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BOGGABRI COAL MINE MODIFICATION 9 TO SSD 09_0182

SUBMISSIONS REPORT

for Boggabri Coal Operations Pty Ltd

23 December 2022

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1. INTRODUCTION

1.1 BACKGROUND

Boggabri Coal Operations Pty Limited (BCOPL) operates the Boggabri Coal Mine (BCM) on behalf of Idemitsu Australia (IA) and its joint venture partners. BCM is owned by the following joint venture partners:

- IA via its subsidiary company, Boggabri Coal Pty Ltd (BCPL) – 80%;
- Chugoku Electric Power Australia Resources Pty Ltd – 10%; and
- NS Boggabri Pty Limited – 10%.

BCM is located approximately 15 km north-east of the township of Boggabri in the North West Region of New South Wales (NSW) and is located wholly within the Narrabri Local Government Area (LGA). BCM is part of the Boggabri, Tarrawonga, Maules Creek Coal Mining Complex (BTM Complex) and is immediately adjacent to the Tarrawonga Coal Mine (TCM) to the south and Maules Creek Coal Mine (MCCM) to the north (see **Figure 1**). TCM is operated by Tarrawonga Coal Pty Limited (TCPL). MCCM is operated by Maules Creek Coal Pty Limited (MCCPL). Both TCPL and MCCPL are subsidiaries of Whitehaven Coal Limited (Whitehaven Coal).

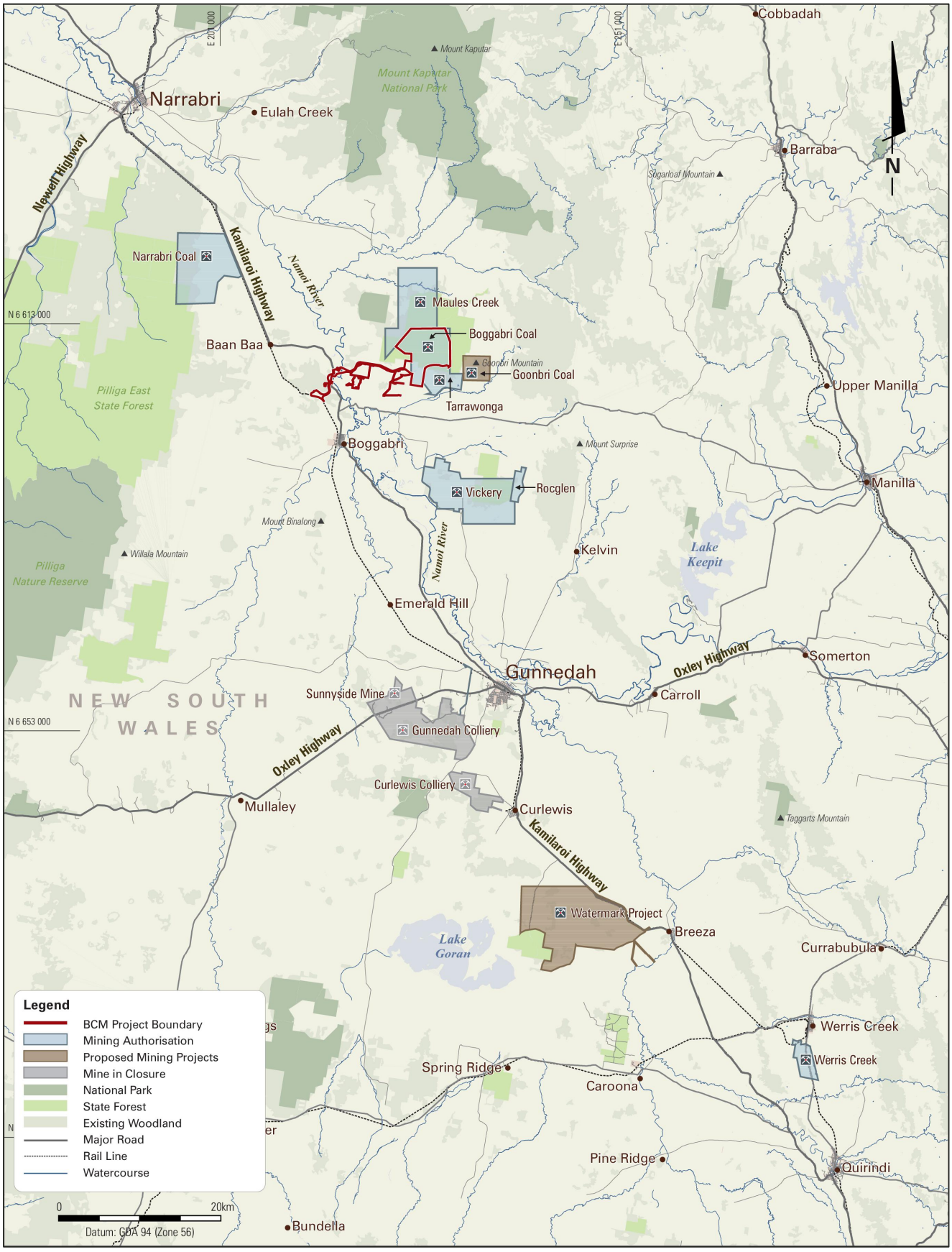
BCM is an open cut coal mining operation which has operated since 2006. BCM operates in accordance with State Significant Development Approval (SSD) 09_0182 which was originally granted under the former Part 3A of the Environmental Planning & Assessment Act 1979 (EP&A Act) on 18 July 2012. SSD 09_0182 permits the production up to 8.6 Million tonnes per annum (Mtpa) of Run of Mine (ROM) coal from site until the end of 2033.

BCOPL is seeking to modify SSD 09_0182 via an application made under Section 4.55 of the EP&A Act to facilitate the operation of a mobile rock crushing facility and associated fleet within the approved Mine Disturbance Boundary at BCM; the construction and use of a new Pre-Shift Information (PSI) Site at a location closer to active mining operations and access to the new site via a section of the former Leard Forest Road (which has previously been closed to the public); and minor administrative changes to conditions of SSD 09_0182 relating to the management of rehabilitation activities to align requirements with recent amendments to the Mining Regulation 2016 (MOD 9).

The Modification Application and supporting 'Boggabri Coal Mine Modification 9 to SSD 09_0182 Modification Report' (Modification Report) (JBA, 2022) were submitted to the NSW Department of Planning and Environment (DPE) for assessment on 21 October 2022. DPE requested further information to be included in the Modification Report on 1 November 2022. The Modification Report was subsequently updated to address the additional information requested by DPE and was resubmitted on 9 November 2022. DPE subsequently confirmed that the additional information was adequate and placed the Modification Report on public exhibition between 15 and 28 November 2022.

During public exhibition of the Modification Report, a total of six submissions were received from government agencies. No submissions were received from members of the public.

This Submissions Report has been prepared to respond to government agency queries raised during the exhibition period. This Submissions Report has generally been prepared in accordance with *State Significant Development Guidelines – Preparing a Submissions Report* (SSD Submissions Guidelines) (DPIE, July 2021).



JBA 2167 MOD 8 APPROVALS - F 01 REGIONAL LOCALITY (5/09/2022)

BOGGABRI COAL MINE

Regional Locality

FIGURE 1

1.2 DOCUMENT PURPOSE

This Submissions Report has been prepared by James Bailey & Associates (JBA) on behalf of BCOPL to support MOD 9 to SSD 09_0182 under Section 4.55 of the EP&A Act. The document responds to the issues raised in submissions by stakeholders during the public exhibition period for MOD 9.

1.3 DOCUMENT STRUCTURE

This Submissions Report is structured as follows:

- **Section 2** includes an analysis of the submissions received from stakeholders;
- **Section 3** provides comprehensive responses to the issues raised by Government Agencies;
- **Section 4** provides an updated modification justification, including evaluation of the merits;
- **Section 5** provides a revised management and monitoring summary;
- **Section 6** outlines all referenced materials relevant to this Submissions Report; and
- **Section 7** lists the abbreviations utilised in this Submissions Report.

Appendix A provides a register identifying the stakeholders who made submissions on MOD 9 and the issue(s) raised by each stakeholder. A response to each issue is provided in **Section 3** where relevant.

Technical specialists involved in the preparation of the Modification Report have provided additional expert advice which has been utilised during the preparation of this Submissions Report. Further, BCOPL has provided additional information and responses to key stakeholder issues, wherever practicable.

2. ANALYSIS OF SUBMISSIONS

This section provides an analysis and summary of the stakeholder submissions pertaining to MOD 9.

2.1 REGULATORY SUBMISSIONS

A total of five government agencies made submissions in relation to MOD 9 as per the list below:

- Narrabri Shire Council (NSC);
- Environment Protection Authority (EPA);
- NSW Resources Regulator (Resources Regulator);
- DPE – Crown Lands Division (DPE-CL); and
- Biodiversity, Conservation & Science Directorate of the DPE (BCS).

There were no government agencies who objected to MOD 9. Submissions generally commented on the proposed components of the Modification, seeking clarification and/or additional information or they have recommended approval conditioning to meet their requirements. A response to each submission received from Regulatory Authorities is provided in detail in **Section 3**.

2.2 OTHER SUBMISSIONS

There was a single submission from the Forestry Corporation of NSW, whom is the land manager of the Leard State Forest. The BCM is partly located within the southern portion of the Leard State Forest. The Forestry Corporation of NSW raised concern in relation to the use of gravels as part of the mining process. A response to the Forestry Corporation of NSW submission is provided in **Section 3**.

3. RESPONSE TO SUBMISSIONS

This section responds to the five submissions received from government agencies as well as the submission from Forestry Corporation of NSW as requested by DPE. No government agency has objected to MOD 9. Submissions have either provided comments seeking clarification or additional information or have recommended approval conditioning to meet their requirements.

A response to each of the matters raised by the relevant government agency in their submissions to MOD 9 is provided below. A copy of the original submissions can be found on the DPE Major Projects website.

3.1 NARRABRI SHIRE COUNCIL

3.1.1 Mobile Rock Crushing Plant

Air Quality & Noise Impacts

NSCs submission raised the potential for the mobile rock crushing plant to result in create significant off-site impacts (noise and air quality) and that this is based on the types of machinery to be used.

Sections 6.1 and 6.2 of the Modification Report detail the air quality and noise impact assessments which were completed in respect of the Modification. These assessments considered the potential impacts of the equipment which will be required to operate the mobile rock crushing plant. The assessments confirmed that the air quality and noise impacts from the operation of the mobile rock crushing plant would be negligible in relation to the more extensive approved mining operations and would not result in exceedances of the relevant criteria for the BCM.

Leard Forest Road

NSC commented that there should be no increase in vehicular traffic on the public sections of the Leard Forest Road as a result of the Modification.

As described within Section 3.1.2 of the Modification Report:

> "*Access to the PSI Site will be via the existing BCM Access Road, the southern portion of the former Leard Forest Road and some additional internal access roads within the approved Mine Disturbance Boundary*".

There is no intention to increase vehicular traffic on the public sections of the Leard Forest Road as a result of the Modification. As described within the Traffic Management Plan (BCOPL, 2022), the main access to the site will continue to be via the Kamilaroi Highway Access Roads and the Mine Access Road. However, some employees (only with the permission of the BCOPL Mine Manager) can utilise the southern portion of Leard Forest Road. This enables local residents to access the mine from the East.

Road Signage on Former Leard Forest Road

NSC sought clarification over a statement provided in Appendix D of the Modification Report over the proposed installation of wildlife signs on sections of the Former Leard Forest Road.

BCOPL confirms that these signs are only proposed to be installed on sections of the Former Leard Forest Road which has previously been closed to the public. The purpose of these signs is to mitigate the potential for animal interactions with road users travelling to and from the new PSI Site via the Former (i.e. closed section of) Leard Forest Road.

3.1.2 Pre-Shift Start Up Infrastructure

NSC's submission raised that BCOPL will require an approval under Section 68 of the *Local Government Act 1993* for the proposed wastewater treatment system for the PSI Site and that the application for this approval will need to be supported by an Onsite Wastewater Management Plan which has been completed by a suitably qualified person.

BCOPL will liaise with NSC in relation to the application for an approval under Section 68 of the *Local Government Act 1993* to ensure its requirements are satisfied.

3.1.3 Administrative Changes to SSD 09_0182

NSC did not raise any issues in relation to the proposed administrative changes to SSD 09_0182.

3.2 ENVIRONMENT PROTECTION AUTHORITY

The submission from the EPA noted the findings from the noise and air quality assessments and commented that based on the information provided, a variation to EPL 12407 was not required.

3.3 DEPARTMENT OF REGIONAL NSW – RESOURCES REGULATOR

The submission from the Department of Regional NSW – Resources Regulator (Resources Regulator) requested a further clause (regarding the integration of rehabilitation with Tarrawonga Coal Mine) to be included within the proposed clause for the Rehabilitation Strategy as detailed within Section 3.1.3 of the Modification Report.

BCOPL would accept a condition which requires the Rehabilitation Strategy to detail how rehabilitation will be integrated with the neighbouring Tarrawonga Coal Mine. The underlined wording below illustrates the additions to the proposed condition for the Rehabilitation Strategy to address the Resources Regulator's comment:

> *"Rehabilitation Strategy*
>
> *The Proponent must prepare a Rehabilitation Strategy for the development, to the satisfaction of the Secretary. This strategy must:*
>
> *(a) be prepared by a suitably qualified and experienced person(s) whose appointment has been endorsed by the Secretary;*
>
> *(b) be prepared in consultation with RR, Forestry Corporation of NSW, BCD, DPE Water, North West Local Land Services, Council and the CCC;*
>
> *(c) be submitted to the Secretary for approval by 31 June 2023, or as otherwise agreed by the Secretary;*
>
> *(d) build upon the Rehabilitation Objectives in Table 16 and proposed Rehabilitation Strategy in the EA, describe the overall rehabilitation outcomes for the site, and address all aspects of rehabilitation including mine closure, final landform, post-mining land use/s and water management;*
>
> *(e) align with the strategic rehabilitation and mine closure objectives and address the principles of the Strategic Framework for Mine Closure (ANZMEC and MCA, 2000), or its latest version;*
>
> *(f) describe how the rehabilitation measures would be integrated with the measures in the Biodiversity Management Plan required under condition 49;*
>
> *(g) describe how rehabilitation will be integrated with the mine planning process, including a plan to address premature or temporary mine closure;*

(h) include details of:

i. target vegetation communities and species to be established within the proposed revegetation areas, including habitat for threatened fauna; and

ii. the design of the surface water drainage network on the final landform; and

iii. the measures in place to enable the development of an integrated final landform with the neighbouring Tarrawonga Coal Mine;

(i) investigate opportunities to refine and improve the final landform over time;

(j) include a post-mining land use strategy to investigate and facilitate post-mining beneficial land uses for the site, that:

i. align with regional and local strategic land use planning objectives and outcomes;

ii. support a sustainable future for the local community;

iii. utilise existing mining infrastructure, where practicable; and

iv. avoid disturbing self-sustaining native ecosystems, where practicable;

(k) include a stakeholder engagement plan to guide rehabilitation and mine closure planning processes and outcomes;

(l) investigate ways to minimise adverse socio-economic effects associated with rehabilitation and mine closure; and

(m) include a program to report on the outcomes of the investigations required under this condition and review and update this strategy at least every five years.

The Proponent must implement the approved Rehabilitation Strategy as approved from time to time by the Secretary."

It is important to note that BCOPL has completed its overburden emplacement and rehabilitation obligations under the Common Boundary Integrated Management Plan (CBIMP) dated August 2015 which was developed and is being implemented by BCOPL and Tarrawonga Coal Pty Limited. BCOPL has subsequently transferred sections of the BCM Coal Lease (CL) 368 to Tarrawonga Coal Pty Limited to enable it to complete the final rehabilitation and shaping activities within this common boundary area. Accordingly, it should be recognised by Government authorities that the integration of the final landform design will be implemented by Tarrawonga Coal Mine as its mining operations progress through this area.

3.4 DPE – CROWN LANDS DIVISION

The submission from the DPE – Crown Lands Division did not raise any comments in relation to the Modification.

3.5 BIODIVERSITY, CONSERVATION & SCIENCE DIRECTORATE

The Biodiversity, Conservation and Science Directorate (BCSD) has raised several concerns related to the proposed use of the Former Leard Forest Road to access the new PSI Site and the potential for significant impacts to fauna. WSP has prepared a response to BCSD's concerns. A copy of the WSP letter report is provided in **Appendix B,** with a summary provided in the following sections.

3.5.1 Revaluate Significance of Impacts to Fauna from Traffic Increase

BCSD disagrees that the increase of 200 vehicles per day on the former Leard Forest Road will be small and incremental when considering the resulting potential impacts to fauna within Leard State Forest and has requested a revaluation of these impacts.

Traffic volume is an important contributor to the impacts of roads and traffic on wildlife (Bond and Jones, 2008). Definitive data on the potential impact of traffic volume on fauna in NSW are lacking.

WSP continues to consider that whilst the inclusion of an additional 200 vehicles per day on the section of former Leard Forest Road (which is currently intermittently used by BCOPL workers) will result in some additional impacts as a result of wildlife-vehicle collision (WVC), it is unlikely to result in a significant impact on fauna populations within the Leard State Forest. This is particularly the case with the proposed mitigation and management measures to be applied throughout the life of operations.

Whilst there is no conclusive NSW related data, information from various other sources indicates that significant impacts to fauna can occur when both traffic volumes are much greater than those proposed for the MOD 9 scenario (i.e. an additional 200 vehicle movements per day). Seiler and Helldin (2006) modelled this interaction between traffic volumes and WVC resulting in animal death and found that more than 2,000 vehicles per day would be required before a significant impact is caused. Further, the German Federal Agency for Nature Conservation classified roads with less than 1,000 vehicles per day as being 'areas unfragmented by traffic' and thus important for biodiversity conservation purposes (Selva et al., 2015).

The significance of the proposal road movements on the local wildlife is further reduced by the fact the Leard Forest Road is an existing road that currently contains occasional traffic movements. Additionally, this section of Leard Forest Road has been a publicly accessible road with regular traffic movements with speeds up to 80 km/hr only a few years ago. These existing factors of pre-existing impacts on local wildlife and existing habitat values are directly relevant when considering the significance of the impacts.

Given the proposed intermittent low traffic volumes, the controlled low speed limit (50 km/hr which has now proposed to be reduced to 40 km/hr) and a combination of other mitigating measures proposed to be implemented (as further discussed in **Section 3.5.2**), the assessment of impacts on fauna provided within Appendix D of the Modification Report was found by WSP following its revaluation to be suitably conservative and reasonable.

3.5.2 Revise Determinations for Impact Assessments and Devise Additional Mitigation & Management

WSP has considered the comments provided by the BCSD in relation to the mitigating factors which will minimise the impact of the use of the former Leard Forest Road on fauna. WSPs responses to the BCSD's comments are summarised within **Table 1**.

Table 1 Response to BCSD Comments Over Factors Influencing WVC

Factors Identified to Decrease Potential WVC	BCSD Comment	WSP Response to BCSD Comment
The short duration over which a small incremental increase in light vehicle movements will be experienced	*The time period, in which the daily 200 vehicle volume of traffic proposed to utilise Leard State Forest Road, is:* • *"Morning shift - between around 5:30 am and 6:30 am* • *Evening shift - between around 5:30 pm and 6:30 pm"* *In Summer and Spring, the proposed morning shift timing will likely coincide with the period when diurnal fauna are at their most active i.e. foraging and moving through habitat, prior to the warmer parts of the day when activity lessens.* *This includes the following taxa:* • *woodland birds,* • *macropods,* • *reptiles; and* • *other diurnal terrestrial mammals including echidna, yellow-footed antechinus etc.* *In Winter and Autumn, the proposed morning and evening shift timing will likely coincide with the period when crepuscular fauna are at their most active i.e. foraging and moving through habitat during dawn and dusk.* *This includes the following taxa:* • *the koala,* • *large terrestrial marsupials including quolls and wombats,* • *small terrestrial marsupial rodents and dasyurids, including dunnarts,* • *arboreal possums and gliders,* • *nocturnal reptiles, including the pale-headed snake,* • *owls,* • *megabats and microbats; and* • *amphibians*	BCS assertions around the time of traffic movement in relation to diurnal and crepuscular fauna movements, demonstrate that only some species active during the period of traffic movement are likely to be impacted and these impacts will be seasonally restricted to intermittent period throughout the year. For some of the taxa listed by BCS, the suggested activity is also likely to be overstated (eg reptiles are unlikely to be active during summer traffic movements). Despite the period of traffic movements coincided with some species activity, the short duration of these movements (~1 hr) will still provide periods of key diurnal and crepuscular fauna activity outside of the traffic movements. Given the seasonally intermittent nature of the period of proposed activity coinciding with a period of likely fauna activity and the short window of duration traffic movement, it is still considered a mitigating factor in reducing the risk of fauna collision.

Factors Identified to Decrease Potential WVC	BCSD Comment	WSP Response to BCSD Comment
	Given the above, BCS do not consider the duration over which a large increase in traffic is expected to occur to be a mitigating factor in reducing the potential for wildlife collision.	
Low traffic volumes outside the two shift change over periods	*It is agreed that there may be lesser traffic outside of shift change periods. However, the proposal will still result in an increase of traffic in-between shift change periods, when compared to the current traffic using Leard State Forest Road.* *In addition, as stated above, the in-between shift change period is likely to coincide when fauna activity reduces.*	The majority of the proposed road use (22 hrs or 91%) will be at low traffic volumes not significantly different to current use and less than historical activity (~5 years) when the road was publicly accessible. The proposed low traffic volumes for the majority of the daily road use is a relevant mitigation measure to prevent wildlife collision.
Leard Forest Road occurring at grade	*It is unclear how this relates to the potential for fauna to cross Leard State Forest Road. Further clarification should be provided.*	The formation of the road influences the ease with which animals can get onto and get off the road surface. Roads on fill or in cuttings are harder for animals to get onto, and more importantly, harder for them to exit when faced with oncoming vehicles. The former Leard Forest Road is at-grade, which means they can quickly escape from the road surface if they encounter a vehicle.
The relatively short distance (~25 m at widest point) between remnant vegetation that borders the immediate road boundary	*The adjacency of vegetation to the roads edge is also likely to decrease the amount of visibility drivers have to detect and avoid fauna attempting to cross Leard State Forest Road.* *Given the above, BCS do not consider the distance between remnant vegetation to be a mitigating factor in reducing the potential for wildlife collision.*	The gap size is an important factor in influencing the rate of crossing by wildlife. Woodlands are naturally patchy, and most woodland species are capable of gap-crossing, with species-specific thresholds in gap-size. Radiotracking studies of small woodland birds (e.g. Brown treecreeper, White-throated treecreeper, Eastern Yellow Robin, Fuscous Honeyeater, White-plumed Honeyeater) found that the mean size of gaps between trees that they crossed was 77 m, with maximums up to 230 m. The potentially gap sensitive Squirrel Glider, have been found to cross 50 -75 m clearing (van der Ree et al. 2003), while the remaining likely fauna species within the Leard State Forest are considered to be mobile and/or uninhibited by the 25 m clearing. The 25 m gap of Leard Forest Road is therefore not a physical barrier to movement of key species of woodland birds, mammals or any likely fauna utilizing the surrounding habitats. Furthermore, the barrier effect of a 25 m clearing is minimised even more by the retention of canopy cover above the road.

Factors Identified to Decrease Potential WVC	BCSD Comment	WSP Response to BCSD Comment
		The BCS concern of increased risk of WVC due to the inability of drivers to detect wildlife and respond accordingly is significantly mitigated by the existing nature of the road alignment generally forming a linear straight <1km in length, providing clear line of site and viability for driver collision avoidance. When combined with the proposed speed restrictions of <50 km/hr the minimum road width and surrounding vegetation is a clear mitigation of the proposal's potential for WVC.
Any road upgrades being limited to the existing road corridor (no additional vegetation clearing is proposed)	*It is agreed that avoiding vegetation clearing will lessen the impact of MOD 9.*	N/A
Canopy connectivity that provides gliding passage a cross the former Leard Forest Road.	*It is agreed that the canopy connectivity across Leard State Forest Road may potentially benefit gliders.* *However, this relies on the assumption that the perceived risk of gliding over a trafficked road is considered acceptable by relevant fauna. Further discussion, with reference to peer-reviewed literature, should be provided to support this determination.*	A study of the occurrence of Squirrel Gliders in isolated paddock trees found that they occurred in trees up to 75 m from the nearest road reserve and with most detections up to about 50 m away. These thresholds represent the absolute maximum and typical maximum distance that gliders will traverse across clearings (van der Ree et al. 2003). Glide distance is dependent on the launch height and the size of the glider (including body weight and size of the gliding membrane) (Jackson 1999). Tree heights and glider sizes at Boggabri are similar to the northern plains of Victoria for these thresholds to apply. Therefore, the gap size at Boggabri (<25 m) is well within the glide capability of Squirrel Gliders and the increased use of Leard Forest Road will not impact the movement of Squirrel Gliders. In addition, gliders are active throughout much of the night (van der Ree, R, unpub data), and thus the lack of vehicles during most of the night significantly reduces the risk of collision. Furthermore, slow speeds and low numbers of vehicles at dawn and dusk at times of the year when the movement of staff overlaps with crepuscular species is highly unlikely to have a significant impact on Squirrel Gliders. Squirrel Gliders also frequently cross high-volume and high-speed roads, such as the Hume Freeway in northern Victoria. Indeed, the rate of crossing of low-volume 'country' roads with connected canopy was similar to the rate of crossing of the Hume Freeway with >5,000 VPD and speeds up to 110km/hr (van der Ree et al. 2010). In other words, traffic volume did not appear to influence crossing rates, the size of the gap was more important.

3.5.3 Further Avoidance and Mitigation Measures

BCSD considers that the mitigation measures provided by BCOPL within the Modification Report will likely be insufficient to decrease the potential for significant wildlife strikes to occur. BCSD recommended that the proponent consider further mitigation options to reduce fauna collision risk or alternatively to consider other access options to the mine site for staff.

Whilst BCSD's comments were on the basis that significant WVC would occur as a result of the additional traffic movements, which is

BCOPL has considered the BCSDs recommendation and will commit to the following additional mitigation measures to further avoid and mitigate impacts:

- Reducing the suggested vehicle speed in vegetated roadsides from 50 to 40 km/hr;
- Incorporate speed bumps/or similar road design device within the existing road disturbance areas at the beginning of the Leard State Forest to reduce vehicle speeds;
- Undertake road maintenance to keep dust levels down;
- Policing of speed limits with speed camera / detection devices; and
- Systematic monitoring of roadkill.

The systematic monitoring and incidental reports from workers will be used to determine if there are any roadkill hotspots and the species, timing and location of such hotspots.

If roadkill hotspots are detected and continue to be a common trend, BCOPL will investigate further measures to avoid and minimise the occurrence of WVC. This may include measures such as (but not limited to) offering a temporary shuttle bus service between the existing MIA and the new facilities to minimise the vehicle movements during the identified periods for fauna movement.

3.5.4 MOD 8 & MOD 9 Impacts to Fauna

The BCSD has previously raised concerns over the vegetation to the south of the former Leard Forest Road which is proposed to support the Fauna Movement Crossing over the existing haul road is already disconnected from the vegetation within the Leard State Forest. BCSD has commented that the inclusion of additional traffic on the former Leard Forest Road will further detract from the viability of the proposed Fauna Movement Crossing over the BCM Haul Road.

A central aim of the BCM Biodiversity Offset Strategy (BOS) (WSP, 2018) is the restoration and establishment of a network of regional and local wildlife corridors that provide linkages between important large, isolated remnants within the region; specifically connecting the Namoi River floodplain with the Nandewar Range. The integration of BCMs mine rehabilitation as part of the Regional East-West Wildlife Corridor is a requirement of SSD 09_0182 and the Leard Forest Regional Strategy (Umwelt, 2017). MOD 8 is key component in improving this connectivity and mitigating potential wildlife impacts as a result of the BCM operations.

BCSs concerns around the combination of MOD 8 and MOD 9 creating 'large and on-going impacts to Leard State Forest biodiversity' is confusing and overstated. MOD 8 includes a proposal for the establishment of a fauna crossing structure, mitigating the impacts of the current mining operations (specifically the BCM haul road, which is currently an effective barrier to fauna movement to the east and west of the Leard State Forest). The BCM operations and haul road have an existing risk of WVC at the interface with habitats within Leard State Forest. MOD 8 incorporates a key mitigation to reduce this existing risk through the implementation of an appropriate fauna movement crossing structure and associated fencing.

The BCS responses to MOD 8 reference the potential for existing obstructions to connectivity (in the form of roads, tracks and clearing) impacting on the viability of potential fauna habitat. The Leard Forest Road and track to the water retention basin are below minimum thresholds for gap crossing distances for any relevant fauna and are unlikely barriers to any likely species present within the locality.

The 'cleared agricultural land' to the southwest is unlikely to impact on the potential to provide a 1 km wide east-west movement of fauna within the extensive areas of remnant vegetation within the Leard State Forest.

The proposed location of the MOD 8 fauna movement crossing structure is within a patch of vegetation which is approximately 20 ha in size, over 600 m in length at the interface with the former Leard Forest Road and 500 m widest point. This substantial patch still provides for a connectivity structure unimpacted by potential edge effects from the above-mentioned roads.

If the BCS concerns raised in response to MOD 8 around the barrier effects of the gaps were valid, it would further counter the concerns raised regarding the significance of MOD 9 impacts on wildlife, particularly given the reduced potential for WVC from vegetation and habitats along the entire eastern boundary of the road.

It is acknowledged that the proposed MOD 9 will result in increased vehicle movements along one of the existing obstructions to connectivity (the former Leard Forest Road). However, the responses provided above reaffirm that any increase in traffic over a very limited window (2 hrs of day/night), combined with the proposed mitigation and vehicle speed controls is unlikely to significantly increase WVC for fauna. Irrespective of the relatively small and minor potential increased risk of WVC from MOD 9, the benefits provided by the proposed fauna movement crossing as part of MOD 8 in reducing existing impacts of the BCM on wildlife connectivity and WVC on the haul road are clear.

3.6 FORESTRY CORPORATION OF NSW

The Forestry Corporation of NSW's submission noted that based on the information contained within the Modification Report, it objects to the grant of the Modification until a Forest Materials Licence is obtained from the Forestry Corporation of NSW under the *Forestry Act 2012* for the use of forestry resources.

BCOPL notes that this correspondence is contrary to discussions held with Forestry Corporation of NSW prior to the submission of the Modification Report in October 2022. Since receiving the submission, BCOPL has consulted with Forestry Corporation of NSW to ascertain the basis of the submission. This consultation has confirmed that Forestry Corporation of NSW was concerned that the Modification Report describes the use of the crushed rock materials within the BCM Project Boundary, which includes land which is located outside of the Leard State Forest. Accordingly, BCOPL seeks to clarify that it will only utilise the crushed rock materials produced in the course of mining operations on land within the Leard State Forest.

Forestry Corporation of NSW's submission stated that it did not object to the construction and use of the PSI facilities.

4. UPDATED MODIFICATION JUSTIFICATION

This section includes a summary of the justification and evaluation of the project, which incorporates any relevant issues raised in submissions and the Proponents response to these issues.

4.1 EVALUATION OF MERITS

Section 7 of the Modification Report provides a justification and evaluation of the Modification as a whole, considering the economic, environmental and social impacts of MOD 9. The

The Modification will facilitate the following improvements to operations at BCM:

- Lining of haul roads with crushed rock on land within the Leard State Forest, which may enable greater operability under wet conditions and reduced maintenance costs;
- Reduced reliance on external gravel suppliers, thus reducing risk of interruptions due to external factors and fewer deliveries to the site; and
- More efficient shift changeovers by enabling this to occur closer to the active mining area.

These operational efficiencies have the potential to result in greater resource production at BCM, which leads to greater benefits including royalties to NSW, VPA payments to the NSC and other flow-on benefits of improved efficiencies of operations.

The public exhibition for the Modification resulted in six submissions from regulatory authorities and Forestry Corporation of NSW (as the land manager). BCOPL's has addressed the Forestry Corporation of NSW's concerns by confirming that that the crushed gravel product would only be utilised on areas located within the Leard State Forest. WSP has completed a revaluation of potential impacts to fauna as a result of the additional traffic use of the former Leard Forest Road as recommended by the BCSD. BCOPL has also committed to the implementation of further mitigation and management measures to manage impacts to fauna from the increased traffic movements from those previously provided within the Modification Report.

The environmental impact assessments have determined that the dust, GHG and noise emissions generated by the Modification will not significantly increase the impacts of the currently approved development under SSD 09_0182. The infrastructure proposed by the Modification will not be visible from public locations and appropriate measures will be implemented to minimise night lighting impacts. A revaluation of the potential impacts of the increased usage of the former Leard Forest Road on fauna found that the previous assessment was conservative and appropriate for the expected impacts.

Given that the Modification will not significantly increase the environmental impacts of the approved development, the potential benefits of the Modification will outweigh its environmental costs. Given that key aspects of the approved development are unaffected by the Modification, as well as the benefits of the proposed development outweighing its costs, the Modification is in the public interest and will not affect the merits of the approved development.

5. REVISED MANAGEMENT AND MONITORING SUMMARY

Table 2 provides a consolidated summary of the additional management and monitoring commitments resulting from this Submissions Report.

Table 2 Submissions Report Mitigation and Monitoring Commitments

Ref	Commitment	Section
Biodiversity		
1.	BCOPL will adopt a 40 km/hr speed limit on the vegetated portions of the former Leard Forest Road.	**Section 3.5.3**
2.	Speed bumps and/or similar road design devices will be installed on the former Leard Forest Road at the beginning of Leard Forest Road to reduce vehicle speeds.	**Section 3.5.3**
3.	Speed limits will be policed utilising speed camera / detection devices.	**Section 3.5.3**
4.	Regular road maintenance will be undertaken to minimise wheel generated dust.	**Section 3.5.3**
5.	Roadkill will be subject to systematic monitoring and utilised to trigger the requirement for the implementation of further mitigation and management measures to be implemented.	**Section 3.5.3**
6.	Should systematic monitoring and incidental reports from workers identify hotspots for species, timing and location, BCOPL will investigate and then implement further measures to avoid and minimise the occurrence of Wildlife Vehicle Collision.	**Section 3.5.3**
Crushed Gravel Usage		
7.	BCOPL will only utilise the crushed gravel product generated using the mobile rock crushing plant at locations within the Leard State Forest.	**Section 3.6**

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7. ABBREVIATIONS

Term	Definition
BCSD	NSW Department of Planning and Environment – Biodiversity Conservation and Science Directorate
BCM	Boggabri Coal Mine
BCOPL	Boggabri Coal Operations Pty Limited
BOS	Biodiversity Offsets Scheme
BTM Complex	Boggabri Coal Mine, Tarrawonga Mine, Maules Creek Mine
CL	Coal Lease
DPE	NSW Department of Planning and Environment
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA	Environment Protection Authority
Forestry Corporation	Forestry Corporation of NSW
GHG	Greenhouse Gas
IA	Idemitsu Australia
km	Kilometres
LGA	Local Government Area
m	Metres
MOD 8	The Modification seeks to increase the depth of approved mining operations to recover an additional coal resource over six years and to facilitate the construction of a fauna movement crossing.
Mt	Million tonnes
NSC	Narrabri Shire Council
NSW	New South Wales
Resources Regulator	Department of Regional NSW – Resources Regulator
ROM	Run of Mine
SSD	State Significant Development
Whitehaven Coal	Whitehaven Coal Limited

APPENDIX A

Submissions Register

Table A-1 Submissions Register

Abbrev.	Stakeholder	Section where addressed in Submissions Report
NSC	Narrabri Shire Council	**Section 3.1**
EPA	Environment Protection Authority	**Section 3.2**
RR	Department of Regional NSW – Resources Regulator	**Section 3.3**
DPE (CL)	Department of Planning and Environment – Crown Lands	**Section 3.4**
BCSD	Department of Planning and Environment - Biodiversity, Conservation & Science Directorate	**Section 3.5**
FCNSW	Forestry Corporation of NSW	**Section 3.6**

Table A-2 Submissions Register

Organisation	Air Quality	Noise	Traffic Route	Rehabilitation Strategy Conditions	Biodiversity Impacts	Use of Gravel
NSC						
EPA						
RR						
DPE (CL)						
BCSD						
FCNSW						

APPENDIX B

WSP Response to BCSD

Our ref: PS134749-NEW-ECO-LTR-001 R2S for BCD

23 December 2022

Nathan Cooper
Principal
James Bailey & Associates

Dear Nathan

Boggabri Coal Mine Modification 9 - R2S BCD 21 Nov 2022

On 21 November 2022, Biodiversity, Conservation and Science Directorate (BCS) provided a submission on Boggabri Coal Operations Pty Limited's (BCOPL's) Modification application to facilitate the construction and use of new Meeting Room Infrastructure and In Pit Rock Crushing Facility (MOD 9). WSP has been engaged by JBA on behalf of BCOPL to provide a response to the BCS submission. This response to the BCS submission incorporated advice from Dr Rodney van der Ree. Rod is an accredited BAM species expert for the Squirrel Glider and international authority on road ecology. Each of the BCS recommendations and following responses are provided below.

Recommendation 1.1 Revaluate the significance of traffic volumes and fauna impacts resulting from MOD 9

Traffic volume is an important contributor to the impacts of roads and traffic on wildlife (Bond and Jones, 2008), however, definitive data on the impacts of traffic volume in NSW are lacking. Based on a study by Seiler and Helldin (2006), a significant impact from traffic begins to occur when traffic is around or exceeds approximately 2000 vehicles per day. The conceptual model published (Seiler and Helldin, 2006) illustrates the varying impacts of traffic volume on successful crossings, un-attempted crossings and those that die due to wildlife-vehicle collision (WVC).

There are numerous other standards or guidelines which reference traffic volume impacts on wildlife. For example, the German Federal Agency for Nature Conservation classify roads with <1000 vehicles per day as being 'areas unfragmented by traffic' and thus important for biodiversity conservation (Selva et al., 2015).

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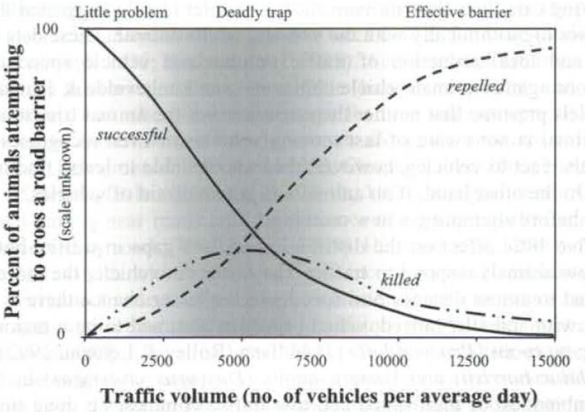

Figure 3. Conceptual model on the effect of traffic volume on the percentage of animals that successfully cross a road, are repelled by traffic noise and vehicle movement, or get killed as they attempt to cross. The model is partly based on empirical data on moose-vehicle collisions in Sweden (changed after Seiler 2003b)

The traffic volume on the former Leard Forest Road will be an order of magnitude less than when impacts begin to occur based on the conceptual model by Seiler and Helldin (2006) and would be further considered unfragmented by traffic under the German scheme.

The significance of the proposed road movements on the local wildlife is further reduced by the fact the former Leard Forest Road is an existing road that currently contains occasional traffic movements and only a few years ago was a publicly accessible road providing regular movements of up to 80km/hr. These existing factors of preexisting impacts on local wildlife and existing habitat values are directly relevant when considering the significance of the impacts.

In addition to traffic movements and consideration of existing disturbances, the proposals potential for WVC is also related to potential vehicle speed on the former Leard Forest Road. The mitigation provided by the proposals enforced speed limit is discussed in detail below in response to BCS recommendation 2.2. It is considered that given the proposed intermittent low traffic volumes, controlled low speed and combination of other mitigating measures listed below in Table 1 in response, the assessment of impacts on fauna provided by the WSP biodiversity assessment is suitably conservative and reasonable.

Recommendation 2.1 revise the determinations of the ecological impact assessment and consider further proposals for avoidance and mitigation

Table 1 Response to BCS comments

Factors identified to decrease potential wildlife collision	Responses to BCSs comments
The short duration over which a small incremental increase in light vehicle movements will be experienced	BCS assertions around the time of traffic movement in relation to diurnal and crepuscular fauna movements, demonstrate that only some species active during the period of traffic movement are likely to be impacted and these impacts will be seasonally restricted to intermittent period throughout the year. For some of the taxa listed by BCS, the suggested activity is also likely to be overstated (e.g. reptiles are unlikely to be active during summer traffic movements). Despite the period of traffic movements coinciding with some species activity, the short duration of these movements (~1hr) will still provide

Factors identified to decrease potential wildlife collision	Responses to BCSs comments
	periods of key diurnal and crepuscular fauna activity outside of the traffic movements. Given the seasonally intermittent nature of the period of proposed activity coinciding with a period of likely fauna activity and the short window of duration of traffic movement, it is still considered a mitigating factor in reducing the risk of fauna collision.
Low traffic volumes outside the two shift change over periods	Most of the proposed road use (22hrs or 92%) will be at low traffic volumes not significantly different to current use and less than historical activity (~5 years) when the road was publicly accessible. The proposed low traffic volumes for most of the daily road use is a relevant mitigation measure to prevent wildlife collision.
Leard Forest Road occurring at grade	The formation of the road influences the ease with which animals can get onto and get off the road surface. Roads on fill or in cuttings are harder for animals to get onto, and more importantly, harder for them to exit when faced with oncoming vehicles. The former Leard Forest Road is at-grade, which means they can quickly escape from the road surface if they encounter a vehicle.
The relatively short distance (~25m at widest point) between remnant vegetation that borders the immediate road boundary	The gap size is an important factor in influencing the rate of crossing by wildlife. Woodlands are naturally patchy, and most woodland species are capable of gap-crossing, with species-specific thresholds in gap-size. Radiotracking studies of small woodland birds (e.g. Brown treecreeper, White-throated treecreeper, Eastern Yellow Robin, Fuscous Honeyeater, White-plumed Honeyeater) found that the mean size of gaps between trees that they crossed was 77m, with maximums up to 230m (Robertson and Radford, 2009). The potentially gap sensitive Squirrel Glider, have been found to cross 50-75m clearing (van der Ree et al. 2003), while the remaining likely fauna species within the Leard State Forest are considered to be mobile and/or uninhibited by the 25m clearing. The 25m gap of Leard Forest Road is therefore not a physical barrier to movement of key species of woodland birds, mammals or any likely fauna utilizing the surrounding habitats. Furthermore, the barrier effect of a 25m clearing is minimized even more by the retention of canopy cover above the road. The BCS concern of increased risk of WVC due to the inability of drivers to detect wildlife and respond accordingly is significantly mitigated by the existing nature of the road alignment generally forming a linear straight <1km in length, providing clear line of site and viability for driver collision avoidance. When combined with the proposed speed restrictions of <50km/hr, the minimum road width and surrounding vegetation is a clear mitigation of the proposal's potential for WVC.

Factors identified to decrease potential wildlife collision	Responses to BCSs comments
Any road upgrades being limited to the existing road corridor (no additional vegetation clearing is proposed)	It is agreed that avoiding vegetation clearing will lessen the impact of MOD 9.
Canopy connectivity that provides gliding passage across the former Leard Forest Road.	A study of the occurrence of Squirrel Gliders in isolated paddock trees found that they occurred in trees up to 75m from the nearest road reserve and with most detections up to about 50m away. These thresholds represent the absolute maximum and typical maximum distance that gliders will traverse across clearings (van der Ree et al., 2003). Glide distance is dependent on the launch height and the size of the glider (including body weight and size of the gliding membrane) (Jackson, 1999). Tree heights and glider sizes at Boggabri are similar to the northern plains of Victoria for these thresholds to apply. Therefore, the gap size at Boggabri (<25m) is well within the glide capability of Squirrel Gliders and the increased use of the former Leard Forest Road will not impact the movement of Squirrel Gliders. In addition, gliders are active throughout much of the night (van der Ree, R, unpub data), and thus the lack of vehicles during most of the night significantly reduces the risk of collision. Furthermore, slow speeds and low numbers of vehicles at dawn and dusk at times of the year when the movement of staff overlaps with crepuscular species is highly unlikely to have a significant impact on Squirrel Gliders. Squirrel Gliders also frequently cross high-volume and high-speed roads, such as the Hume Freeway in northern Victoria. Indeed, the rate of crossing of low-volume 'country' roads with connected canopy was similar to the rate of crossing of the Hume Freeway with >5000 vehicle per day and speeds up to 110kmhr^{-1} (van der Ree et al., 2010). In other words, traffic volume did not appear to influence crossing rates, the size of the gap was more important.

Recommendation 2.2: Consider further options for avoidance and mitigation of impact, including alternative access options.

While based on responses provided above a potentially significant WVC is considered unlikely, BCOPL have considered and will commit to the following additional mitigation measures to further avoid and mitigate impacts:

- Reducing the suggested vehicle speed in vegetated roadsides from 50 to 40 km hr;
- Incorporate speed bumps/or similar road design device within the existing road disturbance areas at the beginning of the Leard State Forest to reduce vehicle speeds;
- Undertake road maintenance to keep dust levels down;
- Policing of speed limits with speed camera / detection devices; and
- Systematic monitoring of roadkill.

1.1.1 Systematic monitoring

Roadkill surveys to be undertaken for five consecutive days immediately after the shift changes at dawn and dusk and completed each season. Workers will be encouraged to report WVC and any dead animals on the road side. Workers will be rewarded for reporting such instances. All roadkill locations will be georeferenced and stored within the WVC database.

The results of the systematic roadkill surveys and incidental reports from workers will be used to determine if there are any hotspots and the species, timing and location of such hotspots.

If roadkill hotspots are detected and continue to be a common trend, BCOPL will investigate further measures to avoid and minimize the occurrence of WVC. This may include measures such as offering a shuttle bus service between the existing MIA and the new facilities to minimize the vehicle movements along the former Leard Forest Road.

Recommendation 3.1 The potential impacts of the proposed MOD 8 and MOD 9 in combination be considered by the consent authority

A central aim of the Boggabri Coal Mine (BCM) Biodiversity Offset Strategy (BOS) (WSP, 2018) is the restoration and establishment of a network of regional and local wildlife corridors that provide linkages between important large, isolated remnants within the region; specifically connecting the Namoi River floodplain with the Nandewar Range. The integration of BCMs mine rehabilitation as part of the Regional East-West Wildlife Corridor is a requirement of the project's Conditions of Approval and the Leard Forest Regional Strategy (Umwelt, 2017). MOD 8 is key component in improving this connectivity and mitigating wildlife impacts as a result of the BCM operations.

BCS concerns around the combination of MOD 8 and MOD 9 creating 'large and on-going impacts to Leard State Forest biodiversity' is confusing and overstated. MOD 8 includes a proposal for the establishment of a fauna crossing structure, mitigating the impacts of the current mining operations (specifically the Run-of-Mine (ROM) haul road, which is currently an effective barrier to fauna movement to the east and west of the Leard State Forest). The BCM operations and ROM haul road have an existing risk of WVC at the interface with habitats within Leard State Forest, the MOD8 proposal incorporates key mitigation to reduce this existing risk through the implementation of an appropriate fauna crossing structure and associated fencing.

The BCS responses to MOD 8 reference the potential for existing obstructions to connectivity (in the form of roads, tracks and clearing) impacting on the viability of potential fauna habitat. The Leard Forest Road and track to the water retention basin are below minimum thresholds for gap crossing distances for any relevant fauna and are unlikely barriers to any likely species present within the locality. The 'cleared agricultural land' to the southwest is unlikely to impact on the potential to provide a 1km wide east-west movement of fauna within the extensive areas of remnant vegetation within the Leard State Forest.

The proposed location of the MOD 8 fauna movement crossing structure is within a patch of vegetation which is approximately 20ha in size, over 600m in length at the interface with the former Leard Forest Road and 400 m at widest point. This substantial patch still provides for a connectivity structure unimpacted by potential edge effects from the above-mentioned roads.

If the BCS concerns raised in response to MOD 8 around the barrier effects of the gaps were valid, it would further counter the concerns raised regarding the significance of MOD 9 impacts on wildlife, particularly given the reduced potential for WVC from vegetation and habitats along the entire eastern boundary of the road.

It is acknowledged that the proposed MOD 9 will result in increased vehicle movements along one of the existing obstructions to connectivity (the former Leard Forest Road). However, the responses provided above reaffirm that any increase in traffic over a very limited window (2hrs of day/night), combined with the proposed mitigation and vehicle speed controls is unlikely to significantly increase WVC for fauna. Irrespective of the relatively small and minor potential increased risk of WVC from MOD 9, the benefits provided by the proposed fauna movement crossing as part of MOD 8 in reducing existing impacts of the BCM on wildlife connectivity and WVC on the ROM haul road are clear.

Yours sincerely

Alex Cockerill
National Executive - Ecology

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