


# 1 January 2022 – 31 March 2022 Environmental Monitoring Results Summary

Name of Mine	Northparkes Mines
Name of Leaseholder and Mine Operator	CMOC Mining Pty Ltd
Mining Leases	ML1247, ML1367, ML1641 AND ML1743
Environment Protection Licence	EPL 4784
Development Consent	DC11_0060 (as modified)

Reviewed by	Chris Higgins
Title	Superintendent – Environment & Farms
Date	
Signature	
Approved by	Stacey Kelly
Title	Manager – People, Safety & Environment
Date	11 MAY 2022
Signature	

## 1. SCOPE OF REPORT

This report provides a summary of monitoring results for the period from 1 January to 31 March 2022. This monitoring is undertaken in accordance with the Environmental Monitoring Program (available at [www.northparkes.com.au](http://www.northparkes.com.au)). Details of air quality, noise, water and vibration monitoring locations are available in the Environmental Monitoring Program. Refer to appendix A for all monitoring location maps.

## 2. AIR QUALITY

The air quality monitoring program utilises PM<sub>10</sub> (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 PM<sub>10</sub> monitoring have been undertaken at three nearby farm residences Hubberstone, Milpose and Hillview. A summary of the monitoring results are provided below.

### 2.1 PM<sub>10</sub>

PM<sub>10</sub> 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 Development Consent DC11\_0060, known as the Consent), are >30 µg/m<sup>3</sup> for the annual average and >50 µg/m<sup>3</sup> for a 24-hour monitoring period.

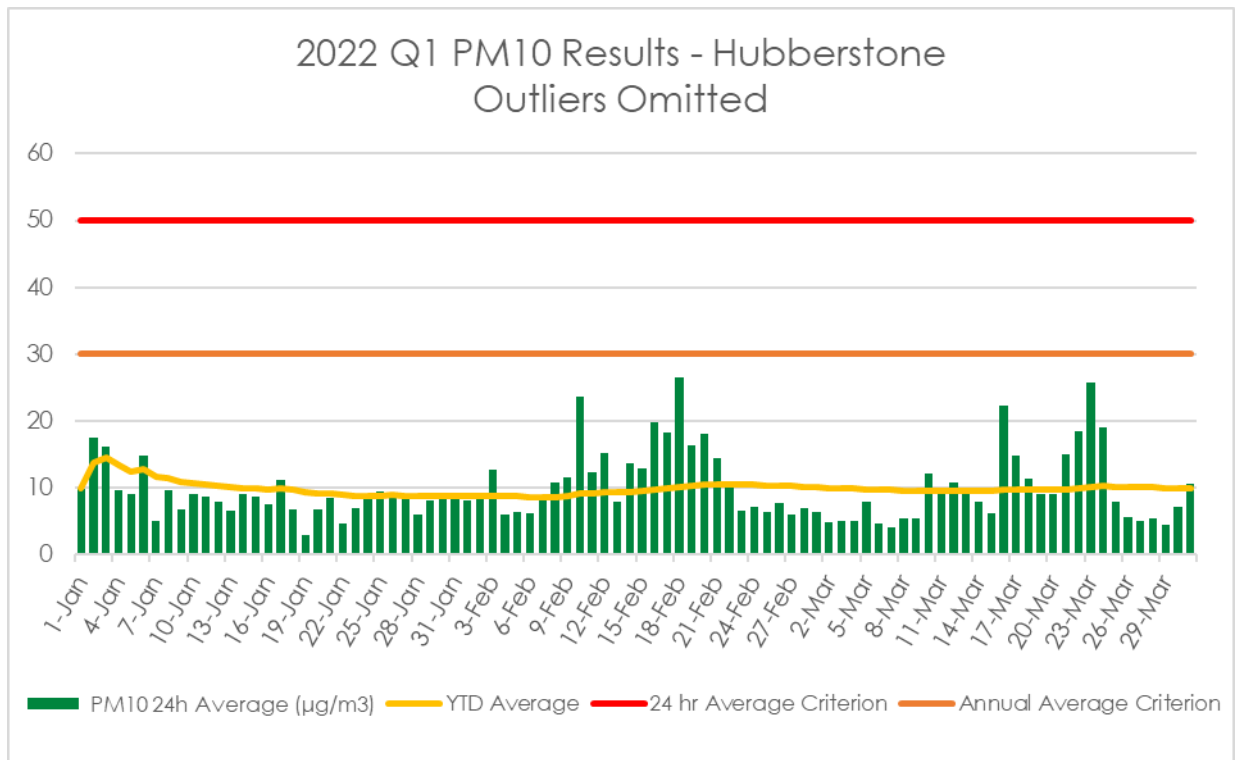
During the reporting period, Hillview recorded an elevated result of 241.2 µg/m<sup>3</sup> on 17 January. The cause of the result was identified as a power surge at the property, which affected the monitoring unit. Winds during this period were from the west south west, not corresponding with the direction of the mining lease. The result has since been omitted from the dataset.

During the reporting period no exceedances of the Consent criteria were recorded.

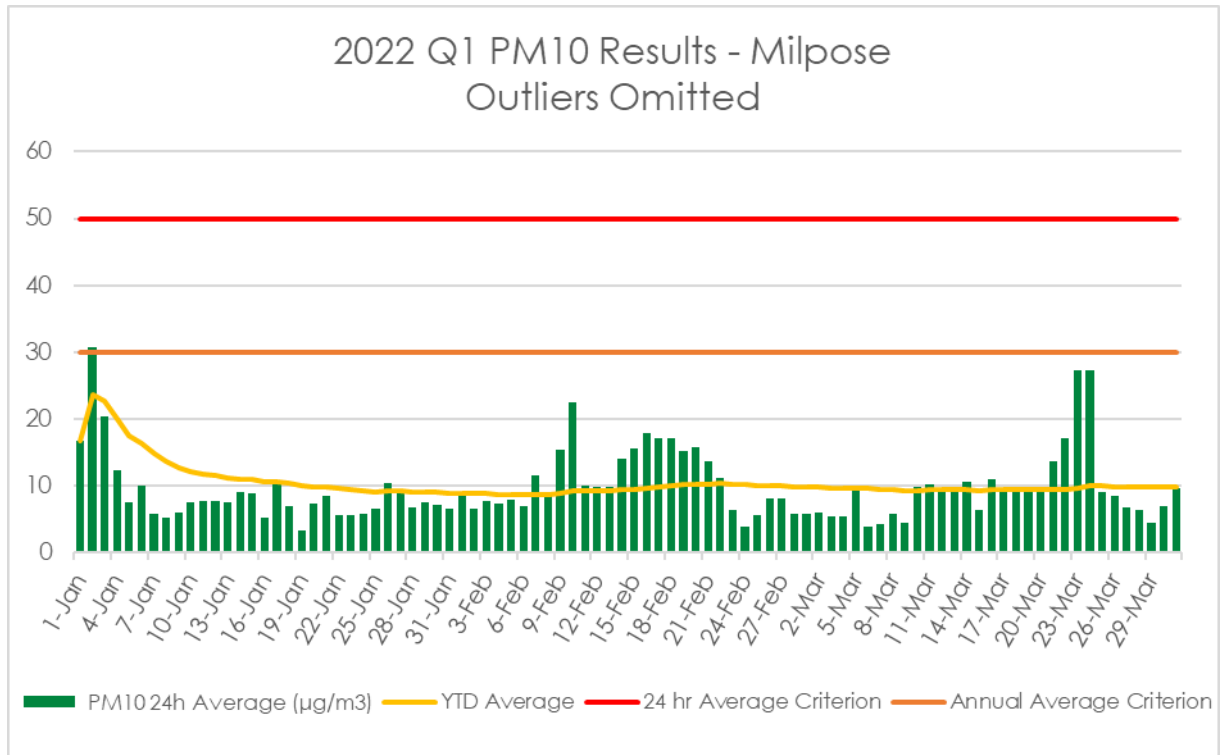
#### **Annual Averages:**

Annual averages recorded at all monitoring locations are below the Consent criteria of 30 µg/m<sup>3</sup>, recording:

- 9.9 µg/m<sup>3</sup> at Hubberstone
- 9.7 µg/m<sup>3</sup> at Milpose, and
- 9.9 µg/m<sup>3</sup> at Hillview.



**Figure 1:** Hubberstone



**Figure 2:** Milpose

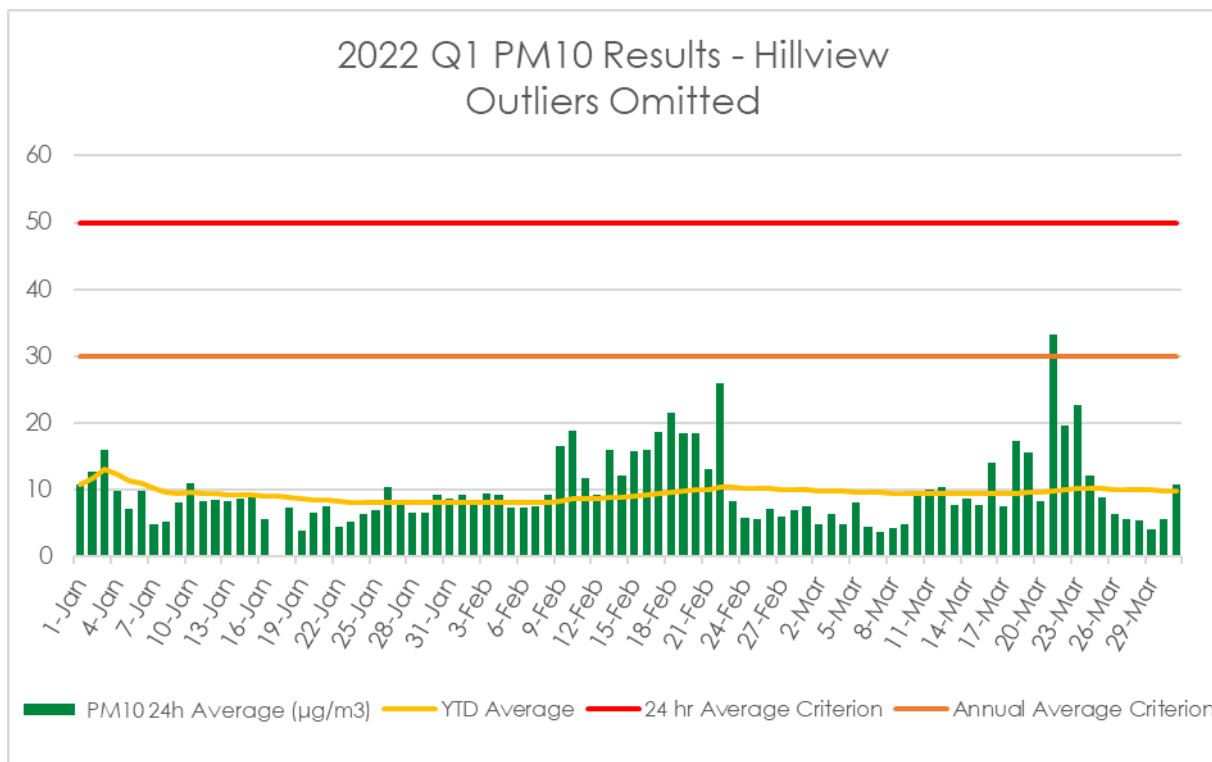


Figure 3: Hillview

## 2.2 TSP

Hubberstone, Milpose and Hillview all recorded dust levels at the TSP monitoring locations under the required average annual criteria set by the Consent ( $90 \mu\text{g}/\text{m}^3$ ) for the quarter for the reporting period.

Missing results at Hillview and Milpose during the months of January and February are a result of instrumentation malfunction. With ongoing pandemic concerns, a qualified person was unable to inspect and resolve the issues with the monitoring equipment until the following month. The issues are being progressively resolved.

During the reporting period no exceedances of the Consent criteria were recorded.

### Annual Averages:

Annual averages recorded at all monitoring locations are significantly below the Consent criteria of  $90 \mu\text{g}/\text{m}^3$ , recording:

- $25.5 \mu\text{g}/\text{m}^3$  at Hubberstone
- $22.7 \mu\text{g}/\text{m}^3$  at Milpose, and
- $21.0 \mu\text{g}/\text{m}^3$  at Hillview.

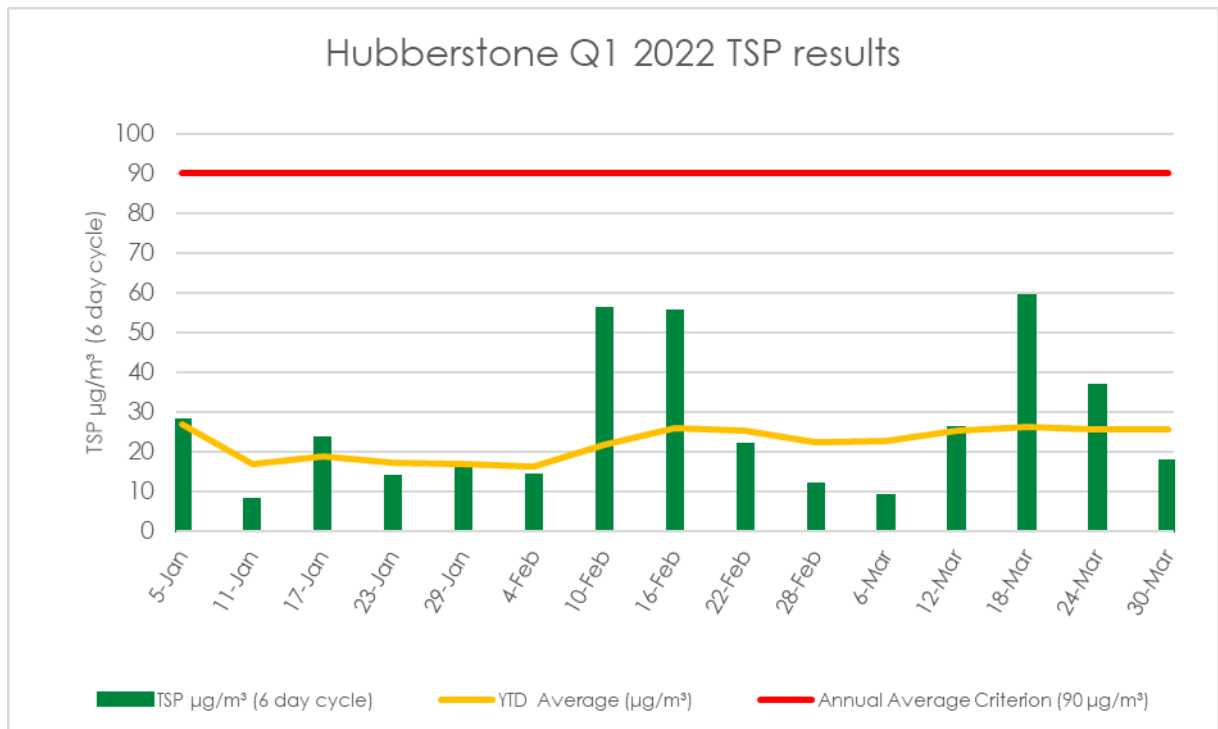


Figure 4: Hubberstone

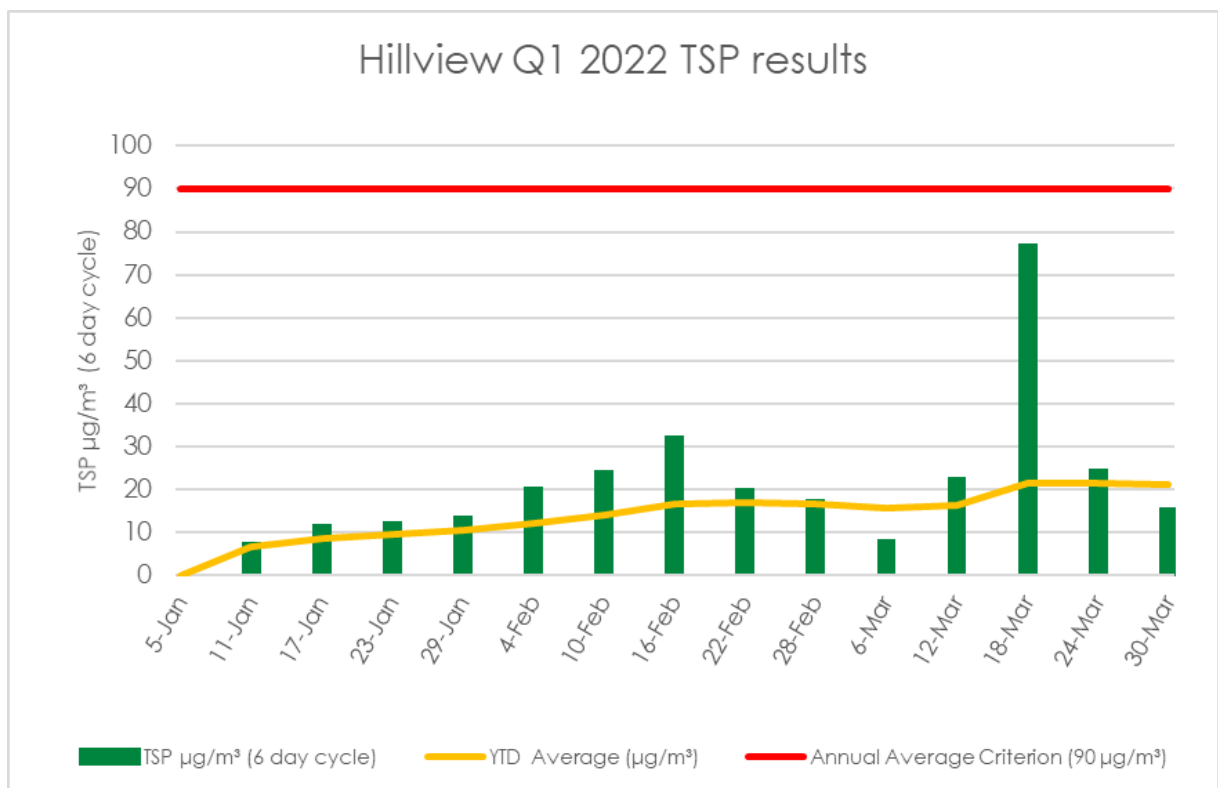
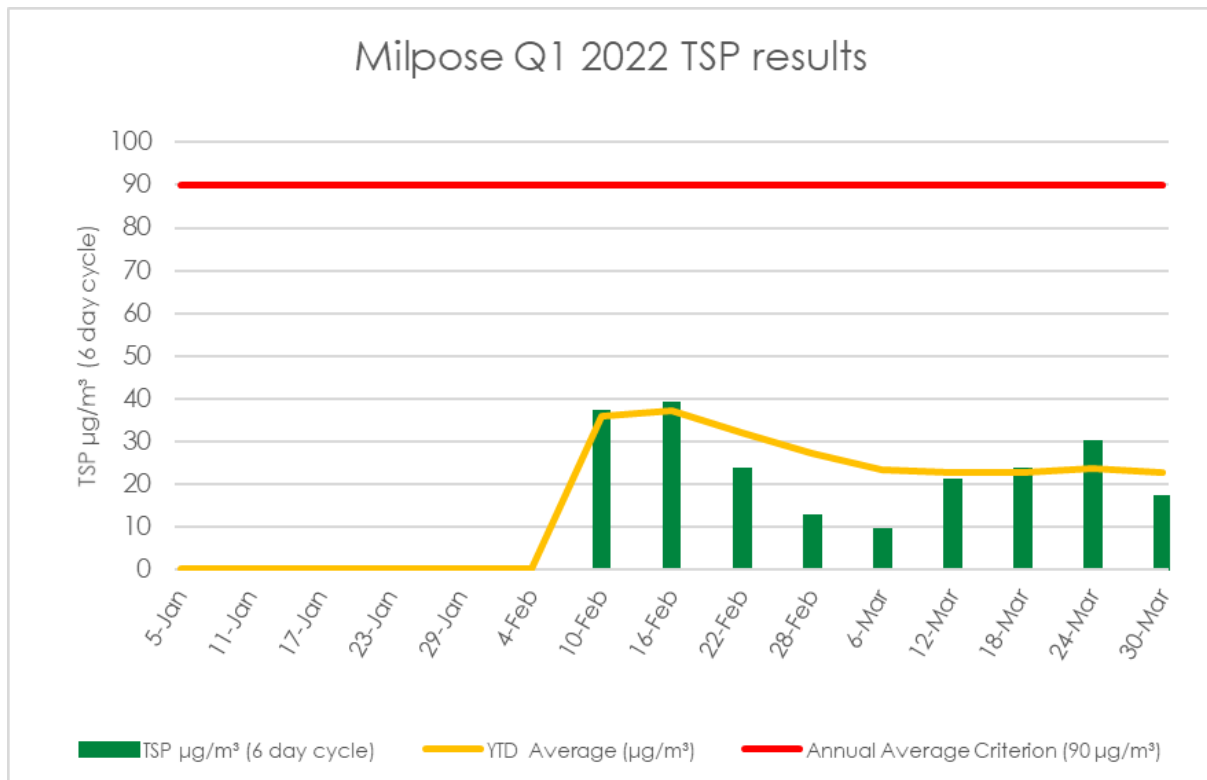


Figure 5: Milpose



**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.

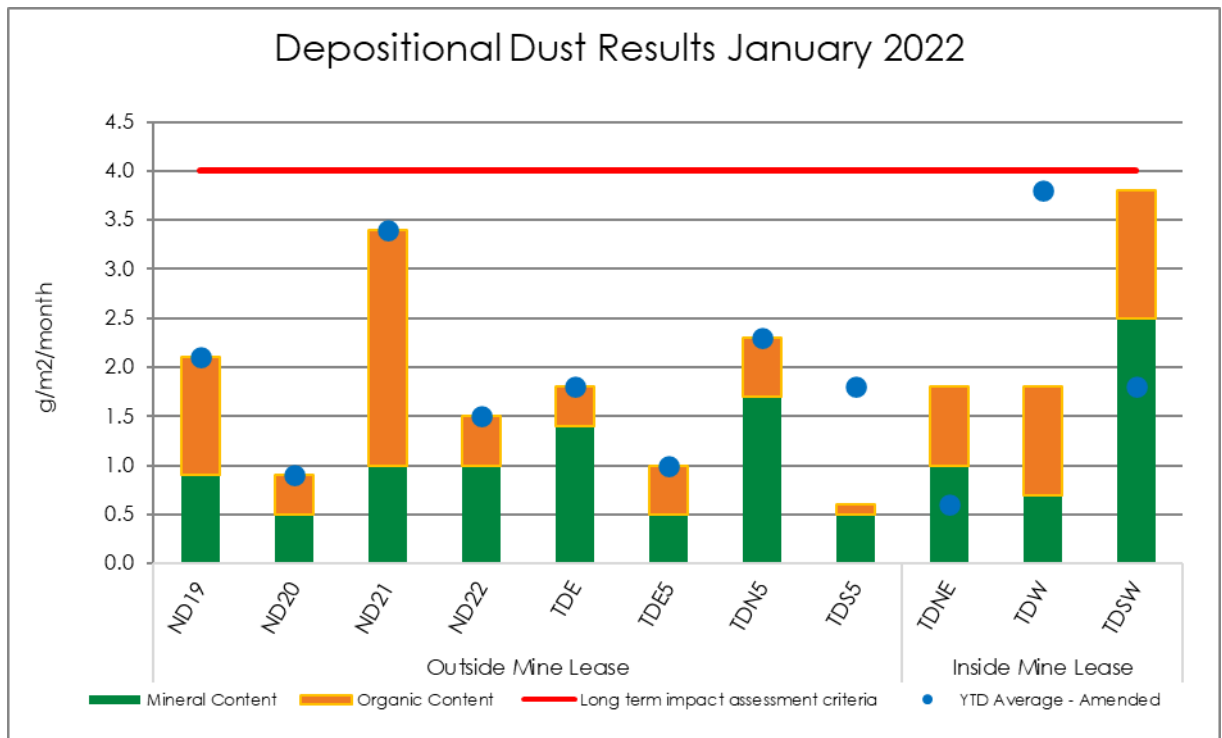
Eleven depositional dust gauges are located across the mining lease and neighbouring residential properties to monitor atmospheric dust. A summary of the monthly monitoring results at each monitoring location are presented the figures below. Please be advised that only monitoring locations ND19, ND20, ND21 & ND22 are regulated by the criteria stated in the Consent, as they are the only depositional dust gauges that are at a residence on privately-owned land. All other depositional dust gauges are used to inform operational activities.

The indicative annual average for all locations are below the long-term impact assessment criteria (4 g/m<sup>2</sup>/month), complying with the conditions of the Consent.

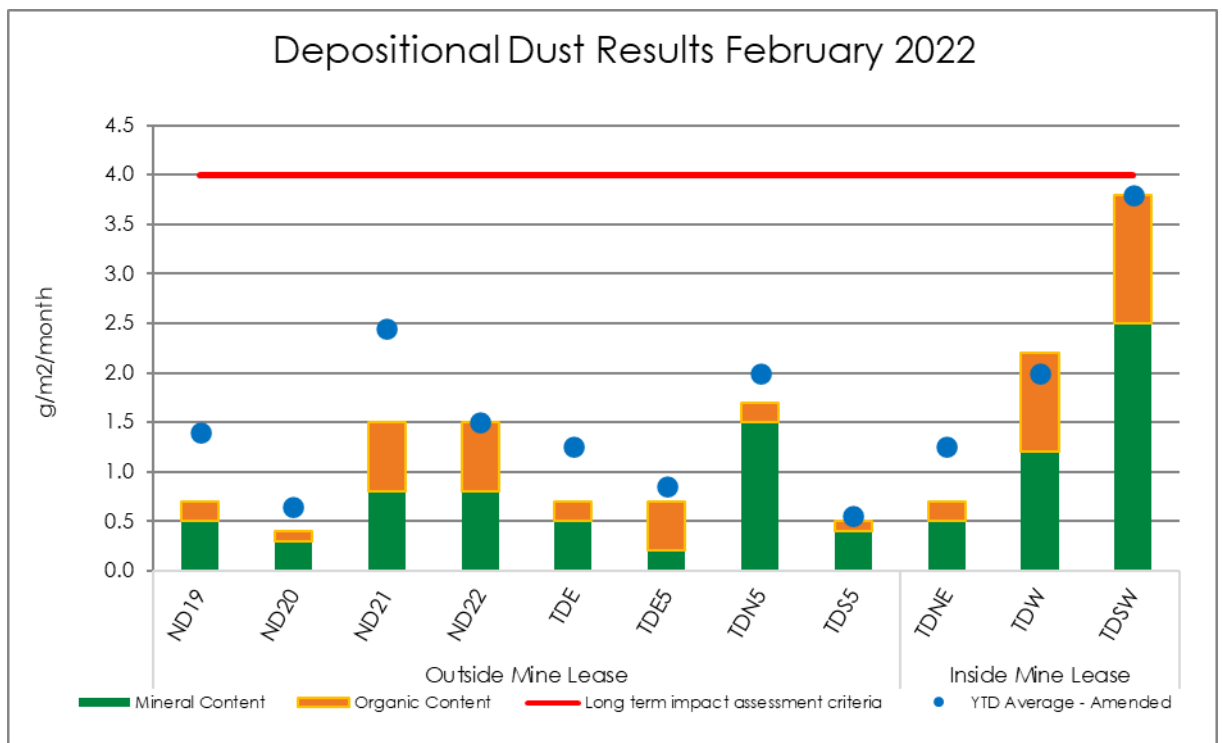
During the quarter, only TDE recorded results above the internal trigger level of 4.0 g/m<sup>2</sup>/month during March. An internal investigation was undertaken for this result and is detailed below.

### TDE

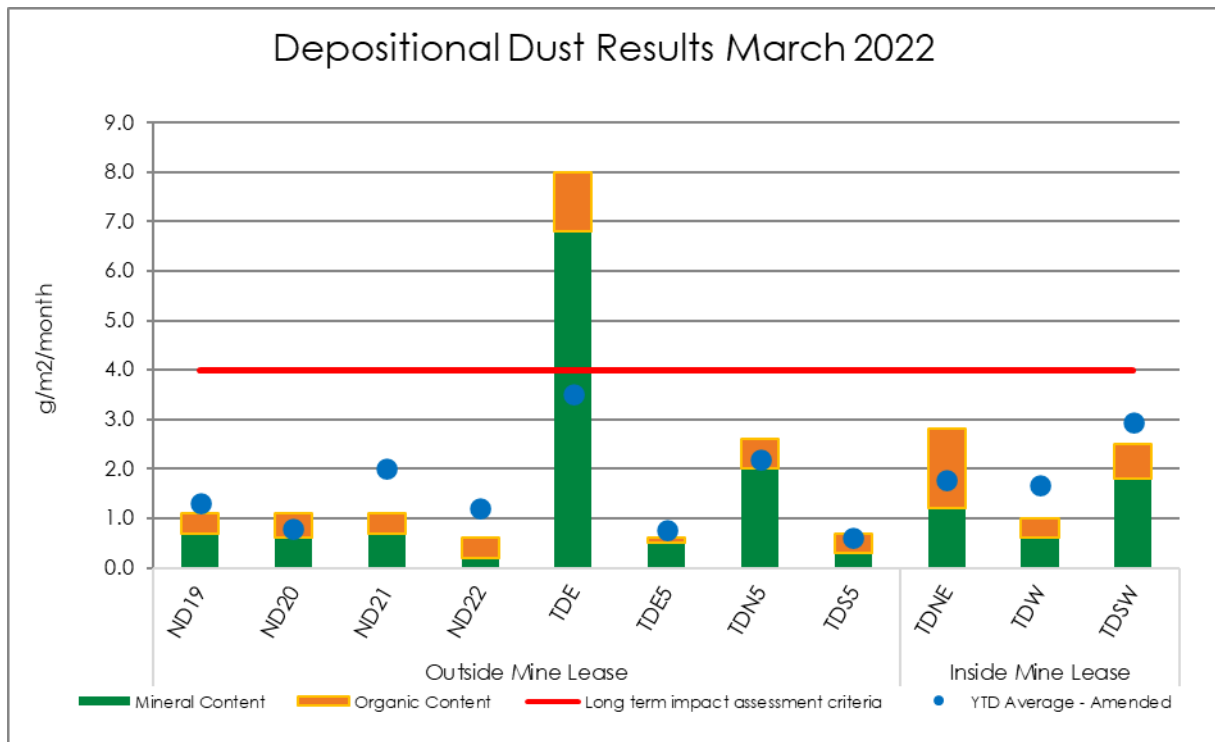
- March: 8.0 g/m<sup>2</sup>/month: an elevated result was recorded comprising predominantly of ash content during the period. Observations noted that intensive agricultural activities had occurred in the adjacent farming paddock throughout the month, suggesting the result may have been impacted on by these practices. Winds during the month predominantly prevailed from a southerly direction, further supporting that the source of the particulate matter to be non-mine related.



**Figure 7:** January depositional dust results for all locations



**Figure 8:** February depositional dust results for all locations



**Figure 9:** March 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 Consent. 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.

The groundwater monitoring program at Northparkes aims to identify any changes to the natural groundwater system as a result of mining operations and ensure compliance with the Consent. 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 carried out generally in accordance with the Consent, with no significant changes to the pH or EC for all locations. Copper concentrations increased at several locations, although results are still in consistent with long term fluctuations. These locations will be closely monitored during the future reporting periods. A summary of the monitoring results at each location sampled are presented in Tables 1-7 below.

An issue with the TSF2 facility has meant the area that holds W26, W27, MB16, W14, W22, W23, RP09 and RP28 has been declared an exclusion zone. The EPA have been regularly consulted on the issue, including the restricted access to the monitoring locations, and have been advised that monitoring will recommence following the removal of the exclusion area.

**Table 1: Process Water System**

Location	RP01	RP02	RP03	RP04	RP05	RP06	RP07	RP08	RP09	RP12	RP13	RP15	RP19	RP20	RP21
pH	7.9	7.91	7.80	8.04	7.42	8.14	8.54	7.78	No access	8.29	7.45	8.03	8.29	7.98	7.98
EC (uS/cm)	306	1558	1760	589	449	461	641	2036	No access	259	736	4105	1536	5811	2356
Cu (mg/L)	0.21	0.028	0.048	0.312	0.04	0.015	0.022	0.038	No access	0.035	0.219	0.037	0.009	0.025	0.014

**Table 1 continued: Process Water System**

Location	RP23	RP24	RP25	RP26	RP27	RP28	RP32	RP33	Caloola	PWD	GT02
pH	7.93	7.98	7.97	8.45	8.20	No access	8.7	8.07	8.05	7.62	INSUFFICIENT WATER
EC (uS/cm)	583	347	335	414	3113	No access	1163	214	5020	45,684	INSUFFICIENT WATER
Cu (mg/L)	0.041	0.044	0.024	0.035	0.028	No access	0.063	0.022	0.007	0.046	INSUFFICIENT WATER

**Table 2: Sediment Ponds**

Location	SP03	SP10	SP15
pH	8.26	7.95	8.16
EC (uS/cm)	1546	180	271
Copper (mg/L)	0.006	0.049	0.014

**Table 3: Farm Dams**

Location	FD04	FD05	FD06	FD07	FD11	FD16	FD18	FD25	FD26	FD27
pH	8.38	7.98	7.38	7.41	9.36	8.84	7.27	8.51	8.72	8.23
EC (uS/cm)	118	117	121	117	228	127	3,109	243	265	288
Copper (mg/L)	0.032	0.013	0.009	0.019	0.124	0.017	0.029	0.01	0.019	0.007

**Table 4: TSF Bores**

Location	MB01	MB02	MB03	MB05	MB06B	W26	W27	W28	W29	W30	W31	W32
pH	7.04	699	6.31	6.77	7.02	No access	No access	7.13	12.76	7.26	8.08	11.72
EC (uS/cm)	6127	9989	22113	24641	18739	No access	No access	16364	22605	2506	699	2537
Copper (mg/L)	0.012	0.011	0.025	0.014	0.01	No access	No access	0.014	0.072	0.013	0.017	0.012

**Table 5: Opencut Bores**

Location	MB10	MB13	MB14	MB16	W14	W19	W20	W21	W22	W23	W24	W25
pH	7.07	6.97	21.6	No access	No access	7.66	6.81	7.47	No access	No access	7.56	7.07
EC (uS/cm)	14262	24552	3040	No access	No access	6423	12303	26215	No access	No access	2523	2420
Copper (mg/L)	0.021	0.01	0.018	No access	No access	0.006	0.022	0.002	No access	No access	0.003	0.018

**Table 6: Underground Bores**

Location	MB17	MB18	MB19	MB20	P101	P102	P139	P145	P149
pH	7.84	10.4	7.36	7.39	7.17	7.03	6.38	6.95	6.87
EC (uS/cm)	899	11840	14307	12572	9772	28258	27021	181	28240
Copper (mg/L)	0.01	0.016	0.006	0.034	0.002	0.001	0.05	0.012	0.024

**Table 7: Regional Bores**

Location	Moss #1	Wright	Far Hilliers	Long Paddock
pH	7.18	7.05	6.91	No sample
EC (uS/cm)	2313	1120	630	No sample
Copper (mg/L)	0.021	0.005	0.001	No sample

## 4. VIBRATION

### 4.1 Overview

The assessment criteria for blast impacts at Northparkes are based on the ANZECC Guideline, aimed to minimise annoyance to human comfort levels. Table 8 below shows the blast impact criteria as set out in the Schedule 3 Conditions 6-13 of the Consent.

**Table 8:** Vibration and overpressure criteria of DC11\_0060.

<b>Location</b>	<b>Airblast overpressure (dB(Lin Peak))</b>	<b>Ground vibration (mm/s)</b>	<b>Allowable exceedance</b>
Residence on privately owned land	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months
All public infrastructure	-	50 (or a limit determined by the structural design methodology in AS 2187.2-2006, or its latest version, or other alternative limit for public infrastructure, to the satisfaction of the Secretary)	0%

The blast monitoring program uses blast units which measure ground vibration and air overpressure at the residences of the four closest privately owned properties, "Hubberstone", "Hillview", "Milpose", and "Adavale". The program is designed to measure the effectiveness of control measures and ensure compliance with consent and licence conditions, relevant standards and corporate requirements. A summary of the monitoring results are provided below.

### 4.2 Quarterly Monitoring Analysis

During the reporting period, no surface blasting was undertaken during the monitoring period. All underground blasts were restricted to the E26L1N draw bell development and were within the criteria limits detailed in the Consent.

A false trigger was recorded on 4 February at the Hillview monitor location. An internal investigation was undertaken and the result was found to be caused by a Northparkes Mines employee undertaking weed spraying around the monitoring equipment. The result has been removed from the dataset.

## 5. NOISE

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 definitions of the roles and responsibilities for noise management.

### 5.1 Overview

CMOC undertakes a noise monitoring program that consists of both operator-attended and unattended surveys at the five nearest occupied residences 'Hubberstone', 'Milpose', 'Lone Pine', 'Hillview' and 'Adavale'.

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.

### 5.2 Quarterly Monitoring Analysis

Attended noise monitoring was undertaken between Wednesday 9 and Thursday 10 February 2022.

The assessment was completed to quantify site noise emissions against relevant noise criteria pertaining to Northparkes operations in accordance with Conditions 1 to 5 of Schedule 3 of the NSW Development Consent Conditions (DC11\_110060), Northparkes Noise Management Plan (NMP, 2019) and Traffic Management Plan (TMP, 2019).

Road noise monitoring identified that vehicle movements associated with shift change generated levels below the relevant road noise criteria specified in the TMP and NMP.

Attended monitoring has identified that operational emissions generated by Northparkes comply with relevant noise criteria at all monitoring locations for all assessment periods. Furthermore, project related noise emissions are generally barely audible at monitoring locations. Extraneous non-mining sources such as traffic, insects, wind in trees, birds, aircraft, residential and agricultural noise were audible during the monitoring period. A summary of the monitoring results at each monitoring location are presented in Tables 9-14 below.

**Table 9:** Attended noise monitoring results for Hubberstone

Table 3 Operator-Attended Noise Survey Results – Location NM1, Hubberstone					
Date/Time (hrs)	Noise Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
Duration 15min	L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>		
Day					
17:12 09/02/2022	52	35	29	WD: NW WS: <0.5m/s Stab Class: D	Insects 27-39 Birds 25-57 Traffic 25-46 NPM Inaudible
17:27 09/02/2022	51	35	30		
17:42 09/02/2022	57	36	30		
Site L <sub>Aeq</sub> (15min) Contribution			<30		
Evening					
20:22 09/02/2022	51	45	39	WD: N WS: <0.5m/s Stab Class: G	Insects 39-52 Dogs Barking 36-40 Birds 38-59 Traffic 40-50 NPM Inaudible
20:37 09/02/2022	59	48	47		
20:52 09/02/2022	55	46	44		
Site L <sub>Aeq</sub> (15min) Contribution			<35		
Night					
01:02 09/02/2022	49	38	33	WD: NW WS: 0.1m/s Stab Class: F	Insects 31-54 NPM Inaudible
01:17 09/02/2022	49	37	34		
01:32 09/02/2022	54	38	34		
Site L <sub>Aeq</sub> (15min) Contribution			<30		
Site L <sub>A1</sub> (1min) Contribution			<40		

Note: NPM denotes Northparkes Mines.

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

**Table 10:** Attended noise monitoring results for Lone Pine

Table 4 Operator-Attended Noise Survey Results – Location NM2, Lone Pine						
Date/Time (hrs)	Noise Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA	
Duration 15min	L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>			
Day						
16:18 09/02/2022	71	47	30	WD: NW WS: 0.1m/s Stab Class: D	Insects 27-43 Residential Noise 25-71	
16:33 09/02/2022	53	39	31		Traffic 25-52 Birds 25-48	
16:48 09/02/2022	52	39	30		NPM Inaudible	
Site L <sub>Aeq</sub> (15min) Contribution					<30	
Evening						
19:24 09/02/2022	64	45	40	WD: N WS: 0.1m/s Stab Class: D	Insects 33-50 Dogs Barking 30-49	
19:39 09/02/2022	50	44	43		Birds 30-51 Traffic 30-64	
19:54 09/02/2022	51	42	40		NPM Inaudible	
Site L <sub>Aeq</sub> (15min) Contribution					<35	
Night						
00:04 09/02/2022	48	33	31	WD: N WS: 0.1m/s Stab Class: F	Insects 27-48 Dogs Barking 25-38	
00:19 09/02/2022	47	33	30		Livestock 25-42 NPM Inaudible	
00:34 09/02/2022	42	33	30			
Site L <sub>Aeq</sub> (15min) Contribution					<30	
Site L <sub>A1</sub> (1min) Contribution					<40	

Note: NPM denotes Northparkes Mines.

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

**Table 11:** Attended noise monitoring results for Milpose

Table 5 Operator-Attended Noise Survey Results – Location NM3, Milpose					
Date/Time (hrs)	Noise Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
Duration 15min	L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>		
Day					
08:23 10/02/2022	53	38	36	WD: W WS: 1.0m/s Stab Class: A	Birds 31-61 Agricultural Noise <30 Residential Noise 40-68 Insects 30-35 Wind 34-46 NPM – Exhaust Fan <30 (Barely Audible throughout first 2 periods)
08:38 10/02/2022	68	43	36		
08:53 10/02/2022	61	38	36		
Site L <sub>Aeq</sub> (15min) Contribution			<35		
Evening					
21:06 08/02/2022	44	40	38	WD: N WS: 0.1m/s Stab Class: D	Insects 36-48 Aircraft 33-40 NPM Inaudible
21:21 08/02/2022	46	40	37		
21:36 08/02/2022	48	40	38		
Site L <sub>Aeq</sub> (15min) Contribution			<35		
Night					
22:10 08/02/2022	67	40	36	WD: N WS: 0.1m/s Stab Class: G	Insects 33-46 Aircraft 35-49 MAC Operator 67 NPM Inaudible
22:25 08/02/2022	46	37	35		
22:40 08/02/2022	49	38	36		
Site L <sub>Aeq</sub> (15min) Contribution			<35		
Site L <sub>A1</sub> (1min) Contribution			<40		

Note: NPM denotes Northparkes Mines.

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.



**Table 32:** Attended noise monitoring results for Hillview

Table 6 Operator-Attended Noise Survey Results – Location NM4, Hillview					
Date/Time (hrs)	Noise Descriptor (dBA re 20 $\mu$ Pa)			Meteorology	Description and SPL, dBA
Duration 15min	L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>		
12:25					Wind 28-44
09/02/2022	55	39	34		Birds 25-40
12:40				WD: NW	Traffic 25-55
09/02/2022	78	53	31	WS: 1.0m/s	Insects 25-43
12:55				Stab Class: D	Residential Noise 30-78
09/02/2022	87	62	32		MAC Operator 87
					NPM Inaudible
Site L <sub>Aeq</sub> (15min) Contribution					<30
Evening					
18:10					Insects 31-41
09/02/2022	58	41	32	WD: NW	Birds 28-46
18:25				WS: <0.5m/s	Traffic 30-58
09/02/2022	50	40	34	Stab Class: D	NPM Inaudible
18:40					
09/02/2022	52	39	35		
Site L <sub>Aeq</sub> (15min) Contribution					<30
Night					
02:00					Insects 20-43
09/02/2022	78	40	23		Traffic 25-59
02:15				WD: NW	MAC Operator 78
09/02/2022	59	37	23	WS: 0.1m/s	Site - Processing 20-27
				Stab Class: E	(audible for first 2 periods)
02:30					Site - Hum <20
09/02/2022	43	21	19		(barely audible throughout measurements)
Site L <sub>Aeq</sub> (15min) Contribution					<25
Site L <sub>A1</sub> (1min) Contribution					<40

Note: NPM denotes Northparkes Mines.

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

**Table 13:** Attended noise monitoring results for Adavale

Table 7 Operator-Attended Noise Survey Results – Location NM5, Adavale					
Date/Time (hrs)	Noise Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
Duration 15min	L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>		
Day					
07:25	52	36	26	WD: N WS: <0.1m/s Stab Class: E	Birds 25-57
10/02/2022					Insects <25
07:40	48	32	28		Site - Exhaust Fans <25-30
10/02/2022					(barley to audible throughout measurements)
07:55	57	31	27		Site – Hum <25
10/02/2022					(barely audible throughout measurements)
Site L <sub>Aeq</sub> (15min) Contribution					27
Evening					
20:10	50	32	29	WD: N WS: 0.1m/s Stab Class: E	Birds 28-35
08/02/2022					Insects 27-48
20:25	49	35	31		MAC Operator 50
08/02/2022					Site – Hum <25
20:40	49	35	33		(barely audible throughout measurements)
08/02/2022					
Site L <sub>Aeq</sub> (15min) Contribution					<25
Night					
23:07	52	34	27	WD: N WS: 0.1m/s Stab Class: E	Insects 25-52
08/02/2022					Aircraft 25-36
23:22	39	29	26		Site – Hum <25
08/02/2022					(barely audible throughout measurements)
23:37	52	30	26		
08/02/2022					
Site L <sub>Aeq</sub> (15min) Contribution					<25
Site L <sub>A1</sub> (1min) Contribution					<40

Note: NPM denotes Northparkes Mines.

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

**Table 14:** Attended road noise survey results**Table 8 Operator-Attended Road Noise Survey Results – Location NM4, Hillview**

Date/Time (hrs) Duration 1 hour	Measured Noise Level dB LAeq(1hr)	Meteorology	Criteria dB LAeq(1hr)	Description and SPL dBA
12:25 09/02/2022 (Day)	<50	WD: NW WS: 1.0m/s Stab Class: D	55	Wind 28-44
				Birds 25-55
				Traffic 25-55
				Insects 25-43
				Residential Noise 30-82
				NPM concentrate truck 35-55 (1 pass, Offsite)
				Approx. 13 vehicles enter/exit NPM Site
18:10 09/02/2022 (Evening)	40	WD: NW WS: <0.5m/s Stab Class: D	55	Insects 31-41
				Birds 28-46
				Traffic 30-58
				NPM concentrate truck 35-58 (2 passes, Offsite)
				Approx. 54 vehicles enter/exit NPM Site

Note: NPM denotes Northparkes Mines.

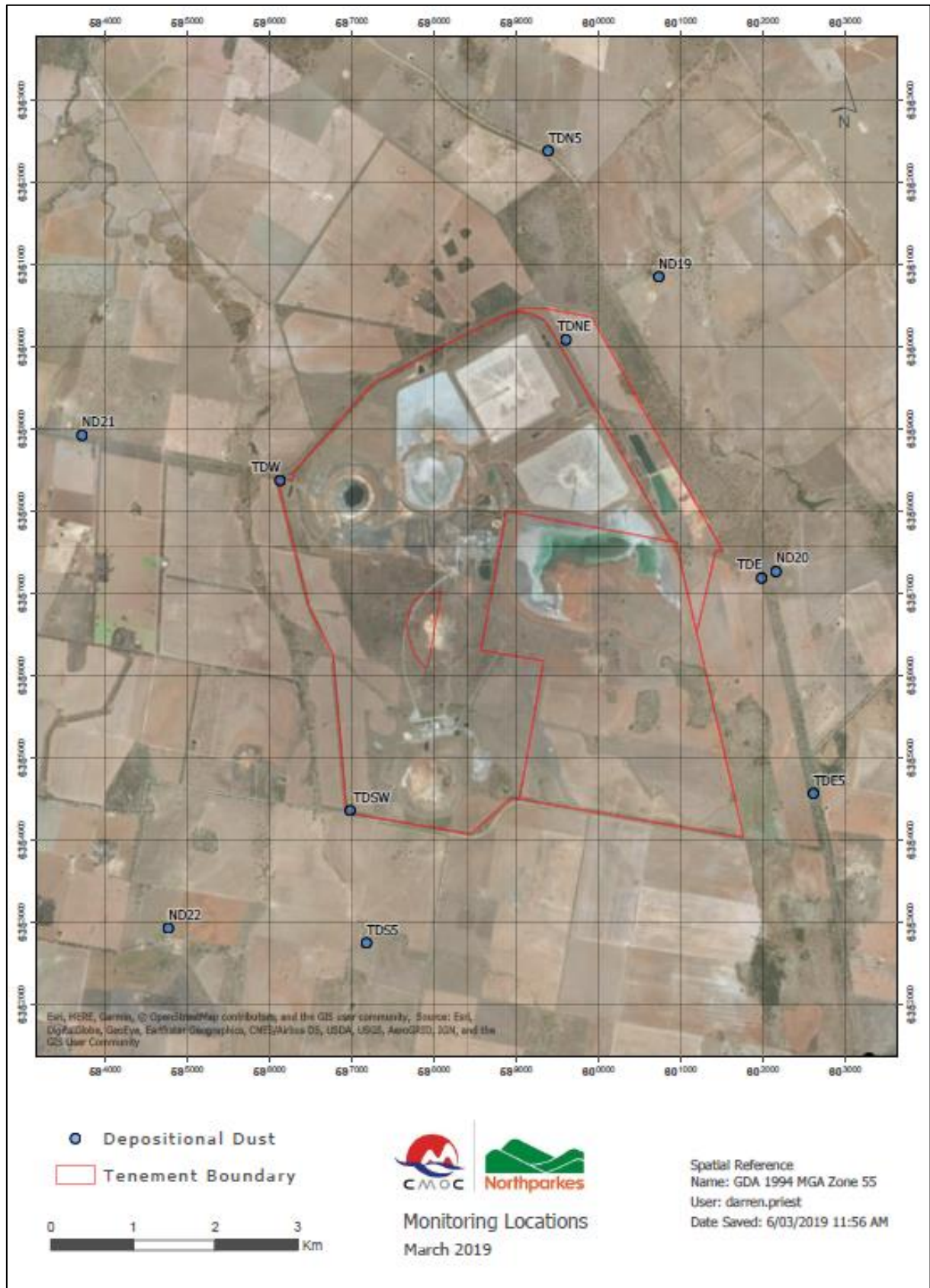
Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

## Appendix A – PM10/TSP Monitoring Locations

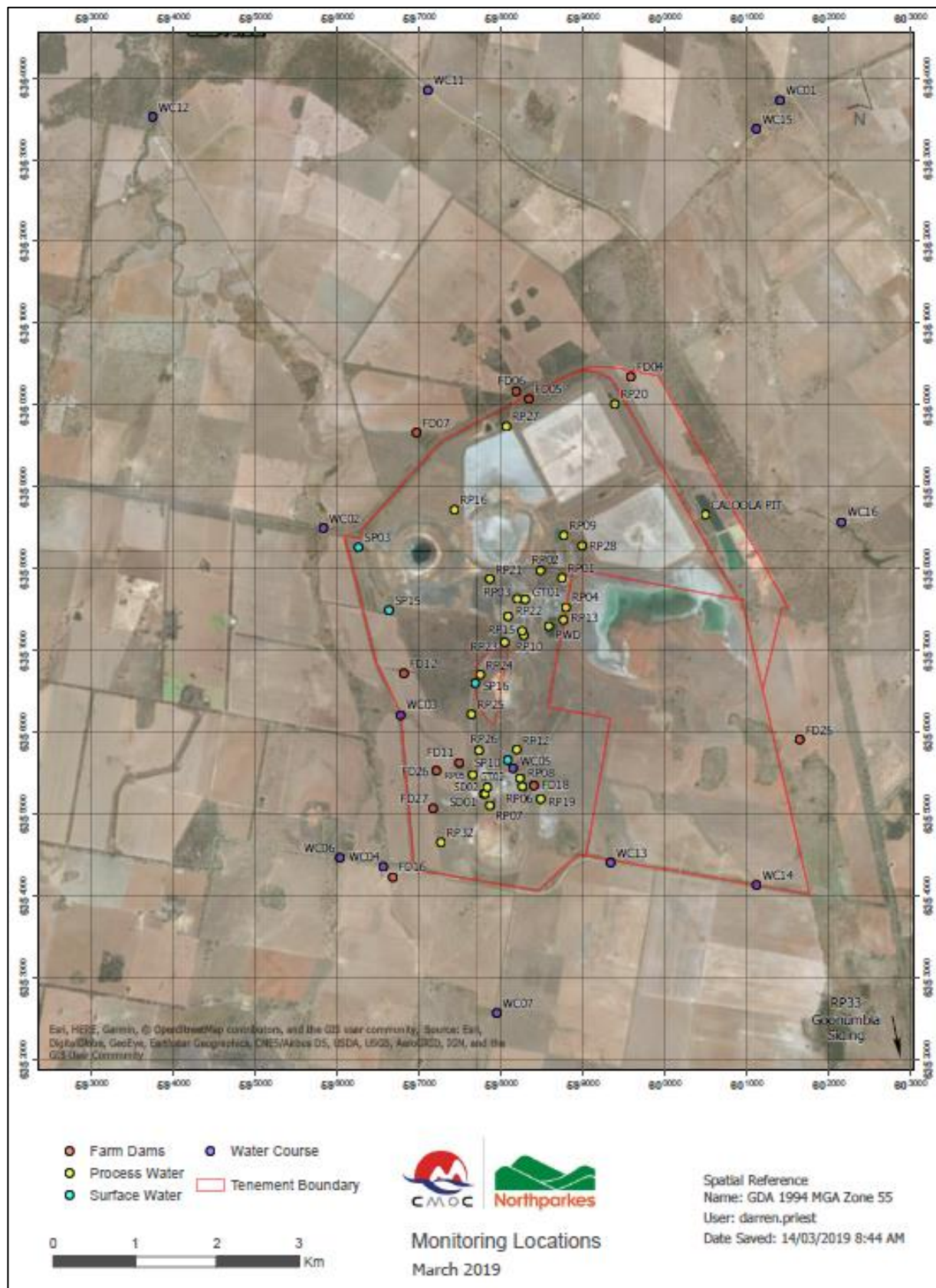




## Appendix B – Depositional Dust Monitoring Locations

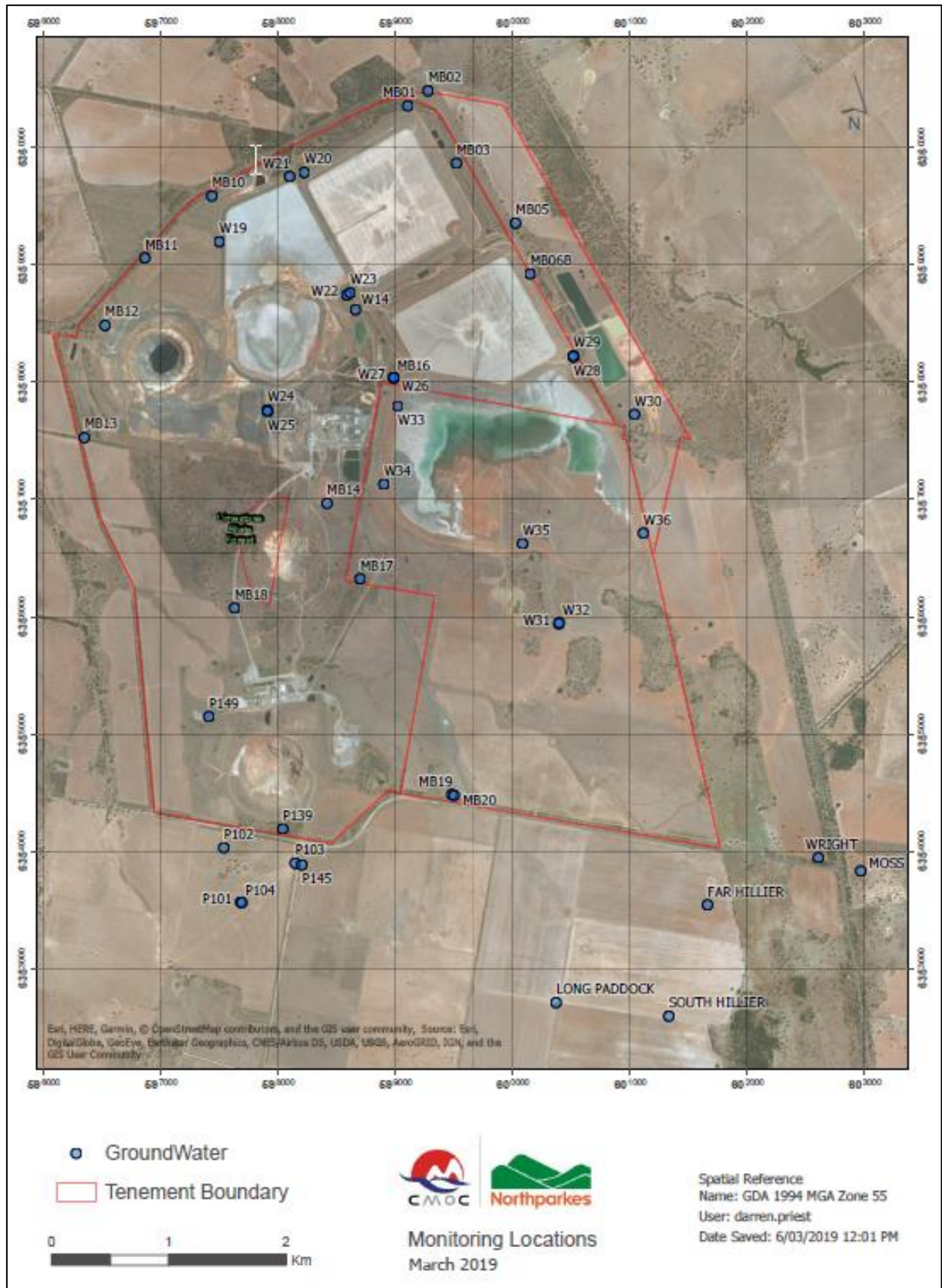


## Appendix C – Surface Water Monitoring Locations





## Appendix D – Groundwater Monitoring Locations



## Appendix E – Attended Noise Monitoring Locations

