APPENDIX C

NOISE IMPACT
RESPONSE TO PAC REVIEW REPORT

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COALPAC PTY LTD

COALPAC CONSOLIDATION PROJECT

ACOUSTICS - REVIEW OF AND RESPONSE TO PLANNING ASSESSMENT COMMISSION REPORT

REPORT J0130-29-R3
5 MARCH 2013

Prepared for:
Hansen Bailey Pty Ltd
P.O. Box 473
SINGLETON NSW 2330

Prepared by:
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1 INTRODUCTION

Bridges Acoustics has been commissioned by Hansen Bailey on behalf of Coalpac Pty Ltd (Coalpac) to provide a response to acoustic issues raised by the Planning Assessment Commission (PAC) in its review of the Coalpac Consolidation Project (the Project). The Project as reviewed by the PAC included:

- Consolidation and expansion of the existing Cullen Valley Mine and Invincible Colliery operations to produce up to a total of 3.5 Million tonnes per annum (Mtpa) of product coal;
- Continuation of coal supply to the local Mount Piper Power Station (MPPS) via a dedicated coal conveyor over the Castlereagh Highway (to be constructed) and emergency supply to Wallerawang Power Station (WPS) via road, with flexibility for supply to additional domestic destinations and Port Kembla for export;
- Upgrades to existing administration, transport and other infrastructure;
- Construction and operation of additional offices at Cullen Valley Mine;
- Construction and use of the previously approved Coal Deshaling Plant (CDP) at Cullen Valley Mine;
- Construction and use of a bridge over the Castlereagh Highway to link operations east and west of the Highway and the development of required access roads to the East Tyldesley area;
- Construction and operation of a bridge and haul road across the Wallerawang - Gwabegar Railway Line (WGRL) to permit access to mine the previously approved Hillcroft resource;
- Extraction of the Marangaroo Sandstone horizon from immediately below the Lithgow Coal Seam in the northern coal mining area of Cullen Valley Mine. This material would be trucked to an onsite crushing station prior to sale into the Sydney (and surrounds) industrial sand market;
- Construction of a rail siding with associated infrastructure to permit transport of coal and sand products;
- Integration of the water management of both sites into a single system; and
- Integration of the management of mine rehabilitation and conceptual final landform outcomes for Cullen Valley Mine and Invincible Colliery.

The PAC Review included consideration of the *Coalpac Consolidation Project Environmental Assessment* (Hansen Bailey, March 2012) (the Project EA) and written and oral submissions in response to the public exhibition of the Project from a number of individuals and organisations including:

- The NSW Department of Planning and Infrastructure (DP&I);
- The NSW Office of Environment & Heritage (OEH);
- Lithgow City Council (LCC);
- Energy Australia;
- NSW Health;
- NSW Department of Trade and Investment;
- A number of conservation and other special interest groups; and
- Various individuals from Cullen Bullen and surrounding areas.

The PAC review report: *NSW Planning Assessment Commission, Coalpac Consolidation Project Review: Main Report* and *Appendices A to E* was prepared by Dr Neil Shepherd, Mr Garry Payne and Mr Joe Woodward on 14 December 2012.

2 AUTHOR'S QUALIFICATIONS AND EXPERIENCE

This report has been prepared by Mark Bridges, Principal Consultant of Bridges Acoustics. Mark has relevant engineering qualifications and experience, as detailed in his CV which is attached as Appendix A, including completion of over 20 Acoustic Impact Statements for inclusion in Environmental Impact Statements or Environmental Assessments for coal mine projects in NSW and Queensland.

Mark has also completed over 100 other noise impact assessments, in other industrial sectors such as manufacturing, steelmaking and petroleum refining, which are primarily based on the recommended procedures in the NSW Industrial Noise Policy (INP) (EPA, 2000) which forms the basis of the noise assessment for the Project.

Mark has provided acoustic advice to the Land & Environment Court and appeared as an expert witness in acoustics in over 14 previous cases.

Mark has read and agrees to be bound by the Uniform Civil Procedures Rules 2005 Part 31 and Schedule 7 Expert Witness Code of Conduct.

3 DIRECTOR GENERAL'S REQUIREMENTS

The Acoustic Impact Assessment (AIA) included in the Project EA was completed in accordance with the Director General's Requirements (DGRs) for the Project. The DGRs, under the *General Requirements* heading, require

A *detailed assessment of key noise and blasting issues including a quantitative assessment of potential:*

- *Construction, operational, transport and offsite rail and road noise impacts;*
- *Blasting impacts on people, livestock and property;*
- *Reasonable and feasible mitigation measures, including costing of the proposed measures;*
- *Monitoring and management measures, in particular real-time and attended noise monitoring (including predictive meteorological modelling) to facilitate reactive management of noise to ensure impacts are within relevant criteria and goals throughout the life of the Project.*

Under the *References* heading, the DGRs require:

The environmental assessment of the key issues listed above [of which *noise and blasting* is one] *must take into account relevant guidelines, policies, and plans. While not exhaustive, the following attachment contains a list of some of the guidelines, policies, and plans that may be relevant to the environmental assessment of this project.*

Under the *Policies, Guidelines and Plans* heading, the DGRs specify the following:

Noise & Blasting

- *NSW Industrial Noise Policy (DECC)*
- *Environmental Noise Management – Assessing Vibration; a technical guide (DEC)*
- *Environmental Criteria for Road Traffic Noise (NSW EPA)*
- *Interim Guidelines for the Assessment of Noise From Rail Infrastructure Projects (DECC)*

- *Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration (ANZEC)*
- *Interim Construction Noise Guideline (DECC)*
- *DIN 4150 Part 3 – Structural Vibration effects of vibration on structures (ISO, 1999)*

4 ACOUSTIC IMPACT ASSESSMENT

The AIA was completed according to the DGRs, with particular attention to and in compliance with the NSW Industrial Noise Policy (INP) by adopting the following processes:

- Measurement of existing background noise levels at four representative receiver locations. Measured background noise levels, excluding any noise from existing Coalpac operations and atypical sources, were over 32 dBA during the day and evening due to traffic on the Castlereagh Highway for receivers within 500 m of the Highway, 30 to 32 dBA during the day and evening at receivers more than 500 m from the Castlereagh Highway, and in the range 27 to 29 dBA during the night due primarily to distant Highway traffic noise with some contribution from other sources such as birds;
- Determination of appropriate Project Specific Noise Levels (PSNLs) for the day, evening and night according to the procedure defined in the INP, considering measured background noise levels, the character of the receiver area and the minimum default background level of 30 dBA as recommended in the INP. The PSNLs developed in the Project EA were:
  - 37 LAeq,15min during the day at all receivers within 500 m of the Castlereagh Highway; and
  - 35 LAeq,15min at other times and at all other receivers.
- Determination of prevailing weather conditions based on measured weather data from two local weather stations operated by Coalpac;
- Adopting all noise control and management measures that could reasonably be adopted, including a comprehensive noise barrier strategy, best practice equipment noise control and operating hours restrictions in various areas close to receivers where necessary;
- Calculation of predicted noise levels considering all operating plant and equipment operating simultaneously in reasonable worst case locations and the effect of prevailing weather conditions where relevant;
- Identification of all receivers that are predicted to experience noise levels over the adopted criteria under worst case conditions during one or more time periods or Project stages, after all reasonable noise control measures were adopted;
- A review of the blasting history associated with the existing mining operations and prediction of vibration and noise effects from proposed blasts;
- An assessment of road traffic noise levels compared to currently approved traffic levels and relevant traffic noise criteria; and
- An assessment of rail traffic noise levels compared to relevant noise criteria.

5 ASSESSMENT OUTCOMES

The AIA reported predicted noise levels at all residences and properties that may receive noise levels over relevant PSNLs. Blast effects and road and rail traffic noise levels were also calculated and reported at closest receivers. Specifically:

- 4 rural residences were predicted to receive significant noise impacts of more than 5 dBA above the adopted PSNLs;
- 18 rural residences were predicted to receive moderate noise impacts of 2 to 5 dBA above the adopted PSNLs;
- 14 rural residences were predicted to receive mild noise impacts of up to 2 dBA above the adopted PSNLs;
- All residences in Cullen Bullen were predicted to receive noise levels within the adopted PSNLs in all time periods and Project stages; and
- Noise levels inside Cullen Bullen School classrooms would be at least 10 dBA below the INP recommended noise criterion of 35 LAeq,1hr;
- With adopted management measures, blast effects were predicted to comply with relevant vibration and overpressure criteria at all receivers;
- Road traffic noise levels would in general be lower than permitted under the existing approvals for Cullen Valley Mine and Invincible Colliery, with the majority of Project coal to be transported by conveyor or rail rather than the current road transport fleet. Road traffic noise levels would comply with the NSW Road Noise Policy (RNP) traffic noise criteria of 60 LAeq,15hr day and 55 LAeq,9hr night at all assessed receivers; and
- Noise from proposed train movements would have a minor effect on average rail noise levels to all receivers near the Wallerawang - Gwabegar Railway Line (WGRL) and no effect on maximum train pass by levels.

6 THE CONTRACTED PROJECT

6.1 Changes Included in the Contracted Project

Following the PAC Report, Coalpac has reviewed the Project and has adopted a number of changes that are intended to further reduce noise impacts (the Contracted Project). The relevant changes adopted in the Contracted Project, from an acoustic perspective, are:

- Removal of the Hillcroft Mining Area and associated access infrastructure (including the Wallerawang-Gwabegar Rail Line overpass bridge and Red Springs Road crossing);
- Removal of the sand extraction component of the Project located in the Cullen Valley mining area, including the requirement for associated crushing and screening infrastructure and the transport of product sand by road from the site to market; and
- Modification and regulation of blasting practice to minimise the potential for blasting impacts to any Significant Pagoda Landforms (SPLs) and cliffs.

Other changes adopted in the Contracted Project that have limited or no acoustic effect, and are therefore not considered further in this report, are:

- Enhanced Biodiversity Offset Strategy for any residual ecological impacts.
- Modification of the open cut mining footprint in relation to the SPLs to improve ecological outcomes;
- Contraction of the highwall mining footprint from under SPLs to improve ecological, heritage and geotechnical outcomes; and
- Modification of the open cut mining footprint to avoid the area of Clandulla Geebung habitat previously located in the north western mining area at Cullen Valley Mine;

6.2 Contracted Project Noise Levels

Noise levels were assessed in the AIA in Years 2, 8, 14 and 20. As the Contracted Project mainly differs from the Project in Year 2, specifically due to removal of mining in the Hillcroft area and removal of sand mining in the northern part of the Project area, changes in calculated noise levels in the Contracted Project would occur primarily in Year 2 with little change to noise levels in other assessed years. Year 2 noise levels have therefore been recalculated for the Contracted Project (without mining in the Hillcroft area or sand mining operations) and are presented in Tables 1 and 2 for direct comparison with the predicted Year 2 noise levels assessed in the Project EA and reviewed by the PAC.

Table 1: Operational Noise Levels at Residences, Year 2, LAeq,15min

Owner ID	Residence ID	Predicted Year 2 Noise Level, LAeq,15min						Criteria Day/ Evening/ Night
		Day/Evening Neutral		Day/Evening Prevailing		Night Prevailing		
		Project EA	Contracted Project	Project EA	Contracted Project	Project EA	Contracted Project	
2	217N	31.2	31.1	36.1	36.1	37.2	37.2	37/35/35
	217S	28.7	28.6	33.0	33.0	34.3	34.3	37/35/35
5	139	29.5	28.3	29.5	29.0	33.1	33.1	35/35/35
6	179	37.4	28.7	37.8	36.7	39.7	38.5	35/35/35
8	364	31.9	24.8	36.4	34.7	38.7	36.7	35/35/35
	367	31.3	25.7	36.6	35.6	38.9	37.9	35/35/35
9	205	33.0	27.6	38.4	36.6	40.6	38.7	35/35/35
10	368	29.4	23.6	34.7	33.7	37.1	35.8	35/35/35
11	383	29.6	24.9	35.5	34.8	37.7	36.9	35/35/35
13	384	28.7	24.1	34.4	33.9	36.6	35.9	35/35/35
14	385	28.5	24.0	34.2	33.8	36.3	35.7	35/35/35
17	386	28.9	25.5	35.5	34.9	37.7	37.0	35/35/35
23	403	27.1	24.5	34.5	34.3	36.4	36.0	35/35/35
	404	26.3	23.7	34.3	34.1	35.9	35.6	35/35/35
30	198	36.2	36.1	39.3	39.3	39.7	39.7	35/35/35
	199	35.1	35.1	38.9	38.9	39.5	39.5	37/35/35
31	197	37.7	37.7	40.1	40.1	40.4	40.4	35/35/35
32	201	35.3	35.3	38.9	38.9	39.4	39.4	37/35/35
33	195	41.2	41.2	42.5	42.5	43.8	43.8	37/35/35
34	194	41.5	41.5	43.1	43.1	45.3	45.3	37/35/35
50	114	27.8	27.7	32.2	32.2	31.2	31.2	37/35/35
51	113	27.0	26.9	32.5	32.5	31.9	31.9	37/35/35
52	112	26.1	25.9	29.1	29.1	30.9	30.9	37/35/35
53	109	25.6	25.2	26.1	25.9	29.8	29.8	35/35/35
54	108	25.7	25.2	26.0	25.6	29.7	29.7	35/35/35
56	106	26.1	25.6	26.2	25.7	30.0	30.0	35/35/35
65	142	26.1	26.0	35.0	35.0	35.7	35.7	35/35/35
66	143	26.7	26.7	35.3	35.3	36.4	36.4	35/35/35
67	144	29.3	29.3	36.4	36.4	38.0	38.0	35/35/35
68	209	28.7	26.4	32.2	31.5	35.1	33.9	35/35/35
72	349	32.0	31.6	34.7	34.7	37.8	37.7	35/35/35
73	391	28.0	26.4	35.1	34.9	36.9	36.7	35/35/35

Owner ID	Residence ID	Predicted Year 2 Noise Level, LAeq,15min						Criteria Day/ Evening/ Night
		Day/Evening Neutral		Day/Evening Prevailing		Night Prevailing		
		Project EA	Contracted Project	Project EA	Contracted Project	Project EA	Contracted Project	
75	392	30.6	30.1	37.4	37.3	38.4	38.3	35/35/35
76	372	31.0	26.2	36.5	35.7	39.3	38.5	37/35/35
77	373	30.0	28.5	35.0	34.6	37.1	36.6	35/35/35
78	388	28.7	27.1	34.0	33.6	35.8	35.4	35/35/35
80	412	27.3	26.2	36.1	36.0	38.4	38.3	35/35/35
85	426	27.7	27.2	34.5	34.4	36.3	36.3	35/35/35
Number of Affected Residences Total		7	6	19	15	30	29	
Significant		2	2	3	3	4	3	
Moderate		2	1	6	4	16	12	
Mild		3	3	10	8	10	14	

Table 2: Operational Noise Levels over 25% of Properties, Year 2, LAeq,15min

Owner ID	Property ID	Year 2 Predicted Noise Level, LAeq,15min						Criteria Day/ Evening/ Night
		Day/Evening Neutral		Day/Evening Prevailing		Night Prevailing		
		Project EA	Contracted Project	Project EA	Contracted Project	Project EA	Contracted Project	
2 Crown	192 Waste	45.3	45.3	48.8	48.8	51.0	51.0	70/ - / -
	193 Cemetery	48.3	48.3	48.9	48.9	52.8	52.8	65/ - / -
	196 Vacant	42.8	42.8	45.1	45.1	46.9	46.9	- / - / -
	217	35.9	35.9	40.9	40.9	41.5	41.5	37/35/35
5	97-102, 138-141	32.7	29.1	33.9	32.8	34.3	33.4	35/35/35
6	173-175, 178-186	39.4	23.8	40.7	30.5	41.1	32.3	35/35/35
7	176	34.4	20.6	37.8	29.4	40.0	31.4	35/35/35
8	203,204,364, 365,367	32.3	23.6	36.4	34.0	38.6	36.1	35/35/35
9	205,206	37.0	26.8	40.6	36.6	42.9	38.9	35/35/35
10	368,369	30.0	24.3	35.6	34.6	37.8	36.5	35/35/35
11	383	29.1	24.2	35.1	34.4	37.3	36.5	35/35/35
13	384	28.7	23.9	34.4	33.9	36.6	35.9	35/35/35
14	385	27.6	23.5	33.8	33.4	35.7	35.2	35/35/35
15	371	30.4	25.9	35.7	34.8	38.1	37.2	35/35/35
16	370	31.6	26.0	36.5	35.4	39.1	38.2	35/35/35
17	386	28.9	25.8	35.5	34.9	37.7	37.0	35/35/35
18	387	28.3	26.1	34.9	34.6	37.1	36.6	35/35/35
23	403-405	27.1	24.8	34.6	34.4	36.5	36.2	35/35/35
24	406	25.8	23.3	34.6	34.5	36.2	36.0	35/35/35
26	408	24.8	22.3	34.0	33.9	35.4	35.3	35/35/35
29	170	60.4	60.4	61.2	61.2	61.3	61.3	37/35/35
30	198,199	37.6	37.6	45.6	45.6	46.6	46.6	37/35/35
31	197	67.6	67.6	68.1	68.1	67.2	67.2	37/35/35
32	201	35.3	35.3	38.9	38.9	39.4	39.4	37/35/35

Owner ID	Property ID	Year 2 Predicted Noise Level, LAeq,15min						Criteria Day/ Evening/ Night
		Day/Evening Neutral		Day/Evening Prevailing		Night Prevailing		
		Project EA	Contracted Project	Project EA	Contracted Project	Project EA	Contracted Project	
33	195	41.2	41.2	42.5	42.5	43.8	43.8	37/35/35
34	194	42.8	42.8	44.0	44.0	46.7	46.7	37/35/35
35	200	46.0	46.0	49.6	48.6	49.1	49.1	37/35/35
50	114	28.2	28.1	34.1	34.1	31.7	31.7	35/35/35
51	113	27.3	27.1	32.0	32.0	31.7	31.7	37/35/35
52	110,112	26.2	26.0	29.5	29.5	31.2	31.2	37/35/35
53	109	26.8	26.6	27.4	27.4	29.9	29.9	35/35/35
54	108	27.3	27.0	27.6	27.4	29.9	29.9	35/35/35
55	107	28.3	28.1	28.9	28.7	30.0	30.0	35/35/35
56	105,106	27.7	27.0	27.7	27.0	29.8	29.8	35/35/35
58	111	25.0	24.8	28.1	28.1	30.7	30.7	37/35/35
61	119	24.8	24.7	30.7	30.7	31.6	31.6	37/35/35
62	122	25.3	25.2	33.3	33.3	32.6	32.5	37/35/35
65	142	25.2	25.1	33.1	33.1	34.1	34.1	35/35/35
66	143	26.0	26.0	34.6	34.6	33.9	33.9	35/35/35
67	144	30.6	30.6	37.0	37	38.7	38.7	35/35/35
68	209	33.0	28.7	36.1	34.5	38.5	36.7	35/35/35
69	210	31.4	28.2	33.5	32.7	36.1	35.2	35/35/35
71	348	29.4	28.9	31.0	31.0	35.2	35.1	35/35/35
	362	31.3	30.9	32.3	32.3	37.0	36.9	37/35/35
72	349	31.5	31.0	34.4	34.2	37.2	37.1	37/35/35
73	374-376, 390,391	31.5	31.0	35.2	35.1	38.1	38	35/35/35
75	392	31.5	31.2	37.3	37.2	38.2	38.1	35/35/35
76	372	30.2	26.8	35.6	34.8	38.3	37.5	35/35/35
77	373	29.9	28.5	34.8	34.4	37.0	36.5	35/35/35
78	388,409	28.9	27.4	34.7	34.5	36.6	36.3	35/35/35
79	410	26.8	25.5	34.4	34.3	36.4	36.1	35/35/35
80	412-414	28.3	27.4	36.3	36.2	38.4	38.3	35/35/35
81	417-419	26.5	25.3	34.9	34.8	36.7	36.6	35/35/35
82	411,415,416, 420-425	29.8	29.4	38.0	37.9	39.0	39.0	35/35/35
97	220	27.3	27.1	31.9	31.9	33.2	33.2	35/35/35
128	350	29.0	28.7	31.5	31.5	35.2	35.2	37/35/35
137	216	31.9	31.9	36.6	36.6	37.6	37.6	37/35/35
Number of Affected Properties Total		10	8	25	16	40	32	
Significant		5	5	9	7	9	7	
Moderate		2	1	4	3	18	12	
Mild		3	2	12	6	13	19	

The comparisons in Tables 1 and 2 between the predicted noise levels in the Project EA and for the Contracted Project, indicates the Contracted Project would:

- Reduce the number of affected residences and properties; and

- Reduce mining noise levels generally to the north west of the Project Boundary which would place some residences and properties in a lower noise affectation category.

The Contracted Project would therefore have a positive effect on community noise levels compared to the Project assessed in the Project EA and reviewed by the PAC.

The PAC has made a number of recommendations and these are discussed in the next section.

7 REVIEW OF PAC'S RECOMMENDATIONS

The PAC's observations regarding acoustic issues are discussed in the order in which they appear in the PAC Report.

7.1 Minimum 30 dBA Background Noise Level

The INP has adopted the general principle of setting noise criteria 5 dBA above the Rating Background Level (RBL), which is calculated from measured background noise levels or from the minimum 30 dBA RBL, to control the relative audibility of the proposed noise source. This approach is consistent with previous practise in NSW and current practice in other countries and Australian states.

PAC Recommendation 13: The Commission recommends the proposed review of the Industrial Noise Policy include a review of the minimum default background noise level of 30 dBA.

The AIA was completed according to the DGRs for the Project. The PAC's recommendation cannot be addressed by Coalpac and is not a matter for this report to consider.

7.2 Cullen Bullen Public School

The Cullen Bullen Public School is located in Cullen Bullen on the western side of, and adjacent to, the Castlereagh Highway. The INP recommends an internal classroom noise criterion of 35 dBA, which is consistent with AS2107:2000 and is designed to provide an acceptable level of speech audibility and to minimise interruptions to students concentrating on set tasks.

Predicted noise levels from both the Project and the Contracted Project, during day and evening periods under prevailing weather conditions, would remain below 35 LAeq,15min outside the classrooms and below 25 LAeq within the classrooms with windows and doors open. Noise levels from the Contracted Project would therefore remain at least 10 dBA below the recommended noise criteria for the Cullen Bullen Public School.

PAC Recommendation 14: The Commission recommends the cumulative noise, including the project and ambient noise, at the Cullen Bullen school should not exceed 45 LAeq(1hr) at any time during a school day.

The PAC has recommended control of cumulative ambient noise, which includes noise from the Project and from other environmental noise sources such as Castlereagh Highway traffic, at the Cullen Bullen School. The AIA indicates the Project would produce a noise level at least 10 dBA below relevant classroom noise criteria and would therefore have an insignificant effect on classroom noise levels.

The PAC's recommendation is reflected in the Contracted Project Statement of Commitments (CPSoC), Commitment 27 which states:

> 27. Coalpac will carry out monitoring of the Project noise sources as required to ensure that noise emissions from the Project are not responsible for noise levels at the Cullen Bullen school exceeding 45 LAeq (1hr) at any time during a school day.

Any cumulative noise levels above the classroom noise criteria that may occur would therefore be a matter for others, rather than for Coalpac, to address.

7.3 Noise from the Highwall Miner

Open cut mining and highwall mining differ substantially in the number of noise sources and level of environmental noise that is produced.

- Open cut mining generally involves a fleet of machines with a loading unit such as an excavator, a number of haul trucks, a dozer to clean up the mining area and a second dozer to push and shape overburden deposited by the trucks. Other machines such as graders and water carts work with each mining fleet intermittently, as required. Some machines associated with a mining fleet, particularly haul trucks carrying overburden, tend to operate in relatively exposed areas of the mine at times; and
- Highwall mining generally involves only the miner itself, with a loader sometimes required to handle the coal stockpile. The highwall miner always operates behind a bund or wall, below the natural surface and adjacent to a highwall or cliff face that can act as an effective noise barrier. A coal transport fleet consisting of a loader and a number of haul trucks is required to serve the miner, however the miner can operate for a number of hours without the coal transport fleet by stockpiling the coal as it is mined.

A highwall mining operation is therefore significantly quieter than an open cut operation as it involves few machines and occurs entirely within a shielded mining area. It is these characteristics that allow the highwall miner to be exempt from the noise management strategies recommended for the open cut mining fleet.

PAC Recommendation 15: The Commission recommends that the proposed exemptions for the highwall miner from some of the management zone recommendations should be justified before any final determination of the project.

As discussed above, the highwall miner can generally operate alone, or at worst with a single front end loader, and therefore produces significantly lower environmental noise levels than an open cut mining fleet. The lower source noise levels reduce or eliminate the requirement for noise barriers and other noise management measures recommended in the Project EA for relatively exposed sections of the Project area. The highwall miner can therefore be exempt from these management measures.

The PAC Report quoted a paragraph from the Project EA which includes the following sentence:

The highwall miner is therefore generally exempt from the management measures recommended for each zone, ***however coal trucks associated with the highwall miner will comply with the noise management recommendations for each zone*** *(emphasis added).*

Coal trucks associated with the highwall miner are not included in the exemption, as a coal truck fleet includes a number of potentially noisy machines and does not always operate in remote or well shielded mining areas. The highwall miner can therefore operate alone and stockpile coal during the more sensitive time periods (such as the night), while the coal transport fleet can operate in less

sensitive time periods (such as the day) to transport coal to the CHPP, while the highwall miner operates in sensitive mining areas.

7.4 Active Noise Management

The AIA in the Project EA and the Project Response to Submissions report included a range of noise management measures and commitments for the Project, including:

- Best practice noise control for coal processing and mobile equipment;
- A number of strategically placed noise barriers; and
- Active management of mining noise using predictive and real time monitoring systems.

Coalpac has proposed an active management strategy including relocation of mining fleets or individual machines where required to avoid noise above the predicted levels. Where no alternative working locations could be used, the machine or fleet would be stood down until weather conditions improve.

PAC Recommendation 16: The Commission recommends the proponent should stop or modify operations under certain weather conditions where noise criteria are predicted to be exceeded and should stop noise generating operations if acceptable noise criteria are exceeded. In addition the proponent's performance should also be independently audited.

The PAC's recommendations are consistent with Commitment 35 in the CPSoC which states:

> 35. Coalpac will modify operations where real time predictive monitoring forecasts exceedances due to noise enhancing weather conditions and stop relevant operations where noise criteria are exceeded. In the unlikely event of a noise exceedance still occurring, Coalpac will report on this in its AEMR.

7.5 Coal Transport by Road

All product coal from the existing Cullen Valley Mine and Invincible Colliery is currently hauled by road. The Contracted Project includes construction and use of a conveyor to Mt Piper Power Station (MPPS) and a rail siding for loading trains destined for Port Kembla or other destinations served by the rail network. The current truck fleets operating on public roads from both mines to the MPPS would therefore substantially reduce, with a corresponding reduction in total road traffic noise along the haul routes used under current approvals.

Coalpac seeks to retain road haulage of coal to both MPPS and Wallerawang Power Station (WPS) in emergency situations, such as a failure of the coal conveyor. Such situations would typically occur with little or no prior notice. The Project EA includes a commitment for Coalpac to notify DP&I and/or the EPA at such times.

Coalpac also seeks to retain road haulage of coal up to the currently approved combined limit of 0.45 Mtpa to domestic destinations other than MPPS or WPS.

PAC Recommendation 17: The Commission recommends that once the conveyor is completed, road haulage of coal to MPPS should only occur for a minimal period in emergency situations where there are no other reasonable options and only with written approval from the Department. Haulage should be restricted to 0700 to 2100 and none on Sundays or Public Holidays.

As emergency situations would generally extend over a relatively brief period such as a few days or weeks, any delays in obtaining Department approval would effectively remove or limit Coalpac's desired ability to haul coal by road when required. CPSoC Commitment 87 states:

> 87. Haulage of product coal by road to WPS and MPPS (following the construction of the MPPS conveyor) for emergency supply will only be undertaken on a limited basis and with prior notification to DP&I and the local community.

Rather than the strategy recommended by the PAC, Coalpac has advised it would prefer an in-principle approval from DP&I to transport coal by road during agreed and well defined situations with appropriate notification to regulatory agencies and the local community.

PAC Recommendation 18: The Commission recommends that road haulage of export coal to Port Kembla should not be permitted once the rail facility has been constructed.

The PAC's recommendation is reflected in CPSoC Commitment 89 which states:

> 89. Upon completion of the rail siding, all export bound coal will be transported via rail to Port Kembla.

PAC Recommendation 19: The Commission recommends that road haulage of export coal to Port Kembla before the rail facility is operational should not be permitted without further assessment of the traffic impacts.

Coalpac currently has approval for limited road transport of product coal to Port Kembla. The Contracted Project includes construction of the rail siding specifically to address traffic noise and other issues associated with road transport to Port Kembla, however Coalpac has advised it would prefer to retain approval for road transport of product coal for a limited time until the rail siding is constructed and commissioned.

7.6 Rail Noise

PAC Recommendation 20: The Commission recommends the proponent should cooperate with rail managers and train operators, in consultation with the EPA, to develop a regional train noise study.

The PAC's recommendation is reflected in CPSoC Commitment 41 which states:

> 41. Coalpac will cooperate with rail managers and train operators, in consultation with the EPA, to develop a regional train noise study.

7.7 Noise from Rail Wagons on the Siding

The loading operation would generally include the following tasks:

- The train would enter the siding at very slow speed, particularly as the railway tracks would end a relatively short distance beyond the loading area;
- The locomotives would be disconnected from the head of the train and would be recoupled to the other end of the train ready for the return journey;

- Front end loaders would commence loading coal into the wagons. The train may need to move forward occasionally to ensure the loaders can access all wagons; and
- The loaded train would travel from the siding to the Wallerawang - Gwabegar Railway Line (WGRL).

Operation of the rail siding would therefore include the following potentially significant noise sources:

- Locomotive movements;
- Wagon movements (wheels and couplings); and
- Loading equipment such as front end loaders.

Noise from the locomotives idling on the siding for an extended period of time would have the potential to affect received LAeq,15min noise levels and has been included in the noise model. Similarly, noise from loading equipment (front end loaders) has been included in the model.

Noise from wagon wheels, at the very slow speeds that would occur on the siding, would be inaudible compared to noise from the locomotives and loaders and has therefore been omitted as noted in the AIA and PAC's report. Noise from the wagon couplings, however, has been considered and assessed as a potential source of sleep disturbance.

PAC Recommendation 21: The Commission recommends operational noise from the rail loading facility should not cause or contribute to exceedance of the relevant noise criteria at any time.

A detailed analysis of the noise model results indicates noise from operation of the rail siding, including the attenuating effect of the proposed earth bund along the western side of the siding, would comply with the noise criteria at all receivers. In addition, CPSoC Commitment 28 states:

> 28. Coalpac will ensure that operational noise from the rail loading facility will not cause or contribute to exceedances of the relevant noise criteria at any time.

PAC Recommendation 22: The Commission recommends the proponent should demonstrate compliance with the predicted noise levels from the rail loading facility within six months of its commencement of operation.

PAC Recommendation 23: The Commission recommends if evening or night time noise criteria are exceeded then loading should not occur in evening or at night until rectification is complete and the noise criteria can be met.

The PAC's recommendations are reflected in CPSoC Commitment 28 which states:

> 28. Coalpac will demonstrate compliance with the predicted noise levels from the rail loading facility within six months of commencement of operations at the facility. If evening or night time noise criteria are exceeded then loading will not occur in evenings or at night until rectification is complete and the noise criteria can be met.

7.8 Equipment Noise Level Testing

Calculated noise levels in the Project EA are based on a number of factors including the level of noise emissions from proposed equipment, the number of machines operating simultaneously, each

machine's location and other factors such as weather conditions. It is true that any items of equipment that produce a higher noise level than assumed in the Project EA would be expected to contribute a greater noise level than calculated in the Project EA.

The calculated noise levels at receivers as reported in the Project EA are generally influenced by a number of individual noise sources. In most cases noise from each individual source would not be sufficient to exceed the noise criteria or the predicted noise levels; it is generally the sum, or cumulative level, of multiple Project related sources operating simultaneously that would have the potential to approach or exceed the noise criteria. In principle, each machine could produce more noise if the total number of machines that contribute significant noise to a receiver is reduced.

Once the proponent makes the decision to increase the equipment fleet to enable increased production, or to extend the operating hours into the more critical night period, it would be appropriate to require all new machines with the potential to produce significant environmental noise to be purchased or retrofitted with appropriate noise suppression components and for the existing fleet to be replaced or upgraded with noise suppression components.

The Contracted Project proposes to use the same mining fleet that was analysed in the Project EA noise model.

PAC Recommendation 24: The Commission recommends all new mining equipment should be independently tested by an acoustic engineer against predicted sound power levels prior to delivery and should not be put into operation until it meets the predicted level.

Large mining machines cannot generally be assembled and tested off site then transported in one piece to the Project. Machines such as excavators, trucks and dozers are typically transported to a Project site in a number of parts and are assembled and commissioned on site. It would be impossible, or at least impractical, for a machine to be assembled and noise tested off site before being disassembled for delivery and reassembly on the site.

The PAC's recommendation is reflected in CPSoC Commitment 26 which states:

> 26. Coalpac will have all new mining equipment independently tested by an acoustic engineer against predicted sound power levels. Specified sound power levels will be achieved during commissioning.

7.9 Operating Hours

*PAC Recommendation 25: The Commission recommends that operating hours should be limited to the following times **until** all noise mitigation measures have been implemented and demonstrated to be effective and certified by an independent acoustic expert that they meet the noise criteria. These noise mitigation measures include; the noise sound suppression on mobile plant and stationary equipment, earthen bund walls, conveyor, bridge over the Castlereagh Highway, location of infrastructure within the project footprint and the real time monitoring and management system.*

- *Monday to Saturday*
  - *7.00 am to 6.00 pm – for mining coal processing activities;*
  - *7.00 am to 9.30 pm – for haulage and transportation from Invincible Colliery exit;*
  - *7.00 am to 5.30 pm Monday to Friday and 7.00 am to 5.00 pm on no more than 30 Saturdays annually – Coal haulage from Cullen Valley Mine, Hillcroft and East Tyldesley.*
  - *10.00 pm to 7.00 am – non-audible equipment maintenance activities.*

- *9.00 am to 5.00 pm - blasting.*

- *Sunday*
  - *8.00 am to 6.00 pm – for mining and all associated activities;*
  - *6.00 pm to 7.00 am – non-audible equipment maintenance activities.*
  - *No blasting*
- *And at no time on public holidays.*

Note: these times may be further restricted by specific recommendations, for example near the Cullen Bullen cemetery.

Coalpac has advised it can accept the PAC's recommendation with the following amendments to the first and third dot points to be consistent with the Project and existing approvals (amended sections are highlighted in bold font):

- 7.00 am to **9.30 pm** – for mining and coal processing activities; and
- 7.00 am to 5.30 pm Monday to Friday and 7.00 am to 5.00 pm on no more than 30 Saturdays annually – Coal haulage **from the Cullen Valley Mine exit**.

The amended recommendation is reflected in CPSoC Commitment 33.

*PAC Recommendation 26: The Commission recommends that operating hours should be limited to the following times **after** all noise mitigation measures have been implemented and certified by an independent acoustic expert that they meet the predicted noise outcomes. These noise mitigation measures include; the noise sound suppression on mobile plant and stationary equipment, earthen bund walls, conveyor, bridge over the Castlereagh Highway, location of infrastructure within the project footprint and the real time monitoring and management system.*

- *Monday to Saturday*
  - *24-hours – for mining (other than blasting) and coal processing;*
  - *7.00 am to 9.30 pm – for haulage and transportation from Invincible Colliery exit;*
  - *Coal haulage from Cullen Valley Mine, Hillcroft and East Tyldesley only in emergencies with written approval from DOPI.*
  - *10.00 pm to 7.00 am – non-audible equipment maintenance activities.*
  - *9.00 am to 5.00 pm - blasting.*
- *Sunday*
  - *24-hours – for mining (other than blasting) and coal processing;*
  - *No road haulage;*
  - *No blasting*
- *And at no time on public holidays.*

Notes:

- *Temporary night time operation should be permitted only after an initial compliance certification following three months operation. This should be repeated and reconfirmed following twelve months of operation before longer term night time operation is permitted.*

- *Where mining is carried out in different sectors and some sectors show compliance and others show non compliance then the above night operating times should be permitted for those sectors only where there is full compliance with the noise criteria.*
- *These times may be further restricted by specific recommendations, for example the cemetery.*

Coalpac has indicated it can accept the PAC's recommendation with the following exceptions or modifications:

- In relation to the third dot point, to be consistent with the Project and existing approvals (amended section highlighted in bold font):
  - *Coal haulage **from the Cullen Valley Mine exit** only in emergencies with written **notification to** DP&I.*
- Coalpac would prefer an in-principle approval to haul coal by road to MPPS in emergency situations with appropriate and timely notification to regulatory authorities. Any delay in obtaining written approval for road haulage of coal would remove Coalpac's desired ability to respond to emergency situations;
- The notification process (to regulators and the community) and management of the temporary reinstatement of road haulage in the event of emergencies would be approved in advance by DP&I;
- The PAC has recommended only non-audible maintenance activities during the hours 10.00 pm to 7.00 am, however an amended condition allowing maintenance activities to produce noise levels up to the 35 LAeq,15min night noise criterion is recommended; and
- The PAC's recommendation precludes mining and coal processing on Public Holidays. It is normal practice to permit a 24/7 mining operation to continue mining and coal processing on Public Holidays. This section of the PAC's recommendation should therefore be omitted.

The amended recommendation is reflected in CPSoC Commitment 34.

7.10 Property Acquisition and Negotiated Agreements

PAC Recommendation 27: The Commission recommends a NSW policy for acquisition of properties subjected to excessive noise or air emissions by new developments should be completed as soon as practical.

The PAC's recommendation is a matter for relevant NSW regulatory agencies rather than Coalpac. The PAC's recommendation should not affect or delay determination of the Project Application.

PAC Recommendation 28: The Commission recommends the Proponent should be required to implement negotiated agreements, additional at-receiver noise mitigation measures or property acquisition consistent with the criteria in Table 5-11.

Table 5 - 11: Recommended Noise Impact Acquisition Criteria for the Coalpac Project

Level of exceedence	*Criteria*	*Response*
Significant	*greater than 5dBA above the PSNL at private residence or more than 25% of privately owned land.*	*Acquire property upon written request from landowner.*
Moderate	*greater than 2 and up to 5dBA above the PSNL.*	*Install noise mitigation measures at the receiver upon written request from landowner where negotiated agreement is not already in place.*
Mild	*up to 2dBA above the PSNL at private residence or more than 25% of privately owned land.*	*All reasonable and feasible noise mitigation measures at the project site. No specific additional noise mitigation measures at receiver.*

Notes:

1. Acceptable noise criteria are the Project Operational Noise Levels.

2. These responses apply where noise levels are predicted to exceed the criteria or where they are predicted to be below the criteria but in practice they have been found to cause sustained exceedences of the criteria.

The PAC's recommendation is consistent with previous DP&I policy and is reflected in CPSoC Commitment 40 which states:

> 40. Coalpac will implement negotiated agreements, additional (at-receiver) noise mitigation measures or property acquisition consistent with the criteria in Table 5-11 of the PAC Review Report.

7.11 Noise Monitoring and Compliance

PAC Recommendation 29: The Commission recommends the responses to real time monitoring that show an exceedence or potential exceedence of noise requirements should be included in an annual report made available to Council, relevant agencies and the public.

The PAC's recommendation to report exceedances of noise criteria has been accepted by Coalpac. However, potential exceedances of the noise criteria that were successfully avoided by Coalpac's noise management responses should not be of interest to Council, regulatory agencies or the public and should not need to be reported.

Overall performance of operations and interaction with the community would be discussed with the Community Consultative Committee of which Lithgow City Council would normally have membership. Similarly the Annual Environmental Management Report, a publically available document, would disclose and describe the general performance of the RTNMS.

CPSoC Commitment 35 states:

> 35. Coalpac will modify operations where real time predictive monitoring forecasts exceedances due to noise enhancing weather conditions and stop relevant operations where noise criteria are exceeded. In the unlikely event of a noise exceedance still occurring Coalpac will report on this in its AEMR.

PAC Recommendation 30: The Commission recommends there should be no increase in production until the Real Time Noise Management System is established and demonstrated to be operating effectively under all weather conditions, including temperature inversions.

The PAC's recommendation is reflected in CPSoC Commitment 30 which states:

> 30. Coalpac will install a real-time noise monitoring system with monitors at locations selected in consultation with the EPA. There shall be no increase in production levels above 2.2 Mtpa of product coal until the Real Time Noise Management System is established and demonstrated to be operating effectively under a variety of weather conditions, including temperature inversions.

PAC Recommendation 31: The Commission recommends a comprehensive evaluation of the effectiveness of real time monitoring and proactive and reactive management systems used for air and noise management in mines in NSW.

Coalpac would cooperate with DP&I in relation to any such evaluation.

PAC Recommendation 32: The Commission recommends an independent audit should be conducted at the end of 12 months and then every three years to investigate and report on the effectiveness of the Real Time Noise Management System in maintaining noise levels within the relevant criteria. This should include measures taken in all meteorological conditions. The audit should report on any additional measures available to mitigate impacts.

The PAC's recommendation is reflected in CPSoC Commitment 30 which states:

> 30. The effectiveness of the Real Time Noise Management System in maintaining noise levels within the relevant criteria in all meteorological conditions shall be audited as part of the Project Approval independent compliance auditing process. The independent auditor will be required to report to the DP&I on additional measures available to mitigate impacts.

PAC Recommendation 33: The Commission recommends any approval for the project should include a condition that the mining only proceed in stages until it demonstrates compliance with the noise criteria.

The PAC's recommendation is reflected in CPSoC Commitment 32 which states:

> 32. Mining will only proceed in stages as it is demonstrated that compliance is achieved with the Project Approval noise criteria (as specified in Commitments 33 and 34 below).

7.12 Blasting to Rock Shelters

There are four Aboriginal rock shelters in the vicinity of the proposed mining area identified in the Project EA and an additional shelter has since been identified as noted by OEH in their correspondence with the PAC. Each of the shelters has been inspected by heritage consultants and their level of scientific significance assessed. The consultants also assessed the relative stability, and hence resistance to potential blast induced damage, of each shelter. As each shelter is unique and an inspection cannot reveal all relevant details, it is difficult to make scientifically robust recommendations regarding appropriate ground vibration criteria for each shelter.

Coalpac has adopted a target of half of the ground vibration criteria that were included in the Project EA for each shelter to minimise the risk of vibration related damage. Rock shelters regularly withstand high prevailing wind speeds and are therefore not sensitive to overpressure, so overpressure criteria are not expected to be required for the shelters.

PAC Recommendation 34: The Commission recommends ground vibration criteria for Aboriginal heritage rock shelters should not be greater then the criteria set out by the Proponent, that is half the recommended ground vibration criteria and 3dB below the overpressure criteria. The Blast Management Plan should demonstrate how blasting can occur with negligible mining-induced damage of the Aboriginal rock shelter RCK2-10.

The PAC's recommendation is reflected in CPSoC Commitment 42 which states:

> 42. Coalpac will design all mine blasts through utilising the control and management measures in the EA to comply with the vibration and overpressure criteria for all sensitive surface features listed in the EA (see Table 30). A Blast Management Plan will be developed to demonstrate how blasting can occur with no noticeable mining-induced damage of the Aboriginal rock shelter RCK2-10 and that no noticeable blast induced damage is caused to any grave or gravestones at the Cullen Bullen cemetery or to Carleon Coach House.

7.13 Noise and Blasting to the Cullen Bullen Cemetery

The Cullen Bullen Cemetery is located on the eastern side and adjacent to the Castlereagh Highway approximately 1.5 km north of Cullen Bullen. While graves and headstones within the cemetery are inherently resistant to damage from ground vibration and are insensitive to overpressure, headstones in poor condition may potentially be affected by relatively high ground vibration levels. This has been addressed in the Terrock Report (2013).

The cemetery would not continuously contain visitors so would not be considered a noise sensitive receiver at all times. People would visit the cemetery during funeral services and intermittently at other times particularly during weekends and on Public Holidays. Coalpac has committed to no mining or coal haulage within 1.5 km of the cemetery during scheduled funeral services to preserve the existing acoustic amenity of the cemetery during these sensitive time periods.

PAC Recommendation 35: The Commission recommends no mining-induced damage is to be caused to any grave or gravestones at the Cullen Bullen cemetery. The Blast Management Plan must demonstrate how this would be achieved.

The PAC's recommendation is reflected in CPSoC Commitment 42 which states:

> 42. Coalpac will design all mine blasts through utilising the control and management measures in the EA to comply with the vibration and overpressure criteria for all sensitive surface features listed in the EA (see Table 30). A Blast Management Plan will be developed to demonstrate how blasting can occur with no noticeable mining-induced damage of the Aboriginal rock shelter RCK2-10 and that no noticeable blast induced damage is caused to any grave or gravestones at the Cullen Bullen cemetery or to Carleon Coach House.

PAC Recommendation 36: The Commission recommends no mining or coal haulage occurs within a 1.5km radius of the Cullen Bullen cemetery on any Saturday, Sunday or Public Holiday.

This recommendation is considered particularly onerous for Coalpac.

The suggested 1.5 km setback distance for mining and coal haulage on weekends and Public Holidays would affect a significant proportion of the East Tyldesley mining area and the proposed main haul road from the existing Cullen Valley mining area across the Highway Bridge to the East Tyldesley

Coal Handing and Preparation Plant (ETCHPP). The suggested 1.5 km setback would therefore affect mining operations in at least half of the Project area.

Gravesites and headstones within the cemetery are located approximately 20 m to 80 m from the Castlereagh Highway. Calculations indicate maximum noise levels from cars travelling on the Castlereagh Highway past the cemetery would range from approximately 50 to 65 dBA depending on the noise level produced by the car and distance from each headstone to the Castlereagh Highway. Passing highway trucks would produce a maximum noise level in the range 62 to 74 dBA within the cemetery.

With cemetery visitors already subjected to maximum traffic noise levels up to 65 dBA from cars and 74 dBA from highway trucks, Coalpac should not be required to effectively cease mining over much of the Project site on weekends and Public Holidays.

An appropriate compromise may include a maximum noise level of perhaps 55 dBA as a mining vehicle passes the cemetery, which would result in the Project contributing approximately 10 dBA less noise compared to the existing highway near the centre of the cemetery. A maximum noise level of 55 dBA would be produced by heavy vehicles on a mine haul road approximately 350 m from the cemetery, therefore a condition of consent requiring a 350 m setback distance from the cemetery on weekends and Public Holidays would be recommended.

CPSoC Commitment 48 states:

> 48. Blasts required for any mining activities within 500 m of the Cullen Bullen General Cemetery (the closest point being a distance of 250 m from the centre of the cemetery) will be designed to manage vibration and overpressure levels.
>
> No blasting will occur on days when formal services are scheduled at Cullen Bullen General Cemetery; and no mining or coal haulage within a 1,500 m radius will occur within two hours of formal services at Cullen Bullen General Cemetery.
>
> No mining operations will occur on weekends and Public Holidays within a radius of 350 m from the centre of the Cullen Bullen General Cemetery.

7.14 Number of Blasting Events

Blast effects include ground vibration and air overpressure, both of which propagate from the blast site to receivers. Both ground vibration and overpressure levels are affected by the Maximum Instantaneous Charge (MIC), the blast pattern, distance from the blast site and other relevant factors. Vibration and overpressure levels can be reduced by reducing the charge weight per hole, by reducing the number of charges that are simultaneously fired or by designing a blast pattern to avoid wavefront reinforcement in the direction of a receiver.

The Project EA noted the MIC would need to be carefully controlled in areas of the Project site close to residences in order to meet the vibration and overpressure criteria. A lower MIC generally implies a smaller blast, which requires an increase in the number of blast events for the same production rate.

In the absence of a reduced MIC to control blast impacts, the proposed production rate would normally require up to 20 blast events per month or an average of 5 events per week. Section 4.12 of the AIA reported up to 40 blast events per week or 10 events per day may be required where the MIC needs to be controlled, which is acknowledged as an error. The AIA should have stated that up to 40 blast events per month, or 10 events per week, may be required when blasting close to residences which is double the normal number of blast events per day for limited time periods.

PAC Recommendation 37: The Commission recommends that the Proponent's approach to controlling noise and vibration from blasting at residences by reducing the MIC and increasing the number of blasts to be rejected as imposing an unreasonable impact on the residents. Any

exceedence of the ANZEC guideline for blasting frequency should be strictly limited, particularly when the expected noise or vibration levels are likely to be at or close to the limits.

The PAC's recommendation is reflected in CPSoC Commitment 47 which states:

> 47. Coalpac will not exceed the ANZEC guideline for blasting frequency (i.e. there will be no more than 1 blast event per permissible blast day).

7.15 Blasting to Rock Pagodas and Other Natural Features

Mining is proposed to occur close to rock pagodas and cliff lines, with a minimum setback distance of 50 m proposed in some areas of the Project. As the condition of the rock structure varies from place to place, it is difficult to determine vibration criteria that would provide sufficient confidence that significant damage to the features is unlikely to occur, yet still allows efficient coal mining in the vicinity of the pagodas.

PAC Recommendation 38: The Commission recommends that there should be no impacts to the pagodas and cliff lines from blasting. The Commission does not accept that a 50m buffer will guarantee this outcome, but is unable to determine a satisfactory buffer distance from the available information. To accommodate this situation the Commission recommends that no blasting occur within 300m of the pagodas or cliff lines without an independent geotechnical surveyor certifying that the blasting proposed will not cause impact to the pagodas or cliff lines. In any event a minimum stand-off distance of 100m must be maintained for blasting from all pagodas, cliffs and other rocky outcrops.

PAC Recommendation 39: The Commission recommends that strict monitoring requirements which allow detection of any blasting-induced impacts to pagodas, cliff lines or rocky outcrops be required in the event that the project proceeds.

The PAC has focussed on setback distance to protect pagodas and cliff lines from blast damage, however other factors such as MIC also affect ground vibration levels at pagodas and cliff lines. This has been investigated and reported by Terrock (2013). Coalpac has accepted there should be no noticeable damage to pagodas and cliff lines as reflected in CPSoC Commitment 43 which states:

> 43. Coalpac will design all blasts such that there shall be negligible impact or damage to SPLs and Sandstone Outcrops. As mining advances towards these features, blast monitoring will be conducted with the aim of determining 'safe' or 'non-damaging' vibration levels at the SPL and sandstone outcrops, beginning 200 m from their base. Prior to the eastern advance of the Invincible mining area toward the SPL, the stability of the rock mass will be assessed and a Hazard Map produced to identify unstable features.

7.16 Potential Blast Related Damage to Residences and Other Buildings

PAC Recommendation 40: The Commission recommends that the Department review the mechanism used to assess complaints of blast damage to private property with a view to providing the residents with confidence that their claims are being assessed by a qualified person who is transparently independent from the Proponent.

The PAC's recommendation is a matter for DP&I to consider and cannot be addressed by Coalpac.

8 CONCLUSION

The Planning Assessment Commission's review of the Coalpac Consolidation Project contains 28 specific recommendations related to acoustic issues, including:

- Four recommended policy reviews by DP&I, the EPA and other regulatory organisations;
- Two recommended modifications or requests for clarification of the assumptions, assessment strategies or information presented in the Project EA; and
- Twenty two recommended conditions of consent, assuming the Project Application is approved, or issues to be addressed as conditions of consent in any approval.

The four recommended policy reviews are, by their nature, unable to be resolved by Coalpac. The outcome of any reviews completed by regulatory organisations in response to the PAC's recommendations would in all cases apply to all future projects seeking approval in NSW but should not affect determination of the Project Application.

The two recommended modifications to information presented in the Project EA, or requests for clarification, are:

- Recommendation 15 (clarify the proposed exemption from noise management measures for the highwall miner) - clarification of this issue has been provided in section 7.3 of this report.
- Recommendation 37 (40 blast events per week as incorrectly reported as an assumption in the Project EA) - this assumption has been corrected to the originally intended maximum of 40 blast events per month, or 10 events per week, for blasts in areas of the Project site relatively close to residences. Coalpac has since committed to a maximum of 20 blast events per month or one blast event per weekday, which addresses the PAC’s recommendation.

The PAC's remaining twenty two recommendations can be addressed via appropriate conditions of consent, subject to a review and consideration of comments and suggested amendments to some of the recommendations in the relevant sections above.

From an acoustic perspective, the PAC does not appear to have identified any issues for Coalpac's attention that have not been, or that cannot be, adequately addressed.

The Contracted Project would:

- Reduce the number of affected residences and properties by:
  - up to a 25% reduction of residences in the Significant impact category; and
  - up to a 33% reduction of residences in the Moderate impact category.
- Reduce mining noise levels generally to the north west of the Project Boundary which would place some residences and properties in a lower noise affectation category.

The Contracted Project would therefore have a positive effect on community noise levels compared to the Project assessed in the Project EA and reviewed by the PAC.

APPENDIX A – CURRICULUM VITAE

Name: Mark Bridges.

Qualifications: Bachelor of Mechanical Engineering (Hons), awarded May 1991.

Affiliations: Member of the Australian Acoustical Society, admitted February 1999.

Employment:

Since Feb 2000:	Principal, Bridges Acoustics.
Oct 1998 to Feb 2000:	A/Manager, Caleb Smith Consulting.
Nov 1995 to Oct 1998:	Senior Acoustic Engineer, Caleb Smith Consulting.
Feb 1995 to Nov 1995:	Acoustic Engineer, Caleb Smith Consulting.
Feb 1984 to Feb 1995:	Various positions in the Water, Hydraulics and Manufacturing industries.

Experience: Mark has specialised in environmental noise measurement, prediction and control with a particular emphasis on software-based noise modelling and effective noise control strategies for mines and quarries. He has completed over 110 noise impact statements and more than 160 other environmental noise assessments in the mining, industrial, commercial, domestic, utilities and services sectors and has prepared expert evidence and appeared in the Land & Environment Court and the Liquor Licensing Court.

Mark's experience in the coal mining and quarrying industry has provided a detailed understanding of the industry including approvals, compliance, operational and public relations issues. He has contributed to a number of Planning Focus Meetings and has presented environmental noise issues to Planning, the Office of Environment and Heritage and various local Councils. He has completed a large number of noise compliance assessments for various mines, assisted clients with compliance or non-compliance related issues, prepared noise monitoring protocols and strategies and completed independent noise investigations.

He has a detailed understanding of operational issues which assists in tailoring noise control recommendations for each situation with minimal impacts on efficiency and cost. He has a good track record when dealing with the public, typically during background noise investigations or compliance assessments.

Some of Mark's more significant acoustic projects include:

Mining

- Minyango Coal Project EIS, Central Queensland, for Blackwater Coal;
- Drayton South Project EA, Hunter NSW, for Anglo American;
- Maules Creek Coal Mine EA, Gunnedah Basin NSW, for Aston Resources;
- Foxleigh Plains Coal Mine EIS, Bowen Basin Qld, for Anglo Coal;
- Coalpac Consolidation Project EA, Lithgow Region NSW, for Coalpac;
- Grosvenor Mine EIS, Bowen Basin Qld, for Anglo Coal;
- Boggabri Coal Mine Extension EA, Gunnedah Basin NSW, for Boggabri Coal;
- Eagle Downs Coal Mine EIS, Bowen Basin Qld, for Bowen Central Coal Management;
- Mannering Mine EA, Central Coast NSW, for Centennial Coal;
- Mandalong Mine Modification EA, Hunter NSW, for Centennial Coal;

- Wambo Coal Mine review, Hunter NSW, for Blake Dawson Waldron Lawyers and the Land & Environment Court;
- Bengalla Mine Wantana Modification EA, Hunter NSW, for Coal & Allied;
- Drayton Mine Expansion EA, Hunter NSW, for Anglo Coal;
- Bengalla ROM Modification EA, Hunter NSW, for Coal & Allied;
- Bengalla S92 Modification, Hunter NSW, for Coal & Allied;
- Newstan Awaba Coal Mine EA, Hunter NSW, for Centennial Coal; and

Water

- Toronto Wastewater Treatment Works upgrade, Hunter NSW, for Hunter Water;
- Branxton Wastewater Treatment Works upgrade, Hunter NSW, for Hunter Water;
- Burwood Beach Wastewater Treatment Works upgrade, Hunter NSW, for Hunter Water;
- Wilton Sewage Treatment Plant, Southern Highlands NSW, for Bradcorp;
- Effluent Irrigation Scheme, Tamworth NSW, for Tamworth City Council; and
- Thrumster Wastewater Scheme EIS, Port Macquarie NSW, for Hastings Council.

Other

- Summerhill landfill gas generator, Hunter NSW, for LMS Generation;
- Failford Concrete Plant, Great Lakes NSW, for Great Lakes Council and the Land & Environment Court;
- Blast Furnace 5 reline project, Port Kembla NSW, for Bluescope Steel;
- Marine Supply Base White Bay EA, Sydney NSW, for Baileys Marine Fuels;
- Sinter Plant Upgrade, Port Kembla NSW, for Bluescope Steel;
- Cold Pickle Line Upgrade, Port Kembla NSW, for Bluescope Steel;
- Catalytic Cracker Upgrade, Sydney NSW, for Shell Refining;
- Hydrodesulphurisation Unit Upgrade, Sydney NSW, for Shell Refining;
- Hot Strip Mill Upgrade, Port Kembla NSW, for Bluescope Steel;
- Devonport to Darling Harbour Ferry, Sydney NSW, for Sydney Ports Corporation; and
- Cogeneration Plant EIS, Port Kembla NSW, for Duke Energy and Bluescope Steel.