Appendix J

Noise Specialist Response

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Global Acoustics

Noise and Vibration Analysis and Solutions

14 January 2016

Rix's Creek Pty Limited
PO Box 4
East Maitland NSW 2323
Attention: John Hindmarsh

Dear John,

Regarding: Rix's Creek Extension Project Submissions

1 INTRODUCTION

This letter provides responses to submissions lodged with the Department of Planning and Environment (DP&E) regarding the Rix's Creek Mine (RCM) Expansion Project Environmental Noise Assessment (ENA). Two submissions were lodged regarding noise:

1. An agency submission was made by NSW Health; and

2. A public submission was lodged by Orbit Planning on behalf of R & J Wilkinson (Inverlea Pty Ltd), owners of Lot 32 & 33 DP 634692, No. 349 Bridgman Road, Singleton.

The following sections summarise the submissions, and provide additional information in response to issues raised.

2 ORBIT PLANNING

The Orbit Planning submission pertains to Lot 32 & 33 DP 634692, No. 349 Bridgman Road, Singleton (the subject lots), for which a planning proposal has been lodged with Singleton Council seeking rezoning from RU1 Primary Production to a mix of R1 General Residential and E2 Environmental Conservation.

2.1 Objections

The submission makes the following objections:

1. Future use of the subject lots as residential land has not been considered;

2. The western part of the subject lots are not included within any Noise Assessment Group (NAG); and

3. The submission seeks assurance that the proposed expansion of the mine and continued operation will not result in unlawful noise impacts on the subject lots.

2.2 Responses

1. Whilst not specifically included in the original vacant land assessment, the subject lots were included in the acoustic assessment by generating noise contours over the lot areas. This approach is standard practice for assessing vacant areas, as there are not currently individual residences to predict levels to. To improve the accuracy of the noise contours in the area, the models have been reprocessed with a higher density of receiver points over the subject lots. Updated noise contours over the subject lots and an assessment against Voluntary Land Acquisition and Mitigation Policy criteria are included in Attachment A.

2. NAG were developed to categorise existing private residential receptors into groups with similar acoustic environment. The eastern extent of the subject lots were allocated to NAG B due to proximity to the Great Northern Railway and RCM CHPP, and, the similarity of the existing acoustic environment to the background noise logging location located approximately 900 metres north of the subject lots. Noise from the Great Northern Railway will be, often, considerably higher than proposed criteria for the project. With consideration of the proposed residential development, the western extent of the NAG B boundary should be extended west to the Great Northern Railway. The subject lots and the vacant land immediately south would be incorporated into NAG B.

3. If approval of the project is granted, a development consent will be issued by DP&E, and a licence will be issued by the Environment Protection Authority (EPA). These documents will contain noise limits and conditions that RCM will be obligated to comply with. Noise limits and conditions are typically set with due consideration of the EIS, ensuring all reasonable and feasible noise mitigation controls are considered and implemented. RCM are committed to managing noise emission from the mine to comply with all noise limits and conditions provided in regulatory documents. Unlawful noise impacts on the subject lots should not result.

2.3 Submission Comments

The submission makes a series of comments, which are commented on in the following points.

1. The submission states that "*The existing mine has a history of noise complaints and there is a Pollution Reduction Program in place*".

   It is acknowledged that RCM has historically received noise complaints. A complaint history log is provided in the EIS. RCM has developed a noise management plan (NMP) that contains a contemporary complaint response protocol, and has implemented a proactive noise management system to reduce the incidence of noise complaints.

2. The submission states that "*The mine does not comply with the current conditions of consent in relation to noise limits*".

   A review of monthly attended compliance monitoring results over the past two years indicates no exceedance of current consent criteria has occurred during that period.

The submission states that "*the independent acoustic review commissioned by our client highlighted that they could see no reason to amend the Project Specific Noise Goal (PSNG) from the existing level in the Consent other than to bring them into line with current measurement practice, which we are advised would be 39dB(A) L_{eq} for daytime and 37 dB(A) L_{eq} for nighttime.*"

The reviewing acoustic consultant has estimated contemporary L_{Aeq} criteria for current consent conditions. 90Th percentile predictions for the Year 17 scenario are higher than these in some instances. Therefore, the assertion may be based on these predictions.

It is noted however, that conditions in the current consent apply under "average conditions" or "neutral atmosphere", and not during enhancing meteorological conditions. Model predictions presented in Table 4.7 and Table A.1 of the ENA are 90th percentile levels. As such, they represent the upper range of levels likely to be experienced during periods of meteorological enhancement. Comparison of these predictions with criteria that apply under neutral atmospheric conditions is not appropriate. Predictions for neutral atmospheric conditions are presented in Table 4.6 of the ENA; these predictions are well below consent criteria, indicating compliance is currently achieved, and would be throughout the life of the Project.

3. The submission states that "*the proposed mine expansion does not comply with intrusiveness criteria identified under the Industrial Noise Policy".*

Intrusiveness criteria outlined in the INP are known as Project Specific Noise Levels (PSNL). Section 1.4.1 of the INP describes the intent of PSNL:

The industrial noise source criteria set down in Section 2 are best regarded as planning tools. They are not mandatory, and an application for a noise producing development is not determined purely on the basis of compliance or otherwise with the noise criteria. Numerous other factors need to be taken into account in the determination. These factors include economic consequences, other environmental effects and the social worth of the development. The criteria help to determine consent/licence conditions because they provide information on the likely effect of any environmental noise associated with the development.

Section 10.1 of the INP states:

Where noise emissions from the site exceed the project-specific noise levels, the regulatory authorities and the noise-source manager need to negotiate achievable noise limits for the site. The project-specific noise levels should not be applied as mandatory noise limits. The project-specific noise levels supply the initial target levels and drive the process of assessing all feasible and reasonable control measures. Achievable noise limits result from applying all feasible and reasonable noise control measures. For sites with limited mitigation measures the achievable noise limits may sometimes be above the project-specific noise levels.

Clearly, the intent of the INP is for PSNL to be used as a planning tool, and a trigger for reasonable and feasible noise controls to be considered. Compliance with PSNL is not mandatory. Noise controls proposed for the project are in line with industry best practice.

4. The submission states that *"The mine seeks approval for a Project Specific Noise Goal which exceeds both the current conditions of consent and intrusiveness criteria under the INP"*.

   As described above, the current conditions of consent apply under neutral atmospheric conditions. Proposed noise criteria for the project would apply under enhancing atmospheric conditions. With consideration of meteorological enhancement, proposed noise criteria are considered more stringent than those in the current consent. As described in the above point, project specific criteria can be higher than PSNL in accordance with the INP.

5. The submission states that "*The mine seeks to rely on 'legacy noise' provisions in the INP to justify increasing permitted noise levels on nearby properties*".

   Chapter 10 of the INP provides guidelines for applying the policy to existing industrial premises. The proposed expansion meets necessary criteria for assessment under this approach. As discussed above, proposed criteria are considered more stringent than existing consent criteria, which do not apply during enhancing atmospheric conditions.

The final five paragraphs of Section 5.4 of the submission generally reiterate the assumption that proposed noise criteria for the project are higher than those in the existing consent, and that they do not comply with the INP.

The following general points are made in response to the submission:

- With consideration of meteorological effects, and adjustment between L_{A10} and L_{Aeq}, proposed criteria are more than 3 dB more stringent than those in the existing consent;

- Model predictions indicate a reduction in noise levels over the life of the project. Implementation of noise controls will further reduce noise emission from the site. A general improvement in off site noise levels is predicted relative to both historic and current situations; and

- Advancement of the mine remains in a direction away from Singleton, and away from the subject lots. Adoption of proposed criteria and implementation of noise mitigation and management strategies will serve to reduce noise levels in the area of concern.

3 DEPARTMENT OF HEALTH

3.1 Submission

The NSW Department of Health submission does not provide any objections, but rather points out that significant exceedances of PSNL are predicted for worst case scenarios. The submission acknowledges that the INP allows for exceedance of PSNL when response and mitigation measures are considered.

The submission states that: *"it would be preferable for the affected sensitive receivers if these measures were implemented sooner and that very strict controls were placed on operations during*

conditions that would lead to the noise levels predicted in Table 4.7: 90th Percentile Operational Predictions".

3.2 Response

RCM has recently purchased the Integra Open Cut mine which adjoins RCM to the north, with the resulting acquisition of ten fully attenuated Caterpillar 789 rear dump trucks and one fully attenuated Caterpillar 994 loader. This will allow the coal fleet to be fully noise attenuated, including the front end loader used to load them. Only five coal trucks are typically in operation, so the remaining attenuated Caterpillar 789 trucks can be used for overburden haulage in critical areas during enhancing meteorological conditions. A Caterpillar 992K loader has recently been moved from the Bloomfield site to replace an older Caterpillar 992C loader, and is currently in use on the RCM ROM pad.

These actions effectively result in earlier implementation of key noise control measures, which will tend to reduce noise emission in the earlier stages of the project.

RCM has developed a contemporary noise management plan, that outlines procedures for managing noise during enhancing meteorological conditions. The procedures are based on a program of proactive forecasting, attended monitoring, and reactive measures involving modifying operations to reduce noise emission to acceptable levels when required.

4 CLOSURE

I trust this information meets your requirements. If you have any questions or need further details please contact me.

Regards,

Jeremy Welbourne
Acoustics Engineer

Attachment A.

Figure 1 to Figure 4 present indicative 90th percentile noise contours for the day, evening, Night N1 (full operations) and Night N2 (modified operations) scenarios. Each contour set represents the maximum envelope of the four stages assessed (Years 2017, 2020, 2023 and 2026).

Figure 5 present indicative noise contours for neutral atmospheric conditions, and represents the maximum envelope of the four stages assessed.

Lot 32 & 33 DP 634692, No. 349 Bridgman Road, Singleton are indicated with blue boundaries. Lots with magenta boundaries are vacant lots indicated as proposed R1 General Residential zoning in the Singleton Council proposed land use plan included in the Orbit Planning submission.

Where applicable, contours indicating recommended maximum noise levels from Table 2.1 of the INP are highlighted red. These are used to provide an assessment of vacant land impact in accordance with the Voluntary Land Acquisition and Mitigation Policy (VLAMP). Further detail is contained in Section 3.3.2 of the ENA.

RCM is committed to managing noise emission through proactive and reactive noise management in order to comply with proposed noise criteria during periods of meteorological enhancement. Therefore, the modified night operations scenario is considered applicable for assessment of impact over vacant land for enhancing conditions (Figure 4). Noise contours for neutral atmospheric conditions apply for the full night operations scenario N1 (Figure 5). The percentage of area exceeding the relevant time period criterion is less than 25 percent across all time periods for Lot 32 & 33 DP 634692, and vacant lots indicated as proposed R1 General Residential zoning in the Singleton Council proposed land use plan.

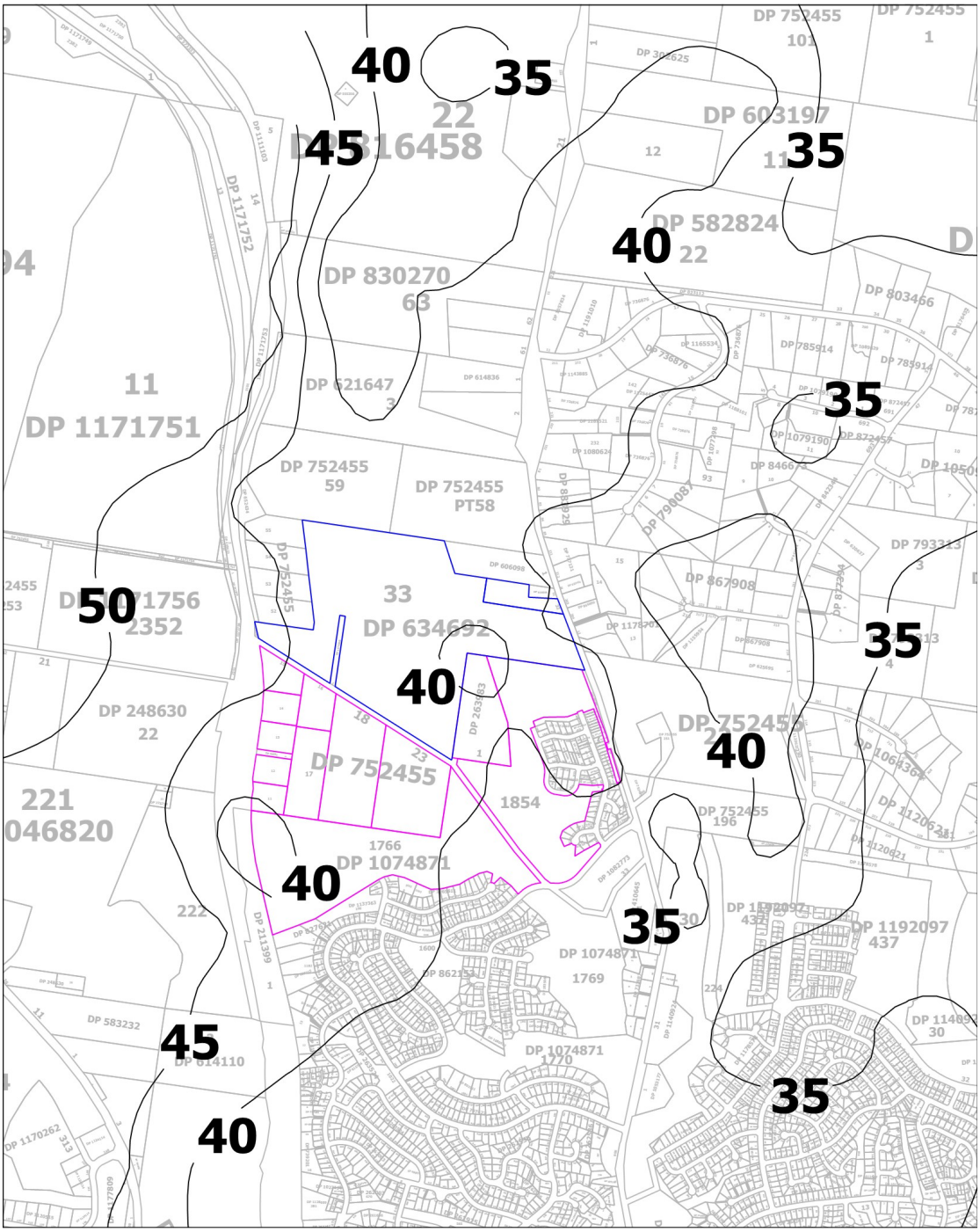

Figure 1: 90th Percentile Noise Contours – Day ($L_{Aeq,\ 15minute}$ dB)

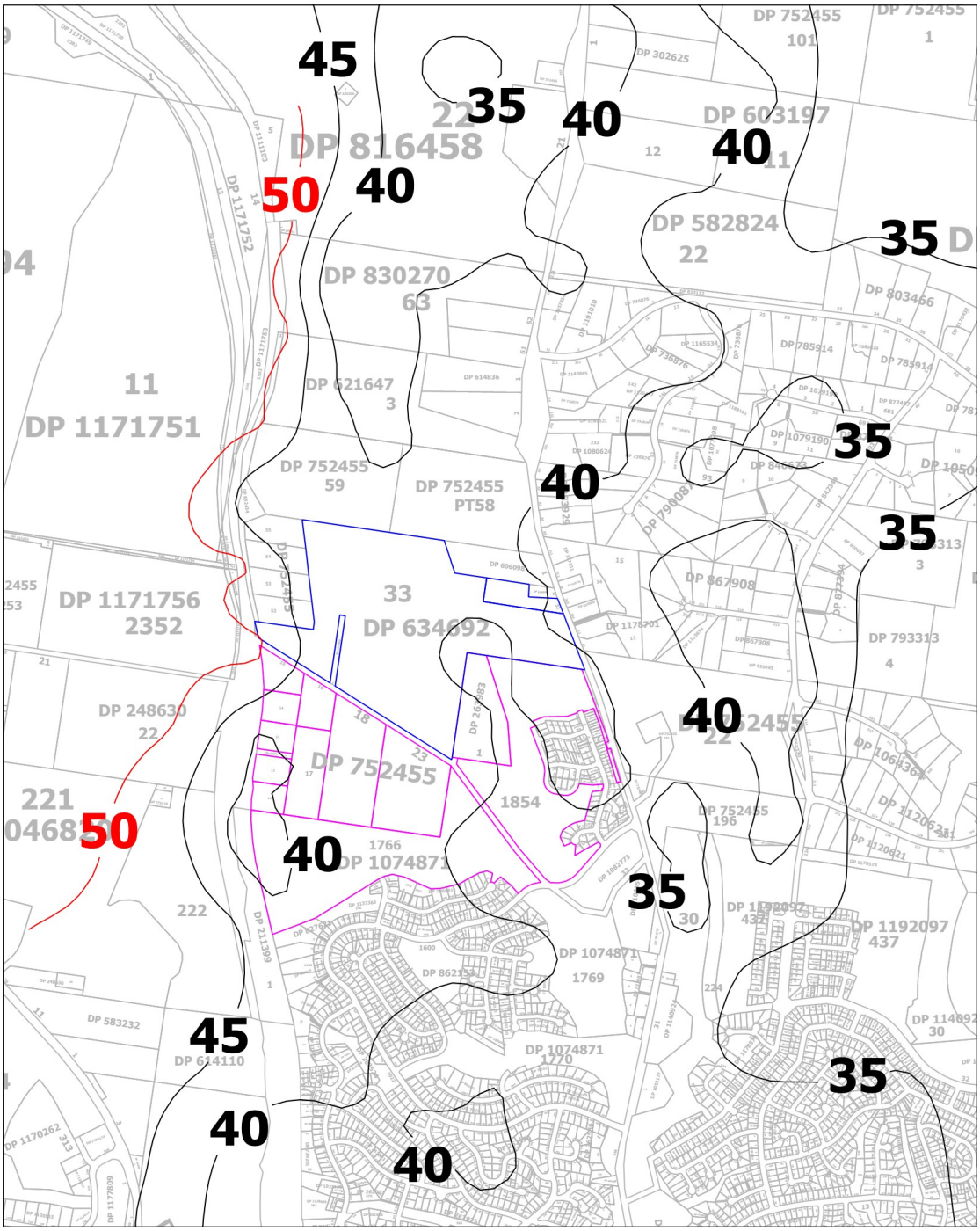

Figure 2 90th Percentile Noise Contours – Evening ($L_{Aeq,\ 15minute}$ dB)

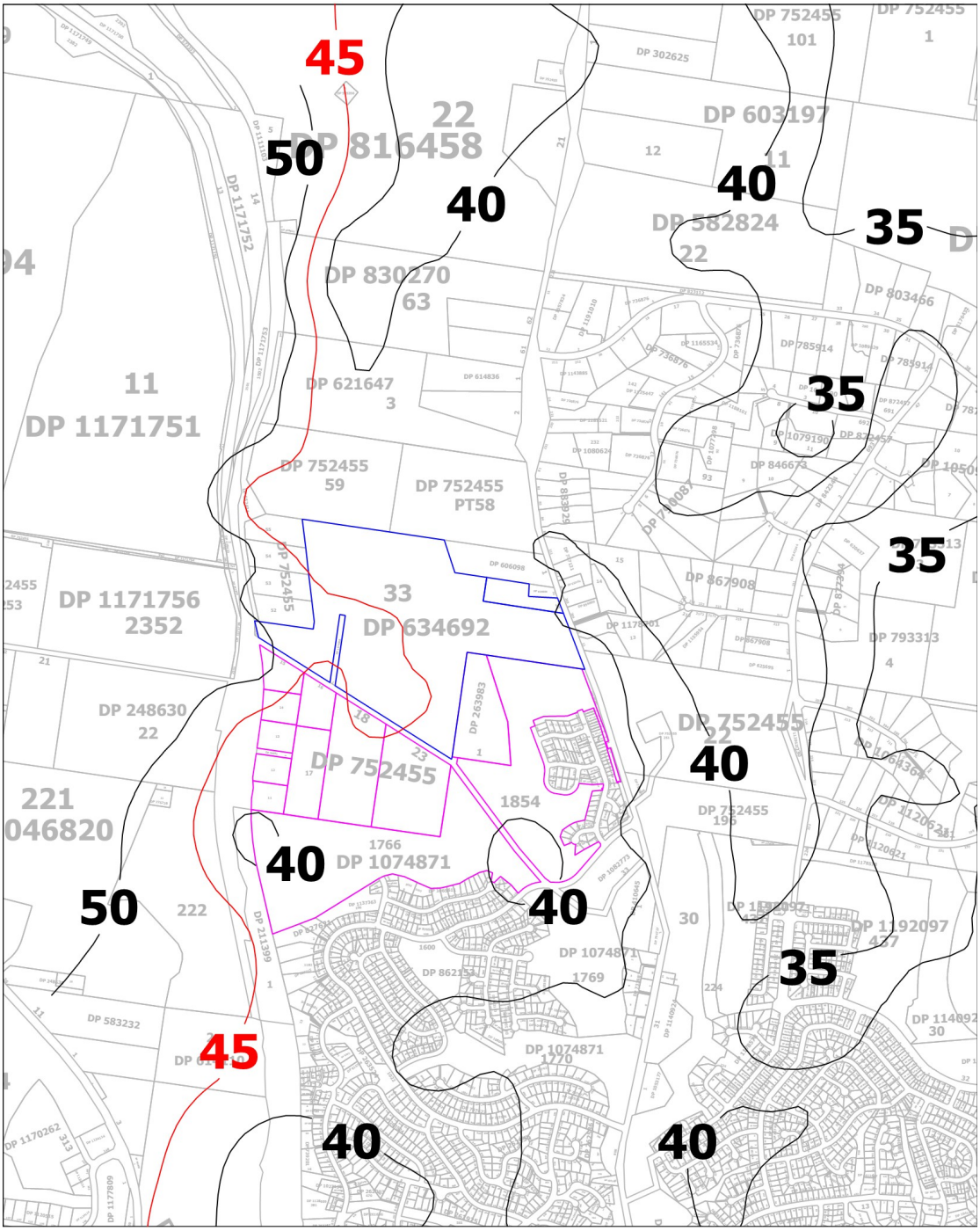

Figure 3: 90th Percentile Noise Contours – Night N1 ($L_{Aeq,\ 15minute}$ dB)

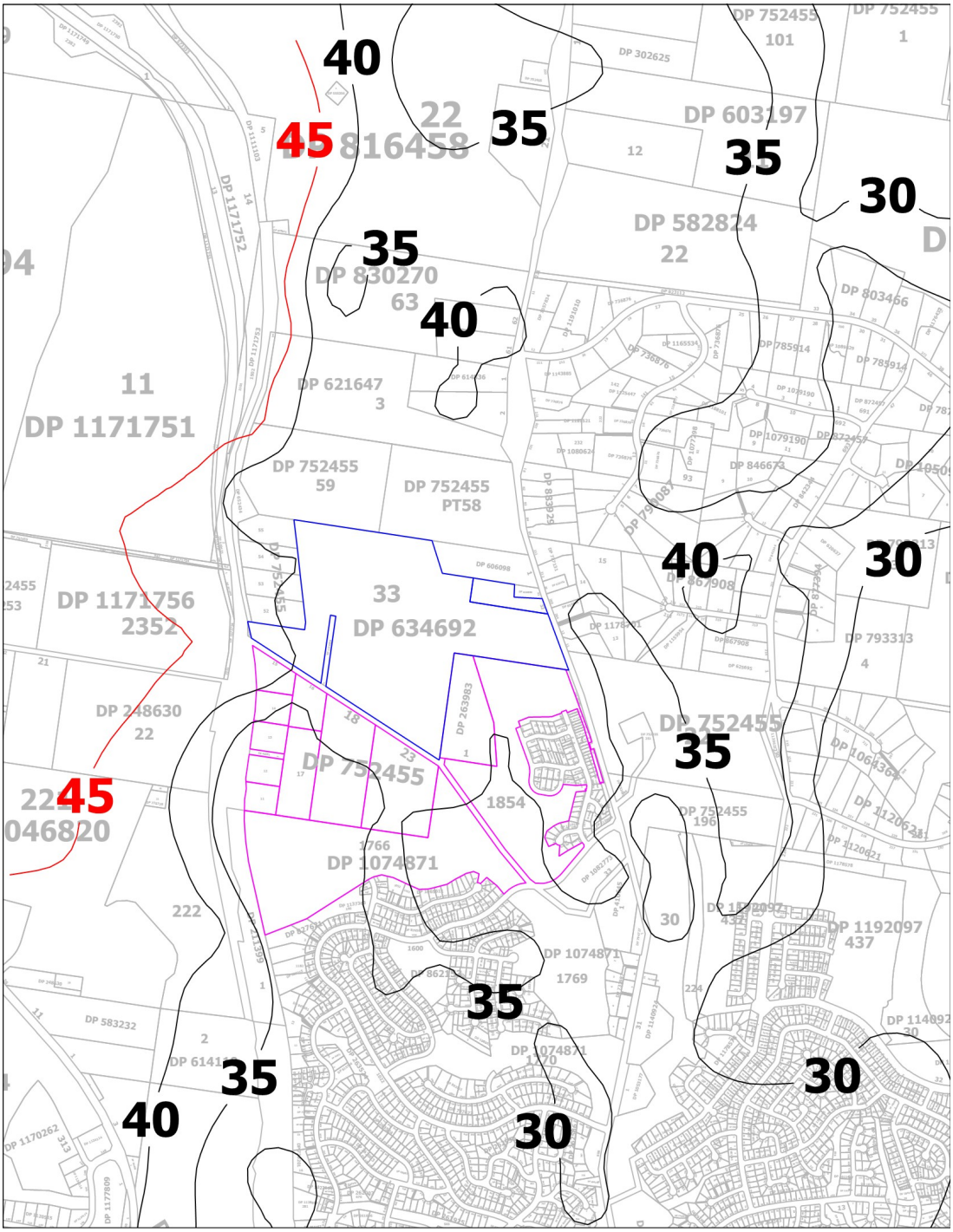

Figure 4 90th Percentile Noise Contours – Night N2 ($L_{Aeq,15minute}$ dB)

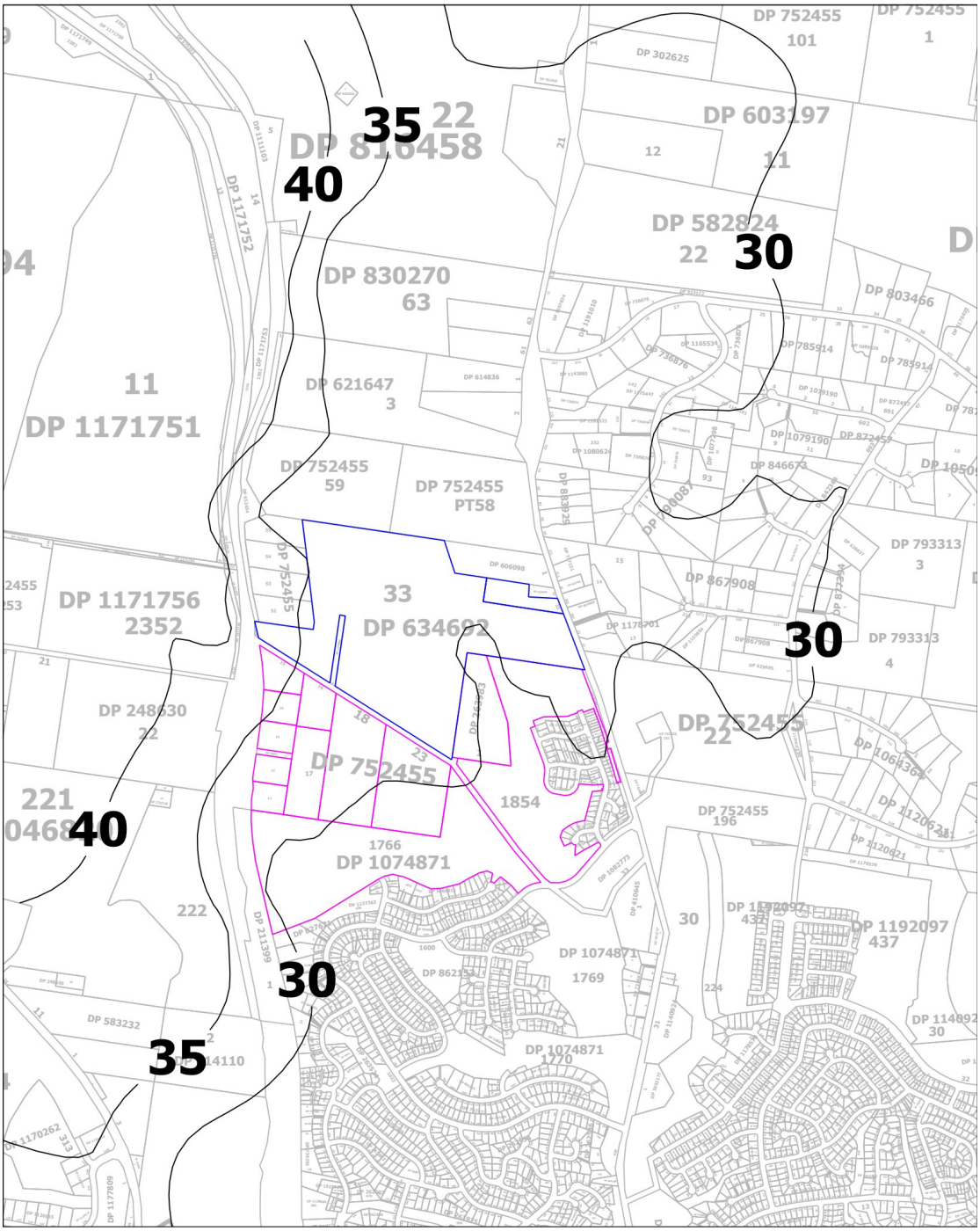

Figure 5 - Neutral Atmosphere Noise Contours – Night N1 ($L_{Aeq,15min}$ dB)

Global Acoustics

Noise and Vibration Analysis and Solutions

20 June 2016

Rix's Creek Pty Limited
PO Box 4
East Maitland NSW 2323
Attention: John Hindmarsh

Dear John,

Regarding: Rix's Creek Continuation of Mining Project

1 INTRODUCTION

This letter provides information regarding background noise levels, proposed noise criteria and proposed operational changes at the Rix's Creek Mine (RCM).

2 BACKGROUND NOISE LEVELS

Background noise survey graphs contained in Appendix E of the RCM Continuation of Mining Environmental Noise Assessment (the ENA) indicate relatively low noise levels during the night period.

Section 3.1 of the INP states:

> *Background noise levels need to be determined before intrusive noise can be assessed. The background noise levels to be measured are those that are present at the time of the noise assessment and without the subject development operating. Hence, for the assessment of modifications to an existing development, the noise from the existing development should be excluded from background noise measurements.*

As stated in the ENA:

> *The background noise surveys undertaken by Global Acoustics were conducted over two separate logging periods. During the first survey in July 2013, the presence of meteorological conditions that enhanced noise from RCM influenced measured background levels during some measurement periods. Once these periods were removed, that data set was deemed insufficient in quantity for calculation of reliable RBL. Therefore, a second survey was conducted during February 2014 to improve the integrity of the measured data set. Data recorded during both surveys were analysed to remove any data measured during periods of meteorological enhancement from RCM in order to ensure that background levels used in the determination of RBL was in the absence of any contributions from the mine.*

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It is noted that these background surveys were undertaken during preparation of the ENA, which was commenced during 2013. The surveys specifically targeted periods when meteorological enhancement from RCM was not present in order to comply with INP requirements.

The acoustic environment around RCM varies considerably depending on the direction of meteorological enhancement. It is common for the mine to be inaudible when wind direction is from receiver to source, but to regularly approach and exceed L_{Aeq} 40 dB in Noise Assessment Groups (NAG) A, B, D, G, H and K when wind direction is from the mine to the receiver. Enhancing wind directions for these NAG are generally from north to west.

2.1 RCM Attended Monitoring Program

RCM commenced a program of managing noise through attended noise monitoring in August 2014. The procedure is documented in the approved RCM Noise Management Plan (NMP). RCM provided nightly monitoring records from this monitoring program for the period January 2015 to April 2016 inclusive. Records provide the following information:

- Monitoring location;
- Time;
- Wind conditions;
- Temperature;
- Characteristics of RCM generated noise;
- Level of RCM generated noise (L_{Aeq});
- Whether the RCM predictive noise model indicated enhancement; and
- Characteristics of other noise sources.

Actions taken in response to measured levels exceeding noise management trigger levels, including results of follow up measurements are also documented.

These records were filtered to extract RCM generated L_{Aeq} measured levels during periods with wind direction from the north-west quadrant (W, WNW, NW, and NNW). A total of 969 measurements were taken during these conditions. Of these, 305 were excluded as RCM L_{Aeq} was either inaudible, not measurable, or wind speeds were too high.

Table 1 provides a summary of RCM L_{Aeq} measured during wind conditions from the north-west quadrant.

Table 1: RCM MEASURED L_{Aeq} DURING ENHANCING METEOROLOGICAL CONDITIONS, dB

Measured L_{Aeq}	Count	% of Valid Measurements	% of Total Measurements
Greater than 35 dBA	513	77%	53%
Greater than 36 dBA	458	69%	47%
Greater than 37 dBA	386	58%	40%
Greater than 38 dBA	320	48%	33%
Greater than 39 dBA	253	38%	26%
Greater than 40 dBA	177	27%	18%
Greater than 41 dBA	102	15%	11%
Greater than 42 dBA	56	8%	6%

Results in Table 1 indicate:

- RCM L_{Aeq} exceeded 40 dB during 18% of all measurements taken during these wind conditions, and 27% of valid measurements when RCM was not inaudible, not measurable, or excluded due to elevated wind speeds; and
- RCM L_{Aeq} exceeded 42 dB during 6% of all measurements taken during these wind conditions, and 8% of valid measurements when RCM was not inaudible, not measurable, or excluded due to elevated wind speeds.

RCM readily modifies operations in response to measured levels exceeding the noise management trigger level. Review of monitoring records indicates management response actions are typically effective in reducing off-site noise levels to below management levels.

Results demonstrate that RCM noise levels regularly reach proposed noise criteria in these NAG areas, and management actions are required to maintain noise levels within to proposed limits. It is likely that if management actions were not implemented, RCM L_{Aeq} would exceed proposed criteria by significant margins during periods of strong meteorological enhancement.

2.2 CRITERIA JUSTIFICATION

RCM propose the following noise criteria be applied to the Project:

- $L_{Aeq,15minute}$ 40 dB for NAG D to O inclusive, applicable to all time periods; and
- $L_{Aeq,15minute}$ 42 dB for NAG A, B and C, applicable to all time periods.

These criteria are higher than Project Specific Noise Levels (PSNL) determined in accordance with the INP.

Section 1.4.1 of the INP describes the intent of PSNL:

> *The industrial noise source criteria set down in Section 2 are best regarded as planning tools. They are not mandatory, and an application for a noise producing development is not determined purely on the basis of compliance or otherwise with the noise criteria. Numerous other factors need to be taken into account in the determination. These factors include economic consequences, other environmental effects and the social worth of the development. The criteria help to determine consent/licence conditions because they provide information on the likely effect of any environmental noise associated with the development.*

Section 10.1 of the INP states:

> *Where noise emissions from the site exceed the project-specific noise levels, the regulatory authorities and the noise-source manager need to negotiate achievable noise limits for the site. The project-specific noise levels should not be applied as mandatory noise limits. The project-specific noise levels supply the initial target levels and drive the process of assessing all feasible and reasonable control measures. Achievable noise limits result from applying all feasible and reasonable noise control measures. For sites with limited mitigation measures the achievable noise limits may sometimes be above the project-specific noise levels.*

Clearly, the intent of the INP is for PSNL to be used as a planning tool, and a trigger for reasonable and feasible noise controls to be considered. Compliance with PSNL is not mandatory.

The draft Industrial Noise Guideline (dING) also provides guidance on applying assessment noise levels to existing operations. dING Fact Sheet A states:

> *For the assessment of modifications to an existing development, the noise from the existing development should generally be excluded from background noise measurements. However, where a development has been operating continuously for a significant period of time and is considered a normal part of the acoustic environment, it may, under certain circumstances be included in the background noise assessment. The factors that need to be considered for this to occur are as follows:*
>
> - *the development must have been operating for a period in excess of ten (10) years;*
> - *the development must be operating in accordance with noise limits and requirements imposed in a consent or license and/or be applying best practice.*
>
> *Note: This is acknowledging the true purpose of the intrusiveness criterion, which is to limit significant change in the acoustic environment. It will not result in undue 'background noise creep', as the project amenity noise level will moderate against that.*

Measured ambient L_{A90} are often low during atmospheric conditions that do not cause enhancement of mining noise from RCM. PSNL were determined from Rating Background Levels (RBL) which were based on L_{A90} measured during such conditions. However, RCM is a long established operation, and can be considered a normal part of the acoustic environment. A review of monthly attended compliance monitoring results over the past two years indicates no exceedance of current consent criteria has occurred during that period. PSNL determined in the ENA are not considered applicable to RCM.

Outcomes of the ENA indicate compliance with PSNL would not be possible during adverse meteorological conditions. As outlined in Section 10 of the INP, negotiation of achievable noise levels for existing operations may occur once reasonable and feasible noise mitigation options have been investigated. All reasonable and feasible noise controls were evaluated in the ENA, and noise controls and management strategies proposed for the project are in line with industry best practice.

Acceptable night period amenity criteria for industrial noise sources specified in Table 2.1 of the INP are $L_{Aeq,period}$ 40 dB and $L_{Aeq,period}$ 45 dB for rural and suburban environments respectively. Applying a 2 dB adjustment to convert to $L_{Aeq,15minute}$, these criteria become $L_{Aeq,15minute}$ 42 and 47 dB respectively.

RCM has historically operated standard (unattenuated) equipment, and an open sided wash plant (no cladding). Measured levels in NAG B during attended compliance monitoring typically reach or exceed L_{Aeq} 42 dB during periods of strong meteorological enhancement due to proximity to the CHPP. Similarly, measured levels in NAG J, H and K often reach or exceed L_{Aeq} 40 dB during periods of strong meteorological enhancement, due to proximity to the RCM West Pit.

RCM has committed to phasing in an attenuated equipment fleet, and will provide cladding to the critical sides of the wash plant. Both of these actions should improve the acoustic environment to the south, southeast and east of the mine relative to the historic situation.

Model predictions in the ENA indicate proposed criteria would be exceeded during enhancing meteorological conditions, despite implementation of reasonable feasible noise controls. Proposed noise criteria are below acceptable night period amenity criteria, and are considered reasonable for an environment with a history of elevated mining noise.

3 PROPOSED OPERATIONAL CHANGES

RCM has recently purchased the Integra Open Cut mine which adjoins RCM to the north, with the resulting acquisition of ten fully attenuated Caterpillar 789 rear dump trucks and one fully attenuated Caterpillar 994 loader. This will allow the coal fleet to be fully noise attenuated, including the front end loader used to load them. Only five coal trucks are typically in operation, so the remaining attenuated Caterpillar 789 trucks can be used for overburden haulage in critical areas during enhancing meteorological conditions. A Caterpillar 992K loader has been moved from the Bloomfield site to replace an older Caterpillar 992C loader, and is currently in use on the RCM run of mine (ROM) pad.

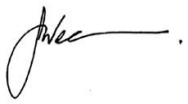
These actions effectively result in earlier implementation of key noise control measures, which will allow RCM to operate for longer periods during enhancing meteorological conditions before modifications to operations are required.

RCM has developed a contemporary noise management plan, that outlines procedures for managing noise during enhancing meteorological conditions. The procedures are based on a program of proactive forecasting, attended monitoring, and reactive measures involving modifying operations to reduce noise emission to acceptable levels when required. Implementation of the program should allow RCM to operate within proposed noise limits.

4 CLOSURE

I trust this information meets your requirements. If you have any questions or need further details please contact me.

Regards,



Jeremy Welbourne
Acoustics Engineer