurs due to unexpected mine subsidence that it is offset in accordance with OEH biodiversity offsetting policy.

References:

EcoLogical (2016) *Wambo Coal Mine – South Wambo Underground Mine Modification – Fauna Assessment. Prepared for Wambo Coal Pty Limited. 14 march 2016.* EcoLogical Australia Pty Ltd, Mudgee. http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5586

FloraSearch (2016) *South Wambo Underground Mine Modification – Flora Assessment. Prepared for Wambo Coal Pty Limited. March 2016.* FloraSearch, Orange. http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5586

RPS (2016) *Cultural Heritage Impact Assessment: South Wambo Underground Mine Modification. Prepared for Wambo Coal Pty Limited. March 2016.* RPS Australia East Pty Ltd, Broadmeadow. http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5586

OEH (2016) *OEH principles for the use of biodiversity offsets in NSW.* 18 April 2016. NSW Office of Environment and Heritage, Sydney. www.environment.nsw.gov.au/biodivoffsets/oehoffsetprincip.htm

Peabody Energy (2016) Wambo Coal Pty Limited. South Wambo Underground Mine Modification Environmental Assessment for the Modification of DA 305-7-2003 (MOD 12): The Realignment and Extension/Relocation of the Approved South Wambo Underground Mine. April 2016. Peabody Energy Australia Pty Limited, South Brisbane. http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5586

OEH – MAY 2016

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File No. EF15/19770
Our Ref. DOC16/195023

Mr Jessie Evans
Resource Assessments
Department of Planning and Environment
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SYDNEY NSW 2001

Dear Mr Evans

Re: Wambo (South) Mine PART 3A Modification 12 (DA 305-7-2003 MOD 12) .

The Heritage Division of the Office of the Environment & Heritage (OEH) as Delegate of the NSW Heritage Council received a letter on the 22 April 2016 referring the Wambo South Underground Mine Modifications Environmental Assessment (EA) (herein referred to as the 'Project') for comment. The following documents were reviewed by the Heritage Division in providing this comment:

- South Wambo Underground Mine Modification Environmental Assessment, prepared by Peabody Energy dated April 2016; and
- Appendix F: Cultural Heritage Impact Assessment South Wambo Underground Mine Modification, prepared by RPS dated March 2016.

Based on the above documentation the following comments and recommended conditions of approval are provided:

The Cultural Heritage Impact Assessment (CHIA) identifies two items of environmental heritage within the impact area for the proposed mine extension. This include a locally significant item referred to as the 'Abandoned Stony Creek Cottage Site', first identified by EJE Architecture in 2003 and not identified on the Heritage Schedule of the Singleton Local Environmental Plan (LEP). The second item is the 'Wambo Homestead' which is listed on the NSW State Heritage Register (SHR 00200).

The CHIA argues because the 'Abandoned Stony Creek Cottage Site' is of *'minor local significance it will not be further considered in the impact assessment'*. This argument is not supported by the Heritage Council. If an item has been assessed against the significance criteria and determined to retain local heritage significance, it should be managed according to that significance.

The CHIA states the Wambo Homestead (SHR #00200) is located 200m outside the proposed long-walls and current engineering advice predicts *'there would be no change in the currently approved subsidence parameters for the main homestead, and other buildings…as a result of the modification'* (MSEC 206:86). However the CHIA also states the predicted vertical subsidence for the mounting yard and horse boxes will be 30mm and 60mm respectively. Because these elements are timber framed MSEC considers they are unlikely to experience adverse impacts and on that basis the EA does not recommend any additional methods of mitigation are necessary for this item.

The CHIA also contains no assessment of whether the heritage values of the Wambo Homestead would be further affected by the subsidence stated by the MSEC report. It is recommended that the DPE require the CHIA and EA be revised to include advice of a suitably qualified heritage architect and structural engineer as outlined below to address the lack of this information. It is considered this is important in understanding the cumulative impact to the Wambo Homestead as a result of these increased subsidence levels.

The Heritage Council notes that the existing Conservation Management Plan prepared by GML Heritage dated 2013 has not been endorsed by the Heritage Council of NSW. This appears to be in contradiction

of existing conditions of approval issued under the *Heritage Act 1977*. Conservation Management Plans are considered a key document necessary for the long term management and conservation of items of the environmental heritage. The Heritage Council recommends a condition to address this continuing lack of a CMP under the current modification.

Prior to Approval of this Application, the Heritage Council recommends that the CHIA and EA be revised to include advice of a suitably qualified heritage architect and structural engineer to consider the existing state of the Wambo Homestead, the recent MSEC 2016 assessment and provide written advice to DPE to clarify what the additional subsidence may mean to the fabric of this state significant heritage item. This advice should also consider the existing and known impacts from the previously approved Wambo Longwall coal mining approvals. If necessary additional mitigation measures should be identified in this advice to DPE. Based on this response additional mitigation may be necessary for the Wambo Homestead as a result of the extension of the Wambo underground coal mine to the South of the existing approval zones.

The Heritage Council recommends two conditions be included in the Project Approval to address the above discussed matters:

i. The Applicant should include a statement of heritage impact for 'Abandoned Stony Creek Cottage Site' with advice on its existing structural condition and integrity and provisions to mitigate the harm of subsidence through the long wall extensions to this heritage item. This may involve stabilisation, recording and/or monitoring activities.

ii. The Applicant shall seek and obtain the endorsement of a Conservation Management Plan from the Heritage Council of NSW for 'Wambo Homestead' within a period of 12 months of the date of approval.

Should you have any queries, please contact Felicity Barry, Senior Archaeologist, at the Heritage Division, Office of Environment and Heritage on telephone (02) 9995 6914 or via email to Felicity.Barry@environment.nsw.gov.au.

Yours sincerely

Rajeev Maini
Acting Manager, Conservation
Heritage Division
Office of Environment and Heritage
AS DELEGATE OF THE NSW HERITAGE COUNCIL OF NSW
12 May 2016

Department of Industry
Resources & Energy

BN16/3628

Ms Jessie Evans
Team Leader
Planning Services - Resource Assessment & Compliance
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Email: jessie.evans@planning.nsw.gov.au

Dear Ms Evans

South Wambo Coal Mine – Mod 12 Project (DA 305-7-2003)
Review of Environmental Assessment

I refer to your email of 26 April 2016 regarding Wambo Coal Pty Ltd's (the Proponent) application for the South Wambo Underground Coal Mine modification in the Singleton Shire Council local government area.

NSW Department of Industry, Division of Resources & Energy (the Division) has reviewed the *South Wambo Underground Mine Modification Environmental Assessment* (EA) dated April 2016.

The following comments are directed at specific areas of the Division's responsibility for this proposal.

MINING TITLE
Under the *Mining Act 1992*, mining and rehabilitation are regulated by conditions included in the mining lease, including requirements for the submission of a Mining Operations Plan (MOP) prior to the commencement of operations, and subsequent Annual Environmental Management Reports (AEMR).

SUBSIDENCE
DRE's advice is relevant only to health and safety risks to people which may arise from subsidence caused by the extraction of the proposed modification to the approved South Wambo Mine.

The proposed modification comprises the re-orientation of a number of previously approved longwalls in the Arrowfield Seam and Woodlands Hill Seam and a new domain of longwalls in these seams.

Overall there will be an increase in the extent of subsidence due to the proposed modification however; the risk profile of the site will remain largely the same as that of the approved mine.

The aforementioned risks should be manageable during the Extraction Plan stage.

REHABILITATION

It is noted that the rehabilitation commitments within the MOD 12 EA references the Wambo Development Project EIS (2003) prepared in support of DA-305-7-2003, and accordingly are general in nature, and do not include detailed information.

The Division is unable to determine that sustainable rehabilitation outcomes can be achieved as a result of the project. Further information is required from the Proponent and should be addressed in the Response to Submissions. In summary, the additional information will need to include the following:

1. A description of vegetation communities to be achieved by rehabilitation;
2. Further detail in regards to final landform design, including the provision of drawings and cross-sections at an appropriate scale. Key questions to be addressed include:
    - How have similar landscape features and adjacent mining operation rehabilitation been integrated into the post-mining landform design?
    - Are there any significant geotechnical risks associated with the final voids that may compromise the ability to achieve success closure?
    - Will there be any stability issues associated with the final landform in regards to its ability of sustaining the intended final land use (e.g. grazing)?
3. Further detail on the proposed mine layout and scheduling (including open cut operations) with the objective of maximising opportunities for progressive rehabilitation of emplacements and tailings facilities. This should include mapping the proposed rehabilitation schedule against production milestones in order to provide clear means of assessing future compliance with the mining lease / MOD 12 EA in regards to progressive rehabilitation that is undertaken and;
4. Provide further information to justify the proposed final land form design as opposed to other alternatives considered (e.g. void backfilling, concave final slopes etc.).

Rehabilitation Objectives and Domains

Rehabilitation objectives are broad and rehabilitation objectives refer to the Wambo Development Project EIS (2003). The completion criteria are very preliminary in nature and will need to be refined as part of the MOP process under the mining lease to be specific, measurable, achievable, realistic and time bound (SMART). As noted above, further information is required in the criteria in regards to the target vegetation community type to be achieved.

Rehabilitation Methodology

Mine Design

Whilst the layout for the underground operations is provided in Figure 9 of the EA, the timing, other than commencement and completion dates for mining of seams (not for individual longwall panels) is not provided. The open cut operation involves the largest rehabilitation liability for the Wambo Coal activities. However, no detail regarding open cut mine operation or schedule is provided within the MOD 12 EA. Instead, the EIS refers to the MOP for more detail in regards to the rehabilitation scheduling for open cut operations. No detailed information is given regarding the management of tailings and associated rehabilitation schedule for particular tailings disposal facilities against key production schedules for each of the mining areas.

From a compliance point of view in regards to maximising progressive rehabilitation, it would be difficult to establish general compliance against the MOD 12 EA schedule should production/mining be delayed.

- It is noted that the MOD 12 EA refers to the development of a final landform based on the Wambo Development Project EIS (2003). However, the location of final voids has changed from what is shown in the Wambo Development Project EIS (2003) and the MOD 12 EA does not include a figure that identifies where the final void/s are proposed.
- The proposed maximum extraction rates are within the approved extraction limits.

Rehabilitation

- Rehabilitation methodologies for the proposed underground mine activities as described in the MOD 12 EA, whilst conceptual, are sufficiently detailed to demonstrate the case that sustainable rehabilitation can be achieved (with exception of landform design and tailings management as noted below).
- The document does not appropriately describe the functional domains of the project with regard to the open cut activities. Any reference to the Wambo Development Project EIS (2003) is not appropriate as the mining schedule and rehabilitation objectives have changed since the approval of that project.
- In general, other risks such as geochemical constraints, spontaneous combustion hazards, tailings management etc. have not been detailed in the MOD 12 EA other than to refer to the Wambo Development Project EIS (2003). In particular, issues related to the rehabilitation of the North East Tailings Dam have not been discussed, despite the delayed rehabilitation of this facility being an on-going liability to the rehabilitation of the Wambo Mine.

Conceptual Final Landform Design

- The MOD 12 EA refers to the Wambo Development Project EIS (2003) and lacks the level of specific detail to provide an adequate assessment as to whether the landform design presents a potential barrier or limitation to achieving a sustainable rehabilitation outcome.
- No post-mining landform drawing and cross-sections developed since the Wambo Development Project EIS (2003) are provided, so it is not possible to assess whether the final landform will be capable of supporting the intended final land use(s). MOD 12 EA commits to the development of a final land form design toward the end of the Wambo Mine's life. As the cessation of open cut operations is expected by 2020, the lack of final landform design is a key issue for the Division and it is a preference that it should be resolved as part of the modification.
- Whilst it is acknowledged that the final landform design may be significantly altered under a potential future open cut proposal associated with the adjacent United Collieries, the Division considers that a final landform design for the current operations needs to be developed in the event that any future projects do not proceed.

Options Analysis

- No options analysis beyond economic considerations is provided. The MOD 12 EA does compare underground mine surface impacts related to subsidence and portals and it is apparent that there is no analysis in regards to final void configuration/layout and shape (e.g. backfilling of void, partial backfilling of void; battering back slopes; highwall treatments etc.) as well as number of final voids or tailings facilities.

It is proposed to reduce the area of Agricultural Classes 4 and 5 available to grazing as a result of an increase in biodiversity offset areas. No analysis is given regarding the potential to improve the grazing potential of rehabilitated areas to offset the reduction in agricultural potential.

ASSESSMENT OF THE RESOURCE

While amendments to the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP) have removed the provision that made the economic significance of the resource the principle consideration when determining mining projects and require the Department to assess the significance of the resource, the Division considers that an analysis of the resource utilisation and its economics will assist the consent authority in considering the efficiency or otherwise of the development in terms of resource recovery.

This analysis concentrates on geological, mining and economic aspects of the project and the Division makes the following assessment:

Size, quality and availability of the resource

The Project is owned and operated by Wambo Coal Pty Ltd (the Proponent), a 100% owned subsidiary of Peabody Energy Australia Pty Ltd.

A range of open cut and underground mine operations have been conducted at Wambo since 1969. Mining of the South Wambo area (Arrowfield and Bowfield seams) was assessed as part of the Wambo Development Project and approved in 2004 under the Development Consent (DA 305-7-2003). No mining has occurred at South Wambo to date.

Following further mine planning for the approved South Wambo Underground Mine, which considered recent exploration results, the Proponent has identified a modified mine layout that can be mined more economically and efficiently than the approved mine design.

The Project will be an underground longwall coal mine which will operate as a new operation in the existing Wambo mine area. The life of the Project will be 16 years. Approval is being sought to extract coal at a rate of up to 10 million tonnes per annum (Mtpa) of run-of mine (ROM) coal that would produce over 6.5 Mtpa of product coal.

The Division has verified that the Project will provide approximately 108 million tonnes (Mt) of ROM coal and approximately 74 Mt of product coal. The Proponent has completed resource and reserve estimation for the Project in accordance with the Australasian Code for Reporting Exploration Results, Mineral Resources and Ore Reserves 2012 "the JORC Code".

A semi-soft coking coal and three thermal coal products are proposed meet export markets. Approximately 58% of product will meet the export thermal coal markets and the remaining 42% export metallurgical coal markets. Of exported thermal coal 94% will receive a premium to the established 6,322 kcal/kg GAR Newcastle benchmark on the basis of lower ash and/or higher specific energy specifications.

A review of available coal quality information suggests this target is achievable. Raw ash levels necessitate washing all coal to meet export market specifications. The Division considers that a total of 74 Mt of product (saleable) coal from the Project is feasible.

Over the life of the Project, assuming production is sold on the export thermal and metallurgical markets, the value of the coal produced would be worth around $7.3 billion in current dollars. The net present value of this revenue stream has been estimated by the Division at approximately $3.8 billion.

Export income is vital for the health of both the NSW and Australian economies contributing export income to the Nation's balance of trade thereby providing positive benefits to both the NSW and Australian credit rating.

The Hunter coalfield had sixteen mines that were producing coal as at December 2015, three are underground mines and thirteen are open cuts. Of the mines that operate in the Hunter coalfield, the Project producing at its maximum production rate of 10 Mtpa ROM would be the ninth largest coal mine and the largest producing underground mine in the region. If approved the Project would be ranked tenth out of the 42 producing NSW coal mines in 2015. The Project producing at its maximum ROM rate would be considered a medium to large sized mine when compared to other operating coal mines in NSW, i.e. the average size of currently operating coal mines in NSW in 2014-15 was around 5 Mtpa of ROM coal.

At full production the Project will generate 230 direct full time jobs, which would generate around 900 jobs in other mine and non-mine related industries throughout the State. During the initial construction stage around 250 jobs would be generated from the Project.

Resource Recovery

The approved South Wambo Mine (approved in 2004) planned underground extraction by longwall mining methods in the Arrowfield and Bowfield seams. The Project proposes the same extraction techniques but with a revised target stratigraphy of the Arrowfield and Woodlands Hill seams and a revised longwall layout. The Woodlands Hill seam is shallower and requires less pre-mining gas drainage than the Bowfield seam.

Longwall equipment from the existing Wambo underground operation will be utilised to extract Woodlands Hill coal and a new longwall will be used to extract Arrowfield seam coal. Proposed working sections for both target seams seek to maximise resource recovery with due consideration for product quality and equipment limitations.

The Project will not materially sterilise coal resources amenable to extraction by underground or open cut mining methods. The Bowfield seam is deeper than the proposed target seams and may be considered in future mining proposals along with other deeper coal seams. Shallower coal seams in the Project area are not considered viable targets for extraction due to previous extraction (Whybrow, Wambo) or insufficient working thicknesses, poor coal product or geotechnical constraints (Redbank Creek, Whynot, Blakefield and Glen Munro seams).

A large number of factors constrain extraction of resources proposed in the Project mine plan and methodology. These include geological constraints, potential subsidence of sensitive features such as Endangered Ecological Communities, Wambo Creek and various heritage listings. Given the constraints outlined in the proponent's EA, the Division considers the Project mine plan for underground operations to adequately recover the resource.

Coal Royalty

The Project is a proposed underground mine and as such a royalty rate of 7.2% applies to production at less than 400m in depth, and 6.2% applies to production above 400m in depth. The royalty rates are applicable to the net disposal value. Net disposal value is the price received per tonne minus any allowable deductions. The main allowable deduction is for coal beneficiation which is either; $3.50 per tonne for coal subjected to a full washing cycle, or $2.00 per tonne for coal subjected to a simple washing process, or $0.50 per tonne for coal that is washed and screened. As all product coal from the Project will be subjected to a full washing cycle, a deduction of $3.50 per tonne from the value of coal produced applies. A deduction for levies also applies which would amount to no more than $1.00 per tonne. Hence allowable deductions for royalty for the Project would amount to $4.50 per tonne.

One of the most important assumptions in the calculation of future royalty for a coal proposal is the estimate of a future coal price over the life of a project. Coal from the Project is expected to be sold into the export thermal and metallurgical markets.

The current NSW average export thermal coal price is currently A$74 per tonne. It is possible that the export thermal coal price could drop further over the next four years, before rising from 2020 onwards.

Coal price forecasting is inherently difficult and over the long term time frame of the Project there will be many variations in coal prices. However, there is a growing consensus in the coal industry that coal prices will improve in the medium to long term over the current five year lows. For its royalty calculation, the Division uses the current low short term coal prices, and medium to long term export thermal prices (in real terms) in the range of A$80 to $A100 per tonne.

Another important aspect of future royalty calculation for a proposed coal project is estimation of future annual production. The Division has estimated that if the Project is approved, around 74 Mtpa of product coal would be able to be economically mined from the Project area from 2017 to 2032.

Using the above parameters the Division has calculated that in a typical full production year the State will receive around $40 million per annum in royalty and $490 million over the life of the Project. The net present value of this royalty stream would be $257 million using a 7% real discount rate.

DRAFT RECOMMENDED CONDITIONS OF APPROVAL

If the Project is granted development approval, the Division recommends that the following conditions be incorporated into the Development Consent, if granted:

Rehabilitation Plan

1. The proponent must prepare and implement a Rehabilitation Plan to the satisfaction of the Secretary of the Department of Industry, Skills and Regional Development. The Rehabilitation Plan must:
    a. be prepared in accordance with the Division's guidelines;
    b. be submitted and approved by the Secretary of the Department of Industry, Skills and Regional Development prior to the commencement of activities;
    c. address all aspects of rehabilitation and mine closure, including post mining land use assessment, rehabilitation objectives, completion criteria and rehabilitation monitoring.
    d. include a final landform design that is consistent with the surrounding topography of the area and considers natural drainage design and relief patterns and principles.

Note: The approved Mining Operation Plan (which will become the REMP once the Mining Act Amendments have commenced), required as a condition of the Mining Lease(s) issued in relation to this project, will satisfy the requirements of this condition for a Rehabilitation Plan.

Overall, the Division supports the South Wambo Underground Coal Mine Modification (the Project) as a responsible utilisation of the State's coal resources that will continue to bring economic benefits to the local region and the State as a whole.

Should you have any enquires regarding this matter please contact Bryan Whitlock, Acting Manager Royalties & Advisory Services on (02) 9842 8575.

Yours sincerely

K Hargreaves

Kylie Hargreaves
Deputy Secretary
Resources & Energy

31 MAY 2016

DOC16/235848; EF13/3816

Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Attention: Ms Jessie Evans

Environmental Assessment
South Wambo Underground Mine Modification (DA 305-7-2003 MOD 12)

I refer to your email to the Environment Protection Authority (EPA), dated 26 April 2016, seeking the EPA's comments in relation to the Wambo Coal Pty Limited modification application for the Wambo Coal Mine, reference DA 305-7-2003 MOD 12 (the project).

The project is detailed in the report titled '*South Wambo Underground Mine Modification – Environmental Assessment*' (EA), dated April 2016 and prepared by Resource Strategies Pty Ltd. The proposal generally involves the following:

- Changes to the approved South Wambo Underground Mine longwall panels and layout;
- Underground mining of the Woodlands Hill Seam;
- Extension to the life of mine for the underground operations up to and including 2032;
- Extension to the life of mine for the open cut operations up to and including 2020; and
- Increasing underground run-of-mine coal production from 7.5 million tonnes per annum (Mtpa) to 9.75 Mtpa, with no change to the total site approved run-of-mine coal production rate of 14.7 Mtpa.

The EPA has reviewed the EA and determined that while the proposal is unlikely to result in significant impacts in relation to air quality or water management at the site above those already approved for the current operations, there may be noise impacts associated with the drilling, construction and operation of the surface ventilation shafts.

The EA details that the ventilation shaft construction activities would occur 24 hours per day, seven days a week for up to 12 weeks. A number of noise attenuation or mitigation measures are proposed, including potentially enclosing the drilling activities or erection of noise barriers. The proponent states that given the construction works are to be undertaken within an operational mine site application of the 'Interim Construction Noise Guideline' (ICNG), dated 2009, is not appropriate, and that current operational noise limits for the mine premises apply.

Appendix H of the EA is a report titled '*South Wambo Underground Mine Modification Noise Review*' (NIA), dated 18 March 2016 and prepared by SLR Consulting Australia Pty Ltd. Figure B1 in Appendix B of the NIA shows the location of private residences in the area surrounding the mine. There is a private residence identified in the Warkworth area, in close proximity to monitoring location N03. This residence appears to be the residence referred to as '19A & B – Kelly' within the acquisition table (Table 1 of Schedule 4) of the consolidated consent DA 305-7-2003.

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Location 19 is shown in Appendix B1 of the report '*Wambo Development Project – Construction, Operation and Transportation – Noise and Blasting Impact Assessment*' dated 23 June 2003 and prepared by Richard Heggie Associates Pty Ltd, which is included as Appendix A to the report '*Wambo Development Project Environmental Impact Statement*', dated July 2003.

Residence 19 A & B does not appear to be included in the ventilation system intrusive and amenity noise level assessment detailed within the noise impact assessment. The EPA believes this may be due to residence 19 A & B having acquisition rights at that property, however this is not specifically stated in the noise impact assessment.

Noting that residence 19 A & B is not listed in the noise limits at condition L4.1 of Environment Protection Licence (EPL) 529, the EPA's position is that an adopted noise limit of 35 dB(A) applies at that location during both the construction and operation of the ventilation shafts and all other activities associated with the premises.

The EPA's position is that the noise limits on EPL 529 will apply to the project, including the construction and operation of the ventilation shafts. Where privately owned residence are not listed at condition L4.1 of EPL 529, the limit of 35dB(A) $L_{Aeq\ (15\ minute)}$ will apply during all periods.

The EPA also recommends that the proponent is required to adopt the mitigation measures proposed in the EA in relation to ventilation shaft construction. The EPA suggests that the proponent also have a complaints management protocol that includes strategies such as regular community notifications and provision of respite periods for residents during construction if complaints are received.

If the project is approved the EPA is satisfied that the project can operate under the current conditions of EPL 529. As such the EPA does not have any recommended conditions of approval to provide for this application.

If you require any further information regarding this matter please contact Michael Howat on 4908 6819.

Yours sincerely

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KAREN MARLER
Head Regional Operations Unit - Hunter

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