REPORT

VICKERY EXTENSION PROJECT – REVIEW OF DETAILED RAIL SPUR DESIGN

REGIONAL NSW

NOISE REVIEW
RWDI # 2406615
11 August 2026

SUBMITTED TO

Steve Lee
Project Manager
Slee@whitehavencoal.com.au

SUBMITTED BY

Roman Haverkamp
Senior Engineer
Roman.haverkamp@rwdi.com

Davis Lai
Senior Project Manager
Davis.lai@rwdi.com

Whitehaven Coal Limited
Level 31, 12 Creek Street
Brisbane QLD 4000

RWDI Australia Pty Ltd (RWDI)
ABN: 86 641 303 871

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GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

L_{Amax} – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

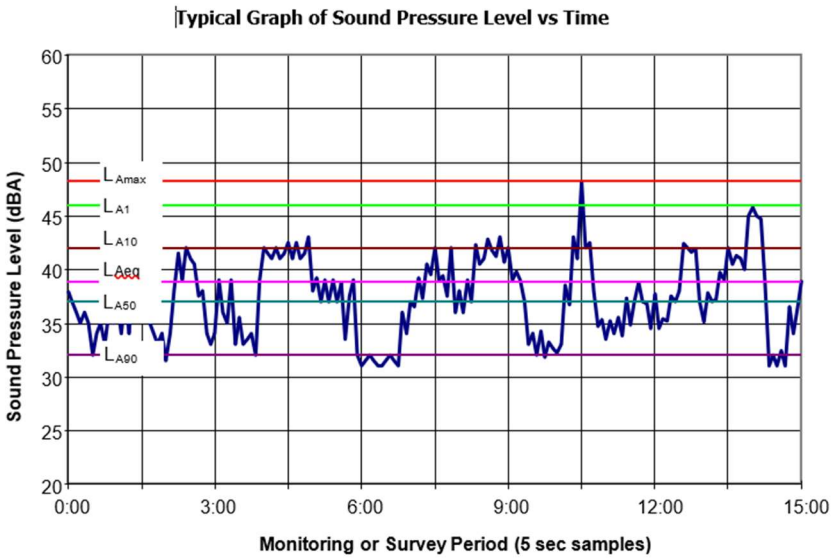

TABLE OF CONTENTS

1 INTRODUCTION 1
2 REVIEW OF DETAILED RAIL SPUR DESIGN 3
3 RAIL NOISE ASSESSMENT 5
3.1 Project Approval Noise Criteria 5
3.2 Methodology 5
3.2.1 Predictive Noise Model & Source Database 5
3.2.2 Model Validation 6
3.2.3 Rail-to-Wheel Noise 6
3.2.4 Assessment Scenarios & Rail Movements 6
3.3 Noise Predictions & Discussion 7
4 LOW-FREQUENCY NOISE ASSESSMENT 10
4.1 Representative Noise-Sensitive Receivers 10
4.2 Low-Frequency Noise Levels 12
4.3 Assessment of Unbalanced Spectra & Audibility 12
5 CONCLUSION & RECOMMENDATIONS 14
5.1 Recommended Noise Mitigation and Management Measures 14
6 STATEMENT OF LIMITATIONS 16

APPENDIX A - RESUMES

LIST OF FIGURES

Figure 1-1: Project Rail Spur Sections 2
Figure 2-1: Rail Spur Alignments 4
Figure 4-1: Low-Frequency Noise Assessment Zones 11

LIST OF TABLES

Table 3-1: Project Rail Spur Noise Criteria 5
Table 3-2: Noise Source Sound Power Levels 6
Table 3-3: Peak Daily Maximum Train Movements on Project Rail Spur 7
Table 3-4: Night-time Noise Predictions and Comparison with VEP EIS 7
Table 4-1: LFN Zones & Representative Receivers 10
Table 4-2: Representative LFN Spectrum Shape 12
Table 4-3: C - A-Weighted Noise Level Assessment Results - Night 12
Table 4-4: LFN Spectra 13

1 INTRODUCTION

Vickery Extension Project (VEP) (SSD 7480), owned by Whitehaven Coal Limited (Whitehaven), was approved by the Independent Planning Commission (IPC) in August 2020. It includes an 18.4 kilometres (km) private rail spur connecting the Project Rail Loop with the Australian Rail Track Corporation (ARTC) rail network line.

Whitehaven has now completed the detailed design works for the Project Rail Spur, which includes the following components (**Figure 1-1**):

- Two rail bridges:
  - Namoi River and Kamilaroi Highway Bridge (approx. 2.2 km long)
  - Stratford Creek Bridge (approx. 500 metres [m] long)
- raised culverts over the floodplain between the Kamilaroi Highway and the ARTC rail network line to meet the EIS flood conditions; and
- small sections of embankment east of the Namoi River.

Condition B11 of Project Approval SSD 7480 stipulates that Whitehaven must commission a review of the detailed design of the Project Rail Spur prior to commencing the construction of it, to determine whether it incorporates all reasonable and feasible noise mitigation measures, including suitable measures to minimise low-frequency noise.

As such, Whitehaven has commissioned RWDI Australia (RWDI) to conduct a review of the detailed design of the Project Rail Spur. For completeness, a rail noise assessment at nearby noise-sensitive receivers is also included, with consideration of potential dominant low-frequency noise in accordance with the NSW EPA (2017) *NSW Noise Policy for Industry* (NPfI).

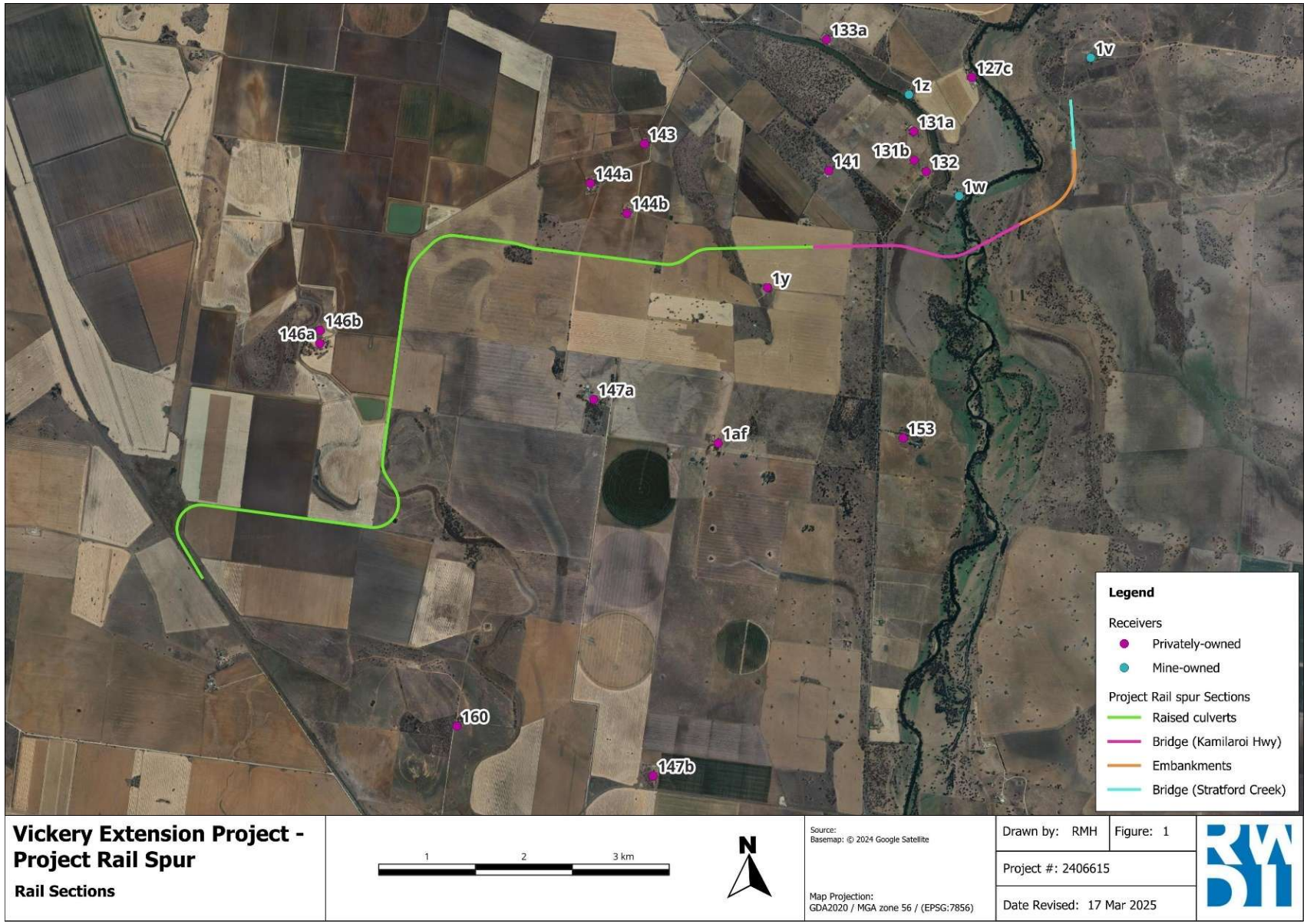

Figure 1-1: Project Rail Spur Sections

2 REVIEW OF DETAILED RAIL SPUR DESIGN

A review was conducted to compare the Project Rail Spur detailed design with that assumed as part of the noise assessment (Wilkinson Murray, 2018) prepared in support of the VEP Environmental Impact Statement (EIS).

Despite some minor changes to the footprint, the detailed design of the rail spur alignment was found to be generally consistent with the VEP EIS, as shown in **Figure 2-1**. The maximum offset distance between the two alignments is approximately 65 m, which is considerably smaller than the separation distance between the rail spur and surrounding receivers. As such, this variation is not expected to result in any material change to noise levels at noise-sensitive receivers.

However, material changes to the design were noted in relation to the proposed structure of the rail spur:

1. The VEP EIS noise assessment generally assumed a rail viaduct on steel pylon-like structures over the floodplain between the ARTC rail network line and the Namoi River. In the detailed design, this was replaced for the most part by raised concrete culvert sections (average 2 m high) with ballast, extending from the ARTC rail network line to the Kamilaroi Highway (approx. 10 km).
2. The two rail bridges (Namoi River and Kamilaroi Highway Bridge and Stratford Creek Bridge), which had been assumed as steel structures in the VEP EIS, would predominantly consist of concrete structures (i.e. concrete piers [enclosed in steel tubes], pier heads, girders, decks and ballast walls) with ballast.

The above changes are expected to lower the amount of radiated noise emanated from the structure when compared with steel pylon-like structures (e.g. Maules Creek Coal Mine [MCCM] rail spur viaduct) assumed for the VEP EIS. Furthermore, the bridge/raised culvert structures and track design proposed as part of the detailed design would generally be considered best practice with regard to acoustic radiation efficiency, thus resulting in lower radiated noise from structures (including low-frequency noise). As such, the detailed design is deemed to incorporate all reasonable and feasible noise mitigation measures, including suitable measures to minimise low frequency noise.

It is also noted that the detailed design includes reduced rail elevations when compared with the concept design used for the VEP EIS – this would increase ground effects, thus providing more attenuation to noise propagating toward nearby noise-sensitive receivers.

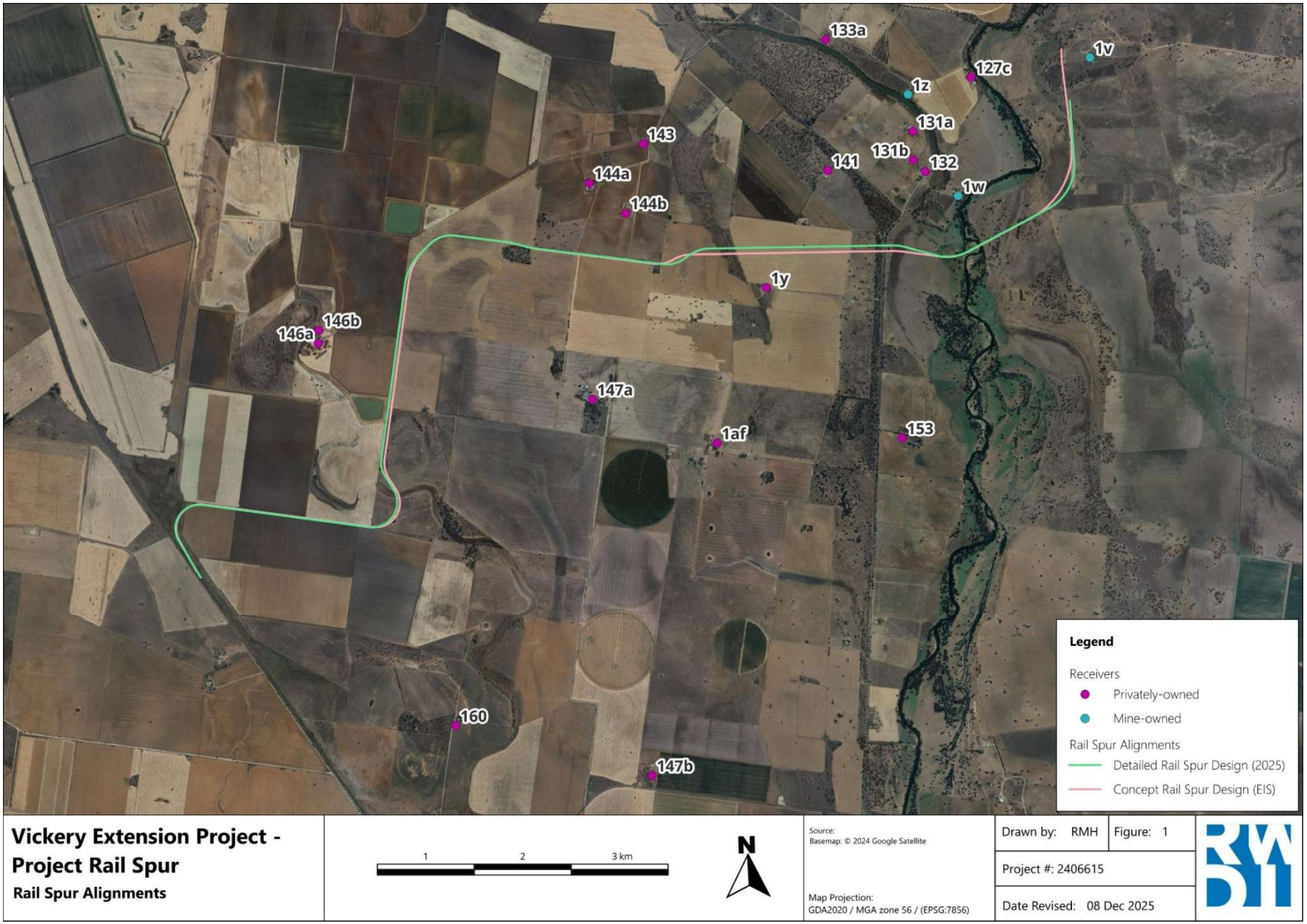

Figure 2-1: Rail Spur Alignments

3 RAIL NOISE ASSESSMENT

3.1 Project Approval Noise Criteria

Condition B7 of Project Approval SSD 7480 requires Whitehaven to ensure that the noise generated by the transportation of coal on the Project Rail Spur does not exceed the criteria in **Table 3-1** at any residence on privately-owned land.

Table 3-1: Project Rail Spur Noise Criteria

Receiver	Project Rail Spur Noise Criteria, $L_{Aeq,Period}$		
	Day	Evening	Night
DA approved dwelling on property 144[3]	50	45	42
All other privately-owned residences	50	45	40

NOTES:

1. $L_{Aeq,Period}$ = The equivalent continuous A-weighted sound level over the assessment period (Day, Evening or Night).
2. Day: 7:00 am to 6:00 pm; Evening: 6:00 pm to 10:00 pm; Night: 10:00 pm to 7:00 am
3. Applicable only to the DA approved dwelling on this property once it has been constructed.

Property 144 includes two existing receivers (dwellings) – 144a and 144b located north of the rail as shown in Appendix 3 of Project Approval SSD 7480, and a DA approved dwelling (located approximately 280 m north of the rail spur between receivers 1y and 141), which has not been constructed. As indicated in **Table 3-1**, the applicable night-time noise criterion for the two existing receivers (144a and 144b) is 40 dBA, and 42 dBA for the DA approved dwelling.

3.2 Methodology

3.2.1 Predictive Noise Model & Source Database

Rail noise levels at nearby noise-sensitive receivers were calculated using the Environmental Noise Model (ENM) (a proprietary computer program from RTA Technology Pty Ltd developed in conjunction with the EPA). The model included the rail spur section extending from the ARTC rail network junction to the VEP licensed premises (as defined in the approved operation's Environment Protection Licence [EPL] 21283).

Based on the same meteorological dataset as that used for the VEP EIS noise assessment, $L_{Aeq,Period}$ noise levels were predicted considering statistical occurrences of local weather conditions.

Noise levels and spectra were established using the Transport for NSW (TfNSW) standard rail noise database for locomotives and freight wagons. The database accounts for diesel motor noise from locomotives and rail-to-wheel noise for both wagons and locomotives. Levels can be adjusted for train speed, locomotive type, and rolling stock wheel defects.

Table 3-2 summarises the noise source levels and spectra used for modelling.

Table 3-2: Noise Source Sound Power Levels

Noise Source	Sound Power Level (dBA)	Octave Band Levels (dBZ)							
		31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Locomotive 82 Class (40 km/hr)	113.2[2]	111.8	112.4	112.6	112.6	109.7	108.2	106.2	99.7
Wagons (40 km/hr)	70.1/m[3]	72.6	72.5	70.0	67.2	65.8	64.9	64.0	59.7

NOTES:
1. dBA = A-weighted decibel; dBZ = Linear weighted decibel; Hz = Hertz; kHz = kilohertz.
2. Sound power level per locomotive.
3. Decibel per linear metre of train length.

3.2.2 Model Validation

Noise monitoring data of comparable rolling stock carried out in the Bylong valley (*Bylong Passing Loop Extension Noise & Vibration Assessment*, Wilkinson Murray, 2011; *Bylong East Duplication EA Noise & Vibration Assessment*, Wilkinson Murray, 2013) was used to validate the noise model. The freight rail noise data was based on approximately two hundred individual rail passbys measured between 200 and 640 m from the rail track, predominately at night in April and June.

3.2.3 Rail-to-Wheel Noise

Noise predictions only account for typical rail-wheel interaction with low-to-medium wheel defects and do not include prevailing wheel squealing and flanging noise associated with potential rail misalignment and deformation. It was assumed that Whitehaven would implement suitable mitigation and management measures to minimise wheel squealing and flanging noise, especially on curved rail sections. Such measures may include any of the following (or a combination thereof):

- Rail grinding and tamping during commissioning of the rail spur and on an as needed basis during the life of the VEP; and/or
- implementation of a rail lubrication program on sections of the rail spur if deemed necessary.

3.2.4 Assessment Scenarios & Rail Movements

Due to prevalent noise-enhancing meteorological conditions at night and the more stringent Project Rail Spur night-time noise criteria (**Table 3-1**) (also noting that the number of hourly rail movements at night is comparable to the day and evening, when averaged over each assessment period), the rail spur noise assessment focused on the night-time period (10.00 pm to 7.00 am). Compliance at night would infer compliance for the other assessment periods.

Rail noise assessment of the Project Rail Spur is based on peak daily maximum train movements as opposed to average daily movements. **Table 3-3** presents the peak daily maximum train movements assumed for the VEP EIS.

Table 3-3: Peak Daily Maximum Train Movements on Project Rail Spur

Project	Train Movements[1] - Peak Daily Maximum			
	Day	Evening	Night	24 Hour
VEP	8	4	6	18

NOTES:

1. Movement = arrival or departure of train.
2. Day: 7.00 am to 6.00 pm; Evening: 6.00 pm to 10.00 pm; Night: 10.00 pm to 7.00 am.

Consistent with the VEP EIS, the review has considered a locomotive configuration consisting of three 82 Class locomotives.

3.3 Noise Predictions & Discussion

Night-time $L_{Aeq,9hr}$ noise levels were predicted for the closest and most exposed noise-sensitive residential receivers, with results presented in **Table 3-4**. Demonstrated compliance at those receivers would infer compliance at all other noise-sensitive receivers. Mine-owned residential receivers are included for information only. Condition B7 of SSD-7480 requires that noise generated by transporting coal on the Project Rail Spur must not exceed the criteria listed in Table 4 of SSD-7480 (included in **Table 3-1**).

Also included in **Table 3-4** is a comparison with the VEP EIS noise predictions.

Table 3-4: Night-time Noise Predictions and Comparison with VEP EIS

Receiver ID	Night $L_{Aeq,9hours}$ (dBA)[1,2]					
	Detailed Design		VEP EIS[3]		Delta (dB)[4]	
	Local Meteorology	Calm Isothermal	Local Meteorology	Calm Isothermal	Local Meteorology	Calm Isothermal
Privately-Owned Residential Receivers						
127c	31	29	32	31	-1	-2
131a	29	28	32	31	-3	-3
131b	33	32	36	35	-3	-3
132	35	34	38	37	-3	-3
133a	19	18	22	21	-3	-3
141	35	33	37	36	-2	-3
143	28	27	29	28	-1	-1
144a	34	33	36	35	-2	-2
144b	39	38	42	41	-3	-3
146a	34	32	36	35	-2	-3

Receiver ID	Night $L_{Aeq,9hours}$ (dBA)[1,2]					
	Detailed Design		VEP EIS[3]		Delta (dB)[4]	
	Local Meteorology	Calm Isothermal	Local Meteorology	Calm Isothermal	Local Meteorology	Calm Isothermal
146b	34	32	36	35	-2	-3
147a	25	23	28	27	-3	-4
147b	8	7	12	12	-4	-5
153	20	19	24	23	-4	-4
160	16	15	18	17	-2	-2
1af	20	19	23	22	-3	-3
1y	40	39	45	44	-5	-5
Mine-Owned Residential Receivers[5]						
1v	35	34	43	42	-8	-8
1w	39	38	42	40	-3	-2
1z	27	26	28	27	-1	-1

NOTES:

1. $L_{Aeq,9hr}$ = The equivalent continuous A-weighted sound level over the night assessment period.
2. Noise predictions include façade reflection in accordance with the *Rail Infrastructure Noise Guideline* (NSW EPA, 2013).
3. Noise predictions based on VEP Submissions Report (Whitehaven, 2019).
4. Delta = VEP EIS prediction minus detailed design prediction.
5. Mine-owned residential receivers are not subject to rail noise criteria and are included for information only.

The results indicate that night-time noise levels would comply with the relevant criterion of 40 dBA at all privately-owned residential receivers. Based on the night-time assessment outcomes, compliance is inferred for the day and evening periods. As such, rail noise associated with the Project Rail Spur is not expected to impact on the acoustic amenity of the surrounding noise-sensitive receivers.

Whitehaven is committed to complying with Condition B7 of SSD-7480 and will conduct attended monitoring at the monitoring point N-AT3 as described in Section 5.2.1 of the VEP Noise Management Plan to verify compliance. In accordance with Condition B8 of SSD-7480 if Whitehaven has an agreement with an owner of a relevant residence or land to generate higher noise levels than described in Table 4 of SSD-7480 then those limits will not apply if the Department has been advised in writing of the terms of any such agreement.

In accordance with Condition B14(f) and (g) of SSD-7480 Whitehaven will ensure that the Project Rail Spur is only accessed by locomotives that are approved to operate under the noise limits in ARTC's EPL (No. 3142) and that the rolling stock has been designed, constructed and maintained to minimise noise.

A comparison of the noise results with the VEP EIS noise assessment predictions shows that predicted noise levels under local meteorology have generally decreased by 0-3 dB at the identified privately-owned residential receivers. This is in large part attributable to lower radiated noise from the rail spur structures. It is also noted that receiver 144b, which was predicted to exceed the night-time criterion of 40 dBA in the VEP EIS, is now expected to comply.

It was also determined that, should the DA approved dwelling on property 144 be constructed, noise levels at the receiver would comply with the receiver-specific night criterion of 42 dBA with the implementation of reasonable and feasible operational mitigation and management measures (in the absence of an agreement with the landowner). The measures will be implemented if a) the residence is built and b) monitoring indicates that night-time noise levels exceed 42 dBA at the residence.

4 LOW-FREQUENCY NOISE ASSESSMENT

A low-frequency noise (LFN) assessment was conducted to ascertain whether any of the identified receivers would be subject to a modifying factor correction due to dominant low-frequency content. If required, such correction would be applied to the predicted noise levels before comparing to the Project Rail Spur noise criteria in **Table 3-1**.

The NPfI provides a two-step methodology for assessing LFN:

1. Assessment of unbalanced spectrum (based on the difference between the C- and A-weighted predicted noise level); and
2. assessment of audibility (based on the emergence of predicted noise levels over nominated one-third octave low-frequency noise thresholds).

4.1 Representative Noise-Sensitive Receivers

For practical reasons, the LFN assessment was conducted for a selection of key receivers deemed representative of various zones surrounding the Project Rail Spur where privately-owned residential receivers are likely to be subject to similar LFN content.

Table 4-1 summarises the representative receivers and corresponding zones. The six LFN zones are shown in **Figure 4-1**.

Table 4-1: LFN Zones & Representative Receivers

LFN Zone	Representative Receiver
1	144b
2	131a
3	133a
4	146a
5	153
6	147b

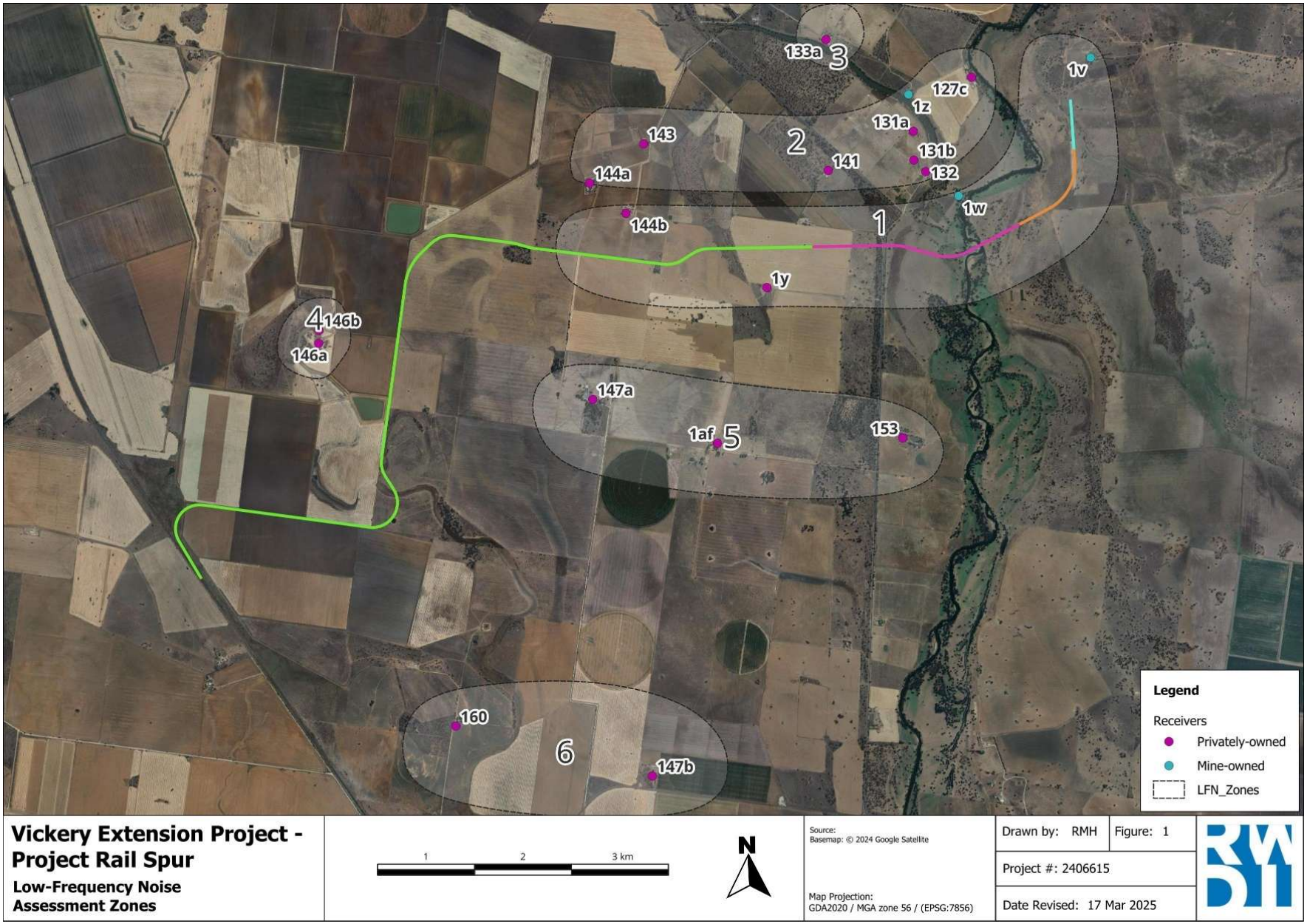

Figure 4-1: Low-Frequency Noise Assessment Zones

4.2 Low-Frequency Noise Levels

All operational noise predictions presented in the assessment are based on octave band levels ranging 31.5 Hertz (Hz) to 16 kilohertz (kHz). Predictions do not include one-third octave band levels in frequency bands ranging 10 Hz to 160 Hz as required for assessing LFN in accordance with the Fact Sheet C methodology of the NPfI. As such, noise predictions were extrapolated in the lower frequencies using a LFN spectrum shape deemed representative of the Project Rail Spur (**Table 4-2**).

It is important to note that the LFN spectrum shape, obtained from the RWDI proprietary database, is based on rail spur measurements conducted at relatively close distances from the rail spur (i.e. within 100 m of the rail spur).

Table 4-2: Representative LFN Spectrum Shape

Hz/dBZ	One-Third Octave $L_{Zeq,15min}$ Level												
Frequency (Hz)	**10**	**12.5**	**16**	**20**	**25**	**31.5**	**40**	**50**	**63**	**80**	**100**	**125**	**160**
dBZ	65	68	71	75	77	69	77	72	67	65	69	64	61

NOTE:
1. dBZ = decibel (Z frequency weighted).

4.3 Assessment of Unbalanced Spectra & Audibility

Using the resultant spectra (10Hz – 20 kHz), a C- minus A-weighted noise level assessment was carried out to determine the potential presence of unbalanced spectra exhibiting "dominant" levels in the low-frequency range at receivers surrounding the site.

Table 4-3 summarises the C- minus A-weighted noise level assessment results, with differences of 15 dB or more indicative of unbalanced spectra.

Table 4-3: C - A-Weighted Noise Level Assessment Results - Night

LFN Zone	Representative Receiver	C-A-Weighted $L_{Aeq,15min}$ Noise Level (dB)
1	144b	15.3
2	131a	21.3
3	133a	25.7
4	146a	17.3
5	153	25.3
6	147b	29.3

The results indicate that all representative noise-sensitive receivers (including the closest receivers 144b and 1y) would be exposed to unbalanced spectra containing "dominant" components in the low-frequency range of the spectrum. This is due to the relatively low rail noise emissions, which would reduce rapidly with distance.

As expected, the more distant zones (e.g. Zone 6) would be subject to more unbalanced spectra than the closer zones (e.g. Zone 1).

In accordance with the NPfI, the unbalanced spectra identified above were further considered and compared with the low-frequency audibility noise thresholds. LFN spectra for all representative receivers are presented in **Table 4-4**.

Table 4-4: LFN Spectra

Hz/dBZ	One-Third Octave $L_{Zeq,15min}$ Level												
Frequency (Hz)	**10**	**12.5**	**16**	**20**	**25**	**31.5**	**40**	**50**	**63**	**80**	**100**	**125**	**160**
Threshold Levels	**92**	**89**	**86**	**77**	**69**	**61**	**54**	**50**	**50**	**48**	**48**	**46**	**44**
Zone 1	37	40	43	47	49	41	49	44	39	36	34	31	28
Zone 2	34	37	40	44	47	38	46	41	36	32	29	25	21
Zone 3	29	32	35	39	41	32	40	35	31	26	21	16	13
Zone 4	34	37	40	44	47	38	46	41	36	33	30	26	23
Zone 5	29	32	35	39	42	33	41	36	31	27	22	17	14
Zone 6	21	24	27	31	34	25	33	28	23	18	12	7	5

NOTE:
1. dBZ = decibel (Z frequency weighted).

All spectra were found to be below the LFN threshold levels, indicating that privately-owned residential receivers surrounding the Project Rail Spur would unlikely be subject to LFN as defined by the NPfI and no modifying factor correction would be warranted.

It is important to note that the above LFN assessment is theoretical in nature and based on non-project specific LFN spectral data (**Section 4.2**). It is expected that site noise from the VEP would also interfere with the received noise profile at some of the identified receivers closer to the VEP. As such, it is recommended that LFN measurements be conducted as part of the targeted noise monitoring required under Project Approval SSD 7480 (Condition B11d) to confirm LFN emissions.

5 CONCLUSION & RECOMMENDATIONS

RWDI has conducted a review of the detailed design of the Vickery Extension Project Rail Spur. The review indicated material changes to the proposed bridge structures when compared with the VEP EIS, which are expected to lower the amount of radiated noise emanated from the structure, and increase ground effects attenuating noise levels at surrounding receivers.

The raised culvert, embankment and bridge sections proposed as part of the detailed design would generally be considered best practice and deemed to incorporate all reasonable and feasible noise mitigation measures, including suitable measures to minimise low frequency noise. Key mitigation measures incorporated into the detailed design include:

- Adoption of raised concrete culvert sections across the floodplain between the ARTC rail network and the Namoi River, replacing the steel, pylon-type structures assessed in the VEP EIS.
- Use of concrete rail bridge structures (Namoi River and Kamilaroi Highway Bridge and Stratford Creek Bridge), incorporating concrete piers (encased in steel tubes), pier heads, girders, decks and ballast walls, instead of steel rail bridge structures assumed in the VEP EIS.
- Inclusion of ballast on raised concrete culvert and bridge sections, which was not included in the VEP EIS design.
- An overall reduction in rail elevation relative to the VEP EIS reference design.

A rail noise assessment was conducted for the detailed design of the Project Rail Spur. Results demonstrated that noise levels would comply with the Project Rail Spur Noise Criteria set in Project Approval SSD 7480 at all surrounding privately-owned residential receivers and during all assessment periods. A comparison of the noise results with the VEP EIS noise assessment predictions also showed that predicted noise levels under local meteorology have generally decreased by 0-3 dB at the identified privately-owned residential receivers, thus demonstrating a lower noise impact when compared with the EIS.

For completeness, a low-frequency noise assessment was conducted and indicated that it is unlikely that any of the nearby noise-sensitive receivers would be subject to dominant low-frequency content warranting modifying factor corrections.

5.1 Recommended Noise Mitigation and Management Measures

Based on the review of the Project Rail Spur detailed designs, it is recommended to implement the following noise mitigation and management measures. These recommendations will be implemented by Whitehaven in accordance with Condition B11b of Project Approval SSD7480.

- Implement mitigation and management measures to minimise wheel squealing and flanging noise, especially on curved rail sections. This may include:
    - rail grinding and tamping during commissioning of the rail spur and on an as needed basis during the life of the Project;
    - implementation of a rail lubrication program on sections of the rail spur if deemed necessary; and/or
    - reduce train speed for sections of the rail spur if required.
- Following commissioning of the rail spur targeted attended noise monitoring will be undertaken at appropriate locations to determine the accuracy of predicted acoustic impacts (including low-frequency

noise) and effectiveness of any noise reduction measures, including monitoring during adverse inversion conditions. It is noted this is included as a commitment in Section 5.2.1 of the VEP Noise Management Plan (Whitehaven, 2025).

- As per Condition B11c of Project Approval SSD 7480:

  undertake commissioning trials of the Project Rail Spur to determine the optimal train speed to minimise noise impacts

- As per Condition B11d of Project Approval SSD 7480:

  Following commissioning of the spur line, undertake targeted noise monitoring to determine the accuracy of predicted acoustic impacts and effectiveness of any noise reduction measures.

  Targeted monitoring will be undertaken during winter months to capture noise emissions under temperature inversion conditions. Low-frequency noise monitoring should also be included as part of the targeted noise monitoring.

- Make provisions for the implementation of reasonable and feasible mitigation and management measures to ensure rail noise emissions do not impact on the DA approved dwelling on property 144 should it be constructed and night-time noise levels exceeds 42dB at the residence (in the absence of an agreement with the landowner).

6 STATEMENT OF LIMITATIONS

This report entitled *Vickery Extension Project – Review of Detailed Rail Spur Design*, 11 August 2026, was prepared by RWDI Australia Pty Ltd ("RWDI") for Whitehaven Coal Limited ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

APPENDIX A
RESUMES

ROMAN HAVERKAMP MAAS
SENIOR ENGINEER

T: 612 94374611 | Roman.Haverkamp@rwdi.com

A senior engineer with two decades of professional experience in environmental acoustics, Roman has consulted with a wide range of industries throughout Australia. He has lent his knowledge to numerous projects, routinely project managing and conducting environmental noise impact assessments involving detailed and complex noise models. Roman specializes in industrial, construction and transportation noise and vibration, with a particular focus on mines, collieries, and quarries. His experience in industrial noise stems from extensive involvement in numerous large-scale surface operating mining projects, including Tarrawonga Coal Mine, Vickery Coal Mine, Mount Pleasant Operation, Cadia Valley Operations, Maxwell Project, Maules Creek Coal Mine, and Mount Arthur Coal Mine.

Employment History

2020-Present
Senior Engineer, RWDI

2012-2020
Senior Engineer, Wilkinson Murray

2006-2012
Project Engineer, Wilkinson Murray

2003-2006
Technical Officer, Wilkinson Murray

Education

BA (Recording Arts) (Hons)

Certificate IV in Multimedia Production

Certificate IV in Audio Engineering

Distance Learning Program for Professional Education in Acoustics (Association of Australasian Acoustical Consultants)

Project Experience

Industry

- Vickery Coal Mine - Noise and Blasting Impact Assessments
- Mount Pleasant Operation - Noise and Blasting Impact Assessments & Noise Management Plan
- Cadia Valley Operations - Noise Impact Assessments
- Maxwell Project - Noise and Blasting Impact Assessment
- Maules Creek Coal Mine - Noise Impact Assessment
- Narrabri Mine - Noise Impact Assessments
- Ulan Coal Mine – Noise Impact Assessments
- Marulan South Limestone Mine – Noise and Blasting Impact Assessment
- Russell Vale Colliery - Noise Impact Assessments & Noise Management Plan
- Calga Sand Quarry - Noise Impact Assessments
- SUEZ Advance Waste Treatment Facility – Noise Impact Assessment
- AGL Camden Gas - Noise Impact Assessments

Construction

- Victoria Road Upgrade – Noise Monitoring and Management
- South Sydney Freight Line - Construction Noise and Vibration Impact Statements

Transport

- Cronulla Duplication
- Hume Highway Duplication Project – Operational Noise Impact Statement
- Pacific Highway, Oxley Highway to Kempsey - Environmental Impact Statement

BEN LAWRENCE, BE MECH(HONS), MIEAUST, MAAS
SENIOR TECHNICAL DIRECTOR

M: +61 414 549 499 | Ben.Lawrence@rwdi.com

Ben has over two decades experience assessing noise and vibration across a variety of industries and projects. His areas of expertise include advanced noise monitoring techniques, vibration measurement and diagnostic analysis, environmental noise assessment, rail noise assessment, building/architectural acoustics and mechanical services analysis. Ben has been involved with a number of large building projects, including acoustic design for the ABC Accommodation Project, the State Library of Victoria, Woolworths Norwest head office and the Foxtel relocation project. Other projects include noise monitoring, calculation and assessment for the Epping to Chatswood Rail Link (ECRL), Sydney Olympic Park, the Perth Urban Rail Development and Mount Arthur North Mine.

Selected Project Experience

Environmental/Infrastructure

- Yelgun to Chinderah Compliance Monitoring
- Penrith Lakes Sand Quarry
- West Camden Water Recycling Plant
- Adelaide State Aquatic Centre
- ANZAC Bridge dynamic analysis study
- Caltex Terminal, Kurnell
- Viva Energy Terminal, Gore Bay
- Western Sydney Airport EIS

Commercial

- ABC Accommodation Project, Ultimo
- Woolworths Norwest Head Office
- Ravesis Hotel, Bondi
- State Library of Victoria
- Oakdale West Industrial Estate
- Oakdale East Industrial Estate
- Industrial Estate - 132 McCredie Road, Smithfield
- Barangaroo Stages 1A and 1B
- Industrial Estate - 45-57 Moxon Road, Punchbowl

Fitouts

- Pitcher Partners Fitout, Darling Harbour
- Banco Chambers
- Australian Embassy, Bangkok

Residential & Other

- Garden World Residential subdivision, Braemar
- Trio Apartments, Camperdown NSW
- Islands Apartments, Fremantle
- St Augustine's College Creative Arts Centre
- Mount Wilga Private Hospital
- Gosford Hospital
- Wyong Hospital

Rail Infrastructure

- Epping to Chatswood Rail Link
- Doha Metro Project
- Kuala Lumpur KV MRT
- Gautrain Rail Project, South Africa
- Sydney Metro – Victoria Cross and Central Stations
- Central Precinct Renewal Project
- RIGA Station groundborne vibration assessment
- Sydney Metro – Sydenham to Bankstown

Employment History

2021-Present
Senior Technical Director, RWDI

2010-2020
Director Wilkinson Murray

2001-2010
Engineer, Wilkinson Murray

Education

Bachelor of Engineering (Mechanical), University of New South Wales

Affiliations

Member Institute of Engineers Australia (MIEA)

Member Australian Acoustical Society (MAAS)

Department of Planning, Housing and Infrastructure

Reference:

SSD-7480-PA-84

Tony Dwyer
Group Manager - Approvals and Biodiversity
VICKERY COAL PTY LTD
28/259 George Street
Sydney, NSW, 2000
31/08/2026

Sent via the Major Projects Portal only

Vickery Coal 2 - Rail Spur Design Noise Assessment

Dear Mr. Dwyer

I refer to your Rail Spur Design Noise Assessment, submitted as required by Schedule 2, Condition B11 of SSD-7480 as modified the consent to the NSW Department of Planning, Housing and Infrastructure (the Department).

The Department has carefully reviewed the Rail Spur Design Noise Assessment, version 2 August 2026 and is satisfied that the review demonstrates the final rail spur design incorporates all reasonable and feasible noise mitigation measures to minimise low frequency noise impacts.

Accordingly, the Planning Secretary has approved the Rail Spur Design Noise Assessment and notes that Whitehaven will implement the recommendations of the assessment in accordance with Condition B11(b) of the consent.

Should you wish to discuss the matter further, please contact Charissa Pillay, (Senior Planning Officer) on 02 99955944 or email compliance@planning.nsw.gov.au

Yours sincerely

Stephen O'Donoghue
Director
Resource Assessments

As nominee of the Planning Secretary