

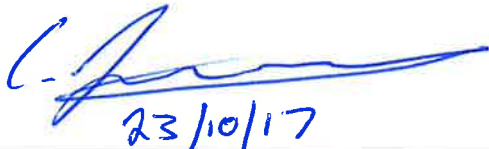
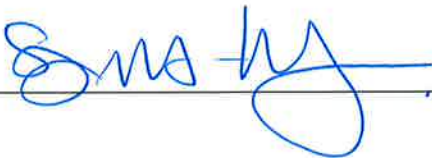


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1 July to 30 September 2017 - Quarter 3 Environmental Monitoring Results Summary

Name of Mine	Northparkes Mines
Name of Leaseholder and Mine Operator	CMOC Mining Pty Ltd
Mining Leases	ML 1247, ML 1367, ML 1641 and 1743
Environment Protection Licence	EPL 4784
Development Consent	PA11-0060, (Mod 1-3)

Reviewed by	Chase Dingle
Title	Superintendent – Community, Environment & Farming
Date	
Signature	 23/10/17
Approved by	Stacey Kelly
Title	Manager – People, Safety and Environment
Date	23 OCTOBER 2017
Signature	

1. SCOPE OF REPORT

This report provides a summary of monitoring results for the period from 1 July 2017 to 30 September 2017. This monitoring is undertaken in accordance with the Environmental Monitoring Program (available at www.northparkes.com.au). Details of air quality, noise and water monitoring locations are available in the Environmental Monitoring Program.

2. AIR QUALITY

The air quality monitoring program utilises PM₁₀ (beta attenuated monitors), TSP's (high volume air samplers (HVAS)) and depositional dust gauges. Monitoring locations are strategically positioned around the mine lease and neighbouring properties. TSP and PM₁₀ monitoring has been undertaken at three nearby farm residences Hubberstone, Milpose and Hillview. A summary of the monitoring results are provided below.

2.1 PM₁₀

PM₁₀ monitoring results for the 'Hubberstone', 'Milpose' and 'Hillview' monitoring locations, for the reporting period, are displayed in Figure 1, Figure 2 and Figure 3 respectively. The criteria for exceedances (as nominated in the Approval), is >30 µg/m³ for the annual average and >50 µg/m³ for a 24-hour monitoring period.

Monitoring results for all three locations, were under the air quality criteria required by the approval. The missing data for each of the locations was attributed to power surges, most likely the result of nearby lightning strikes, damaging equipment and/or equipment failure due to aging equipment.

The annual average PM₁₀ levels recorded at all PM₁₀ monitoring locations are below the predicted levels within the EA (20 µg/m³).

Hubberstone PM10 Results for Q3 2017

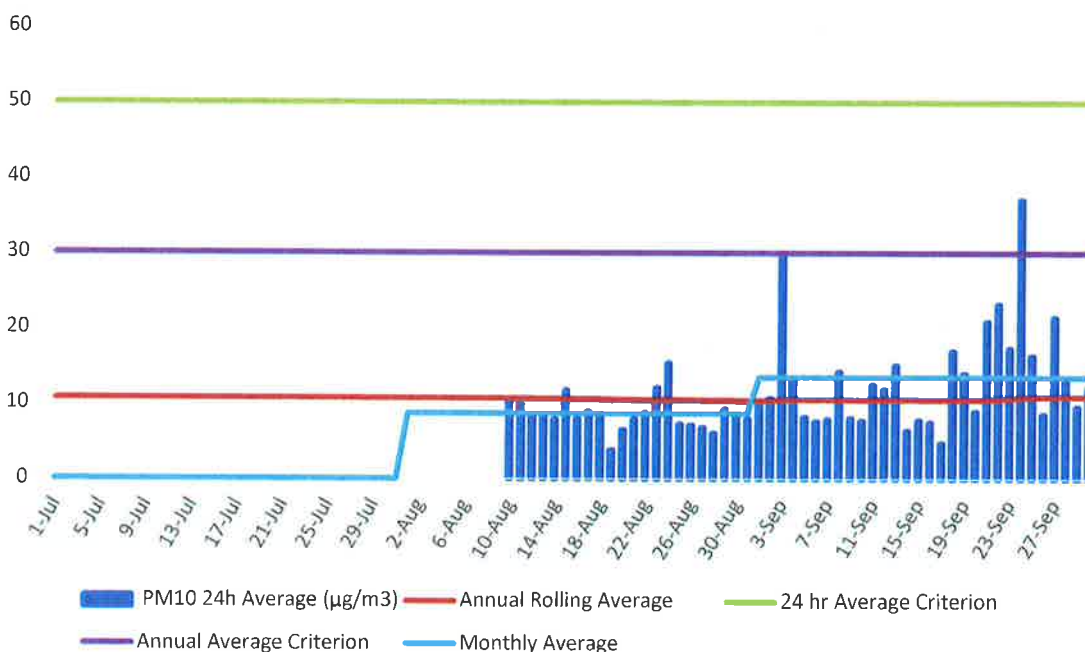


Figure 1: Hubberstone

Milpose PM10 Results for Q3 2017

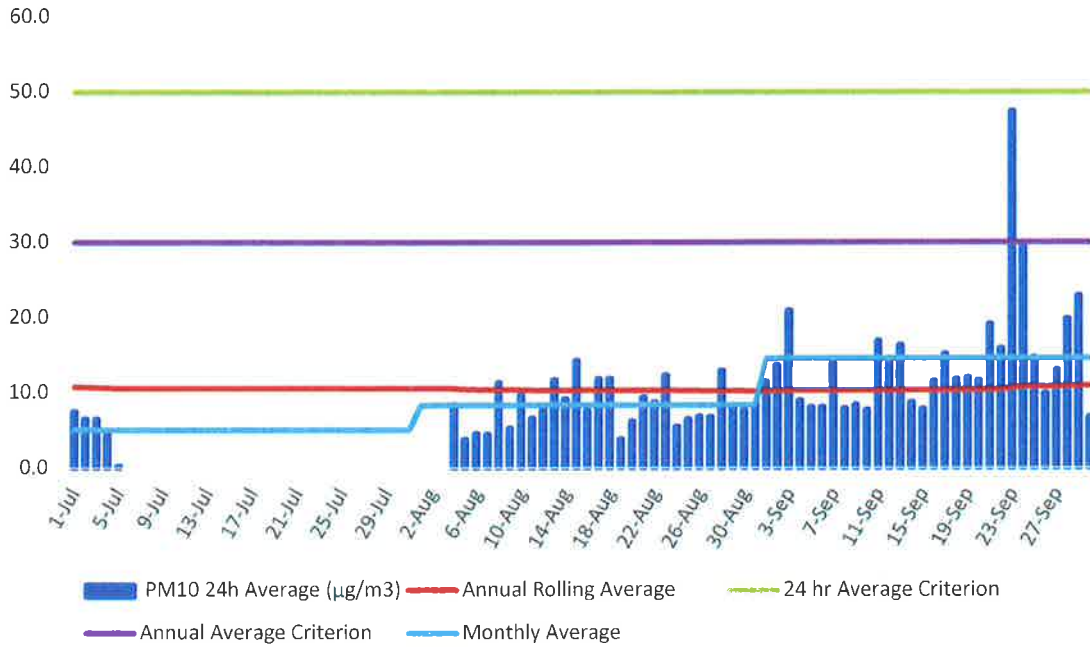


Figure 2: Milpose

Hillview PM10 Results for Q3 2017

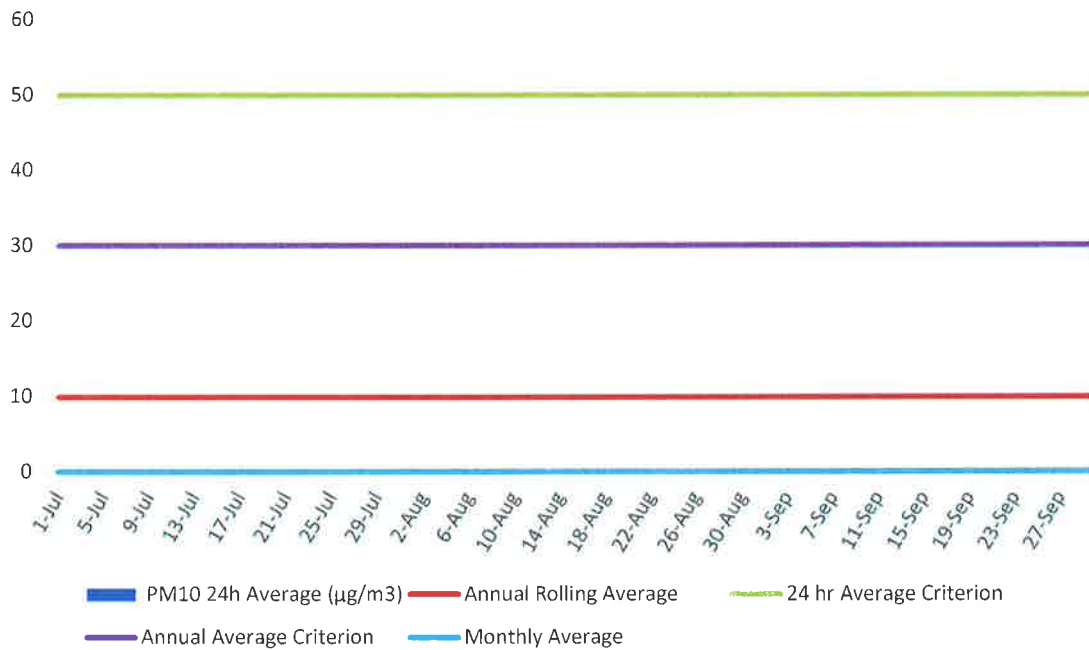


Figure 3: Hillview

2.2 TSP

All recorded dust levels at all TSP monitoring locations were under the required criteria set by the Approval (90 µg/m³) for the Q3 2017 monitoring period. Results are presented in Figure 4, Figure 5 and Figure 6 respectively. The annual average TSP dust levels recorded at all TSP monitoring locations are below the predicted levels within the EA (50 µg/m³).

The missing data for each of the locations was attributed to power surges, most likely the result of nearby lightning strikes, damaging equipment and/or equipment failure due to aging equipment.

Hubberstone TSP Results for Q3 2017

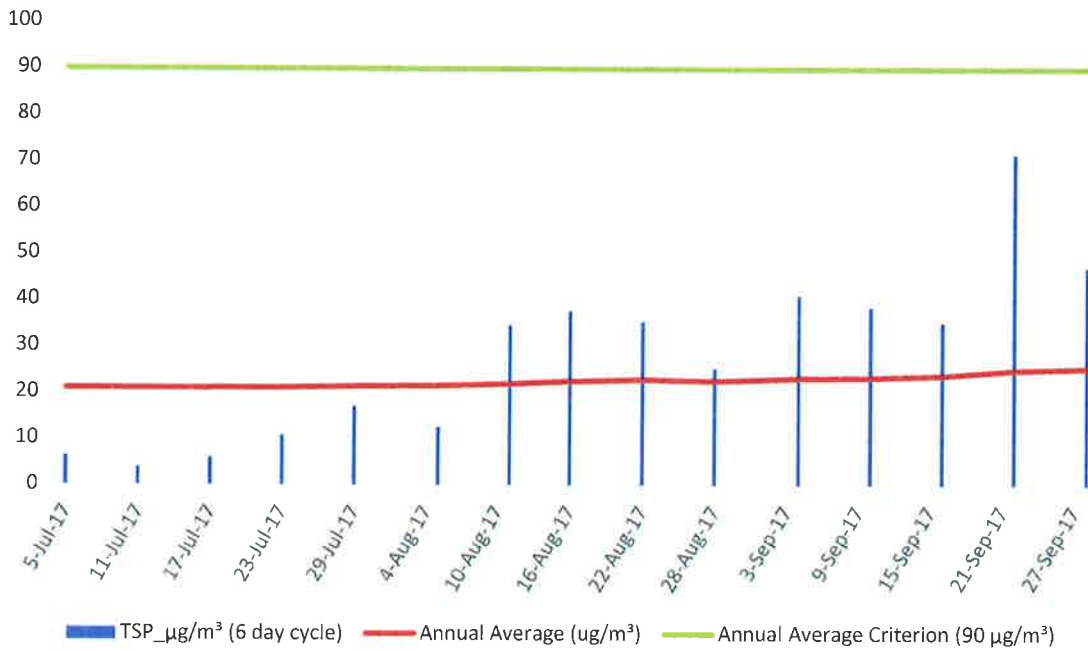


Figure 4: Hubberstone

Milpose TSP Results for Q3 2017

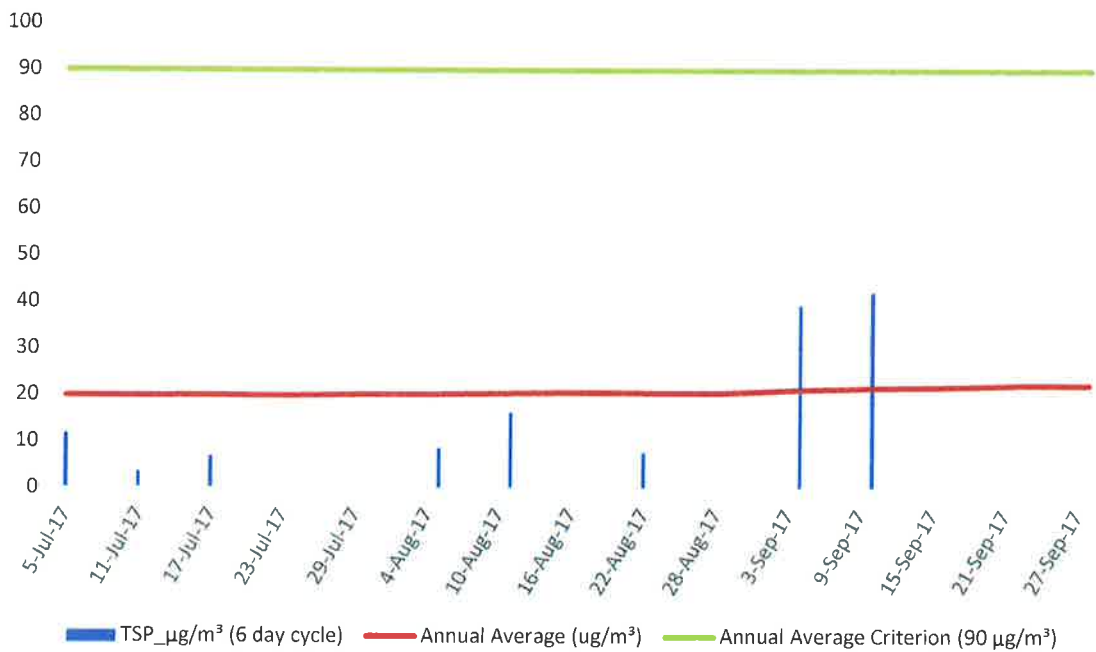


Figure 5: Milpose

Hillview TSP Results for Q3 2017

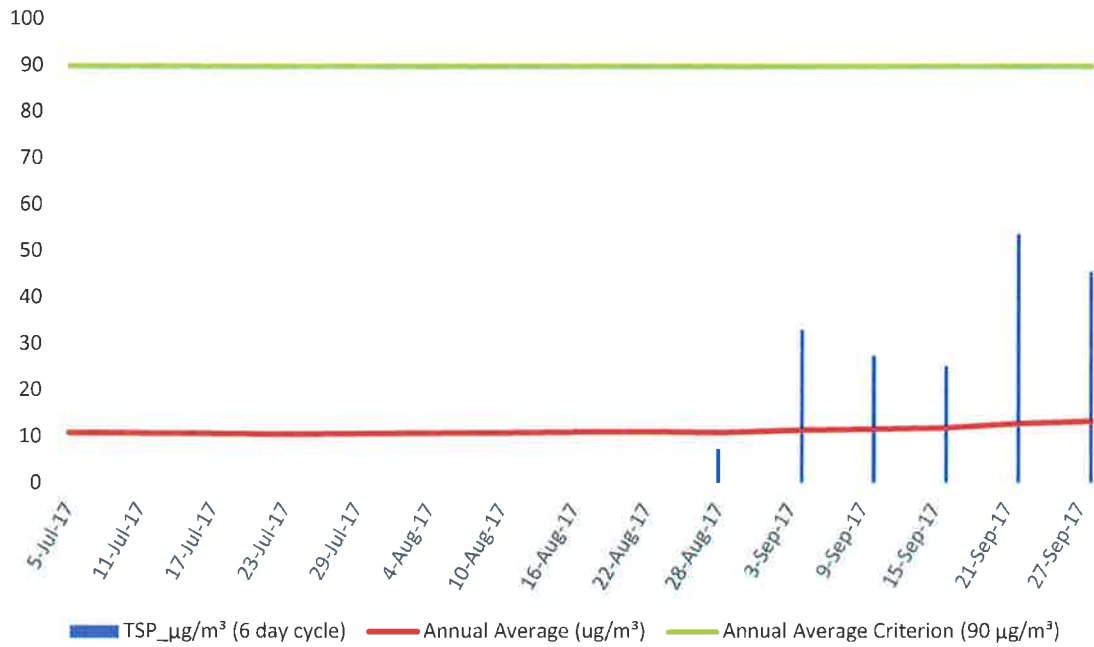


Figure 6: Hillview

2.3 Depositional Dust

Depositional dust gauges record the total of deposited dust for a month long period and are a useful measure of broad scale changes to the local air quality.

Eleven depositional dust gauges are located across the mining lease and neighbouring residential properties to monitor atmospheric dust. A summary of the monthly monitoring results at each monitoring location are presented in Figure 7, Figure 8 and Figure 9 respectively,

The indicative rolling average for all locations are below the long-term impact assessment criteria, complying with the conditions of the Approval.

Depositional Dust Results for July 2017

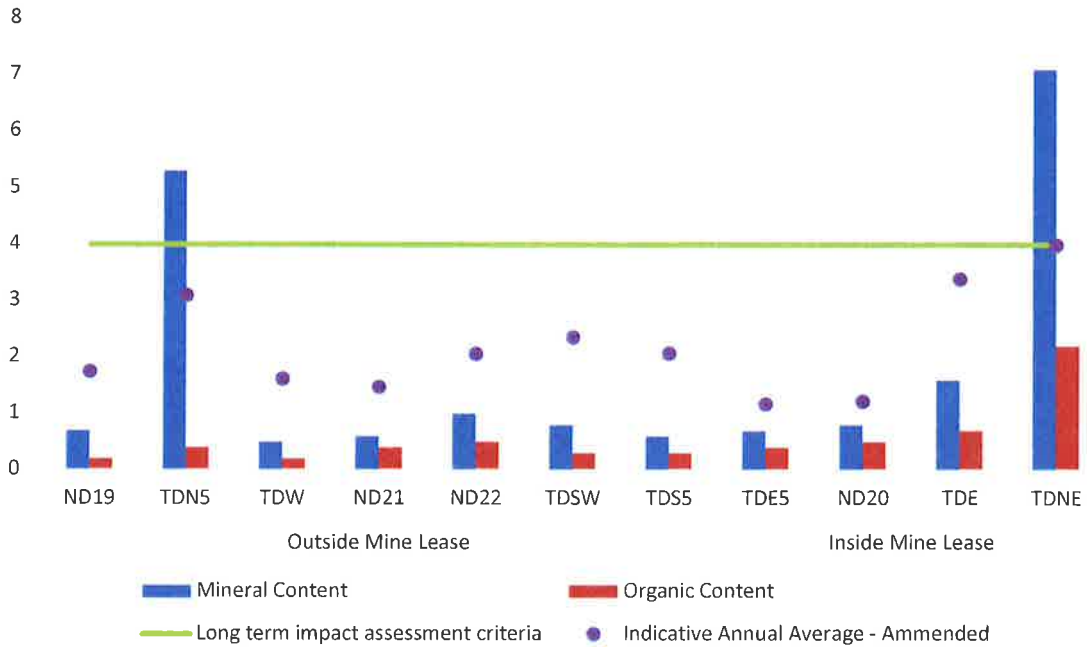


Figure 7: July depositional dust results for all locations

Depositional Dust Results for August 2017

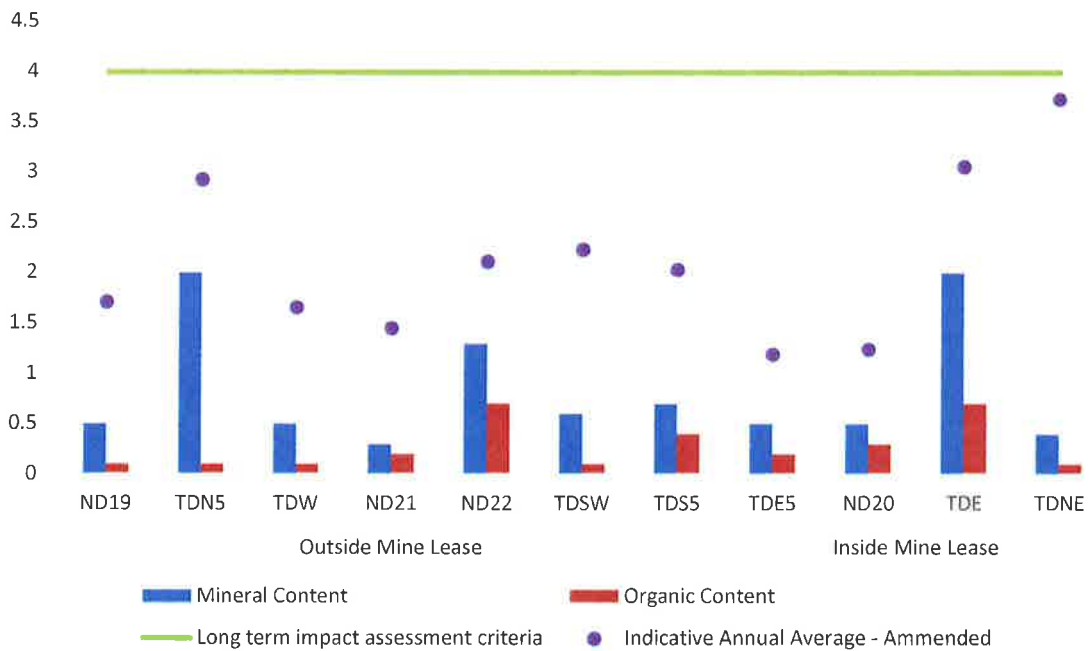


Figure 8: August depositional dust results for all locations

Depositional Dust Results for September 2017

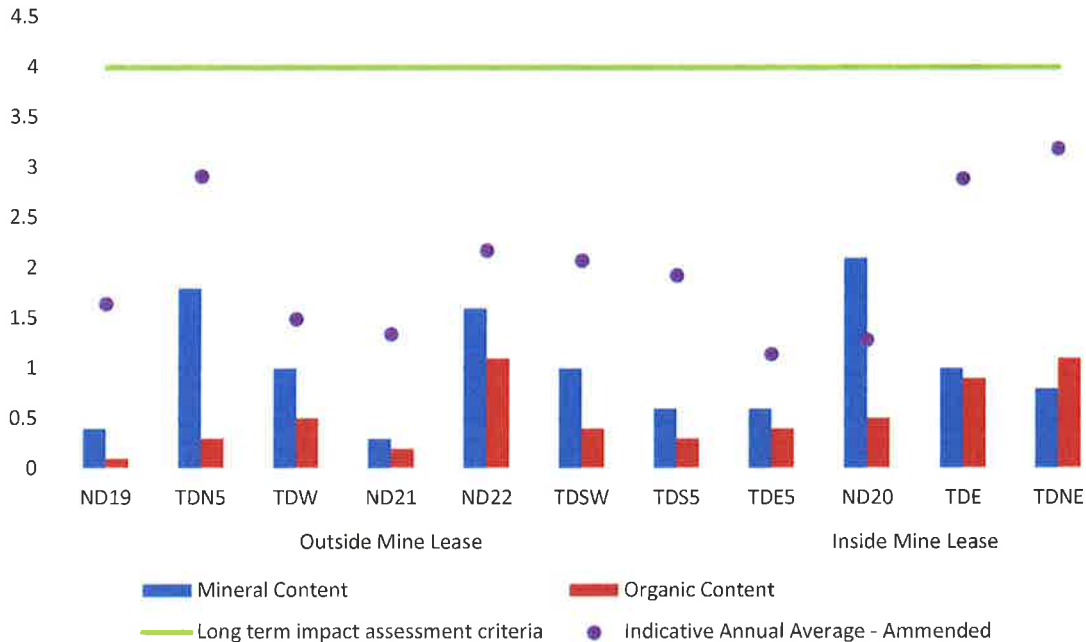


Figure 9: September depositional dust results for all locations

3. WATER

3.1 Overview

Water management at Northparkes is undertaken in accordance with approved management plans, prepared in accordance with Approval. All water samples are analysed at an independent National Association of Testing Authorities (NATA) accredited laboratory

Surface water quality monitoring is undertaken at Northparkes specifically within the three defined water management systems of;

- Clean water management system, which includes farm dams and watercourses;
- Dirty water management system, which includes settlement ponds; and
- Contaminated water management system, which includes all aspects of ore processing, and retention ponds.

CMOC's groundwater monitoring program aims to identify any changes to the natural groundwater system as a result of mining operations and ensure compliance with the Approval. It focuses on potential impacts to environmental assets and groundwater users in the area surrounding Northparkes.

Monitoring results are assessed and interpreted utilising historical trend analysis and internal water quality criteria and trigger levels to identify potential changes.

3.2 Quarterly Monitoring Analysis

Water quality monitoring was successfully carried out for the reporting period with no significant changes to the pH, EC or copper concentrations for all locations. Due to below average rainfall prior to monitoring, many locations were deemed dry and unable to be sampled. A summary of the monitoring results at each sampled location are presented in Tables 1-8 below.

Table 1: Process Water System

	RP1	RP2	RP3	RP4	RP5	RP6	RP7	RP8	RP9	RP10	RP13	RP15	RP16	RP19
pH	8.47	8.73	8.36	8.22	8.5	8.3	8.37	8.29	8.4	8.13	8.37	8.3		8.2
EC (uS/cm)	257	1390	2137	1039	499	1005	977	1215	1490	551	975	3470		3710
Cu (mg/l)	0.322	0.019	0.218	0.412	0.073	0.010	0.019	0.043	0.031	0.174	0.237	0.182	0.014	0.019

	RP20	RP21	RP23	RP26	RP27	RP29	RP30	RP32	RP33	GT1	GT2	PWD	SD1	SD2	CALOOOLA PIT
pH	9.72	8.58	8.32	8.83	8.41		8.16	8.56		8.1		7.89	8.29	8.05	8.5
EC (uS/cm)		1717	357	820	2307	331	517	200			837	4790	2720	10700	1810
Cu (mg/l)		0.031	0.063	0.180	0.014	0.016	0.016	0.022	0.022			0.009		0.177	0.021

Table 2: Sediment Ponds

	SP3	SP4	SP10	SP15
pH			9.05	
EC (uS/cm)			293	
Cu (mg/l)			0.100	
TDS (mg/l)	1710	422	26	372

Table 3: Watercourses

	WC1	WC2	WC3	WC4	WC7	WC11	WC12	WC14
pH	8.6	8.68			9.12		8.7	
EC (uS/cm)	141	148			169		109	
Cu (mg/l)	0.02	0.05			0.03		0.042	
TDS (mg/l)			1710	422		26		372

Table 4: Farm Dams

	FD4	FD5	FD6	FD7	FD11	FD13	FD16	FD18	FD21	FD25	FD26	FD27
pH	8.65	8.84	8.55	9.47	8.5		8.7	8.47	9.54	9.3	8.6	8.84
EC (uS/cm)	252	85	156	97	241		98	1450	271	145	266	282
Cu (mg/l)	0.03	0.02	0.008	0.015	0.07		0.029	0.01	0.01	0.010	0.022	0.013
TDS (mg/l)			1710	422		26	372					

Table 5: TSF Bores

	MB1	MB2	MB3	MB5	MB6b
pH	7.33	7.28	6.75	6.97	7.18
EC (us/cm)	5470	9610	22030	23960	11890
Cu (mg/L)	0.032	0.011	0.026	0.012	0.003

Table 6: Opencut Bores

	W14	W19	W20	W21	W22	W23	W24	W25
pH	7.16	7.83	7.33	7.8	7.16	7.7	8.39	8.65
EC (us/cm)	10110	5490	14500	13300	17750	15350	1639	1455
Cu (mg/L)	0.012	0.015	0.014	0.016	0.016	0.06	0.008	0.011

Table 7: Underground Bores

	P101	P102	P103	P139	P145	P149	MB17	MB18	MB19	MB20
pH	7.7	6.98	9.37	7.2	8.81	6.89	7.95	8.35	7.8	7.7
EC (us/cm)	9717	25006	24547	28400		28200	849		8060	11230
Cu (mg/L)	0.037	0.042	0.014	0.005	0.012	0.128	0.018	0.151	0.022	0.038

Table 8: Regional Bores

	Far Hillier	Wright	Moss
pH	7.5	7.73	7.47
EC (us/cm)	449	743	2372
Cu (mg/L)	0.017	0.032	0.042

4. NOISE AND VIBRATION

Operational noise is managed by CMOC in accordance with the approved Noise Management Plan (NMP). The NMP covers all operational activities with the potential to generate noise at Northparkes. It details specific noise management and mitigation measures, outlines monitoring and reporting requirements and provides clear definition of the roles and responsibilities for noise management.

4.1 Overview

CMOC undertakes a noise monitoring program at four locations on privately owned properties outside the mining leases. The program consists of both operator-attended and unattended surveys at the four nearest occupied residences 'Hubberstone', 'Milpose', 'Lone Pine' and 'Hillview'.

Operator-attended noise measurements and recordings are undertaken at four locations on privately owned properties outside the mining leases in order to quantify the intrusive noise emissions from construction and of general mine activity as well as the overall level of ambient noise. This noise monitoring was undertaken by an independent and suitably qualified noise professional.

4.2 Quarterly Monitoring Analysis

Attended noise monitoring was undertaken from the 20th to the 22nd of September 2017 during favourable atmospheric conditions. Several measurements were impacted by non-NPM related noise, specifically, insect noise. Nevertheless, attended noise monitoring results indicate that noise emissions from the mine site comply with the project approval criteria. A summary of the monitoring results at each monitoring location are presented in Tables 9-11 below.

Table 9: Attended noise monitoring results (daytime)

<i>Location</i>	<i>Date and Time</i>	<i>L_{A1}</i> <i>dB</i>	<i>L_{A10}</i> <i>dB</i>	<i>L_{Aeq}</i> <i>dB</i>	<i>L_{A90}</i> <i>dB</i>	<i>Compliance?</i>	<i>Notes</i>
Hillview	20/09/17 12:50	40	35	32	27	Yes	Wind gusts. Occasional truck noise.
	20/09/17 13:49	39	34	33	29	Yes	Continuous bird and insect noise. Mine inaudible.
	20/09/17 14:07	39	35	33	29	Yes	
Hubberstone	20/09/17 14:53	41	38	31	34	Yes (adj.)	Wind gusts. Continuous bird and insect noise necessitating adjustment. Mine audible.
	20/09/17 15:14	44	41	33	36	Yes (adj.)	
	20/09/17 15:34	43	41	35	37	Yes (adj.)	
Milpose	20/09/17 17:44	38	30	28	21	Yes	Mine inaudible. Continuous frog noise.
	21/09/17 17:08	45	43	27	29	Yes (adj.)	

	21/09/17 17:33	46	45	27	31	Yes (adj.)	Mine barely audible. Continuous insect noise necessitating adjustment. Occasional domestic and bird noise.
Lonepine	20/09/17 16:06	42	37	28	33	Yes (adj.)	Continuous bird and insect noise necessitating adjustment. Mine inaudible.
	21/09/17 16:42	45	37	29	31	Yes (adj.)	
	21/09/17 17:00	49	46	28	34	Yes (adj.)	

Table 10: Attended noise monitoring results (evening)

<i>Location</i>	<i>Date and Time</i>	<i>L_{A1} dB</i>	<i>L_{A10} dB</i>	<i>L_{Aeq} dB</i>	<i>L_{A90} dB</i>	<i>Compliance?</i>	<i>Notes</i>
Hillview	20/09/17 20:00	37	24	25	15	Yes	Continuous insect noise. Mine inaudible.
	20/09/17 20:23	34	21	24	16	Yes	
	20/09/17 20:42	37	26	24	14	Yes	
Hubberstone	21/09/17 19:51	33	31	29	26	Yes	Continuous frog noise. Mine inaudible.
	21/09/17 20:10	31	29	27	25	Yes	
	21/09/17 20:34	31	25	27	22	Yes	
Milpose	21/09/17 18:41	41	38	34	25	Yes	Continuous frog noise. Mine inaudible.
	21/09/17 19:01	41	38	34	25	Yes	
	21/09/17 19:21	41	38	34	25	Yes	
Lonepine	20/09/17 18:11	55	54	27	51	Yes (adj.)	Continuous bird, insect and frog noise necessitating adjustment. Occasional dog barking. Mine inaudible.
	20/09/17 18:45	53	52	26	47	Yes (adj.)	
	20/09/17 19:05	49	47	27	40	Yes (adj.)	

Table 11: Attended noise monitoring results (night)

<i>Location</i>	<i>Date and Time</i>	<i>L_{A1} dB</i>	<i>L_{A10} dB</i>	<i>L_{Aeq} dB</i>	<i>L_{A90} dB</i>	<i>Compliance?</i>	<i>Notes</i>
Hillview	22/09/17 01:53	32	20	22	18	Yes	Mine barely audible.
	22/09/17 02:10	33	20	22	18	Yes	
	22/09/17 02:26	35	22	23	19	Yes	
Hubberstone	21/09/17 22:00	35	25	24	17	Yes	

	21/09/17 22:27	28	21	19	15	Yes	Occasional dog barking.
	21/09/17 22:45	40	22	26	15	Yes	Continuous frog noise. Mine inaudible.
Milpose	22/09/17 00:39	40	37	34	27	Yes	Continuous frog noise. Mine slightly audible.
	22/09/17 00:56	42	38	35	26	Yes	
	22/09/17 01:13	47*	43	27	28	Yes (adj.)*	
Lonepine	21/09/17 23:20	46*	23	30	14	Yes (adj.)*	Occasional dog barking.
	21/09/17 23:42	34	20	23	14	Yes	
	22/09/17 00:01	28	15	19	14	Yes	