

# Monthly Noise Monitoring Assessment

Tomingley Gold Mine, July 2021

Prepared for: Tomingley Gold Operations Pty Limited  
July 2021  
MAC160270-2021RP7



# Document Information

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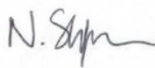

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Document ID	Status	Date	Prepared By	Signed	Reviewed By	Signed
MAC160270-2021RP7	Final	22 July 2021	Nicholas Shipman		Oliver Muller	

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APPENDIX A - GLOSSARY OF TERMS

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# 1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Tomingley Gold Operations Pty Ltd (TGO) to complete a Noise Monitoring Assessment (NMA) for Tomingley Gold Mine (the 'mine'), Tomingley, NSW.

The NMA involved quantifying the noise contribution of the mine by direct attended measurements to determine mining noise emissions so that effective management and controls can be implemented where required. The monitoring has been conducted in accordance with the TGO Noise Management Plan and in general accordance with Conditions L4.2 to L4.7 of the EPL at six representative receiver locations. It is noted that this assessment has been completed as part of an internal noise management initiative and does not form part of the annual noise monitoring program to address conditions of the Environmental Protection License (EPL).

The assessment has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Environment Protection Licence EPL 20169 (EPL); and
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise - General Procedures.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

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## 2 Environmental Protection License Noise Limits

Historic assessments for the mine categorise receivers into Noise Assessment Groups (NAGs). The NAGs were derived based on ambient noise data that controlled receiver RBLs.

**Table 1** reproduces the operational and sleep disturbance noise limits for assessed receivers referenced from the EPL that have been adopted for this NMA and are consistent with historic EPL monitoring locations.

Table 1 Noise Limits, dBA					
Noise Assessment Group	Receivers	Day	Evening	Night	
		LAeq(15min)	LAeq(15min)	LAeq(15min)	LA1(1min)
NAG A	R4, R5, R6	35	35	35	45
NAG B	R2	36	35	35	45
NAG C	R3, R29	45	35	35	45
NAG D	R23	43	38	36	45

Note: Refer to figure in Appendix 4 of Project Approval 09-0155 for noise locations. However, these criteria do not apply if the Proponent has an agreement with the relevant owner(s) of these residences / land to generate higher noise levels, and the Proponent has advised the Department of Planning and Infrastructure and EPA in writing of the terms of this agreement.

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### 3 Methodology

#### 3.1 Locality

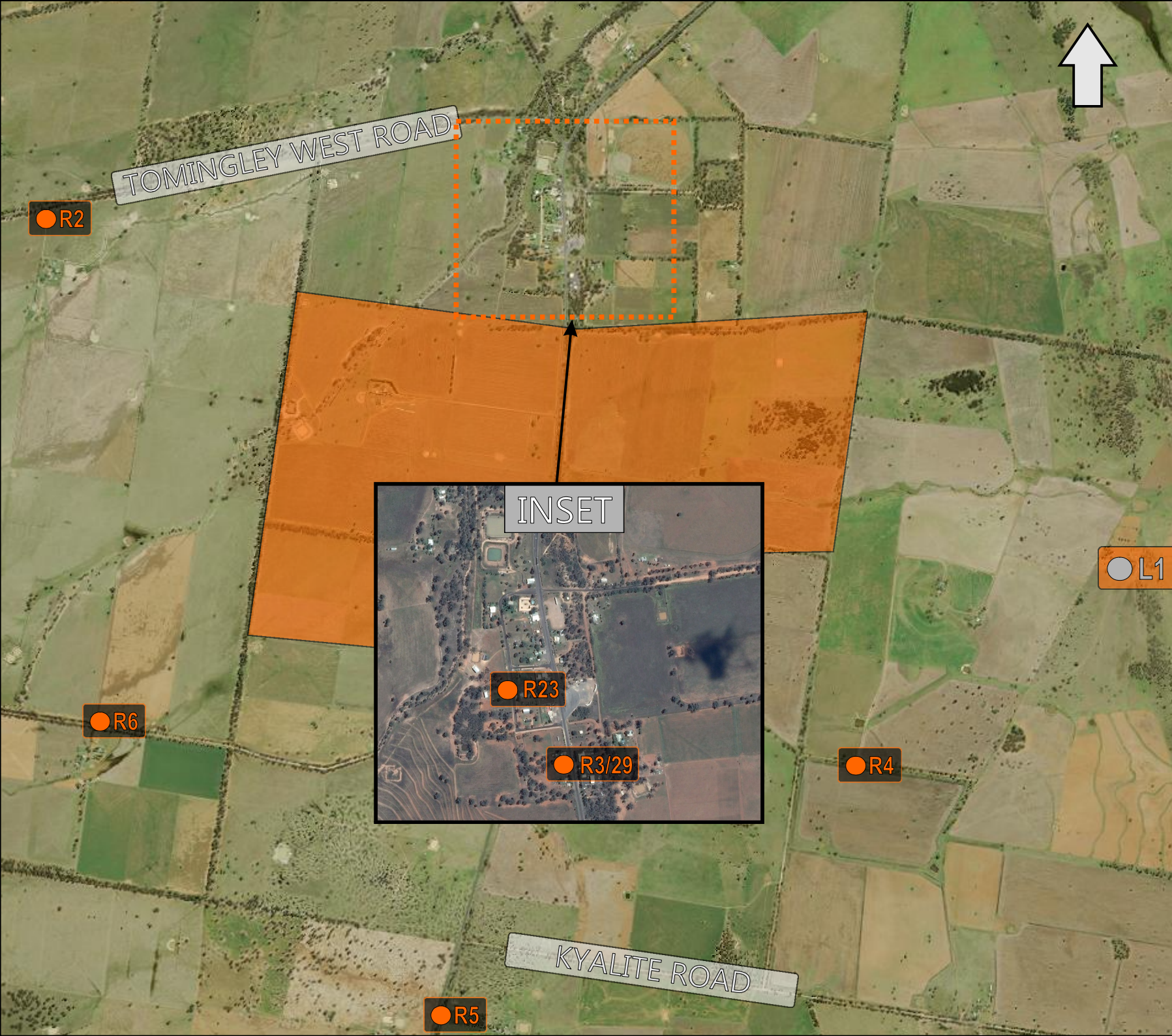
TGO is located to the south of the village of Tomingley, NSW. Receivers in the locality surrounding the mine are primarily rural/residential and for consistency the naming conventions for each receiver have been retained from historic noise assessments. The monitoring locations with respect to the mine are presented in the locality plan shown in **Figure 1**.

#### 3.2 Assessment Methodology

The attended noise survey was conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and the EPL. Measurements were carried out using Svantek Type 1, 971 noise analyser between Tuesday 6 July 2021 and Thursday 8 July 2021. The acoustic instrumentation used carries current NATA calibration and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed  $\pm 0.5\text{dBA}$ .




Both evening and night measurements were of 15 minutes in duration. Where possible, throughout each survey the operator quantified the contribution of each significant noise source. Extraneous noise sources were excluded from the analysis to calculate the  $L_{Aeq}(15\text{min})$  mine noise contribution for comparison against the relevant EPL limit.

Prevailing meteorological conditions for the monitoring period were sourced from TGO's meteorological station and analysed in accordance with Appendix D1 of the NPI to determine the stability category present at the time of each measured sample. This was undertaken to determine applicability of results in accordance with Condition L4.3 of the EPL. Results obtained during non-prevailing meteorological conditions (ie F Class Stability in conjunction with a 2m/s drainage or G Class Stability) are considered not applicable against the EPL criteria.



**FIGURE 1**  
**LOCALITY PLAN**  
 REF: MAC160270-2021RP7



KEY	
	UNATTENDED LOGGER LOCATION
	RECEIVER LOCATION
	SITE LOCATION



\*Imagery Source - 6MAPS

## 4 Results

The monitoring and assessment results are presented in individual tables for each assessment location.

### 4.1 Assessment Results - Location R2

The results of the attended noise measurements at location R2 for the July 2021 survey are summarised in **Table 2** with the relevant EPL limits, the calculated mining noise contribution and prevailing meteorological conditions at the time of each measurement.

Table 2 Operator-Attended Noise Survey Results – Location R2									
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology <sup>1</sup>	Description and SPL, dBA		
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>					
06/07/2021	21:45 (Evening)	63	35	32	35	WD: S WS: 0.1m/s Stab Class: E	Operator 60-63 TGO hum 31-34		
		TGO Site L <sub>Aeq</sub> (15min) Contribution						33	
		06/07/2021	22:00 (Night)	50		34	31	35	WD: S WS: 0.1m/s Stab Class: E
TGO Site L <sub>Aeq</sub> (15min) Contribution						35			
07/07/2021	21:45 (Evening)			52	36	30	35		WD: NE WS: 0.1m/s Stab Class: E
		TGO Site L <sub>Aeq</sub> (15min) Contribution						34	
		07/07/2021	22:00 (Night)	45	33	29		35	WD: NE WS: 0.1m/s Stab Class: F
TGO Site L <sub>Aeq</sub> (15min) Contribution						29			
08/07/2021	21:45 (Evening)			56	35	31	35		WD: E WS: 0.4m/s Stab Class: D
		TGO Site L <sub>Aeq</sub> (15min) Contribution						32	
		08/07/2021	22:00 (Night)	64	39	31		35	WD: E WS: 0.3m/s Stab Class: D
TGO Site L <sub>Aeq</sub> (15min) Contribution						30			

Note 1: Meteorological data obtained from TGO's on-site weather station or by direct measurement by the operator.

## 4.2 Assessment Results - Location R3/R29

The results of the attended noise measurements at location R3/R29 for the July 2021 survey are summarised in **Table 3** with the relevant EPL limits, the calculated mining noise contribution and prevailing meteorological conditions at the time of each measurement.

**Table 3 Operator-Attended Noise Survey Results – Location R3/R29**

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology <sup>1</sup>	Description and SPL, dBA
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>			
06/07/2021	21:07 (Evening)	86	67	39	35	WD: S	Traffic 35-86
						WS: 0.1m/s	TGO hum 33-36
						Stab Class: E	
TGO Site L <sub>Aeq</sub> (15min) Contribution							35
06/07/2021	22:40 (Night)	83	66	44	35	WD: S	Traffic 40-83
						WS: 0.1m/s	TGO Inaudible
						Stab Class: D	
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
07/07/2021	21:04 (Evening)	86	65	39	35	WD: ENE	Traffic 39-86
						WS: 0.1m/s	TGO hum <35
						Stab Class: E	
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
07/07/2021	22:40 (Night)	92	66	41	35	WD: NE	Traffic 40-92
						WS: 0.1m/s	TGO Inaudible
						Stab Class: D	
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
08/07/2021	21:01 (Evening)	85	65	39	35	WD: E	Traffic 37-85
						WS: 0.1m/s	TGO Inaudible
						Stab Class: E	
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
08/07/2021	22:38 (Night)	83	63	36	35	WD: E	Traffic 33-83
						WS: 0.1m/s	TGO Inaudible
						Stab Class: D	
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35

Note 1: Meteorological data obtained from TGO's on-site weather station or by direct measurement by the operator.

#### 4.3 Assessment Results - Location R4

The results of the attended noise measurements at location R4 for the July 2021 survey are summarised in **Table 4** with the relevant EPL limits, the calculated mining noise contribution and prevailing meteorological conditions at the time of each measurement.

Table 4 Operator-Attended Noise Survey Results – Location R4									
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology <sup>1</sup>	Description and SPL, dBA		
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>					
06/07/2021	20:20 (Evening)	53	33	25	35	WD: S WS: 0.4m/s Stab Class: D	Traffic 23-53 Wind in trees <23 TGO Inaudible		
		TGO Site L <sub>Aeq</sub> (15min) Contribution						<35	
		06/07/2021	23:29 (Night)	56		30	22	35	WD: S WS: 0.1m/s Stab Class: E
TGO Site L <sub>Aeq</sub> (15min) Contribution						<35			
07/07/2021	20:16 (Evening)			50	28	20	35		WD: NE WS: 0.1m/s Stab Class: D
		TGO Site L <sub>Aeq</sub> (15min) Contribution						<35	
		07/07/2021	23:29 (Night)	54	32	26		35	WD: E WS: 0.1m/s Stab Class: F
TGO Site L <sub>Aeq</sub> (15min) Contribution						<35			
08/07/2021	19:52 (Evening)			53	35	30	35		WD: E WS: 0.6m/s Stab Class: E
		TGO Site L <sub>Aeq</sub> (15min) Contribution						<35	
		08/07/2021	23:24 (Night)	57	45	42		35	WD: E WS: 2m/s Stab Class: D
TGO Site L <sub>Aeq</sub> (15min) Contribution						<35			

Note 1: Meteorological data obtained from TGO's on-site weather station or by direct measurement by the operator.

#### 4.4 Assessment Results - Location R5

The results of the attended noise measurements at location R5 for the July 2021 survey are summarised in **Table 5** with the relevant EPL limits, the calculated mining noise contribution and prevailing meteorological conditions at the time of each measurement.

Table 5 Operator-Attended Noise Survey Results – Location R5							
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology <sup>1</sup>	Description and SPL, dBA
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>			
06/07/2021	19:56 (Evening)	80	62	31	35	WD: S	Traffic 23-80
						WS: 0.4m/s	Wind in trees 23-26
						Stab Class: D	TGO Inaudible
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
06/07/2021	23:50 (Night)	80	58	22	35	WD: S	Traffic 22-80
						WS: 0.1m/s	TGO Inaudible
						Stab Class: D	
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
07/07/2021	19:54 (Evening)	79	63	31	35	WD: NE	Traffic 31-79
						WS: 0.1m/s	Insects 22-27
						Stab Class: E	TGO Inaudible
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
07/07/2021	23:52 (Night)	88	59	29	35	WD: E	Offsite Drilling 30-34
						WS: 0.1m/s	Traffic 30-88
						Stab Class: F	TGO Inaudible
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
08/07/2021	19:30 (Evening)	80	63	35	35	WD: E	Traffic 29-80
						WS: 0.1m/s	Insects <29
						Stab Class: E	TGO Inaudible
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
08/07/2021	23:47 (Night)	79	58	38	35	WD: E	Traffic 38-79
						WS: 1m/s	Wind in trees 38-43
						Stab Class: E	TGO Inaudible
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35

Note 1: Meteorological data obtained from TGO's on-site weather station or by direct measurement by the operator.

#### 4.5 Assessment Results - Location R6

The results of the attended noise measurements at location R6 for the July 2021 survey are summarised in **Table 6** with the relevant EPL limits, the calculated mining noise contribution and prevailing meteorological conditions at the time of each measurement.

Table 6 Operator-Attended Noise Survey Results – Location R6							
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology <sup>1</sup>	Description and SPL, dBA
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>			
06/07/2021	20:45 (Evening)	50	32	26	35	WD: S WS: 0.4m/s Stab Class: D	Traffic 25-50
							Offsite Drilling 25-33
							Wind in trees 25-34
							TGO Inaudible
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
06/07/2021	23:02 (Night)	53	28	21	35	WD: S WS: 0.1m/s Stab Class: E	Traffic 24-53
							Offsite Drilling 24-35
							Livestock 24-38
							TGO Inaudible
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
07/07/2021	20:40 (Evening)	52	32	26	35	WD: NE WS: 0.1m/s Stab Class: D	Traffic 26-38
							Livestock 26-52
							TGO hum 26-28
TGO Site L <sub>Aeq</sub> (15min) Contribution							27
07/07/2021	23:02 (Night)	49	38	35	35	WD: NE WS: 0.1m/s Stab Class: D	Offsite Drilling 35-49
							Traffic 35-42
							TGO Inaudible
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
08/07/2021	20:23 (Evening)	50	40	37	35	WD: E WS: 0.2m/s Stab Class: E	Offsite Drilling 38-40
							Traffic 36-39
							Wind in trees 36-50
							Livestock 36-44
							TGO Inaudible
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
08/07/2021	23:00 (Night)	50	41	39	35	WD: E WS: 0.1m/s Stab Class: D	Offsite Drilling 32-42
							Traffic 40-50
							Wind in trees 40-42
							Insects <40
							TGO Inaudible
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35

Note 1: Meteorological data obtained from TGO's on-site weather station or by direct measurement by the operator.

#### 4.6 Assessment Results - Location R23

The results of the attended noise measurements at location R23 for the July 2021 survey are summarised in **Table 7** with the relevant EPL limits, the calculated mining noise contribution and prevailing meteorological conditions at the time of each measurement.

**Table 7 Operator-Attended Noise Survey Results – Location R23**

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology <sup>1</sup>	Description and SPL, dBA
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>			
06/07/2021	21:25 (Evening)	53	43	37	38	WD: S	Traffic 35-53
						WS: 0.3m/s	TGO hum 34-36
TGO Site L <sub>Aeq</sub> (15min) Contribution							35
06/07/2021	22:23 (Night)	59	46	41	36	WD: S	Traffic 34-59
						WS: 0.1m/s	TGO hum 33-38
TGO Site L <sub>Aeq</sub> (15min) Contribution							35
07/07/2021	21:22 (Evening)	59	48	40	38	WD: NE	Traffic 35-59
						WS: 0.1m/s	TGO hum <35
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
07/07/2021	22:22 (Night)	56	46	40	36	WD: NE	Traffic 38-56
						WS: 0.1m/s	TGO hum <36
TGO Site L <sub>Aeq</sub> (15min) Contribution							35
08/07/2021	21:20 (Evening)	53	43	33	38	WD: E	Traffic 33-53
						WS: 0.1m/s	TGO Inaudible
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35
08/07/2021	22:20 (Night)	62	46	35	36	WD: E	Traffic 32-62
						WS: 0.3m/s	Insects <32
TGO Site L <sub>Aeq</sub> (15min) Contribution							<35

Note 1: Meteorological data obtained from TGO's on-site weather station or by direct measurement by the operator.



## 5 Discussion

### 5.1 Discussion of Results - Location R2

Monitoring between Tuesday 6 July 2021 and Thursday 8 July 2021 identified that TGO processing was audible during all six measurements at location R2. The estimated mining contribution remained below the relevant noise limit of 35dB LAeq(15min). Extraneous sources such as operator noise, traffic, livestock, insects and wind were audible during the survey periods.

### 5.2 Discussion of Results - Location R3/R29

Monitoring between Tuesday 6 July 2021 and Thursday 8 July 2021 identified that TGO was audible during two measurements at location R3. The estimated mining contribution remained below the relevant noise limit of 35dB LAeq(15min). Extraneous sources such as traffic were audible during the measurements.

### 5.3 Discussion of Results - Location R4

Monitoring between Tuesday 6 July 2021 and Thursday 8 July 2021 identified that TGO was inaudible during all six measurements at location R4, therefore the relevant noise limit of 35dB LAeq(15min) was satisfied. Extraneous sources such as traffic, wind in trees, birds and offsite drilling were audible during the measurements.

### 5.4 Discussion of Results - Location R5

Monitoring between Tuesday 6 July 2021 and Thursday 8 July 2021 identified that TGO was inaudible during all measurements at location R5. The estimated mining contribution remained below 35dBA, therefore the relevant noise limit of 35dB LAeq(15min) was satisfied. Extraneous sources such as traffic, wind in trees, insects and offsite drilling were audible during the measurements.

## 5.5 Discussion of Results - Location R6

Monitoring between Tuesday 6 July 2021 and Thursday 8 July 2021 identified that TGO was audible for one measurement at location R6. The estimated mining contribution remained below 35dBA, therefore the relevant noise limit of 35dB LAeq(15min) was satisfied. Extraneous sources such as traffic, offsite drilling, wind in trees, livestock and insects were audible during the measurements.

## 5.6 Discussion of Results - Location R23

Monitoring between Tuesday 6 July 2021 and Thursday 8 July 2021 identified that TGO was audible during four measurements at location R23. The estimated mining contribution remained below 36dBA, therefore the relevant noise limit of 38dB LAeq(15min) for evening and 36dB LAeq(15min) for night was satisfied. Extraneous sources such as traffic and insects were audible during the measurements.

## 6 Comparison of Attended and Unattended Monitoring Results

To address Condition 6 of Schedule 3 of the Project Approval, a program to calibrate and validate the real-time noise monitoring results with the attended monitoring results has been completed.

It is noted that the Thornycroft property (nearest to R4) has been adopted as an alternative location for this assessment, due to the real-time monitor located at the Brooklands property being temporarily unavailable.

Currently, TGO has an unattended real-time monitoring terminal installed at the Thornycroft property (nearest to R4). **Figure 1** identifies the location of the monitor with respect to the attended monitoring locations. It is noted that the Thornycroft unattended monitor is situated 2km north-east of the attended noise monitoring location R4, therefore, background (LA90) noise levels are significantly lower due to offset distance to highway traffic.

Historically, a comparison of mine noise contributions between attended and unattended noise monitoring demonstrates a general consistency between attended and unattended results at the Brooklands property. It was noted that wind, insects, birds, and highway traffic noise influenced measured noise levels for this assessment. Furthermore, for July 2021, results remained below the relevant criteria for both attended and unattended locations.

**Table 8** provides a summary comparison of results between the attended and unattended noise surveys for R4.

**Table 8 Comparison of Attended and Unattended Results – R4**

Assessment Type	Time (hrs)	Descriptor (dBA re 20 µPa)			Criteria	Mine Noise Contribution	Meteorology <sup>1</sup>	Description and SPL, dBA
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>				
		<b>Tuesday 6 July 2021</b>						
Attended	20:20	53	33	25	35	<35	WD: S WS: 0.4m/s Stab Class: D	Traffic 23-53 Wind in trees <23 TGO Inaudible
Unattended	20:16	39	27	23	35	<35		Dog bark TGO Inaudible
Attended	23:29	56	30	22	35	<35	WD: S WS: 0.1m/s	Traffic 24-56 TGO Inaudible
Unattended	23:31	67	36	23	35	<35	Stab Class: E	Dog bark TGO hum
<b>Wednesday 7 July 2021</b>								
Attended	20:16	50	28	20	35	<35	WD: NE WS: 0.1m/s	Traffic 15-50 TGO Inaudible
Unattended	20:15	38	28	25	35	<35	Stab Class: D	Livestock TGO hum
Attended	23:29	54	32	26	35	<35	WD: E WS: 0.1m/s	Traffic 26-54 Offsite Drilling 26-33 TGO Inaudible
Unattended	23:30	34	26	20	35	<35	Stab Class: F	Livestock Traffic TGO Inaudible
<b>Thursday 8 July 2021</b>								
Attended	19:52	53	35	30	35	<35	WD: E WS: 0.6m/s Stab Class: E	Birds 31-36 Wind in trees 29-53 Traffic 30-35 TGO Inaudible
Unattended	19:56	46	32	29	35	<35		Wind TGO Inaudible
Attended	23:24	57	45	42	35	<35	WD: E WS: 2m/s	Wind in trees 42-57 TGO Inaudible
Unattended	23:26	47	40	38	35	<35	Stab Class: D	Wind Insects TGO Inaudible

Note 1: Meteorological data obtained from TGO's on-site weather station or by direct measurement by the operator.

## 7 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment on behalf of Tomingley Gold Operations (TGO). The assessment was completed to provide monthly monitoring data so that TGO can actively quantify and manage site noise emissions.

Attended monitoring conducted between Tuesday 6 July 2021 and Thursday 8 July 2021 identified that TGO mine noise was occasionally audible during the measurement period. A review of monitoring data and operator attended observations determined that TGO contributions did not exceed relevant limits during applicable meteorological conditions.

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# Appendix A - Glossary of Terms

Several technical terms have been used in this report and are explained in **Table A1**.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmx	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (SWL)	<p>This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by :</p> $= 10 \cdot \log_{10} (W/W_0)$ <p>Where : W is the sound power in watts and W<sub>0</sub> is the sound reference power at 10-12 watts.</p>



Table A2 provides a list of common noise sources and their typical sound level.

**Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA**

Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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