YANCOAL
兖煤澳大利亚有限公司

AUSTAR COAL MINE
PART OF THE YANCOAL AUSTRALIA GROUP

Noise and Vibration Management Plan

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1 INTRODUCTION

1.1 BACKGROUND

Austar Coal Mine Pty Ltd (Austar), a subsidiary of Yancoal Australia Limited (Yancoal), operates the Austar Coal Mine, an underground coal mine located approximately 10 kilometres southwest of Cessnock in the Lower Hunter Valley in NSW (refer to **Figure 1**). The Austar Coal Mine incorporates the former Pelton, Ellalong, Cessnock No. 1 (Kalingo) and Bellbird South Collieries and includes coal extraction, handling, processing and rail and road transport facilities (refer to **Figure 1**).

Extensive mining has been undertaken within the Austar Coal Mine since 1916. Historical mining was predominantly via bord and pillar mining and more recently via conventional longwall mining and longwall top coal caving (LTCC) methods. Mining within the Bellbird South areas (Southland, Stage 1 and Stage 2, refer to **Figure 1**) was approved by the Minister for Urban Affairs and Planning in 1996 under DA 29/95, while mining of Stage 3 was approved by the Minister for Planning in 2009 under Project Approval 08_0111. Longwall mining commenced in the Ellalong Colliery area in 1983 and has subsequently progressed into the Bellbird South and the Stage 3 areas.

Mining is currently proceeding in the LWB1-B7 mining area in accordance with DA 29/95 (as modified).

1.2 SCOPE

This Noise and Vibration Management Plan (NVMP) has been prepared to manage noise and vibration impacts associated with construction and operational phases of the Austar Mine Complex. This plan has been prepared in accordance with the requirements of:

- Development Consent DA29/95 (MOD7) Conditions 15 and 16 of Schedule 2;
- Project Approval PA08_0111 (MOD3) Condition 3 of Schedule 4; and
- Environment Protection Licence 416 (EPL 416).

The above development consent, project approval and licence are referred to collectively in this NVMP as the Approvals.

Specific noise and vibration related requirements of the Approvals, including where the specific requirements are addressed in the NVMP are detailed in **Appendix A**.

1.3 OBJECTIVES

The objectives of this management plan are to:

- ensure that construction and operational noise and vibration from Austar are managed;
- maintain compliance with conditions of the Approvals and legislation relating to noise and vibration;
- provide a protocol for monitoring and evaluation of noise impacts on surrounding private residences and sensitive receivers;
- manage project specific noise and vibration impacts associated with the construction and operations; and
- communicate with the local community and regulators regarding Austar activities.

1.4 CONSULTATION

The NSW Environment Protection Authority (EPA) was consulted during preparation of the original NVMP (July 2013). The NVMP was revised and updated following the DA29/95 MOD 6 approval, and again provided to EPA for comment in April 2017. The EPA response on the April 2017 revision is included as **Appendix B**.

This revision of the NVMP (June 2018) addresses any previous comments provided by the EPA, however further consultation has not been sought based on the LWB4-B7 Modification (MOD7) not involving any additional surface development, and due to the predicted minimal impacts on the ground surface associated with subsidence being unlikely to have any adverse impacts on current land uses.

2 EXISTING ENVIRONMENT

2.1 NOISE

With the exception of agricultural activities (poultry farms, vineyards) and construction activities associated with new developments, there are few other industrial noise sources near to Austar's surface infrastructure. A description of the noise environment in the area of each of the major surface infrastructure areas is provided below.

2.1.1 Pelton CHPP

A mixture of limited rural-residential landholdings to the north and west, Pelton Village to the south, and the suburb of Bellbird to the northeast and east surround the CHPP. An approved quarry is located on land immediately west of the CHPP site along Wollombi Road which may contribute to daytime noise emissions when operating.

Pelton Colliery has operated in this area since 1916, and the Pelton CHPP has operated in this area since approximately 1960. As such, the CHPP operations may be considered a feature of the acoustic environment. Measured noise levels are routinely in the order of EPL noise limits (L_{A90} 37 to 43 dB). Despite higher noise levels in the area surrounding the CHPP, there are few complaints.

Austar is engaged in a continuous improvement program by entering into a voluntary noise Pollution Reduction Program (PRP) in consultation with the EPA in an effort to minimise noise impacts. Further information on the PRP is included in **Section 6**.

2.1.2 Austar Pit Top and No. 1 Shaft

The current Austar Pit Top and No. 1 Shaft were developed in the 1970's. The Pit Top is located within Paxton, just north of the village of Ellalong. The village of Paxton is located to the west of the Pit Top, and No. 1 shaft is located on the northwestern edge of the village of Ellalong. The No 1 Shaft is used for air intake and secondary access/egress from the mine. There are few environmental issues other than minor noise emissions when operation the man riding system.

2.1.3 Kitchener SIS

The Kitchener SIS is surrounded by the Werakata State Conservation Area (SCA) in all directions, with no private dwellings to the west. Beyond the boundary of the Werakata SCA to the south and east there are private rural properties, including a poultry farm. Background data collected during the EA indicated that levels in the vicinity of the SIS were generally less than 30 dB. To the north of the site, in Kitchener village, daytime background levels were 33 dB. To the south and east of the site, evening background levels were 32 dB. This data has been used to develop construction noise management levels based on guidance provided in the Interim Construction Noise Guide (ICNG) (EPA, 2009).

The Kitchener SIS is the site of the Stage 3 No. 5 upcast ventilation shaft, No. 6 downcast shaft, services borehole, and associated services. Project Approval 08_0111 approves the construction of new Pit Top facilities including a men and materials shaft.

2.1.4 Kalingo Infrastructure Area (No. 3 and 4 Shafts)

The Kalingo Infrastructure Area (KIA) is surrounded by native forest to the north and west, and rural allotments to the east and south. The acoustic environment in the area of the KIA is considered to be typical of a rural area, with background levels (in the absence of KIA infrastructure) less than 30 dB. There have been no recorded exceedances of noise levels at the KIA in recent years.

2.2 VIBRATION

The Werakata SCA and private rural landholdings, including private residences, overlie the Austar Bellbird South and Stage 3 underground mining area. Vibration sources from the existing environment are described below.

2.2.1 Underground Mining

Vibration monitoring results from mining previous Bellbird South longwall panels (LWA1 to LWA5a, and LWB2), and Stage 3 longwall panels (LWA7 to LWA8) have shown vibration events occur coincidental with longwall mining operations, and cease soon after completion of longwall extraction. Vibration events caused by longwall mining are brief (typically less than 1 second) and there may be one or no events on a particular day, several days or a week between events, or on occasion there may be several events in one day.

Vibration events recorded in the Bellibrd South and Stage 3 areas have typically been measured at less than 5mm/s, with occasional events recorded at greater than 10 mm/sec. Vibrations of this magnitude, whilst at levels that will be noticeable for humans, are typically less than any potential building damage criteria, however have at times exceeded the non-mandatory EPA vibration criteria due in part to the potential for events to occur at any time during longwall mining. The maximum vibration event since August 2009 was recorded at 25 mm/sec, which is one of five events greater than 15 mm/sec between 2009 and June 2018. These larger vibration events have been recorded during mining in the Bellbird South area and whilst infrequent at these magnitude, are at a level where published standards indicate a minimal risk of cosmetic damage to structures could occur (e.g. cracking of plaster).

The Stage 3 Modification Environmental Assessment (Umwelt, 2011) notes that vibration events from the Ellalong Mine were recorded between 1993 and 1994 typically at less than 8 mm/sec, with several greater than 8 mm/sec and two greater than 20 mm/sec.

Vibration events are anticipated to continue to be recorded from the Bellbird South and Stage 3 Mining Areas at similar levels to that measured from previous longwall mining in the area.

2.2.2 Other Vibration Sources

The Federal Government agency Geoscience Australia monitors, analyses and reports on earthquakes within Australia and internationally. A search of earthquake activity within approximately 120km radius of the Austar underground mining areas between 1956 and 2018 indicated 253 recorded seismic events, not necessarily related to mining activities. The Geoscience Australia information indicates that a 5.4 magnitude earthquake was recorded in Ellalong in 1994. This was the largest earthquake recorded in Australia in 1994. The total damage bill for this event was is in excess of $40M (Geoscience Australia 2017).

Other potential vibration sources unrelated to Austar's activities include quarry operations near the Austar CHPP site, and live fire exercises conducted at the Singleton Army Range. Austar has previously received community enquiries when heavy artillery or aerial bombardment exercises are conducted at the Singleton Army Range.

3 APPROVED NOISE AND VIBRATION EMISSIONS

3.1 NOISE SOURCES

The Austar Mine Complex operates 24 hours per day, seven days per week. Operational equipment on the Austar Mine Complex for which specific noise criteria are specified include:

- Kitchener Surface Infrastructure Site (SIS) – Includes an access road, upcast and downcast ventilation shafts, main ventilation fans, water management infrastructure, electricity substation and distribution line, service boreholes. The SIS is approved for construction of Pit Top facilities including men and materials shaft, bathhouse, workshop, services, offices and store;
- Kalingo Infrastructure Area (KIA) - nitrogen plant, compressors and ventilation fans;
- Pelton CHPP and associated plant (mobile plant including dozers, coal transport load points, water treatment plant, reject emplacement and conveyors).

Other noise sources at the Austar Mine Complex include the Austar Pit Top, No. 1 Shaft, remote reject emplacement areas (Aberdare Extended Reject Emplacement Area), and train movements. While there are no noise criteria for these sources, they have a history of few complaints.

3.2 VIBRATION SOURCES

3.2.1 Construction – Kitchener SIS

Although an approved method under PA08_0111, shaft construction techniques undertaken to date have not required the use of blasting, therefore there have not been any associated blasting impacts (overpressure and vibration) at neighbouring residences. However, in the event that blasting is required during future men and materials shaft construction at the SIS it will be managed in accordance with criteria detailed **Section 4.2.1**.

3.2.2 Operation – Underground Mining Area

As detailed previously, vibration events are anticipated throughout operation of the Bellbird South and Stage 3 Mining Area at magnitudes previously recorded from underground mining in the area. The nature of vibration generated from underground mining is generally considered to be event based in nature, where strata failures from material overlying the mining area subside, possibly generating seismic activity at the surface.

As the underground mining equipment may operate 24 hours per day, seven days per week, vibration generating activities may occur at any time.

4 NOISE AND VIBRATION CRITERIA

4.1 APPLICABLE APPROVALS

Austar Mine Complex includes the CHPP, KIA and Kitchener SIS. Noise impacts at Austar are addressed in documents detailed in Table 4.1.

Table 4.1 Applicable Approvals for Austar Mine Complex

Austar Mine Complex Area	Approval	Applicable Area
Austar Mine and CHPP	EPL No. 416	Mine and CHPP
Kalingo Infrastructure Area (KIA)	DA 29/95 MOD7	KIA
Surface Infrastructure Site (SIS)	PA08_0111 MOD3	Kitchener SIS

4.2 NOISE CRITERIA

4.2.1 Construction

Construction noise management levels for construction activities at the Kitchener SIS are detailed in **Table 4.2**. These levels have been derived for near receiver locations to the SIS and are based on background noise monitoring undertaken as part of the Environmental Assessment for Stage 3 (Umwelt, 2008) and the *Interim Construction Noise Guideline* (EPA, 2009). These levels apply to construction activities at the SIS as required by PA08_0111. Construction noise monitoring locations are shown on **Figure 2**.

Table 4.2 Construction Noise Management Levels - Kitchener SIS

Descriptor	Monitoring Location	$L_{Aeq,15minute}$ (dB)	
		Recommended Standard Hours	Outside Recommended Standard Hours
NM K1	Pelton Road, Quorrobolong	40	35
NM K2	Coney Creek Lane, Quorrobolong	40	35
NM K3	Richmond Street, Kitchener	43	35

Notes *1. 'Recommended Standard Hours' are Monday to Friday, 7.00 am to 6.00 pm and Saturday, 8:00 am to 1:00 pm. All other times, including Sundays and Public Holidays are considered to be 'Outside Recommended Standard Hours'.*

4.2.2 Operation

Monitoring locations for operational noise monitoring are shown in **Figure 2.** Relevant limits for each consent area are detailed in **Table 4.3** to **Table 4.5** below.

Table 4.3 Noise Impact Assessment Criteria – CHPP

Descriptor	Monitoring Location	Day/Evening/Night[1] $L_{A90,15\ minute}$ (dB)
NM C1	South of Bimbadeen Road, Mt View	40
NM C2	Pelton Village	43
NM C3	Bimbadeen Road, Mt View	37

Notes *1. Day is 7:00am to 6:00pm, evening is 6:00pm to 10:00pm, and night is 10:00pm to 7:00am.*
2. The noise limits apply at all times under wind speeds up to 3 metres per second (measured at 10 metres above ground level) and Pasquill stability class from A to F.

Table 4.4 Noise Impact Assessment Criteria - Kitchener SIS

Descriptor	Monitoring Location	Day/Evening/Night[1,2] $L_{Aeq,15minute}$ (dB)	Night [1,2] $L_{A1,1minute}$ (dB)
NM K1	Pelton Road, Quorrobolong	35	45
NM K2	Coney Creek Lane, Quorrobolong	35	45
NM K3	Richmond Street, Kitchener	35	45

Notes *1. Criteria apply for all privately owned residences; and*
2. Day is 7:00am to 6:00pm, evening is 6:00pm to 10:00pm, and night is 10:00pm to 7:00am.
3. Noise generated by the project is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy.

Table 4.5 Noise Impact Assessment Criteria – Kalingo Infrastructure Area (KIA, 3 shaft)

Descriptor	Monitoring Location	Day/Evening/Night[1,2] $L_{Aeq,15minute}$ (dB)
NM K4	Nash Lane, Quorrobolong	35

Notes *1. Criteria apply for all privately owned residences; and*
2. The noise emission limits identified in the above table apply under meteorological conditions of:
- *Wind speeds of up to 3m/s at 10 metres above ground level; or*
- *Temperature inversion conditions of up to 3oC/100m, and wind speeds of up to 2m/s at 10 metres above ground level.*

INP Modifying Factors

Attended noise monitoring and reporting is carried out generally in accordance with Environment Protection Authority (EPA) *'Industrial Noise Policy'* (INP). Chapter 4 of the INP deals specifically with modifying factors that may apply to industrial noise.

Austar's Approvals (EPL416, DA29/95, and PA08_0111) all reference that noise from the Austar Mine Complex should be measured in accordance with the requirements of the INP. In addition, EPL416 and DA29/95 specifically note:

> *The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied where applicable.*

While the INP is a relevant document for this approval it has since been superseded by the Noise Policy for Industry (NPfI). The transitional arrangements for the NPfI in relation to modifying factors are:

> *The NSW Industrial Noise Policy (2000) will continue to apply where it is referenced in existing statutory instruments (such as consents and licences), except for the NSW Industrial Noise Policy Section 4 modifying factors, which will be transitioned to the Noise Policy for Industry (2017) Fact Sheet C through a NSW Industrial Noise Policy application note. This approach has been taken because the Noise Policy for Industry (2017) modification factor approach reflects more recent understanding of the impact of tonal and low-frequency noise on the community.*

The most common modifying factors are addressed in detail below.

Tonality, Intermittent and Impulsive Noise

As defined in the Industrial Noise Policy:

> *Tonal noise contains a prominent frequency and is characterised by a definite pitch.*
>
> *Impulsive noise has high peaks of short duration or a sequence of such peaks.*
>
> *Intermittent noise is characterised by the level suddenly dropping to the background noise levels several times during a measurement, with a noticeable change in noise level of at least 5 dB. Intermittent noise applies to night-time only.*

Years of monitoring have indicated that noise levels from mining operations, particularly those levels measured at significant distances from the source are relatively continuous. Given this, noise levels from Austar at the monitoring locations are unlikely to be intermittent or impulsive. In addition, there is no equipment on site that is likely to generate tonal or impulsive noise as defined in the INP.

Low Frequency Noise

The NPfI contains the current method of assessing low frequency noise, which is a 2 step process as detailed below:

Measure/assess source contribution C-weighted and A-weighted $L_{eq,T}$ levels over the same time period. The low frequency noise modifying factor correction is to be applied where the C-A level is 15 dB or more and:

- *where any of the 1/3 octave noise levels in Table C2 are exceeded by **up to and including** 5 dB and cannot be mitigated, a 2 dBA positive adjustment to measured A weighted levels applies for the evening/night period; and*

- *where any of the 1/3 octave noise levels in Table C2 are exceeded by **more than** 5 dB and cannot be mitigated, a 5 dBA positive adjustment to measured A weighted levels applies for the evening/night period and a 2 dBA positive adjustment applies for the daytime period.*

Table C2 and associated notes from the NPfI is reproduced below:

Table C2: One-third octave low-frequency noise thresholds.

Hz/dB(Z)	One-third octave $L_{Zeq,15min}$ threshold level												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

Notes:

- dB(Z) = decibel (Z frequency weighted).
- For the assessment of low-frequency noise, care should be taken to select a wind screen that can protect the microphone from wind-induced noise characteristics at least 10 dB below the threshold values in Table C2 for wind speeds up to 5 metres per second. It is likely that high performance larger diameter wind screens (nominally 175 mm) will be required to achieve this performance (Hessler, 2008). In any case, the performance of the wind screen and wind speeds at which data will be excluded needs to be stated.
- Low-frequency noise corrections only apply under the standard and/or noise-enhancing meteorological conditions.
- Where a receiver location has had architectural acoustic treatment applied (including alternative means of mechanical ventilation satisfying the Building Code of Australia) by a proponent, as part of consent requirements or as a private negotiated agreement, alternative external low-frequency noise assessment criteria may be proposed to account for the higher transmission loss of the building façade.
- Measurements should be made between 1.2 and 1.5 metres above ground level unless otherwise approved through a planning instrument (consent/approval) or environment protection licence, and at locations nominated in the development consent or licence.

Management of exceedances which occur due to the applicability of the INP and NPfI modifying factors are described in **Section 9.1.2**.

4.3 VIBRATION CRITERIA

4.3.1 Construction Blasting

Shaft construction techniques are not anticipated to require the use of blasting, therefore there are not anticipated to be any associated blasting impacts (overpressure and vibration) at neighbouring residences. However, in the event that blasting is required during shaft construction at the Kitchener SIS, the following constraints will apply to blasting:

- Airblast overpressure shall not exceed a maximum of 120 dBL at any time, and will not exceed 115 dBL for more than 5% of blasts over a 12 month period at nearest residences (ANZECC limit);
- Vibration (peak particle velocity) shall not exceed a maximum of 10mm/s at any time, and will not exceed 5 mm/s for more than 5% of blasts over a 12 month period at nearest residences (ANZECC limit); and
- Blasting may only occur Monday to Saturday 9am to 5pm with no blasting on Sundays or public holidays.

4.3.2 Underground Mining Vibration (Bellbird South and Stage 3)

There are no operational vibration criteria provided in DA29/95 or PA08_0111 for the underground mining areas, therefore vibration monitoring results will be compared against published data on human response and structural damage as detailed below, and also against values provided in respective Environmental Assessments regarding vibration magnitudes measured in the area from longwall mining.

Human Response

Assessing Vibration: a Technical Guideline (EPA, February 2006) provides preferred and maximum vibration values for different receiver types such as residences, offices, workshops, and critical work areas (hospital operating theatres, precision laboratories). Vibration criteria are presented in terms of acceleration, vibration dose value, and peak particle velocity. The guideline indicates that the criteria are non-mandatory and are goals that should be sought to be achieved through the application of all feasible and reasonable mitigation measures. In the case of longwall mining, there is limited scope for mitigation measures.

The table below is reproduced from Appendix C of *Assessing Vibration: A Technical Guide* and shows vibration criteria.

		Assessment criteria					
		[1]rms acceleration (m/s^2) (& vib. accel. value) (dB re 10^{-6} m/s^2)		[2]rms velocity (mm/s) (& vib. velocity value) (dB re 10^{-9} mm/s)		[2]Peak velocity (mm/s)	
Place	**Time**	Preferred	Maximum	Preferred	Maximum	Preferred	Maximum
Continuous vibration							
Critical working areas (e.g. hospital operating theatres, precision laboratories)	Day- or night-time	0.0050 (74 dB)	0.010 (80 dB)	0.10 (100 dB)	0.20 (106 dB)	0.14	0.28
Residences	Daytime[3]	0.010 (80 dB)	0.020 (86 dB)	0.20 (106 dB)	0.40 (112 dB)	0.28	0.56
	Night-time	0.0070 (77 dB)	0.014 (83 dB)	0.14 (103 dB)	0.28 (109 dB)	0.20	0.40
Offices	Day- or night-time	0.020 (86 dB)	0.040 (92 dB)	0.40 (112 dB)	0.80 (118 dB)	0.56	1.1
Workshops	Day- or night-time	0.040 (92 dB)	0.080 (98 dB)	0.80 (118 dB)	1.6 (124 dB)	1.1	2.2
Impulsive vibration							
Critical working areas (e.g. hospital operating theatres, precision laboratories)	Day- or night-time	0.0050 (74 dB)	0.010 (80 dB)	0.10 (100 dB)	0.20 (106 dB)	0.14	0.28
Residences	Daytime[3]	0.30 (110 dB)	0.60 (113 dB)	6.0 (136 dB)	12.0 (142 dB)	8.6	17.0
	Night-time	0.10 (100 dB)	0.20 (106 dB)	2.0 (126 dB)	4.0 (132 dB)	2.8	5.6
Offices	Day- or night-time	0.64 (116 dB)	1.28 (122 dB)	13.0 (142 dB)	26.0 (148 dB)	18.0	36.0
Workshops	Day- or night-time	0.64 (116 dB)	1.28 (122 dB)	13.0 (142 dB)	26.0 (148 dB)	18.0	36.0

1 Values derived from z-axis critical frequency range 4–8 Hz. Where required, a more detailed analysis can be conducted as per BS 6472–1992.
2 Values given for the most critical frequency range >8 Hz assuming sinusoidal motion. Where required, a more detailed analysis can be conducted as per AS 2670.2–1990. Sufficient justification should accompany the use of a peak velocity approach if used in an assessment.
3 Specific values depend on social and cultural factors, psychological attitudes and expected degree of intrusion.

The nature of vibration generated from underground mining is considered to be event based in nature, where strata failures from material overlying the mining area subside, possibly generating seismic activity at the surface. As such the impulsive criteria are most appropriate for comparison of monitoring data.

Residences will be the most sensitive receptor type in the Bellbird South and Stage 3 mining area. As such, the preferred and maximum criteria for impulsive vibration at residences will be used for comparison with monitoring data.

Structural Damage

For building damage, Australian Standard *AS 2187: Part 2-2006 'Explosives - Storage and Use - Part 2: Use of Explosives'* recommends the frequency dependant guideline values and assessment methods given in British Standard *BS 7385 Part 2-1993 'Evaluation and Measurement for Vibration in Buildings Part'* as they are "applicable to Australian conditions".

The British Standard sets guideline values for building vibration based on the lowest vibration levels above which damage has been credibly demonstrated. These levels are judged to give a minimum risk of vibration-induced damage, where minimal risk for a named effect is usually taken as a 95% probability of no effect. The recommended limits (guide values) for transient vibration to ensure minimal risk of cosmetic damage to residential and industrial buildings are presented in **Table 4.7**.

Table4.7 Transient Vibration Guide Values – Minimal Risk of Cosmetic Damage

Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
	4 Hz to 15 Hz	**15 Hz and Above**
Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	-
Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

The British Standard states that the guide values in **Table 4.7** relate predominantly to transient vibration, which does not give rise to resonant responses in structures and low-rise buildings. Any measurable vibration generated as the longwalls are mined and the strata subsides is considered to be transient in nature, so the values of **Table 4.7** will be used for comparison as structural damage criteria.

5 MONITORING AND MEASUREMENT

5.1 ATTENDED NOISE MONITORING

Attended monitoring is the methodology for determining compliance with prescribed limits; since it allows an accurate determination of the contribution by activities associated with the Austar Mine Complex, if any, to measured noise levels. The limits relevant to this management plan cover construction and operational noise from site activities.

5.1.1 Monitoring Frequency – Construction

Construction noise monitoring for the Kitchener SIS will be undertaken when construction activities for infrastructure are being undertaken at the SIS.

Where construction activities for new shafts, buildings or other infrastructure are occurring, construction noise will be monitored on a monthly basis once during the "recommended standard hours" period, and once during the "outside recommended standard hours" (10pm to 7am). This construction monitoring may be undertaken in conjunction with the operational noise monitoring program.

5.1.2 Monitoring Frequency – Operation

Operational noise impacts are potentially greatest at night when background levels are typically low and the allowable levels are correspondingly low, and, this is the period when noise propagation enhancement is most likely.

Background data indicates that the Austar Mine Complex is typically inaudible during the day period when meteorological conditions are not enhancing and other activities make it difficult to measure the source of interest.

Evening is a transitional period from day to night, from the hours 6pm to 10pm. In suburban areas, traffic flows will be greater during the evening, potentially making it difficult to measure the source of interest.

Therefore, monitoring will be carried out at each location three nights per quarter, nominally once per month (pending weather and operational constraints), with results compared to criteria for all periods (i.e. day, evening and night). Atmospheric conditions and noise propagation are usually the same on the evening/night and night/day period boundaries. As such monitoring during the night period only is considered appropriate.

5.1.3 Locations

Noise monitoring locations, as shown in **Figure 2** (and detailed previously with noise criteria in **Table 4.3** to **Table 4.5**), have been selected as representative of residential receivers that are predicted to be potentially impacted by the Austar Mine Complex, and with consideration given to the privacy of residents (e.g. not monitoring immediately adjacent the dwelling). Locations have been selected to ensure coverage in terms of demonstrating compliance with the noise criteria within the Approvals. It should be noted that **Figure 2** shows the actual monitoring position, not the location of residences.

Noise monitoring locations will be reviewed and where necessary modified as a result of monitoring results, changes to the mining operations or, changes in land ownership. Any review would be undertaken in consultation with relevant government agencies.

5.1.4 Methodology and Compliance Assessment

Attended noise monitoring will be conducted in accordance with the INP, NPfI and Australian Standard AS 1055 *'Acoustics, Description and Measurement of Environmental Noise'*. The duration of each measurement is to be 15 minutes.

Austar's contribution to measured noise levels (if any) must be determined to permit comparison to relevant noise criteria in **Section 4.2,** including any modifying factors where relevant**.** Any potential exceedance of a noise criterion, due to Austar generated noise, recorded during regular attended noise monitoring is to be investigated. The person undertaking the attended monitoring is to contact the Environment & Community Manager as soon as practicable to advise of the recorded results.

All relevant information pertaining to the time of potential exceedance is to be gathered as follows:

- locations and quantities of mining plant operating; and
- meteorological conditions at the time of monitoring.

Using the above data an assessment is to be made as to the validity of the potential exceedance.

Should the noise exceedance be confirmed as being caused by Austar's noise emissions, the site must determine if the impacts are systemic or sustained. In order to determine this, follow up monitoring will be undertaken at that specific location (not all locations). The regular monitoring frequency will be resumed if no further exceedances are measured. However, if a further exceedance is measured during the follow up period (fortnight), then a comprehensive survey will be undertaken to determine if these impacts are regular (systemic/sustained).

5.2 CONTINUOUS UNATTENDED NOISE MONITORING

Continuous unattended noise monitoring is required by PA08_0111. Results from real time monitoring cannot be used to determine compliance, since the noise levels recorded do not represent only noise from the mine. The recorded noise levels represent noise from all sources.

5.2.1 Locations

A mobile continuous noise monitor will be used to monitor noise emissions and to assist with the CHPP PRP. The mobile monitor may be moved around periodically between locations shown in **Table 5.1** and **Figure 2**, subject to landholder agreement.

Table 5.1 Proposed Continuous Noise Monitoring Locations

Descriptor	Monitoring Location
NM C1	South of Bimbadeen Road, Mt View
NM C2	Pelton Village
NM C3	Bimbadeen Road, Mt View

Any unattended data will be collected and stored to allow a data trend analysis to be completed as required.

5.2.2 Methodology

The unattended continuous noise monitor record the following information:

- the date and time;
- the L_{Aeq}, L_{Ceq} and LAeqLF(20-630 Hz) for each 15 minute interval;
- the LAmin, L_{Amax}, LApeak, L1, L10 and L90 for each 15 minute interval;
- the $L_{Aeq,period}$ (where period = day, evening and night) for each 24 hour interval;
- the maximum $L_{A1,1minute}$ noise level recorded over a randomised 15 minute night time measurement period;
- weather data monitoring for wind direction, speed, temperature, relative humidity and rainfall as 15 minute averages; and
- Live streaming of audio and continuous MP3 recording for subsequent playback.

5.3 VIBRATION MONITORING

Vibration monitoring will be conducted in general accordance with *Assessing Vibration: A Technical Guideline* (EPA, 2006).

5.3.1 Locations

Vibration monitoring locations are detailed in **Table 5.2** and shown on **Figure 2.** The locations will be used during extraction of Bellbird South Longwalls and Stage 3 Longwalls A7 to A10 to measure long term monitoring at a variety of distances from the active longwall area.

Table 5.2 Vibration Monitoring Locations Respective to Longwall Extraction

Active Longwall Extraction Area	Descriptor	Monitoring Location
Bellbird South LWB1-B7	V10	Off Sandy Creek Road, Ellalong
	V11	Austar land north of Quorrobolong Creek, Ellalong
	V7	345 Quorrobolong Road, Quorrobolong
Stage 3 LWA7-A10	V8	159 Coney Creek Lane, Quorrobolong
	V7	345 Quorrobolong Road, Quorrobolong

There will be two monitoring locations used during longwall extraction. One monitor (V10 / V11 / V8) will be moved as required to be sited in the active longwall extraction area. The monitor at V7 is intended to remain in place for long-term data collection.

5.3.2 Methodology

Instantel vibration monitors with external triaxial geophones (or similar) shall be used. The external transducers may be either directly attached to concrete pads buried in the ground, or spiked into the ground using ground spikes.

The external transducers have a 2 to 300Hz frequency response and measure transverse, vertical and longitudinal ground vibrations. Both units shall be set to monitor vibrations, continuously storing the relevant peaks for each one-minute interval. The monitor is able to generate and store a vibration waveform if vibration levels exceed a trigger level. The trigger level to record a waveform of both monitors is set at 1 mm/s.

The data shall be downloaded on a monthly basis as a minimum and regular checks made to ensure the monitors are functioning correctly.

5.4 BLAST MONITORING

Blast monitoring may be required in the case that blasting is required as part of shaft or other construction at the SIS to confirm compliance with blast criteria.

5.4.1 Locations

Table 5.3 and **Figure 2** details the possible blast monitoring locations in proximity to the Kitchener SIS.

Table 5.3 Blast Monitoring Locations – Kitchener SIS

Descriptor	Monitoring Location
NM K1	Pelton Road, Quorrobolong
NM K2	Coney Creek Lane, Quorrobolong
NM K3	Richmond Street, Kitchener

5.4.2 Methodology

Instantel vibration monitors (or similar) with external triaxial geophones and overpressure microphone shall be used. The external transducers shall be either directly attached to concrete pads buried in the ground or ground spiked.

6 CONTINUAL IMPROVEMENT

6.1 VOLUNTARY NOISE POLLUTION REDUCTION PROGRAM – CHPP

As part of the Stage 3 Environmental Assessment, and detailed in the Statement of Commitments (Condition 1.15.4 of Appendix 3, PA08_0111), Austar entered into a voluntary Noise Pollution Reduction Program (PRP) at the Pelton CHPP in consultation with the EPA. The PRP includes a program to investigate and implement ways to continually improve performance over time and is ongoing.

The PRP commenced with a noise impact assessment titled *Austar Coal CHPP Assessment of Noise Impacts* (Global Acoustics, September 2008). The assessment was prepared in accordance with Section 10 of the *Industrial Noise Policy* (INP, DECC 2000), which provides guidance on the application of the INP to existing premises, such as the Austar Coal CHPP.

The EPA issued a notice of variation to Environment Protection Licence No. 416 on 10 February 2014. The Notice acknowledged completion of various noise control projects, and the provision of status reports. Noise control projects completed or implemented include:

- An upgrade to acoustic performance of the CHPP walls and roof, and closure of openings. A considerable reduction to noise emissions from the CHPP building was affected by the upgrade program to the CHPP walls and roof. A reduction of between 3 to 9 dB was measured at specific wall noise measurement reference locations in close proximity to the CHPP. The reduction was achieved by both reducing the amount of openings in the CHPP building (e.g. windows, doors, loose sheeting), and improving the transmission loss characteristics of the walls and roof. Based on the measured results at greater distance to the northwest of the CHPP building prior to and after CHPP wall and roof upgrade, a reduction in the order of 5 dB from overall CHPP building noise may have been achieved. In sound power terms, this equates to a reduction of approximately 70% of the noise energy being emitted from the CHPP building, which is a significant result.
- Construction of a noise bund to the west of the CHPP to provide barrier effect to residences to the west;
- Operational control of the CHPP dozers such that they operate in first gear on the coal stockpiles; and
- Improvement to enclosure of overland conveyor drive building.

Off site monitoring is used to monitor improvements in noise emissions realised by the noise reduction program. Due to different operating conditions at the CHPP and variations in weather conditions during monitoring it has proved difficult to determine off site improvements as a result of the noise measures installed to date.

Condition U1 of the varied EPL required a Premises Noise Assessment (PNA) to be conducted in accordance with the INP by 31 August 2014. The assessment of noise levels in the PNA was intended to establish noise levels that can be included as conditions in the EPL.

The assessment included:

1. Project Specific Noise Levels (PSNLs) for the nearest noise sensitive receptors;

2. Predicted or measured noise levels at these noise sensitive receptors due to all activities and operations carried out at the premises;

3. Proposed noise limits for the premises (criteria) derived with regard to the PSNLs and predicted noise level contributions that can be placed on the licence; and

4. Details of methods to determine compliance with noise limits.

Austar completed the PNA for the operations and activities carried out at Austar's licenced premises in accordance with the requirements of condition U1 in August 2014. After completion of the comprehensive PNA, Austar recognise that existing predicted noise levels are significantly greater than any derived contemporary PSNL prepared in accordance with the INP for several operational areas where no current noise limits exist, or where an older style noise limit (L_{A90}) exists. Austar recognises the processes identified in Section 10 of the INP for existing premises where this situation occurs. Austar will continue to address noise levels as part of the PRP, including the following:

- Further onsite noise surveys will be carried out and assessed to determine areas where the program may focus efforts most cost effectively;
- Analysis of existing monitoring data to see where improvements can be made and identify new measures that can be implemented;
- Assess identified measures against a reasonable and feasible test.

Austar recognises the extensive history that mining operations at the premises have been conducted, with mining having commenced at Pelton Colliery in 1916, and the more significant current infrastructure of the Austar Mine Complex (Pit Top, Pelton CHPP, Aberdare Extended Emplacement Area) having been in operation in some instances since the 1960s or 1970s. Despite the proximity to Austar's infrastructure and noise generating activities to noise sensitive receivers, Austar receive very few community noise complaints. With over 50 years of operation for some areas, Austar's mining operations may be considered a feature of the acoustic environment of the area. This PRP is ongoing and will continue until Section 10 of the INP is satisfied, in consultation with the EPA.

6.2 OTHER NOISE SOURCES

Other examples of where Austar has incorporated noise considerations into the design of existing and proposed plant are detailed below.

6.2.1 Kitchener SIS

Noise control works at the Kitchener SIS include:

- silencers fitted to ventilation fan evases;

- directing the ventilation fan outlets to the west away from residences, and construction of a 3.5m Hebel wall as a noise barrier to residents to the north, east, and south;
- As part of the approval process at the Kitchener SIS, Austar have committed to:
- building an acoustic bund to a height of 3.5 metres along the northern boundary of the site adjacent to the car park and bathhouse. This will take place in conjunction with construction of the car park and bathhouse; and
- enclosing the man and materials winder and second egress winder motors will take place during construction of these works.

6.2.2 Kalingo Infrastructure Area – (KIA, 3 shaft)

Noise control works at the KIA include:

- silencers fitted to existing ventilation fan evase;
- ventilation fans face away from residences (fans are directed to the north and west); and
- nitrogen plant and compressors are located within a Hebel acoustic compound.

Any other opportunities for noise control of existing plant at Austar will be assessed as they are identified on the basis of monitoring results. Where they meet the reasonable and feasible test, controls will be implemented. Any additional works would be reported in the Annual Review Report.

7 COMPLAINT MANAGEMENT

Austar has implemented a Community Response Procedure as described in the Austar Coal Mine Environmental Management Strategy (June, 2018). The procedure provides details on how to receive, respond to, record and action any community complaints received in relation to the operation. All actions and operational details are to be logged and reported to the Environment and Community Manager and remedial actions are initiated as required.

Austar will keep a legible record of specific details relating to any community complaint including;

- the date and time of the complaint;
- the nature of the complaint;
- the method by which the complaint was made, e.g. telephone;
- the personal details of the complainant. If none are supplied, then a note to that effect;
- review of any relevant monitoring data, including meteorological conditions at the time of the incident that is subject of the complaint;
- site investigation outcomes and specific data as detailed above;
- site activity and activity changes as discussed with operational personnel if required; and
- any necessary actions assigned.

Using the above information, an assessment is to be made as to the validity of the noise complaint. Complainants will be contacted to gather additional information or to provide feedback on investigation outcomes.

Records of complaints will be maintained in the complaints register database and kept on file for at least four years after the complaint was made.

Austar maintains a 24-hour complaints hotline (1800 701 986) to respond to any complaints from neighbouring residents or interested stakeholders. The complaints hotline is available on the Austar Coal Mine website.

8 CONTINGENCY PLAN FOR UNPREDICTED IMPACTS

8.1 NOISE

In the event of Austar becoming aware of unpredicted noise impacts, not already addressed in this NVMP, Austar will conduct an investigation using a similar process to that used for complaint management.

If the results of the investigation indicate an exceedance of relevant impact assessment criteria, Austar will follow the process for managing an exceedance in **Section 9**.

8.2 VIBRATION

In the unlikely event that vibration impacts from underground mining result in impacts to structures, Subsidence Advisory NSW (formerly the Mine Subsidence Board) will be informed in accordance with management measures in the relevant Austar Extraction Plan for longwall mining. Austar will assist the landholder by providing information to assist any claim to Subsidence Advisory NSW to rectify such damage, including monitoring results.

To manage vibration, Austar will continue to provide adequate community access to vibration monitoring information, and where required, information regarding the processes of Subsidence Advisory NSW as described in this section above. Austar has done this for the Stage 2, Stage 3 and the Bellbird South mining area, and will continue to provide regular underground mine status reports to landholders over the active longwall extraction mining area. These status reports include vibration monitoring and mining status information to affected residents.

9 REPORTING AND REVIEW

9.1 REPORTING

9.1.1 Scheduled Reporting

Austar's environmental noise and vibration performance is reported a number of ways. External reporting includes:

- an Annual Review Report;
- quarterly updates of monitoring results to be submitted to the EPA (in accordance with Condition U2.4 of EPL416);
- the community directly over the active mining area are provided with regular updates on longwall location, subsidence monitoring, vibration monitoring, and other environmental monitoring results through letter updates; and
- Community Consultative Committee (CCC) meetings.

A copy of the Annual Review Report will be forwarded to relevant stakeholders including, but not limited to the NSW Department of Planning & Environment (DP&E), EPA, Cessnock City Council and members of the CCC. The Annual Review Report will also be placed on the Austar Coal Mine website.

9.1.2 Exceedance Reporting

In the event it is determined that an exceedance of a noise criterion has occurred by assessable noise from Austar noise sources (including any applicability of a modifying factor to measured noise), at the earliest opportunity (as soon as practicable) Austar will notify NSW DP&E, and where relevant, the NSW EPA (as relevant for the location/criterion that has been exceeded).

In accordance with Schedule 7 Condition 6 of PA08_0111 and Schedule 5 Condition 4 of DA29/95, Austar will, within 7 days of exceedance date, provide a detailed report on the exceedance to the DP&E and other relevant agencies.

Notification to Landowners

Where the results of the investigation indicate an exceedance of relevant impact assessment criteria by measured noise from Austar noise sources, Austar will, within 2 weeks of obtaining the monitoring results, notify DP&E, the affected landowners and tenants (including tenants of mine owned properties) accordingly. Austar will provide quarterly monitoring results to each of these parties until the results show that the project is complying with the criteria in this NVMP.

9.2 NVMP REVIEW

In accordance with PA08_0111 Schedule 7 Condition 4 and DA29/95 Schedule 5 Condition 8, this NVMP will be reviewed and if necessary revised within 3 months of submission of an independent environmental audit, an Annual Review, a noise/vibration incident report or approval of a modification to conditions of consent. Revisions to the NVMP will be submitted to DP&E to the satisfaction of the Secretary.

10 ROLES AND RESPONSIBILITIES

The roles and responsibilities of staff at Austar in respect of this NVMP are presented below in **Table 10.1**.

Table 10.2 Roles and Responsibilities

Role or Responsibility	Person/People Responsible	Timing
Implementation and periodic review of management plan	Environment & Community Manager	Ongoing
Coordination of noise and vibration monitoring in this plan	Environment & Community Manager	Ongoing
Manage maintenance of unattended monitoring network	Environment & Community Manager	Ongoing
Data review	Environment & Community Manager	Quarterly
Respond to community complaint	Environment & Community Manager	As required
Response to exceedances or other noise and vibration issues	Environment & Community Manager	As required
Scheduled reporting	Environment & Community Manager	Quarterly and annually

11 REFERENCES

NSW Industrial Noise Policy (EPA, 2000)

Noise Policy for Industry (EPA, 2017)

Assessing Vibration: A Technical Guideline (EPA, 2006)

Interim Construction Noise Guideline (EPA, 2009)

Australian Standard 1055-1997: 'Acoustics, Description and Measurement of Environmental Noise'

Australian Standard AS 2187: Part 2-2006 'Explosives - Storage and Use - Part 2: Use of Explosives'

British Standard 7385: Part 2-1993 'Evaluation and Measurement for Vibration in Buildings'

Geoscience Australia – Earthquake Database (Geoscience Australia, http://www.ga.gov.au/earthquakes/searchQuake.do , accessed April 2017)

Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration (ANZECC, 1990)

Austar Coal Mine Environmental Management Strategy ENV-001-02 (Austar Coal Mine, April 2017)

Austar Coal Mine Stage 3 Modification Environmental Assessment (Umwelt, 2011).

Figures

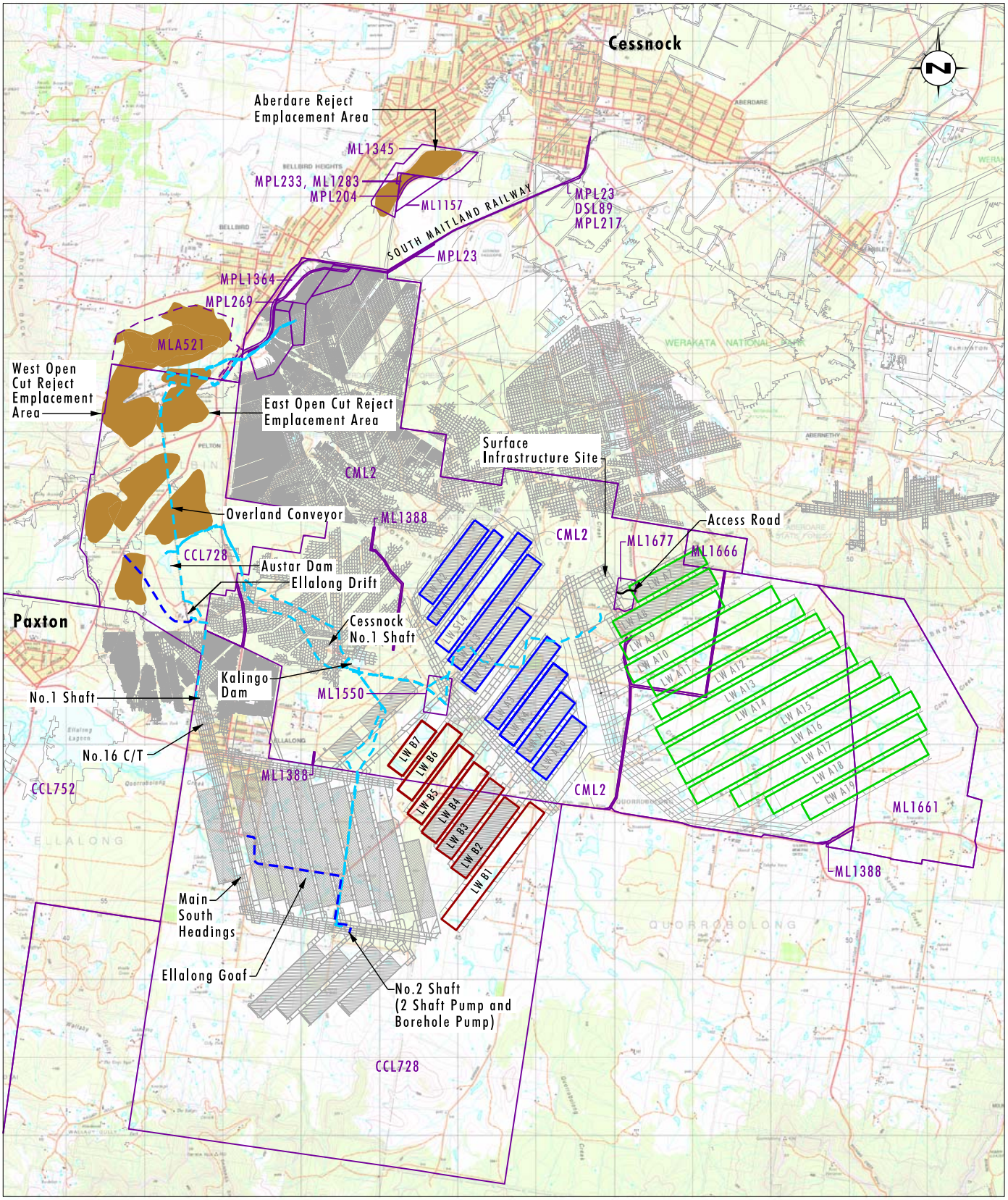


Image Source: LPI NSW (2009)
Data Source: Austar Coal Mine (2017)

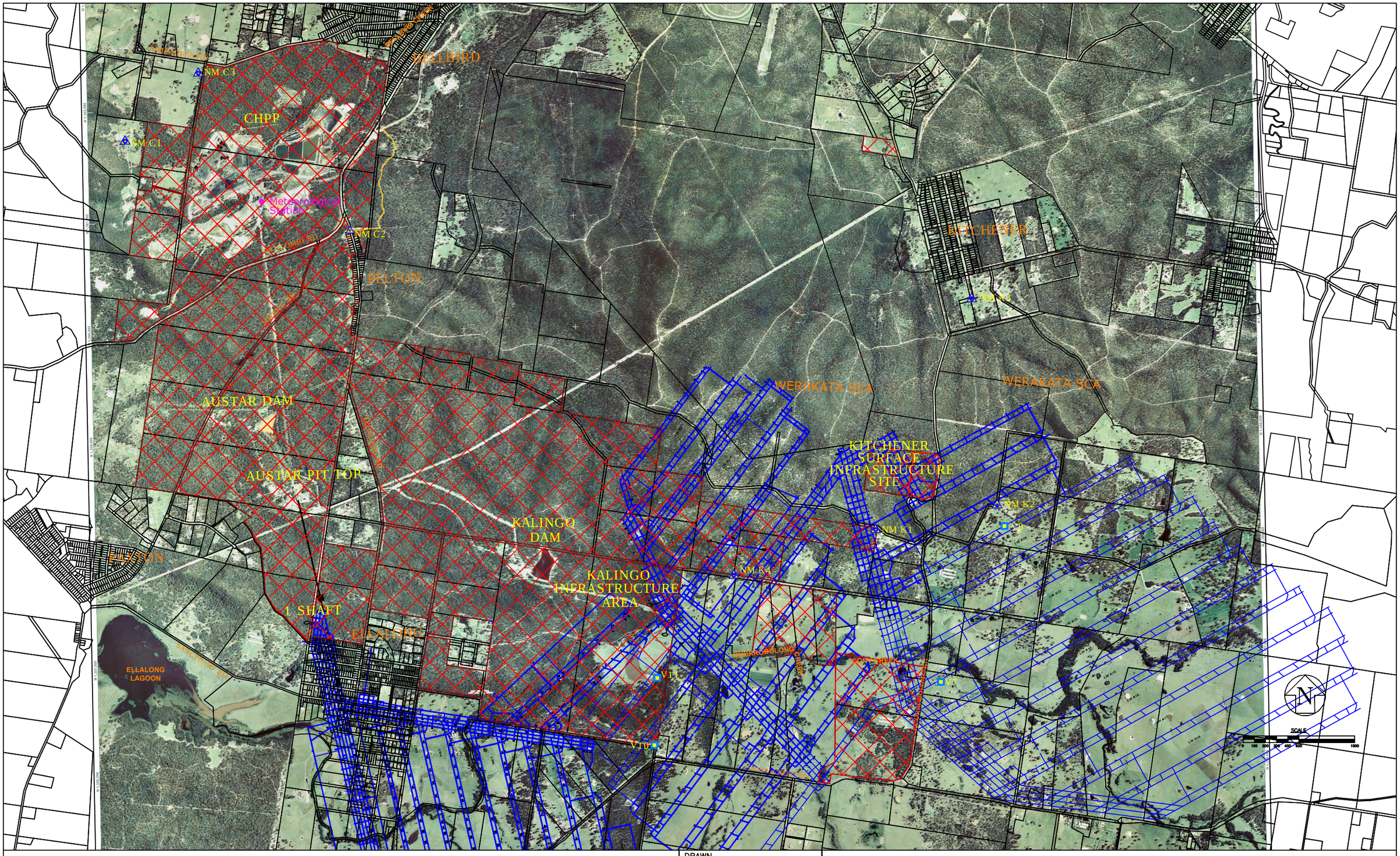
0 1 2 3 km
1:70 000

Legend

- LWB1-B3 and LWB4-B7 Extraction Plan Longwall Panels (DA29/95)
- Bellbird South, Stage 1, Stage 2 and Southland Longwall Panels (DA29/95)
- Stage 3 Longwall Panels (PA08_0111)
- Approved Reject Emplacement Areas
- Completed Underground Workings
- Mining Lease Boundary
- Mining Lease Application Boundary
- Water Pipelines
- Water Pipelines - Potable

Austar Coal Mine Complex and Pipelines

File Name (A4): R08/3900_125.dgn
20180301 15.23



NM K1 ..... Noise Monitoring Location

V7 ..... Vibration Monitoring Location

Austar Owned Land

DRAWN	J. Chadwick
DATE	18/6/2018
CHECKED	C. McCormack
APPROVED	C. McCormack

AUSTAR COAL MINE

TITLE

Figure 2: Austar Noise & Vibration Monitoring Network

SCALE	DRAWING No.	
Not to scale	Environmental/ Monitoring Plan	A3

Appendix A

Approval conditions and the sections that they are addressed in the NVMP are shown in **Table A.1**.

Table A.1 – Performance Requirements for Austar Coal Mine.

<table>
<tr><th>Condition No.</th><th>Approval Condition</th><th>NVMP Reference</th></tr>
<tr><td></td><td>DA29/95 (MOD7)</td><td></td></tr>
<tr><td></td><td>Schedule 3 Specific Environmental Conditions

Noise and Vibration</td><td></td></tr>
<tr><td>13</td><td>Impact Assessment Criteria

The Applicant must ensure that the noise generated by the Infrastructure Upgrade Area identified in Figure 1.3 of the April 2006 SEE does not exceed the noise impact assessment criteria in Table 2.

Table 2: Noise Impact Assessment Criteria dB(A)

<table><tr><th>Day/Evening/Night
L_{Aeq}(15minute)</th><th>Land</th></tr><tr><td>35</td><td>All privately owned land</td></tr></table>
Notes:

a) Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary, to determine compliance with the $L_{Aeq(15minute)}$ noise limits in the above table. Where it can be demonstrated that direct measurement of noise from the development is impractical, the Department and the EPA may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy must also be applied to the measured noise levels where applicable.

b) The noise emission limits identified in the above table apply under meteorological conditions of:

• Wind speeds of up to 3m/s at 10 metres above ground level; or
• Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2m/s at 10 metres above ground level.

However, if the Applicant has a written negotiated noise agreement with any landowner of the land listed in Table 2, and a copy of this agreement has been forwarded to the Department and the EPA, then the Applicant may exceed the noise limits in Table 2 in accordance with the negotiated noise agreement.</td><td>Section 4 and Section 5</td></tr>
<tr><td>14</td><td>Continuous Improvement

The Applicant must:

(a) implement all reasonable and feasible noise mitigation measures;

(b) investigate ways to reduce the noise generated by the development; and

(c) report on these investigations and the implementation and effectiveness of these measured in the Annual Review (see condition 5 of Schedule 5), to the</td><td>Section 6.1 and Section 9.1.2</td></tr>
</table>

<table>
<tr><th>Condition No.</th><th>Approval Condition</th><th>NVMP Reference</th></tr>
<tr><td></td><td>satisfaction of the Secretary.</td><td></td></tr>
<tr><td>15</td><td>Noise Monitoring

The Applicant must prepare a Noise Monitoring Program for the development to the satisfaction of the Secretary. This program must include quarterly attended noise monitoring and a noise monitoring protocol for evaluating compliance with the noise impact assessment criteria in this consent.

The Applicant must implement the approved program as approved from time to time by the Secretary.</td><td>Section 5</td></tr>
<tr><td>16</td><td>Vibration Monitoring

The Applicant must prepare a Vibration Monitoring Program for the development to the satisfaction of the Secretary. This program must be capable of recording ground vibrations on the surface emanating from underground mining activities.

The Applicant must implement the approved program as approved from time to time by the Secretary.</td><td>Section 5</td></tr>
<tr><td></td><td>PA08_0111 (MOD3)</td><td></td></tr>
<tr><td></td><td>Schedule 4 Specific Environmental Conditions - General

Noise</td><td></td></tr>
<tr><td>2</td><td>Noise Impact Assessment Criteria

The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in:

(a) Table 2, for noise generated by the Surface Infrastructure Site; and

(b) Any relevant EPL, for noise generated by all other components of the project.

Table 2: Noise impact assessment criteria – Surface Infrastructure Site, dB(A)
<table>
<tr><th>Day/Evening/Night
L_{Aeq}(15 minute)</th><th>Night
L_{A1}(1 minute)</th><th>Land</th></tr>
<tr><td>35</td><td>45</td><td>All privately owned land</td></tr>
</table>
Notes:
• The location of the Surface Infrastructure Site is shown in the figures in Appendix 2.
• Noise generated by the project is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy.
• The noise limits in Table 2 do not apply if the Proponent has an agreement with the relevant owner/s of these residences/and to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.
• The noise limits in Table 2 do not apply to construction of the Surface Infrastructure Site. Noise generated during construction activities is to comply with the requirements of the Interim Construction Noise Guideline (DECCW 2009).</td><td>Section 4</td></tr>
</table>

Condition No.	Approval Condition	NVMP Reference
3	**Noise and Vibration Management** The Proponent shall prepare and implement a Noise Management Plan for the mine complex, to the satisfaction of the Director-General. This plan must: (a) Be prepared in consultation with EPA, and be submitted to the Director-General for approval prior to the commencement of construction of the Surface Infrastructure Site (other than shaft construction referred to in condition 1 above); (b) Include, in addition to the standard requirements for management plans (see condition 2 of schedule 7): • A noise monitoring program providing for a combination of continuous and supplementary attended monitoring measures; • A vibration monitoring program that is capable of recording ground vibrations on the surface emanating from underground mining activities; and • A detailed continual improvement program for investigating, implementing and reporting on all reasonable and feasible measures to reduce noise levels and vibration impacts generated by the mine complex.	This document Section 5, Section 6
	Schedule 7 Environmental Management, Reporting and Auditing	
2	**Management Plan Requirements** The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include: (a) detailed baseline data; (b) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation or, the project or any management measures; (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria; (d) a program to monitor and report on the: • impacts and environmental performance of the project; • effectiveness of any management measures (see (c) above); (e) a contingency plan to manage any unpredicted impacts and their consequences; (f) a program to investigate and implement ways to continually improve the environmental performance of the project over time;	Section 2 Section 1.2, Appendix A Section 4 Section 5, Section 6 Section 5 and Section 9 Section 8 Section 6
	(g) a protocol for managing and reporting any: • incidents;	Section 7, Section 9

<table>
<tr><th>Condition No.</th><th>Approval Condition</th><th>NVMP Reference</th></tr>
<tr><td></td><td>• complaints;
• non-compliances with statutory requirements; and
• exceedances of the impact assessment criteria and/or performance criteria; and
(h) a protocol for periodic review of the plan.</td><td>Section 9</td></tr>
<tr><td></td><td>Appendix 3 Statement of Commitments</td><td></td></tr>
<tr><td></td><td>Statement of Commitments – Austar Coal Mine Stage 3 EA
As part of approval under Part 3A of the EP&A Act for the proposed Stage 3 Project, Austar Coal Mine will commit to the following controls:</td><td></td></tr>
<tr><td>1.8</td><td>Noise and Blasting</td><td></td></tr>
<tr><td>1.8.1</td><td>Unless otherwise agreed with the landowner, Austar Coal Mine will manage operations associated with the Stage 3 underground mining and Surface Infrastructure Site such that the noise emissions from these operations comply with the noise criteria included in Table 1.1 at surrounding residences for the range of meteorological conditions modelled in the EA.
Table 1.1 – Project Specific Noise Criteria
<table>
<tr><th>Location</th><th>Period</th><th>Intrusiveness Criteria L_{Aeq}(15minute)</th><th>Amenity Criteria L_{Aeq}(15minute)</th><th>Project Specific Noise Criteria L_{Aeq}(15minute)</th></tr>
<tr><td rowspan="3">Kitchener Residences</td><td>Day</td><td>38 dBA</td><td>50 dBA</td><td>38 dBA</td></tr>
<tr><td>Evening</td><td>35 dBA</td><td>45 dBA</td><td>35 dBA</td></tr>
<tr><td>Night</td><td>35 dBA</td><td>40 dBA*</td><td>35 dBA</td></tr>
<tr><td rowspan="3">Serradilla Residence, Kauter Residence, Penney and Linton Property</td><td>Day</td><td>37 dBA</td><td>50 dBA</td><td>37 dBA</td></tr>
<tr><td>Evening</td><td>37 dBA</td><td>45 dBA</td><td>37 dBA</td></tr>
<tr><td>Night</td><td>35 dBA</td><td>40 dBA</td><td>35 dBA</td></tr>
</table></td><td>Section 4</td></tr>
<tr><td>1.8.2</td><td>Unless otherwise agreed with the landowner, Austar Coal Mine will manage the construction phase of the Surface Infrastructure Site in accordance with the requirements of DECCW's Interim Construction Noise Guidelines (2009).</td><td>Section 4 and Section 5</td></tr>
<tr><td>1.8.3</td><td>Acoustic bunding will be constructed to a height of 3.5 metres above ground level along the northern boundary adjacent to the car park and bathhouse.</td><td>Section 6.2</td></tr>
<tr><td>1.8.4</td><td>The ventilation fan outlet will be directed to the west.</td><td>Section 6.2</td></tr>
<tr><td>1.8.5</td><td>Man and materials winder and second egress winder motors will be enclosed.</td><td>Section 6.2</td></tr>
<tr><td>1.8.6</td><td>Blasting will generally take place only once per day and will be undertaken between the hours of 9.00am to 5.00pm Monday to Saturday with no blasting on Sundays or Public Holidays.</td><td>Section 4.3.1</td></tr>
<tr><td>1.8.7</td><td>Airblast overpressure from blasting associated with shaft development at the Surface Infrastructure Site when measured at residences not associated with the development</td><td>Section 4.3.1</td></tr>
</table>

Condition No.	Approval Condition	NVMP Reference
	will not exceed a maximum of 120 dBL Linear Peak at any time and will not exceed 115 dBL for more than 5% of blasts over a 12 month period.	
1.8.8	Peak particle velocity from blasting associated with shaft development at the Surface Infrastructure Site when measured at residences not associated with the development will not exceed a maximum of 10 mm/s at any time and will not exceed 5 mm/s for more than 5% of blasts over a 12 month period.	Section 4.3.1
1.15	**Continuous Improvement of Existing Operations**	
1.15.3	Austar Coal Mine will continue to implement the voluntary Noise Pollution Reduction Program for Pelton CHPP in consultation with OEH.	Section 6.1
1.15.4	Austar Coal Mine will commit to a Noise Management Plan that incorporates current noise monitoring, the voluntary Noise Pollution Reduction Program and associated noise management for Austar Mine Complex operations and will investigate reasonable and feasible noise mitigation strategies where appropriate.	Section 6
	EPL No. 416	
8	**Pollution Studies and Reduction Programs**	
U1	**Coal Handling & Preparation Plant Noise Reduction**	
U1.1	The licensee must conduct a noise assessment in accordance with the document 'NSW Industrial Noise Policy', (EPA, 2000) (INP) for the operations and activities carried out at the licensed premises and submit a report to the Manager, Hunter Region, by no later than 31 AUGUST 2014.	Section 6.1
U1.2	The report referred to in condition U1.1 must include, but is not limited to the following: 1. Project Specific Noise Levels for the nearest noise sensitive receiver location(s). The project specific noise levels may be sourced from recent documentation submitted in support of a project approval application, or determined specifically in response to this condition, provided that: (a) The source of the project specific noise levels are stated; (b) The project specific noise levels have been derived in accordance with the INP; (c) Details are provided of how the project specific noise levels have been derived; (d) The nearest noise sensitive receiver locations chosen are representative of those potentially most affected by noise from the premises.	Section 6.1
	2. Predicted or measured noise level contributions for the noise sensitive receiver locations identified in U1.2.1 above as a result of all activities and operations carried out at the premises. These may be sourced from the recent documentation submitted in support of a project approval application, or determined specifically in response to this condition, provided that: (a) The source of the project specific noise level(s) are stated; (b) Noise levels have been derived in accordance with the INP; (c) Details of how the noise levels have been predicted are provided.	Section 6.1
	3. Noise limits proposed for the location(s) identified in U1.2.1 above, derived with	Section 6.1

<table>
<tr><th>Condition No.</th><th>Approval Condition</th><th>NVMP Reference</th></tr>
<tr><td></td><td>regard to the project specific noise levels and predicted noise level contributions from U1.2.1 and U1.2.2 above, that can be placed on the licence, for all activities and operations carried out at the premises.</td><td></td></tr>
<tr><td></td><td>4. Details of methods to be used to determine compliance with the limits in U1.2.3 above.
(a) A reference to the INP includes a reference to the INP Application Notes; and
(b) Noise sensitive receiver locations do not include any locations owned by the licensee or another coal mine or where a negotiated agreement (as outlined in the INP) is in place between the landowner and any licence longer.
.</td><td>Section 6.1</td></tr>
<tr><td>U2</td><td>Premises Noise Limits</td><td></td></tr>
<tr><td>U2.1</td><td>Noise generated from the premises must not exceed the noise limits below:
<table>
<tr><th>Receiver</th><th>Noise Limit dB(A)L90</th></tr>
<tr><td>Pelton Village</td><td>43</td></tr>
<tr><td>Pyne Residence</td><td>40</td></tr>
<tr><td>O’Hearn Residence</td><td>37</td></tr>
</table>
Note: These noise limits apply until new noise limits, determined through the “Premises Noise Assessment” pollution reduction program, condition U1 of this licence, are applied to the licence.</td><td>Section 4.2.2</td></tr>
<tr><td>U2.2</td><td>The noise limits apply at all times under wind speeds up to 3 metres per second (measured at 10 metres above ground level) and Pasquill stability class from A to F.</td><td>Section 4.2.2</td></tr>
<tr><td>U2.3</td><td>Noise from the premises is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of the dwelling where the dwelling is more than 30 metres from the boundary, to determine compliance with the noise limits in Condition U2.1 unless otherwise stated.
Where it can be demonstrated that direct measurement of noise from the premises is impractical, the EPA may accept alternative means of determining compliance. See Chapter 11 of the NSW Industrial Noise Policy.
The modification factors presented in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise level where applicable.</td><td>Section 5.1
Section 5.1.4</td></tr>
<tr><td>U2.4</td><td>A noise compliance assessment report must be submitted to the EPA’s Regional Manager, Hunter on a quarterly basis. The report must contain the results of noise compliance monitoring specified in U2.3.</td><td>Section 9.1.1</td></tr>
</table>

Appendix B

Doc17/ 258288, EF13/2570

Mr Gary Mulhearn
Environment & Community Manager
Austar Coal Mine Pty Limited
Locked Bag 806
CESSNOCK NSW 2325

Attention: Gary Mulhearn gary.mulhearn@yancoal.com.au

Dear Mr Mulhearn

Environment Protection Licence 416
Austar Coal Mine - Environmental Management Plans

Thank you for your email of 28 April 2017 providing to the Environment Protection Authority (EPA) a number of environmental management plans for Austar Coal Mine (Austar). These plans included the Air Quality and Greenhouse Gas Management Plan, Site Water Management Plan and Noise and Vibration Management Plan.

The EPA encourages the development of such plans to ensure that proponents have met their statutory obligations and environmental objectives. However, the EPA does not review these documents as our role is to set environmental objectives for environmental/conservation management and manage outcomes.

The EPA has not read or reviewed this document and accordingly offers no comments in relation to it.

If you wish to discuss this matter further, please contact me on 02 4908 6891.

Yours sincerely

4 May 2017

JENNY LANGE
Regional Opertions Officer - Hunter
Environment Protection Authority

Contact officer: JENNY LANGE
4908 6891

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