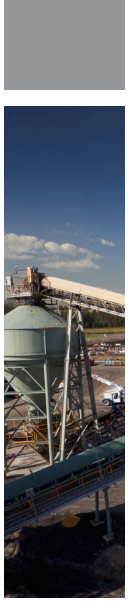
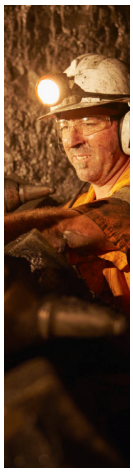
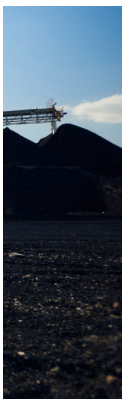


Ashton-Ravensworth Underground Mine Integration Modification

Ravensworth Underground Mine Modification Report

APPENDIX C

Noise Review

RAVENSWORTH UNDERGROUND

GLENCORE

YANCOAL 兖煤澳大利亚有限公司

5 November 2021

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Ashton Coal Operations Pty Ltd
Glennies Creek Road
Camberwell NSW 2330

Attention: Phillip Brown, Environment & Community Relations Superintendent

Dear Phillip

Ashton-Ravensworth Underground Integration Modification - Noise Review

1 Introduction

Ashton Coal Operations Pty Limited (ACOL) has requested SLR Consulting Australia Pty Ltd (SLR) conduct a noise review as part of the proposed Ashton-Ravensworth Underground Integration Modification (the Modification).

This report provides a synopsis of potential noise impacts arising from the integration of the Ashton Underground Mine and Ravensworth Underground Mine (RUM), including an assessment of both operational and construction noise.

2 Project Description

The Ashton Mine Complex and Ravensworth Mine Complex are neighbouring open cut and underground coal mining complexes, located in the Singleton Local Government Area, in the Hunter Valley region of New South Wales (NSW).

The Ashton Mine Complex includes the Ashton Coal Project (including the completed North East Open Cut [NEOC] and the Ashton Underground Mine) and approved Ashton South East Open Cut (SEOC) Project. The SEOC Project has not yet commenced. The Ashton Coal Project comprises a Coal Handling and Preparation Plant (CHPP), a rail siding and rail loadout as well as a range of other surface support facilities and infrastructure.

The Ravensworth Mine Complex includes the Ravensworth Operations Project and the RUM. The Ravensworth Operations Project is a standalone open cut operation authorised under Project Approval 09_0176. The RUM is authorised under Development Consent DA 104/96. In October 2014, after the completion of Longwall 9 in the Pikes Gully Seam, operations at RUM were placed into care and maintenance and no further underground mining has occurred since.

The Ashton Underground Mine and RUM share a common mining lease boundary and are approved to extract coal from similar coal seams. An opportunity therefore exists for ACOL to access and extract the approved but unmined RUM coal resources. Underground mining of the approved RUM coal resource is a logical and efficient proposal and would provide better environmental and social outcomes rather than developing the approved SEOC Project.

To enable the integration of the operations, modifications to Development Consent DA 309-11-2001-i (Ashton Underground Mine) and Development Consent DA 104/96 (RUM) are required.

The modifications to the Ashton Coal Project Development Consent DA 309-11-2001-i would involve the following:

- Underground connection from the existing Ashton Underground Mine workings to the approved RUM Pikes Gully and Middle Liddell coal seams via first workings;
- Receipt of run-of-mine (ROM) coal mined in the RUM Pikes Gully and Middle Liddell coal seams for handling, processing and transportation using the existing Ashton Coal Project Infrastructure;
- Management of RUM ROM coal coarse rejects and tailings by emplacement in the NEOC void and at the Ravensworth Void 4 Tailings Dam;
- Receipt and management of water and gas from the ACOL-operated portion of the RUM;
- Extension of mining operations until approximately December 2035; and
- Other administrative changes to facilitate management of the ACOL-operated portion of RUM and integration with the Ashton Coal Project, such as integrated environmental management plans (as appropriate).

ACOL has approval for development of a gas drainage network to ensure continued safe operation of the Ashton Underground Mine. The gas drainage network will continue to be constructed as approved throughout the life of the Ashton Coal Project. It should be noted that the expected maximum ROM coal production under the Modification would be within the approved maximum annual production and there would be no changes to current product transport via rail. There are no proposed upgrades to the coal handling or CHPP infrastructure required for the Modification (beyond those already approved). The Modification would result in the current CHPP and train load-out facilities at the Ashton Coal Project operating until December 2035.

The modifications to the RUM Development Consent DA 104/96 would involve the following:

- Transfer of ROM coal from the RUM Pikes Gully and Middle Liddell coal seams via underground workings to the Ashton Coal Project for handling, processing and transport;
- Minor changes to the approved Pikes Gully Seam Longwalls 10-15 (narrowing and shortening of some longwall panels) and Middle Liddell Seam Longwalls 14-18 (shortening of some longwall panels);
- Transfer of water and gas from the ACOL-operated portion of the RUM to the Ashton Coal Project;
- Minor adjustments to the gas and ventilation management infrastructure to ensure continued safe operation of the ACOL-operated portion of the RUM;
- Extension of mining operations until 31 December 2032; and
- Other administrative changes to facilitate management of the ACOL-operated portion of the RUM and integration with the Ashton Coal Project, such as integrated environmental management plans (as appropriate).

Gas captured by in-seam drainage at the ACOL-operated portion of the RUM would be transferred by underground pipelines to the existing Ashton Coal Project gas drainage network. Backroad upcast ventilation fans would be constructed to provide adequate ventilation of the RUM workings. The construction and operation of these backroad upcast ventilation fans are the only acoustically significant component of the proposed Modification.

Additional noise from operating the ventilations fans has been assessed in accordance with the NPfI and additional noise from the construction of the ventilations fans has been considered in accordance with the ICNG.

2.1 Noise Criteria – Ashton Coal Project

ACOL carryout mining operations in accordance with DA 309-11-2001-i as modified, and Environment Protection Licence (EPL) 11879. DA 309-11-2001-i does not include any noise criteria for construction noise.

Noise criteria relating to residences on privately owned land from DA 309-11-2001-i as modified, and EPL 11879 are provided in **Table 1** and **Table 2**. It should be noted that noise criteria presented in **Table 1** apply at a residence on privately owned land or on more than 25 per cent of any privately owned land.

Table 1 Ashton Coal Project Noise Impact Criteria – dBA

Location	Day	Evening	Night	
	LAeq(15minute)[1]	LAeq(15minute)[1]	LAeq(15minute)[1]	LA1(1minute)[2]
Any residence not owned by ACOL or not subject to an agreement between ACOL and the residence owner to an alternate noise limit.	38	38	36	46

[1] LAeq(15minute) = The 15 minute 'A' weighted equivalent noise level. It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound over a 15 minute interval.

[2] LA1(1minute) = The noise level exceeded for 1% of a 1 minute interval.

Table 2 Cumulative Noise Acquisition Criteria - dBA

Location	Day	Evening	Night
	LAeq(period)	LAeq(period)	LAeq(period)
Camberwell Village	60	50	45
All other privately-owned land	55	50	45

2.2 Noise Criteria – Ravensworth Underground Mine

Noise criteria for the RUM is provided in Development Consent DA 104/96.

Table 3 Ravensworth Mine Complex Noise Impact Criteria - dBA

Receiver	Day	Evening	Night	
	LAeq(15minute)	LAeq(15minute)	LAeq(15minute)	LA1(1minute)
Any residence on any privately owned land	35	35	35	45

3 Modification Noise Assessment and Methodology

3.1 Project Noise Trigger Levels

The NSW Noise Policy for Industry (NPfI) notes the following with regard to determining Project Noise Trigger Levels (PNTLs) for existing industry:

There is no 'one-size fits-all' approach to determine the impact from an existing industry. The following governing principles should be applied when determining the project noise trigger levels and/or assessment requirements for existing industry:

- *Where a development proposal involves a discrete process, and premises-wide mitigation has or is to be considered outside of the development proposal, a project noise trigger level for noise from new/modified components (not the whole site) of the operation may be set at 10 dB(A) or more below existing site noise levels or requirements.*

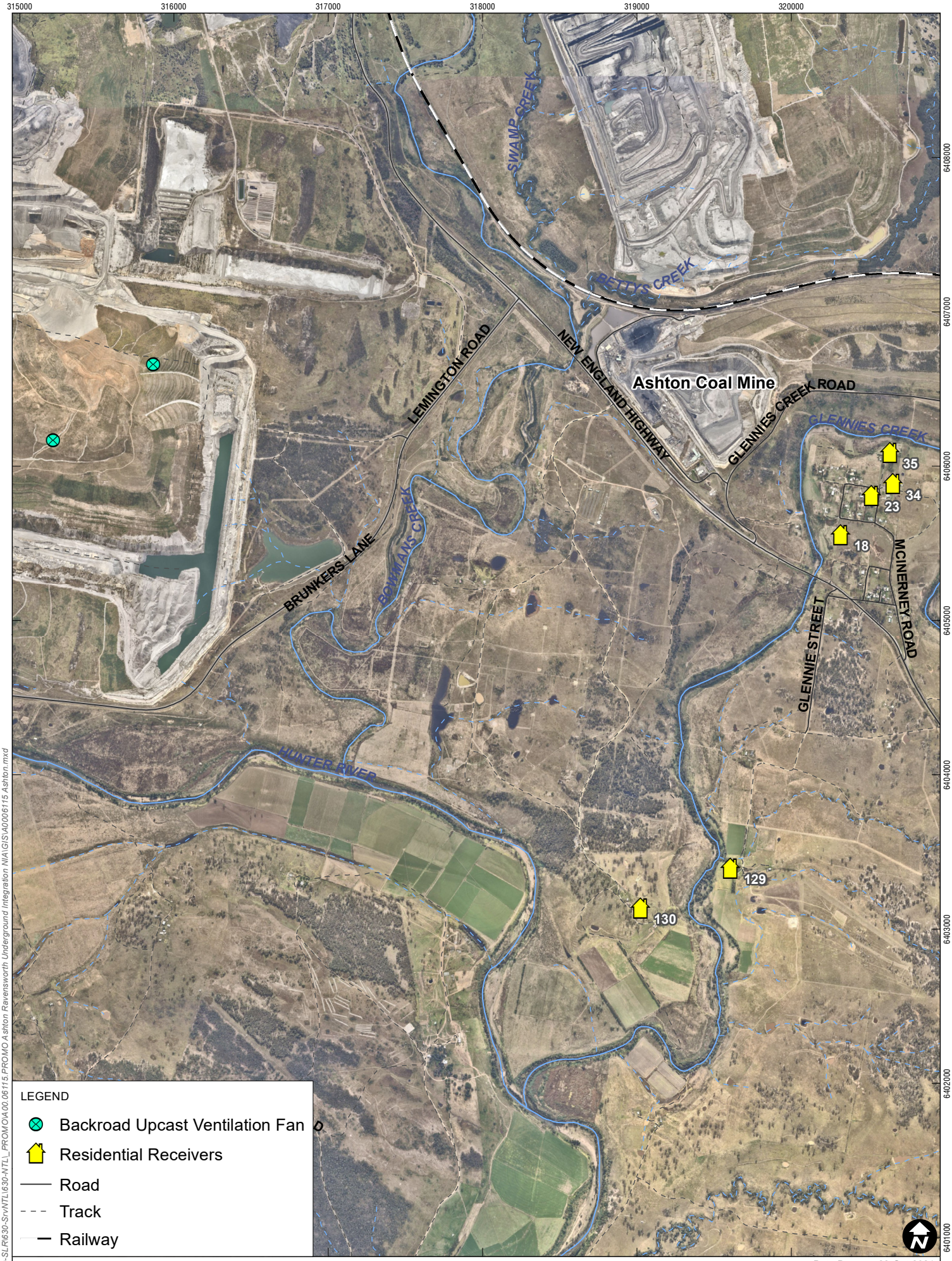
Given that the construction and operation of two backroad upcast ventilation fans within the approved RUM mining area are the only acoustically significant components of the proposal, it is considered appropriate to apply the above assessment methodology to the Modification.

PNTLs have been derived from the lowest noise criteria for the RUM and Ashton Coal Project at the nearest non-mine related residential receivers considered in this assessment to the proposed backroad fans. The resulting PNTLs are provided in **Table 4**.

Table 4 Project Noise Trigger Levels – dBA

Receiver	Day	Evening	Night	
	LAeq(15minute)	LAeq(15minute)	LAeq(15minute)	LA1(1minute)
18 – Turner 23 – Lopes 34 – Oloffson 35 – De Jong 129 – Bowman 130 - Bowman	25	25	25	35

The assessed receiver locations (private residences) and the location of the proposed backroad upcast ventilation fans are provided in **Figure 1**. The location of the backroad upcast ventilation fans would be more than 4.5 km to the nearest private residence.



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SLR

Residential Receivers and Backroad Upcast Ventilation Fans

FIGURE 1

3.2 Construction Noise Criteria

The NSW Environment Protection Authority's (EPA's) Interim Construction Noise Guideline (ICNG) sets out noise management levels (NMLs) for residential and other noise-sensitive receivers and outlines how they are to be applied. A summary of the noise management levels from the ICNG is contained in **Table 5**.

Table 5 Construction Noise Management at Residential Receivers

Time of Day	Noise Management Level $L_{Aeq(15minute)}$[1]	How to Apply
Recommended standard hours Monday to Friday 7am to 6pm Saturday 8am to 1pm No work Sundays or public holidays	Noise Affected RBL[2] + 10 dBA	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq(15minute)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly Noise Affected 75 dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences. 2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise Affected RBL[2] + 5 dBA	A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see section 7.2.2 of the ICNG.

[1] Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5m above ground level. If the property boundary is more than 30m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30m of the residence. Noise levels may be higher at upper floors of the noise-affected residence.

[2] RBL: Rating Background Level, as defined in the NSW Noise Policy for Industry (EPA, 2017).

Assuming the minimum applicable RBL as defined by the NPfI, the adopted construction NMLs at the nearest residential receivers are provided in **Table 6**.

Table 6 Construction Noise Management Levels

Residential Receiver	RBL dBA			Standard Construction Hours $L_{Aeq(15minute)}$	Out of Hours $L_{Aeq(15minute)}$			Sleep disturbance screening (RBL+15) L_{Amax}
	Day	Evening	Night		Daytime Period	Evening Period	Night-time Period	
All residential receivers	35	30	30	45	40	35	35	45

3.3 Noise Model

A computer model was used to predict noise emissions from the operation and construction of the Modification. The noise modelling was undertaken using the CONCAWE algorithms within SoundPLAN v8.1 software. A three-dimensional digital terrain map providing relevant topographic information was used in the modelling process. The model used this map, together with noise source data, ground cover, shielding by barriers and/or adjacent buildings and atmospheric information to predict noise levels at the nearest potentially affected receivers

The prediction of construction and operating noise levels were carried out under standard and enhancing meteorological conditions. Atmospheric parameters under which noise predictions were made are given in **Table 7**.

Table 7 Meteorological Parameters Considered for Noise Predictions

Meteorological Scenario	Temperature	Humidity	Wind Speed	Wind Direction	Stability Class
Standard (All time periods)	10	80%	0.5 m/s	Source to receiver	D
Noise Enhancing Wind (All time periods)	10	80%	3 m/s	Source to receiver	D
Noise Enhancing Inversion and Drainage Flow (Night-time period)	10	80%	2 m/s	Source to receiver	F[1]

[1] Modelling conducted using F class conditions as direct temperature lapse rates are unable to be selected in SoundPlan.

3.4 Acoustically Significant Noise Sources

Sound power levels (SWLs) of acoustically significant plant and equipment proposed for use in the construction and operation of the backroad fans are provided in **Table 8**.

Table 8 Acoustically Significant Plant and Equipment

Scenario	Plant and Equipment	Data Source	L_{Aeq} Sound Power Level
Scenario 1 Operational Scenario All time periods	Backroad Fan	Back Road Fan, Sound Power Assessment (Global Acoustics, 2018)	107 dBA L_{Aeq} each

Scenario	Plant and Equipment	Data Source	LAeq Sound Power Level
Scenario 2 Pad Construction Standard Daytime Construction 7am to 6pm Mon to Sat and 8am to 6pm Sundays and public holidays	20t Excavator	TfNSW[1] Construction Noise Strategy	105 dBA
	D9 Dozer	TfNSW[1] Construction Noise Strategy	116 dBA
	Grader	TfNSW[1] Construction Noise Strategy	113 dBA
	30t Truck and Dog	TfNSW[1] Construction Noise Strategy	108 dBA
Scenario 3 Drilling Ventilation Shaft Standard Daytime and Out of Hours (24/7 operation)	Borehole Drill	SLR database	104 dBA

[1] Transport for NSW.

3.5 Predicted Operational and Construction Noise Levels

Scenario 1 – Fan Operation

The predicted operational noise levels from the proposed backroad fans at the nearest residential receivers are provided in **Table 9**.

Table 9 Predicted Fan Operating Noise Levels – Scenario 1- dBA

Receiver Location	Period	Predicted Noise Level - LAeq(15minute)		PNTL Criteria LAeq(15minute)
		Standard	Noise Enhancing	
18	Day	12	15	25
	Evening	12	15	25
	Night	12	15	25
23	Day	12	14	25
	Evening	12	14	25
	Night	12	14	25
34	Day	12	14	25
	Evening	12	14	25
	Night	12	14	25
35	Day	12	14	25
	Evening	12	14	25
	Night	12	14	25
129	Day	4	6	25
	Evening	4	6	25
	Night	4	6	25

Receiver Location	Period	Predicted Noise Level - $L_{Aeq(15minute)}$		PNTL Criteria $L_{Aeq(15minute)}$
		Standard	Noise Enhancing	
130	Day	8	11	25
	Evening	8	11	25
	Night	8	11	25

Scenario 2 – Pad Construction

The predicted noise levels from construction of the pads for the proposed backroad fans at the nearest residential receivers are provided in **Table 10**.

Table 10 Predicted Construction Noise Levels – Scenario 2 - dBA

Receiver Location	Period	Predicted Noise Level - $L_{Aeq(15minute)}$		NML $L_{Aeq(15minute)}$
		Standard	Noise Enhancing	
18	Day	22	25	45
	Daytime Out of Hours	22	25	40
23	Day	21	24	45
	Daytime Out of Hours	21	24	40
34	Day	21	24	45
	Daytime Out of Hours	21	24	40
35	Day	21	24	45
	Daytime Out of Hours	21	24	40
129	Day	13	15	45
	Daytime Out of Hours	13	15	40
130	Day	19	22	45
	Daytime Out of Hours	19	22	40

Scenario 3 – Vent Shaft Drilling

The predicted construction noise levels from drilling of the shafts for the proposed backroad fans at the nearest residential receivers are provided in **Table 11**.

Table 11 Predicted Drill Construction Noise Levels – Scenario 3 - dBA

Receiver Location	Period	Predicted Noise Level - $L_{Aeq(15minute)}$		NML $L_{Aeq(15minute)}$
		Standard	Noise Enhancing	
18	Day	8	10	45
	Daytime Out of Hours	8	10	40
	Evening	8	10	35
	Night	8	10	35
23	Day	7	10	45
	Daytime Out of Hours	7	10	40
	Evening	7	10	35
	Night	7	10	35
34	Day	7	9	45
	Daytime Out of Hours	7	9	40
	Evening	7	9	35
	Night	7	9	35
35	Day	7	10	45
	Daytime Out of Hours	7	10	40
	Evening	7	10	35
	Night	7	10	35
129	Day	0	1	45
	Daytime Out of Hours	0	1	40
	Evening	0	1	35
	Night	0	1	35
130	Day	5	7	45
	Daytime Out of Hours	5	7	40
	Evening	5	7	35
	Night	5	7	35

The predicted noise levels from the construction and operation of the backroad ventilation fans provided in **Table 9**, **Table 10** and **Table 11** indicates that compliance with the PTNLs and NMLs, as relevant, would be expected at all times under standard and noise enhancing meteorological conditions.

It should also be noted that, for comparison purposes only, that predicted construction noise levels are also compliant with the adopted PTNLs.

Predicted noise levels from the Modification are significantly below approved noise levels and would not lead to an increase in overall noise levels from the RUM and Ashton Coal Project. Given this, the Modification would not result in an exceedance of the noise criteria on more than 25 per cent of any privately owned land.

3.6 Sleep Disturbance

Operational Noise

Sleep disturbance noise levels from the operation of backroad upcast ventilation fans would be similar to that of the operational L_{Aeq} noise levels (**Table 9**) given their continuous and steady operation. As such compliance with the sleep disturbance PTNL would be expected at all times under standard and noise enhancing meteorological conditions.

Construction Noise

To assess sleep disturbance from the Modification construction activities a typical maximum sound level (L_{Amax}) sound power level of 114 dBA has been applied to the ventilation shaft drill rig. The resulting sleep disturbance noise levels at the nearest residential receivers are provided in **Table 12**.

Table 12 Predicted Sleep Disturbance Noise Levels – dBA

Receiver Location	Period	Predicted Sleep Disturbance Noise Level – $L_{A1(1minute)}$		L_{Amax}
		Standard	Noise Enhancing	
18	Night	18	20	45
23	Night	17	20	45
34	Night	17	19	45
35	Night	17	20	45
129	Night	8	11	45
130	Night	15	17	45

Predicted sleep disturbance noise levels from drilling the ventilation fan shafts indicates that compliance with the sleep disturbance screening criterion would be expected at all times under standard and noise enhancing meteorological conditions.

The use of L_{Amax} provides a conservative assessment of sleep disturbance as the L_{Amax} noise would be higher than the $L_{A1(1minute)}$ noise level. As such, for comparison purposes only, predicted construction sleep disturbance noise levels are also compliant with the adopted operational sleep disturbance PTNLs.

3.7 Cumulative Noise Levels

Noise levels from the proposed construction and operation of the backroad upcast ventilation fans are predicted to be at least 10 dB below the existing noise criteria for the Ashton Coal Project and RUM. Given this it can be concluded that construction and operation of the backroad upcast ventilation fans would have minimal impact on existing noise approved noise levels and would not lead to an increase in cumulative noise levels at any residential receiver.

It should also be noted that it is ACOLs preference to proceed with the Modification rather than commencing the approved SEOC Project. The Modification would result in significantly less noise levels in the vicinity of Camberwell compared to that of the approved SEOC Project resulting in improved amenity for residences than if the SEOC Project had commenced.

4 Change of Mine Life

The Modification would require the extension of mine life by 11 years at the Ashton Coal Project to 2035. This would require the continuation of approved operations such as handling and processing of coal at the Ashton Coal Project CHPP and rail loadout, and the emplacement of coarse rejects and tailings into the NEOC void. As the Modification does not lead to an increase in overall noise levels from the RUM and Ashton Coal Project, the existing noise criteria contained in DA 309-11-2001-i as modified, and EPL 11879 are appropriate for the extended mine life.

It is noted that the extension of mine life would not result in Ashton Coal Project operating past the existing mine life of the nearby Ravensworth Mine Complex, Mount Owen Complex, Integra Underground Mine and Rix's Creek Mine. The Modification would result in significantly less noise levels in the vicinity of Camberwell compared to that of the approved SEOC Project, meaning that there would be improved amenity for residences than if the SEOC Project had commenced.

5 Summary of Findings and Conclusion

Ashton Coal Operations Pty Limited has requested SLR Consulting Australia Pty Ltd conduct a noise review as part of the proposed Ashton-Ravensworth Underground Integration Modification.

The construction and operation of two backroad upcast ventilation fans are the only acoustically significant components of the proposed Modification. The expected maximum ROM coal production under the Modification would be within the approved maximum annual production and there would be no changes to current product transport via rail. There are no proposed upgrades to the coal handling or CHPP infrastructure required for the Modification (beyond those already approved).

Noise levels from the construction and operation of the two backroad upcast ventilation fans are predicted to comply with adopted PNTLs and NMLs at the nearest most potentially affected residential receivers under standard and noise enhancing meteorological conditions.

Noise levels from the proposed construction and operation of the backroad upcast ventilation fans are predicted to be at least 10 dB below the existing noise criteria for the Ashton Coal Project and RUM, and as such it can be concluded that construction and operation of the backroad upcast ventilation fans would have minimal impact on existing approved noise levels and would not lead to an increase in cumulative noise levels at any residential receiver.

Furthermore, the Modification would result in significantly less noise levels in the vicinity of Camberwell compared to that of the approved SEOC Project meaning that there would be improved amenity for residences than if the SEOC had commenced.

I trust the preceding meets your current requirements. If you have any questions or would like any further information, please do not hesitate to contact me on 02 4037 3200 or email mdavenport@slrconsulting.com.

Yours sincerely

MARTIN DAVENPORT
Principal - Noise and Vibration

Checked/
Authorised by: GT