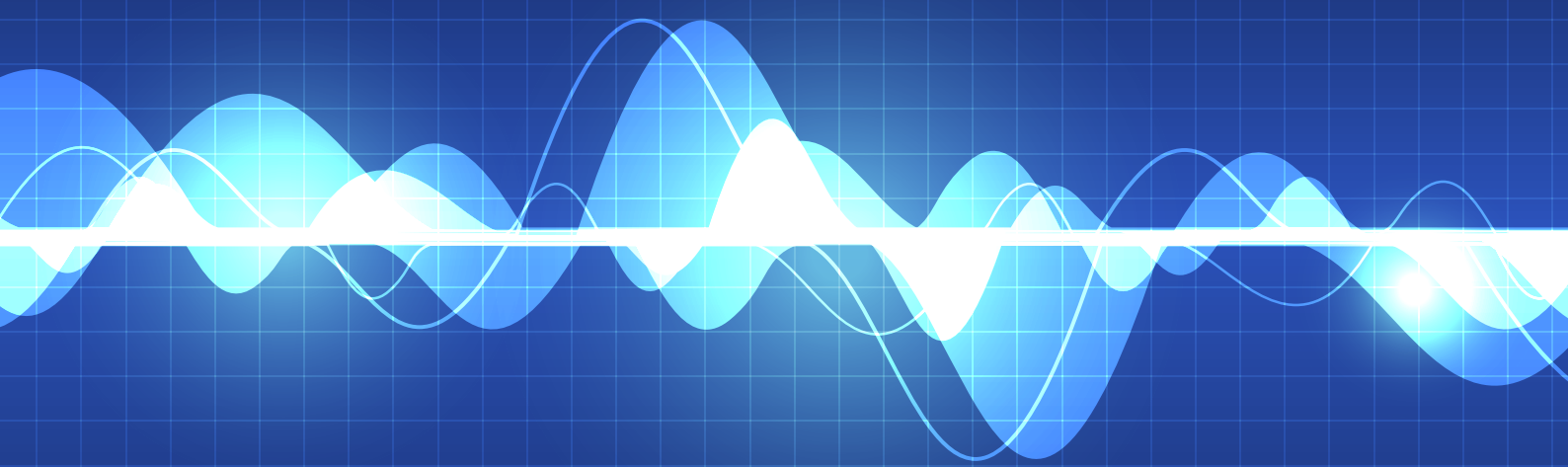


# Hume Coal and Berrima Rail Project

Updated Noise Assessment in response to recommendations R10 and R11 within the Independent Planning Commission Assessment Report dated 27 May 2019

---

Prepared for Hume Coal Pty Ltd  
April 2020





## Servicing projects throughout Australia and internationally

### SYDNEY

Ground Floor, 20 Chandos Street  
St Leonards NSW 2065  
T 02 9493 9500

### NEWCASTLE

Level 3, 175 Scott Street  
Newcastle NSW 2300  
T 02 4907 4800

### BRISBANE

Level 1, 87 Wickham Terrace  
Spring Hill QLD 4000  
T 07 3648 1200

### ADELAIDE

Level 1, 70 Pirie Street  
Adelaide SA 5000  
T 08 8232 2253

### MELBOURNE

Ground Floor, 188 Normanby Road  
Southbank VIC 3006  
T 03 9993 1905

### PERTH

Suite 9.02, Level 9, 109 St Georges Terrace  
Perth WA 6000  
T 02 9339 3184

### CANBERRA

Level 8, 121 Marcus Street  
Canberra ACT 2600

# Hume Coal and Berrima Rail Project

Updated Noise Assessment in response to recommendations R10 and R11 within the Independent Planning Commission Assessment Report dated 27 May 2019

## Report Number

---

J12055 IPC\_HCP and BRP\_Noise

## Client

---

Hume Coal Pty Ltd

## Date

---

1 April 2020

## Version

---

Final

## Prepared by

---



**Katie Teyhan**

Associate

1 April 2020

## Approved by

---



**Najah Ishac**

Director

1 April 2020

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

© Reproduction of this report for educational or other non-commercial purposes is authorised without prior written permission from EMM provided the source is fully acknowledged. Reproduction of this report for resale or other commercial purposes is prohibited without EMM's prior written permission.

# Table of Contents

|       |  |    |
|-------|--|----|
| 1     | Introduction                                     | 1  |
| 1.1   | Overview   | 1  |
| 1.2   | Purpose  | 2  |
| 2     | Updated noise assessment                         | 3  |
| 2.1   | Existing environment                             | 3  |
| 2.1.1 | Noise environment                                | 3  |
| 2.1.2 | Meteorology                                      | 4  |
| 2.2   | Assessment criteria                              | 4  |
| 2.2.1 | Operational noise                                | 5  |
| 2.2.2 | Low frequency noise                              | 8  |
| 2.2.3 | Sleep disturbance                                | 8  |
| 2.2.4 | Voluntary land acquisition and mitigation policy | 9  |
| 2.2.5 | Construction noise                               | 11 |
| 2.3   | Impact assessment                                | 12 |
| 2.3.1 | Overview   | 12 |
| 2.3.2 | Operational noise - HCP                          | 12 |
| 2.3.3 | Operational noise - BRP                          | 16 |
| 2.3.4 | VLAMP  | 17 |
| 2.3.5 | Sleep disturbance                                | 17 |
| 2.3.6 | Cumulative noise                                 | 19 |
| 2.3.7 | Construction noise                               | 20 |
| 2.4   | Noise monitoring and management                  | 21 |
| 3     | Conclusion                                       | 22 |

## Tables

|           |   |   |
|-----------|---|---|
| Table 2.1 | Noise catchment areas - adopted RBLs and estimated existing industrial noise levels | 3 |
| Table 2.2 | Amenity - Recommended and project noise levels from industrial noise sources        | 6 |
| Table 2.3 | Project noise trigger levels, dB  | 7 |
| Table 2.4 | Significance of residual noise impacts (NPfI 2017)                                  | 8 |
| Table 2.5 | Sleep disturbance screening criteria for residential assessment locations           | 9 |

|            |  |    |
|------------|--|----|
| Table 2.6  | Characterisation of noise impacts and potential treatments (VLAMP 2018)  | 11 |
| Table 2.7  | Construction noise management levels for residences  | 12 |
| Table 2.8  | Predicted operations noise levels  | 13 |
| Table 2.9  | Assessment location IDs characterised according to predicted noise levels and PNTL in accordance with the NPfI and VLAMP | 15 |
| Table 2.10 | Predicted operations noise levels – rail maintenance facility (from BRP NVAR)  | 17 |
| Table 2.11 | Maximum noise levels at most affected residential assessment locations   | 18 |

## Figures

|            |  |    |
|------------|--|----|
| Figure 2.1 | General approach to decision-making during the assessment process (VLAMP 2018) | 10 |
|------------|--|----|

# 1 Introduction

## 1.1 Overview

Hume Coal Pty Limited (Hume Coal) proposes to construct and operate an underground coal mine and associated mine infrastructure in the Southern Coalfield of New South Wales (NSW) (the Hume Coal Project). The mine will produce metallurgical coal with a secondary thermal coal product. Around 50 million tonnes (Mt) of run-of-mine coal will be extracted from the Wongawilli Seam via a non-caving mining system, resulting in approximately 39 Mt of saleable coal over a project life of about 23 years, including construction and rehabilitation. The Project area is located to the west of Moss Vale, in the Wingecarribee local government area (LGA).

Hume Coal is also seeking approval in a separate development application for the construction and operation of a new rail spur and loop, known as the Berrima Rail Project. Coal produced by the Hume Coal Project will be transported to port by rail for export or to domestic markets also by rail via this new rail spur and loop. The Hume Coal Project and the Berrima Rail Project together form ‘the Project’.

A full description of the Hume Coal Project, including the location at a regional scale, the project areas and the indicative mine and surface infrastructure plans, is provided in the IPC response report (EMM 2020), to which this report is appended.

Approval for the Project is being sought under Part 4 Division 4.1 (State significant development) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and has been under assessment from 2015 to present. A detailed description of the environmental assessment process to date provided in Hume Coal’s response to the IPC assessment report (EMM 2020), to which this supplementary noise assessment is appended.

The noise and vibration assessment for the EIS was presented in the following reports:

- *Hume Coal Project, Noise and Vibration Assessment Report*, prepared by EMM on 13 February 2017 and presented as Appendix I to the Hume Coal Project EIS (hereafter the HCP NVAR); and
- *Berrima Rail Project, Noise and Vibration Assessment Report*, prepared by EMM on 1 March 2017 and presented as Appendix E to the Berrima Rail Project EIS (hereafter the BRP NVAR).

Further information relating to noise and vibration was also provided in Chapter 14 – Noise and Vibration and Chapter 22 – Health of the *Hume Coal Project and Berrima Rail Project, Response to Submissions, Main Report, Volume 1*, prepared by EMM in June 2018.

The Independent Planning Commission NSW (IPC) released an assessment report in relation to the Hume Coal Project and Berrima Rail Project (collectively, the Project) on 27 May 2019, titled *Independent Planning Assessment Report in relation to the Minister for Planning’s request dated 4 December 2018 under Section 2.9(1)(d) of the Environmental Planning and Assessment Act 1979* (IPC 2019) and herein referred to as ‘the IPC assessment report’.

The IPC assessment report contained 485 comments and 30 detailed recommendations within 18 themes, of which noise was included. The IPC assessment report presents the following two recommendations relating to the specific additional information that the IPC requires for the assessment of noise.

- **R10** The Department is to consider and advise if Assessment Location No 7 should be afforded mitigation rights under the application of the Noise Policy for Industry.
- **R11** The Applicant and Department should explore opportunities to further mitigate noise impacts. Such opportunities may include more extensive noise monitoring, closer attention to atmospheric conditions,

incorporation of any recently developed rail and rolling stock modifications, construction of noise bunds and physical barriers and stop-work when exceedances are observed.

## 1.2 Purpose

In responding to R10, the Applicant has now considered the implication of assessing the Project in accordance with the current NSW noise policy and relevant guidelines. This has afforded the opportunity to contemporise the assessment to current policies. Two key NSW noise guidance documents have been updated since the preparation of both the HCP NVAR and the BRP NVAR for the Project as follows:

- The Industrial Noise Policy (INP) (EPA, 2000) has been replaced by the Noise Policy for Industry (NPfI) (EPA, 2018) as referenced in R10;
- The Voluntary Land Acquisition and Mitigation Policy (VLAMP) originally released by the NSW Government in 2014 was updated in 2018.

Furthermore, additional mine planning has resulted in improvements to the mine schedule and therefore review of the requirements of the temporary coal reject stockpiles. Refinement of the requirements of temporary coal reject stockpiles included updates to the designed angles of repose and a slight (4 m) increase in height to the main (eastern reject stockpile) requiring a total height of 19 m. The main (eastern) temporary coal reject stockpile was modelled to a height of 15 m previously in the HCP NVAR and so the noise modelling was updated to assess compliance with relevant legislation.

## 2 Updated noise assessment

### 2.1 Existing environment

#### 2.1.1 Noise environment

The method described in the NPfI for quantifying the existing acoustical environment and the rating background level (RBL) of noise for green-field developments is similar to that described in the INP with some minor differences in data exclusion criteria. These differences in methodology result in no change to the measured ambient noise levels presented in Section 2 of the both the HCP NVAR and the BRP NVAR which relate to residential properties potentially exposed to noise from proposed operations of the Project.

One of the key differences between the NPfI and the INP is the minimum RBL applied for the daytime period. The minimum RBL for daytime as per the NPfI is 35 dB which is an increase of 5 dB compared to that provided in the INP. This would result in an increase to the “Final background noise level, RBL” at several monitoring locations during the daytime. Hence, where the final RBL is 35 dB or less for the day period, the NPfI minimum background noise level of 35 dB has been adopted. There is no change to the evening and night periods. This approach has been adopted for this updated assessment to conform to NPfI methods.

The adopted background noise levels for each noise catchment area (NCA) are presented in Table 2.1.

The updated assessment resulted in an increase in the daytime RBL from 30 dB to 35 dB, in these noise catchment areas: NCA1, 2, 4 and 5 (compared with Table 2.2 in each of the HCP NVAR and BRP NVAR). There were no changes to the ‘estimated existing  $L_{Aeq}$  industrial noise contribution’ for the Project.

**Table 2.1 Noise catchment areas - adopted RBLs and estimated existing industrial noise levels**

| Noise catchment area<br>(adopted noise logger results) | Period  | Adopted background noise level,<br>RBL, dB <sup>1,2</sup> | Estimated existing $L_{Aeq}$ industrial<br>noise contribution, dB |
|--|---------|---|---|
| NCA1, NCA2, NCA5<br>(BG1 and BG4)                      | Day     | 35  | Nil   |
|  | Evening | 30  | Nil   |
|  | Night   | 30  | Nil   |
| NCA3<br>(BG5)  | Day     | 35  | 45  |
|  | Evening | 34  | 45  |
|  | Night   | 31  | 45  |
| NCA4<br>(NPfI minimum)                                 | Day     | 35  | 39  |
|  | Evening | 30  | 39  |
|  | Night   | 30  | 39  |
| NCA6<br>(BG11)   | Day     | 45  | Nil   |
|  | Evening | 45 <sup>1</sup>   | Nil   |
|  | Night   | 38  | Nil   |
| NCA7<br>(BG12)   | Day     | 41  | Nil   |
|  | Evening | 41 <sup>1</sup>   | Nil   |
|  | Night   | 35  | Nil   |

Notes: 1. In accordance with the NPfI, the day RBL is adopted where the evening RBL is measured to be higher than day, evening RBL is adopted where the night RBL is measured to be higher than evening.



## 2.1.2 Meteorology

### i General approach

To account for the influence of meteorological conditions in the noise impact assessment, the NPfI requires assessment of noise under standard and noise-enhancing weather conditions, if found to be relevant. The NPfI defines these as follows:

- Standard meteorological conditions: defined by stability categories A through to D with wind speeds up to 0.5 m/s at 10 m above ground level (AGL) for day, evening and night periods.
- Noise-enhancing meteorological condition: defined by stability categories A through to D with light winds (up to 3 m/s at 10 m AGL) for the day and evening periods; and stability categories A through to D with light winds (up to 3 m/s at 10 m AGL) and/or stability category F with winds up to 2 m/s at 10 m AGL.

Fact Sheet D of the NPfI specifies the following two options to consider meteorological effects:

1. Adopt the noise-enhancing meteorological conditions for all assessment periods for noise impact assessment purposes without an assessment of how often these conditions occur – a conservative approach that considers source-to-receiver wind vectors for all receivers and F class temperature inversions with wind speed up to 2 m/s at night; or
2. Determine the significance of noise-enhancing conditions. This involves assessing the significance of temperature inversions (F and G class stability categories) for the night-time period and the significance of light winds up to and including 3 m/s for all assessment periods during stability categories other than E, F or G. Significance is based on a threshold of occurrence of 30% determined in accordance with the NPfI provisions. Where noise-enhancing meteorological conditions occur for less than 30% of the time, standard meteorological conditions may be adopted for the assessment.

The general approach adopted in the HCP NVAR and BRP NVAR for consideration of assessable meteorological conditions for noise modelling purposes is consistent with the NPfI option 2, that is determining the significance of noise-enhancing meteorological conditions. This updated assessment has adopted the same approach and hence meteorological effects modelled are unchanged from the HCP NVAR and BRP NVAR.

## 2.2 Assessment criteria

As described in the previous section, the increase in the adopted RBL during the daytime period at some locations would have the effect of increasing the relevant construction and industrial operational noise criteria during the day at some assessment locations. There would be no change to the industrial noise criteria established for evening and night-time periods which are the limiting periods.

The procedures for the assessment of low frequency noise (LFN) and likelihood of sleep disturbance have also been revised with the NPfI. The assessment of LFN was not relevant to the BRP NVAR and has not been considered further. With regard to sleep disturbance, application of the NPfI provides an updated  $L_{Amax}$  screening criteria and introduces a  $L_{Aeq,15minute}$  screening level at all locations. The implications of this to the outcomes of the sleep disturbance assessment are described in Section 2.3 of this report.

The update to the VLAMP has resulted in minor changes to the categorisation of residual noise impacts including consideration of both intrusive and amenity noise levels.

The updates in noise policy have no implications for the assessment of noise associated with road or rail traffic, and hence this updated assessment is limited to the defined industrial activities proposed.

### 2.2.1 Operational noise

This updated assessment has adopted the NPfl approach and hence assessment requirements for operational noise (eg criteria) and modelling methodologies (eg modelled meteorological conditions) have been updated where applicable.

The NPfl provides a framework and process for deriving noise criteria for consents and licences that enable the EPA to regulate premises that are scheduled under the NSW *Protection of the Environment Operations Act 1997* (POEO Act). The objectives of the NPfl are to:

- provide the noise levels that are used to assess both change in noise level and long-term noise levels;
- provide a clear and consistent framework for assessing environmental noise impacts from industrial premises and industrial development proposals;
- promote the use of best-practice noise mitigation measures that are feasible and reasonable where potential impacts have been identified; and
- support a process to guide the determination of achievable noise limits for planning approvals and/or licences, taking into account the matters that must be considered under the relevant legislation (such as the economic and social benefits and impacts of industrial development).

The NPfl provides two components to address noise impacts from industrial noise sources, namely, the intrusiveness noise level and the amenity noise level.

#### i Intrusiveness

For assessing intrusiveness, the background noise level must be measured. The intrusiveness noise level essentially means that the equivalent continuous noise level ( $L_{Aeq}$ ) of the source should not be more than 5 dB above the representative or rating background level (RBL).

#### ii Amenity

##### a Recommended amenity noise levels

‘Recommended amenity noise levels’ are presented in Table 2.2 of the NPfl. The recommended amenity noise levels represent the **total** industrial noise at a receiver location. The recommended amenity noise levels are specific to land use and associated activities, and are designed to protect the majority (90%) of community from being highly annoyed by industrial noise. The recommended amenity noise level relates only to industrial sources of noise and does not include road, rail and/or community noise. Recommended amenity noise levels relevant to the Project are shown Table 2.2 below.

##### b Project amenity noise levels

To ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, the ‘project amenity noise level’ for a new industrial development is the recommended amenity noise level (outlined in Table 2.2 of the NPfl and reproduced in Table 2.2 below) minus 5 dB. It is noted that this approach is based on a receiver being impacted by three or four individual industrial sites (or noise sources).

Where relevant, the minus 5 dB method was used for some assessment locations (ie NCA3). At most assessment locations the Project could ‘take up’ the whole of the amenity target at residences. This is in accordance with the NPfl for areas where there is low to nil existing or probable future industrial noise contributions.

For high-traffic areas, there is a separate amenity noise level, however this is only relevant to some assessment locations associated with the Project (ie those nearer to the Hume Motorway).

To standardise the time periods for the project amenity noise levels, the NPfI states that the  $L_{Aeq,15min}$  is equivalent to the  $L_{Aeq,period} + 3$  dB, unless robust evidence is provided for an alternative approach for the particular project being considered.

**Table 2.2**      **Amenity - Recommended and project noise levels from industrial noise sources**

| NCA                 | Receiver/Amenity Area  | Period <sup>1</sup> | Recommended amenity<br>$L_{Aeq,period}$ noise level <sup>2</sup> , dB | Project amenity noise level <sup>3</sup> ,<br>$L_{Aeq,15minute}$ |
|---------------------|------------------------|---------------------|---|--|
| NCA1, NCA2,<br>NCA5 | Residential - Rural    | Day                 | 50  | 53 <sup>4</sup> (50 + 3)   |
|                     |                        | Evening             | 45  | 48 <sup>4</sup> (45 + 3)   |
|                     |                        | Night               | 40  | 43 <sup>4</sup> (40 + 3)   |
| NCA3                | Residential - Suburban | Day                 | 55  | 53 (55 – 5 + 3)  |
|                     |                        | Evening             | 45  | 43 (45 – 5 + 3)  |
|                     |                        | Night               | 40  | 38 (40 – 5 + 3)  |
| NCA4                | Residential - Rural    | Day                 | 50  | 48 (50 – 5 + 3)  |
|                     |                        | Evening             | 45  | 43 (45 – 5 + 3)  |
|                     |                        | Night               | 40  | 38 (40 – 5 + 3)  |
| NCA6                | Residential - Rural    | Day                 | 50  | 53 <sup>4</sup> (50 + 3)   |
|                     |                        | Evening             | 45  | 48 (45 + 3)  |
|                     |                        | Night               | 40  | 43 <sup>5</sup> (40 + 3)   |
| NCA7                | Residential - Rural    | Day                 | 50  | 53 <sup>4</sup> (50 + 3)   |
|                     |                        | Evening             | 45  | 48 <sup>4</sup> (45 + 3)   |
|                     |                        | Night               | 40  | 43 <sup>4</sup> (40 + 3)   |

Notes: 1. Day 7 am to 6 pm; Evening 6 pm to 10 pm; Night 10 pm to 7 am. On Sundays and Public Holidays, Day 8 am - 6 pm; Evening 6 pm - 10 pm; Night 10 pm - 8 am.  
2. The  $L_{Aeq}$  index corresponds to the level of noise equivalent to the energy average of noise levels occurring over a measurement period.  
3. Recommended amenity noise levels from Table 2.2 of the NPfI, unless stated otherwise. Project amenity  $L_{Aeq,15min}$  noise level is the amenity noise level  $L_{Aeq,period} + 3$  dB as per the NPfI  
4. The ANL has been adopted unadjusted in accordance with the NPfI due to low to nil existing or probable future industrial noise contributions.

### iii      Project noise trigger levels

Project noise trigger levels (PNTLs) replace the term *Project specific noise levels (PSNLs)* previously used in the INP. PNTLs are generally equal to the lower of the derived intrusiveness and amenity noise levels. It is commonly acknowledged and accepted amongst regulators and industry that energy average noise levels are typically 3 dB higher over a 15-minute worst-case assessment period when compared to an entire day (11 hour), evening (4 hour) and night (8 hour) assessment period. To standardise the time periods for the intrusiveness and amenity noise levels, the NPfI states that the  $L_{Aeq,15min}$  is equivalent to the  $L_{Aeq,period} + 3$  dB, unless robust evidence is provided for an alternative approach for the particular project being considered.

The PNTLs for the operational phase of the project with respect to the above are provided in Table 2.3. It can be seen that the NPfI intrusiveness level (ie RBL plus 5 dB) becomes the PNTL for all NCAs for day, evening and night periods. Hence, the amenity noise levels are inconsequential to the assessment, although they are later used to determine mitigation measures.

**Table 2.3 Project noise trigger levels, dB**

| NCA              | Amenity Area | Period  | Adopted RBL <sup>1</sup> | Intrusiveness noise level <sup>2</sup> ,<br>L <sub>Aeq,15minute</sub> | Project amenity noise level <sup>3</sup> ,<br>L <sub>Aeq,15minute</sub> | Project noise trigger level (PNTL) <sup>5</sup> |
|------------------|--------------|---------|--------------------------|---|---|---|
| NCA1, NCA2, NCA5 | Rural        | Day     | 35                       | 40  | 53  | 40  |
|                  |              | Evening | 30                       | 35  | 48  | 35  |
|                  |              | Night   | 30                       | 35  | 43  | 35  |
| NCA3             | Suburban     | Day     | 35                       | 40  | 53  | 40  |
|                  |              | Evening | 34                       | 39  | 43  | 39  |
|                  |              | Night   | 31                       | 36  | 38  | 36  |
| NCA4             | Rural        | Day     | 35                       | 40  | 48  | 40  |
|                  |              | Evening | 30                       | 35  | 43  | 35  |
|                  |              | Night   | 30                       | 35  | 38  | 35  |
| NCA6             | Rural        | Day     | 45                       | 50  | 53  | 50  |
|                  |              | Evening | 45                       | 50  | 53 <sup>4</sup>   | 50  |
|                  |              | Night   | 38                       | 43  | 51 <sup>4</sup>   | 43  |
| NCA7             | Rural        | Day     | 41                       | 46  | 53  | 46  |
|                  |              | Evening | 41                       | 46  | 51 <sup>4</sup>   | 46  |
|                  |              | Night   | 35                       | 40  | 50 <sup>4</sup>   | 40  |

Notes:

1. RBL value taken from Table 2.1.
2. Equal to the RBL plus 5 dB.
3. Recommended amenity noise levels from Table 2.2 of the NPfI, unless stated otherwise. Project amenity L<sub>Aeq,15min</sub> noise level is the amenity noise level L<sub>Aeq,period</sub> + 3 dB as per the NPfI
4. The ANL has been corrected in accordance with the NPfI due to the high influence of existing road traffic noise levels, i.e., measured L<sub>Aeq,period</sub> (traffic) minus 10 dB.
5. The lowest of the intrusive and amenity noise levels.

#### iv Residual noise impacts

As a general guide, where all source and pathway feasible and reasonable noise mitigation measures have been applied, the significance of residual noise levels (that is, noise levels above the PNTL) are to be considered, as outlined in Table 4.1 of the NPfI, which has been reproduced in Table 2.4.

**Table 2.4 Significance of residual noise impacts (NPfI 2017)**

| <b>If the predicted noise level minus the project noise trigger level is:</b> | <b>And the total cumulative industrial noise level is:</b>  | <b>Then the significance of residual noise level is:</b> |
|---|---|--|
| ≤ 2 dB(A)   | Not applicable  | Negligible   |
| ≥ 3 but ≤ 5 dB(A)   | < recommended amenity noise level<br>or<br>> recommended amenity noise level, but the increase in total cumulative industrial noise level resulting from the development is less than or equal to 1dB | Marginal   |
| ≥ 3 but ≤ 5 dB(A)   | > recommended amenity noise level and the increase in total cumulative industrial noise level resulting from the development is more than 1 dB  | Moderate   |
| > 5 dB(A)   | ≤ recommended amenity noise level   | Moderate   |
| > 5 dB(A)   | > recommended amenity noise level   | Significant  |

Source: NPfI (EPA 2017).

### 2.2.2 Low frequency noise

Fact Sheet C of the NPfI provides guidelines for applying modifying factor corrections to account for specific characteristics of noise that may be considered more annoying than other noise at the same level, including low frequency noise (LFN) emissions. Although the NPfI provides a more thorough approach compared to that provided in the INP, at the time of preparing the HCP NVAR the draft LFN assessment guidelines (from the draft NPfI) were available. The draft assessment guidelines were utilised for the assessment of LFN from the Hume Coal Project and are consistent with those now provided in Fact Sheet C of the NPfI. Hence, no update is required in relation to the assessment of LFN from the Hume Coal Project.

### 2.2.3 Sleep disturbance

The Project seeks approval to operate during the night period (Monday to Saturday 10 pm to 7 am and Sundays and public holidays 10 pm to 8 am) which requires assessment of sleep disturbance in accordance with the NPfI. With regard to sleep disturbance, application of the NPfI provides an updated  $L_{Amax}$  screening criteria and introduces an  $L_{Aeq,15min}$  screening level, these are different to the criteria presented in Table 3.6 of the HCP NVAR.

The NPfI sleep disturbance screening criteria for all NCAs (residential assessment locations only) are provided in Table 2.5. The implications of this to the outcomes of the sleep disturbance assessment are described in Section 2.3.5 of this report.

**Table 2.5** Sleep disturbance screening criteria for residential assessment locations

| NCA                    | Adopted RBL, dB <sup>1</sup> | Sleep disturbance screening criteria, dB |                   |
|------------------------|------------------------------|--|-------------------|
|                        |                              | L <sub>Aeq,15minute</sub>                | L <sub>Amax</sub> |
| NCA1, NCA2, NCA4, NCA5 | 30                           | 40                                       | 52                |
| NCA3                   | 31                           | 40                                       | 52                |
| NCA6                   | 38                           | 43                                       | 53                |
| NCA7                   | 35                           | 40                                       | 52                |

Notes: 1. Night-time RBLs adopted from Table 2.1.

#### 2.2.4 Voluntary land acquisition and mitigation policy

The *Voluntary Land Acquisition and Mitigation Policy* (VLAMP September 2018) has been updated from the 2014 version utilised for the HCP NVAR and BRP NVAR. The update to the VLAMP has resulted in minor changes to the categorisation of residual noise impacts including consideration of both intrusive and amenity noise levels.

The VLAMP seeks to balance acquisition and mitigation obligations for mining operators that provide appropriate protections for landholders, where impacts are identified. The VLAMP states:

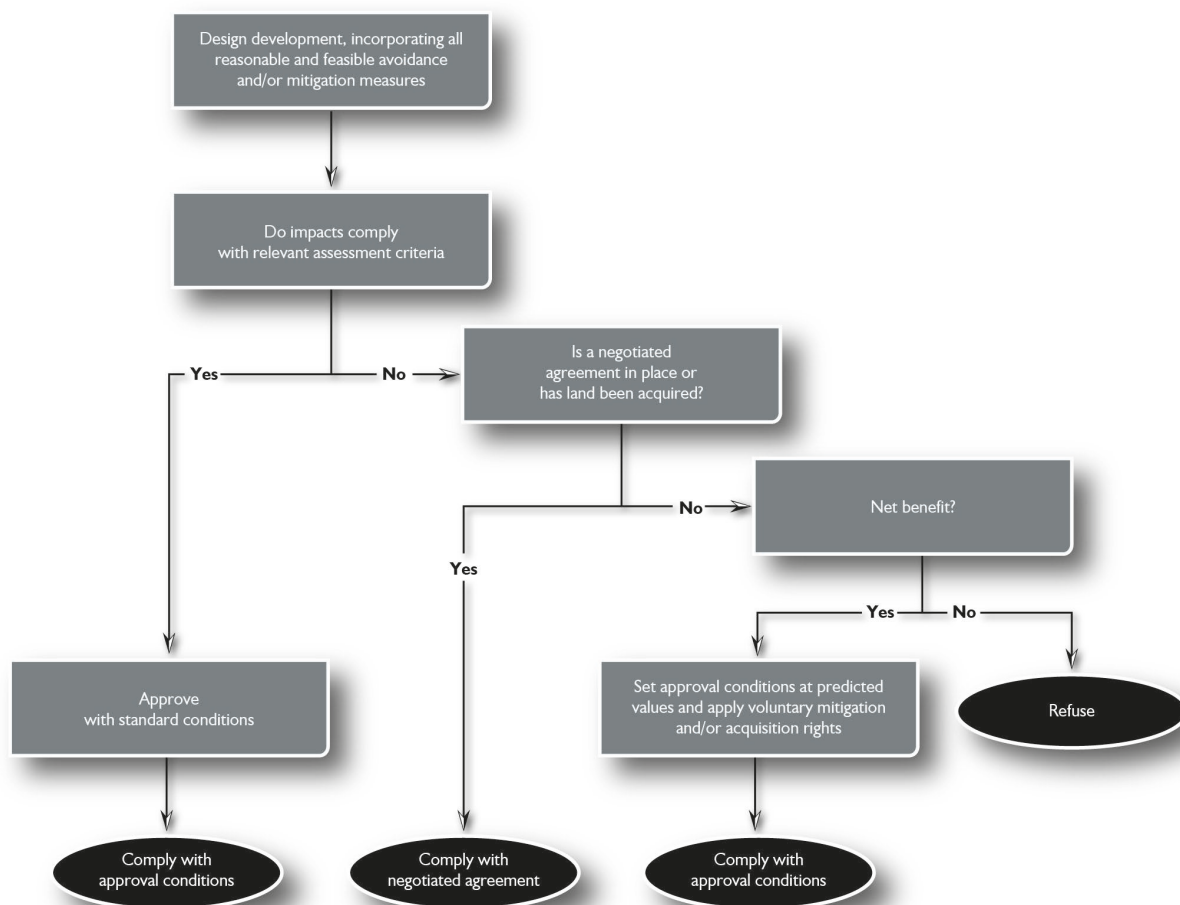
The NSW Government has established a range of policies and guidelines to guide the assessment of the potential impacts of mining, petroleum and extractive industry developments in NSW. These policies and guidelines include assessment criteria to protect the amenity, health and safety of people. They typically require applicants to implement all reasonable and feasible avoidance and/or mitigation measures to minimise the impacts of a development.

In some circumstances, it may not be possible to comply with these assessment criteria even with the implementation of all reasonable and feasible avoidance and/or mitigation measures. This can occur with large resource projects – such as large open cut mines - where the resources are at a fixed location.

However, it is important to recognise that:

- not all exceedances of the relevant assessment criteria equate to unacceptable impacts;
- a consent authority may decide that it is in the public interest to allow the development to proceed, even though there would be exceedances of the relevant assessment criteria, because of the broader social and/or economic benefits of the development; and
- some landowners may be prepared to accept higher impacts on their land, subject to entering into suitable negotiated agreements with the applicant, which may include the payment of compensation.

Consequently, the assessment process can lead to a range of possible outcomes. Figure 2.1 provides the general approach to decision-making during the assessment process that will be applied by a consent authority at the development application stage when assigning voluntary land acquisition and mitigation obligations.



**Figure 2.1** General approach to decision-making during the assessment process (VLAMP 2018)

Voluntary land acquisition and mitigation rights in the VLAMP are assigned to privately-owned dwellings based on the level of predicted noise above the project noise criteria, or the PNTL as defined in the NPfI. The characterisation of the noise impacts is generally based around the human perception to changes in noise levels in the environment. For example, a change in noise level of 1 to 2 dB is typically indiscernible to the human ear. The characterisation of a residual noise impact of 0 to 2 dB above the PNTL is therefore considered negligible. This characterisation of residual noise impacts is outlined in Table 1 of the VLAMP which is reproduced in Table 2.6.

**Table 2.6 Characterisation of noise impacts and potential treatments (VLAMP 2018)**

| Assessment period | If predicted noise minus PNTL is:  | Characterisation of impacts                     | Potential treatment  |
|-------------------|--|---|--|
| All time periods  | 0-2 dB(A)  | Impacts are considered to be <b>negligible</b>  | The exceedances would not be discernible by the average listener and therefore would not warrant receiver-based treatments or controls.  |
| All time periods  | 3-5 dB(A) <u>and</u> below the recommended amenity noise levels in Table 2.2 of the NPfI   | Impacts are considered to be <b>marginal</b>    | Provide mechanical ventilation / comfort condition systems to enable windows to be closed without compromising internal air quality / amenity.                                   |
| All time periods  | 3-5 dB(A) <u>and</u> above the recommended amenity noise levels in Table 2.2 of the NPfI, <u>but</u> the increase in total cumulative industrial noise level resulting from the development is <1 dB |   |  |
| All time periods  | 3-5 dB(A) <u>and</u> above the recommended amenity noise levels in Table 2.2 of the NPfI, <u>and</u> increase in total cumulative industrial noise level resulting from the development is >1 dB     | Impacts are considered to be <b>moderate</b>    | As for marginal impacts but also upgraded façade elements like windows, doors or roof insulation, to further increase the ability of the building façade to reduce noise levels. |
| Day and evening   | >5 dB(A) <u>and</u> below the recommended amenity noise levels in Table 2.2 of the NPfI  | Impacts are considered to be <b>significant</b> | Provide mitigation as for moderate impacts and see voluntary land acquisition provisions.  |
| Day and evening   | >5 dB(A) <u>and</u> above the recommended amenity noise levels in Table 2.2 of the NPfI  |   |  |
| Night             | >5 dB(A)   |   |  |

Source: VLAMP (NSW Government 2018).

Night-time criteria relevant to the acquisition of privately-owned land in accordance with the VLAMP 2018 result in no changes to those determined under the VLAMP 2014.

### 2.2.5 Construction noise

As for operational noise, the minimum RBL for the day period for construction noise as per the NPfI is 35 dB, which is an increase of 5 dB compared to that provided in the INP. Hence, where the final RBL is 35 dB or less for the day period, the NPfI minimum background noise level of 35 dB has been adopted to establish daytime 'standard hours' construction criteria, where relevant. There is no change to the criteria for the out-of-hours assessment as the NPfI minimum background noise level is 30 dB (same as in the INP).

The Project's construction noise management levels (NMLs) for recommended standard and out-of-hour periods are presented in Table 2.7 for residences. It is noted the sleep disturbance criteria provided in Section 2.2.3 has also been applied to the limited proposed construction activity during the night-time period.



The only change to the table below, in comparison to Table 3.8 of the HCP NVAR and Table 3.2 of the BRP NVAR, is the increase by 5 dB for the daytime period for noise catchments: NCA1, 2, 4 and 5; to both the adopted RBL and NML.

**Table 2.7 Construction noise management levels for residences**

| NCA                    | Period                    | Adopted RBL <sup>1</sup> | NML L <sub>Aeq,15min</sub> , dB |
|------------------------|---------------------------|--------------------------|---------------------------------|
| NCA1, NCA2, NCA4, NCA5 | Day (standard ICNG hours) | 35                       | 45                              |
|                        | Evening (out-of-hours)    | 30                       | 35                              |
|                        | Night (out-of-hours)      | 30                       | 35                              |
| NCA3                   | Day (standard ICNG hours) | 35                       | 45                              |
|                        | Evening (out-of-hours)    | 34                       | 39                              |
|                        | Night (out-of-hours)      | 31                       | 36                              |
| NCA6                   | Day (standard ICNG hours) | 45                       | 55                              |
|                        | Evening (out-of-hours)    | 45                       | 50                              |
|                        | Night (out-of-hours)      | 38                       | 43                              |
| NCA7                   | Day (standard ICNG hours) | 41                       | 51                              |
|                        | Evening (out-of-hours)    | 41                       | 46                              |
|                        | Night (out-of-hours)      | 35                       | 40                              |

Notes: 1. The RBLs adopted from Table 2.1.

## 2.3 Impact assessment

### 2.3.1 Overview

As described earlier, application of the NPfI to the Project provides a contemporary noise assessment of operational noise, sleep disturbance and construction noise.

Further, this updated noise assessment considers the 4 m increase to a total height of 19 m of the main (eastern) temporary coal reject stockpile. Updated noise impact assessment results are discussed in the following sections.

### 2.3.2 Operational noise - HCP

#### i Predicted noise levels

Noise modelling methodologies for the NPfI assessment were consistent with those adopted in the HCP NVAR. This included modelled meteorological conditions, equipment quantities, sound power levels, operational scenarios (including maximum noise level events) and adopted noise mitigation and/or management measures. Operational activities associated with the proposed 4 m increase in height of the main temporary reject stockpile were also modelled.

The predicted noise levels at each assessment location for each meteorological condition with all feasible and reasonable mitigation measures applied are provided in Table 2.8.

As a result of the increased 4 m height of the main temporary coal reject stockpile, noise predictions from the Hume Coal Project operations increase by up to 3 dB at locations 11 and 14, and by up to 2 dB at location 7. The 2 dB increase at location 7 has resulted in a change in the category of residual impact from negligible to marginal, and hence this means that assessment location 7 is entitled to mitigation. There were no changes to residual noise characterisations at any other assessment locations.

Shading indicates assessment locations where noise predictions fall into the following noise impact characterisations as described in Table 2.4 (ie as per the NPfl):

- negligible
- marginal
- moderate
- significant

The characterisation of residual noise levels considers the recommended amenity noise level of the NPfl, and the existing level of industrial noise where relevant. As shown, residual noise is only relevant to NCA1 assessment locations, which are not currently exposed to existing industrial noise. Hence predicted total cumulative amenity noise levels are not above those recommended in the NPfl.

**Table 2.8 Predicted operations noise levels**

| Assessment location (NCA) | Predicted noise level, L <sub>Aeq,15min</sub> , dB |          |                              | PNTL (D/E/N), L <sub>Aeq,15min</sub> dB | Overall characterisation of residual noise level |             |
|---------------------------|--|----------|------------------------------|---|--|-------------|
|                           | Day  |          | Night                        |   |  |             |
|                           | Standard   | Standard | Noise-enhancing <sup>1</sup> |   |  |             |
|                           |  |          |                              |   | NPfl   | VLAMP       |
| 1 (NCA1)                  | <35  | <35      | <35                          | 40/35/35                                | -  | -           |
| 2 (NCA1)                  | <35  | <35      | <35                          | 40/35/35                                | -  | -           |
| 3 (NCA1)                  | <35  | <35      | 35                           | 40/35/35                                | -  | -           |
| 4 (NCA1)                  | 37   | 35       | 38                           | 40/35/35                                | Marginal   | Marginal    |
| 5 (NCA1)                  | 37   | 35       | 38                           | 40/35/35                                | Marginal   | Marginal    |
| 6 (NCA1)                  | 37   | 35       | 38                           | 40/35/35                                | Marginal   | Marginal    |
| 7 (NCA1)                  | <40  | <35      | 39                           | 40/35/35                                | Marginal   | Marginal    |
| 8 (NCA1)                  | 38   | 35       | 38                           | 40/35/35                                | Marginal   | Marginal    |
| 10 (NCA1)                 | 40   | 37       | 40                           | 40/35/35                                | Marginal   | Marginal    |
| 11 (NCA1)                 | 43   | 39       | 42                           | 40/35/35                                | Moderate   | Significant |
| 12 (NCA1)                 | 44   | 40       | 43                           | 40/35/35                                | Moderate   | Significant |
| 14A, 14B (NCA1)           | 40   | 35       | 38                           | 40/35/35                                | Marginal   | Marginal    |
| 15 (NCA1)                 | 40   | 36       | 39                           | 40/35/35                                | Marginal   | Marginal    |
| 16 (NCA1)                 | 40   | 37       | 40                           | 40/35/35                                | Marginal   | Marginal    |
| 17 (NCA7)                 | <46  | <39      | 40                           | 46/46/40                                | -  | -           |
| 18 (NCA7)                 | <46  | <39      | <39                          | 46/46/40                                | -  | -           |
| 19 (NCA2)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -           |
| 20 (NCA3)                 | <40  | <36      | <36                          | 40/39/36                                | -  | -           |
| 21 (NCA3)                 | <40  | <36      | <36                          | 40/39/36                                | -  | -           |
| 22 (NCA3)                 | <40  | <36      | <36                          | 40/39/36                                | -  | -           |
| 23 (NCA3)                 | <40  | <36      | <36                          | 40/39/36                                | -  | -           |
| 24 (NCA2)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -           |
| 25 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -           |
| 26 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -           |
| 27 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -           |
| 28 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -           |
| 29 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -           |

| Assessment location (NCA) | Predicted noise level, L <sub>Aeq,15min</sub> , dB |          |                              | PNTL (D/E/N), L <sub>Aeq,15min</sub> dB | Overall characterisation of residual noise level |       |
|---------------------------|--|----------|------------------------------|---|--|-------|
|                           | Day  | Night    |                              |   |  |       |
|                           | Standard   | Standard | Noise-enhancing <sup>1</sup> |   |  |       |
|                           |  |          |                              |   | NPfi   | VLAMP |
| 30 (n/a <sup>2</sup> )    | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 31 (n/a <sup>3</sup> )    | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 32 (NCA3)                 | <40  | <36      | <36                          | 40/39/36                                | -  | -     |
| 33 (NCA3)                 | <40  | <36      | <36                          | 40/39/36                                | -  | -     |
| 34 (NCA1)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 35 (NCA1)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 36 (NCA1)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 37 (NCA1)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 38 (NCA1)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 39 (NCA1)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 40 (NCA1)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 41 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 42 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 43 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 44 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 45 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 46 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 47 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 48 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 49 (NCA7)                 | <46  | <39      | <40                          | 46/46/40                                | -  | -     |
| 50 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 51 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 52 (NCA7)                 | <46  | <39      | <40                          | 46/46/40                                | -  | -     |
| 53 (NCA7)                 | <46  | <39      | <40                          | 46/46/40                                | -  | -     |
| 54 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 55 (NCA7)                 | <46  | <39      | <40                          | 46/46/40                                | -  | -     |
| 56 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 57 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 58 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 59 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 60 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 61 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 62 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 63 (NCA4)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 64 (NCA1)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 65 (NCA1)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 66 (NCA1)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 67 (NCA1)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 68 (NCA1)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 69 (NCA2)                 | <35  | <35      | <35                          | 40/35/35                                | -  | -     |
| 70 (NCA3)                 | <40  | <36      | <36                          | 40/39/36                                | -  | -     |

| Assessment location (NCA) | Predicted noise level, $L_{Aeq,15min}$ , dB |          |                              | PNTL (D/E/N), $L_{Aeq,15min}$ dB | Overall characterisation of residual noise level |       |
|---------------------------|---|----------|------------------------------|----------------------------------|--|-------|
|                           | Day   |          | Night                        |                                  |  |       |
|                           | Standard                                    | Standard | Noise-enhancing <sup>1</sup> |                                  | NPfl   | VLAMP |
| 71 (NCA2)                 | <35   | <35      | <35                          | 40/35/35                         | -  | -     |
| 72 (NCA3)                 | <40   | <36      | <36                          | 40/39/36                         | -  | -     |
| 73 (NCA3)                 | <40   | <36      | <36                          | 40/39/36                         | -  | -     |
| 74 (NCA3)                 | <40   | <36      | <36                          | 40/39/36                         | -  | -     |
| 75 (NCA4)                 | <35   | <35      | <35                          | 40/35/35                         | -  | -     |
| 76 (NCA4)                 | <35   | <35      | <35                          | 40/35/35                         | -  | -     |

Notes: 1. Maximum predicted noise level from all prevailing meteorological conditions discussed in Section 2.2.1iv.  
2. Representative of Moss Vale township.  
3. Representative of Burradoo township.

## ii Summary of operational noise impacts

The noise model predictions have been assessed by comparing the higher of the standard and noise-enhancing meteorology results relative to the day and night NPfl noise trigger levels. Assessment locations predicted with negligible, marginal, moderate or significant residual noise impacts as defined in Table 4.1 of the NPfl (reproduced in Table 2.4 of this report) across all periods and meteorological conditions are presented in Table 2.9.

Assessment locations were also compared to Table 1 of the VLAMP (reproduced in Table 2.6 of this report).

**Table 2.9** Assessment location IDs characterised according to predicted noise levels and PNTL in accordance with the NPfl and VLAMP

| Negligible | Marginal  | Moderate  | Significant |
|------------|-----------|-----------|-------------|
|            | 4         |           | 11          |
|            | 5         |           | 12          |
|            | 6         |           |             |
|            | 7         |           |             |
|            | 8         |           |             |
|            | 10        |           |             |
|            | 14A, 14B  |           |             |
|            | 15        |           |             |
|            | 16        |           |             |
| Total – 0  | Total – 9 | Total – 0 | Total – 2   |

During worst-case prevailing noise-enhancing weather conditions for all assessment periods, for the mining life, with all feasible and reasonable mitigation measures applied, the NPfl assessment indicates:

- nine assessment locations (10 dwellings) within the area modelled are predicted to experience ‘marginal’ residual noise levels as per the NPfl and VLAMP. Examples of voluntary mitigation under the VLAMP include mechanical ventilation / comfort condition systems to enable windows to be closed without compromising internal air quality / amenity. All residual noise level exceedances are predicted for the night period, and so it would be reasonable to focus mitigation measures to rooms that are typically habitable during the night time period.

- two assessment locations within the area modelled are predicted to experience moderate or significant residual noise levels as per the NPfI and VLAMP respectively. Examples of voluntary mitigation include those mentioned above for marginal residual noise levels, in addition to upgraded façade elements like windows, doors or roof insulation, to further increase the ability of building façade to reduce noise levels. With respect to voluntary land acquisition rights, Hume Coal would need to comply with any conditions of consent in this regard.

Alternatively, Hume Coal may enter into amenity agreements with the landholders who are entitled to voluntary mitigation or acquisition.

In response to IPC Recommendation 10, the results of noise modelling indicate that location 7 is predicted to experience a marginal residual noise impact as per the NPfI and VLAMP and is therefore entitled to voluntary mitigation in the form of mechanical ventilation/comfort condition systems to enable windows to be closed without compromising internal air quality / amenity, according to the VLAMP. Marginal impacts to location 7 are limited to the night-time period and so mitigation measures would be reasonably focused on rooms that are typically habitable during the night time period.

### 2.3.3 Operational noise - BRP

#### i Predicted noise levels

Noise modelling methodologies for the NPfI assessment were consistent with those adopted in the BRP NVAR. This included modelled meteorological conditions, equipment quantities, sound power levels, operational scenarios (including maximum noise level events) and adopted noise mitigation and/or management measures.

Table 2.10 includes the data from the BRP NVAR and shows the predicted operational noise levels for the Project. In addition, it also contains the contemporary operational noise goals in accordance with current NSW noise policy. Rows highlighted indicate those locations where noise goals have changed as a result of applying the contemporary noise policy.

**Table 2.10 Predicted operations noise levels – rail maintenance facility (from BRP NVAR)**

| Assessment location | Predicted noise level, $L_{Aeq,15-min}$ , dB |                   |                 | Noise criteria (D/E/N)                     |                   |
|---------------------|--|-------------------|-----------------|--|-------------------|
|                     | Day (Calm)                                   | Evening (adverse) | Night (adverse) | $L_{Aeq,15-min}$ , dB<br>PSNL (as per EIS) | PNTL <sup>1</sup> |
| 14A/B (NCA1)        | 25   | <20               | 23              | 35/35/35                                   | 40/35/35          |
| 15 (NCA1)           | 28   | 20                | 26              | 35/35/35                                   | 40/35/35          |
| 16 (NCA1)           | 27   | <20               | 24              | 35/35/35                                   | 40/35/35          |
| 17 (NCA7)           | 33   | 24                | 30              | 46/46/40                                   | 46/46/40          |
| 18 (NCA7)           | 31   | 22                | 28              | 46/46/40                                   | 46/46/40          |
| 19 (NCA2)           | 36   | 34                | 34              | 35/35/35                                   | 40/35/35          |
| 20 (NCA3)           | 26   | 22                | 22              | 40/39/36                                   | 40/39/36          |
| 21 (NCA3)           | 30   | 28                | 28              | 40/39/36                                   | 40/39/36          |
| 22 (NCA3)           | 24   | <20               | <20             | 40/39/36                                   | 40/39/36          |
| 24 (NCA2)           | 25   | <20               | 20              | 35/35/35                                   | 40/35/35          |
| 60 (NCA4)           | 21   | <20               | <20             | 35/35/35                                   | 40/35/35          |
| 61 (NCA4)           | 23   | <20               | <20             | 35/35/35                                   | 40/35/35          |
| 62 (NCA4)           | 26   | 24                | 24              | 35/35/35                                   | 40/35/35          |
| 63 (NCA4)           | 29   | 22                | 22              | 35/35/35                                   | 40/35/35          |
| 69 (NCA2)           | 22   | <20               | <20             | 35/35/35                                   | 40/35/35          |
| 70 (NCA3)           | 20   | <20               | <20             | 40/39/36                                   | 40/39/36          |
| 73 (NCA3)           | 21   | <20               | <20             | 40/39/36                                   | 40/39/36          |
| 74 (NCA3)           | 25   | 21                | 21              | 40/39/36                                   | 40/39/36          |
| 75 (NCA4)           | 22   | <20               | <20             | 35/35/35                                   | 40/35/35          |

1. Project Noise Trigger Level as defined in the Noise Policy for Industry (NPfI) (EPA, 2107)

As presented in the BRP EIS NVAR, predicted operational noise levels indicate compliance at all but one assessment location with a negligible exceedance (+1 dB) of the daytime PSNL at assessment location 19.

Applying the NSW EPA's current policy (the NPfI), operational noise levels are predicted to satisfy the relevant contemporary noise criteria at all assessment locations. The VLAMP update (i.e. regarding the consideration of amenity noise level in the categorisation of residual noise impacts) has no implications on the outcomes of the BRP operational noise assessment.

#### 2.3.4 VLAMP

There is no change to the VLAMP privately-owned land assessment (25% threshold) outcome as a result of the NPfI or VLAMP updates. There are no privately owned land parcels exceeding the 25% area voluntary land acquisition criteria as defined in the VLAMP for day (standard weather conditions) and night (standard and prevailing noise-enhancing weather conditions).

With regard to assessment of operation of the BRP (non-network rail line) the findings presented in the BRP NVAR are unchanged as a result of the VLAMP update. That is, one assessment location is predicted to be impacted by noise from the Project on the Berrima Branch Line above the trigger level for voluntary mitigation rights.

#### 2.3.5 Sleep disturbance

Maximum noise levels from night operations with the potential to cause sleep disturbance at nearby residences have been assessed in accordance with the NPfI.

Predicted maximum noise levels for the night period during standard and prevailing noise-enhancing meteorological conditions are provided in Table 2.11. Predictions shown are limited to assessment locations with  $L_{Amax}$  noise levels over 30 dB. Noise levels at the remaining assessment locations are predicted to be below this threshold and are not presented in Table 2.11. Shaded cells indicate predicted levels above the NPfl sleep disturbance screening criteria.

**Table 2.11 Maximum noise levels at most affected residential assessment locations**

| Assessment location ID | Predicted night-time maximum noise levels, dB |                 |            |                 | NPfl screening criteria, dB |            |
|------------------------|---|-----------------|------------|-----------------|-----------------------------|------------|
|                        | $L_{Aeq,15min}$                               |                 | $L_{Amax}$ |                 | $L_{Aeq,15min}$             | $L_{Amax}$ |
|                        | Standard                                      | Noise-enhancing | Standard   | Noise-enhancing |                             |            |
| 3                      | <35   | 35              | <35        | 35              | 40                          | 52         |
| 4                      | 35  | 38              | 35         | 38              | 40                          | 52         |
| 5                      | 35  | 38              | 35         | 38              | 40                          | 52         |
| 6                      | 35  | 38              | 35         | 38              | 40                          | 52         |
| 7                      | <35   | 39              | <35        | 39              | 40                          | 52         |
| 8                      | 35  | 38              | 35         | 38              | 40                          | 52         |
| 10                     | 37  | 40              | 37         | 40              | 40                          | 52         |
| 11                     | 39  | 42              | 36         | 39              | 40                          | 52         |
| 12                     | 40  | 43              | 40         | 43              | 40                          | 52         |
| 14A, 14B               | 35  | 38              | 40         | 43              | 40                          | 52         |
| 15                     | 36  | 39              | 43         | 46              | 40                          | 52         |
| 16                     | 37  | 40              | 48         | 51              | 40                          | 52         |
| 17                     | <39   | 40              | 52         | 53              | 40                          | 52         |
| 18                     | <39   | <39             | 40         | 43              | 40                          | 52         |
| 19                     | <35   | <35             | 39         | 42              | 40                          | 52         |
| 20                     | <36   | <36             | 35         | 37              | 40                          | 52         |
| 21                     | <36   | <36             | <36        | 37              | 40                          | 52         |
| 22                     | <36   | <36             | <36        | <36             | 40                          | 52         |
| 23                     | <36   | <36             | <36        | <36             | 40                          | 52         |
| 24                     | <35   | <35             | <35        | 36              | 40                          | 52         |
| 46                     | <35   | <35             | <35        | <35             | 40                          | 52         |
| 48                     | <35   | <35             | <35        | <35             | 40                          | 52         |
| 49                     | <39   | <39             | <39        | <39             | 40                          | 52         |
| 50                     | <35   | <35             | <35        | 34              | 40                          | 52         |
| 51                     | <35   | <35             | <35        | 36              | 40                          | 52         |
| 52                     | <39   | <39             | <39        | <39             | 40                          | 52         |
| 53                     | <39   | <39             | <39        | <39             | 40                          | 52         |
| 54                     | <35   | <35             | <35        | <35             | 40                          | 52         |
| 55                     | <39   | <39             | <39        | <39             | 40                          | 52         |
| 60                     | <35   | <35             | <35        | <35             | 40                          | 52         |
| 61                     | <35   | <35             | <35        | 34              | 40                          | 52         |
| 62                     | <35   | <35             | <35        | <35             | 40                          | 52         |
| 63                     | <35   | <35             | 35         | 38              | 40                          | 52         |

**Table 2.11 Maximum noise levels at most affected residential assessment locations**

| Assessment location ID | Predicted night-time maximum noise levels, dB |                 |                   |                 | NPfl screening criteria, dB |                   |
|------------------------|---|-----------------|-------------------|-----------------|-----------------------------|-------------------|
|                        | L <sub>Aeq,15min</sub>                        |                 | L <sub>Amax</sub> |                 | L <sub>Aeq,15min</sub>      | L <sub>Amax</sub> |
|                        | Standard                                      | Noise-enhancing | Standard          | Noise-enhancing |                             |                   |
| 66                     | <35   | <35             | <35               | <35             | 40                          | 52                |
| 69                     | <35   | <35             | 34                | 37              | 40                          | 52                |
| 70                     | <36   | <36             | <36               | <36             | 40                          | 52                |
| 71                     | <35   | <35             | <35               | <35             | 40                          | 52                |
| 73                     | <36   | <36             | <36               | <36             | 40                          | 52                |
| 74                     | <36   | <36             | <36               | 36              | 40                          | 52                |

Notes: 1. Exceedance shown in bold text and grey shading. Note that predictions of singular L<sub>max</sub> events can be lower than predicted Leq levels since the latter is an accumulation of more than one plant. However, in reality the measured L<sub>max</sub> will be at least equal to the measured Leq from given operations at a site.

Noise modelling results show that night-time maximum L<sub>Aeq</sub> and L<sub>Amax</sub> noise levels are predicted to satisfy the screening criteria for sleep disturbance at most residential assessment locations during standard and noise-enhancing meteorological conditions. The exceptions were at assessment locations 11 and 12 where a 2 and 3 dB exceedances of the L<sub>Aeq,15min</sub> screening criteria are predicted during noise-enhancing weather conditions. The NPfl requires a detailed maximum noise level assessment where this occurs. To that end, the NPfl L<sub>Amax</sub> noise level screening criterion is not predicted to be exceeded. Assessment locations 11 and 12 are entitled to voluntary mitigation and acquisition, as discussed earlier, and hence predicted external L<sub>Aeq,15min</sub> noise levels of 42 to 43 dB would equate to internal noise levels of 32 to 33 dB based on a partially open window providing 10 dB of sound reduction (external-to-internal). Therefore, although the NPfl L<sub>Aeq,15min</sub> screening criteria have been exceeded, the calculated internal noise levels are well below those that are likely to cause awakening reactions.

At assessment location 17, a negligible 1 dB exceedance of the L<sub>Amax</sub> screening criterion is predicted during noise-enhancing weather conditions. The predicted external L<sub>Amax</sub> maximum noise levels would equate to an internal noise level of 42 to 43 dB, based on a partially open window providing 10 dB of sound reduction (external-to-internal). Therefore, although the NPfl screening criterion has been negligibly exceeded, the calculated internal noise levels are well below those that are likely to cause awakening reactions.

The introduction of a L<sub>Aeq,15minute</sub> screening level at residential locations or the change in the L<sub>Amax</sub> screening level does not alter the outcome of the sleep disturbance assessment in that maximum internal noise levels are predicted to be below those likely to cause awakening reactions. Post-approval consultation with the landowner of location 17 would occur to discuss this noise assessment.

## ii Berrima Rail Project

With regard to the assessment of sleep disturbance from the BRP, the introduction of a L<sub>Aeq,15minute</sub> screening level at residential locations would not alter the outcome of the assessment in that maximum internal noise levels are predicted to be below those likely to cause awakening reactions.

### 2.3.6 Cumulative noise

The application of the NPfl and the derivation of amenity noise levels for all assessment locations consider existing industrial noise levels, and therefore the potential for cumulative noise impacts from all industrial noise sources. Therefore, where PNTLs are satisfied, it can be inferred that cumulative impacts are highly unlikely as a result of the Project.



There is no existing industrial noise contribution at the assessment locations directly impacted by the Project (ie properties listed in Table 2.9). Therefore, the potential for increased impacts due to cumulative noise levels is highly unlikely.

The Berrima Rail Project (BCP) will include a rail maintenance facility located to the east of the Hume Highway. It is a separate project that was assessed cumulatively in accordance with the NPfl amenity noise levels, together with the Project and other industrial sites. The assessment found that total noise levels due to the operation of both facilities when combined would not lead to increased noise impacts. That is, assessment locations currently entitled to voluntary mitigation or acquisition would remain as those identified in this NPfl assessment (Table 2.9).

### 2.3.7 Construction noise

Predicted construction noise levels for the early works and construction of portals and access, surface infrastructure area, overland conveyor, ventilation shaft and CPP provided in the HCP NVAR included individual construction scenarios as well as the total construction noise from each scenario occurring simultaneously. Such a situation is considered highly unlikely however is representative of absolute worst-case construction noise levels. The BRP NVAR presented a range of likely construction noise emission levels, up to a predicted highest level, to represent the variability of noise as construction sequentially progresses along the rail line.

Construction noise levels predicted for the day, evening and night periods as presented in the HCP NVAR and BRP NVAR are unchanged as a result of this updated NPfl assessment. One of the key changes from the INP to the NPfl is the minimum RBL applied for residential assessment locations for the day period. The minimum RBL for the day period as per the NPfl is 35 dB, which is an increase of 5 dB compared to that provided in the INP. This would result in an increase to the “adopted RBL” (refer to Table 2.7) for several NCAs where the NPfl minimum RBL for the day period was adopted (ie NCA1, NCA2, NCA4, NCA5).

Construction noise levels are predicted to satisfy noise management levels for the majority of the assessment locations. In applying the contemporary noise criteria, the highest level of exceedance during standard hours has reduced as a result of the change in NML. The highly noise affected level is unchanged and is not predicted to be exceeded at any assessment location, consistent with the findings presented in the HCP NVAR and BRP NVAR. Outcomes and recommendations in relation to activities proposed outside standard construction hours will remain consistent with those presented in the HCP NVAR and BRP NVAR.

Notwithstanding this, the applicant will manage construction noise levels where exceedances of NMLs have been identified. The construction noise management methods will be detailed in a construction noise management plan to be prepared prior to the commencement of any construction activity.

The ICNG recommends the following where NMLs are predicted to be exceeded:

- application of feasible and reasonable work practices to minimise noise;
- inform potentially impacted residents of the nature of the works to be carried out, expected noise levels and duration and relevant contact details; and
- negotiation with the community where noise from work outside standard hours is predicted to exceed the relevant NML by more than 5 dB.

## 2.4 Noise monitoring and management

There are no material changes to the outcomes or recommendations presented in the HCP NVAR and BRP NVAR with regard to the monitoring or management of noise emissions associated with the Project as a result of the updates in noise policy.

### 3 Conclusion

The main purpose of this report is to consider the implications of updates in noise policy to the HCP NVAR and BRP NVAR prepared for the EIS. The updated noise assessment has also taken into account the 4 m increase in height to the main temporary coal reject stockpile.

The findings of this report are summarised as follows:

- some of the changes in noise policy as a result of the application of the NPfI (EPA 2017) would have the effect of providing a more flexible assessment of noise during the daytime period with no changes to the assessment for evening and night-time noise findings;
- the 4 m increase in height of the main temporary coal reject stockpile resulted in an increase in predicted operational noise levels (by up to 3 dB) at assessment locations 11 and 14 and (by up to 2 dB) at assessment location 7;
- nine assessment locations (10 dwellings at locations 4, 5, 6, 7, 8, 10, 14A, 14B, 15 and 16) within the area modelled are predicted to experience 'marginal' residual noise levels as a result of operation of the HCP, and are therefore entitled to voluntary mitigation under the VLAMP. For example, this could include mechanical ventilation / comfort condition systems to enable bedroom windows to be closed without compromising internal air quality / amenity;
- two assessment locations (locations 11 and 12) within the area modelled are predicted to experience 'significant' residual noise levels as a result of operation of the HCP, and are therefore entitled to voluntary mitigation and acquisition. Alternatively, the landholder may enter into an amenity agreement for improvement to ventilation and façade elements to reduce noise levels. Hume Coal would comply with any conditions of consent in this regard;
- applying the NPfI, operational noise levels from the rail maintenance facility are predicted to satisfy the relevant contemporary noise levels at all assessment locations. This is a change from that presented in the BRP NVAR where a 'negligible' exceedance at one assessment location (19) was predicted;
- the findings of the non-network rail assessment as presented in the BRP NVAR are unchanged as a result of the updates in noise policy;
- there are no material changes to the outcome of the sleep disturbance assessment presented in the HCP or BRP NVARs as a result of the updates in noise policy; and
- as per the IPC recommendation R11, opportunities for further mitigation was explored in the context of the above conclusions. It is found that all feasible and reasonable measures have been considered as documented previously in the EIS and RTS reports. Importantly, as design continues to progress and suppliers and manufacturers engaged post approval, further opportunities for mitigation will continue to be explored.



