

Rasp Mine  
Monthly Environmental Monitoring Report  
May 2022



## INTRODUCTION

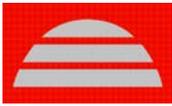
Broken Hill Operations Pty Ltd (BHOP) [a wholly owned subsidiary of CBH Resources Limited (CBH)] owns and operates the Rasp Mine (the Mine), which is located centrally within the City of Broken Hill on Consolidated Mine Lease 7 (CML7).

Mining has been undertaken within CML7 since 1885. The existing operations at the Rasp Mine include underground mining operations, a processing plant producing zinc and lead concentrates and a rail siding for concentrate dispatch. These operations are undertaken in accordance with Project Approval 07\_0018 granted 31 January 2011, under Part3A of the Environmental Planning and Assessment Act 1979 (EP&A Act).

As the holder of an Environmental Protection Licence, 12559, BHOP is required, under Section 66(6) of the NSW *Protection of the Environment Operations Act 1997*, to publish pollution monitoring data. In addition BHOP is required to publish data in accordance with its Project Approval 07\_0018 Schedule 4 Condition 9. These documents can be found on the Rasp Mine web site.

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## 1 Air Quality

The following criteria as listed in the Project Approval (DA 07\_0018 MOD9 December 2021) apply to air quality monitoring:

### Long Term Criteria for Particulate Matter

Pollutant	Averaging Period	Criterion
Total solid particles (TSP)	Annual	90 µg/m <sup>3</sup>
Particulate matter < 10 µm (PM <sub>10</sub> )	Annual	25 µg/m <sup>3</sup>

### Short Term Criterion for Particulate Matter

Pollutant	Averaging Period	Criterion
Particulate matter < 10 µm (PM <sub>10</sub> )	24 hour	50 µg/m <sup>3</sup>

### Long Term Criteria for Deposited Dust

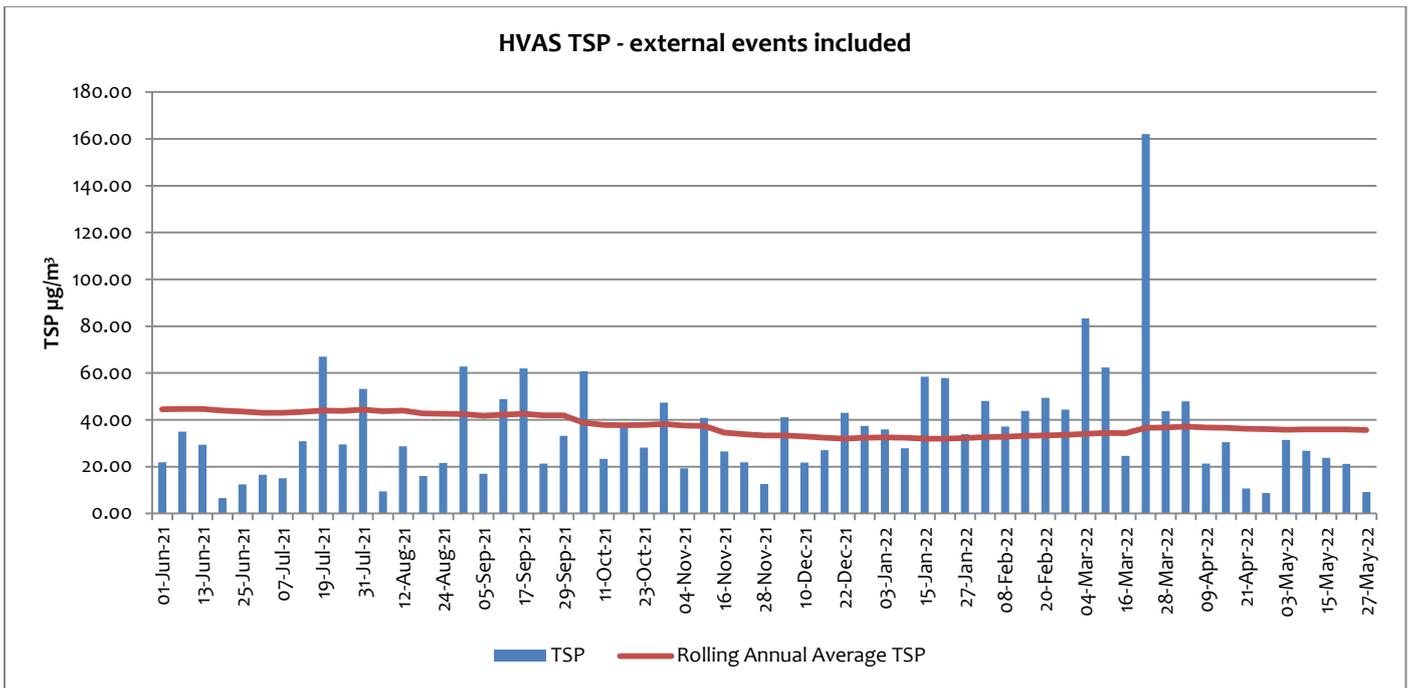
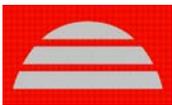
Pollutant	Averaging Period	Maximum Project Contribution	Maximum Total Deposited Dust Level
Deposited dust	Annual	2 g/m <sup>2</sup> /month	4 g/m <sup>2</sup> /month

### 1.1 High Volume Air Samplers

There are four high volume air samplers used to measure ambient air quality at the Rasp Mine – HVAS (EPL10) and HVAS1 (EPL11) are located at the Silver Tank, central and to the south of the mine lease, and HVAS2 (EPL12) and HVAS3 (EPL57) are located adjacent to and north of Blackwood Pit. A map indicating these locations can be found on the Rasp Mine web site. HVAS and HVAS3 sample for total suspended particulates (TSP) and lead dust, and HVAS1 and HVAS2 sample for particulate matter less than 10 microns (PM<sub>10</sub>) and lead dust.

#### ***HVAS (EPL10) - Silver Tank (On Site) Results for May 2022***

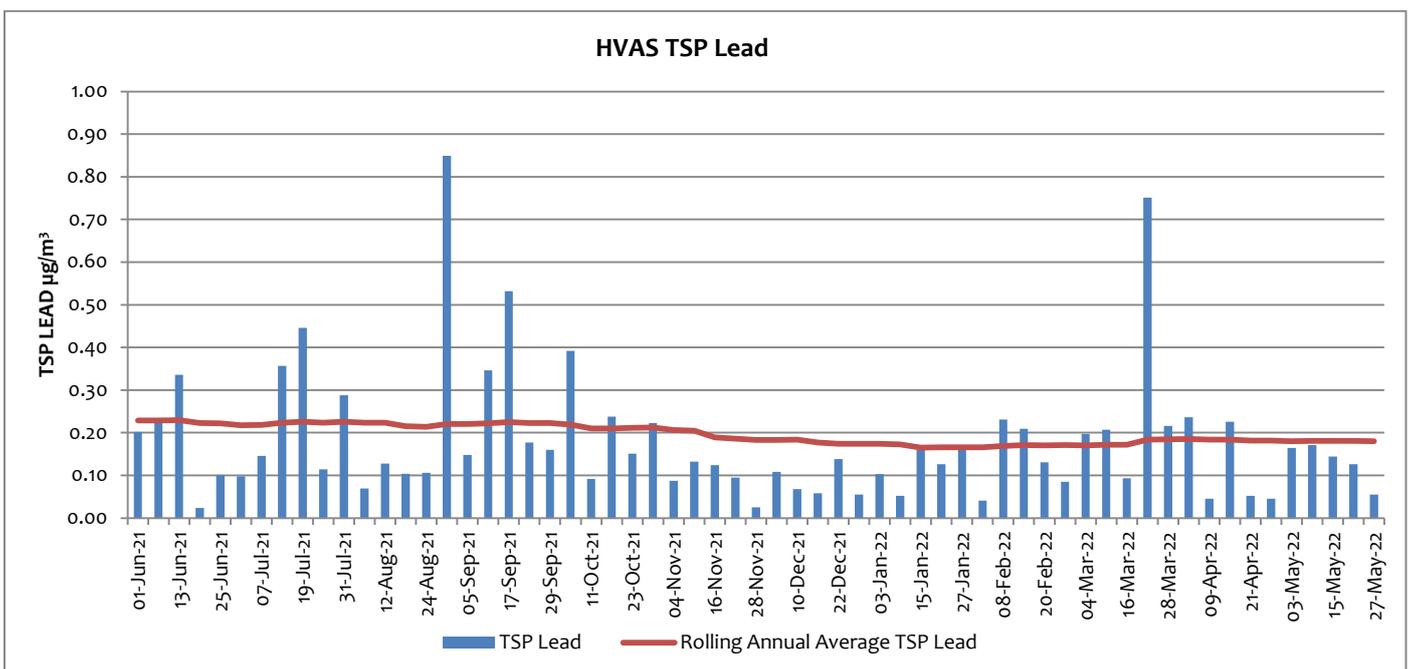
DATE	TSP (µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )
03-May-22	31.40	0.16
09-May-22	26.80	0.17
15-May-22	23.80	0.14
21-May-22	21.20	0.13
27-May-22	9.20	0.06



HVAS (EPL10) is located on the southern boundary of Rasp Mine and while limit criteria do not apply at this point, they do apply at the closest residential location.

TSP dust results at HVAS were low for the month of May compared to previous months. The highest TSP levels for May were 31.40µg/m<sup>3</sup> on 3 May when winds were predominantly from the NW, suggesting there may have been contribution from site activities. The annual rolling average for TSP at this location is 35.58µg/m<sup>3</sup> at the end of May, lower than the average at the beginning of June 2021 which was 44.53µg/m<sup>3</sup>.

The annual rolling average for TSP is determined using data with extreme dust events included.



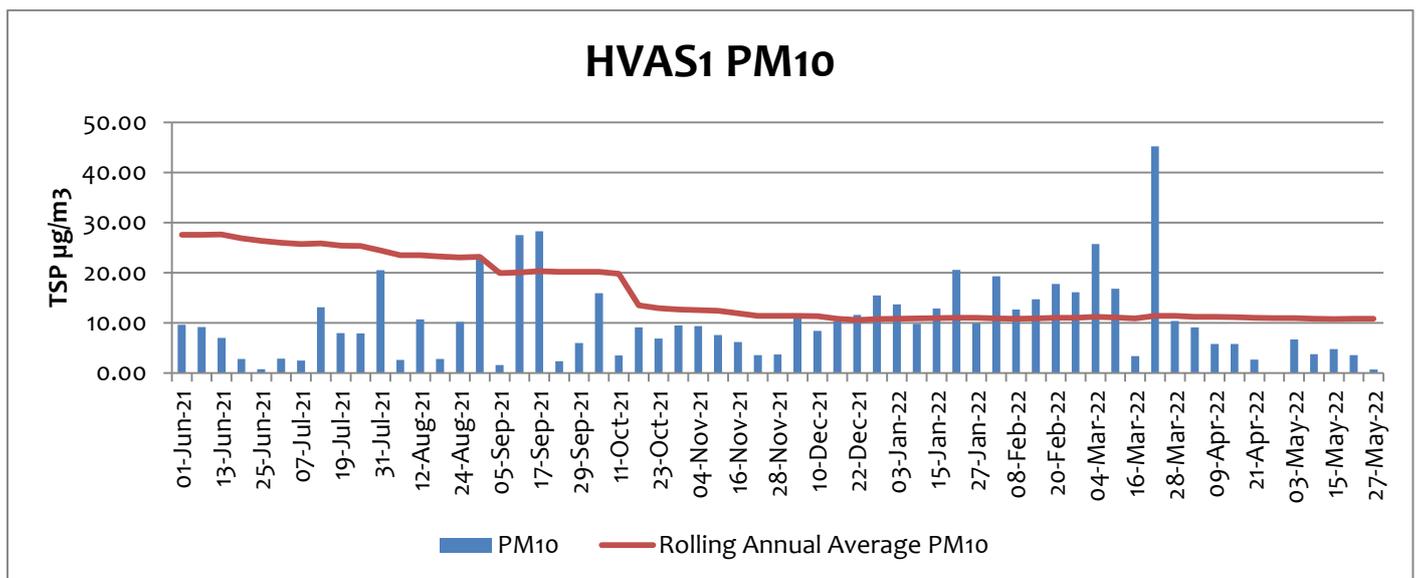


TSP Lead dust results at HVAS were lower in the month of May compared to previous months. The highest TSP Lead level for May was 0.17  $\mu\text{g}/\text{m}^3$  on 9 May when winds were predominately from the South so the source was likely off-site. The rolling annual average for TSP Lead in May 2022 was 0.18  $\mu\text{g}/\text{m}^3$  which is lower than the rolling annual average of 0.23  $\mu\text{g}/\text{m}^3$  for TSP Lead in June 2021.

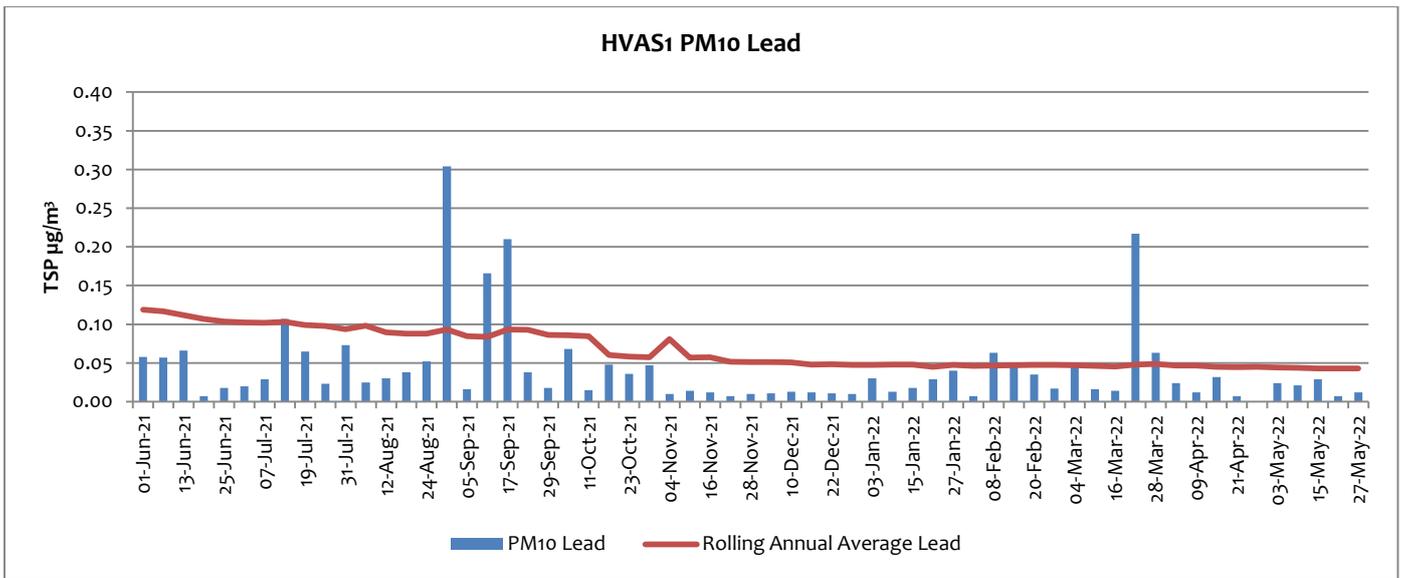
**HVAS1 (EPL11) - Silver Tank (On Site) Results for May 2022**

DATE	PM <sub>10</sub> ( $\mu\text{g}/\text{m}^3$ )	PM <sub>10</sub> Lead ( $\mu\text{g}/\text{m}^3$ )
03-May-22	6.70	0.02
09-May-22	3.80	0.02
15-May-22	4.80	0.03
21-May-22	3.60	0.007
27-May-22	0.70	0.01

HVAS1 (EPL11) is located on the southern boundary of Rasp Mine and while limit criteria do not apply at this point, they do apply at the closest residential location.



PM<sub>10</sub> dust results at HVAS1 were low in the month of May compared to previous months. The highest PM<sub>10</sub> dust levels for May was 6.70 $\mu\text{g}/\text{m}^3$  on 3 May when winds were predominantly from the NW. The annual rolling average for PM<sub>10</sub> dust at this location is 10.8 $\mu\text{g}/\text{m}^3$  at the end of May 2022, lower than the average at the beginning of June 2021 which was 27.6 $\mu\text{g}/\text{m}^3$ . External and extreme dust events are recorded in measurements.



PM<sub>10</sub> Lead dust results at HVAS1 were low in the month of May compared to previous months. The highest Lead PM<sub>10</sub> results for May was 0.03µg/m<sup>3</sup> on 15 May when the predominant wind direction was from the South suggesting the source of Lead was from off-site. The rolling annual average for PM<sub>10</sub> Lead in May was 0.04 µg/m<sup>3</sup>, down from 0.12µg/m<sup>3</sup> in June 2021.

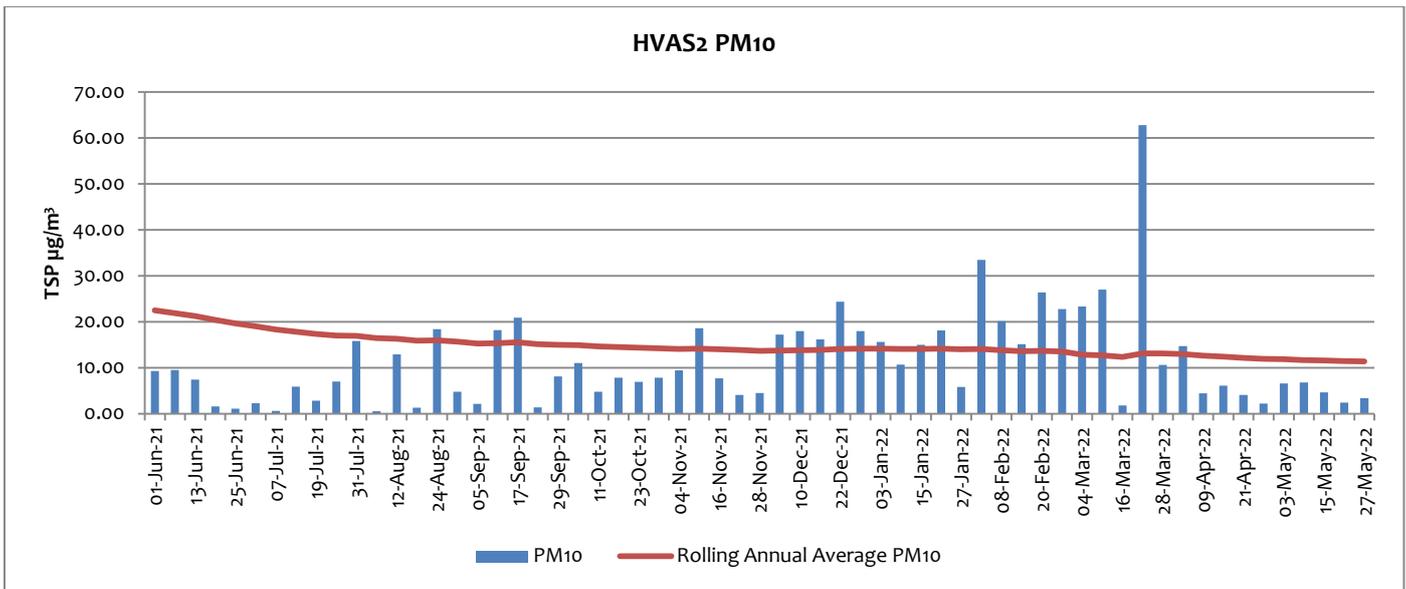
***HVAS 2 (EPL12) - Blackwood Pit (On Site) Results for May 2022***

DATE	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> Lead (µg/m <sup>3</sup> )
03-May-22	6.60	0.02
09-May-22	6.80	0.01
15-May-22	4.60	0.008
21-May-22	2.40	0.01
27-May-22	3.40	0.09

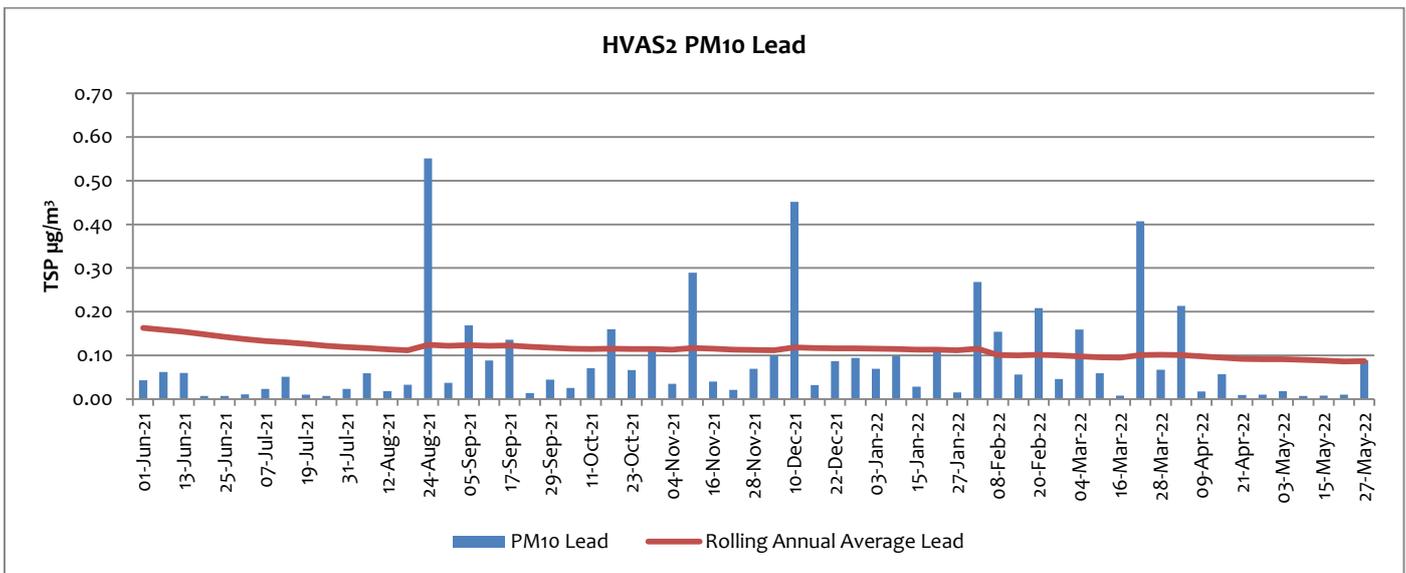
HVAS2 (EPL12) is located on the northern boundary of Rasp Mine and while limit criteria do not apply at this point, they do apply at the closest residential location.

PM<sub>10</sub> levels at HVAS2 were low in May. The highest recorded PM<sub>10</sub> dust reading of 6.80µg/m<sup>3</sup> was on the 9 May when winds were from the NW suggesting the source of dust was largely from off-site. The annual rolling average for PM<sub>10</sub> dust at this location is 11.35µg/m<sup>3</sup> at the end of May 2022, down from 22.47µg/m<sup>3</sup> in June 2021.

The annual rolling average for PM<sub>10</sub> dust is determined using data with extreme dust events included.



There were low PM<sub>10</sub> lead levels in May with a slightly elevated level of 0.09 µg/m<sup>3</sup> on 27 May when winds were from the SSW suggesting there may have been contribution from site activities. The rolling annual average for PM<sub>10</sub> Lead in May 2022 was 0.09 µg/m<sup>3</sup>, down from 0.16 µg/m<sup>3</sup> in June 2021.



**HVAS 3 (EPL57) - Blackwood Pit (On Site) Results for May 2022**

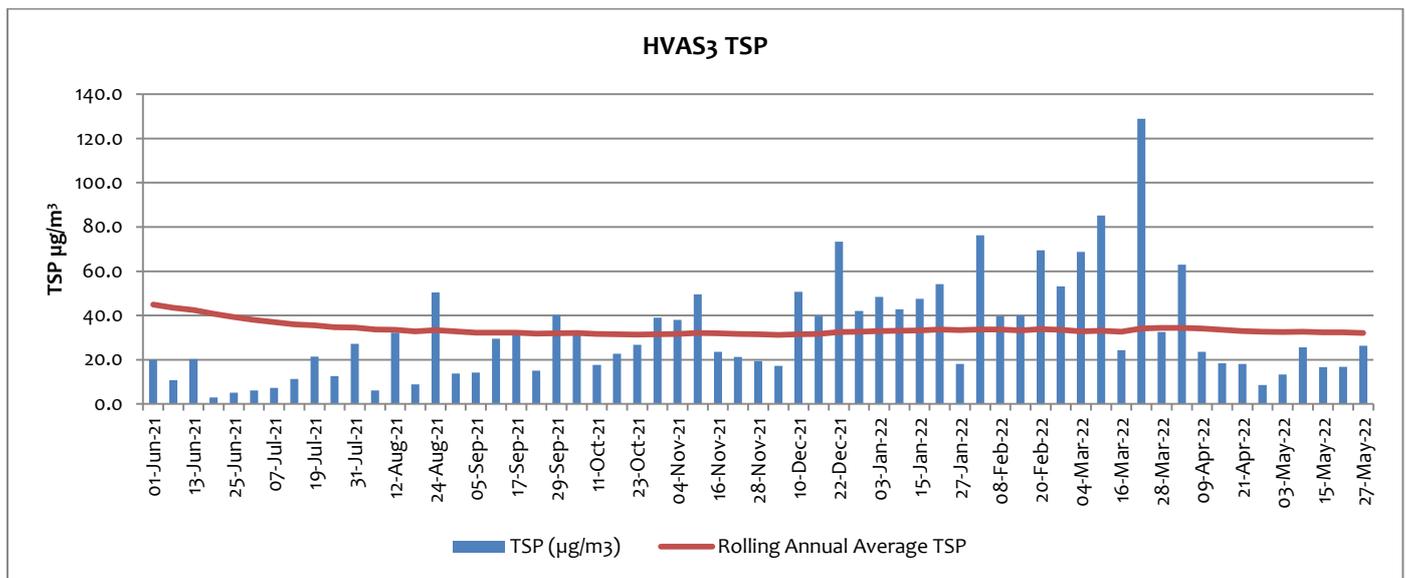
DATE	TSP (µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )
03-May-22	13.30	0.08
09-May-22	25.60	0.05
15-May-22	16.60	0.03
21-May-22	16.70	0.07
27-May-22	26.30	0.40



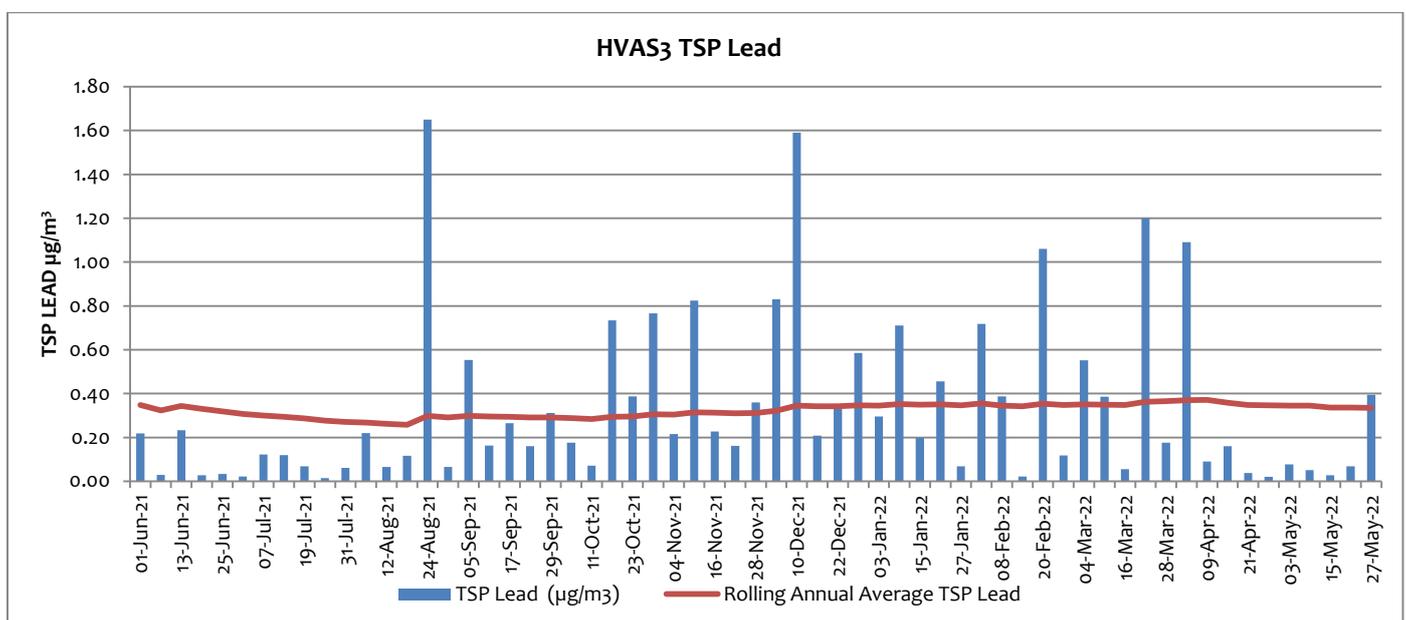
HVAS3 (EPL57) was included in EPL 12559 on 14 March 2019 to provide for monitoring of TSP Dust on the northern boundary of the site at Blackwoods Pit TSF2.

TSP levels were highest on 27 May with results of  $26.30\mu\text{g}/\text{m}^3$ ; wind on this day was predominately from the South hand SSW suggesting potential lift off from TSF2. The TSF2 sprinkler system is currently under construction and dust suppressant is regularly applied to the tailings dam surface. The annual rolling average for TSP dust at this location is  $32.14\mu\text{g}/\text{m}^3$  at the end of May 2022, down from of  $44.97\mu\text{g}/\text{m}^3$  in June 2021.

The annual rolling average for TSP is determined using data with extreme dust events included.



TSP Lead levels were low throughout May, with the highest results being recorded on 27 May of  $0.40\mu\text{g}/\text{m}^3$ . With winds on 27 May predominantly from the South, this elevated level indicated there was contribution from site activities, the most likely being the TSF. The rolling annual average for TSP Lead in May was  $0.33\mu\text{g}/\text{m}^3$ , slightly down from  $0.35\mu\text{g}/\text{m}^3$  in June 2021.





## 1.2 Tapered Element Oscillating Microbalance Sampling (TEOM)

There are two Tapered Element Oscillating Microbalance (TEOM) sampling units used to measure ambient air quality at the Rasp Mine – TEOM1 (EPL13) is located off-site within the perimeter fence of Essential Water south of the mine lease, and TEOM2 (EPL14) is located on-site adjacent to Blackwood Pit to the north of the mine lease. A map indicating these locations can be found on the Rasp Mine web site. TEOM1 and TEOM2 are designed to operate continuously and sample for particulate matter less than 10 microns (PM<sub>10</sub>) in size.

TEOM2 was temporarily decommissioned in 19 June 2019 due to Embankment 2 TSF2 construction works. The decommissioning is in accordance with dust management strategies agreed with the EPA which includes the operation of a real-time PM10 monitor north of the construction works. Both Project Approval and Environment Protection Licence criteria exclude dust storms and other extraordinary events.

Project Approval 07\_0018 criteria apply at TEOM1 and TEOM2, with two criteria listed for PM10, a 24 hour average criteria of 50 ug/m<sup>3</sup> and an annual average criteria of 25 ug/m<sup>3</sup>.

TEOM data is validated by third party consultants using Australian Standards and internal procedures, and is used to populate the table of TEOM monthly data provided below.



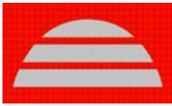
**TEOM1 (EPL13) (Off Site) and TEOM2 (EPL14) (On Site) Validated Results for May 2022**

Particulate Matter <10 Microns 24Hr Average				
Date	TEOM 1 ( $\mu\text{g}/\text{m}^3$ )	Compliant with 50 $\mu\text{g}/\text{m}^3$ 24hr average?	TEOM 2 ( $\mu\text{g}/\text{m}^3$ )	Compliant with 50 $\mu\text{g}/\text{m}^3$ 24hr average?
1-May-22	10.9	Y	7.3	Y
2-May-22	10.9	Y	7.3	Y
3-May-22	10.8	Y	7.5	Y
4-May-22	8.3	Y	8.9	Y
5-May-22	8.8	Y	10.1	Y
6-May-22	7.8	Y	5.6	Y
7-May-22	8.3	Y	6.2	Y
8-May-22	6.7	Y	4.1	Y
9-May-22	5.1	Y	10.2	Y
10-May-22	9.0	Y	11.4	Y
11-May-22	3.3	Y	2.4	Y
12-May-22	3.8	Y	2.1	Y
13-May-22	4.1	Y	0.8	Y
14-May-22	5.5	Y	3.3	Y
15-May-22	6.4	Y	4.8	Y
16-May-22	16.4	Y	12.6	Y
17-May-22	12.0	Y	11.7	Y
18-May-22	7.9	Y	9.2	Y
19-May-22	9.7	Y	6.9	Y
20-May-22	9.1	Y	9.3	Y
21-May-22	6.9	Y	5.5	Y
22-May-22	6.1	Y	3.9	Y
23-May-22	6.4	Y	4.4	Y
24-May-22	13.7	Y	3.2	Y
25-May-22	11.1	Y	5.1	Y
26-May-22	6.2	Y	7.7	Y
27-May-22	5.2	Y	6.7	Y
28-May-22	5.1	Y	4.4	Y
29-May-22	7.3	Y	2.4	Y
30-May-22	8.2	Y	6.5	Y
31-May-22	ns	ns	7.4	Y

NS – no sample collected. SC – sample collected.

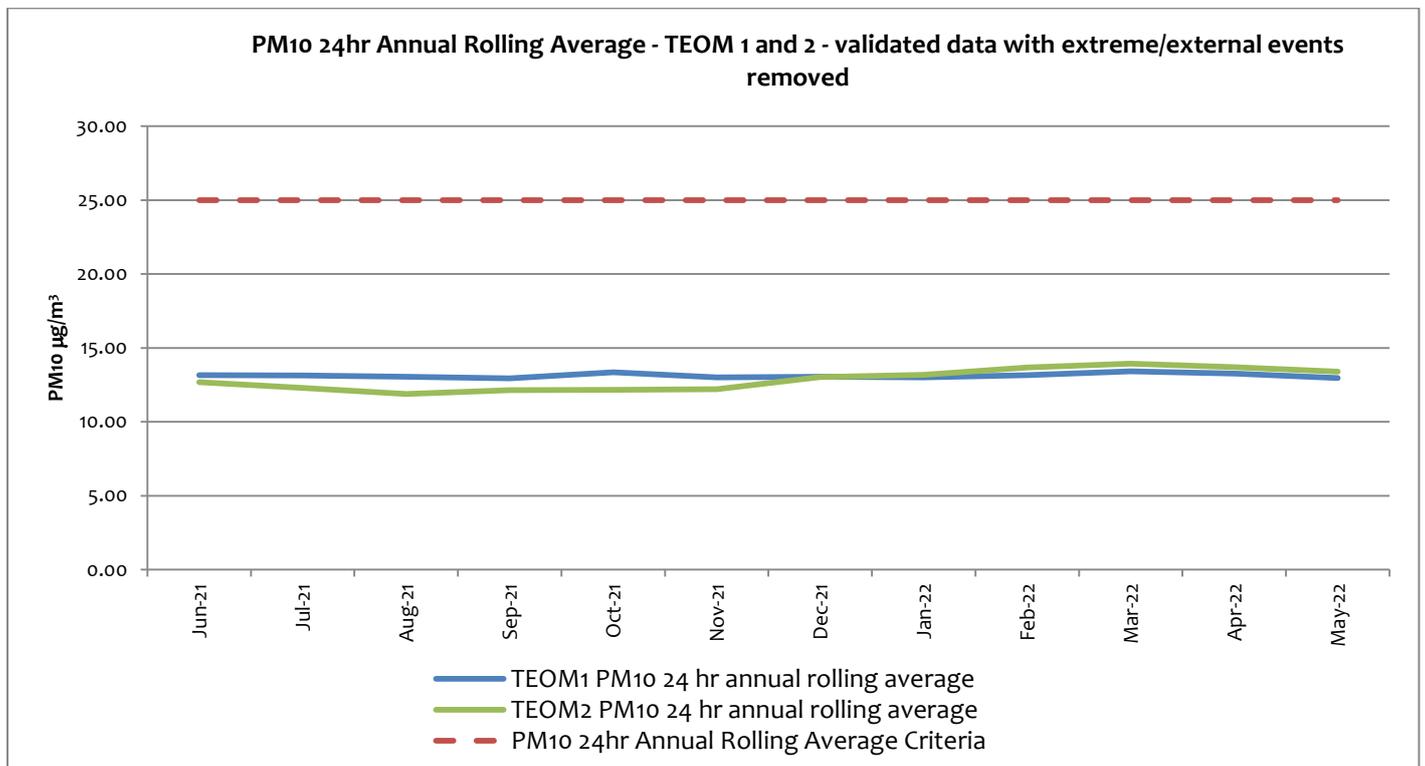
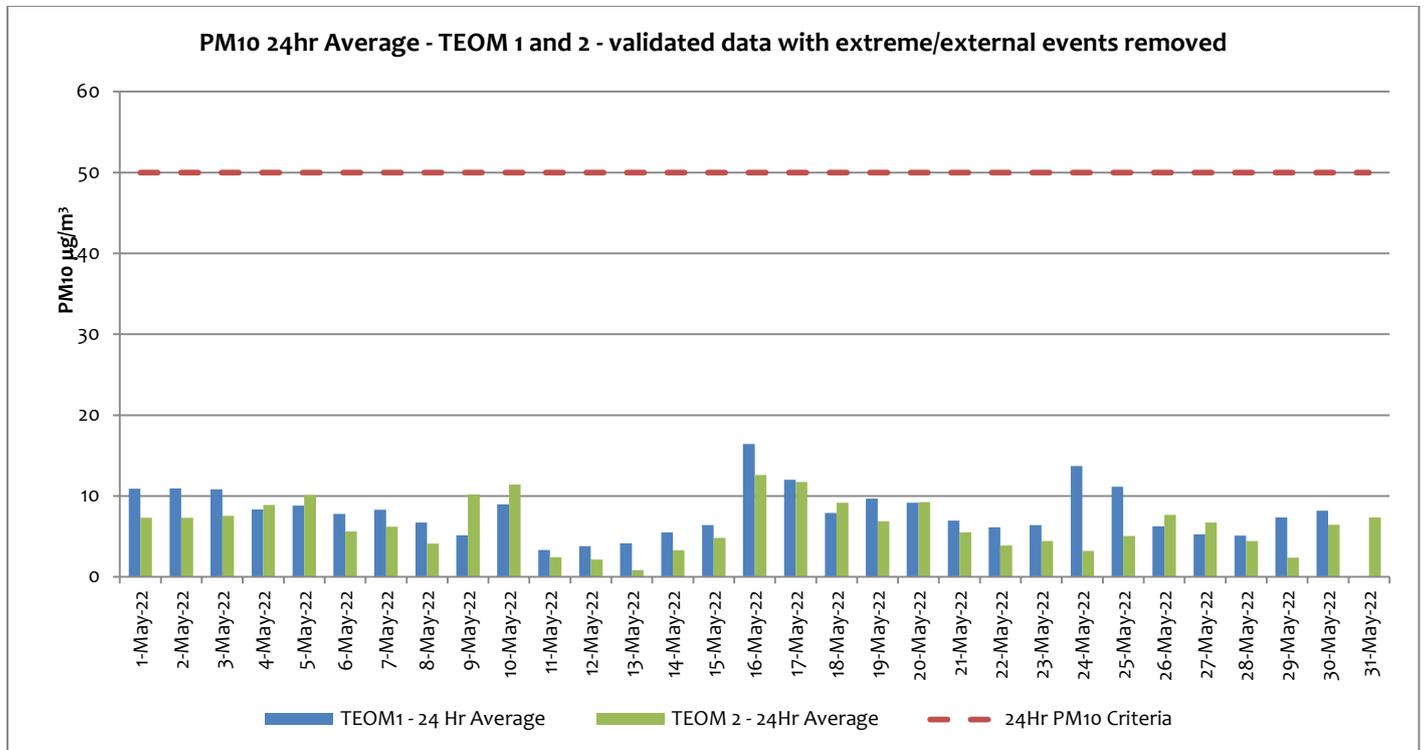
PM<sub>10</sub> dust levels at both TEOM units were low in the month of May, neither site recorded daily average over the daily limit of 50  $\mu\text{g}/\text{m}^3$ . Calibration was performed on TEMO1 on 11 and 12 April 2022 and on TEOM2 12 and 13 April 2022. Due to an unexpected power outage to portions of South Broken Hill on 31 May, TEOM1 failed to monitor for approximately 7 hours and as a consequence less than the required 75% data was collected for the day.

The rolling annual average for PM10 with external dust events removed at TEOM1 for the period is 12.96 $\mu\text{g}/\text{m}^3$ , down from 13.17 $\mu\text{g}/\text{m}^3$  at the end of June 2021.



The rolling annual average for PM<sub>10</sub> with external dust events removed at TEOM2 for the period is 13.39 $\mu\text{g}/\text{m}^3$ , up from 12.67 $\mu\text{g}/\text{m}^3$  in June 2021.

The PM<sub>10</sub> 24-hour rolling annual average for both TEOM sites remain below the annual average criteria of 25  $\mu\text{g}/\text{m}^3$ .





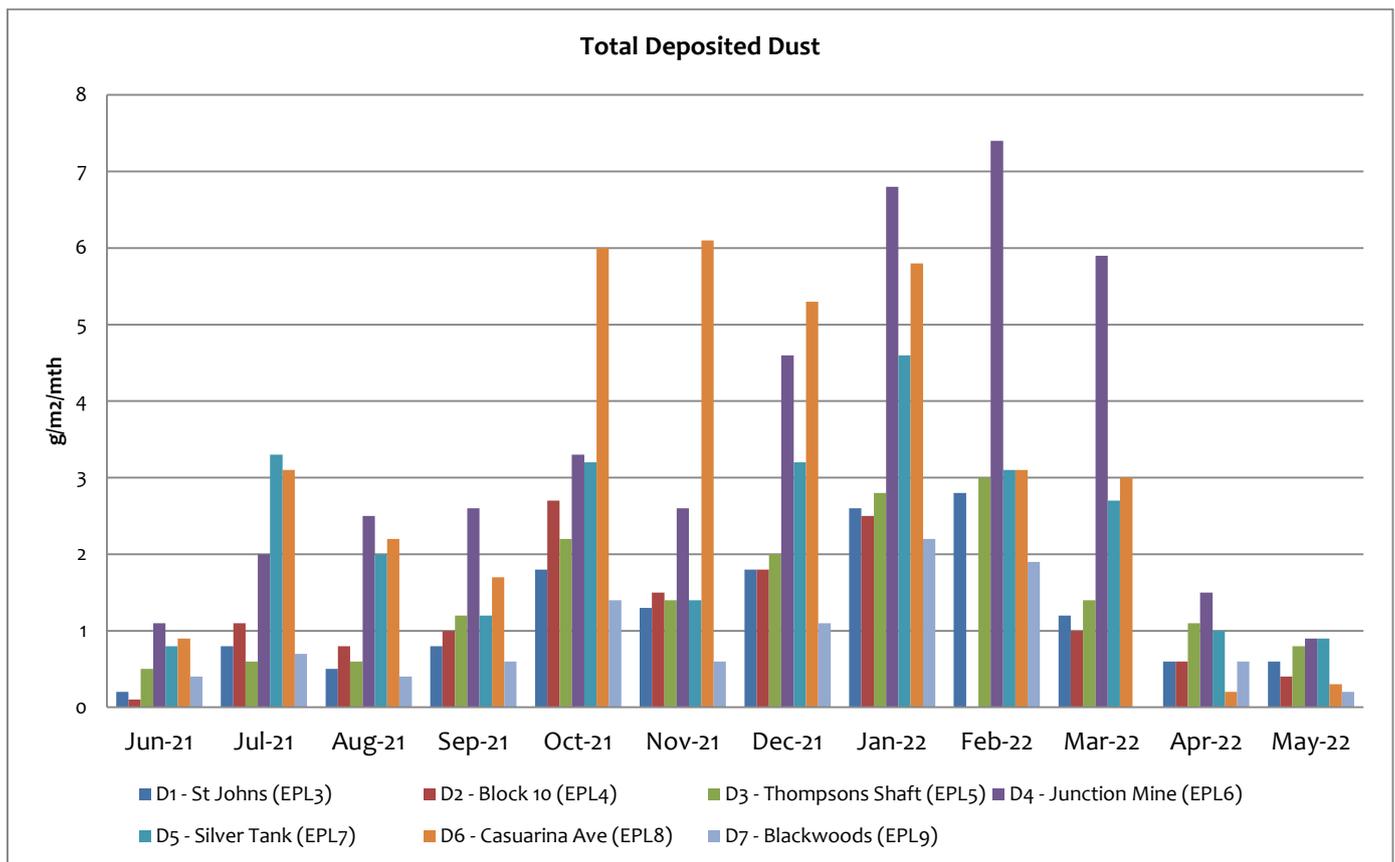
### 1.3 Dust Deposition Sampling

There are seven dust deposition gauges to measure ambient air quality at the Rasp Mine – D1 to D7. D1 and D6 are located off-site, D1 near the St Johns training facility north of the Rasp Mine and D6 in Casuarina Avenue south of the Rasp Mine. D2 to D5 and D7 are located on the mine lease in various locations. A map indicating these locations can be found on the Rasp Mine web site. Dust samples are collected monthly and analysed for total deposited dust and deposited lead dust.

#### ***Dust Deposition Gauges D1 (EPL3) to D7 (EPL9) – Results for May 2022***

Total Deposited Dust (g/m <sup>2</sup> /Month)							
Sample Period	D1 (off site)	D2 (off site)	D3 (on site)	D4 (off site)	D5 (on site)	D6 (off site)	D7 (on site)
<b>May 2022</b>	0.6	0.4	0.8	0.9	0.9	0.3	0.2
<b>Annual Rolling Average</b>	1.3	1.2	1.5	3.4	2.3	3.1	0.9
<b>Background (2010)</b>	4.0	3.1	4.3	5.7	- <sup>1</sup>	5.8	- <sup>1</sup>

Note: “1”= background not available, NS = No sample



The dust levels recorded in Dust Gauges in May 2022 were lower than previous months. The highest dust levels were recorded in the D4 Junction Mine and D6 Casuarina Avenue gauges. The Junction Mine gauge is surrounded on all sides by exposed land which may account for the elevated dust levels. The predominant wind direction for May was from the SSE as shown in the Wind Rose in Section 4.



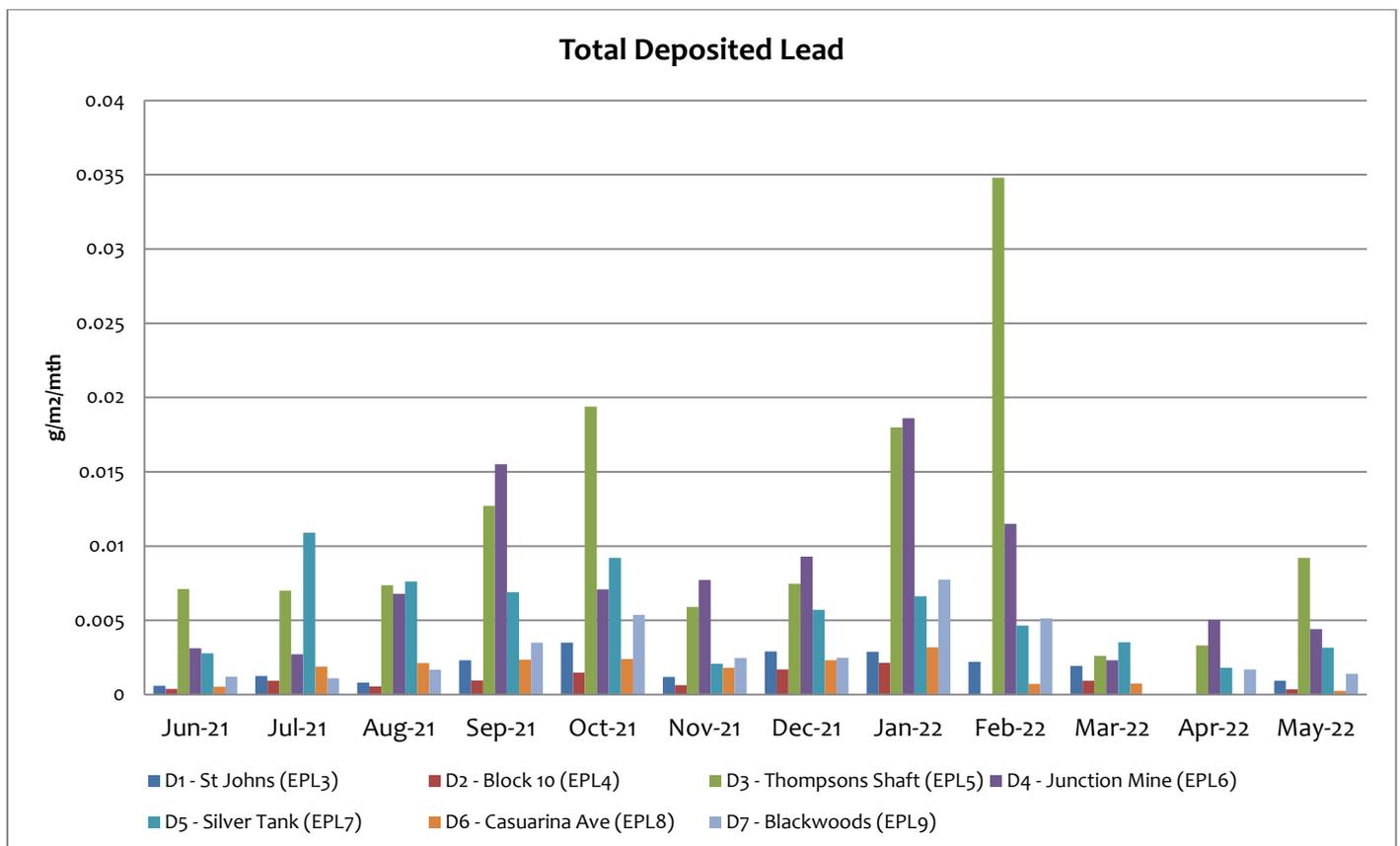
Dust Deposition Gauges that are located off-site must adhere to criteria of annually averaged deposited dust of 4 g/m<sup>2</sup>/month. All off-site Dust Deposition Gauges were compliant in May 2022.

Total Deposited Lead (g/m <sup>2</sup> /Month)							
Sample Period	D1 (off Site)	D2 (on site)	D3 (on site)	D4 (on site)	D5 (on site)	D6 (off Site)	D7 (on site)
May 2022	0.00093	0.00035	0.0092	0.00442	0.00316	0.00025	0.0014
Background (2010)	0.0034	0.005	0.005	0.006	<sup>-1</sup>	0.004	<sup>-1</sup>

Note: "1" = background not available, NS = No sample

There are no guidelines for deposited lead dust. Lead results in May 2022 were highest in the D3 Thompsons Shaft gauge but low compared to previous months. The haul road and loading areas alongside the train is a concrete pad which is regularly swept and watered. A water cart will also attend to the haul road between the concentrate loading shed at the Mill and the rail loadout area when concentrate containers are being transported on site.

Dust suppressant is applied to unsealed areas of the site and roads are frequently watered using water carts in an attempt to control dust emissions. The waste dump adjacent to the rail loadout is treated with dust suppressant to capture any loose dust accumulating on the lower batters and on the upper surface.





### 1.4 Ventilation Outlets and Bag House Monitoring

There are two locations to measure pollutants from exhausts or stacks; these include the Primary Ventilation Shaft, measuring pollutants from underground firings, and the Baghouse Stack at the crusher measuring dust. Each are located on site; the Primary Ventilation Shaft is located centrally and to the north of the mine lease and the Primary Crusher Baghouse Stack is located within the area of the processing plant to the east of the lease. Shaft 6 (EPL56) was removed as a monitoring location with the variation of EPL12559 in March 2019 as it became an intake rather than an exhaust in April 2018. A map indicating these locations can be found on the Rasp Mine web site. Samples are collected quarterly and analysed for a number of parameters listed in below. Reference to the item required in the Rasp Mine Environment Protection Licence (EPL) is provided below. Emissions monitoring is conducted quarterly.

The following criteria apply:

#### Primary Ventilation Shaft (EPL1)

	Unit	Criteria
Nitrogen Oxides	mg/m <sup>3</sup>	350
Volatile Organic Compounds	mg/m <sup>3</sup>	40

#### Primary Ventilation Shaft (EPL1) and Crusher Baghouse (EPL2)

	Unit	Criteria
Total Suspended particles (TSP)	mg/m <sup>3</sup>	20
Type 1 and Type 2 <sup>1</sup>	mg/m <sup>3</sup>	1

**Note 1:** "Type 1 substance" means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements.

"Type 2 substance" means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements.

#### **Primary Vent Shaft (EPL1) and Crusher Baghouse (EPL2) Results for May 2022**

Monitoring was conducted at the Primary Vent Shaft (EPL1) and the Crusher Baghouse (EPL2) on 24 May 2022. The monitoring results for the Primary Vent Shaft and the Crusher Baghouse from this monitoring event were below the licence criteria.

Parameter	Unit	Primary Vent Shaft (EPL1)	Crusher Baghouse (EPL2)
Dry Gas Density	Kg/m <sup>3</sup>	1.29	1.29
Moisture	%	1.81	1.86
Molecular weight of stack gases	g/m <sup>3</sup>	1,289	1,288
Temperature	°C	27.2	21.5
Nitrogen Oxides	mg/m <sup>3</sup>	2.67	NA
Volatile Organic	mg/m <sup>3</sup>	1.38	NA



Compounds			
Total Suspended particles	mg/m <sup>3</sup>	4.31	3.25
Type 1 and Type 2	mg/m <sup>3</sup>	0.135	0.414
Velocity	m/sec	12.8	24.5
Volumetric Flowrate	m <sup>3</sup> /sec	208	10.01

## 2 Noise

### 2.1 Blasting (Vibration and Overpressure)

There are five compliance vibration monitors at various locations measuring for vibration and overpressure from blast firings. These include V1 to V5 which are located on-site and off-site. A map indicating these locations can be found on the Rasp Mine web site. In addition, there are a number of roving monitors which may be used to monitor vibration and overpressure at particular locations as required. Monitors operate continuously and are automatically triggered to record when a blast occurs. The following conditions apply as listed in the PA 07\_0018 and EPL 12559:

#### Blasting Criteria (Western Mineralisation and Main Lodes excluding Block 7)

Location	Airblast Overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	Allowable Exceedance (for production and development blasts)
Residence on privately owned land (7am-7pm)	115	5	5% of the total number of blasts over a 12-month period <sup>1</sup>
(7am-7pm)	120	10	0%
(7pm-10pm)	105	-	-
(10pm-7am)	95	-	-
Public Infrastructure	-	100	0%

**Note 1:** Does not apply until completion of Pollution Reduction Program on the EPL at the end of 2018. Applies to EPL criteria in the period for the Annual Return 3 Nov to 2 Nov the following year and to DPE criteria in the reporting period 1 Jul to 30 Jun each year.

#### Blasting Criteria (Block 7)

Location	Airblast Overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	Allowable Exceedance (for production and development blasts)
Residence on privately owned land (7am-7pm)	115	3 (interim)	5% of the total number of blasts over a 12-month period <sup>1</sup>
(7am-7pm)	120	10	0%
(7pm-10pm)	105	-	-
(10pm-7am)	95	-	-



Broken Hill Bowling Club, Italo (Bocce) Club, Heritage Items within CML7	-	50	0%
Perilya Southern Operations	-	100	0%
Public Infrastructure	-	100	0%

**Note 1:** Applies to EPL criteria in the period for the Annual Return 3 Nov to 2 Nov the following year and to DPE criteria in the reporting period 1 Jul to 30 Jun each year.

In addition the following conditions also apply:

- Production blasts may occur between 6.45 am and 7.15 pm on any day
- 1 production blast per day, with 6 per week averaged over a calendar year
- 6 development blasts per day, with 42 per week averaged over a calendar year

### ***Blasting Data Summary Results for May 2022***

#### **Total Blasts:**

- 0 production blasts occurred before 6.45 am or after 7.15 pm
- The number of Production blasts averaged 2.54 per week over the previous calendar year
- The number of Development blasts averaged 25.17 per week over the previous calendar year

#### **Western Mineralisation and Main Lodes (excluding Block 7):**

- 1 Blast recorded >5 mm/s
- 0 Blasts recorded >10 mm/s
- 0 development blasts recorded an over pressure level over 95 dBL (10pm to 7am)
- 0 development blasts recorded an over pressure level over 105 dBL (7pm to 10pm)
- 0 Blasts recorded an over pressure level over 115dBL (7am to 7pm)
- 0 Blasts recorded an over pressure level over or 120 dBL at any time
- Percentage of development blasts over 5 mm/sec for the annual period = 0%
- Percentage of production blasts over 5 mm/sec for the annual period = 0.8%

#### **Block 7:**

- 0 Blasts recorded >3 mm/s
- 0 Blasts recorded >10 mm/s
- 0 Blasts recorded >50 mm/s at V6
- 0 development blasts recorded an over pressure level over 95 dBL (10pm to 7am)
- 0 development blasts recorded an over pressure level over 105 dBL (7pm to 10pm)
- 0 Blasts recorded an over pressure level over 115 dBL (7am to 7pm)
- 0 Blasts recorded an over pressure level over or 120 dBL at any time
- Percentage of development blasts over 3mm/sec for the annual period = 0%
- Percentage of production blasts over 3mm/sec for the annual period = 0%

The percentage of production blasts in the Western Mineralisation and Main Lodes producing vibration at monitors over 5 mm/sec for the 12-month period is 0.8%.

There have been two production blasts in Block 7 over the last 12 months, neither of which produced vibration at monitors over 3 mm/sec. No complaints have been received about Block 7 blasts.

There were no exceedances of overpressure as a result of blasting in May 2022.



## 2.2 Noise

Noise monitoring is undertaken as per the NSW Noise Policy for Industry at a frequency of once per annum. Annual noise monitoring was conducted during two consecutive night-time periods from 3 to 5 May 2021.

The monitoring assessment found that site LAeq, 15min noise contributions satisfied the relevant limits during the measurements at all assessment locations.

## 3 Water

### 3.1 Groundwater

There are eighteen sampling locations for groundwater. GW01 (EPL37) to GW16 (EPL52) are piezometers installed at various locations around the mine site and are sampled quarterly. There are also two sampling locations for water pumped from underground mining, Shaft 7 (EPL53) and Kintore Pit (EPL54), which are sampled monthly. Results from mine water samples were consistent with previous results. A map indicating these locations can be found on the Rasp Mine web site. Groundwater monitoring is scheduled for completion in March, June, September and December. No limits are applied in the EPL to the results from groundwater monitoring.

#### Groundwater Monitoring Requirements

EPA Identification Number	Frequency	Parameters to be analysed
Shaft 7 EPL53	Monthly	alkalinity (calcium carbonate (CaCO <sub>3</sub> )), cadmium (Cd), calcium (Ca), chloride (Cl), electrical conductivity (EC), iron (Fe), lead Pb), magnesium (Mg), manganese (Mn), pH, sodium (Na), sulphate (SO <sub>4</sub> ), total dissolved solids (TDS) and zinc (Zn)
Kintore Pit (U/G dewatering) EPL54	Monthly	
Piezometers EPL37 (GW01) to EPL52 (GW16)	Quarterly	

#### Shaft 7 (EPL53) and Kintore Pit (EPL54) Results for May 2022

Sample Point	pH	EC (µS/cm <sup>2</sup> )	TDS (mg/l)	Alkalinity (CaCO <sub>3</sub> ) (mg/l)	SO <sub>4</sub> (mg/l)	Cl (mg/l)	Ca (mg/l)	Mg (mg/l)	Na (mg/l)	Cd (mg/l)	Pb (mg/l)	Mn (mg/l)	Zn (mg/l)	Fe (mg/l)
Shaft 7 (EPL53)	6.55	11500	13500	22	7010	1420	537	303	1430	2.73	2.34	420	1420	<0.05
Kintore Pit (EPL54)	5.79	13800	16100	8	7570	2350	485	362	1850	9.54	1.31	555	1270	<0.05

#### Groundwater Bores (EPL37 - EPL52) Results for May 2022

No groundwater monitoring was scheduled in May 2022.

### 3.2 Surface Water Sample Record

There are seven sampling locations for surface water, these include surface water basins located on the mine lease to capture and retain rainfall and two locations up and down stream of an ephemeral creek located south of the mine lease boundary. A map indicating these locations can be found on the Rasp Mine web site. Based on historical data, sampling is most likely to be undertaken in October (highest rainfall month as recorded by Bureau of Meteorology) and April.



### Surface Water Monitoring Requirements

Description	Frequency	Parameters to be Analysed
Federation Way Culvert EPL29/S31-1	2 x per year, six months apart	cadmium (Cd), chloride (Cl), electrical conductivity (EC), lead Pb), manganese (Mn), pH, sodium (Na), sulphate (SO <sub>4</sub> ), total dissolved solids (TDS) and zinc (Zn)
Ryan Street Dam EPL31/S49	2 x per year, six months apart	
Adjacent Olive Grove EPL32/S1A	2 x per year, six months apart	
Adjacent Bowls Club EPL33 /S9-B2	2 x per year, six months apart	
Horwood Dam EPL34/S34	2 x per year, six months apart	
Upstream Bonanza St EPL35	2 x per year, six months apart	
Downstream Sydney Rd EPL36	2 x per year, six months apart	

### *Surface Water Monitoring Results for May 2022*

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No surface water sampling occurred in May 2022 due to lack of rainfall.



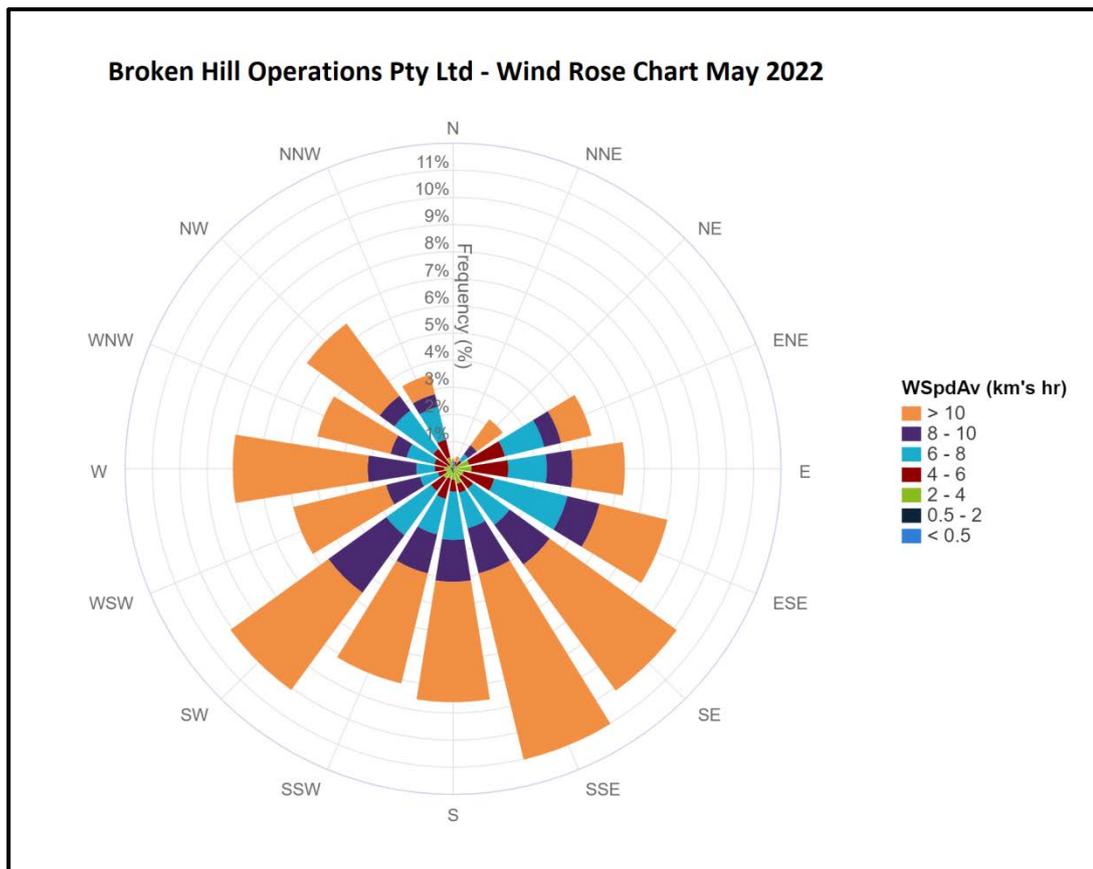
## 4 Weather Data

The weather station continuously monitors the following parameters as per Point 55 of the Environmental Protection Licence.

The following parameters are required to be recorded each month as listed in the EPL 12559:

### Rasp Mine Weather Station (EPL55) Monitoring Requirements

Parameter	Sampling method	Units of measure	Averaging period	Frequency
Temperature at 10 metres	AM-4	degrees Celsius	15 minutes	Continuous
Wind Direction at 10 metres	AM-4	degrees in a clockwise direction from True North	15 minutes	Continuous
Wind Speed at 10 metres	AM-4	metres per second	15 minutes	Continuous
Rainfall	AM-4	millimetres	1 hour	Continuous
Sigma theta	AM-2 & AM-4	degrees	15 minutes	Continuous



The wind rose provided below indicates that there was no prominent wind direction for the month of May, rather it fluctuated between SE and SW for most of the month.



*Weather Data Summary for May 2022*

Date	Temperature @ 10m (°C)		Wind Speed @ 10m (km/hr)		Predominant Wind Direction @ 10m		Rainfall (mm)
	Min	Max	Min	Max	Cardinal	Degree	Total
01-May-22	12.6	17.5	2.0	12.9	NNE	25	0.00
02-May-22	12.4	17.6	1.6	13.4	NNE	20	0.00
03-May-22	11.8	19.9	1.1	14.2	South	184	0.00
04-May-22	10.7	18.4	6.5	26.5	South	185	0.00
05-May-22	6.7	13.9	4.5	28.0	South	178	0.00
06-May-22	5.9	13.6	3.2	18.5	SSW	201	0.00
07-May-22	7.0	15.0	0.8	14.8	NW	312	0.00
08-May-22	8.4	15.8	4.8	19.7	NW	311	0.00
09-May-22	8.4	14.9	2.1	21.9	NW	314	0.00
10-May-22	7.8	16.1	3.5	23.8	NW	312	2.40
11-May-22	11.7	14.7	4.7	25.7	South	181	1.90
12-May-22	13.4	15.7	1.7	16.6	SSW	202	0.00
13-May-22	13.4	15.2	1.2	15.1	NW	313	0.00
14-May-22	12.5	18.3	4.9	25.5	SW	225	0.00
15-May-22	13.9	20.2	1.8	17.1	South	182	0.50
16-May-22	12.0	18.9	1.6	20.1	SSW	201	0.00
17-May-22	9.8	16.4	1.9	12.0	South	180	0.00
18-May-22	9.3	15.3	3.4	18.6	NE	47	0.00
19-May-22	8.4	12.4	5.4	21.9	NNE	46	0.00
20-May-22	7.5	12.5	6.2	22.7	ENE	110	0.00
21-May-22	8.5	16.6	4.8	26.3	East	89	0.00
22-May-22	11.4	17.2	1.6	18.0	ENE	67	0.00
23-May-22	10.7	18.3	1.8	18.4	NE	43	0.00
24-May-22	11.5	18.8	2.3	18.7	NNE	27	0.00
25-May-22	13.8	19.9	4.7	28.0	West	269	0.00
26-May-22	13.4	18.2	1.0	14.9	SSW	204	0.00
27-May-22	11.0	15.8	1.5	21.0	South	180	1.40
28-May-22	9.1	15.1	0.6	18.9	SSE	159	0.00
29-May-22	10.3	16.3	2.8	43.9	SE	135	0.00
30-May-22	7.9	12.2	8.3	58.6	ENE	68	2.20

Rainfall of 8.4mm fell in May 2022.



## 5 Data Log

Sample	Result Received
Hi Volume Samples	10-06-2022
TEOM	28-06-2022
Dust Deposition	24-06-2022
Vents & Bag House	19-06-2022
Noise	14-05-2021
Water	30-05-2022
Blast vibration and overpressure	03-06-2022
Weather	10-06-2022
Date posted to web site	19-07-2022

## 6 Correction Log

No corrections.