Comments on [Bulga Open Cut - Modification 5 - Noise Conditions (Part3AMod)]

2.6 Low Frequency Noise Criteria

Two methodologies have been adopted for assessment of low frequency noise (LFN):

- Evaluation of LFN through comparison of C-weighted and A-weighted predicted total noise levels at receptors, as per INP guidelines. In this method, the difference between C-weighted and A-weighted levels at receptor locations is calculated, and if the difference is greater than or equal to 15 dB, a 5 dB penalty (modifying factor) is added to predicted levels; and

- Evaluation of LFN through comparison of total predicted C-weighted levels at receptor locations with an upper limit criterion. This method is in accordance with recommendations published in *A Simple Method for Low Frequency Noise Emission Assessment* (Broner, 2010), published in the Journal of Low Frequency Noise, Vibration and Active Control, Volume 29 Number 1 2010. The author of the document recommends outdoor criteria for LFN assessment; Table 2.4 presents criteria recommended in the document. If the total predicted C-weighted noise level at a receptor exceeds the relevant criterion a 5 dB penalty (modifying factor) is added to predicted levels. In this assessment, the desirable limit for residential receptors of L_{Ceq} 60 dB has been adopted.

Table 2.4 LOW FREQUENCY NOISE CRITERIA – BRONER METHOD

Land Use	Sensitive Receiver	Range	Criteria L_{Ceq} (dB)
Residential	Night time or plant operation 24/7	Desirable	60
		Maximum	65
	Daytime or Intermittent (1 -2 hours)	Desirable	65
		Maximum	70
Commercial/Office	Night time or plant operation 24/7	Desirable	70
		Maximum	75
Industrial	Daytime or Intermittent (1 -2 hours)	Desirable	75
		Maximum	80

Source: A Simple Method for Low Frequency Noise Emission Assessment by N. Broner

I live in Bulga and have years of unpleasant experience listening to the dreadful noise from coal mines in the area.

Global Acoustics are mixing two different methodologies here :

NSW INP Modification factor for LFN and Broner's "recommendations" for measuring LFN.

The NSW INP does not place any limits on dbC measurements.
It states quite clearly that in the presence of low frequency noise (and there is always LFN coming from coal mines at night, despite what is stated by Global Acoustics) both dbA and dbC shall be measured and if the difference is 15 or greater then a penalty of shall be added to the dbA as a modification factor for low frequency noise.

Broner's "recommendations" are for a dbC only method of determining the impact of low frequency noise. No dbA modification factor.
Broner's recommendations make no mention of a rural environment. His numbers are limited to what he calls residential.
Broner made no measurements in this "paper", he reviewed selected previously published papers and then came up with his "opinion", which in many cases is not in agreement with other notable authors on the subject.

In my view, one cannot use the NSW INP and Broner criteria together. This is deceptive and seems designed to lessen the "impact" of low frequency noise…as I will explain below.

In the summer of 2012, we commissioned an "independent" noise study for Bulga in the face of increasing noise levels from another mine. This study turned out not to be as independent as it should have been. It was undertaken by SKM who, as we later discovered, are Broner's employer.

Contrary to our wishes, the study included measurements using NSW INP Modification factor for Low frequency Noise as well as the Broner methodology.

Interestingly, the results of the study showed that there were a small number of residences that were with respect to Low frequency noise :

SIGNIFICANTLY IMPACTED under NSW INP

BUT

NOT AT ALL IMPACTED under BRONER

This, of course, is patently ridiculous. The impact is the impact…it is what we hear.
The impact doesn't change just because one measures it differently.

That's like saying I'm taller if I measure my height in centimetres rather than inches….my height is the same, it's the ruler that's changed.

3.3 INP Modifying Factors

Section 4 of the INP requires consideration of modifying factors. These are characteristics of noise received at receptor locations that could result in more annoyance than would normally occur from that level. The modifying factors are tonal noise, low frequency noise, impulsive noise, intermittent noise and duration (if single event).

Environmental noise monitoring undertaken around the BCC by Global Acoustics over the past 12 years has shown that these factors are rarely if ever applicable.

I cannot imagine how Global Acoustics can say that truthfully. When the coal mines are operating at night, the C-A difference is nearly always 15 or greater . That indicates low frequency noise is

present. This was shown in the SKM study and is demonstrated by monitoring done by local DoPI officers.
The mines, of course, steadfastly refuse to measure dbC because they know that if they did they would have to apply the 5db penalty to the dbA measurements and that would put them over their consent conditions nearly all the time.

We have a directional noise monitor on our property and it often reads very close to our 35dbA limit laid down in the consent conditions.
On those noisy nights the C-A difference as measured by a handheld monitor is always greater than 15, with the dbC reading often greater than 60 dbC.

> The community has at times expressed concern about LFN, although no exceedance of LFN criteria has been measured during environmental noise monitoring. Evaluation of LFN in this assessment is through comparison of total predicted C-weighted levels at receptor locations with an upper limit criterion as described above. Assessment of C-weighted minus A-weighted totals has also been undertaken as per current INP guidelines.

This is patently untrue.

What he really means by "LFN criteria" is the Broner recommendation.

Broner's recommendation is Broner's opinion, not Government Policy.

Government Policy is the NSW INP in which LFN criteria is the C-A difference.
It is that criterion which should be applied in assessing LFN not Mr Broner's opinion.

The Broner paper is an opinion piece, a review of the literature. It is not a scientific study. Broner makes no measurements, he merely picks up threads of other authors publications and then constructs an opinion based on these threads. Many notable authors, including Hessler do not agree with Broner's opinion

> *"Hessler …. Proposed C-weighted SPLs supplementary to A-weighted site critera which are listed in Table 1. These levels contained no factor of safety or margin of error and Hessler cautioned that these levels should be considered the maximium allowable…..Hessler later clarified that his criteria are all in terms of the C-weighted L_{eq}"*

For extensive or 24/7 operation Hessler's table shows 60dBC as the maximum allowable, but significantly he also says : ***These levels contained no factor of safety or margin of error***.

5.6 Low Frequency Noise Assessment Results

5.6.1 Operational Low Frequency Noise Results

An assessment of LFN was undertaken considering all receptors, across all stages, across all time periods. Total C-weighted predictions were less than $L_{Ceq,\ 15\ minute}$ 60 dB for all receptors, for all stages modelled. Eleven receptors had a C-weighted total minus A-weighted total (C minus A result) of greater than or equal to 15 dB, and an A-weighted prediction greater than $L_{Aeq,\ 15\ minute}$ 30 dB; these are shown in Table 5.7. Receptors with A-weighted predictions less than or equal to $L_{Aeq,\ 15\ minute}$ 30 dB are not listed, as application of the LFN modifying factor penalty would not cause exceedance of PSNC, and both A-weighted and C-weighted predictions are low level in these cases.

The NSW Department of Planning and Infrastructure have indicated the preferred method for assessment of LFN is the Broner method (described in Section 2.6). As the C minus A method is currently contained in the INP, C minus A results are also presented.

All C-weighted predictions are less than the lowest desirable LFN limit of $L_{Ceq,\ 15\ minute}$ 60 dB, therefore LFN is not considered likely to cause impact; no LFN modifying factor penalties have been applied.

C-weighted predictions are included in Table B.2 in Appendix B.

Table 5.7 OPERATIONAL LOW FREQUENCY NOISE RESULTS - dB

Receptor ID	Property Owner	Proposed LFN Criterion	C-weighted Total	A-weighted Total	Total C minus Total A
20 A	Bosco	60	48	33	15
20B	Bosco	60	48	33	15
21	Rogers	60	48	32	16
82	Mears	60	46	31	15
124	Kearns and McKell	60	46	31	15
125	Little	60	46	31	15
140	Logan	60	46	31	15
193	Britten and Herlihy	60	46	31	15
199	Gould	60	46	31	15
225	Harris	60	46	31	15
231	Dawson	60	46	31	15

Results of the operational low frequency noise assessment showed there are eleven receptors where the C-weighted total minus the A-weighted total (C minus A result) is greater than or equal to 15 dB, and with an A-weighted prediction greater than $L_{Aeq,\ 15\ minute}$ 30 dB. However, comparison with the desirable LFN limit shows all C-weighted predictions are less than $L_{Ceq,\ 15\ minute}$ 60 dB. On this basis, operational LFN is not considered likely to cause impact.

Again this is totally misleading.

NSW INP makes no reference to absolute levels of dbC, only that if the C-A difference is 15 or greater, then 5 must be added to the dbA level.

In this table the C-A difference is 15 for each receptor, so under NSW INP, the policy currently in force, 5 must be added to the dbA, making the dbA levels 36 to 38dbA which is significantly different.

To use the Broner criteria of dbC less than 60, cripples the NSW INP low frequency noise modification and leads to an unrealistic assessment of the actual impact of the noise level.

The Dept of Planning and Infrastructure may prefer the "Broner method", but that is not Government Policy as discussed earlier.

In summary, this confusion of the NSW INP and the Broner opinion piece seems to have only one aim and that is to allow the noise impacts of mining to be relaxed.

This is a dishonest way of presenting the noise impacts in the EIS, it is not current Government Policy and should be re-written in conformance with current Government Policy i.e. NSW INP and Broner's opinion discarded.