



Rasp Mine  
Monthly Environmental Monitoring Report  
December 2023



## INTRODUCTION

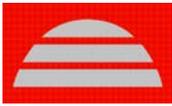
Broken Hill Operations Pty Ltd (BHOP) [a wholly owned subsidiary of CBH Resources Limited (CBH)] owns and operates the Rasp Mine (the Mine), which is located centrally within the City of Broken Hill on Consolidated Mine Lease 7 (CML7).

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 pollutants as listed in the Project Approval (DA 07\_0018 MOD10 December 2022) are required to be monitored in EPL 12559:

### 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          |

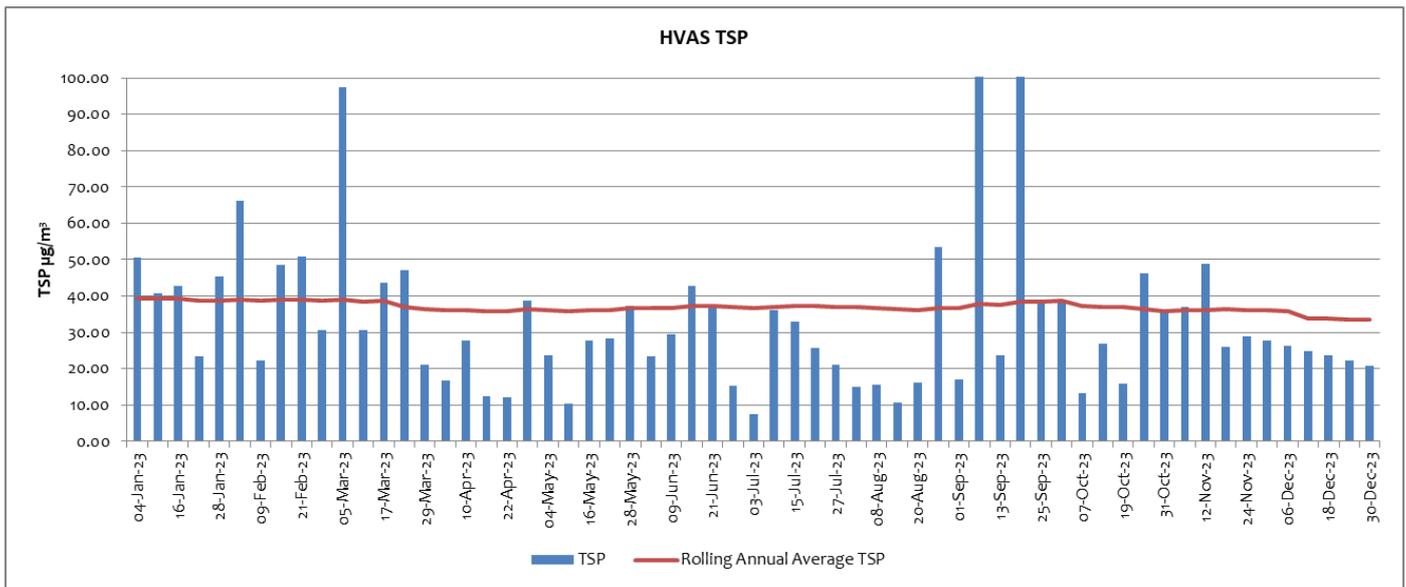
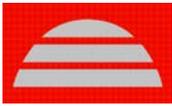
### 1.1 High Volume Air Samplers

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 December 2023***

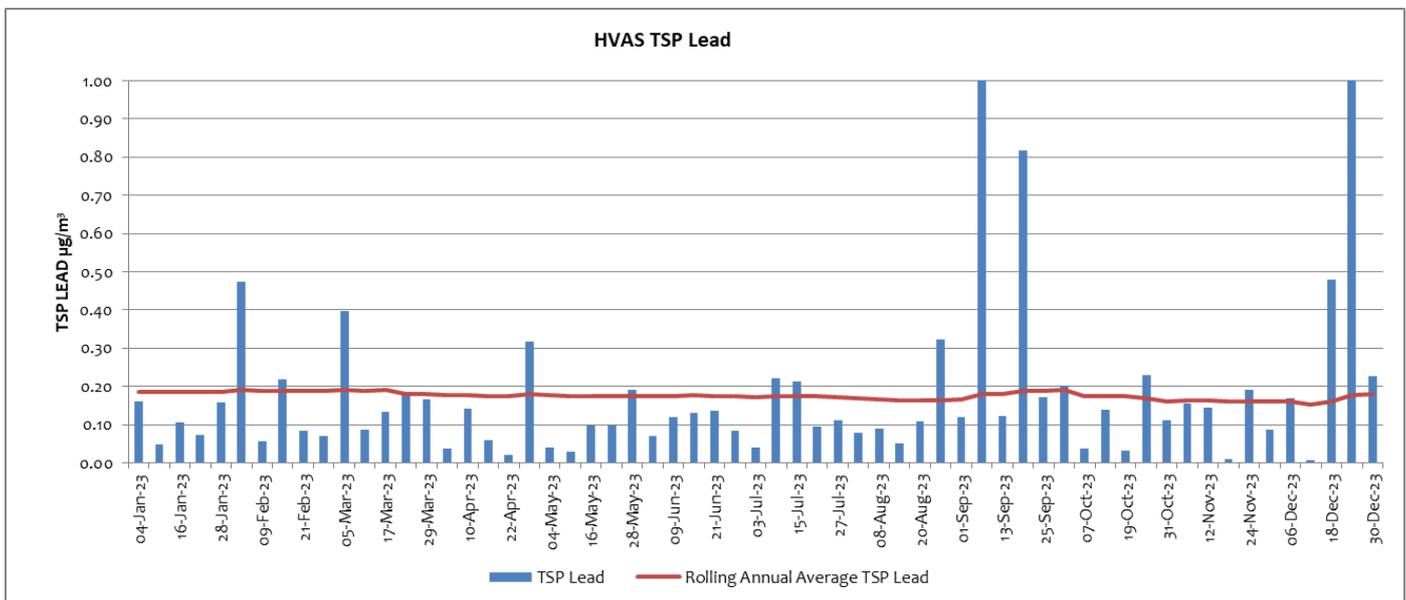
| DATE             | TSP<br>(µg/m <sup>3</sup> ) | Lead<br>(µg/m <sup>3</sup> ) |
|------------------|-----------------------------|------------------------------|
| 06-December-23   | 26.28                       | 0.17                         |
| 12- December -23 | 24.94                       | 0.01                         |
| 18- December -23 | 23.60                       | 0.48                         |
| 24- December -23 | 22.26                       | 1.15                         |
| 30- December -23 | 20.92                       | 0.23                         |

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 for the month of December were consistent with previous months. The highest TSP result for December was 26.28  $\mu\text{g}/\text{m}^3$  on 6 December when winds were predominantly from the South, suggesting this dust has originated off-site. Water carts apply water to site roads daily and dust suppressant is applied to free areas and unsealed roads. The annual rolling average for TSP at this location is 33.39  $\mu\text{g}/\text{m}^3$  at the end of December, lower than the rolling annual average of 39.21  $\mu\text{g}/\text{m}^3$  at the beginning of January 2023.

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



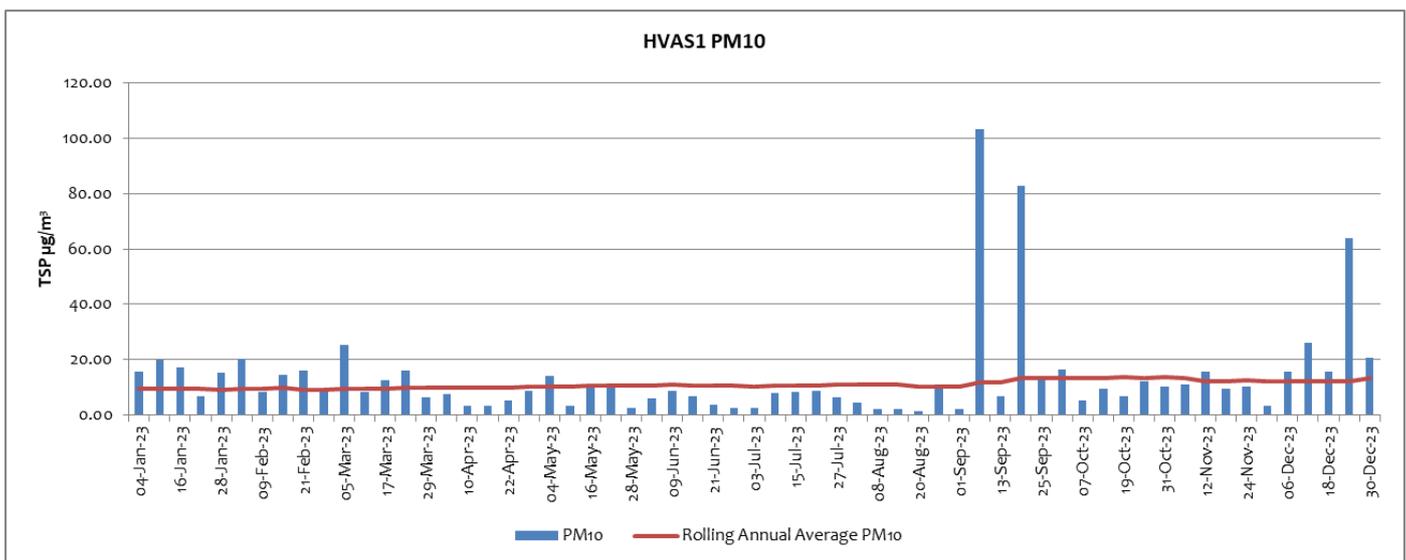
TSP Lead dust results at HVAS for the month of December were higher than in previous months. The highest TSP Lead level for December was 1.15  $\mu\text{g}/\text{m}^3$  on 24 December when winds were predominately from the SW, suggesting contribution from off-site sources. Water carts apply water to site roads daily and dust suppressant is applied to free areas and unsealed roads. The rolling annual average for TSP Lead in December 2023 was 0.18  $\mu\text{g}/\text{m}^3$ , lower than the rolling annual average of 0.19  $\mu\text{g}/\text{m}^3$  for TSP Lead in January 2023.



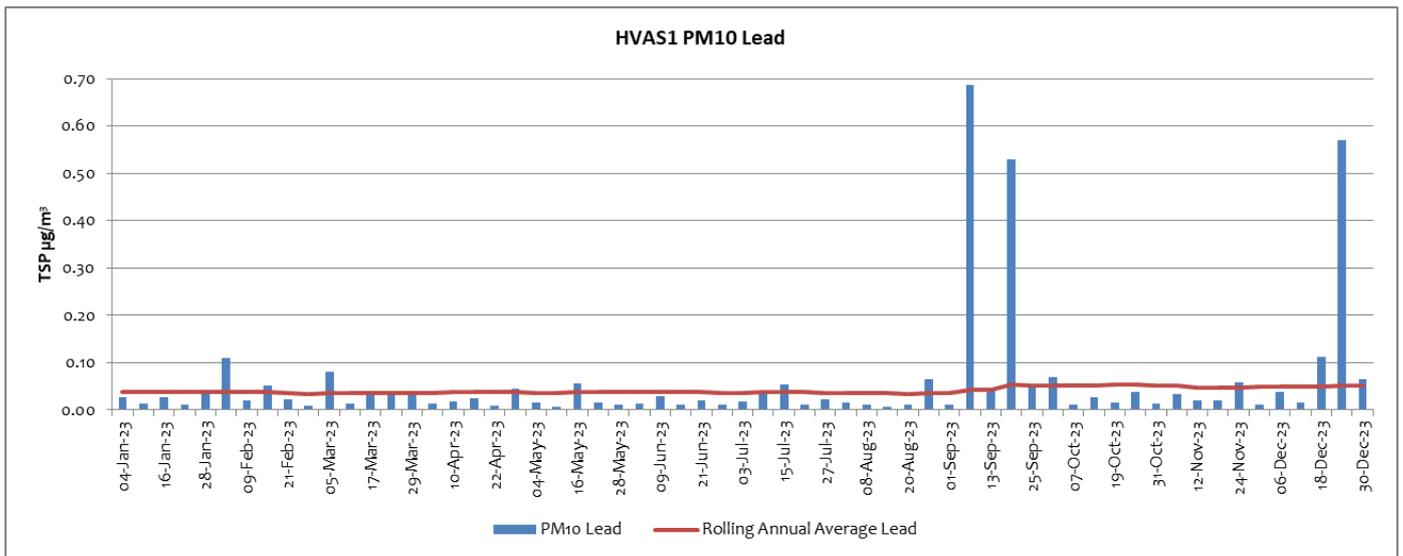
**HVAS1 (EPL11) - Silver Tank (On Site) Results for December 2023**

| DATE             | TSP ( $\mu\text{g}/\text{m}^3$ ) | Lead ( $\mu\text{g}/\text{m}^3$ ) |
|------------------|----------------------------------|-----------------------------------|
| 06-December-23   | 15.90                            | 0.04                              |
| 12- December -23 | 26.30                            | 0.02                              |
| 18- December -23 | 15.90                            | 0.11                              |
| 24- December -23 | 63.70                            | 0.57                              |
| 30- December -23 | 20.70                            | 0.07                              |

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 for December were higher than previous months. The highest PM<sub>10</sub> dust level recorded was 63.70  $\mu\text{g}/\text{m}^3$  on 24 December when winds were predominantly from the SW, suggesting dust contribution from offsite sources. Water carts apply water to site roads daily and dust suppressant is applied to free areas and unsealed roads. The annual rolling average for PM<sub>10</sub> dust at this location is 13.3  $\mu\text{g}/\text{m}^3$  at the end of December 2023, higher than the annual rolling average of 9.8  $\mu\text{g}/\text{m}^3$  at the beginning of January 2023. External and extreme dust events are recorded in measurements.

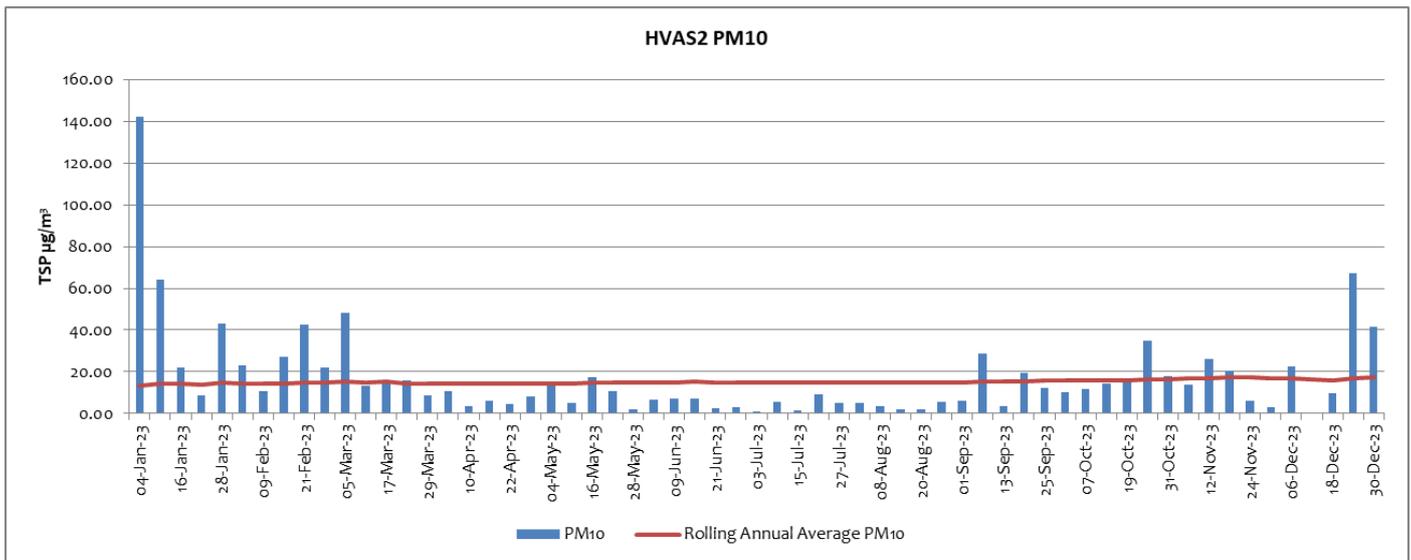


PM<sub>10</sub> Lead dust results at HVAS1 in the month of December were higher than previous months. The highest Lead PM<sub>10</sub> result recorded was 0.57 µg/m<sup>3</sup> on 24 December when winds were predominantly from the SW, the source of this dust is likely from offsite sources. Water carts apply water to site roads daily and dust suppressant is applied to free areas and unsealed roads. The rolling annual average for PM<sub>10</sub> Lead in December was 0.05 µg/m<sup>3</sup>, higher than the rolling annual average of 0.04 µg/m<sup>3</sup> in January 2023.

***HVAS 2 (EPL12) - Blackwood Pit (On Site) Results for December 2023***

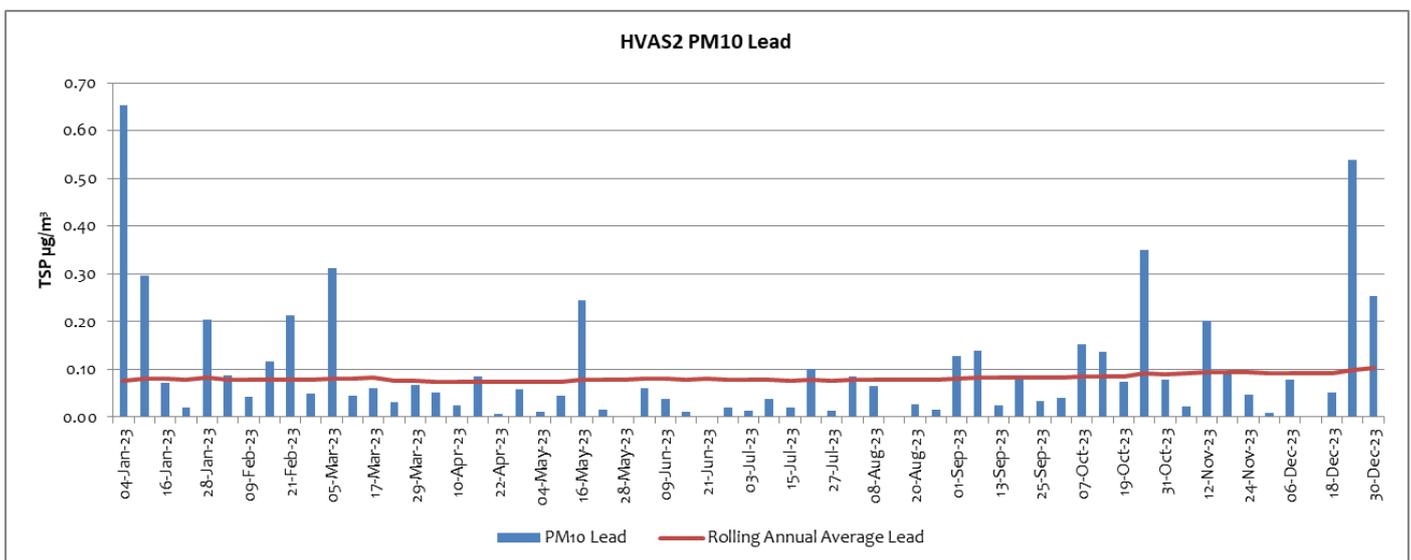
| DATE             | TSP (µg/m <sup>3</sup> ) | Lead (µg/m <sup>3</sup> ) |
|------------------|--------------------------|---------------------------|
| 06-December-23   | 22.60                    | 0.08                      |
| 12- December -23 | <0.1                     | <0.007                    |
| 18- December -23 | 9.70                     | 0.05                      |
| 24- December -23 | 67.10                    | 0.54                      |
| 30- December -23 | 41.40                    | 0.25                      |

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.

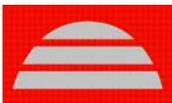


In December PM<sub>10</sub> levels at HVAS2 were higher than previous months. The highest recorded PM<sub>10</sub> dust reading for December was 67.10 µg/m<sup>3</sup> on the 24 December when winds were from the SW suggesting contribution of dust from TSF2 Blackwoods. The surface of TSF2 is treated by a water cart daily and with dust suppressant. The annual rolling average for PM<sub>10</sub> dust at this location is 17.4 µg/m<sup>3</sup> at the end of December 2023, up from 13.22 µg/m<sup>3</sup> in January 2023.

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



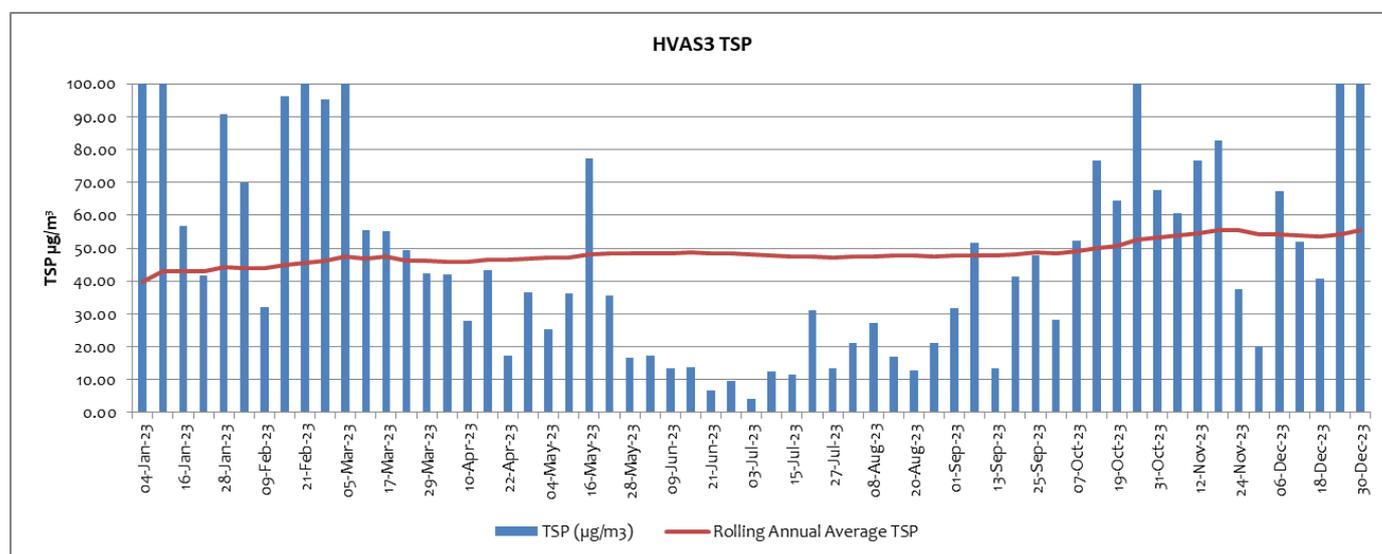
PM<sub>10</sub> lead levels at HVAS2 in December were higher than in previous months. The highest recorded PM<sub>10</sub> Lead dust reading for December was 0.54 µg/m<sup>3</sup> on 24 December when winds were from the SW suggesting there was contribution of Lead dust from TSF2 Blackwoods. Water carts and dust suppressant is applied to the TSF surface to minimise dust lift-off. The rolling annual average for PM<sub>10</sub> Lead in December 2023 was 0.10 µg/m<sup>3</sup>, higher than the value of 0.08 µg/m<sup>3</sup> in January 2023.



**HVAS 3 (EPL57) - Blackwood Pit (On Site) Results for December 2023**

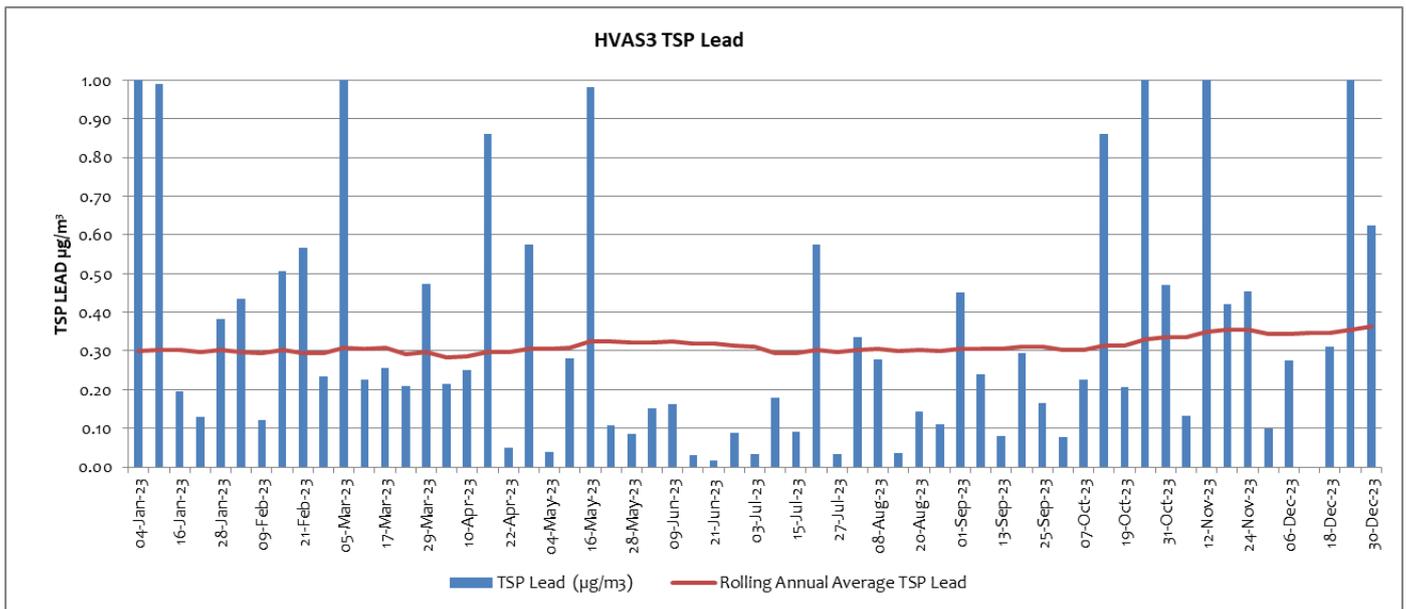
| DATE             | TSP ( $\mu\text{g}/\text{m}^3$ ) | Lead ( $\mu\text{g}/\text{m}^3$ ) |
|------------------|----------------------------------|-----------------------------------|
| 06-December-23   | 67.20                            | 0.28                              |
| 12- December -23 | 51.80                            | <0.007                            |
| 18- December -23 | 40.70                            | 0.31                              |
| 24- December -23 | 146.00                           | 1.06                              |
| 30- December -23 | 114.00                           | 0.63                              |

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 24 December with a result of  $146.0 \mu\text{g}/\text{m}^3$ , when winds were from the SW, suggesting dust has originated in TSF2 Blackwoods. Water carts and dust suppressant is applied to the TSF surface to minimise dust lift-off. The annual rolling average for TSP dust at this location is  $55.46 \mu\text{g}/\text{m}^3$  at the end of December 2023, up from  $39.72 \mu\text{g}/\text{m}^3$  in January 2023.

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



TSP Lead levels in December were consistent with previous months. The highest result of 1.06 µg/m<sup>3</sup> was recorded on 24 December when winds were predominantly from the SW suggesting dust lift-off from TSF2 contributed to this result. The rolling annual average for TSP Lead in December was 0.36 µg/m<sup>3</sup>, up from 0.30 µg/m<sup>3</sup> in January 2023. Water carts and dust suppressant is applied to the TSF surface to minimise dust lift-off.

## 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 µg/m<sup>3</sup> and an annual average criteria of 25 µg/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.

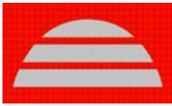


**TEOM1 (EPL13) (Off Site) and TEOM2 (EPL14) (On Site) Validated Results for December 2023**

| Particulate Matter <10 Microns 24Hr Average |  |  |  |  |
|---|--|--|--|--|
| Date  | TEOM 1<br>( $\mu\text{g}/\text{m}^3$ ) | Compliant with<br>50 $\mu\text{g}/\text{m}^3$<br>24hr average? | TEOM 2<br>( $\mu\text{g}/\text{m}^3$ ) | Compliant with<br>50 $\mu\text{g}/\text{m}^3$<br>24hr average? |
| 1-Dec-23                                    | 8.1                                    | Y  | 6.5                                    | Y  |
| 2-Dec-23                                    | 10.6                                   | Y  | 8.4                                    | Y  |
| 3-Dec-23                                    | 9.7                                    | Y  | 4.8                                    | Y  |
| 4-Dec-23                                    | 0.8                                    | Y  | 4.6                                    | Y  |
| 5-Dec-23                                    |  |  |  |  |
| 6-Dec-23                                    |  |  |  |  |
| 7-Dec-23                                    |  |  |  |  |
| 8-Dec-23                                    |  |  |  |  |
| 9-Dec-23                                    |  | Y  |  | N  |
| 10-Dec-23                                   | 13.0                                   | Y  |  | N  |
| 11-Dec-23                                   | 19.5                                   | Y  | 34.1                                   | Y  |
| 12-Dec-23                                   | 20.9                                   | Y  | 22.7                                   | Y  |
| 13-Dec-23                                   |  | Y  | 19.8                                   | Y  |
| 14-Dec-23                                   |  | Y  | 11.3                                   | Y  |
| 15-Dec-23                                   | 15.8                                   | Y  | 16.1                                   | Y  |
| 16-Dec-23                                   | 13.7                                   | Y  | 10.3                                   | Y  |
| 17-Dec-23                                   | 10.9                                   | Y  | 17.4                                   | Y  |
| 18-Dec-23                                   | 17.6                                   | Y  | 9.7                                    | Y  |
| 19-Dec-23                                   | 21.5                                   | Y  | 100.4                                  | N  |
| 20-Dec-23                                   | 12.6                                   | Y  | 37.9                                   | Y  |
| 21-Dec-23                                   | 15.0                                   | Y  | 20.8                                   | Y  |
| 22-Dec-23                                   | 25.8                                   | Y  | 17.4                                   | Y  |
| 23-Dec-23                                   | 28.5                                   | Y  | 20.4                                   | Y  |
| 24-Dec-23                                   |  | Y  |  | Y  |
| 25-Dec-23                                   | 13.7                                   | Y  | 14.8                                   | Y  |
| 26-Dec-23                                   | 12.1                                   | Y  | 6.1                                    | Y  |
| 27-Dec-23                                   | 22.0                                   | Y  | 15.6                                   | Y  |
| 28-Dec-23                                   | 15.7                                   | Y  | 13.4                                   | Y  |
| 29-Dec-23                                   | 21.4                                   | Y  | 24.7                                   | Y  |
| 30-Dec-23                                   | 13.7                                   | Y  | 52.0                                   | N  |
| 31-Dec-23                                   | 10.2                                   | Y  | 12.0                                   | Y  |

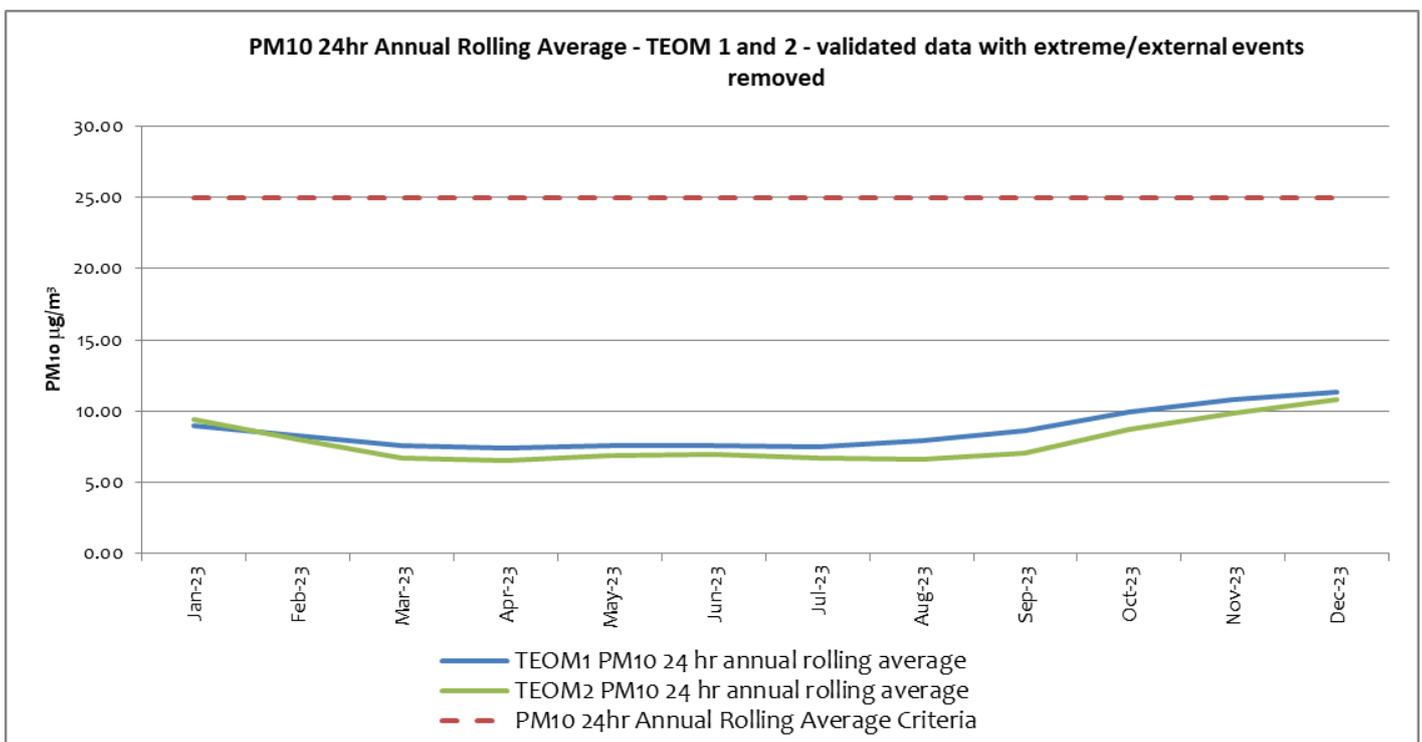
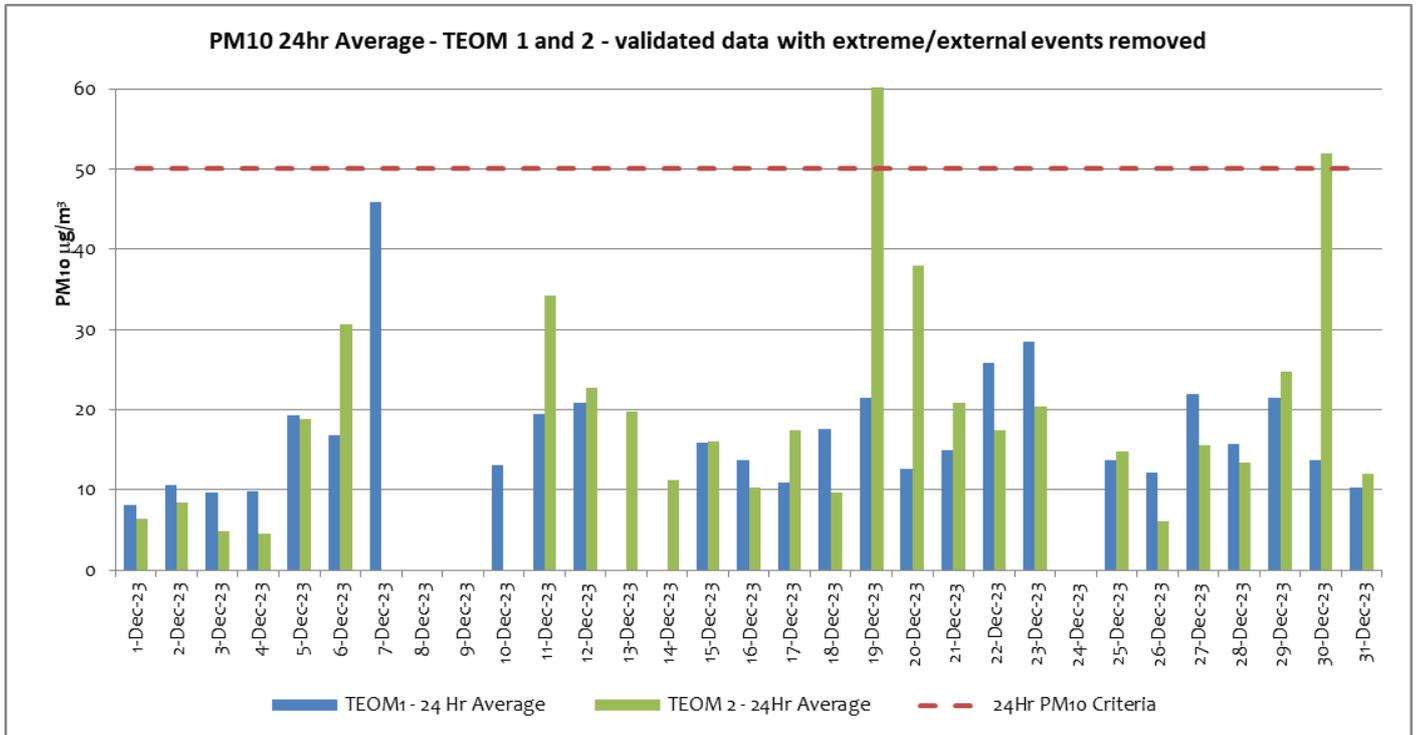
PM<sub>10</sub> dust levels at both TEOM units fluctuated in the month of December. TEOM2 recorded results above licence limits on 19 December and 30 December which were reported to relevant regulatory bodies, and was disabled for four days from 7 to 10 December due to damage from a storm. The storm which damaged TEOM2 on the afternoon of 7 December continued over the next two days so data collected at TEOM1 is invalid for 8 and 9 December. Power fluctuations and repeated stabilisation at TEOM1 on 13 and 14 December rendered the data invalid for those days.

The rolling annual average for PM<sub>10</sub> at TEOM1 with external dust events removed for the period January 2023 to December 2023 is 11.32  $\mu\text{g}/\text{m}^3$ , higher than 9.18  $\mu\text{g}/\text{m}^3$  at the end of December 2022.



The rolling annual average for PM<sub>10</sub> at TEOM2 with external dust events removed for the period January 2023 to December 2023 is 10.78 µg/m<sup>3</sup>, higher than the rolling annual average of 10.12 µg/m<sup>3</sup> at the end of December 2022.

The PM<sub>10</sub> 24-hour rolling annual average for both TEOM sites remain below the annual average criteria of 25 µg/m<sup>3</sup>.





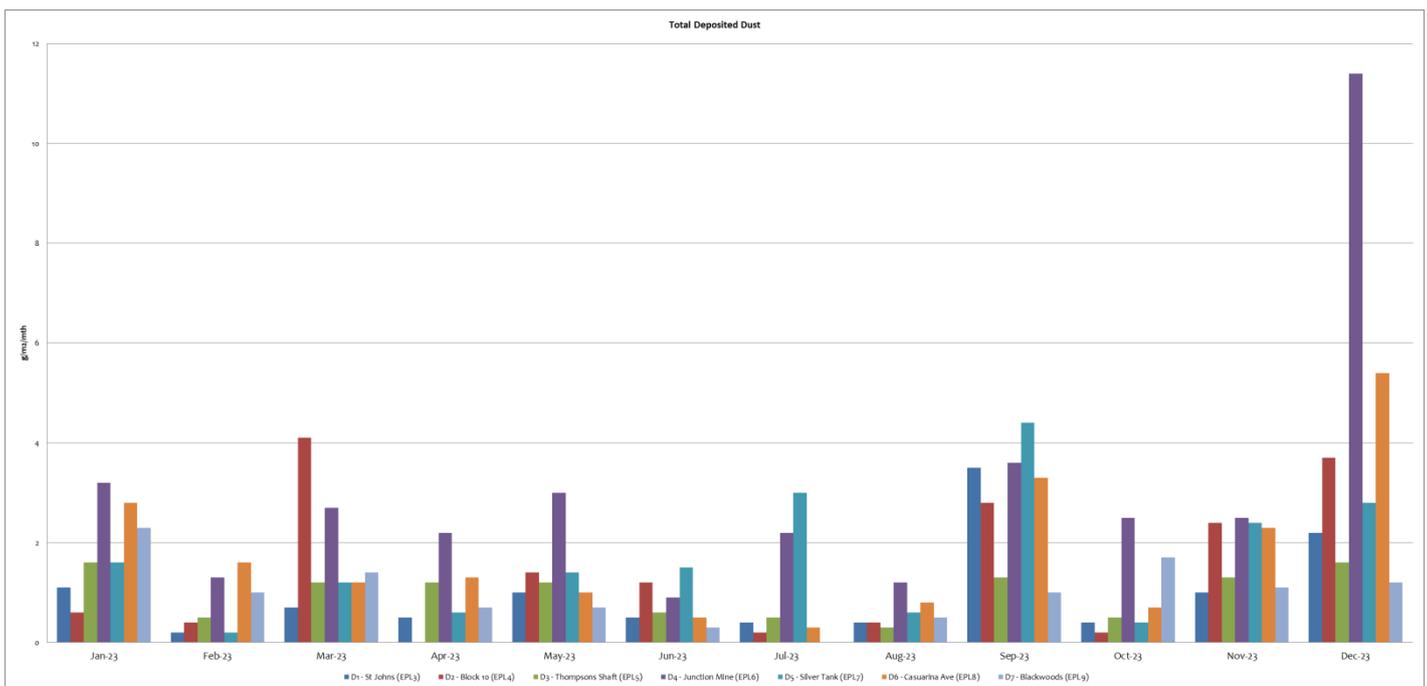
### 1.3 Dust Deposition Sampling

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 December 2023***

| Total Deposited Dust (g/m <sup>2</sup> .month) |                  |                  |                 |                  |                 |                  |                 |
|--|------------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|
| Sample Period                                  | D1<br>(off site) | D2<br>(off site) | D3<br>(on site) | D4<br>(off site) | D5<br>(on site) | D6<br>(off site) | D7<br>(on site) |
| <b>December 2023</b>                           | 2.2              | 3.7              | 1.6             | 11.4             | 2.8             | 5.4              | 1.2             |
| <b>Annual Rolling Average</b>                  | 0.99             | 1.58             | 0.98            | 3.06             | 1.68            | 1.77             | 1.08            |
| <b>Background (2010)</b>                       | - <sup>1</sup>   | 3.1              | 4.3             | 5.7              | - <sup>1</sup>  | 5.8              | - <sup>1</sup>  |

Note: “1”= background not available, N/A = not applicable as dust deposition unit is located on site, NS = No sample



The dust levels recorded in Dust Gauges in December 2023 were higher than previous months. The highest dust levels were recorded in the D4 Junction Mine gauge which is situated in a residence and may have been impacted by localised activities. The predominant wind direction for December was from the South as shown in the Wind Rose in Section 4, although wind direction was variable, suggesting contribution of dust in this location was likely from both off-site sources and site activities.

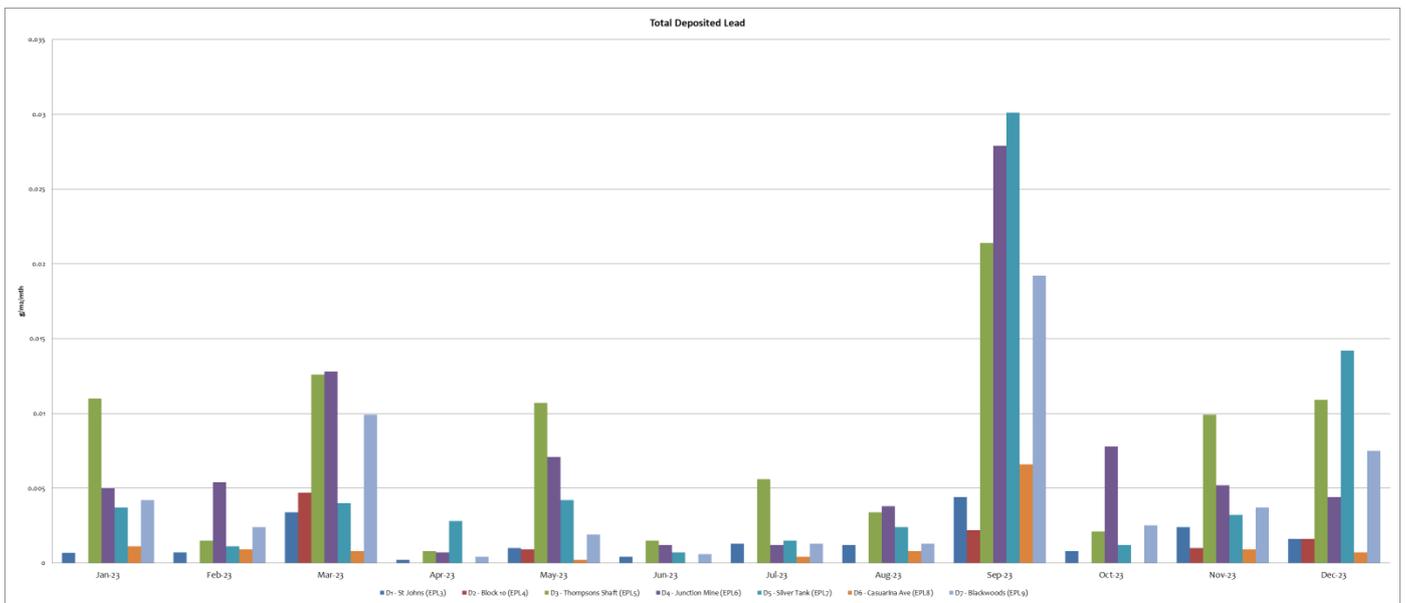
Dust Deposition Gauges that are located off-site must adhere to criteria for annually averaged deposited dust of 4 g/m<sup>2</sup>.month. All off-site Dust Deposition Gauges were compliant in the reporting period.



**Insoluble Lead (g/m<sup>2</sup>.month)**

| Sample Period            | D1<br>(off Site) | D2<br>(on site) | D3<br>(on site) | D4<br>(on site) | D5<br>(on site) | D6<br>(off Site) | D7<br>(on site) |
|--------------------------|------------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|
| <b>December 2023</b>     | 0.0016           | 0.0016          | 0.0109          | 0.004           | 0.0142          | 0.0007           | 0.0075          |
| <b>Background (2010)</b> | 0.0034           | 0.005           | 0.005           | 0.006           |                 | 0.004            |                 |

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



There are no guidelines for deposited lead dust limits. Results for December were slightly higher than previous months with the highest result recorded in the D5 Silver Tank gauge. The predominant wind direction for December was from the South as shown in the Wind Rose in Section 4, suggesting contribution of dust in this location was likely from off-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.

### 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 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 |
|-----------------------------------|-------------------|----------|
| <b>Nitrogen Oxides</b>            | mg/m <sup>3</sup> | 350      |
| <b>Volatile Organic Compounds</b> | mg/m <sup>3</sup> | 40       |



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

|  | Unit              | Criteria |
|--|-------------------|----------|
| <b>Total Suspended particles (TSP)</b> | mg/m <sup>3</sup> | 20       |
| <b>Type 1 and Type 2<sup>1</sup></b>   | 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 December 2023**

Quarterly monitoring was conducted at the Primary Vent Shaft (EPL1) and the Crusher Baghouse (EPL2) on 21 November 2023 and results were within limits.

| Parameter                       | Unit                | Primary Vent Shaft (EPL1) | Crusher Baghouse (EPL2) |
|---------------------------------|---------------------|---------------------------|-------------------------|
| Dry Gas Density                 | Kg/m <sup>3</sup>   | 1.29                      | 1.29                    |
| Moisture                        | %                   | 1.92                      | 1.89                    |
| Molecular weight of stack gases | g/m <sup>3</sup>    | 1,288                     | 1,288                   |
| Temperature                     | °C                  | 25.8                      | 24.7                    |
| Nitrogen Oxides                 | mg/m <sup>3</sup>   | 2.05                      | NA                      |
| Volatile Organic Compounds      | mg/m <sup>3</sup>   | 0.49                      | NA                      |
| Total Suspended particles       | mg/m <sup>3</sup>   | 3.76                      | 6.41                    |
| Type 1 and Type 2               | mg/m <sup>3</sup>   | 0.204                     | 0.298                   |
| Velocity                        | m/sec               | 12.4                      | 22.4                    |
| Volumetric Flowrate             | m <sup>3</sup> /sec | 202                       | 9.35                    |

## 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<br>(dB(Lin Peak)) | Ground Vibration<br>(mm/s) | Allowable Exceedance<br>(for production and<br>development blasts)         |
|---|---|----------------------------|--|
| Residence on privately<br>owned land<br>(7am-7pm) | 115                                     | 5                          | 5% of the total number<br>of blasts over a 12-month<br>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<br>(dB(Lin Peak)) | Ground Vibration<br>(mm/s) | Allowable Exceedance<br>(for production and<br>development blasts)      |
|---|---|----------------------------|---|
| Residence on privately<br>owned land<br>(7am-7pm)                                 | 115                                     | 3 (interim)                | 5% of the total number of<br>blasts over a 12-month period <sup>1</sup> |
| (7am-7pm)   | 120                                     | 10                         | 0%  |
| (7pm-10pm)  | 105                                     | -                          | -   |
| (10pm-7am)  | 95                                      | -                          | -   |
| Broken Hill Bowling<br>Club, Italo (Bocce)<br>Club, Heritage Items<br>within CML7 | -                                       | 50                         | 0%  |
| Perilya Southern<br>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 December 2023 (annual period)**

**Total Blasts:**

- 0 production blasts occurred before 6.45 am or after 7.15 pm
- The number of Production blasts averaged 1.98 per week over the previous calendar year
- The number of Development blasts averaged 15.87 per week over the previous calendar year

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

- 0 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%

**Block 7:**

There have been no blasts in Block 7 for the 12-month period.

The have been no production blasts in the Western Mineralisation and Main Lodes producing vibration at monitors over 5 mm/sec for the 12-month period.

**2.2 Noise**

Noise monitoring is undertaken as per the NSW Noise Policy for Industry at a frequency of once per annum. Attended environmental noise monitoring was done during the night period of 18 December 2023 at 14 monitoring locations. Noise levels from site complied with relevant limits at all monitoring locations during the December 2023 survey.

**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. 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 December 2023**

| 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) |
|---------------------|-------------|--------------------------|------------|--|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Kintore Pit (EPL54) | 6.05        | 13700                    | 14800      | 3                                      | 5870                   | 1640      | 502       | 345       | 1920      | 3.29      | 2.57      | 399       | 1180      | <0.05     |
| Shaft 7 (EPL53)     | Not pumping |                          |            |  |                        |           |           |           |           |           |           |           |           |           |



**Groundwater Bores (EPL37 - EPL52) Results for December 2023**

| 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) |
|--------------|---------------------|--------------------------|------------|--|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| GW01 (EPL37) | 4.6                 | 8130                     | 8400       | 1                                      | 4240                   | 526       | 204       | 335       | 1310      | 0.11      | 0.03      | 224       | 168       | <0.05     |
| GW02 (EPL38) | Bore Dry            |                          |            |  |                        |           |           |           |           |           |           |           |           |           |
| GW03 (EPL39) | 3.8                 | 14500                    | 14000      | <1                                     | 4830                   | 2710      | 580       | 380       | 2300      | 0.558     | 3.2       | 454       | 366       | 0.44      |
| GW04 (EPL40) | 7.5                 | 15000                    | 12300      | 304                                    | 4630                   | 2410      | 554       | 559       | 2340      | 0.018     | 0.002     | 18.8      | 10.2      | <0.05     |
| GW05 (EPL41) | 6.6                 | 13800                    | 12400      | 38                                     | 4590                   | 2220      | 568       | 419       | 2210      | 1.38      | 0.533     | 270       | 210       | <0.05     |
| GW06 (EPL42) | 6.7                 | 14400                    | 13600      | 52                                     | 5000                   | 2390      | 557       | 516       | 2400      | 1.19      | 0.071     | 327       | 219       | <0.05     |
| GW07 (EPL43) | 6.6                 | 12600                    | 11800      | 16                                     | 4490                   | 1880      | 551       | 354       | 2010      | 2.02      | 1.76      | 312       | 302       | <0.05     |
| GW08 (EPL44) | 6.4                 | 10100                    | 9990       | 11                                     | 3310                   | 1650      | 610       | 240       | 1250      | 1.73      | 0.368     | 256       | 457       | <0.05     |
| GW09 (EPL45) | 7.3                 | 11100                    | 9820       | 122                                    | 3810                   | 1610      | 596       | 519       | 1520      | 0.598     | 0.005     | 63.3      | 86.5      | <0.05     |
| GW10 (EPL46) | 7.2                 | 15800                    | 13400      | 110                                    | 4670                   | 2840      | 586       | 568       | 2540      | 2.43      | 0.005     | 115       | 243       | <0.05     |
| GW11 (EPL47) | 6.7                 | 3210                     | 2880       | 12                                     | 1340                   | 298       | 303       | 82        | 365       | 1.15      | 0.609     | 9.32      | 56.9      | <0.05     |
| GW12 (EPL48) | Insufficient sample |                          |            |  |                        |           |           |           |           |           |           |           |           |           |
| GW13 (EPL49) | Bore Dry            |                          |            |  |                        |           |           |           |           |           |           |           |           |           |
| GW14 (EPL50) | Bore Dry            |                          |            |  |                        |           |           |           |           |           |           |           |           |           |
| GW15 (EPL51) | Bore Dry            |                          |            |  |                        |           |           |           |           |           |           |           |           |           |
| GW16 (EPL52) | Bore Dry            |                          |            |  |                        |           |           |           |           |           |           |           |           |           |

### 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.

Results for all locations were consistent with previous samples.

#### Surface Water Monitoring Requirements

| Description                        | Frequency                      | Parameters to be Analysed |
|------------------------------------|--------------------------------|---------------------------|
| Federation Way Culvert EPL29/S31-1 | 2 x per year, six months apart |                           |



|                                  |                                |  |
|----------------------------------|--------------------------------|--|
| Ryan Street Dam EPL31/S49        | 2 x per year, six months apart | cadmium (Cd), chloride (Cl), electrical conductivity (EC), lead Pb), manganese (Mn), pH, sodium (Na), sulphate (SO4), total dissolved solids (TDS) and zinc (Zn) |
| 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 December 2023

No surface water sampling was conducted in December due to lack of rainfall.

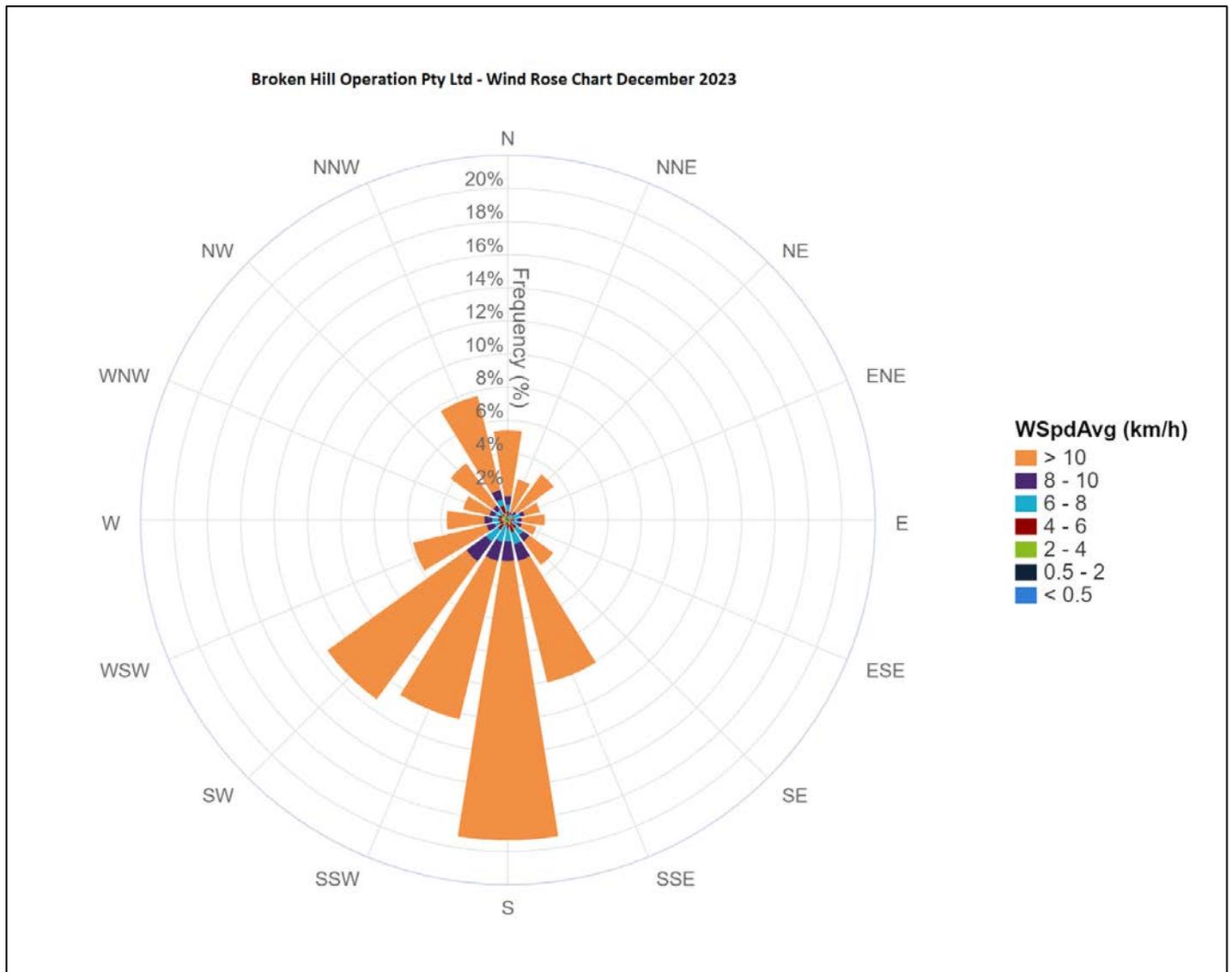
## 4 Weather Data

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 above indicates that the prominent wind direction for the month of December was from the South.



*Weather Data Summary for December 2023*

| Date      | Temperature @ 10m (°C) |      | Wind Speed @ 10m (km/hr) |      | Predominant Wind Direction @ 10m |        | Rainfall (mm) |
|-----------|------------------------|------|--------------------------|------|----------------------------------|--------|---------------|
|           | Min                    | Max  | Min                      | Max  | Cardinal                         | Degree | Total         |
| 1-Dec-23  | 14.8                   | 26.8 | 8.3                      | 11.0 | SW                               | 218    | 0.03          |
| 2-Dec-23  | 14.2                   | 26.9 | 13.3                     | 17.3 | SSW                              | 201    | 0             |
| 3-Dec-23  | 18.9                   | 29.3 | 8.9                      | 11.4 | SE                               | 125    | 0             |
| 4-Dec-23  | 26.8                   | 36   | 12.5                     | 16.5 | SSW                              | 198    | 0             |
| 5-Dec-23  | 21.6                   | 40.2 | 15.1                     | 20.5 | SSW                              | 200    | 0             |
| 6-Dec-23  | 24.7                   | 39.2 | 12.1                     | 16.5 | S                                | 164    | 0             |
| 7-Dec-23  | 28.6                   | 40.2 | 18.5                     | 25.7 | SE                               | 124    | 0.96          |
| 8-Dec-23  | 26.5                   | 39.4 | 20.7                     | 29.2 | SSW                              | 199    | 0             |
| 9-Dec-23  | 18.3                   | 38.6 | 24.6                     | 34.4 | SSW                              | 188    | 0             |
| 10-Dec-23 | 18.1                   | 28.3 | 18.8                     | 24.0 | S                                | 173    | 0             |
| 11-Dec-23 | 21                     | 34   | 12.4                     | 16.8 | SSW                              | 194    | 0             |
| 12-Dec-23 | 21.6                   | 33.9 | 9.9                      | 13.4 | SW                               | 217    | 2.56          |
| 13-Dec-23 | 19.4                   | 33.6 | 14.3                     | 18.8 | W                                | 249    | 0             |
| 14-Dec-23 | 16.9                   | 29.2 | 12.3                     | 15.5 | SSW                              | 197    | 0             |
| 15-Dec-23 | 14.7                   | 30.2 | 15.3                     | 20.3 | SW                               | 219    | 0             |
| 16-Dec-23 | 15.8                   | 27.2 | 11.5                     | 14.9 | S                                | 176    | 0             |
| 17-Dec-23 | 19.7                   | 31.6 | 9.2                      | 11.6 | SE                               | 124    | 0             |
| 18-Dec-23 | 20.9                   | 36.7 | 14.1                     | 18.4 | S                                | 176    | 0             |
| 19-Dec-23 | 13.5                   | 26.2 | 22.9                     | 32.1 | S                                | 167    | 0             |
| 20-Dec-23 | 12.8                   | 24.1 | 19.8                     | 25.5 | S                                | 170    | 0             |
| 21-Dec-23 | 15.4                   | 27   | 14.7                     | 18.7 | SSW                              | 184    | 0             |
| 22-Dec-23 | 19.7                   | 32.1 | 9.6                      | 11.9 | SSW                              | 187    | 0             |
| 23-Dec-23 | 19.3                   | 31.4 | 10.8                     | 14.1 | S                                | 172    | 0             |
| 24-Dec-23 | 13                     | 31.5 | 20.1                     | 25.7 | WSW                              | 236    | 0             |
| 25-Dec-23 | 13.5                   | 22.7 | 23.1                     | 30.5 | WSW                              | 229    | 0             |
| 26-Dec-23 | 15.2                   | 24.7 | 13.4                     | 16.7 | SW                               | 216    | 0             |
| 27-Dec-23 | 17.5                   | 29.4 | 10.2                     | 13.3 | S                                | 180    | 0             |
| 28-Dec-23 | 23.6                   | 34.6 | 10.0                     | 13.9 | SSE                              | 138    | 0.05          |
| 29-Dec-23 | 11.9                   | 33.5 | 21.2                     | 28.4 | S                                | 174    | 0.87          |
| 30-Dec-23 | 13.8                   | 24.2 | 20.4                     | 27.3 | S                                | 175    | 0             |
| 31-Dec-23 | 17.3                   | 27   | 12.2                     | 16.1 | S                                | 160    | 0             |

Rainfall of 14.47 mm fell in December 2023.



## 5 Data Log

| Sample                           | Result Received |
|----------------------------------|-----------------|
| Hi Volume Samples                | 19-02-2024      |
| TEOM                             | 29-01-2024      |
| Dust Deposition                  | 14-02-2024      |
| Vents & Bag House                | 14-12-2023      |
| Noise                            | 05-02-2024      |
| Water                            | 19-12-2023      |
| Blast vibration and overpressure | 01-01-2024      |
| Weather                          | 01-01-2024      |
| Date posted to web site          | 8-03-2024       |

## 6 Correction Log

No corrections.