Boggabri Coal Mine

Mobile Plant Sound Power Survey 2020

Prepared for Boggabri Coal Pty Limited



Noise and Vibration Analysis and Solutions

Boggabri Coal Mine

Mobile Plant Sound Power Survey 2020

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Table of Contents

1 INTRODUCTION	1
1.1 Terminology	1
2 METHODOLOGY	2
2.1 Test Standards	2
2.2 Test configuration	2
2.2.1 Screening Sound Power Methodology	2
2.3 Equipment Used	5
2.4 Weather Conditions	5
2.5 Criteria	5
2.6 Tonality	5
3 Overall Sound Power Results	7
4 SUMMARY	11

Appendices

ALIBRATION CERTIFICATES1	2
-	ALIBRATION CERTIFICATES1

1 INTRODUCTION

This report provides sound power (L_W) data for mobile equipment operating at Boggabri Coal Mine (BCM). An assessment of tonality for each plant item is also provided.

Sound power testing is undertaken over the course of the calendar year. Plant items identified with elevated sound power levels come under additional investigation. This type of monitoring and action is a form of noise control to ensure that equipment noise levels remain at or near modelled levels, assisting in compliance with off site receptor noise limits.

Noise level measurements in this report were taken on 6, 7, and 8 July, and 9 and 19 October 2020.

1.1 Terminology

Some definitions of terminology, which may be used in this report, are provided in Table 1.1.

Table 1.1: TERMINOLOGY & ABBREVIATIONS

Descriptor	Definition
dB	Decibels. For sound pressure level this is 10 times the logarithm to the base 10 of the ratio of the mean-square sound pressure to the square of the reference sound pressure (20 micro-pascals)
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to describe human response to noise.
SPL	Sound pressure level (SPL), fluctuations in pressure measured as 10 times a logarithmic scale, the reference pressure being 20 micro-pascals.
LW	Linear sound power level, expressed in decibels, is the logarithmic ratio of the sound power of a source in watts (W) relative to the sound power reference base of 10-12W
LWA	A-weighted sound power level.
LAeq	The average A-weighted noise energy during a measurement period, in dB

2 METHODOLOGY

2.1 Test Standards

Test standards referenced in this document include:

- AS 2012.1-1990 'Acoustics Measurement of airborne noise emitted by earth-moving machinery and agricultural tractors – Stationary test condition – Determination of Compliance With Limits for External Noise';
- AS 2012.2-1990 'Acoustics Measurement of airborne noise emitted by earth-moving machinery and agricultural tractors Stationary test condition Operator's Position';
- AS 1269.1-2005 'Occupational Noise Measurement Part 1 Measurement and assessment of noise immission and exposure';
- ISO 3744-2010 'Acoustics Determination of sound power levels and sound energy levels of noise sources using sound pressure – Engineering methods for an essentially free field over a reflecting plane';
- ISO 6393:2008(E) 'Earth-moving machinery Determination of sound power level Stationary test conditions'; and
- ISO 6395:2008(E) 'Earth-moving machinery Determination of sound power level Dynamic test conditions'.

2.2 Test configuration

2.2.1 Screening Sound Power Methodology

Sound power measurement and calculation of plant to screening sound power methodology (as shown in Table 3.1) conducted using a reduced scope version of Section 2.1 standards.

The reduced scope uses fewer microphone positions than specified in the standards, with only ground positions used. The rationale being to increase mobility of the testing team, provide flexibility in choice of testing location, and to minimise disruption to mining production.

The test is mainly used as a screening tool. A more precise equipment sound power that would result from full adherence to the above standards was not required. A minimum of two test runs were recorded for each plant item with the aim to have less than 1.5 dB difference between results. It is considered that the results are of sufficient accuracy and repeatability for the purpose of this survey.

Typical test areas showing microphone positions are presented in Figure 1 and Figure 2. The majority of tests for mobile plant were undertaken using a dynamic test only, where the plant item passes through the test area shown in Figure 1 under full power on level ground. The measurement is commenced and

completed when the plant item (centre of) passes between microphone positions 2 & 3 and 1&4 respectively. In some cases, stationary tests were conducted for dozers, wheel dozers, and loaders in order to determine engine noise in the absence of track noise and reverse alarms.

Haul trucks, water carts, service carts, front end loaders, graders and dozers were all tested on a flat test area at high idle using the test area shown in Figure 1. Drills were tested in-situ during normal operations using the test area shown in Figure 2. Excavator testing involved measurement at one or more locations at a known distance whilst normal truck loading operations were undertaken. This method provides the most convenient means to test diggers as it presents minimal disruption to production. Excavator testing was performed using some of the positions in Figure 2 (microphone positions being dependant on the excavator immediate working environment).

A more detailed test methodology document can be provided upon request.



Figure 1 Sound Power Microphone Positions



Figure 2 Alternate Stationary Sound Power Microphone Positions

2.3 Equipment Used

Equipment used to measure and record noise levels are listed in Table 2.1. Calibration certificates are provided in Appendix A.

Table 2.1: SOUND LEVEL MEASUREMENT EQUIPMENT

Model	Serial Number	Calibration Due Date
SVAN 958 noise and vibration analyser	20880	22/01/2021
SVAN 958A noise and vibration analyser	69814	23/05/2021
Rion NC74 sound level calibrator	50941314	17/06/2021
Rion NC74 sound level calibrator	34172616	22/01/2021

2.4 Weather Conditions

Weather conditions at the time of testing are presented in Table 2.2.

Table 2.2: ATMOSPHERIC CONDITIONS

Date	Temperature (°C)	Wind Speed (m/s)	Barometric Pressure (hPa)	Relative Humidity (%)
06/07/2020	17	0 - 2	1027	45
07/07/2020	13	0 – 1	1028	54
08/07/2020	22	2 - 3	1029	71
09/10/2020	16	1	1018	47
19/10/2020	16	1	1014	64

2.5 Criteria

Sound power results in this report have been assessed against sound powers used in modelling for the Continuation of Boggabri Coal Mine Environmental Assessment (EA) (Hansen Bailey, 2010), as advised by Boggabri Coal Mine. Dozers have been assessed against the specified limits for 1st gear operation only.

2.6 Tonality

The NPfI states that a noise is determined to be tonal when the level of an individual one-third octave band exceeds the level of the adjacent bands on both sides by:

• 5 dB or more if the centre frequency of the band containing the tone is above 400Hz;

- 8 dB or more if the centre frequency of the band containing the tone is 160 Hz to 400 Hz inclusive;
- 15 dB or more if the centre frequency of the band containing the tone is below 160 Hz.

Tonal plant is listed in Table 3.1.

3 Overall Sound Power Results

Overall A-weighted sound power levels determined from measured SPL are shown in Table 3.1. Overall sound power screening results which exceeded the relevant criterion by 2 dB or less are considered minor and not significant enough to require additional investigation. Overall sound power screening results which exceeded the relevant criterion by 3 dB or more are considered significant and require additional investigation. Any difference in screening results for the same plant between consecutive years of +3 dB or more would also trigger a more detailed analysis of results (third octave band results analysis) and potentially follow-up machine inspection and/or additional testing.

This approach has been developed in consideration of a number of uncertainty factors and has been adopted and approved by the Department of Planning and Environment (DPE) in other annual noise testing regimes of mobile plant in NSW. These factors include, but are not limited to:

- As described in the Methodology section of this report, the acceptable repeatability for screening is up to 1.5 dB between measured results;
- Due to the mobile nature of screening testing, additional variables such as other mobile plant operating nearby, hard-packed and/or uneven testing surfaces, varying skill of operators, and certain modes of operations being undertaken during testing (in the case of excavators and drills) can result in measured noise levels that are slightly higher than they would be under full scope noise testing;

Single and one-third-octave graphs for equipment tested can be useful in identifying noise sources or differences between like machines. These graphs have not been included in this report but are available upon request.

Note that overall linear sound power levels are a better indicator of low frequency noise content of plant than overall A-weighted sound power levels. Low frequency noise can propagate further than high frequency noise, and so can indicate items with higher potential for off-site noise impacts.

Table 3.1: 2020 SOUND POWER LEVELS

Plant No	Make/Model	Test Level	Test Type	Test Date	Results dB	Results dB(A)	Limit dB	Limit dB(A)	Exceedance dB	Exceedance dB(A)	Comments	Tonal Hz
]	Excavators	/Loaders					
EX127	Komatsu PC450LC-8	Screen	Stationary	2020-07-07	116	106	130	120	Nil	Nil		500Hz
EX128	Komatsu PC300LC	Screen	Stationary	2020-07-07	109	98	130	120	Nil	Nil		
EX255	Caterpillar 6060	Screen	Dynamic	2020-07-07	128	119	130	120	Nil	Nil		
EX256	Caterpillar 6060	Screen	Dynamic	2020-07-08	128	116	130	120	Nil	Nil		
EX258	Hitachi EX1900-6	Screen	Stationary	2020-07-07	125	115	130	120	Nil	Nil		
WL03	Caterpillar 992K	Screen	Stationary	2020-07-07	122	109	126	117	Nil	Nil		
						Truc	cks					
DT178	Komatsu HD1500-7	Screen	Dynamic, Forward	2020-07-06	126	119	126	117	Nil	2		
DT180	Komatsu HD1500-7	Screen	Dynamic, Forward	2020-07-06	127	119	126	117	1	2		
DT181	Komatsu HD1500-7	Screen	Dynamic, Forward	2020-07-06	125	118	126	117	Nil	1		
DT267	Komatsu 930E	Screen	Dynamic, Forward	2020-07-06	127	116	126	117	1	Nil		
DT755	Komatsu 930E	Screen	Dynamic, Forward	2020-07-06	131	119	126	117	5	2		
DT279	Komatsu 730E	Screen	Dynamic, Forward	2020-07-06	125	114	126	117	Nil	Nil		
DT281	Komatsu 730E	Screen	Dynamic, Forward	2020-07-06	126	113	126	117	Nil	Nil		
DT282	Komatsu 730E	Screen	Dynamic, Forward	2020-07-06	126	114	126	117	Nil	Nil		
DT285	Komatsu 730E	Screen	Dynamic, Forward	2020-07-06	127	113	126	117	1	Nil		
DT288	Komatsu 730E	Screen	Dynamic, Forward	2020-07-06	126	114	126	117	Nil	Nil		
DT289	Komatsu 730E	Screen	Dynamic, Forward	2020-07-06	124	113	126	117	Nil	Nil		

Plant No	Make/Model	Test Level	Test Type	Test Date	Results dB	Results dB(A)	Limit dB	Limit dB(A)	Exceedance dB	Exceedance dB(A)	Comments	Tonal Hz
DT290	Komatsu 730E	Screen	Dynamic, Forward	2020-07-06	125	113	126	117	Nil	Nil		
DT304	Hitachi EH3500ACII	Screen	Dynamic, Forward	2020-07-06	130	118	126	117	4	1		
DT305	Hitachi EH3500ACII	Screen	Dynamic, Forward	2020-07-06	129	115	126	117	3	Nil		
						Doz	ers					
TD02	Komatsu D475A	Screen	1st Gear Forward	2020-07-07	118	110	126	116	Nil	Nil		
TD02	Komatsu D475A	Screen	1st Gear Reverse	2020-07-07	119	111	126	116	Nil	Nil		
TD02	Komatsu D475A	Screen	Stationary	2020-07-07	116	104	126	116	Nil	Nil		
TD074	Komatsu D475	Screen	1st Gear Forward	2020-10-19	117	107	126	116	Nil	Nil		
TD074	Komatsu D475A	Screen	1st Gear Reverse	2020-10-19	118	110	126	116	Nil	Nil		
TD074	Komatsu D475A	Screen	Stationary	2020-10-19	116	103	126	116	Nil	Nil		
TD075	Komatsu 375A-6	Screen	1st Gear Forward	2020-07-07	116	109	126	116	Nil	Nil		
TD075	Komatsu 375A-6	Screen	1st Gear Reverse	2020-07-07	117	112	126	116	Nil	Nil		
TD075	Komatsu 375A-6	Screen	Stationary	2020-07-07	115	105	126	116	Nil	Nil		
TD076	Komatsu 375A-6	Screen	1st Gear Forward	2020-07-07	115	108	126	116	Nil	Nil		
TD076	Komatsu 375A-6	Screen	1st Gear Reverse	2020-07-07	117	109	126	116	Nil	Nil		
TD076	Komatsu 375A-6	Screen	Stationary	2020-07-07	112	105	126	116	Nil	Nil		
TD079	Komatsu D475A	Screen	1st Gear Forward	2020-07-08	120	117	126	116	Nil	1		3150
TD079	Komatsu D475A	Screen	1st Gear Reverse	2020-07-08	121	119	126	116	Nil	3		3150
TD079	Komatsu D475A	Screen	Stationary	2020-07-08	115	106	126	116	Nil	Nil		
TD08	Caterpillar D10T	Screen	1st Gear Forward	2020-07-07	122	113	126	116	Nil	Nil		

Plant No	Make/Model	Test Level	Test Type	Test Date	Results dB	Results dB(A)	Limit dB	Limit dB(A)	Exceedance dB	Exceedance dB(A)	Comments	Tonal Hz
TD08	Caterpillar D10T	Screen	1st Gear Reverse	2020-07-07	123	115	126	116	Nil	Nil		
TD08	Caterpillar D10T	Screen	Stationary	2020-07-07	120	110	126	116	Nil	Nil		
TD081	Komatsu D475A	Screen	1st Gear Forward	2020-10-09	119	111	126	116	Nil	Nil		
TD081	Komatsu D475A	Screen	1st Gear Reverse	2020-10-09	120	114	126	116	Nil	Nil		
TD081	Komatsu D475A	Screen	Stationary	2020-10-09	116	104	126	116	Nil	Nil		
TD09	Caterpillar D10T	Screen	1st Gear Forward	2020-07-07	122	112	126	116	Nil	Nil		
TD09	Caterpillar D10T	Screen	1st Gear Reverse	2020-07-07	122	116	126	116	Nil	Nil		
TD09	Caterpillar D10T	Screen	Stationary	2020-07-07	120	108	126	116	Nil	Nil		
						Water T	rucks					
WC041	Komatsu 730E	Screen	Dynamic, Forward	2020-07-06	124	116	128	117	Nil	Nil		
WC043	Komatsu 730E	Screen	Dynamic, Forward	2020-07-06	127	115	128	117	Nil	Nil		
WC042	Komatsu 730E	Screen	Dynamic, Forward	2020-07-06	124	113	128	117	Nil	Nil		
						Service	Trucks					
TK828	Caterpillar 775G	Screen	1 st Gear Forward	2020-07-06	122	114	NA	NA	NA	NA		
TK829	Caterpillar 775G	Screen	1 st Gear Forward	2020-07-06	124	115	NA	NA	NA	NA		
						Dri	lls					
DR650	ReichDrill C700D	Screen	Stationary	2020-07-07	126	115	129	117	Nil	Nil		
DR655	ReichDrill C700D	Screen	Stationary	2020-07-07	126	116	129	117	Nil	Nil		

4 SUMMARY

This report provides sound power (L_W) data for mobile equipment operating at Boggabri Coal Mine (BCM).

Results in Table 3.1 show that:

- Hitachi EH3500ACII trucks 304 and 305 exceeded the linear target by 4 dB and 3 dB respectively;
- Komatsu 930-E truck 755 exceeded the A-weighted target by 5 dB;
- Komatsu D475A TD79 exceeded the A-weighted target by 3 dB during the 1st gear reverse test and was noted as tonal in the 1/3 octave band during the dynamic tests;

Global Acoustics recommend that any plant with a sound power level change between test periods of greater than 2 dB and/or an exceedance of a sound power limit by more than 2 dB, be initially inspected for damaged or missing sound attenuation, further action to be determined from the outcomes of said inspection.

We trust this information is per your requirements. Please contact us if you require further details or advice.

Global Acoustics Pty Ltd

APPENDIX

A CALIBRATION CERTIFICATES

6	Acoust Researc Labs Pyr	h Pen h Ph: 4	el 7 Building 2 42 nant Hills NSW 61 2 9484 0800 A. W. acousticres	3 Pennant Hills AUSTRALIA 21 B.N. 65 160 399 1 earch.com.au	Rd 20 19
	Sou	ind Le	vel Meter		
	C 111	EC 6167	2-3.2013		
	Calibr	ation	Certificat	e	
	Calibration Nu	mber C	19031		
	Client D	etails Glo 12/ The	obal Acoustics Pty Lte 16 Huntingdale Drive ornton NSW 2322	d z	
Equip	ment Tested/ Model Num Instrument Serial Num Microphone Serial Num Pre-amplifier Serial Num	ber: SV ber: 208 ber: 298 ber: 900	ANTEK 958 180 1761 181		
Pre-Test A	tmospheric Conditions		Post-Test At	mospheric Condit	tions
Ambient Let	nperature : 22.9°C		Ambier	if Temperature :	24.3°C
Barometri	Pressure : 99.39kPa		Rei	ative Humidity :	49.9%
Calibration Tech	aician : Lucky Jaiswal	_	Secondary Che	ck: Lewis Boorn	130
Calibration	Date : 22 Jan 2019		Report Issue Dat	te: 24 Jan 2019	
	Approved Signat	ory :	to 1-		Ken Williams
Clause and Charac	teristic Tested	Result	Clause and Char	acteristic Tested	Result
12: Acoustical Sig. tes 13: Electrical Sig. test	to of a frequency weighting	Pass	17: Level linearity in 18: Tonaburat meaning	cl, the level range co	ntrol Pass
14: Frequency and tim	e weightings at 1 kHz	Pass	19: C Weighted Peak	Sound Level	Pass
15: Long Term Stabili	by performance laund movies	Pass	20: Overload Indicat	ion	Pass
the factor includy on i	na renarence ievel range	Pass	21: High Level Stabi	lity	Pass
The sound level meter su	bmitted for testing has successful conditions o	ly completed i nder which the	he class 1 periodic tests of tests were performed.	IEC 61672-3-2013, for	the environmental
As public evidence was performed in accordance IEC 61672-1-20	available, from an independent 1 with IEC 61672-2-2013, to demo 113, the sound level meter submitt	esting organise sostrate that the red for testing	ition responsible for appro e model of sound level met conforms to the class I req	ving the results of patter ter fully conformed to the minements of IEC 6167.	m evaluation test he requirements in 2-1:2013.
	Least	Incertainties e	Measurement -		
Acoustic Tests	0.1540	Envi	ronmental Conditions		
12.3kHz	10.21dB		Relative Humidin	= 0.2°C + 2.4%	
16kH: Electrical Tests	=0.29dB		Barometric Prezenre	10.055kPa	
31 3 Hz to 20 kHz	=0.12dB				
	All uncertambes are derived a	the 95% cont	idence level with a covera	re factor of 2	
	This cultbration certificate is to	be read in cor	njunction with the calibrati	da test report.	
NATA	Acoustic Research Labs Pry Lt Accredited for compliance with	d in NATA Ad h ISO/IEC 176	credited Laboratory Numb 25 - calibration	ser 14172.	
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	Calibration	Number C1934	3		
	Clier	it Details Global A 12/16 Hu Thorton	cousties Pty Ltd ntingdale Drive NSW 2322		
Equi	pment Tested/ Model N Instrument Serial N	umber : Rion NC umber : 5094131	-74		
	Ambient Temp	Atmospheric Cond erature : 24.2°C	itions		
	Relative Hu Barometric P	midity: 47.4% ressure: 100.85kP	a		
Calibration Tech Calibratio	nician : Lucky Jaisw n Date : 17 Jun 2019	al S	econdary Check:	Eloise Bur 17 Jun 201	ows 9
Characteristic Ter	Approved Sig	matory : K	y		Ken Williams
Generated Sound Pre Frequency Generated Total Distortion	issure Level	Pass Pass Pass Pass			
Measured Output	Nominal Level 94.0	Nominal Frequency	Measured L	evel Meas	ured Frequency
The sound calibrator ha	s been shown to conform to th	e class 1 requirements for	periodie testing, descri	bed in Annex B o	f IEC 60942:2017 for
Specific Tens	L	can Uncertainties of Mear	tal conditions under w urement = fol Conditions	hich the texts wer	o performed
Generated SPL Frequency	+0.11dB +0.01%	Temp: Relan	rature v Humidity	=/E21C =2.474	
Distortion	±0.48%	Roram	etric Pressure	±0.015kPa	
	The tests <1000 kHz are not	rea at the 93.9 conjutance	erver with a coverage j	actor of 2.	
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Sound Calibraton IEC 60942-2017 Calibration Number C19030 Client Details Global Acoustics Pty Ltd 12/6 Huntingdale Drive Thormton NSW 2322 Equipment Tested/Model Number : NC-74 Instrument Serial Number : 34172616 Atmospheric Conditions Ambient Tempspheric Conditions Ambient Tempspheric Conditions Ambient Tempspheric Pressue Calibration Technician : Charlie Neil Ecalibration Technician : Charlie Neil Calibration Technician : Charlie Neil Cancented Sound Pressure Level <u>Pass</u> Prequency Generated Prequency Generated Prequency Generated Prequency Generated Prequency Generated Prequency Measured Level Nominal Frequency Measured Level Measured Preque Measured Output <u>4.0</u> 1000.0 <u>44.2</u> 1002.33 The sound calibration the data ! requirements for periodic testing, described in Annex II of IEC 6042.201 the word pressure beer shown to conform to the data ! requirements is for periodic testing, described in Annex II of IEC 6042.201 the sound recourse testific and recourse in the data ! With the calibration test warp performed Prequency Statistics and the analysis (Pressure 2007) All incommutes are derived at the 95% conjidence level with a coverage factor of 2. All incommutes and derived in the Statistics . The results of the tests, calibration and/or measuremense included in tim document are tneeable to A	6	Acoustic Research	Level 7 Building 2 423 Pennant Hills NSW Ph: +61 2 9484 0800 A.I WWW. acousticress	Pennant Hills R AUSTRALIA 212 B.N. 65 160 399 13	1d 20 19			
IEC 60942-2017 Calibration Certificate Calibration Number C19030 Client Details Global Acoustics Pty Ltd 12/16 Huntingdale Drive Thornton NSW 2322 Equipment Tested/ Model Number : NC-74 Instrument Serial Number : 34172616 Atmospheric Conditions Ambient Tempspheric Conditions Ambient Tempspheric Conditions Ambient Tempspheric Conditions Calibration Technician : Charlie Neil Secondary Check: Lewis Boorman Report Issue Date : 22 Jan 2019 Approved Signatory : Ken Willi Characteristic Tested Result Generated Sound Pressure Level Pass Total Distortion Messure douput 94.0 Nominal Level Nominal Frequency Measured Level Measured Frequee Measured Output 94.0 Nominal Level Nominal Frequency Measured Level Measured Frequee Measured Comptant of the cuts of requirements for periodic testing described in Annes H offic G0442201 Specific Tests Calibration and requescivel and requirements for genotice testing described in Annes H offic G044201 Specific Tests Calibration and requescivel and requirements for genotice testing described in Annes H offic G044201 Specific Tests Calibration and requescivel and requirements for genotice testing described in Annes H offic G044201 Specific Tests Calibration and requescivel and requirements for genotice testing described in Annes H offic G044201 Specific Tests Calibration and requescivel and requirements for genotice testing described in Annes H offic G044201 Specific Tests Calibration and requescivel and requirements for genotice testing described in Annes H offic G044201 Alt meeritainties are derived at the 95% confidence level with a coverage factor of 2. Alt meeritainties are derived at the 95% confidence level with a coverage factor of 2. Alt is a significant to the calibration and/or measurements included in this document are taxeable to Acoustic Research Labo Pty Lid (S NATA Acceding Laborator) Number 1412. Acredied for compliance with ISO/IEC 17025 - calibration		Sound	Calibrator					
Calibration Number C19030 Client Details Global Acoustics Pty LM L216 Huminghale Drive Thornton NSW 2322 Equipment Tested/ Model Number: NC-74 Instrument Serial Number: 24.726.16 Annospheric Conditions Annospheric Conditions Ambient Temperature: 22.97C Relative Humidity: 34.726.16 Calibration Technician: Charospheric Conditions Ambient Temperature: 22.97C Relative Humidity: 34.726.16 Calibration Technician: Charospheric Conditions Ambient Temperature: 22.97C Relative Humidity: 34.726.16 Calibration Technician: Charospheric Conditions Amproved Signatory: Weith Meteorematics Proquency Generated Pars Trequency Generated Pars Trequency Generated Sound Pressure Level Pars Measured Output 94.0 1000.0 94.2 1002.33 The sound adubrator hus be onton to ocotion to the class 1 equipments for periodic tosting the time sovem performat 20.27 1002.33 Specific Testi an11.08 Terestoned Level With a co		Callburg	60942-2017					
Client Details Global Acoustics Pty Ltd 12/16 Huningdale Drive Thornton NSW 2322 Equipment Tested/Model Number: NC-74 Instrument Serial Number: 22.9°C Relative Hunidity: 34.2% Barometric Pressure: 29.946kPa Calibration Technician : Charlie Neil Calibration Date : 22.3 an 2019 Secondary Check: Lewis Boorman Report Issue Date : 24 Jan 2019 Approved Signatory : Ken Willi Generated South Pressure Level Prequency Generated Total Distortion Pass Prequency Generated Pass Measured Output 94.0 1000.0 94.2 Measured Frequency Measured Frequency the sound adited or has been shown to conform to the class 1 equirements for periodic testing. described in Anaex II of EC 60412.201 the sound adited or has been shown to conform to the class 1 equirements of Periodic south the tests were performed Level Uncertainter of Measurement. Specific Tests Generated SPL a0.17.01 a0.05% This calibration to conform to the dates 1 equirements of Periodic testing. described in Anaex II of EC 60412.201 the sound adited for has been shown to conform to the class 1 equirements of Measurements. Specific Tests Generated SPL a0.17.01 a0.05% a1.22% Relative Humidian All uncertainties are derived at the 95% confidence level with a coverage factor of 2. All uncertainties are derived at the 95% confidence level with a coverage factor of 2. This calibration certificate is to be read in		Calibration Number	C19030	e				
Equipment Tested/ Model Number: NC-74 Instrument Serial Number: 34172616 Atmospheric Conditions Ambient Temperature: 22.9°C Relative Humidity: 54.275 Barometric Pressure: 99.46kPa Calibration Technician : Charlie Neil Calibration Date : 22 Jan 2019 Approved Signatory : Ken Willi Generated Sound Pressure Level Pass Prequency Generated Pass Prequency Generated Pass Production Pass Secondary Check: Lewis Boorman Report Issue Date : 24 Jan 2019 Ken Willi Generated Sound Pressure Level Pass Prequency Generated Pass Prequency Generated Pass Prequency Generated Pass Production Pass Ken Willi Generated Sound Pressure Level Pass Prequency Generated Pass Pass The sound calibrator has been shown to conform to the class I requirements for periodic testing, described in Annex II of IEC 60042 201 (the sound resource levels) and frequency(tries) stated, for the environmental conditions Generated SPL #edults al.11/dl Tengerature: al.27C Relative Humidity Al.27C Relative		Client Details	Global Acoustics Pty Lt 12/16 Huntingdale Drive Thornton NSW 2322	d c				
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