KEY FINDINGS

The project has been designed to minimise or mitigate noise impacts where possible.

The results of the noise modelling conducted for the construction and operation of the Hume Coal project and Berrima Rail project indicate that the levels of operational noise generated will not affect the surrounding townships of Medway, Berrima, New Berrima, Sutton Forest, Moss Vale or Bowral.

A small number of landholders immediately adjacent to the northern boundary of the project may experience an increase in noise levels that is perceptible above existing background noise. Hume Coal will provide reasonable mitigation measures or, offer to acquire the properties, in accordance with government’s guidelines and requirements.

Ongoing noise monitoring and management measures will help to maintain noise levels below the noise limits set for the project.
INTRODUCTION

Noise and vibration assessments have been undertaken for both the Hume Coal project and Berrima Rail project by technical specialists. A summary of the results of those investigations is detailed here.

The noise and vibration assessment considered the potential sources of noise and vibration during both construction, and operation of the mine. In addition, an assessment of the rail noise and vibration was undertaken. All of the assessments were conducted according to the relevant government policies and guidelines.

The assessment quantified potential noise effects for daytime, evening and night-time background noise levels. Various worst-case weather conditions were also considered and modelled in the assessment. Existing everyday noise levels of the area, based on field monitoring data, were taken into account by the specialists.

The proposed management and mitigation measures proposed by Hume Coal were factored into the assessment including:

- Using stackers and reclaimers on coal stockpiles
- Fitting quieter machined steel idlers on all outdoor conveyors
- Enclosing conveyor transfer points and other components of the coal processing plant
- Using advanced electric motors, stiffening structures and installing cladding around the coal processing plant
- Limiting particular activities to daytime only
- Using advanced locomotives and new wagons for rail transport, which can help to eliminate bunching noise (when wagons bump together during braking)
- Installing a noise barrier along a section of the rail loop
- Design and positioning site infrastructure to reduce the height of plant and equipment as much as possible

It’s important to note that the Hume Coal project is an underground mine, thus limiting the potential noise effects for nearby residents when compared to open cut mining.
NOISE

Noise is created as part of everyday life. Sources of noise can be natural (such as wind, animals, birds, and storms) or man-made (such as industrial plant, electrical equipment and lawn mowers).

Noise levels are measured in decibels (dB). The human ear does not hear all frequencies equally well (for example, it is common knowledge that dogs hear high frequencies much better than humans), so to better represent what actually will be heard by the human ear, a weighting (A) is applied to the frequencies measured by sound monitoring equipment, and this is recorded as (dBA).

EXISTING NOISE LEVELS

The area surrounding the Hume Coal Project is diverse in terms of existing noise levels and noise sources. For example, the Hume Highway is a significant noise contributor at properties positioned nearby, with its contribution reducing as distance increases. The presence of Berrima Cement Works also provides an existing level of industrial noise for properties in and around New Berrima and at some scattered rural properties to the south. Otherwise properties situated away from these two noise sources generally experience noise levels typical of a rural environment.

ASSESSMENT

A computer model was developed to assess the potential noise impacts of the mine and railway, using data from Hume Coal’s baseline noise monitoring program. The model includes:

• The plant and equipment to be used by the project, including each item’s noise profile
• times of day when plant and equipment will be operating;
• local weather patterns (such as wind speed/direction and temperatures), particularly calm and adverse conditions;
• local topography (such as the locations of hills and valleys); and
• noise mitigation measures that will be used, such as noise barriers.

The model considered the different scenarios that may result in different levels of noise and vibration during construction and operations in relation to low frequency noise, possible disturbance of sleep, cumulative noise and road traffic. The modelling results were then compared to the noise assessment criteria set by government.
RESULTS

Construction noise

Construction noise levels from proposed out-of-hours activities are predicted to satisfy the government’s construction noise guidelines for evening and night time noise at all 76 assessed locations with appropriate mitigation measures in place.

During the day time, some of the properties immediately adjacent to the northern boundary of the project area may experience noise levels for brief periods of time that fall into the lower level “noise affected” management level, according to the government’s construction noise guidelines. The “highly affected” noise limit will not be exceeded at any time. This outcome is not uncommon for construction projects. The construction noise management level is not a fixed standard like the operational noise limits. It is simply a trigger for when construction noise management and mitigation measures are to be considered and implemented.

Hume Coal will develop a project construction environment management plan, which will detail proposed construction noise management and mitigation measures.

Construction vibration

Based on the distances between the construction plant items and the surrounding privately owned residential properties, human response vibration standards were determined as “unlikely to be exceeded”.

Extremely small-scale underground shot firing may be required for the underground drifts and ventilation shaft construction. The nearest privately-owned property to these activities is approximately 600 metres away. Underground shotfiring activities during construction will satisfy the government air blast and ground vibration standards at all surrounding privately owned assessment locations.

Underground mining will occur at depths of approximately 110 metres or greater under the Hume Highway. There will be no vibration impacts from mining on the highway or other surface features.

Operational noise

The operational noise assessment concluded that the townships of Medway, Berrima, Sutton Forest, Moss Vale, Bowral and Mittagong will be unaffected by noise from the project, even during adverse weather conditions.

The assessment found that 10 properties immediately adjacent to the northern project boundary may experience increases in noise that will range from “generally indiscernible” to “just perceptible” compared to existing background noise levels. The owners of these properties will have the right to request that Hume Coal provides reasonable mitigation measures.

An additional two properties may experience increases in noise levels that are a “noticeable difference” compared to background noise levels. The owners of these properties will have the right to request that Hume Coal either acquires their property, or provides reasonable mitigation measures.
RESULTS (continued)

Low frequency noise

Hume Coal has designed the coal processing plant to avoid the potential for low-frequency noise. Notwithstanding this, Hume Coal will accurately quantify low frequency noise during operations through regular compliance noise monitoring. If it detects low frequency noise that exceeds the permissible standard, Hume Coal will offer mitigation or compensation to the affected landholder in accordance with government policy.

Sleep disturbance

Outdoor construction activities will occur generally during the day Monday to Saturday, with some minor exceptions. During operations, night-time activities on the surface, such as deliveries to site will be limited.

The potential for noise from random or accidental loud events during the night, has been assessed as unlikely to disturb the sleep of nearby residents. Hume Coal will monitor noise levels at night-time during the initial construction phase and reduce or eliminate noise effects where management levels or sleep criteria have the potential to be exceeded.

The sleep disturbance assessment concluded that the predicted internal noise levels at the assessment locations will be well below those likely to cause residents to awaken.

Cumulative noise

The cumulative noise assessment found that the potential for any noise effect resulting from the combination of the existing industrial noise levels with the Hume Coal project was highly unlikely.

The Berrima Rail project will include a rail maintenance facility located to the east of the Hume Highway. Noise levels from this facility have been assessed in combination with noise from the Hume Coal project. The assessment found that total noise levels due to the operation of both facilities when combined would not lead to increased noise impacts.

Road traffic noise

Road traffic noise was assessed in the EIS and it was found that there would be negligible increase due to the Hume Coal project.
NOISE MANAGEMENT, MONITORING AND MITIGATION MEASURES

Construction noise will be managed by the hours of operation and the project's construction environmental management plan. Any potentially affected landholders will be consulted before and during construction where exceedance of the government's construction noise standards is predicted, and will be notified of proposed measures that will be used to manage construction noise levels.

Operational noise will be managed and mitigated via the engineering design of the project, and the use of an operations noise management plan, which will include provisions for noise monitoring and actions to be taken in case of noise complaints. Noise management and mitigation measures in the infrastructure design include: using quiet plant and equipment; enclosing machinery; and the overall site layout.

<table>
<thead>
<tr>
<th>Item and location</th>
<th>Adopted noise mitigation/management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining infrastructure area</td>
<td></td>
</tr>
<tr>
<td>Ventilation Sites</td>
<td>External casing acoustic treatment. Discharge attenuation. NW orientation.</td>
</tr>
<tr>
<td>Loader</td>
<td>3.5m bund around rejects load hopper</td>
</tr>
<tr>
<td>Overland conveyor</td>
<td>Machined steel idlers and enclosed (roof and east side)</td>
</tr>
<tr>
<td>Stockpiles</td>
<td>Use of stackers and reclaimers</td>
</tr>
<tr>
<td>Crushing station</td>
<td>Sheet metal enclosure</td>
</tr>
<tr>
<td>Tertiary screens</td>
<td>Sheet metal enclosure</td>
</tr>
<tr>
<td>Coal Preparation Plant</td>
<td>Fully enclosed in metal clad building, variable voltage, variable frequency (VVF) drives, concrete platforms for screens, increased steel work to stiffen structure</td>
</tr>
<tr>
<td>Stackers &amp; reclaimer</td>
<td>Drives enclosed</td>
</tr>
<tr>
<td>Reject plant (paste plant)</td>
<td>Fully enclosed in metal clad building</td>
</tr>
<tr>
<td>All conveyors</td>
<td>Machined steel idlers, enclosure of drives and transfers</td>
</tr>
<tr>
<td>Train load out</td>
<td></td>
</tr>
<tr>
<td>Bin, feeder and train load out</td>
<td>Enclosed</td>
</tr>
<tr>
<td>Locomotives</td>
<td>Latest generation locomotives</td>
</tr>
</tbody>
</table>
Noise and vibration management plans

A noise management plan will be developed for the project, which will:

- identify noise-affected properties consistent with the environmental assessment and any subsequent assessments;
- outline mitigation measures to achieve the noise limits established;
- outline measures to reduce the effect of intermittent, low frequency and tonal noise (including vehicle reversing alarms using broadband quackers and ambient noise level adjusting alarms or in-cabin alarms);
- specify measures to document any higher level of effect or patterns of temperature inversions, and detail actions to quantify and reduce those effects if they occur;
- specify protocols for routine noise monitoring of the project, including provision for regular low frequency noise monitoring;
- outline the procedure to notify property owners and occupiers that could be affected by noise from the mine;
- establish a protocol to handle noise complaints that includes recording, reporting and acting on complaints; and
- Specify procedures for undertaking independent noise investigations.

CONCLUSION

The project has been designed to minimise or mitigate noise impacts where possible.

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