Land and Environment Court, New South Wales
Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Limited (2o13) NSWLEC 48

Decision date: April 15, 2013

On this web page: Extract: PART 4: NOISE AND DUST IMPACTS

The competing positions on noise and dust impacts

256The Association's case is that as a direct result of impacts from noise and a deterioration in air quality from the existing operations, Bulga residents are experiencing substantial negative impacts on health and wellbeing, including stress, anxiety, sleep deprivation, impacts on family relationships and friendships, solastalgia (a feeling of loss of place), and impacts on their socialising and recreational activities in the community (Applicant's SFC at [75]). As a result of increased noise limits under the Project, those impacts will be exacerbated and the cumulative impacts of dust and noise on the health and wellbeing of Bulga residents cannot be mitigated.

257Warkworth's position is that the current performance of the mine is not the subject of the present proceedings, and that in any event the mine is in compliance with noise and air quality requirements (Warkworth's SFCR at [36]). Warkworth contends that the mitigation strategies proposed as part of the Project will adequately mitigate noise and dust impacts (SFCR at [38]).

258The Minister contends that, notwithstanding the occurrence of a small number of non-compliances in the period between 2004 and 2011, the Warkworth and Mount Thorley mines

are operating substantially in accordance with the noise and dust conditions in their existing development consents (Minister's SFCR at [33]). The Minister contends that the proposed conditions tighten existing noise limits, set appropriate noise and dust criteria, provide mitigation measures and set acquisition criteria for certain properties, and that the conditions are suitable to ensure that noise and dust impacts are acceptable and the Project will not have a significant impact on health and wellbeing of the residents of Bulga (Warkworth's SFCR at [33](c)(iii), (iv)).

Noise impacts: an introduction to the issues and their resolution

259The Warkworth mine generates noise, as do the other mines in the surrounding area. It is clear that the extension of the mine to the west, bringing it closer to Bulga, will continue and increase noise impacts, which are estimated to be at their highest in the early years of the Project when both Mount Thorley and Warkworth mines are operating (Ishac report [30]). Whether or not the removal of Saddleback Ridge will exacerbate those impacts is disputed. The issues are whether those impacts are acceptable, or if not, whether they can be mitigated, and whether any residual impacts are outweighed, in the overall assessment of the Project, by other factors.

260The first task is to identify the likely noise impacts of the Project. That task is made more complex by the presence of other mines in the locality. In addition to the Mount Thorley mine, which has one open pit (Loders) and two box cuts (Abbey Green North & South), the Bulga open cut and underground mine complex is to the south, Wambo open cut and underground mine complex is to the north east, and Hunter Valley Operations (South) mine complex is to the north (DP& I Environmental Assessment Report, TB vol 2, tab 9 pp 792-3). The changing operations of those mines, and consequent changing conditions of approval for those projects, have consequences for establishing background levels for noise against which the noise produced by the Project could be measured, and on which appropriate noise criteria for the Project could be based, and also in assessing the cumulative noise impacts.

261Having identified as far as possible the likely noise impacts of the Project, the next task is to consider whether they are acceptable. In many respects, for example in identifying the extent of impacts from low frequency noise in the overall assessment of noise impacts, there was limited data to support firm conclusions. The determination of acceptability is assisted by reference to accepted standards, such as are published in the NSW Industrial Noise Policy ('INP'). Then, the task is to consider whether conditions can be imposed to avoid or mitigate likely adverse impacts, and whether any such conditions are enforceable.

262The approach adopted by Warkworth and the Minister was to set, in the Warkworth approval, combined noise criteria for the Mount Thorley-Warkworth mine complex. The proposed conditions of the Project Approval (Exhibit W33) impose requirements on Warkworth to take steps to limit emission of noise, including by attenuation of vehicles, and provide rights for the owners of residences to request mitigation and acquisition where the noise levels are expected to exceed the levels imposed.

263One issue with this approach is whether these proposed conditions adequately mitigate expected impacts, or, as the applicant contends, themselves give rise to other unacceptable impacts, in particular adverse social impacts. Another issue is whether the approach of

combining the noise criteria for the Project with a different mine, even if it is open as a matter of law (an issue which is discussed below) confounds the task of identifying the actual noise impacts of the mine the subject of the approval and determining whether there has been compliance with the conditions of that approval.

264For the reasons below, I am not satisfied that the likely noise impacts of the Project as permitted by the proposed noise criteria in the conditions of approval are acceptable. The evidence as to noise impacts from the present operations of the Warkworth and Mount Thorley mines is that the noise is either at or, at times, above levels established in the 2003 Warkworth consent; it has annoying characteristics, and it is disruptive. The proposed noise criteria assume a continuation of those noise impacts for the extended period of operation of the mine, and as the mine moves closer to Bulga. I am not satisfied that the proposed revised noise conditions (Exhibit W33) set appropriate noise criteria or are adequate to mitigate noise impacts. Those conditions set noise criteria based on generalised background levels greater than those that apply at many locations and above the project-specific noise levels which are acceptable by application of the INP.

265As a result of the degree and extent of noise impacts, the conditions also require the undertaking of works for noise mitigation or acquisition of numerous noise-affected properties. If appropriate background levels and criteria based on application of the INP are used, there would be a material increase in the number of noise affected properties requiring noise mitigation or acquisition. The degree and extent of noise mitigation and acquisition that would be required to address adequately the noise impacts of the Project are sufficiently great as to be evidence of the unacceptability of the noise.

266The noise criteria in the conditions also rely on the activities of another mine in different ownership, which operates in accordance with a separate consent. Even if there were power to impose such conditions, the difficulty in ensuring compliance would mean that they should not be imposed.

Noise impacts of existing operations

267The 2003 Warkworth consent imposes noise criteria, and mitigation and acquisition criteria, based on the operations of the Warkworth mine, setting operational limits at 38 dB(A), and creating an entitlement to request mitigation measures for identified properties at noise levels exceeding the operational limit and acquisition at 43 dB(A). The existing consent for the Mount Thorley mine (2009 modification) similarly establishes separate noise criteria, with 35 dB(A) and 40 dB(A) for operational and acquisition limits respectively. The proposed conditions for the Project refer to the "Mount Thorley-Warkworth mine complex", and combine the Warkworth and Mount Thorley mines for the purposes of setting the noise criteria, on the basis that, although separately owned and operated, Mount Thorley and Warkworth mines are managed in practice as one operation.

268Evidence as to the impacts of the presently approved mining operations comes from the residents and from independent monitoring undertaken on behalf of the Department of Planning at the request of Bulga residents in accordance with the conditions of the Warkworth and Mount Thorley approvals. That evidence confirms that the present operations of both mines generate substantial noise.

269The Department commissioned an assessment by Sinclair Knight Merz ('SKM') for the period December 2011 - January 2012 (TB vol 7 p 4380), which involved both attended and unattended noise monitoring, at eight locations in Bulga (being two in Wambo Road, five in Inlet Road, and one in Noses Peak Road). The SKM report of April 2012 (TB vol 7, tab 277) noted (6.1.1) that operational mine noise at all of the residential properties on which the report focussed was generally caused by constant truck engines from either Warkworth or Mount Thorley mines, or both. Other regular sources of operational mine noise were dozer trucks and miscellaneous bangs, likely generated by diggers during the loading of trucks.

270This evidence as to the type of noise generated by the existing operations is confirmed by the residents. Mr Lamb states (aff at [23]) that often at nights he can hear "...distinctive noises from surrounding mines, including sheaves of the dragline, squeals, reversing beepers and the clank of trucks". Mr Upward's evidence was that, having worked in the mines, he can distinguish each individual noise of the machinery, and can hear "...dozers, trucks, the shovel dipper door, reversing beeping, the dropping of rocks into an empty truck, trucks accelerating, often so loud I can hear the gears changing" (aff at [24]). Mrs Leslie stated that the mining noise regularly wakes her in the night and she has trouble getting back to sleep; she can hear "...banging, crashing, the droning of trucks, getting louder as acceleration increases, vehicles going up the slag heap, accelerating and dumping" (aff at [8]). Mr Hedley states that in the evenings he can hear "...bulldozer tracks, dragline and shovel buckets impact noises, truck operations and reversing beepers" (aff at [20]). Ms Melanie Caban referred in oral evidence to "a low hum sound which reverberates through your head, along with a loud clang of rocks being thrown in truck bodies, shovel bucket doors squealing, horns beeping, rattle of bulldozer tracks clacking, high pitched tone of drilling machines, revving and changing of gears in trucks..." (T 22.8.12 p 8). In her oral evidence Ms Danielle Hanson stated that her morning "...started at 3.30 this morning, which is not uncommon, with the sound of dozers, shovels, beeping, everything else" (T 22.8.12 p 43).

271The SKM report noted that for two of the eight locations monitored, the operational criteria applicable to noise from Warkworth was 38 dB(A) LAeq (15 minute); and 35 dB(A) LAeq (15 minute) for the remainder. The noise criteria applicable to noise from Mount Thorley for all eight locations was 35 dB(A) LAeq (15 minute) (TB vol 7, p 4387-8). The SKM report recorded 72, 15 minute attended monitoring events, and a single exceedence of consent conditions based on a 15 minute equivalent energy noise. The report noted that noise levels were observed to be equal to the operational criteria on numerous occasions at all sites, and that operational noise at all sites regularly exceeded the project criteria for a short time but did not generally constitute an exceedence of the 15 minute LAeq limits (6.1.2, p 4406). The unattended directional ("Barnowl") monitoring at Putty Road recorded 14 short term exceedences, all around dawn; and ten potential exceedences while other noise sources were present. Three of the events lasted for half an hour and a single event lasted for 45 minutes. The report noted that noise levels at four of the monitoring locations were likely to be approximately 2 dB(A) higher, given that the Barnowl site is located further from the mine (6.2, p 4406).

272The timing of the monitoring on which the SKM report was based is significant. There was a hiatus in operations at the Mount Thorley mine from mid 2006 to mid 2010 with next to no activity at the Mount Thorley main pit with the exception of haulage to the coal preparation plant and the coal preparation plant itself, which were areas on the east side of the site away from Bulga residences. From mid 2010, operations at Mount Thorley recommenced with a relatively small fleet including one shovel, with larger plant arriving in November

2011; and full operations resumed in March 2012, when the dragline arrived and there was a full complement of truck fleet (Ishac's report at [34]-[36]). The period December 2011 - January 2012 during which SKM monitored noise levels was, therefore, a period during which noise levels would not have reached the levels permitted under both consents, and experienced by residents at the time of the hearing. The evidence of the residents, including Mr Krey (aff at [24], [25]), Mr Upward (aff at [21]) and Mr Mitchell (aff at [21]) was that noise impacts have increased since late 2011. Mr Ishac, an acoustic engineer called by Warkworth, accepted that the lull in activities at Mount Thorley provided noise respite that was recognised only once operation in the main pit of Mount Thorley recommenced (Ishac report pp 16-17).

273The Court heard evidence on the site view on 21 August 2012 from Mrs Leslie and Mr Graeme O'Brien that on the evening of 20 August and in the early hours of 21 August 2012 there were noise events that woke them up and kept them awake for significant periods. That evidence was confirmed by monitoring data provided by Warkworth for the period Sunday 19 to Wednesday 22 August 2012 for the Putty Road and Scout Hall Barnowls (Exhibit W4). That data shows for the "selected source" (red), levels at Putty Road rising from 2.00am to a spike just before 8.00am of approximately 55 dB(A) on Monday 20 August, and a similar pattern, starting from higher levels above 30 dB(A) to a peak of just under 55 dB(A) on Tuesday 21 August. The data for the Scout Hall monitor shows a similar rise in levels from 2.00am on Monday 20 August to a peak at just above 40 dB(A) at approximately 7.00am; levels between 35-40 dB(A) between 4.00am-8.00am and a peak of 45 dB(A) at 10.00pm, on 21 August. Mr Ishac's oral evidence was that the latter spike was not mine-related because it was unusual, and would probably have been from a passing vehicle. Mr Ishac agreed that the data supported Mrs Leslie's evidence that she was woken at 4.00am on Monday 21 August until 6.00am. He commented that the noise levels from all sources was also up at that time.

274Mr Ishac responded (report pp 15-18) to the affidavit evidence of Mr Lamb, Mr Upward, Mr Krey, Mr Caban, Mr Hedley, Mr Mitchell, and Mrs Leslie, commenting that the predicted noise levels in the PPR for their residences are expected to be equivalent to current or historic levels for the concurrent operation of the two mines. For Mr Upward, Mr Krey, and Mr Caban, that is at 38 dB(A) or up to 40 dB(A); and Mr Hedley's property at 41 dB(A) is subject to the mitigation condition.

275Even if it can be accepted that the mines are operating within the noise limits required under the existing consents or proposed under the new conditions, I am satisfied, based on the evidence of the residents which was supported by the available monitoring data, that the noise levels of the present operations of the mine are at a level sufficient to impact on amenity, including sleep disruption.

Noise impacts of the extended operations

276The assessment of noise impacts of the proposed extension undertaken in the EA (Annexure G) was on the basis of potential impacts of Warkworth as a stand-alone operation, with consideration of the approved operations at Mount Thorley as part of the cumulative noise assessment (PPR TB vol 1, tab 8, p 557). The EA modelled three mine plan years for the proposed extension, Years 2, 9 and 21, with Year 2 being the early stage of mining when both Mount Thorley and Warkworth are in operation; Year 9 the year in which mining is forecast to have progressed through Saddleback Ridge; and Year 21 when the mine is at its furthest point west (EA Red volume p 192-3). The EA noted (EA Red p 195) that 13

receivers to the west and north west, and 26 receivers to the north and east, would exceed the operational criteria, and noise levels for 7 receivers would exceed the likely property acquisition criteria. Six of those receivers were already within an acquisition zone for Warkworth or a neighbouring mine or both.

277In December 2010, following public exhibition of the EA, and as a result of the concurrent application for a modification at Mount Thorley (the Abbey Green North modifications), the Department requested Warkworth to consider impacts from Mount Thorley and Warkworth mines as a complex (TB vol 1, tab 8, p 557). The noise assessment in the PPR for the extension of the mine was undertaken on that basis. The PPR notes that in Year 2, with all Warkworth and Mount Thorley pits operating, predicted noise levels would be 1-2 dB above operational noise limits for 41 non-mine owned properties; 3-5 dB above for 12 non-mine owned properties; and greater than 5 dB above for nine of the properties. The PPR provides data as to the proportion of Mount Thorley and Warkworth mine noise contributions for the nine privately owned residences considered likely to be significantly impacted, all but one of which is in Mount Thorley: the proportion of noise contributions made by the Warkworth mine (as opposed to Mount Thorley) range from 7 per cent to 93 per cent (PPR TB vol 1, tab 8, p 559). The PPR does not provide similar information for Bulga residences.

278The PPR adopted what it described as a hybrid approach, being combined criteria, using existing criteria for Warkworth and Mount Thorley mines, for receivers to the east, and a single mining complex criteria for receivers to the west, including Bulga, and to the north (PPR, TB vol, 1 tab 8, p 560). Table 4.3 of the PPR (pp 567-582) shows in tabular form the single site criteria for each receiver, the combined criteria for the two sites, the predicted worst case Leq (15 minute) noise level of Warkworth + Mount Thorley, and the extent of exceedence for both the combined criteria and the hybrid complex criteria. For the 81 Bulga residences, the predicted worst case Leq (15 minute) noise level with both Mount Thorley and Warkworth mines operating ranges from 32 to 44 dB(A). The predicted worst case Leq (15 minute) noise level would equal or exceed the combined Leq (15 minute) operational criteria for both mines (which is 40 dB(A) for all residences except for 5 residences where the level is 42 dB(A)) for 45 residential receivers (that is, 56% of Bulga residences). The predicted worst case Leq (15 minute) noise level for both mines would equal or exceed the 38 dB(A) Leq (15 minute) operational noise limit set in the 2003 Warworth consent for Warkworth mine for 68 residential receivers (that is, 84% of the Bulga residences).

279The Director-General's Environmental Assessment Report (TB vol 2, tab 9, p 809 ff) assessed the impacts of noise of the Mount Thorley-Warkworth mine complex and the mitigation measures proposed. The assessment was based on Warkworth implementing mitigation measures, which included:

- relocation of haul trucks from the high wall to in-pit haul routes;
- reduction of mobile equipment operating during night-time on critical haul routes;
- reduction of dozers operating on elevated overburden emplacement areas at night;
- noise suppression of the haul truck fleet;
- placement of noise suppressed haul trucks on critical haul routes; and

- cladding of the Warkworth CPP.

280The EAR continued:

The Department notes that noise suppression of the haul truck fleet is a key assumption of the noise model. The Department also notes that Warkworth has not been at the forefront of continual improvement in relation to noise mitigation. Given the importance of this factor in the management of predicted noise impacts, Warkworth has provided a specific commitment to the progressive implementation of noise suppression of the haul truck fleet, with 50% of the truck fleet to be attenuated by Year 2, and 80% by Year 6. To ensure that appropriate noise mitigation measures are applied, the Department has included specific conditions requiring Warkworth to implement, validate and report on these and other noise attenuation works.

The assessment indicates that with the proposed mitigation measures in place, and with reference to the new more stringent noise criteria, the project would result in an increase in the total number of residences experiencing exceedences of the applicable noise criteria by up to 13 private properties (in Year 2) under the worst case operating scenario (refer to Table 4).

Table 4 reports the predicted exceedences in the context of the Department's preferred management approach in relation to noise exceedences, how these impacts relate to the existing scenario, and the likely duration of the expected impact.

Table 4: Summary of Operational Noise Limit Exceedences

Noise Exceedence	***Management Approach***	***No. of Affected Private Properties***			
		Existing	***Yr 2***	***Yr 9***	***Y21***
Marginally affected residences (1-2dB exceedence)	Noise mitigation at source	50	50	13	11
Moderately affected residences (3-5dB exceedence)	Noise mitigation, including mitigation at residence	~30	37	12	2
Significantly affected residences (>5dB exceedence)	Acquisition	5	11	2	3
Significantly affected land (>5dB exceedence on >25% of land)	Acquisition	6	6	6	4
Total Private Properties Exceeding New Noise Criteria		**~91**	**104**	**33**	**20**

281The EAR noted that Warkworth had committed to the implementation of a proactive and reactive noise management system, including the use of real time weather data to guide mining and overburden emplacement activities, and proactive mine planning to provide contingencies, such as during prevailing weather conditions.

282The PAC accepted that there are substantial noise impacts from the Project (TB vol 5, tab 112, p 2583). One factor which the PAC noted was relevant to the noise impacts is the high stripping ratio, which means that the noise impacts are sustained for longer per tonne of coal extracted than at many comparable mines, thus causing a greater overall noise impact on the community. Secondly, the PAC accepted, based on submissions made, that many decisions to acquire residential property and businesses in the vicinity of Bulga or to remain in the vicinity of Bulga had been made on the basis that the western extent of mining was firmly limited to the boundaries in the 2003 approval, which fixed the proximity of noise-generating activities in relation to the residences. The PAC's response accepted that there would be impacts from the western expansion of the mine, and considered that it was appropriate to require improved control over noise-generating activity at the mine complex, for example, by imposition of controls including purchase, retro-fitting and maintenance of noise attenuation equipment and improved practice during adverse meteorological conditions, and what it described (p 2584) as improved control of impacts on receivers, being an increased number of properties to be offered an option for acquisition.

Contribution of Saddleback Ridge to noise attenuation

283The Director-General's Environmental Assessment Report (TB vol 2, p 810) accepted that there is no technical basis to support the claim that substantial noise attenuation is achieved by the ridgeline, and that modelling had shown that the ridge does not provide appreciable noise mitigation under adverse meteorological conditions as they neutralise any mitigation effect provided by the ridge.

284Mr Ishac's expert report addressed the contribution to noise amelioration made by Saddleback Ridge (part 2.4, p 13). His modelling was based on the mine plan figures, which

showed that for Year 2 the mining equipment operates east of Saddleback Ridge in areas similar to current operations; in Year 21 when mining is furthest to the west, equipment positions are shown west of Saddleback Ridge; and in between is Year 9 where some mining equipment is located on Saddleback Ridge. A comparison of predicted noise levels for Years 9 and 21 with Year 2 shows the differences between received noise with and without Saddleback Ridge for Bulga residences. That showed marginal increases of 1 dB to 3 dB between Year 2 and either Year 9 or Year 21 noise levels under prevailing weather, and higher increases during calm weather conditions of up to 5 dB. Mr Ishac noted that that finding was affected by Mount Thorley operating in the early, but not the latter, years. Mr Ishac was of the opinion that this demonstrates that the ridge is more beneficial during calm weather conditions when noise from the mine is significantly lower and below typical background noise levels. His experience is that noise benefits of topography during calm weather conditions are virtually nullified during adverse winds or temperature inversion conditions. Mr Ishac concluded that the main buffer for Bulga residences is the distance to the mine. In Year 21 Bulga village is approximately 2.6 km to the mine disturbance area and 2.8 km from proposed mining areas. That distance is associated with a loss factor of 85 dB, which is higher than the probable noise loss factor associated with the effects of a ridge which are typically in the order of 10 dB or lower under adverse weather conditions.

285The applicant did not lead expert evidence to challenge this evidence. On the basis of Mr Ishac's evidence, I accept that Saddleback Ridge may make some contribution to noise attenuation, particularly in calmer meteorological conditions, and that the proposal to remove it by the expansion of mining operations to the west from Year 2 onwards will increase noise impacts to some extent. While it may be accepted that Saddleback Ridge does not provide substantial noise attenuation, of greater significance is its contribution to screening the visual impact of the mine, an environmental benefit acknowledged in the EIS for the 2003 development consent (TB vol 5, tab 114, p 2615-6). The significance of the removal of Saddleback Ridge is considered below as an element of the social impact of the proposed Project.

The noise criteria proposed in conditions of Project Approval

286The revised conditions of approval (Exhibit W33) reflect the recommendations in the EAR, and require Warkworth to:

- prepare and implement an Environmental Management Strategy (Condition 1 of Sch 5) and a Noise Management Plan (Condition 8 of Sch 3);

- ensure that new trucks and equipment are commissioned as noise suppressed units and progressively attenuate the noise of the existing fleet by the end of 2015 (Condition 5 of Sch 3);

- operate according to specified operating conditions (Condition 7 of Sch 3), and specified noise criteria (Condition 3 of Sch 3);

- monitor and report on compliance (Conditions 5(b) of Sch 3, and 1(f), 3(d) of Sch 5);

- review the noise criteria during 2015 (Condition 7(g) of Sch 3), and other management plans (Condition 3(h) of Sch 5); and

- provide for the taking of further action if noise criteria are not met, including remediation (Condition 2 of Sch 5), and acquisition on request of affected properties (Conditions 2 and 4 of Sch 3).

287Conditions 1, 2, 3 and 4 of Sch 3 establish the scheme for dealing with noise affected properties. The 20 properties identified in Table 1 in Condition 1 are the worst noise affected properties where no mitigation measures can reduce the noise impacts to a satisfactory level, and Warkworth will be required to acquire those properties on the written request of the owners.

288Table 3 in Condition 3 sets the noise criteria for land other than the noise affected land in Table 1, including 72 specifically identified properties in Bulga, as well as "all other privately owned land" in Bulga. Condition 3 requires Warkworth to ensure that the noise generated at the Mount Thorley-Warkworth mine complex does not exceed those criteria at any residence on privately-owned land, other than where there is a written agreement with the owner to generate higher noise levels. Appendix 12 sets out the meteorological conditions under which the noise criteria apply. An "exceedence" is defined in Condition 3 to occur "when valid attended noise data from compliance monitoring (collected in accordance with the requirements in Appendix 12) indicates the noise generated by the Mount Thorley-Warkworth mine complex has exceeded the criteria set out in Table 3".

289Appendix 12 specifies (para 1) that the noise criteria applies under all meteorological conditions except during periods of rain or hail; when average wind speed at microphone height exceeds 5 m/s; when windspeeds are greater than 3 m/s measured at 10m above ground level; or when temperature inversion conditions are greater than 3°C/100m. The determination of meteorological conditions is, however, done at the mine site, except for wind speed at microphone height (para 2). Appendix 12 also specifies that only attended monitoring is to be used to evaluate compliance with the conditions of approval (para 3). Accordingly, the unattended directional monitoring ('Barnowl') sites, are not to be used for compliance monitoring which record data in real time. Appendix 12 specifies that, unless otherwise agreed with the Director-General, compliance monitoring is to be carried out in accordance with the relevant requirements for reviewing performance in the INP, including the requirements relating to monitoring locations (para 4).

290Condition 4 of Sch 3 provides that if there are "sustained exceedences" of the noise acquisition criteria in Table 4 of Sch 3, which are set at a LAeq (15 minute) level of 43 dB(A) for day, evening and night at all privately owned land in Bulga, measured at any residence on privately-owned land, or on more than 25 per cent of privately-owned land, Warkworth must acquire the land on the written request of the owner. A "sustained exceedence" is defined in Condition 4 to occur "when valid attended noise data from compliance monitoring (collected in accordance with the requirements in Appendix 12) indicates the noise generated by the Mount Thorley-Warkworth mine complex has exceeded the noise criteria set in Table 4 for 10% or more of an individual day, evening or night assessment period (as those periods are defined in the NSW Industrial Noise Policy) and this has occurred on 3 occasions or more during any 30 day period."

291Condition 2 of Sch 3 makes provision for implementation of additional noise mitigation measures at 41 specified residences, identified in Table 2. Those properties do not include the properties listed in Table 1, and for Bulga residences includes the properties for which Table 3 establishes noise criteria at 41 or 42 dB(A). Warkworth would be required, on the written request of the owner, to implement additional noise mitigation measures such as double-glazing, insulation, and airconditioning.

292The proposed noise conditions reflect the intention that both Warkworth and Mount Thorley will continue to operate until 2017, when Mount Thorley will cease operation. Year 2 is regarded in the PPR as the potentially worst case year of operations, when all pits are expected to be operative at Warkworth and Mount Thorley (PPR TB vol 1, tab 8, p 559). Noise levels from Warkworth are expected to increase as the extended mine moves westwards given the relatively closer proximity to Bulga.

293The evidence of Mr Ishac was that had the noise criteria remained separate for the Warkworth and Mount Thorley mines, the allowable combined noise level would be 40 dB(A) and 45 dB(A) for operational and acquisition limits at Bulga residences respectively, derived from the logarithmic addition of both noise limits (Ishac report [20]). The hybrid approach assumes a single mining complex and sets 38 dB(A) Leq (15 minute) for intrusive noise contribution from the complex. Mr Ishac summed up the benefits of the hybrid noise criterion as being an increase from zero to 26 in the number or properties entitled to mitigation, and an increase from zero to one in the number of properties entitled to acquisition rights (Ishac report [24]).

294The combined noise criteria for the Mount Thorley-Warkworth mine complex in Sch 3 are proposed to apply until Mount Thorley ceases operation. Once (in the opinion of the Director-General) extraction of coal at Mount Thorley approved under the development consent DA 43/95 has been substantially completed, Condition 3 ceases to be operative and is replaced by Condition 2 in Appendix 10, which provides alternative noise criteria based on Warkworth alone.

295The acceptability of the Project's noise impacts, if operating at the noise levels permitted by the proposed conditions of approval, depends, in part, on the acceptability of the noise levels set by the conditions. An accepted standard against which the noise levels set by the conditions can be assessed for their acceptability is the INP. The INP explains the processes to be followed to fix project-specific noise levels and noise limits in conditions of approval.

INP process for determining appropriate noise criteria

296It was common ground that the starting point for determining appropriate noise levels for the Project is the INP published by the EPA in 2000 (TB vol 7, tab 273). The INP notes (at 1.4, p 2) that assessment of noise impact is complex and subjective, and the INP outlines processes "to help strike a feasible and reasonable balance between the establishment and operation of industrial activities and the protection of the community from noise levels that are intrusive or unpleasant".

297The INP provides that noise management involves the following main steps:

1. Determining the project specific noise levels for intrusiveness and amenity that are relevant to the site or the area (*Section 2*).

2. Measuring and determining existing background and ambient noise levels, using the method relevant to the expected level of impact (as outlined in *Section 3*).

3. Where the proposed development is expected to produce annoying noise characteristics, adjustments are to be applied to the noise levels produced by the development in question (as outlined in *Section 4*).

4. Predicting or measuring the noise levels produced by the development in question, having regard to meteorological effects (such as wind, temperature inversions) (see *Section 5*).

5. Comparing the predicted or measured noise level with the project-specific noise levels and assessing impacts (*Section 6*).

6. Considering feasible and reasonable noise mitigation strategies where the project-specific noise levels are exceeded (*Section 7*).

7. Negotiation between the regulatory/consent authority and the proponent and between the community and the proponent to evaluate the economic, social and environmental costs and benefits from the proposed development against the noise impacts (*Section 8*).

8. The regulatory/consent authority sets statutory compliance levels that reflect the achievable and agreed noise limits for the development (*Section 9*).

9. Monitoring of environmental noise levels from the development to determine compliance with the consent/licence conditions (*Section 11*).

298The first step of determining the project-specific noise levels involves selection of the industrial noise criteria. The industrial noise criteria set out in Section 2 of the INP are "best regarded as planning tools" and are intended "to protect at least 90 per cent of the population living in the vicinity of industrial noise sources from the adverse effects of noise for at least 90 per cent of the time." (INP, 1.4.1 p 3). The INP sets two separate noise criteria to meet environmental noise objectives: one to control intrusive noise impacts in the short term for residences, and the other to protect and maintain noise level amenity for particular land uses for residences and other land uses (INP, 1.4.4, p 4). The evidence of Mr Parnell, a noise specialist in the Department of Planning, was that in his experience, the controlling criteria for mines will be the intrusiveness criteria; the amenity criteria is superfluous for mines but useful for other industrial operations eg Newcastle port.

299Selection of the intrusiveness criterion starts with measurement of the background noise. At the project approval stage, a long-term method is used to determining background noise. This involves two steps: first, determining the assessment background level for each day, evening and night period using the tenth percentile methods and, second, determining the rating background level, which is the median assessment background level over all days for each period (INP, 3.1.1, p 22 and Table 3.1, p 23). The base measure is LA90 (15 minute). The long term method for determining background noise is designed to ensure that the criterion for intrusive noise will be achieved for at least 90% of the time periods over which annoyance reactions may occur (taken to be periods of 15 minutes) (INP, 3.1.1, p 22).

300After determining the rating background level, the intrusiveness criteria is determined. The intrusiveness criterion essentially means that the equivalent continuous (energy-average) A-weighted sound pressure level of the source over 15 minutes LAeq (15 minute) should not be more than 5 dB above the measured rating background level (INP, 1.4.4, p 5 and 2.1, p 14).

301Amenity criteria are intended to protect the noise amenity of an area to limit continuing increases in noise levels. The INP provides that the "maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels in Table 2.1. Meeting the acceptable noise levels in Table 2.1 will protect against noise impacts

such as speech interference, community annoyance and, to some extent, sleep disturbance." (INP, 2.2, p 15).

302The amenity criterion is based on noise criteria specific to land use and associated activities (INP, 1.4.4, p 5). At Table 2.1 of the INP (p 16), for a residential receiver in a rural noise amenity area (which are both applicable to Bulga), acceptable LAeq noise levels are 50 dB(A) for day, 45 dB(A) for evening, and 40 dB(A) for night and recommended maximum levels are 55 dB(A) for day, 50 dB(A) for evening, and 45 dB(A) for night. "Day" is defined as 7.00am-6.00pm Monday to Saturday and 8.00am-6.00pm Sundays and public holidays; "evening" as 6.00pm-10.00pm; and "night" as 10.00pm-7.00am Monday to Saturday and 10.00pm-8.00am Sundays and public holidays (INP, pp 56 and 58).

303After assessing intrusiveness and amenity, it is necessary to set the project-specific noise levels. The INP provides that for a particular project, "the more stringent of the intrusive or the amenity criteria sets the project- specific noise levels for that project". (INP, 1.4.4, p 5).

304The third step in the INP process for noise management is to take account of any annoying noise characteristics. The INP notes that where a noise source contains certain characteristics, such as tonality, impulsiveness, intermittency, irregularity or dominant low frequency content, it can cause greater annoyance than other noise at the same noise level (INP, 4.1, p 28). Of critical relevance to the Project is low frequency noise. The INP defines low frequency noise as "noise containing major components within the low frequency range (20 Hz-250 Hz) of the frequency spectrum" (INP, 4.2, p 28). The INP outlines the correction factors to be applied to the source noise level at the receiver, before comparison with the noise criteria specified, to account for the additional annoyance caused by these modifying factors (including low frequency noise (INP, 4.1, p 28)). Table 4.1 of the INP (p 29) requires, for low frequency noise, a correction of 5 dB to be added to the measured or predicted noise levels if the difference between the C-weighted and A-weighted levels over the same time period is 15 dB or more.

305The fourth step in the process specified in the INP is to account for the effect of meteorology on noise levels. The project-specific noise levels are expected to apply under weather conditions characteristic of an area. These conditions may include calm, wind and temperature inversions (INP, 1.4.4, p 5).

306Section 5 of the INP outlines the process for assessing the amount by which noise is increased by the effects of certain meteorological conditions. The INP notes (5.1, p 31) that temperature inversions (atmospheric conditions where temperatures increase with height above ground level) and where there is a wind gradient (that is wind velocities increasing with height) with wind direction from the source to the receiver, typically increase noise levels by 5 to 10 dB, or as much as 20 dB in extreme conditions. Figure 5.1 provides the procedure for assessing the amount by which noise is increased by inversion effects, confined to the night noise assessment period as this is when temperature inversions usually occur and disturbance to sleep is possible (INP, 5.2, p 31-32).

307After determining the project-specific noise levels, the fifth step in the INP process is to predict the noise levels from the industrial noise source, which can then be compared with the project-specific noise levels to determine the noise impacts (see Section 6 of the INP, pp 36-37).

308When the predicted noise level from the industrial noise source exceeds the project-specific levels, mitigation measures that will reduce noise levels to meet the project-specific noise levels need to be considered (INP, 7.1, p 38). This is the sixth step in the INP process.

309There are three main mitigation strategies for noise control: controlling noise at the source (using best management practice and best available technology economically achievable); controlling the transmission of noise (through the use of barriers and land-use controls, which attenuate noise by increasing the distance between source and receiver); and controlling noise at the receiver.

310Controlling noise at the source involves, first, application of best management practice but then, when best management practice fails to achieve the required noise reduction by itself, use of best available technology economically available (INP, pp 38-39). Best management practice is the adoption of particular operational procedures that minimise noise while retaining productive efficiency. The INP suggests, as an example for open cut mines, that application of best management practice may involve "restricting movement of trucks on ridgelines and exposed haul routes where their noise can propagate over a wide area, especially at night. This means restricting night-time movement of spoil to areas shielded by barriers or mounds, and reserving large-scale spoil movements for daytime" (INP, 7.2, p 38). Another practice suggested by the INP is scheduling the use of noise equipment at the least sensitive time of day (INP, 7.2, p 38). Use of the best available technology economically available involves ensuring that equipment, plant and machinery that produce noise incorporate the most advanced and affordable technology to minimise noise output (INP, 7.2, p 39). Examples of use include adjusting reversing on heavy equipment to limit acoustic range to the immediate danger area; using equipment with efficient muffler design; using quieter engines; and active noise control (INP, 7.2, p 39).

311Controlling noise in transmission includes use of barriers, such as earth mounds or bunds (INP, 7.3, p 39). Land use planning is a strategic approach to noise mitigation involving isolation, by strategic planning, of future sensitive land uses, such as residential development, from future noise-producing industries, such as extractive industries and open cut mines. (INP, 7.3, pp 39-40). It is of no assistance for existing land uses near industries, as is the case here.

312Controlling noise at the receiver is expensive when many receivers require treatment (INP, 7.4, p 40). The two major controls are insulation and double-glazing of windows. For these to be effective, the residence needs airconditioning or a sophisticated ventilation system that does not compromise the effect of the noise insulation. The most extreme control is property acquisition (INP, 7.4, p 40).

313The INP provides a preference ranking for particular noise mitigation strategies, from most preferred to least preferred, of land-use controls to separate noise-producing industries from sensitive areas; control at the source; control in transmission; and receiver controls, which are "the least-preferred option, as it protects only the internal environment of the receiver and not the external noise environment" (INP, 7.5, p 40-41).

314The seventh and eighth steps in the INP process, where applied to a consent authority's determination of whether to approve a noise-producing project and, if so, the noise limits and noise mitigation strategies to be imposed in the conditions of approval, include an evaluation of the acceptability of setting noise limits in the conditions at levels greater than the project-

specific noise levels. Section 9 of the INP notes that a consent authority in determining whether to grant approval to a noise producing project and if so, on what conditions, will undertake the analytical process specified in the INP, including taking into account the assessed noise impact (which includes the impact of the noise source and any additional impact caused by meteorological conditions), mitigation measures required to achieve the project-specific noise levels, and whether the final noise level proposed is acceptable (INP, 9.1, p 47).

315The INP notes that it is important that the noise limit fixed by the conditions of approval apply under the typical meteorological conditions determined by the INP to be relevant to the assessment site (INP, 9.1, p 47). However, the noise limits may be expressed to not apply under typical meteorological conditions, such as particularly intense, non-standard temperature inversions. The INP gives an example of an approval condition for a development where F-class inversions (normally associated with non-arid areas such as the Hunter Valley) are a feature of the area. The Condition specifies the meteorological conditions under which the noise limits apply and do not apply:

The noise limits apply under all meteorological conditions except

during rain and wind speeds greater than 3 m/s; and

from 6 pm to 7am during intense inversions, which are indicated by cloud cover less than 40 per cent and wind speeds less than 1.0 m/s.

Note: Wind data should be collected at 10 m height.

316The INP notes that the latter point in the Condition excludes non-standard inversions (which are intense inversions - G-class in the example given, compared to the standard F-class inversion) (INP, 9.2, pp 47-48).

The process followed for setting noise criteria in the Project Approval

317Mr Parnell explained the process the Department followed in setting the noise limits in the conditions in the Project Approval (affidavit affirmed on 7 September 2012). Mr Parnell stated that the noise levels set in the originally proposed conditions address both intrusive noise criteria and amenity noise criteria, as addressed in the INP.

318Intrusive noise criteria are set relative to the background noise levels and are used to contain the emergence of industrial noise over the surrounding noise levels. As a starting point, the project-specific noise levels ('PSNLs') were established at 5 dB(A) above the rating background level ('RBL') or 30 dB(A), whichever was the higher (aff at [14]). The measurement period for intrusive noise criteria is 15 minutes Leq (15 minute) (aff at [15]).

319Mr Parnell explained how the intrusive noise criteria in the proposed conditions were established, (aff at [20]-[21]) starting with the PSNL:

For Bulga, the RBL [rating background level] was calculated to be 33 dB(A) in the Environmental Impact Assessment in 2002. In assessing the Project, I considered that calculation of the RBL to still represent valid background levels. The PSNL was therefore 33 + 5 = 38 dB(A).

On the basis of my experience with the EPA, and more recently in my interaction with the EPA in assessing projects for the Department, I consider there is the established practice between the Department and the EPA is [sic] to follow the protocols below for setting the intrusive noise criteria for a project:

(a) If the predicted noise levels at a receiver are less than the PSNL: Set criteria for the receiver at predicted level with a minimum level of 35 dB(A).

(b) If the predicted noise levels at a receiver are the same as the PSNL: Set criteria at the PSNL. For Bulga, this would be 38 dB(A) at night.

(c) If the predicted noise levels at a receiver are 1-2 dB above the PSNL: Set criteria at the predicted level, provided reasonable and feasible mitigation measures have been implemented. For Bulga this would be 39-40 dB(A) at night.

(d) If the predicted noise levels at a receiver are 3-5 dB(A) above the PSNL: Set criteria at predicted level but assign treatment rights (the right to obtain mitigation measures on request) to the property. For Bulga this would be 41-43 dB(A) at night.

(e) If the predicted noise levels at a receiver are greater than 5 dB(A) above the PSNL: Assign acquisition rights to the property. For Bulga, this would be greater than 43 dB(A) at night.

320This approach was reflected in Conditions 1 to 3 of Sch 3 of the Project Approval, where the noise criteria for the Project are set in Condition 3 and acquisition rights and mitigation rights are provided in Conditions 1 and 2 (aff at [22]).

321The amenity noise criteria are set to protect the noise amenity of the surrounding noise catchment. These are land use specific and are set to protect at least 90% of the population from being highly annoyed (aff at [16]). The purpose is to cap the noise levels at an acceptable level and to limit any background noise creep that would occur if only the intrusive noise criteria were adopted and multiple industries moved into the area (aff at [17]). The amenity noise criteria average the noise over each of three periods, the day, evening and night periods (Leq (period)). The objective for a rural area for a night period is for all cumulative industrial noise to be 40 dB(A) averaged over the 9 hour period (aff at [18]). The Department therefore set an amenity (cumulative) noise criterion for the night period of 40 dB(A) LAeq (period) for Bulga and all other privately owned land (in former Condition 5 of Sch 3). The amenity (cumulative) noise criteria for the other periods of day and evening were higher (reflecting the higher ambient noise in these periods), being 45 dB(A) LAeq (period) for evening period for both Bulga and all other privately owned land and for day period 55 dB(A) LAeq (period) for Bulga and 50 dB(A) LAeq (period) for all other privately owned land. The amenity (cumulative) noise acquisition criteria were set at 5 dB(A) LAeq (period) above each of these amenity noise criteria (in former Condition 6 of Sch 3).

322Mr Parnell stated (aff at [19]) that there is not a strict arithmetical relationship between the Leq (15 minute) level and the Leq (period) level due to the differing time domains and the variability that can occur in the meteorological conditions over time. In assessing mine noise, there is a general rule of thumb of a 3 dB(A) difference between the Leq (15 minute) level and the Leq (period) level for mine noise. Hence, 43 dB(A) Leq (15 minute) approximates 40 dB(A) Leq (period).

323Mr Parnell stated that in fixing the amenity (or cumulative) noise criteria the Department determined to treat the Warkworth mine and the Mount Thorley mine as a single mine complex. The other mine in the area that could have a cumulative noise impact on the residents of Bulga is the Bulga mine (aff at [34]). In order for the Mount Thorley-Warkworth mine complex to exceed amenity (cumulative) noise criteria in concert with another mine,

such as the Bulga mine, one or more mines would need to exceed their intrusive noise criteria for the whole 9 hour night period (aff at [35]).

324Mr Parnell gives an example, using the intrusive noise criterion for the night period for all other privately owned land in Bulga for the Mount Thorley-Warkworth mine complex of 38 dB(A) (in Condition 3 of Sch 3 of the Project Approval) and the equivalent intrusive noise criterion in the development consent for the Bulga mine of 36 dB(A) LAeq (15 minute). Adding logarithmically these two intrusive noise criteria gives a result of Leq (15 minute) of 40 dB(A). Applying the rule of thumb, 40 dB(A) Leq (15 minute) approximates 37 dB(A) Leq (period). That level would be 3 dB(A) below the amenity (cumulative) noise criteria for all other privately owned land of 40 dB(A) and 8 dB(A) below the amenity (cumulative) noise acquisition criteria of 45 dB(A) (aff at [36]).

325Mr Parnell further stated that, in his experience, he has not seen or heard of a situation where the cumulative noise criteria have been breached before the intrusive noise criteria as a result of mining activity. Hence, he has never been in a position where it was necessary to assess compliance with the cumulative noise conditions from mining activity, as there has not been a situation where these limits were breached (aff at [38]).

326No doubt as a result of Mr Parnell's experience, the Department in its revision of the conditions of approval deleted these conditions setting amenity (cumulative) noise criteria and cumulative noise acquisition criteria for the Project. The Project now only needs to comply with intrusive noise criteria and the proposed conditions only set intrusive noise criteria for operations, mitigation and acquisition.

The Project Approval noise criteria and mitigation strategies differ from those of the INP

327The approach adopted by the Minister in establishing the noise criteria in the proposed conditions differs from the approach required by the INP in five significant respects. First, for many residences, a higher background noise level has been used than is supported by the measurement evidence. As both intrusiveness criteria and amenity criteria are dependent on background noise, the result of using higher background levels has been to increase the project-specific noise levels. Secondly, the project-specific noise levels are not the lower of the intrusive criterion and the amenity criterion, as required by the INP, but have been increased to equate with the predicted noise levels for the Project. Thirdly, the noise limits in the conditions do not apply under all meteorological conditions typical to the area, as required by the INP. Fourthly, the approval conditions do not account for annoying noise characteristics, such as low frequency noise. Fifthly, the noise limits in the conditions of approval are not specific to only the Project but are combined with another mine project not the subject of the approval.

328One consequence of these differences in approach to setting noise limits in the approval is that the noise limits are greater, and hence noise emissions from the Project at the greater noise levels permitted will have greater noise impacts, including intrusiveness and on amenity. In my view, these greater noise impacts are unacceptable. A second consequence flows from the setting of noise limits at too high levels. If the noise limits were to be reduced to the levels that would result from application of the INP, more extensive noise mitigation strategies would be required. In particular, many more properties would need to have

mitigation works undertaken, such as insulation, double glazing of windows and airconditioning, or be acquired by Warkworth. The extent of controls at the noise receivers and the impacts those controls will cause, are sufficiently great as to be unreasonable in my view.

329I will now elaborate on the five respects in which the approach of the Project Approval differs from that of the INP.

Establishing too high background levels

330The INP addresses the importance of establishing background levels before intrusive noise can be assessed (3.1, p 22). The respondents relied on the selection of 33 dB(A) as the background noise level based on a noise survey taken at six representative monitoring stations as part of the preparation of the 2002 EIS, and results of monitoring in 2008 which suggested that the 2002 data remained representative of background noise (Minister's Notes in relation to Noise Conditions dated 7 September 2012 [6]). The Department was satisfied that this method of establishing background noise levels, and the levels themselves, were "reasonable and consistent with guidance levels provided by Australian Standards and the INP" (Minister's Notes in relation to Noise Conditions dated 7 September 2012 [6], referring to TB vol 2, tab 9, p 810). In his affidavit Mr Parnell stated (at [20]) that in assessing the Project, he had considered that calculation of the RBL to still represent valid background levels. In assessing the noise impact assessment prepared on behalf of Warkworth, Mr Parnell had noted that "[l]evels adopted as background noise levels are generally within 3-4 dB(A) of the minimum accepted RBL of 30 dB(A) recommended in the INP as a basis for calculation of intrusive noise criteria" (Parnell aff, Annexure D, at 2.1).

331However, the evidence establishes that the background noise level for some residences to the north of Bulga village is 30 dB(A) rather than 33 dB(A). The 2002 Noise and Vibration Study undertaken on behalf of Warkworth by ERM (Supp TB vol 4, p 2199), included data from two noise logger locations in Bulga (N6) and to the north of Bulga (N5). Relying on table 2.2 of the ERM 2002 report, residences close to N5 would have a background noise level of 30 dB(A) during the day and night, and 31 dB(A) in the evening. The correlation of Figures 2.1 and 2.2 of the 2002 ERM report with the mapping of residences in Exhibit W20 confirms that a number of residences to the north of Bulga village, being numbers 25, 27, 29, 34 and 42, would be in that locality. If that is correct, and the background is 30 or 31 dB(A), applying the INP would lead to an intrusive noise level for those residences of 35 or 36 dB(A), rather than 38 dB(A).

332This variation in background noise levels in one part of the Bulga area likely to be affected by noise of the Project raises doubts as to the reliability of the adopted background noise levels for other parts of that area. The six monitoring stations used in preparation of the 2002 EIS for the original mine are not distributed over all of the area likely to be affected by the current Project. The residents' evidence is that there are differences in noise levels and the characteristics of the noise at different receivers to those at or near the monitoring stations.

333The consequence of adoption of too high background noise levels is not only to increase the project-specific noise levels (and the still higher noise levels set in the proposed conditions of approval), but also to apply less noise mitigation strategies. The proposed conditions of approval make the undertaking of noise mitigation or acquisition of properties dependent on the noise generated at the Mount Thorley-Warkworth mine complex exceeding

specified criteria. Those criteria are based on the adopted background noise levels plus 5 dB(A) for the intrusiveness criterion plus the margins applicable for either mitigation (3-5 dB(A)) or acquisition (>5 dB(A)). Using the example of the residences to the north of Bulga, adoption of a background noise level of 33 dB(A) for the night period results in a noise mitigation criterion of 41 dB(A), (that is, assigning a right to obtain mitigation measures if the noise generated by the Mount Thorley-Warkworth mine complex is greater than 41 dB(A), being 33 plus 5 plus 3 dB(A)) and a noise acquisition criterion of 43 dB(A) (that is, assigning a right to have the property acquired if noise generated is greater than 43 dB(A), being 33 plus 5 plus 5 dB(A)). However, if a lower background noise level is used, such as 30 dB(A) measured for the night period, the noise mitigation criterion would be 38 dB(A) and the noise acquisition criterion would be 40 dB(A). A lowering of the noise mitigation and acquisition criteria increases the number of properties likely to require mitigation or acquisition.

Setting the criteria based on what the mine can achieve, not what is acceptable

334The setting of criteria by reference to the predicted level above the PSNL is based on the approach adopted by the 2004 Commission of Inquiry under the then s 119(1) of the EPA Act into the environmental aspects of the proposed extension of coal mining operations at the Mount Owen mine. The PSNL had been assessed for that project at 35 dB(A). The then Department of Environment and Conservation (DEC) and Department of Infrastructure Planning and Natural Resources (DINPR) had considered an exceedence of up to 2 dB(A) as minor; between 2 dB(A) and 5 dB(A) as marginal; and greater than 5 dB(A) as significant (Exhibit W3, p 40). The Commission of Inquiry agreed with DIPNR that the applicant should be required to acquire properties affected by noise levels over 40 dB(A) if the owner requested, and recommended that residences predicted to be affected by project noise levels above 37 dB(A) and up to 40 dB(A) should be able to request strategies such as double glazing, insulation and air conditioning (Exhibit W3, p 40). This approach by the Commission of Inquiry has been followed by the Department of Planning and other mine proponents in setting noise limits and criteria for noise mitigation and acquisition of noise-affected properties in development consents and project approvals for mines. (Minister's notes re Applicant's proposed conditions, [6]-[7]).

335The justification provided in these proceedings for regarding predicted exceedences of 1-2 dB(A) as minor, and setting the noise limits to permit higher levels of noise, was that measurement, and perception, of noise, are difficult, and that there should be latitude given that these are conditions that need to be enforced (Williams subs T 8/11/12, p 227.20). Indeed, the reality is that the Project cannot achieve, by controlling noise at the source or the transmission of noise, the project-specific noise levels that would be derived by application of the INP. The noise limits proposed in the conditions have therefore been increased beyond what would be the project-specific noise levels to match the predicted noise levels of the Project.

336The INP does contemplate that it may, in some instances, be appropriate to set noise limits for a development above the project-specific noise limits recommended by the INP (1.4.7, p 6). Part 9 of the INP states that determining an approval condition should take into account the assessed noise impact (including additional impact caused by meteorological conditions); mitigation measures required to achieve project-specific noise levels; identification of a practical limit on noise control; consideration of trade offs; and whether the final noise proposed is acceptable (INP, 9.1, p 47). In particular, there needs to be an

evaluation of the acceptability of setting noise limits in the approval conditions above the project-specific noise levels.

337The approach adopted by the Department of Planning and Warkworth in setting the noise limits in the approval conditions is not consistent with the approach recommended by the INP. There should be first a correct identification of the project-specific noise levels, derived from application of the INP. In the case of the Project, these would be lower at many locations than the noise limits proposed in the approval conditions. Next, the predicted noise levels, after applying all feasible and reasonable mitigation strategies, should be calculated. Then there should be an assessment that quantifies the remaining or residual noise impacts of the Project that exceed the project-specified noise levels, after applying feasible and responsible mitigation strategies.

338Finally, there should be an evaluation of the acceptability of the residual noise impacts. The evaluation of acceptability should take into account:

(a)characteristics of the area and receivers likely to be affected, such as the extent of the areas and the numbers of receivers likely to be affected by noise level above the project-specific noise levels, the daily activities of the community (in particular, effects such as sleep disturbance and level of annoyance), the potential change in the ambient noise level as a result of the Project, cumulative noise impacts in the area, and whether parts of the area that are already moderately or badly affected by noise will be more affected;

(b)characteristics of the project and its noise, such as the noise characteristics of the activity, the extent to which any remaining noise impact exceeds the project-specific noise levels, the circumstances and times when the project-specific noise levels are likely to be exceeded, the circumstances and times when the source noise levels are likely to be below the project-specific noise levels (for example when wind blows source noise away from the receiver), the accuracy with which impacts can be predicted and the likelihood that the impacts will occur in the manner predicted, and the economic benefit and social worth of the project for the local area, the region or the nation;

(c)the feasibility of additional mitigation or management measures; and

(d)equity issues in relation to the costs borne by some for the benefit of others, the long term cumulative increase in noise levels, and the opportunity to compensate effectively those affected (INP, 8.2.1, pp 43-44).

339Whilst some of these factors were taken into account by the Department and Warkworth, all of the factors were not taken into account in setting the noise limits in the approval conditions. There has been no evaluation of the acceptability of setting those noise limits for the Project above the project-specific noise levels recommended by the INP. The twin reasons given, that setting higher limits accords with the departmental practice since 1994 and with what is able to be achieved by the Project, are not cogent reasons for departing from project-specific noise levels recommended by the INP.

340In my view, consideration of the factors suggested in the INP for evaluating the acceptability of the residual impacts supports a conclusion that setting the noise limits above the project-specific levels recommended by the INP is unacceptable.

341In relation to the characteristics of the area and receivers likely to be affected, there is a wide area and there are numerous receivers likely to be affected by noise from the Project above the project-specific noise levels. This is firstly illustrated by the fact that the predicted worst case Leq (15 minute) noise level for both Warkworth and Mount Thorley mines would equal or exceed the operational noise limit set for the Warkworth mine in the 2003 Warkworth consent for 84% of Bulga residences and the proposed combined operational criteria for both mines for 56% of Bulga residences.

342This is secondly illustrated by the location and number of properties that would need to have controls at the receiver, either by way of mitigation treatment to the residential dwelling or acquisition of the property. The majority of the 20 properties identified as subject to acquisition on request for noise or noise and air are located in Mount Thorley, to the east of the mine; two are located in Warkworth, to the north, and three in Bulga on Putty Road to the east of Wollombi Creek. Of the 41 properties identified as subject to mitigation measures on request for noise or noise and air, over half are located in Bulga: 11 on Wambo Road to the north, 11 on Inlet Road to the south west, and three on Wambo Road to the south of Bulga village. The remainder are located in Maison Dieu, to the north of the mine, Gouldsville/Long Point to the north east, and eight are located in Hambledon Hill, to the north east of the mine.

343The evidence establishes that noise emitted by existing operations interferes with the daily activities of receivers, including sleep disturbance and annoyance. The residual impacts of noise exceeding the project-specific noise levels could only exacerbate such interference. The residual impacts would be cumulative upon an already adversely affected noise environment.

344In relation to the characteristics of the Project and its noise, the noise characteristics of the Project include low frequency content which increases annoyance. The residual noise impacts exceed project-specific noise levels by a sufficient extent as to justify undertaking controls at numerous receivers, such as by mitigation treatment and acquisition. The project-specific noise levels are likely to be exceeded at any time throughout the day, evening and night, as the Project operates continuously 24 hours a day, each day and there is no restriction on the nature or location of noise-producing activities throughout the day. As indicated below, the noise criteria do not operate during certain meteorological conditions, but this does not mean that noise levels will be below project-specific noise levels at that time - indeed, it is likely they may be above (such as at times of extreme temperature inversions). Under the proposed conditions there will be great difficulty in monitoring compliance with the noise limits proposed in the conditions. There is not reasonable certainty that the Project could comply with those limits, let alone if the limits were set at the lower project-specific noise levels. There is, therefore, considerable uncertainty in the prediction of residual impacts.

345In relation to additional mitigation measures, those measures proposed in the conditions are unlikely to be efficacious in mitigating or managing noise from the source to a sufficient extent, or in a sufficiently timely manner, to reduce noise at receivers to the project-specific noise levels.

346In relation to equity issues, the costs resulting from the residual impacts will be borne by the residents of Bulga who are the noise receivers, but the benefits of the Project will be enjoyed by others, including Warkworth. The burdened residents of Bulga will not be compensated effectively by Warkworth. There will not be full internalisation by Warkworth

of the external costs of the Project, occasioned by its noise impacts, on the Bulga residents. Even the residents who are eligible to and do request noise treatment of their houses to control noise at the receiver will not receive compensation for the reduction in amenity and enjoyment from the noise treatment (such as not being able to open windows or use outdoor recreation areas). If they are eligible to and do request acquisition of their properties, compensation will not be on a value to owner basis or address the subjective or emotional loss occasioned by being dispossessed of their home. The long term cumulative increase in noise levels caused by the expansion of the Warkworth mine, as well as the Mount Thorley mine and other mines in the area, is not addressed.

347In my view, the case has not been made for setting the noise limits for the Project at the levels proposed in the approval conditions above the project-specific noise levels recommended by the INP. Furthermore, even if the project-specific noise levels recommended in the INP were to be applied in the approval conditions, the Project would be unable to comply with these limits, triggering far more extensive noise mitigation at receivers and acquisition of receivers' properties, which would itself lead to unacceptable impacts.

Insufficient accounting for the effect of meteorology on noise levels

348The INP requires that the noise limits in the approval conditions (which ordinarily should be the project-specific noise levels) should apply under all weather conditions characteristic of the area. These may include conditions of calm, wind and temperature inversions (INP, 1.4.4, p 5; 5.1, p 31 and 9.1, p 47). To ensure that the noise limits in the approval conditions do apply under typical meteorological conditions, the INP recommends inclusion of a condition of approval to this effect. However, the INP recognises that the approval condition may exclude application of the noise limits in non-standard meteorological conditions (INP, 9.2, p 48).

349The proposed conditions of approval purport to adopt this approach. Conditions 3 and 4 of Sch 3 provide that the noise criteria therein stated apply in the meteorological conditions set out in Appendix 12. Paragraph 1 of Appendix 12 states that the noise criteria apply under all meteorological conditions except those specified in the paragraph, which are:

(a)during periods of rain or hail;

(b)average wind speed at microphone height exceeds 5 m/s;

(c)wind speeds greater than 3 m/s measured at 10 m above ground level; and

(d)temperature inversion conditions greater than 3°C/100 m

350That is a change from the conditions approved by the Minister, which simply stated in the notes to the conditions that "noise generated from the Mount Thorley-Warkworth mine complex is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions)" of the INP.

351Except for measuring wind speed at microphone height (subpara (b)), the data used is that recorded by the meteorological station located on the site, not at the receivers (para 2).

352The INP identifies two situations where meteorological conditions may increase noise levels: during temperature inversions and where there is a wind gradient with wind direction from the source to the receiver (INP, 5.1, p 31). These two types of meteorological conditions are included in the first example of a condition of approval given in the INP (pp 47-48). However, to be an exception, the inversion or the wind gradient must be non-typical or non-characteristic of the area. Conditions of wind and temperature inversion which are typical or characteristic of an area should not be excepted. The INP's example is of a development where F-class inversions (normally associated with non-arid areas such as the Hunter Valley) are a feature of the area. The Condition given applies the noise limits in all meteorological conditions (including during F-class inversions) except where there is a non-standard intense inversion (a G-Class inversion in the example given). The INP's example also exempts application of the noise limits when there are source-to-receiver wind speeds (at 10m height) which are greater than 3 m/s (INP, 9.2, p 48).

353The assessment of potential for temperature inversions and of wind effects undertaken as part of the Noise and Vibration Study for the 2010 Environmental Assessment (Annexure G) concluded from monitoring in 2006-2008 that F-class inversions occurred for only 10% of winter nights, which is below the 30% threshold where temperature inversions are considered to be a "feature" of the area. While that meant that this factor did not need to be included in the noise impact assessment, the prediction of noise levels included consideration of the effects of a 3°C/100 m temperature inversion. The wind in the Project area was assessed as above the INP threshold of 3 m/s or below at 10 m height occurring for 30% of more of the time in any assessment period in any season. The modelling included a drainage wind of 2 m/s and a 3°C/100 m temperature inversion for Year 2, when [the] mining plant will operate on Saddleback Ridge (Annexure G to EA, p 27).

354I accept that the modelling for the noise assessment incorporated the relevant factors identified in the INP, including F-class temperature inversions which although not found to be a feature of the area, are identified in the INP as being a feature of the Hunter Valley generally.

355The relevance of Appendix 12 comes in determining compliance with the noise criteria in Tables 3 and 4.

356Subparagraph (a) of para 1 of Appendix 12 makes the noise criteria not applicable during periods of rain or hail. The exclusion of periods of rain is consistent with the INP's recommendation that noise monitoring should not be conducted when rainfall occurs (provided the proponent is able to show that sound levels due to rain are at least 10 dB(A) below the noise levels (that is, background and/or ambient) under investigation) (INP, 3.4, p 26 and Appendix B, B 1.1, pp 68-69). The EA in this case does not show that sound levels due to rain are at least 10 dB(A) below the background or ambient noise levels. But in any event, the INP only recommends excluding noise monitoring during rain rather than making the noise criteria for a project not applicable.

357Subparagraph 1(b) excepts application of the noise criteria where "average wind speed at microphone height exceeds 5 m/s". The INP recognises that wind can create extraneous noise on noise-monitoring equipment and suggests that an upper limit of 5 m/s at the microphone position is commonly applied during noise measurement to reduce this effect (INP, 5.3.2, p 35). However, again this is an issue of measurement of the noise generated by the Project at a receiver and does not provide a basis for exempting the Project from complying with the

noise criteria. Put another way, if the average wind speed at microphone height at a particular receiver exceeds 5 m/s, it may not be possible to establish whether the noise generated at the Mount Thorley-Warkworth mine complex exceeds the criteria in the conditions of approval, but that does not justify making the criteria not applicable. I note that the example condition given in the INP does not include an exception for wind near the ground at the microphone position.

358Subparagraph 1(c) reflects the default wind speed and height provided in the INP for assessing noise impacts of gradient winds (INP, 5.3.2, p 35). The INP recognises that winds at these speeds can noticeably increase noise received downwind of a noise source but may not increase ambient noise levels to the point where they mask noise from the source and make it unnoticeable. However, the subparagraph does not specify that the exclusion of wind speed greater than 3 m/s only applies when the wind direction is from source to receiver.

359The exception in subparagraph 1(d) ("temperature inversion conditions greater than 3°C/100 m") is drafted so as to continue the application of the noise criteria in an F-class inversion, but not for more intense inversions (G-class or above).

360While these exclusions might be inspired by the approach adopted in the INP for noise prediction and noise monitoring, they do not operate to exclude noise monitoring to determine compliance with the noise criteria during the excluded meteorological conditions but rather operate to exclude the applicability of the noise criteria during those conditions. This lessens the incentive for the mine to conduct its operations so as to keep noise emissions below the specified noise criteria. That would be the case in particular during periods of predicted continued rain when the noise criteria would not apply and there would be no limits to the noise the mine complex could emit.

361Further, the weather data, other than wind speed at microphone height, is taken at the mine, and not at the receiver, and it is therefore possible for experience of actual noise impacts at the receivers to be different, and potentially non-compliant. While Appendix 12 is drafted with greater precision than the conditions as approved by the Minister, it does not provide any assurance that the mine complex would meet the noise criteria at all times.

Insufficient accounting for annoying noise characteristics

362The INP requires modifying factor corrections to be applied to the noise from the source measured or predicted at the receiver before comparison with the noise criteria (see Section 4 of INP). The particular modifying factor affecting noise from the Project is the low frequency content. The SKM report (Ishac report, Appendix C) concluded that two of the eight locations monitored (345 Wambo Road and 339 Inlet Road) were significantly impacted by low frequency noise, as over 30% of results exceeded the INP criteria; and a further two (129 Wambo Road and 5a Noses Peak Road) were moderately affected by low frequency noise (6.3.2, p 33).

363The noise criteria in the proposed conditions of approval have not been set having regard to, and do not refer to, low frequency noise. Low frequency noise is taken into account in evaluating compliance with the noise criteria in the conditions of approval. Conditions 3 and 4 of Sch 3 provide that Appendix 12 sets out "the requirements for evaluating compliance with these criteria" specified in these conditions. Paragraph 4 of Appendix 12 requires compliance monitoring to be carried out in accordance with the relevant requirements for

reviewing performance set out in the INP (in Section 11) relating to, amongst other matters, "modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration". One of the penalties for modifying factors would be to apply a correction of 5 dB to the source noise level at the receiver if the difference between the C-weighted and A-weighted levels over the same period is 15 dB or more (INP, Table 4.1, p 29). Making this correction may result in the corrected source noise level at the receiver exceeding the noise criteria in the proposed conditions of approval for that receiver.

364The difficulty with this approach in the proposed approval would be evaluating compliance of the Project in practice. Appendix 12 requires that attended monitoring only is to be used to evaluate compliance. The conditions do not specify the number of attended monitoring stations, the location of the monitoring stations, the frequency of attended monitoring or the duration of attended monitoring on any occasion. Appendix 12 simply states monitoring is to be carried out in accordance with the requirement for reviewing performance in Section 11 of the INP. While this section of the INP provides guidance, it does not prescribe the number or location of monitoring stations, or the frequency or duration of attended monitoring.

365Condition 8 of Sch 3 of the proposed approval requires the preparation and implementation of a noise management plan. This plan must describe the measures to be implemented to ensure compliance with the relevant conditions of approval, such as a monitoring program that uses attended monitoring measures to evaluate performance of the Mount Thorley-Warkworth mine complex, including a minimum of four days of attended monitoring per quarter at locations agreed by the Director-General or more regularly where required (Condition 8(b), (c) and (d)). Therefore, the number and locations of attended monitoring stations and the frequency of attending monitoring would be determined through preparation of the noise management plan. However, this does not assist the Court, exercising the functions of the approval authority, in determining now whether there will be sufficient attended monitoring to evaluate adequately compliance with the noise criteria. It defers to later, and to the satisfaction of a different person, that determination. Moreover, comparison of the minimum requirement of four days of attended monitoring every 3 months at locations agreed by the Director-General (in Condition 8(d)) with the definition of "sustained exceedence" (in Condition 4) which requires noise generated by the Mount Thorley-Warkworth mine complex not to exceed the noise criteria for 10% or more of an individual day, evening or night on 3 or more occasions during any 30 day period, suggests that the attended monitoring required is unlikely to establish a "sustained exceedence" as there would not be 3 or more occasions of attended monitoring in 30 days at any location.

366The evidence of attended monitoring in the past is insufficient to allow the Court to draw any inference that attended monitoring in the future is likely to evaluate adequately compliance with the noise criteria. Past attended monitoring has been at too few locations on too few occasions.

Combining the noise criteria for different mines

367While there are concerns as to the way in which the noise criteria have been set in variance to the approaches recommended in the INP, of more fundamental concern is the decision to combine the noise criteria for the Warkworth and Mount Thorley mines. This has no precedent in the INP.

368The Mount Thorley and Warkworth mines have separate, but cross linked, ownership and operate under separate consents. The mines have been operated under single management as an integrated mine complex since 2004, sharing employees and surface infrastructure, and are connected by a series of haul roads (with bridges over Putty Road), conveyors and pipelines; coal, overburden, tailings and water is moved between the two mines (DP&I Environmental Assessment Report, TB vol 2, tab 9, p 792). The proposed extension involves the transfer of overburden and coal between the two mines, and the continuation of the use of the Mount Thorley coal preparation plant and other mining infrastructure currently used for the integrated Mount Thorley-Warkworth operations after mining ceases at Mount Thorley in 2017 (Ishac report [10]).

369The Abbey Green modification to the Mount Thorley consent, approved in May 2012, extends the Mount Thorley pit to the west closer to Bulga village (Williams subs, T 8/11/12, p 229). Evidence as to the modelling undertaken for setting the noise limits for Mount Thorley was not before the Court (Williams subs, T 8/11/12, p 228). However, Annexure G to the EA (Vol 3), the PPR, and the data in Exhibit W30, provide a basis for an understanding of the Mount Thorley noise criteria in relation to one of the residential receivers (65), which is located close to the intersection of Wambo Road and Putty Road, and thus for an understanding of how the combined criteria would work. Table 11 of Annexure G (p 49) includes the operational limit of 38 dB(A), and worst case figures of 38 dB(A) in Year 9 (day, adverse meteorological conditions) and Year 21 (night, adverse meteorological conditions). Based on the PPR table 4.3, the predicted worst case was 38 dB(A) for Warkworth alone; and for the combined Warkworth and Mount Thorley, 42 dB(A). The data provided by Mr Ishac (Exhibit W30) that includes the Abbey Green modification shows that for receiver 65, Mount Thorley would be 40 dB(A). On a logarithmic basis, subtracting 38 from 42, Mount Thorley (including Abbey Green) would be 40 dB(A). Warkworth submits (Williams subs T 8/11/12, p 235) that the level of 40 dB(A) would be the predicted noise from Mount Thorley alone, and would satisfy the INP criteria. On that basis, the residents of receiver 65 would be in the same position as they would be if Mount Thorley had been assessed as one project with its predicted noise level of 40 dB(A), and Warkworth as one project with a noise level of 38 dB(A). However, under the proposed conditions, more properties become subject to the mitigation or acquisition entitlements.

370The PPR recognises that the approach of combining Mount Thorley and Warkworth is inconsistent with the INP (TB vol 1, tab 8, p 557), and highlights the difficulties in the approach. Each mine is separately owned and has its own separate consent, and within those consents there are differences in noise criteria for residences in Bulga. For example, for locations 9, 10 and 15 located in Bulga village, the limits under the Mount Thorley consent are 39 dB(A), 35 dB(A) and 39 dB(A) respectively whereas under the Warkworth 2003 consent all have a noise limit of 38 dB(A) (TB vol 1, tab 8, p 558).

371The difficulty with accepting the combined criteria is that compliance with two different consents for two different mines is assumed; and while it may be accepted that in practice the two mines are operated as a single entity, the legal separation remains. There is no evidence before the Court as to any contractual or other arrangements between the two mines. No condition has been put forward that would specify what is the noise limit for the Warkworth mine operations alone. To test the operation of the combined criteria, Condition 3 sets 42 dB(A) LAeq (15 minute) as the criteria for receiver 65. If the operational limit for Warkworth alone is 38 dB(A), Mount Thorley would have to adjust its noise to be no greater than 40 dB(A) in order to meet that level. If noise is emitted from Warkworth transferring overburden

onto Mount Thorley land which takes up most of the 42 dB(A) allowed for the combined operation, then that would impact on Mount Thorley's ability to continue operations. That would be beyond the reach of any approval granted to Warkworth for its operations. The combined approach also opens up the possibility that a receiver which would otherwise have an acceptable noise level of 38 dB(A) (consistent with the INP), may be subject to a higher level of noise because a project that is not the subject of the application is included in the calculation. It would be possible for receiver 65, for example, to be subject to noise at 42 dB(A) from Warkworth alone if Mount Thorley was not emitting noise; and that would be in excess of the limits on the 2003 consent, and above the level contemplated under the INP.

372Warkworth submits that in a practical sense that is not how it would operate (Williams subs, T 8/11/12, p 244.15). Warkworth submits that the combined approach is justified, for two reasons: first, the higher number of residences that become entitled to request mitigation or acquisition than would otherwise be the case for Warkworth alone on the 2003 consent; and secondly, because the expectation is that the noise levels will drop once operations at Mount Thorley cease.

373In my view, it is not sufficient to rely either on a present arrangement for the combined management and operation of the two mines, or on the expectation that noise impacts may improve some years hence. The Court is required to assess the likely noise impacts of the mine that is the subject of the present application, namely Warkworth, and any conditions imposed on a project approval must relate to that project, and be capable of implementation by whomever is carrying out the activities authorised by the approval: *Hub Action Group Inc v Minister for Planning & Orange City Council* [2008] NSWLEC 116; (2008) 161 LGERA 136 at [118]. A condition imposed on an approval granted in these proceedings could not purport to impose obligations on the operator of a separate mine that is subject to its own consent. It is unlikely that any such condition would have a sufficient nexus with the project that is the subject of the present approval and proceedings so as to satisfy the second limb of the *Newbury* test requiring conditions of consent to fairly and reasonably relate to the proposed project: *Hub Action Group* at [125]. Further, any approval granted in these proceedings for the proposed extension could not require, or preclude, the operator of Mount Thorley seeking approval to alter its operations, or to extend its operations past the expected cessation in 2017. The legal inability of Warkworth to control the operations of Mount Thorley mine is recognised in proposed Condition 7(i) of Sch 3, which requires Warkworth "to use its best endeavours to procure the lodgement of an application to modify the Mount Thorley Mine Development Consent as soon as reasonably practicable so that it has noise conditions in similar terms to this approval".

374Even if there were power to impose a condition that required for its practical implementation an adjustment to operations of a separate mine, or which depended on the operations of a separate mine in achieving compliance, the difficulty in ensuring compliance with such a condition would be a reason not to impose it. On the evidence before the Court, the real time Barnowl monitors located in Bulga would be unable to distinguish noise generated by Warkworth transferring overburden to Mount Thorley from the noise generated by Mount Thorley operations behind. Attended monitoring would be required at more locations and at a frequency substantially higher than that proposed, which is the minimum four days per quarter proposed in Condition 8(d). However, even attended monitoring will have difficulty in distinguishing the sources of noise generated.

Increased noise mitigation and acquisition of noise receivers

375The proposed conditions (Exhibit W33) include conditions entitling owners of identified privately owned land to request acquisition of their land, or mitigation measures, such as noise treatment of their residences.

376In appropriate circumstances, it may be desirable to include requirements for undertaking mitigation measures or acquisition of noise affected properties, as a response to identified likely adverse impacts: see, for example, *Ironstone Community Action Group Inc v NSW Minister for Planning and Duralie Coal Pty Ltd* [2011] NSWLEC 195. However, the acceptability of such mitigation and acquisition measures depends on their extent and impacts. In this case, 20 properties are so badly noise affected that the owners are given an entitlement to have their properties acquired at the outset of the Project (Condition 1 of Sch 3). A further 41 properties are sufficiently noise affected as to give the owners an entitlement to have noise treatment on their residence at the outset of the Project (Condition 2). There is also the potential for all privately owned land in Bulga to be acquired if "the noise generated at the Mount Thorley-Warkworth mine complex causes sustained exceedences" of the noise criteria (Condition 4). This might be unlikely because of the high levels at which the noise criteria have been set in the approval conditions (for the reasons given earlier) and the difficulty in ever proving that a "sustained exceedence" has occurred (having regard to the definition and the unlikelihood of the attended monitoring required by the conditions ever establishing a "sustained exceedence").

377If the noise criteria had been set at the project-specific noise levels as recommended by the INP, and the noise mitigation and acquisition criteria had been set at some margins above that level, more properties would become entitled to request noise mitigation and acquisition, adding to the 61 existing properties already so entitled.

378Hence, under both the proposed noise criteria in the conditions, and under any noise criteria determined in accordance with the INP, large numbers of persons will be so affected by noise as to give rise to mitigation treatment or acquisition of their properties. In my view, these numbers are sufficiently large as to be evidence of the unacceptability of the noise impacts of the Project. The Project's externalities in terms of noise impacts are sufficiently large in terms of the number of persons and properties affected, areas of extent, and effect, and are insufficiently internalised by the Project, as to be unacceptable.

379Further, as explained in Part 4 dealing with social impacts, the mitigation strategies proposed, such as double glazing, airconditioning and the acquisition of homes, themselves have an adverse impact on residential amenity, and potential social impacts of a change in the composition of the community arising from residents leaving Bulga following acquisition of their property.

380It was common ground that properties acquired by Warkworth are likely to be occupied by mine employees; and that such residences will be subject to noise levels exceeding those considered acceptable under the conditions applicable to privately owned land. The conditions attempt to provide some safeguard for tenants who may occupy properties owned by the mine, such as may occur following acquisition by Warkworth from a private landowner. Proposed Condition 2A of Sch 3 requires that Warkworth terminate a tenancy

agreement at the request of a tenant on land owned by Warkworth if noise levels exceed 40 dB(A) LAeq over the night time period; and/or particulate matter concentrations at the residence on the land exceed the criteria listed in Tables 12, 13 and 14. While Condition 2A, added during the course of the proceedings, provides some protection, it does not overcome the possibility that some individuals will be living in residences subject to noise levels that exceed those regarded as appropriate under the INP. It is doubtful whether, even if there is power to impose conditions that leave open that possibility, it is appropriate in the exercise of discretion to do so.

Association's proposed noise conditions

381The Association has proposed conditions (Exhibit Z) which set lower noise limits that only apply to the Warkworth mine and to the Mount Thorley-Warkworth mine complex, and which would apply to all land including mine-owned properties. The Association also has deleted conditions requiring mitigation measures and acquisition in its proposed conditions.

382The Association's proposed conditions set the noise criteria limit at 38 dB(A), and 35 dB(A) for those properties for which the background noise level is 30 dB(A). The Minister agreed with Warkworth's position that the noise limits proposed by the applicant amount to a constructive refusal of the application, as they set levels that cannot reasonably be achieved by the Project.

383Both respondents opposed the Association's proposal to set noise criteria for Warkworth alone. Warkworth's position was that it had originally opposed the Department's proposal for hybrid conditions for the Mount Thorley-Warkworth mine complex, however it has now accepted proceeding on that basis. While Warkworth's position is that it is not possible now to separate the two mines because of difficulty with enforcing compliance, and the number of properties that have been assigned mitigation or acquisition rights, there are figures based on modelling that would enable separate figures to be provided in each of the Project Approvals, and Warkworth would use its best endeavours to achieve those limits (Williams subs, T 15/11/12, p 328.25).

384Whatever may be the merits of the Association's proposed conditions, including separate provision for the Warkworth mine, it would not be appropriate to impose conditions that could not be met by the proponent of the Project.

Conclusion on noise impacts

385At the noise levels proposed in the approval conditions, the noise impacts of the Project on the residents of Bulga, including the impact of the noise source on receivers, taking account of annoying noise characteristics and the effect of meteorological conditions, are likely to be significant, intrusive and reduce amenity. The noise mitigation strategies proposed in the approval conditions are not likely to reduce noise levels to the project-specific noise levels recommended by the INP or to levels that have acceptable impacts on the residents. The significant residual impacts are unacceptable, taking into account social and economic factors. Further, the extensive noise control at receivers, being mitigation treatment and acquisition of properties in Bulga, is likely to cause social impacts. The combining of noise criteria for the Warkworth and Mount Thorley mines in the proposed approval conditions is of doubtful legal validity but in any event is likely to be difficult to

monitor or enforce compliance. Hence, no confident conclusion can be drawn that the noise impacts of the Project will be acceptable.

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Social impacts from adverse noise and dust impacts

431The type and extent of noise impacts have been considered in Part 3 above. The resident evidence, which is supported by the monitoring data and the SKM report, establishes that the noise impacts of the Warkworth mining operations are real and disruptive. I accept the resident evidence that the noise impacts are affecting family relationships: Mr Krey felt that his wife is more affected by the noise than he is and this causes friction in their relationship (aff at [25]); Mr Upward stated that the noise imposes on time he spends with his wife relaxing in the evening; he has had trouble getting to sleep in the last 12 months and he is often woken by loud mining noises (aff at [21]-[22]); Mr Caban often has trouble sleeping because of the mining noise, and often averages only a few hours sleep (aff at [25]); and Mr Hedley stated (aff at [19]) that during last summer because of the constant noise from the mine they had to close all their windows and use air conditioning to keep the house cool; and he no longer sleeps with his bedroom windows open. In my assessment, approval of the Project on the conditions regarding noise proposed will only increase the noise impacts and their effect on amenity and family relationships.

Read the entire judgement at : http://www.caselaw.nsw.gov.au/action/pjudg?jgmtid=164038