





Northparkes Mines
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1 April to 30 June 2018 - Quarter 2 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, (as modified)

Reviewed by	Chase Dingle
Title	Superintendent – Environment, Community and Farms
Date	02/08/2018
Signature	
Approved by	Stacey Kelly
Title	Manager – People, Safety and Environment
Date	02/08/2018
Signature	

1. SCOPE OF REPORT

This report provides a summary of monitoring results for the period from 1 April 2018 to 30 June 2018. 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.

During the reporting period there were three elevated 24hr criteria readings recorded at various monitoring locations. All recordings triggered the internal investigation process and were found to be caused by external factors and deemed non-mine related. The high readings at Hillview on April 13th and Hubberstone on Jun 7th were most likely caused by the recorded agricultural activities (crop sowing) occurring within the vicinity of the monitoring locations. A localised dust storm on 14th April most likely caused the elevated reading at the Milpose monitoring location. The missing data for Hubberstone was due to a localised power outage.

The annual average PM₁₀ levels recorded at all PM₁₀ monitoring locations are below the predicted levels within the EA (30 µg/m³).

Hubberstone PM₁₀ Results for Q2 2018

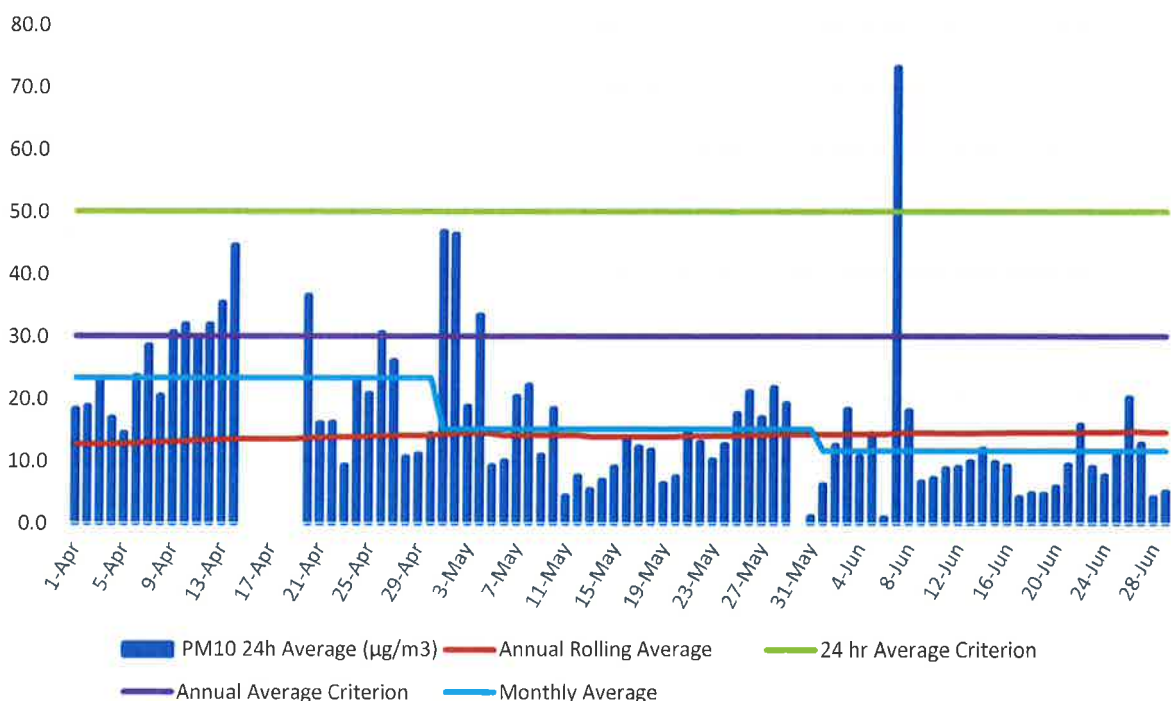


Figure 1: Hubberstone

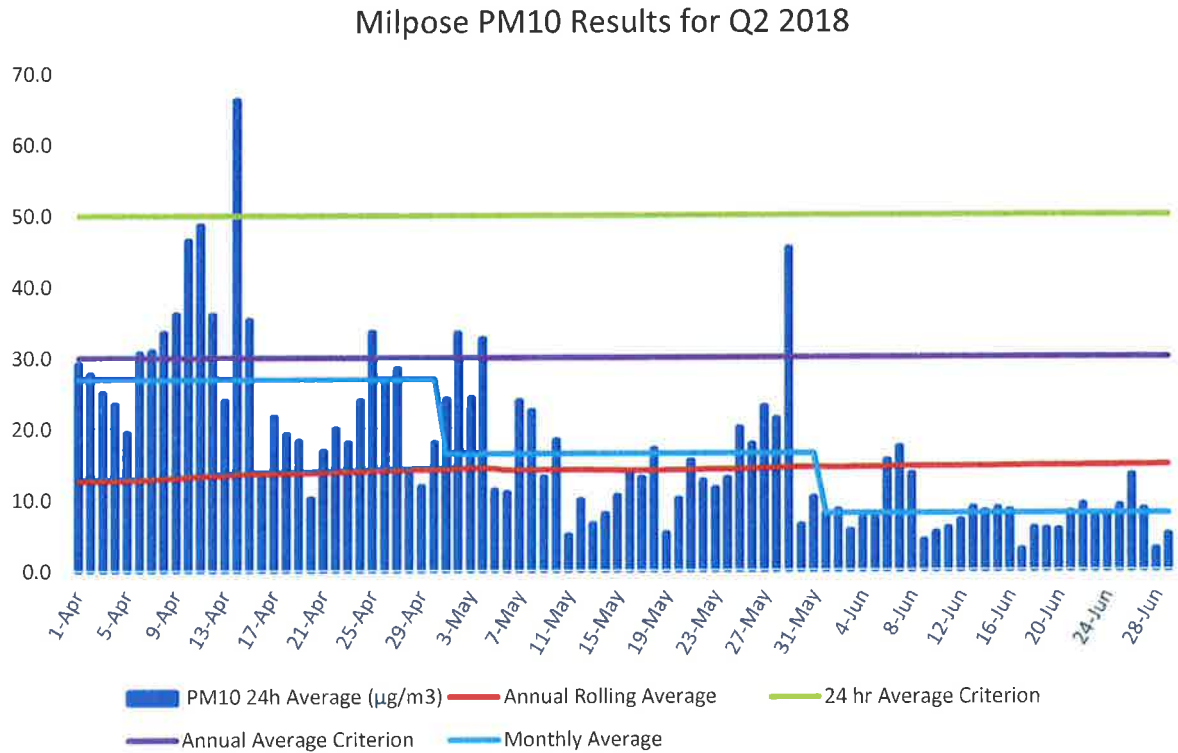


Figure 2: Milpose

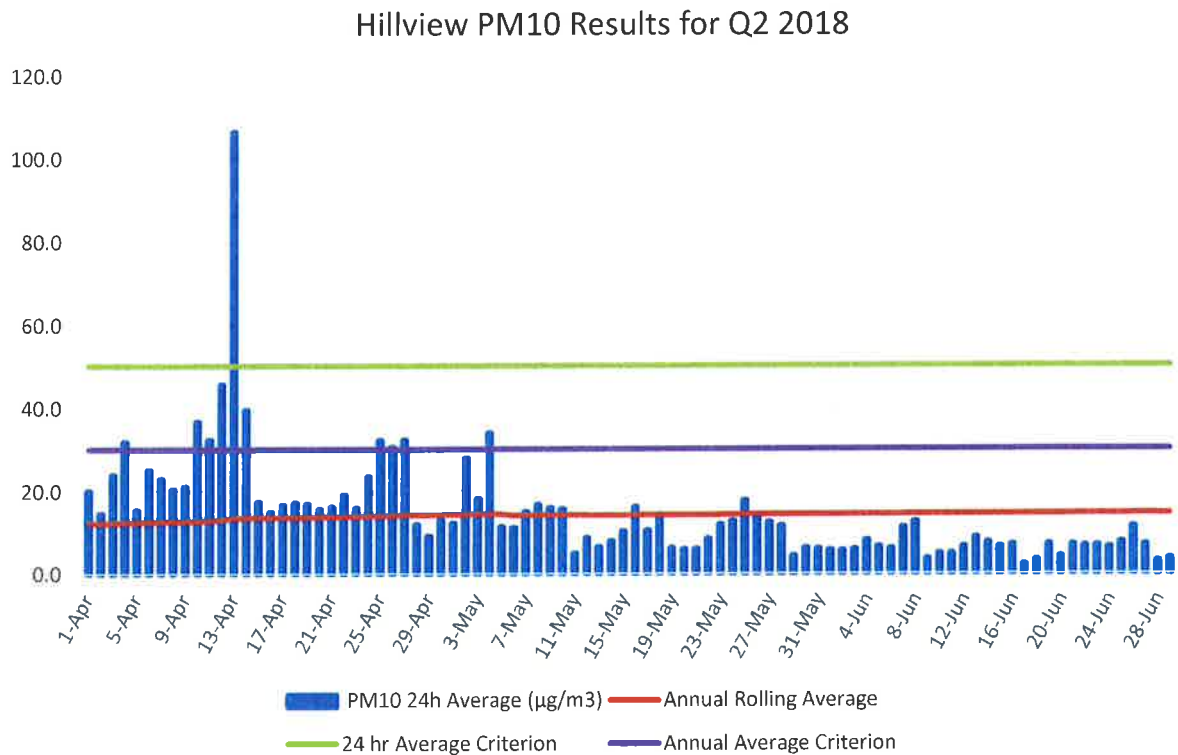


Figure 3: Hillview

2.2 TSP

All recorded dust levels at all TSP monitoring locations were under the required annual criteria set by the Approval ($90 \mu\text{g}/\text{m}^3$) for the Q2 2018 monitoring period. Elevated results during the month of April are most likely attributed to increased agricultural activities within the local area. Results are presented in Figure 4, Figure 5 and Figure 6 respectively. The missing data for Hubberstone was due to a localised power outage.

Hubberstone Q2 2018 TSP results

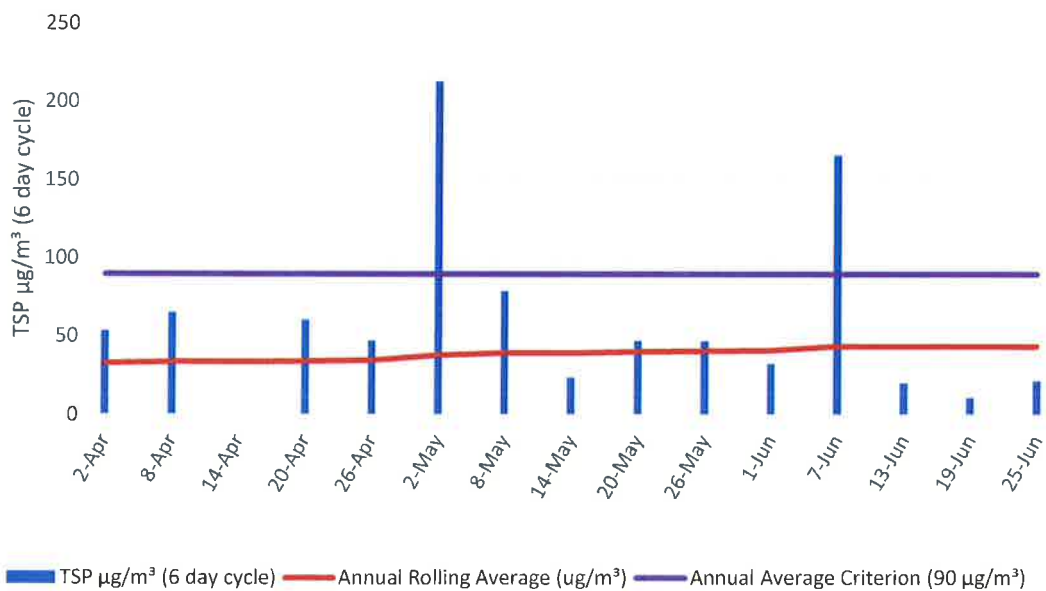


Figure 4: Hubberstone

Milpose Q2 2018 TSP results

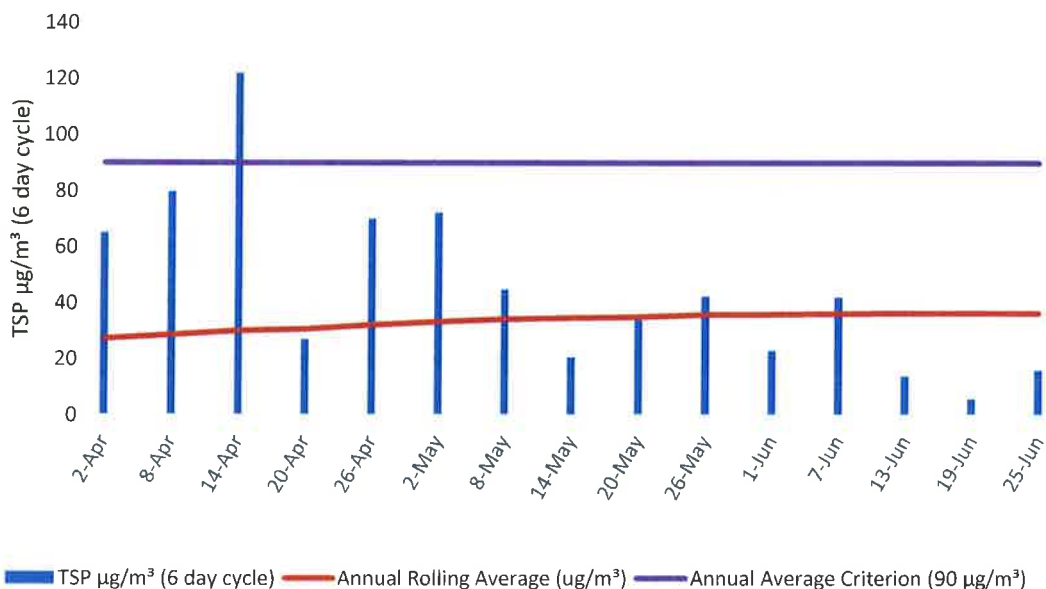


Figure 5: Milpose

Hillview Q2 2018 TSP results

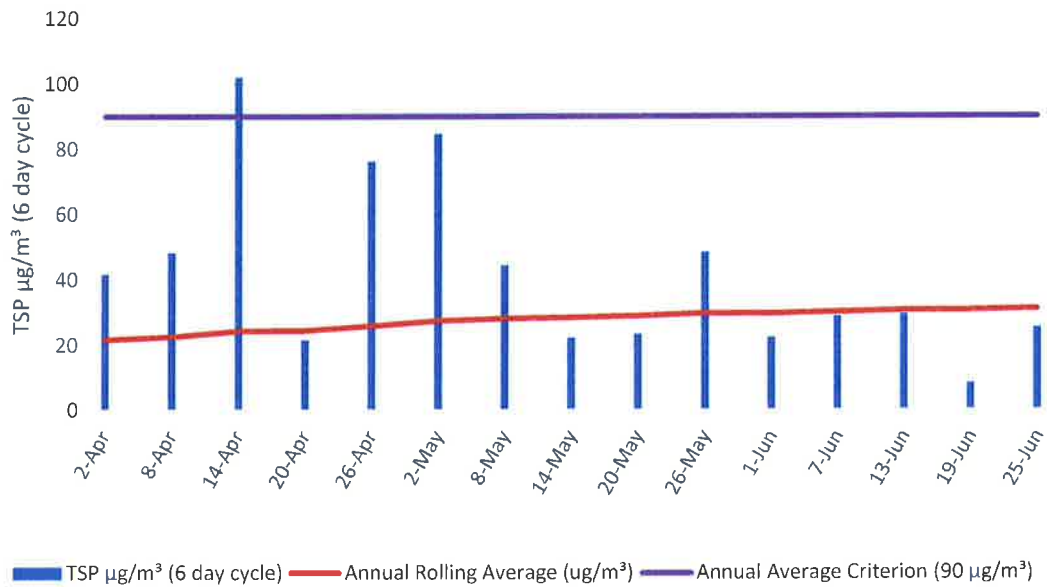


Figure 6: Hillview

2.3 Depositional Dust

Depositional dust gauges record the total of deposited dust for a month long period and are a 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 annual average for all locations are below the long-term impact assessment criteria, complying with the conditions of the Approval.

Monitoring location TDE is located adjacent to seasonal cropping paddocks, which during agricultural activities (weed seed burning, sowing and harvesting), generally experiences higher than average depositional dust levels. The two higher results in April and May during the reporting period coincided with these practices. The elevated readings for TDN5 in May and June were most likely attributed to a combination of increased vehicle movement of timber logging trucks on the adjacent gravel road and agricultural activities in the paddock across the road from the monitoring location.

Depositional Dust Results for April 2018

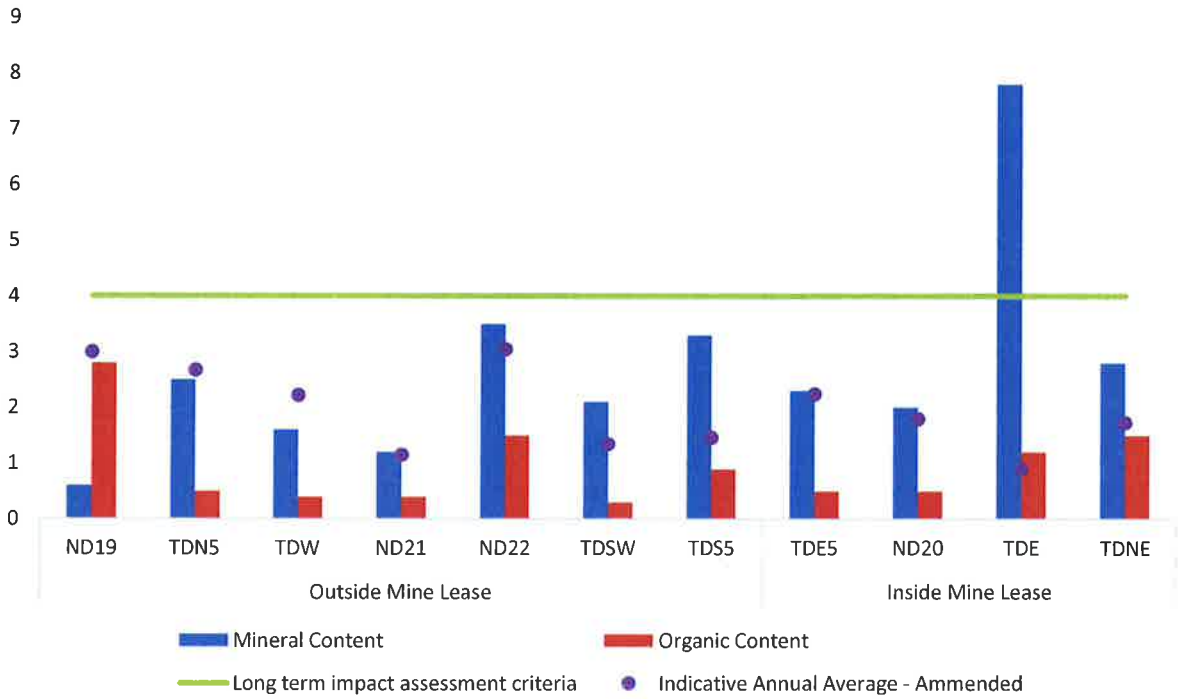


Figure 7: April depositional dust results for all locations

Depositional Dust Results for May 2018

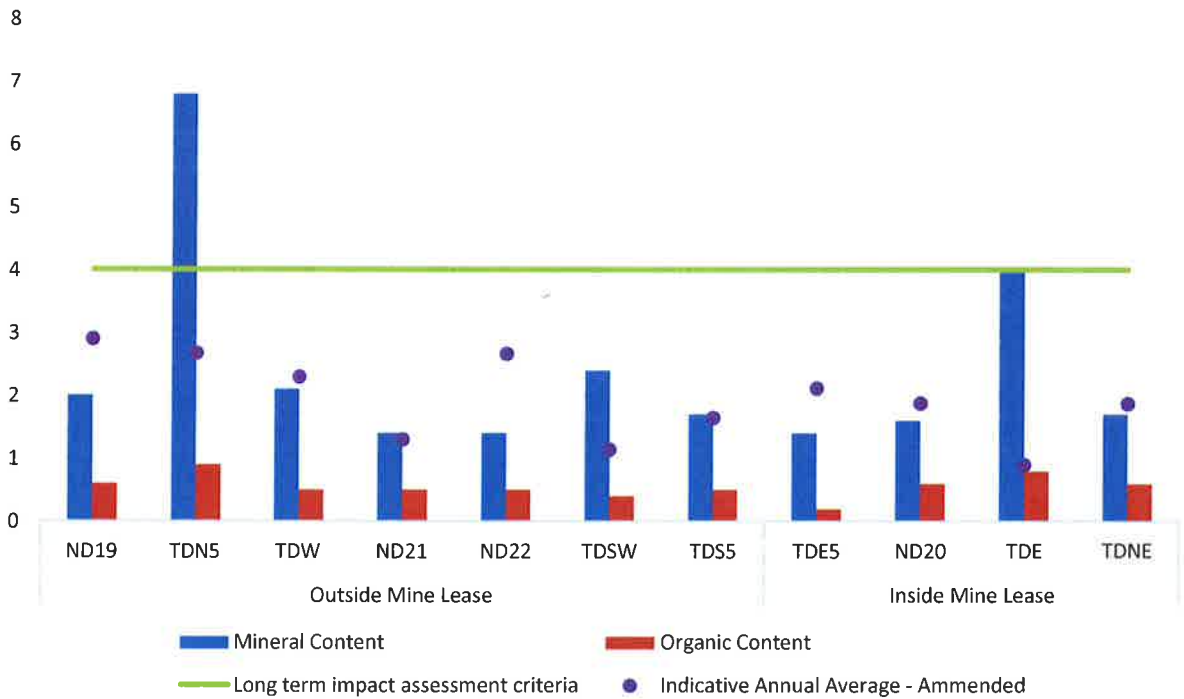


Figure 8: May depositional dust results for all locations

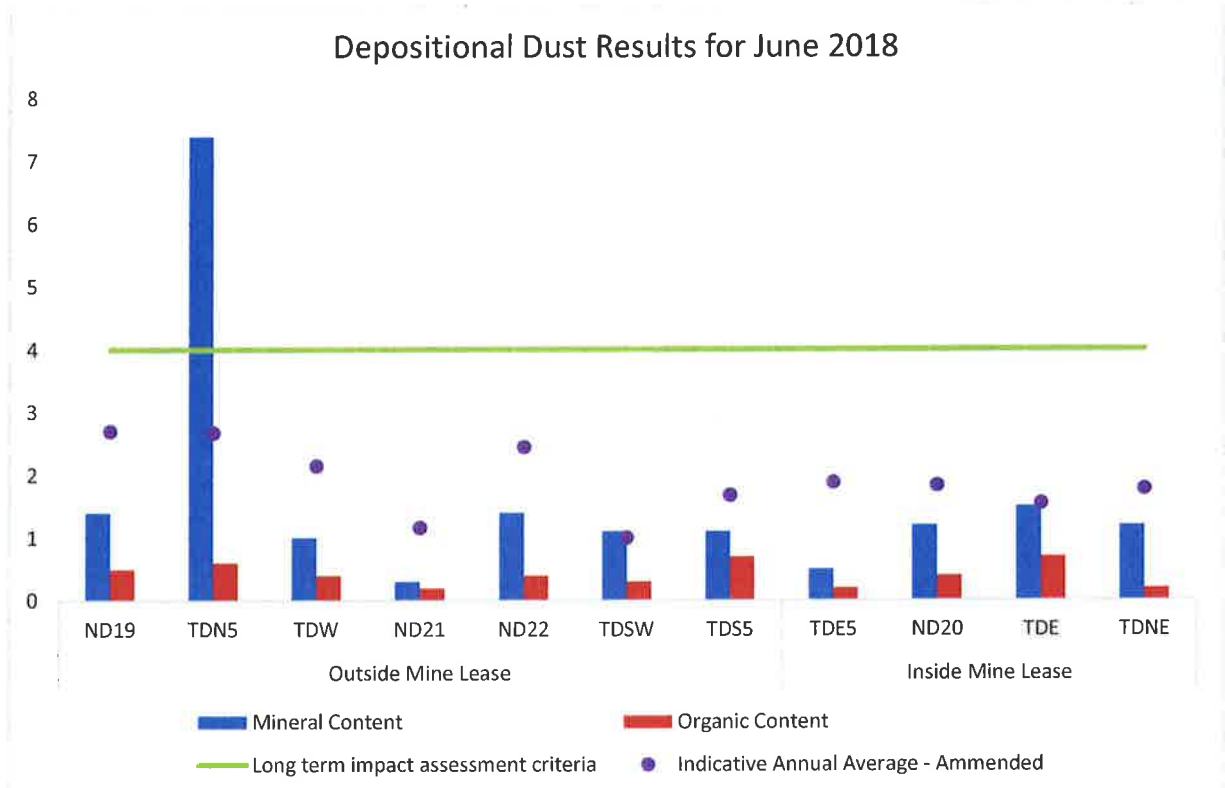


Figure 9: June depositional dust results for all locations

3. WATER

3.1 Overview

Water management at Northparkes is undertaken in accordance with approved management plans, prepared in accordance with the 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 location sampled are presented in Tables 1-8 below.

Table 1: Process Water System

	RP1	RP2	RP3	RP4	RP5	RP09	RP13	RP15	RP20	RP21	RP27	RP32	RP33	GT1	GT2	FWD	SD2	CALLOOLA PIT
pH	8.41	9.21	8.33	8.2	8.65	8.32	8.31	8.36	8.51	8.23	8.28	9.26	8.65	8.31	8.26	8.41	9.05	9.01
EC (µS/cm)	467	2041	6455	757	712	5317	419	2711	7701	2498	4595	11173	276	3533	1850	1763	7756	7558
Cu (mg/L)	0.036	0.018	0.09	0.539	0.013	0.014	0.129	0.045	0.028	0.02	0.016	0.018	0.008	0.064	0.127	0.033	0.114	0.01

Table 2: Sediment Ponds

	SP3	SP10
pH	9.12	9.26
EC (µS/cm)	2282	388
Cu (mg/L)	0.01	0.02

Table 3: Watercourses

	WC12
pH	8.07
EC (µS/cm)	227
Cu (mg/L)	0.022

Table 4: Farm Dams

	FD4	FD5	FD6	FD7	FD11	FD16	FD18	FD21	FD25	FD26	FD27
pH	8.8	8.47	8.7	8.43	8.8	8.2	8.27	9.09	8.83	8.68	9.08
EC (µS/cm)	570	240	206	175	516	231	2454	521	383	741	555
Cu (mg/L)	0.008	0.009	0.013	0.017	0.012	0.036	0.013	0.013	0.012	0.007	0.009

Table 5: TSF Bores

	MB1	MB2	MB3	MB5	MB6b	W26	W27	W28	W29	W30	W31	W32	W33	W34	W35
pH	7.53	7.3	6.31	6.96	7.1	7.01	11.96	7.23	13.15	7.66	7.92	12.09	7.66	4.98	7.55
EC (µS/cm)	5428	10558	23976	25542	13259	16729	20559	17924	21808	2025	804	2345	6441	16870	1611
Cu (mg/L)	0.006	0.006	0.04	0.009	0.011	0.014	0.007	0.013	0.034	0.006	0.013	0.01	0.027	0.023	0.01

Table 6: Opencut Bores

	MB10	MB13	MB14	MB16	W14	W19	W20	W21	W22	W23	W24	W25
pH	7.2	6.96	7.38	6.85	7.42	7.7	7.24	11.05	7.24	7.69	8.18	8.27
EC (uS/cm)	13919	23995	2265	16484	9759	5988	14828	13752	18318	18353	1933	1391
Cu (mg/L)	0.008	0.02	0.007	0.017	0.008	0.008	0.006	0.006	0.01	0.009	0.011	0.018

Table 7: Underground Bores

	P101	P102	P103	P104	P139	P145	P149	MB17	MB18	MB19	MB20
pH	7.63	7.42	9.57	10.25	6.64	7.85	6.97	7.99	8.34	7.68	7.95
EC (uS/cm)	11675	29341	26243	17981	30279	208	28281	948	473	14552	12482
Cu (mg/L)	0.002	0.009	0.002	0.001	0.01	0.008	0.017	0.009	0.122	0.008	0.02

Table 8: Regional Bores

	Far Hillier	Wright	Moss
pH	6.79	7.16	7.27
EC (uS/cm)	446	781	2385
Cu (mg/L)	0.002	0.01	0.005

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 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 on the 20th and 21st of June 2018. Weather conditions for all noise monitoring periods were during favourable conditions and adequate noise measurements were obtained for this period. Attended noise monitoring results indicate 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)

Location	Date and Time	L _{A1} dB	L _{A10} dB	L _{Aeq} dB	L _{A90} dB	Compliance?	Notes
Hillview	20/06/2018 13:32	37.6	32.4	30.1	24.4	Yes	
	20/06/2018 13:48	40.9	33.6	32.9	24.1	Yes	Bird noise Wind gusts Mine not audible
	20/06/2018 14:07	35.0	30.3	28.2	28.2	Yes	
Hubberstone	20/06/2018 15:32	42.0	34.5	32.0	25.7	Yes	
	20/06/2018 15:46	38.6	32.3	30.0	24.2	Yes	Bird noise Mine not audible
	20/06/2018 16:01	30.9	32.9	30.4	26.1	Yes	

Milpose	20/06/2018 17:15	34.4	28.2	25.3	16.8	Yes	
	20/06/2018 17:30	31.5	26.8	23.3	17.0	Yes	Dog barking Mine not audible
	20/06/2018 17:45	33.5	25.4	23.0	15.2	Yes	
Lonepine	20/06/2018 14:20	46.2	32.5	34.1	26.2	Yes	
	20/06/2018 14:35	42.3	33.4	32.2	27.1	Yes	Dog barking Bird noise Mine not audible
	20/06/2018 14:50	38.4	34.8	32.4	27.2	Yes	

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	20/06/2018 19:25	28.6	23.7	19.7	13.9	Yes	
	20/06/2018 19:41	28.3	18.3	18.9	13.6	Yes	Mine not audible
	20/06/2018 19:56	25.6	20.7	17.7	13.8	Yes	
Hubberstone	21/06/2018 19:53	27.4	19.5	19.5	16.4	Yes	
	21/06/2018 20:13	27.5	21.9	21.4	18.5	Yes	Mine not audible
	21/06/2018 20:30	28.0	22.8	22.4	17.7	Yes	
Milpose	20/06/2018 18:02	33.4	24.7	23.3	16.2	Yes	
	20/06/2018 18:18	32.5	35.2	23.1	18.2	Yes	Dogs barking Mine not audible
	20/06/2018 18:35	36.7	27.9	25.5	17.1	Yes	

Lonepine	21/06/2018 21:13	32.2	23.7	21.5	13.7	Yes	
	21/06/2018 21:30	36.7	26.8	24.5	14.5	Yes	Mine not audible
	21/06/2018 21:45	35.1	24.0	24.0	15.0	Yes	

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	21/06/2018 0:40	33.9	29.8	26.7	21.4	Yes	
	21/06/2018 0:55	32.0	27.3	24.6	19.8	Yes	Mine not audible
	21/06/2018 1:10	31.6	27.5	25.5	22.7	Yes	
Hubberstone	21/06/2018 1:35	31.3	26.5	26.1	23.2	Yes	
	21/06/2018 1:50	31.2	28.2	26.3	23.2	Yes	Mine barely audible
	21/06/2018 2:05	30.5	27.6	25.9	22.7	Yes	
Milpose	21/06/2018 23:27	27.5	24.6	22.6	19.5	Yes	
	21/06/2018 23:42	32.2	27.2	25.4	22.1	Yes	Mine not audible
	21/06/2018 23:57	32.7	27.3	24.9	19.5	Yes	
Lonepine	21/06/2018 22:35	33.8	18.2	21.9	14.0	Yes	
	21/06/2018 22:50	28.0	18.8	18.4	15.0	Yes	Mine not audible
	21/06/2018 23:05	29.1	19.2	19.1	15.2	Yes	