



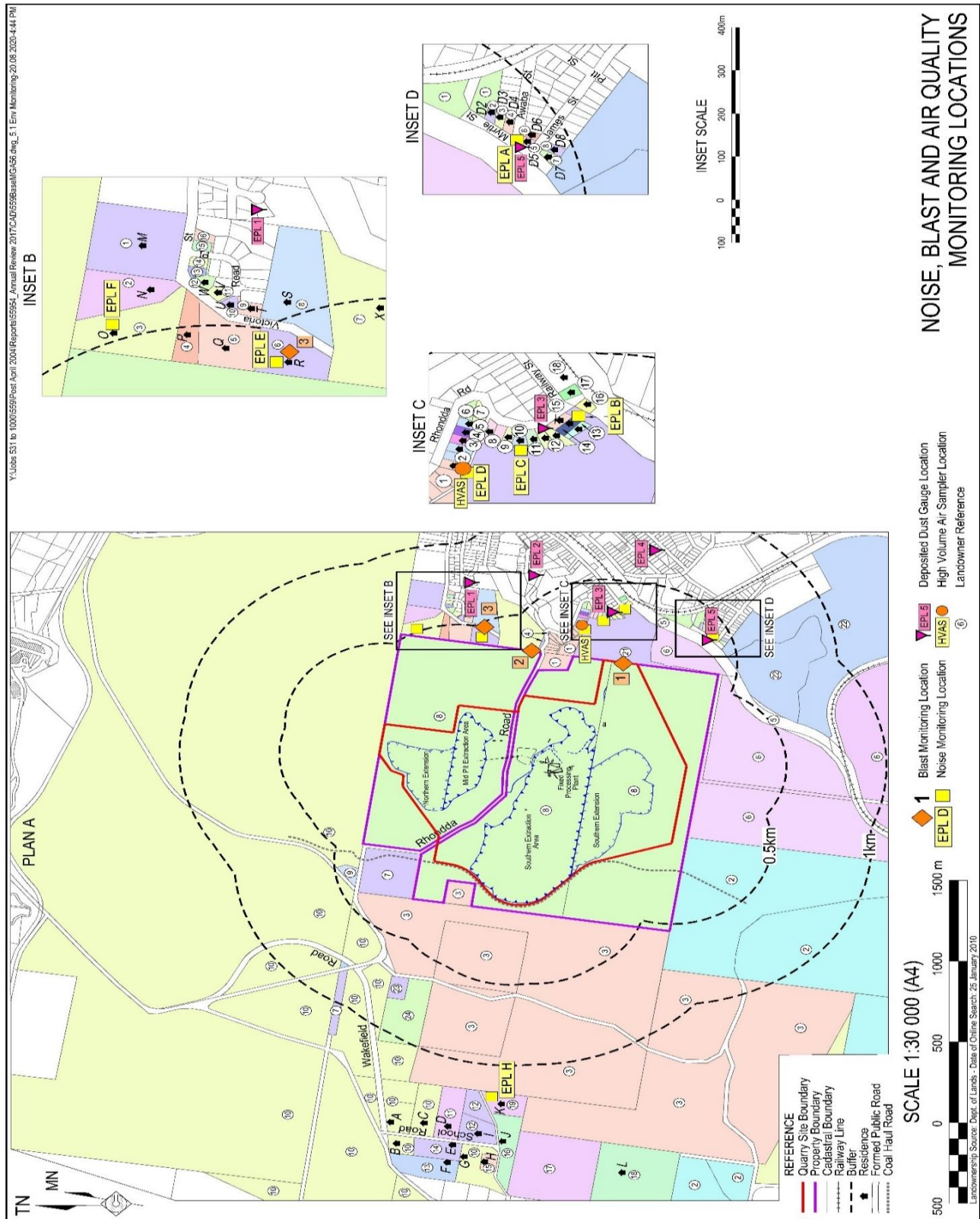
Teralba Quarry Environmental Monitoring Summary

August 2021

Environmental Protection Licence (EPL):	536
Licensee:	Metromix Pty Limited
Licensee Address:	PO Box 1295 Parramatta, NSW 2124
Premises:	Metromix Pty Limited Teralba Quarry Rhondda Road Teralba, NSW 2284
Licensee Website:	https://www.metromix.com.au/
Licensee Website - Monitoring Results:	https://www.metromix.com.au/resources/#quarry
EPA Public Register:	https://www.epa.nsw.gov.au/licensing-and-regulation/public-registers
Prepared by:	R. W. Corkery & Co.
Sample Period:	August 2021
Data Last Received	15 September 2021
Date of Report	16 September 2021

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Deposited Dust

Sample Period Start: 2/08/2021
Sample Period End: 1/09/2021
Sample Frequency: 30 ± 2 days
Sample Collected By: Metromix - GS
Date Received by Laboratory: 1/09/2021
Date Results Received by Metromix: 10/09/2021

EPA Identification No.	Location	Criteria (g/m ² /month)	Insoluble Solids (g/m ² /month)	Ash Fraction (g/m ² /month)	% Ash Fraction
1	Hillside Crescent	4.0	0.1	0.1	100%
8	Rodgers Street	4.0	0.6	0.5	83%
9	Rhondda Road	4.0	0.9	0.6	67%
11	Myrtle Street	4.0	1.0	0.7	70%
23	York Street	4.0	0.4	0.3	75%

Comments

All deposited dust results remained below the approved criteria for the sample period.

Deposited Dust - Year to Date

	Rhondda Road			Myrtle Street			Hillside Crescent			Rodgers Street			York Street		
	Total Insoluble Solids	Ash Fraction	% Ash	Total Insoluble Solids	Ash Fraction	% Ash	Total Insoluble Solids	Ash Fraction	% Ash	Total Insoluble Solids	Ash Fraction	% Ash	Total Insoluble Solids	Ash Fraction	% Ash
Units	g/m ² /month	g/m ² /month		g/m ² /month	g/m ² /month		g/m ² /month	g/m ² /month		g/m ² /month	g/m ² /month		g/m ² /month	g/m ² /month	
EPA Approved Level	4.0			4.0			4.0			4.0			4.0		
January	0.7	0.4	57	1.0	0.5	50	0.7	0.3	43	0.7	0.4	57	1.2	0.7	58
February	0.3	0.2	67	0.4	0.2	50	0.4	0.2	50	0.5	0.3	60	0.4	0.4	100
March	0.6	0.2	33	0.5	0.2	40	0.8	0.2	25	0.5	0.2	40	0.9	0.5	56
April	0.3	0.2	67	0.2	0.1	50	0.4	0.1	25	0.2	0.2	100	0.4	0.3	75
May	0.3	0.1	33	0.4	0.3	75	0.4	0.2	50	0.2	0.1	50	0.8	0.6	75
June	0.4	0.2	50	0.3	0.2	67	0.1	0.1	100	0.2	0.2	100	0.5	0.4	80
July	1.8	0.7	39	0.5	0.3	60	0.1	0.1	100	0.7	0.4	57	0.7	0.4	57
August	0.9	0.6	67	1.0	0.7	70	0.1	0.1	100	0.6	0.5	83	0.4	0.3	75
September															
October															
November															
December															
Annual Average	0.7	0.3	51.6	0.5	0.3	57.8	0.4	0.2	61.6	0.5	0.3	68.4	0.7	0.5	72.0
Annual Maximum	1.8	0.7	67.0	1.0	0.7	75.0	0.8	0.3	100.0	0.7	0.5	100.0	1.2	0.7	100.0
Annual Minimum	0.3	0.1	33.0	0.2	0.1	40.0	0.1	0.1	25.0	0.2	0.1	40.0	0.4	0.3	56.0

Particulate Matter (PM₁₀)

Sample Location: EPA 3 - Rodgers Road
 Sample Frequency: 6 days

Date Sample Taken (24-hr)	Collected by	Date Results Received	PM ₁₀ µg/m ³	Monthly Average Criteria (µg/m ³)	Annual Average Criteria (µg/m ³)
1/08/2021	CBased - LK	12/08/2021	35	50	
7/08/2021	CBased - LK, MB	12/08/2021	10	50	
13/08/2021	CBased - MB	17/08/2021	12	50	
19/08/2021	CBased - MB	31/08/2021	18	50	
25/08/2021	CBased - MB	31/08/2021	3	50	
31/08/2021	CBased - MB	1/09/2021	13		
Monthly Average			15.1		25/30*
*Project Approval (PA 10_0183) outlines the annual average PM ₁₀ criteria to be 30µg/m ³ . However, EPL 536 Condition R4.5a) requires that the air quality monitoring data is assessed against the Air Impact Assessment Criteria outlined in EPA's <i>Approved Methods for the Modelling and Assessment of Air Pollutants in NSW</i> . The most up to date version of this guideline was published in 2017 and outlines the annual average PM ₁₀ criteria to be 25µg/m ³ . Metromix has considered both criteria for its review of particulate matter monitoring.					

Comments

All PM₁₀ results remained below the approved criteria for the sample period.

Particulate Matter (PM₁₀) - Year to Date

Date	PM ₁₀ (µg/m ³)	Monthly Average (µg/m ³)	Year to Date Average (µg/m ³)	24-Hr Criteria (µg/m ³)	Comments
3/01/2021	10	18.0	10.0	50	
9/01/2021	5		7.5	50	
15/01/2021	37		17.3	50	
21/01/2021	18		17.5	50	
27/01/2021	20		18.0	50	
2/02/2021	11	10.0	16.8	50	
8/02/2021	6		15.2	50	
14/02/2021	12		14.8	50	
20/02/2021	7		14.0	50	
26/02/2021	14		14.0	50	
4/03/2021	9	9.0	13.5	50	
10/03/2021	14		13.6	50	
16/03/2021	8		13.1	50	
22/03/2021	6		12.6	50	
28/03/2021	8		12.3	50	
3/04/2021	5	11.1	11.9	50	
9/04/2021	10		11.7	50	
15/04/2021	17		12.0	50	
21/04/2021	14		12.1	50	
27/04/2021	10		12.0	50	
3/05/2021	11	8.0	12.0	50	
9/05/2021	10		11.9	50	
15/05/2021	8		11.7	50	
21/05/2021	10		11.6	50	
27/05/2021	2		11.2	50	
2/06/2021	15	9.2	11.4	50	
8/06/2021	12		11.4	50	
14/06/2021	6		11.2	50	
20/06/2021	12		11.2	50	
26/06/2021	2		10.9	50	
2/07/2021	9	7.5	10.8	50	
8/07/2021	6		10.7	50	
14/07/2021	8		10.6	50	
20/07/2021	6		10.5	50	
26/07/2021	9		10.4	50	
1/08/2021	35	15.1	11.1	50	
7/08/2021	10		11.1	50	
13/08/2021	12		11.1	50	
19/08/2021	18		11.3	50	
25/08/2021	3		11.0	50	
31/08/2021	13		11.1	50	

Minimum	2
Maximum	35
Average	10.1
Standard Deviation	5.9
24-hr Criteria	50
Number of Exceedences	0
Annual Average Criteria	25/30*
Annual Average Criteria Exceeded	No
*See explanation on previous page.	

Water**Water Monitoring****EPL Point 4 - Monthly Monitoring**

Date	Time	Sampled By	Date Results Received		pH	EC	TSS	Oil & Grease	Comments
				Units	pH Units	µS/cm	mg/L	mg/L	
				EPL Criterion*	6.5-8.5	NA	<50	10	
				ANZECC Water Quality Limits	6.5-8.5	125-2200	<50	-	
2/08/2021	08:00am	Metromix - AL	6/08/2021		7.34	1960	<5	<5	-

EPL Point 5 - Monitoring Within 12 Hours of Commencing Discharge

Date	Time	Sampled By	Date Results Received		pH	EC	TSS	Oil & Grease	Comments
				Units	pH Units	µS/cm	mg/L	mg/L	
				EPL Criterion*	6.5-8.5	NA	<50	10	
				ANZECC Water Quality Limits	6.5-8.5	125-2200	<50	-	

No discharge occurred at this location and therefore no monitoring was required

EPL Point 6 - Monthly Monitoring

Date	Time	Sampled By	Date Results Received		pH	EC	TSS	Oil & Grease	Comments
				Units	pH Units	µS/cm	mg/L	mg/L	
				EPL Criterion*	6.5-8.5	NA	<50	10	
				ANZECC Water Quality Limits	6.5-8.5	125-2200	<50	-	

No discharge occurred at this location and therefore no monitoring was required

EPL Point 7 - Monthly Monitoring

Date	Time	Sampled By	Date Results Received		pH	EC	TSS	Oil & Grease	Comments
				Units	pH Units	µS/cm	mg/L	mg/L	
				EPL Criterion*	6.5-8.5	NA	<50	10	
				ANZECC Water Quality Limits	6.5-8.5	125-2200	<50	-	

No discharge occurred at this location and therefore no monitoring was required

Flow Meter Records

EPA Identified Point	Location	Description	Sample Period	Daily Average Flow ML	Monthly Total Flow ML
4	Adit Dam	Adit Dam to Creek (off site)	2/08/2021 to 1/09/2021	0.90	28.05
5	Dam B	Discharge from Dam B (from Quarry)	2/08/2021 to 1/09/2021	N/A	0
4	Adit Dam	Water pumped from Adit Dam to Dam G (processing use)	2/08/2021 to 1/09/2021	N/A	99.00

Comments

All water monitoring results remained within the approved criteria levels during the monitoring period.

Water - Year to Date**EPL Point 4 : Monthly Monitoring**

	pH	EC	TSS	Oil & Grease	Comments
Units	pH Units	µS/cm	mg/L	mg/L	-
EPL Criterion*	6.5-8.5	NA	<50	10	-
ANZECC Water Quality Limits	6.5-8.5	125-2200	<50	<5	-
January	7.18	1890	6	<5	-
February	7.11	1880	<5	<5	-
March	7.16	1800	8	6	-
April	7.07	1600	6	<5	-
May	7.12	1680	8	<5	-
June	7.49	1940	26	<5	-
July	7.32	1970	<5	<5	-
August	7.34	1960	<5	<5	-
September					
October					
November					
December					

EPL Point 5 : Monitoring During Discharge

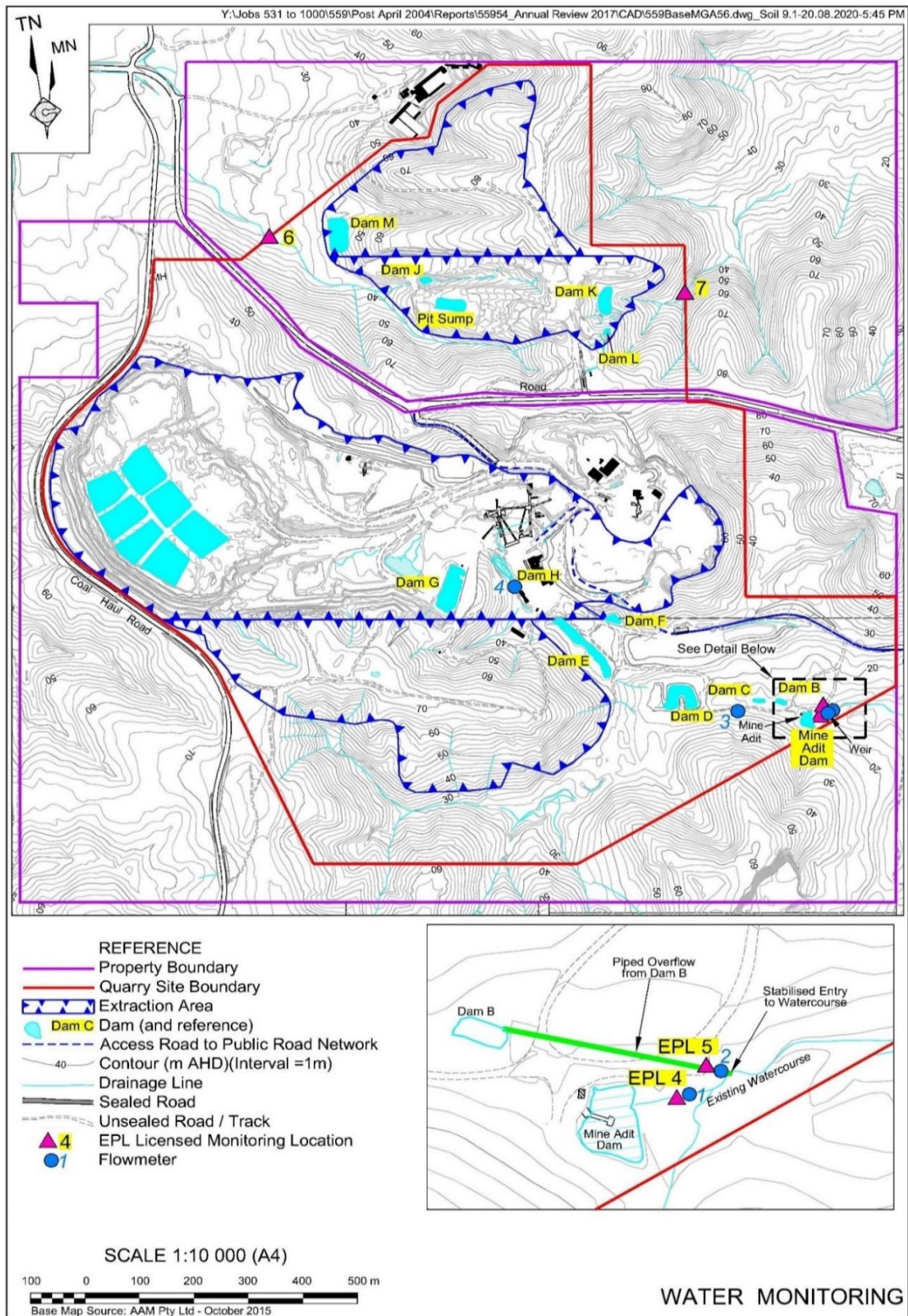
	pH	EC	TSS	Oil & Grease	Comments
Units	pH Units	µS/cm	mg/L	mg/L	-
EPL Criterion*	6.5-8.5	NA	<50	10	-
ANZECC Water Quality Limits	6.5-8.5	125-2200	<50	-	-
4/01/2021	7.24	862	6	<5	-
1/02/2021	7.40	921	<5	<5	-
11/02/2021	7.32	1140	<5	<5	-
1/04/2021	6.67	793	<5	<5	-
3/05/2021	6.83	771	<5	<5	-

Flow Meter Records

EPA Identifier	Location	Description	Date	Monthly Total (ML)
4	Adit Dam	Water pumped from Adit Dam to Dam G (processing use)	4/01/2021 - 1/02/2021	80.9
			1/02/2021 - 1/03/2021	94.8
			1/03/2021 - 1/04/2021	88.5
			1/04/2021 - 3/05/2021	91.4
			3/05/2021 - 1/06-2021	107.8
			1/06/2021 - 1/07/2021	91.8
			1/07/2021 - 2/08/2021	92.9
			2/08/2021 - 1/09/2021	99.0

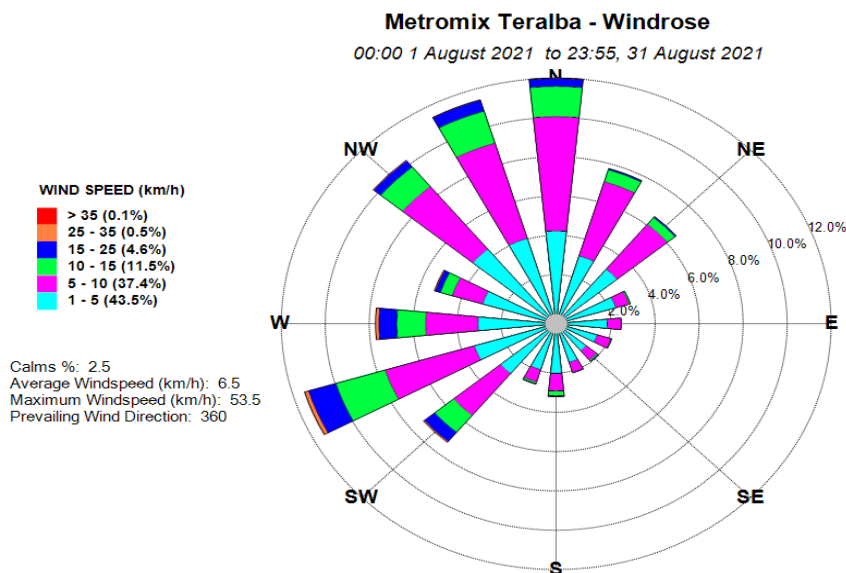
EPA Identified	Location	Description	Date	Monthly Total (ML)
5	Dam B	Discharge from Dam B (from Quarry)	4/01/2021 - 1/02/2021	0.0
			1/02/2021 - 1/03/2021	0.0
			1/03/2021 - 1/04/2021	28.3
			1/04/2021 - 3/05/2021	3.7
			3/05/2021 - 1/06-2021	0.0
			1/06/2021 - 1/07/2021	0.0
			1/07/2021 - 2/08/2021	0.0
			2/08/2021 - 1/09/2021	0.0

EPA Identified	Location	Description	Date	Monthly Total (ML)
4	Adit Dam	Adit Dam to Creek (off site)	4/01/2021 - 1/02/2021	33.5
			1/02/2021 - 1/03/2021	94.9
			1/03/2021 - 1/04/2021	271.1
			1/04/2021 - 3/05/2021	142.1
			3/05/2021 - 1/06-2021	65.7
			1/06/2021 - 1/07/2021	74.1
			1/07/2021 - 2/08/2021	29.1
			2/08/2021 - 1/09/2021	28.1



Meteorological Conditions

Monitoring Location: Mid-Pit Entrance
Monitoring Frequency: Continuous

Windrose**Monthly Summary**

Date	Mean Wind Direction (°)	Mean Wind Speed (km/h)	Daily Rainfall (mm)	Mean Sigma Theta	Max Temperature (°C) at 2m	Min Temperature (°C) at 2m
01/08/21	201	8.0	0.0	31.6	26.2	13.8
02/08/21	136	4.9	0.0	30.0	20.0	10.6
03/08/21	196	8.4	1.8	30.4	21.0	10.8
04/08/21	252	12.6	0.0	39.9	16.0	9.2
05/08/21	254	7.5	0.0	33.0	20.2	8.0
06/08/21	257	5.6	0.0	33.5	19.8	8.4
07/08/21	258	6.0	0.0	32.6	18.4	7.2
08/08/21	163	5.0	3.2	31.0	15.2	8.8
09/08/21	124	5.3	0.2	20.1	19.6	11.2
10/08/21	140	6.4	0.0	24.5	22.8	8.8
11/08/21	163	7.7	0.0	22.3	23.8	11.0
12/08/21	208	5.1	0.6	29.7	20.8	11.2
13/08/21	182	3.3	0.0	25.5	19.8	7.8
14/08/21	164	3.4	0.0	29.5	20.6	9.0
15/08/21	210	4.0	0.0	30.4	22.4	9.4
16/08/21	253	7.9	0.0	32.0	22.4	8.6
17/08/21	211	4.2	0.0	36.8	18.8	8.9
18/08/21	196	4.3	3.4	26.9	18.4	8.2
19/08/21	153	5.7	0.0	25.4	22.4	8.8
21/08/21	223	6.4	0.0	27.1	24.2	12.4
21/08/21	249	7.2	0.2	24.2	20.6	14.0
22/08/21	152	7.2	0.0	22.2	27.4	13.0
23/08/21	196	9.1	3.6	27.6	24.4	14.8
24/08/21	229	11.0	50.8	31.5	15.0	7.8
25/08/21	250	12.5	0.0	19.7	16.6	9.4
26/08/21	233	4.6	0.0	30.5	17.4	7.4
27/08/21	266	6.6	0.0	28.7	18.4	9.6
28/08/21	253	6.2	0.0	25.4	17.0	7.8
29/08/21	205	5.7	0.0	24.2	20.2	8.4
30/08/21	206	4.0	0.0	28.9	19.8	8.4
31/08/21	182	5.2	0.0	26.8	23.4	9.2

Meteorological Conditions - Year to Date

Monitored Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total Rainfall (mm)	130.0	135.0	362.8	24.0	25.0	55.2	22.4	63.8					
Average Minimum Temperature (°C) at 2m	18.1	18.2	17.2	13.1	11.6	9.1	8.6	9.7					
Average Maximum Temperature (°C) at 2m	28.6	26.4	25.5	23.3	20.7	17.4	17.5	20.4					
Average Minimum Temperature (°C) at 10m	18.5	18.5	17.5	13.9	12.3	9.7	9.2	10.6					
Average Maximum Temperature (°C) at 10m	27.3	25.4	24.7	22.5	20.0	16.9	17.0	19.8					
Average Sigma Theta	30.9	32.2	31.9	27.3	27.0	28.3	29.8	28.4					
Average Solar Radiation (W/m ²)	214.6	183.9	137.7	148.3	104.6	88.7	101.7	127.5					
Average Relative Humidity (%)	71.7	77.0	75.0	66.0	68.0	69.0	62.0	57.0					

Blasting

Monitoring Frequency: Each Blast
Blast Monitoring Completed By: Orica (Blast 1 to 12)
MAXAM (Blast 13)

Shot #	Day	Month	Time	Location	Location 1		Location 2		Location 3		Comments
					Overpressure dB(L)	Vibration mm/s	Overpressure dB(L)	Vibration mm/s	Overpressure dB(L)	Vibration mm/s	
1	22	January	11:52:04	Stage 2A	101.7	0.2	NT	NT	NM	NM	The trigger parameters for the blast monitors were reduced to 100dB(L) and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 111.7dB(L) overpressure and 0.35mm/s vibration.
2	11	February	14:50:06	Stage 2A	105.6	0.37	102.3	0.08	NM	NM	
3	17	February	12:50:00	Stage 2A	109.7	1.43	NT	NT	NM	NM	
4	11	March	13:42:00	Stage 2A	101.5	0.24	NT	NT	NM	NM	The trigger parameters for the blast monitors were set to 100dB(L) and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 110.6dB(L) overpressure and 0.55mm/s vibration. The Rhondra Road monitor was tested prior to blasting and recorded readings of 102.2dB(L) (via clapping) and 7.31mm/s (via stomping).
6A & 6B	7	April	14:56:49	Stage 2A	NT	NT	111.2	0.16	NM	NM	
5	14	April	13:36:13	Stage 1C	106.3	0.3	100.8	0.05	NM	NM	
7	5	May	11:44:23	Stage 2A	NT	NT	101	0.12	NM	NM	The trigger parameters for the blast monitors were set to 100dB(L) and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 108.5dB(L) overpressure and 0.35mm/s vibration.
8	25	May	14:38:00	Stage 2A	100.2	2.61	105.9	0.16	NM	NM	
9	3	June	12:58:38	Stage 2A	103.1	0.1	99.9	0.12	NM	NM	
10	17	June	14:04:00	Stage 1C	NT	NT	104	0.12	NM	NM	The trigger parameters for the blast monitors were set to 100dB(L) and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 109.4dB(L) overpressure and 0.22mm/s vibration.
11	23	June	14:17:06	Stage 2A	108.8	0.11	103.2	0.12	NM	NM	
12	30	June	15:01:11	Stage 2A	103.1	0.08	NT	NT	NM	NM	
13	14	July	13:05:06	Stage 2A	105	0.45	100.4	0.3	NM	NM	The trigger parameters for the blast monitors were set to 100dB(L) and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 109.5dB(L) overpressure and 1.36mm/s vibration.
14	22	July	13:24:00	Stage 1C	NT	NT	NT	NT	NM	NM	
15	27	July	12:15:00	Stage 2A	NT	NT	NT	NT	NM	NM	
16A & 16B	9	August	12:52:17	Stage 2A	102.9	0.22	NT	NT	NM	NM	The trigger parameters for the blast monitors were set to 100dB(L) and 0.13mm/s to assist in obtaining a reading. An additional monitor was placed halfway between Blast monitor 1 (McEwen St) and the blast. This monitor recorded 108.7dB(L) overpressure and 0.25mm/s vibration.
17	20	August	15:12:21	Stage 2A	103.9	0.3	NT	NT	NM	NM	
18	30	August	15:12:21	Stage 2B	NT	NT	NT	NT	NM	NM	

NT Not Triggered
NM Not Monitored

Blasting Criteria		
Units of Measure	Limit	
	95% of blasts per year	100% of blasts
decibels (dB(L))	115	120
millimetres per second	5	10

Comments

Three blasting events occurred during the monitoring period. All blast monitoring results were within the approved criteria.

Waste Management**Waste Removal Summary**

Month	January	February	March	April	May	June	July	August	September	October	November	December
Items	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity
General Waste Bin (10m ³)												
General Waste Bin (4.5m ³)												
General Waste Bin (6m ³)												
General Waste Bin (20m ³)	1				1		1					
Paper & Cardboard Bin (3m ³)	1	1		1	1	1	1					
Shredded Paper Bin (240L)												
Co Mingled Recycling (2 x 240 L)	4	4	6	4	4	4	4	4				
Tonner Cartridges												
Waste Oil (L)			1800			800		2000				
Scrap Steel (t)												
Timber (m ³)												
Engine Coolant (L)												
Oil Filters (240L bin)		3	1					3				
Batteries			15									
Oily Rags (240L bin)					1							
Aerosols (120L bin)												
Tyres												
Other												
Oily Water (L)												
Grease Waste (L)												

Noise Monitoring Result and Discussion

Attended noise monitoring was conducted during daytime, evening, shoulder and night periods between 16 August 2021 and 18 August 2021 at monitoring locations EPL-A, B, D, E and H by Spectrum Acoustics Pty Ltd (Spectrum).

Based upon the location of active quarrying activities (i.e. only within the existing Southern Extraction Area and Southern Extension), it was determined that the nominated locations identified above would only be monitored. Locations EPL-C and EPL-F were omitted from the monitoring program as compliance at these locations may be inferred from other nearby monitoring locations.

During the monitoring period in 2017, the landowner at Residence B (EPL-B) requested that the monitoring not take place in front of their house. Since that time the monitoring location has been moved 30m to the south of this location so that operators could still distinguish Quarry vehicles from other noise sources and record noise levels.

Monitoring location EPL-B is situated close to the corner of Rhondda Road and Railway Street. This monitoring location is included predominantly to measure Quarry noise from trucks exiting the Quarry along the private section of the access road (through the Teralba Business Park). It was noted that at the time of noise measurements being undertaken, monitoring at EPL-B did not require a spotter to determine the number of quarry-related trucks from the overall truck movements, as it was possible for Spectrum staff to identify those trucks associated with Quarry activities from this monitoring location. Noise emissions at EPL-B were indistinguishable from industrial noise and other traffic noise at this location.

Noise compliance reporting prepared by Spectrum Acoustics identifies a number of non-compliances of approved noise criteria as specified in PA 10_0183 and EPL 536.

The non-compliance matters are summarised as follows.

- Location D – Criteria 35dB with noise levels measured at 38dB(A) and 40dB(A) during the daytime period, 38dB(A) during the morning shoulder period and 37dB(A) during the evening period.
- Location E - Criteria 35dB with noise levels measured at 38dB(A) during the daytime period

The locations monitored are subject to a range of background noise sources that generally exceed the levels produced at the Quarry and the criteria applied to the operation. It is also noted that there were no complaints received during August 2021 regarding noise levels.

Metromix has commenced an investigation into the sources of noise that contributed to the exceedances. Metromix will continue to plan operations to ensure that noise generation is minimised, especially considering current operations are occurring at a high point of the Quarry. The incident report will be published on the Metromix website once accepted by DPIE and the EPA.

Monitoring of LA(1min) was undertaken to assess potential sleep disturbance during the period from 10:00pm to 7:00am. Night-time monitoring of LA(1min) was within the criteria of 45 dB(A) at all monitoring locations.

More details are available from the noise monitoring report available from the Metromix website.