

Department of Energy, Environment and Climate Action

Kangaroo Flat Dust Monitoring Report

Q4 OCTOBER-DECEMBER 2023

27TH MARCH 2024



CERTIFICATE OF APPROVAL FOR ISSUE OF DOCUMENTS

Client: Department of Energy, Environment and Climate Action
Project Title: Kangaroo Flat Dust Monitoring Report Q4 2023
Title: Kangaroo Flat Dust Monitoring Report Q4 2023
Project: MV214940
Document Status: Final
Date of Issue: 27/03/2024

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This report is prepared for the Client, Department of Energy, Environment and Climate Action, for the purpose of monitoring dust at the Kangaroo Flat Mine site which is currently in care and maintenance. An unrestricted copy of this report will be shared with the public via the Earth Resources Regulation website.

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Executive Summary

ALS is engaged by the Department of Energy, Environment and Climate Action , Earth Resources Regulator (DEECA(ERR)) to undertake dust monitoring at the former Kangaroo Flat Mine. This report provides results and analysis of data collected from sampling in Q4 2023 for the Kangaroo Flat Mine site.

DEECA(ERR) have responsibility for care and maintenance and rehabilitation of the former Bendigo Gold Mine sites, as its operator, Kralcopic Pty Ltd went into liquidation. Prior to inheriting this responsibility, DEECA(ERR) engaged ALS to undertake depositional dust monitoring at their former Kangaroo Flat and Woodvale sites.

This report analyses the data gathered in Q4 2023 for the Kangaroo Flat Mine site by comparing the levels to accepted standards (where available) and previous dust monitoring results. The results of dust monitoring in the first half of 2021 were published in a report by CDM Smith. ALS has completed the collection of samples/monitoring, analysis of lab results (Springvale ALS Laboratory - NATA accredited) and drafted the dust monitoring reports since Q3 2021.

The Kangaroo Flat Mine site (including dust monitoring sites) is located approximately 4 km south from the centre of Bendigo. The Kangaroo Flat Mine site includes:

- fine tailings dam currently covered in mullock overburden.
- course tailings dam which has been covered with waste rock
- two water dams which capture rainwater
- various other smaller ponds for stormwater management
- process plant
- mine administration buildings and various sheds.

This site is currently under care and maintenance. To keep dust levels down, DEECA(ERR) is applying a range of dust control measures at the site, including applying water and dust suppression polymer and ensuring vegetation cover, and minimising vehicle movements across the site. Inspections are carried out regularly to make sure that dust levels are minimised.

To maintain continuity and comparability of data, dust monitoring was undertaken at the same locations and a similar methodology and analysis process was followed in this report as per other quarters. Upon routine monthly monitoring, ALS field staff observed all monitoring sites where in good working order with no obvious variations to sites that would reflect abnormalities in results.

The original scope of dust monitoring at Kangaroo Flat was to operate and maintain four depositional dust gauges and a background site. Data from this control site will be used for comparative background analysis.

The purpose of dust monitoring is to assure the local community that dust issues are being minimised and managed effectively. The objective of the dust monitoring program at Kangaroo Flat is to gather baseline data and report exceedances when the site is in care and maintenance, including testing the effectiveness of dust control measures. These results will inform decision making on rehabilitation requirements and measures required to ensure works meet air quality standards (where available).

As done previously in the CDM Smith Report, the following questions are answered for Q4 2023:

- *Did the dust deposition rates recorded in Q4 2023, exceed the adopted dust deposition criteria of 4 g/m²/month, measured as Total Insoluble Matter (TIM)?*

In Q4 there were no instances where the dust level exceeded over the 4 g/m²/month criteria at any of the monitoring sites.

- *Are dust deposition rates recorded in Q4 2023, comparable to available historic results in this area?*

Overall results for Q4 were comparable to previous quarters for with all results under 4 g/m²/month. There were no elevated results in Q4, when making comparisons to Q3 results which had previously seen KF3 during July and KF5(BG) during September record slightly higher readings although under 4 g/m²/month.

- *Are arsenic concentrations recorded in deposited dust in Q4 2023, comparable to available historic results in this area?*

As shown in Figure 8 the overall total arsenic mean value for all source monitoring sites for Q4 2023 excluding the background site was 43.6 mg/kg. The mean is well below the 100 mg/kg assessment level.

One exceedance did occur at KF2 (E) during November with a value of 154.5 mg/kg being recorded.

Continued monitoring at the background location KF5 (BG) provides additional data to which the site data can be compared.

1 Introduction

ALS was engaged by the Earth Resource Regulation (ERR) team in the Department of Jobs, Precincts and Regions (DJPR) to undertake dust monitoring at the Kangaroo Flat mine from the start of January 2021. On 1st January 2023 ERR joined a new Government department, the Department of Energy, Environment and Climate Action (DEECA). The ongoing engagement of ALS is now with DEECA Earth Resources Regulator. This report provides results and analysis of data collected from sampling in Q4 2023. ALS undertook the field component of maintaining dust gauges and replacing sample containers, as well as laboratory analysis of samples collected. Samples were collected from locations specified by DJPR on a routine monthly basis (Figure 1 and Figure 2). These locations are displayed in Section 3.1 of this report.

2 Background

In April 2021, ERR inherited the responsibility for care and maintenance and rehabilitation of the former Bendigo Gold Mine sites as its operator, Kralcopic Pty Ltd went into liquidation. Prior to inheriting this responsibility, ERR engaged ALS to undertake depositional dust monitoring at their former Kangaroo Flat and Woodvale sites. This report analyses the data gathered in Q4 2023 for the Kangaroo Flat site by comparing the levels to accepted standards (where available) and previous dust monitoring results published in:

- ALS Report for Q3 2023
- ALS Report for Q2 2023
- ALS Report for Q1 2023
- ALS Report for Q4 2022
- ALS Report for Q3 2022
- ALS Report for Q2 2022
- ALS Report for Q1 2022
- ALS Report for Q4 2021
- ALS Report for Q3 2021
- CDM Smith report for the first half of 2021
- Kralcopic Report for Q4 2018.

All reports are referenced in this document. To maintain continuity and comparability of results, this document has been prepared in a similar format to the CDM Smith Report.

The Kangaroo Flat Mine site is located to the east of Kangaroo Flat, approximately 4 km south of the centre of Bendigo. The site includes decommissioned mine tunnels and shafts as well as processing plants and tailings dams. The site is currently in care and maintenance. To keep dust levels down, DEECA(ERR) is applying a range of dust control measures at the former the Kangaroo Flat Mine site, including applying water and dust suppression polymer, ensuring vegetation cover where practical, and minimising vehicle movements. Inspections are also carried out regularly to make sure dust levels are being maintained.

To ensure continuity and comparability of data, monitoring was undertaken at the same previous locations, and similar methodology and analysis was used. This report builds on the previous results and provides baseline information to potentially inform decisions around some aspects of rehabilitation.

2.1 Scope and Objectives

The scope of dust monitoring at Kangaroo Flat is to operate and maintain five depositional dust gauges.

All depositional dust gauges are located at their historic locations with the following naming conventions since the dates specified below:

- KF1 (W) Jan 2021
- KF2 (E) Jan 2021
- KF5 (BG) Sep 2021
- KF3 (N) Jan 2021
- KF4 (S) Jan 2021

Laboratory analysis requirements were provided by DEECA(ERR) and were in line with historical requirements during the previous monitoring program undertaken by Kralcopic to meet its legislative requirements. This alignment maintains continuity and comparability of results.

The purpose of dust monitoring is to check that dust issues are managed effectively including testing the effectiveness of dust control measures. Another objective of the dust monitoring program at Kangaroo Flat is to gather baseline data ahead of rehabilitation works. These results will inform decision making on dust control measures required during site rehabilitation, to ensure works meet air quality standards (where available).

As done previously, the following considerations were included in the assessment of Q4 2023 data:

- *Did the dust deposition rates recorded in Q4 2023, exceed the adopted dust deposition criteria of 4 g/m²/month, measured as Total Insoluble Matter (TIM)?*
- *Are dust deposition rates recorded in Q4 2023, comparable to available historic results in this area?*
- *Are arsenic concentrations recorded in deposited dust in Q4 2023, comparable to available historic results in this area?*

2.2 Regulatory Environment

The Environment Protection Authority (EPA) has overarching responsibility for administering legislation related to the air quality across Victoria. The EPA administers the *Environment Protection Act 2017* and the *Environment Protection Regulations 2021* under which Environmental Reference Standards (ERS) and related Guidelines are provided.

The purpose of the ERS is to support the protection of human health and the environment from harms posed by pollution and waste. The ERS does this by providing benchmarks to assess and report on environmental conditions in the whole or any part of Victoria.

The ERS seeks to achieve this purpose by:

- (a) identifying environmental values to be achieved or maintained in the whole or any part of Victoria; and
- (b) specifying indicators and objectives to be used to measure, determine, or assess whether those environmental values are being achieved, maintained or threatened.

The ERS provides guidance, objectives and levels on values where the environment may be impacted and incorporates the Ambient Air Quality National Environment Protection Measure (NEPM AAQ).

The main guidance document used for the purpose of this report is EPA Publication 1191 – Protocol for Environmental Management – Mining and Extractive Industries (Mining PEM). The criteria in the Mining PEM used for this report has been carried over to the EPA’s latest Guideline for Assessing and Minimising Air Pollution in Victoria, Publication 1961, February 2022. As stated in PEM, Results of monitoring should not exceed 4g/m²/month (no more than 2g/m²/month above background) as a monthly average.

Under the new EPA legislation, duty holders have responsibility under the general environmental duty to apply controls to eliminate or minimise risks of harm to human health and the environment as far as reasonably practicable. This means that the primary focus is on applying effective elimination, minimisation, and control measures. Monitoring is for the purpose of determining the effectiveness of control measures.

2.3 What is Dust

Dust is not typically classified according to its composition, but instead on its particle size, as follows:

- Deposited matter - any particles that fall out of suspension in the atmosphere.
- Total Suspended Particles (TSP) - particles suspended or entrained in the air. Typically, this is particles of 30 µm (0.03 mm) equivalent aerodynamic diameter or less. Larger particles tend not to become suspended.
- PM₁₀ - particles 10 µm equivalent aerodynamic diameter or less.
- PM_{2.5} - particles 2.5 µm equivalent aerodynamic diameter or less.

Dust particle size is an important consideration influencing dispersion and transport in the atmosphere and potential effects on human health. Human activities (e.g., energy use, transport, industrial activities etc) can affect the air quality, in particular airborne dust.

Potential sources of dust are:

- natural sources such as dust storms, agricultural dust, bushfires, vegetation, pollen and fungi; and
- anthropogenic sources such as mines sites, industry, roads and vehicles, construction sites, domestic and diffuse sources (CDM Smith, 2021).

3 Measurement of Dust

3.1 Site Locations

Locations of depositional dust gauges around the Kangaroo Flat Mine are presented in [Figure 1](#).

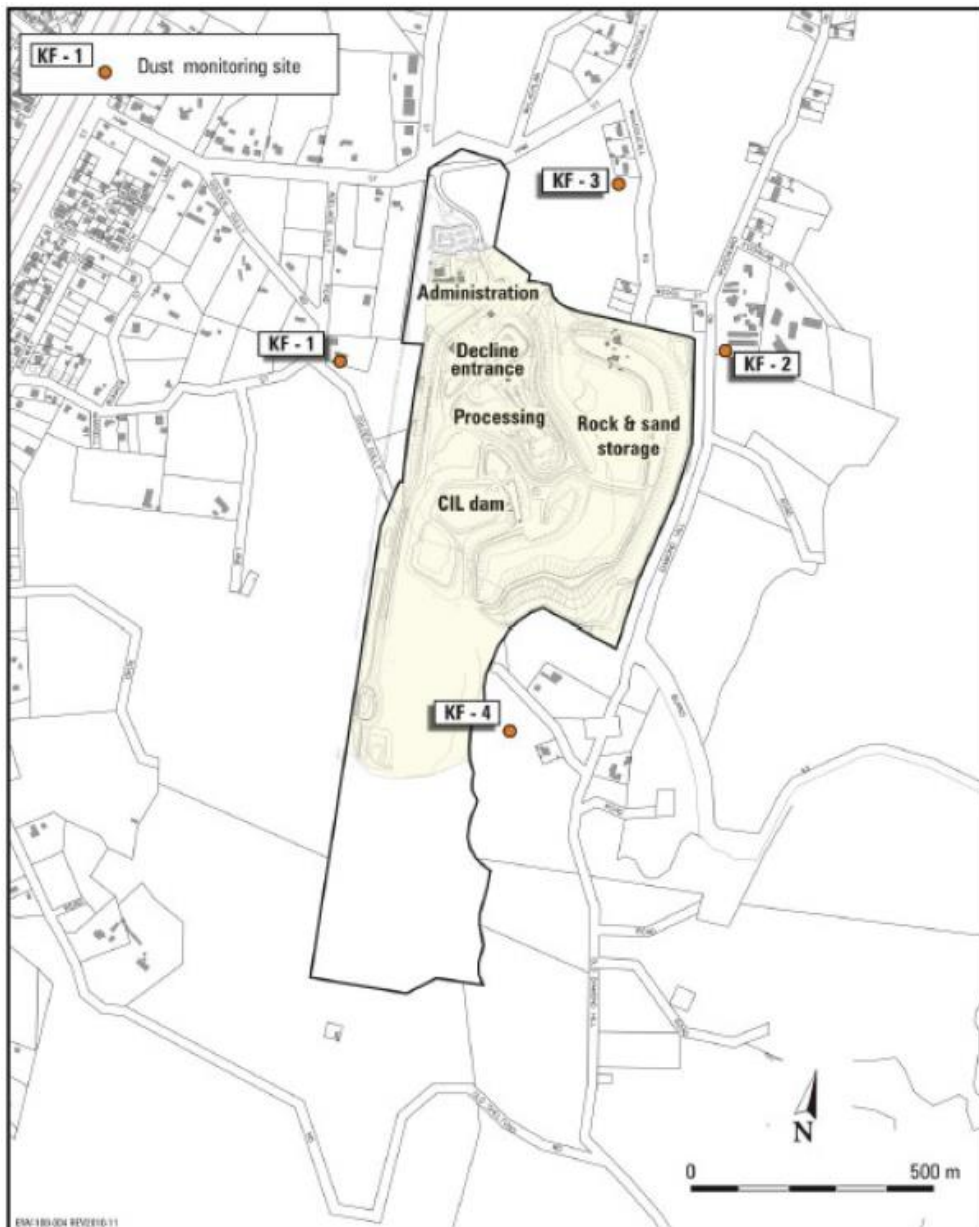


Figure 1 - Kangaroo Flat - Monitoring Locations

Location of background gauge and image are presented in [Figure 2](#) and [Figure 3](#) below.

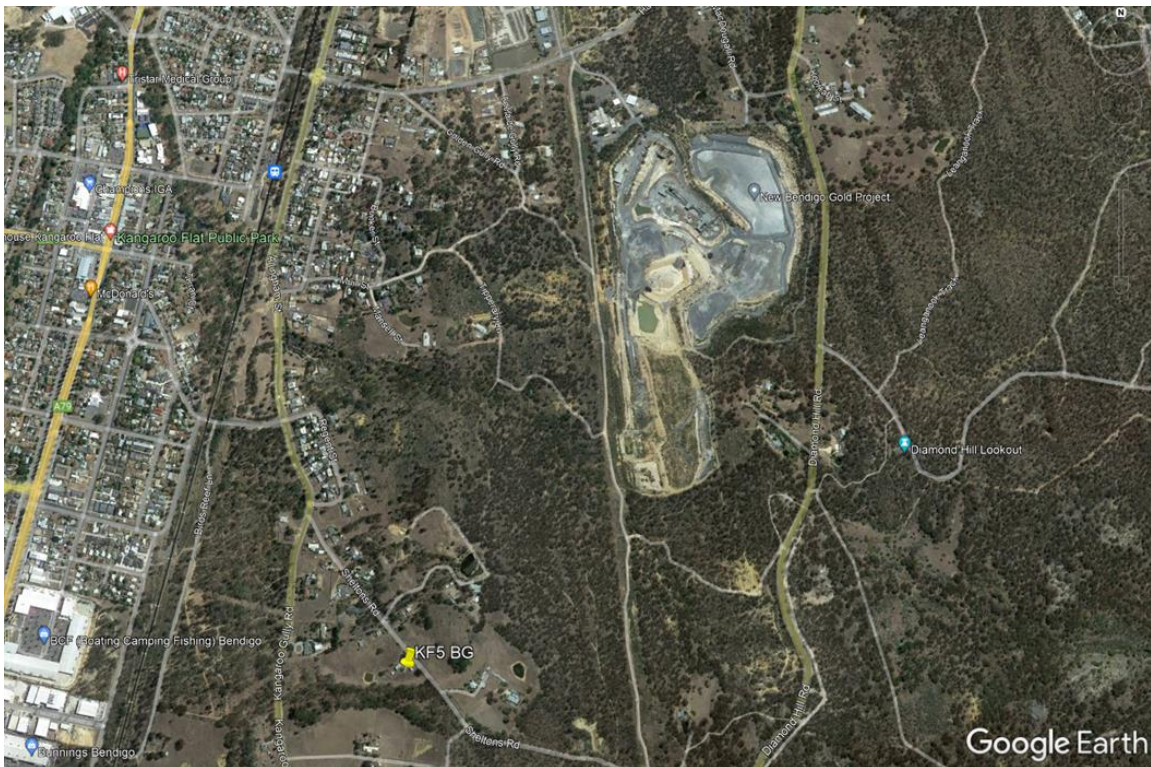


Figure 2 - Kangaroo Flat - Control Site Location KF5 (BG)



Figure 3 - Kangaroo Flat - Control Site Gauge KF5 (BG)

Samples were collected in accordance with the Standard AS/NZS 3580.10.1 - Methods for sampling and analysis of ambient air - Determination of particulate matter - Deposited matter - Gravimetric method and ALS Dust Sampling and Depositional Dust Gauge Work Procedure MAT-MAP1000 (See [Appendix A - Supplementary Information](#)).

ALS Laboratory in Springvale analysed the samples for the following:

- Total deposited matter
- Total ash content
- Metals/metalloids, in the soluble, insoluble and ash content fraction of dust.

3.2 Deposited Matter

The Standard (AS/NZS 3580.10.1:2016) sets out a method (used in this report) for sampling particulate matter that is deposited from the atmosphere. This Standard also sets out procedures for the gravimetric (i.e., by weighing) determination of the mass deposition rate of insoluble/soluble solids, ash/combustible matter, and total solids from ambient air.

The method provides an estimate of the mean surface concentration of deposited matter settling from the air over a sampling period, typically of one month. Particulate matter deposition rates of 0.1 g/m²/month and above may be determined using a monthly sampling period. The sample obtained by the sampling procedure specified may be subjected to physical or chemical analysis.

Over a given sampling period, particles that settle from the ambient air are collected in a vessel ([Figure 4](#)) and retained together with any rainwater. The sample is passed through a sieve to remove any extraneous matter (e.g., leaves, insects), and the sieved sample containing the deposited matter is transferred to a filtration apparatus. The insoluble and soluble materials are separated by filtration, and the mass of the dried insoluble solids is gravimetrically determined.

The ash and combustible matter content are determined by loss on ignition of the insoluble solids. Soluble solids are determined from the filtrate. The total solids are obtained by the addition of the insoluble solids and the soluble solids. The mass deposition rate of deposited matter is then calculated from the mass of solids obtained, the funnel cross-sectional area and the exposure period. (AS/NZS 3580.10.1:2016)



Figure 4 - Kangaroo Flat - Dust Deposition Gauge KF1 (W)

3.3 Metals/Metalloids Monitoring in Dust

The inclusion of the analysis of metals/metalloids in the dust samples assist in identifying possible sources of contamination if present.

Analysis for insoluble matter, soluble matter and ash content was undertaken for the following:

- Arsenic
- Barium
- Manganese

It is understood that there are no specific threshold values for metals and metalloids in deposited dust either in the former Mining Licence or within the ERS. (CDM Smith, 2021)

3.4 Ash Content

Ash Content is the remaining material after the sample has been combusted in the laboratory. Ash content provides an indication of the mineral content (or soil dust) of the sample. The mineral content may be attributable to mine site contributions, but may also be attributed to other sources such as agriculture, unsealed roads, etc.

3.5 Dust Monitoring Standards

Results were compared against relevant dust deposition rate criteria described by EPA Publication 1191 (2007), as shown below which has been adopted in EPA Publication 1961 (2022):

Averaging period	Maximum increase above background (2g/m ² /month) in deposited dust level	Maximum total deposited dust level
Annual	2g/m ² /month	4g/m ² /month

The following points apply to the criteria:

- Results of monitoring should not exceed 4 g/m²/month (no more than 2 g/m²/month above background) as a monthly average.
- The 2 g/m²/month criteria are used when baseline data on deposited dust levels exist, while the 4 g/m²/month criteria is used when no baseline data exists.
- If dust levels exceed these values, then site management practices should be reviewed, and additional dust controls investigated.
- The criteria refer to all sources of deposited matter (including sources from mines, agriculture, unsealed roads, etc) and cumulative impacts.
- The criteria states that in some cases, a mine may increase deposited dust levels by up to 2 g/m²/month. However, the total deposited dust level (including sources from mines, agriculture, unsealed roads, etc) must not exceed 4 g/m²/month.

Deposited matter (dust) can be used as an indicator of the effectiveness of site management practices and the potential for offsite nuisance dust (fugitive dust). Deposited dust monitoring, when conducted over a set time, is useful for examining trends and evaluating deviation from long term trends with respect to site activities.

3.6 Dust Monitoring Program

The current method of undertaking depositional dust monitoring is considered sufficient as the site is in care and maintenance i.e., no new pollution is being introduced to the site from industry. There is a considerable body of knowledge about the contamination level at the site, so all that is required at this stage is to determine whether this contamination is becoming air borne and becoming a health hazard or problem to the nearby landholders. Depositional dust monitoring provides a range of useful information to be able to understand what’s happening at this site and its surrounds.

Depositional dust monitoring can provide the following invaluable information:

- test the effectiveness of dust minimisation, control and management measures
- identify key problematic sources, or groups of sources on larger more complex sites
- identify where dust sensitivities may occur
- characterise temporal or spatial trends
- metallic/metalloid concentrations are useful for health effect considerations.

The tailings dam level located at Kangaroo Flat Mine is not continuously monitored by ALS.

4 Dust Deposition Results

4.1 Kangaroo Flat Mine – Q4 2023

Dust deposition analysis results are presented in [Table 1](#) and the accompanying Laboratory Certificates of Analysis are presented in [Appendix B](#).

Where results were reported as “less than” (<) a specified number (laboratory reporting limit) the number reported was adopted for use in the graphical displays. This approach adopts a conservative value for the number being reported.

4.1.1 Deposition of Total Insoluble Matter

Total Insoluble Matter (TIM) met the criteria of less than 4 g/m²/month on 15 of 15 measurements during Q4 2023. See Figure 5 below.

Dust deposition rate were low with no exceedances during October, November and December, with KF1 (W) recording a result of 1.6 g/m²/month in December. When the data from all source monitoring sites was averaged for Q4 2023 (excluding the background site), an average of 0.82 g/m²/month was recorded. This value is below the inferred background level suggested within the Mining PEM. When reviewing both exceedance criteria's all sites remained under the 4 g/m²/month.

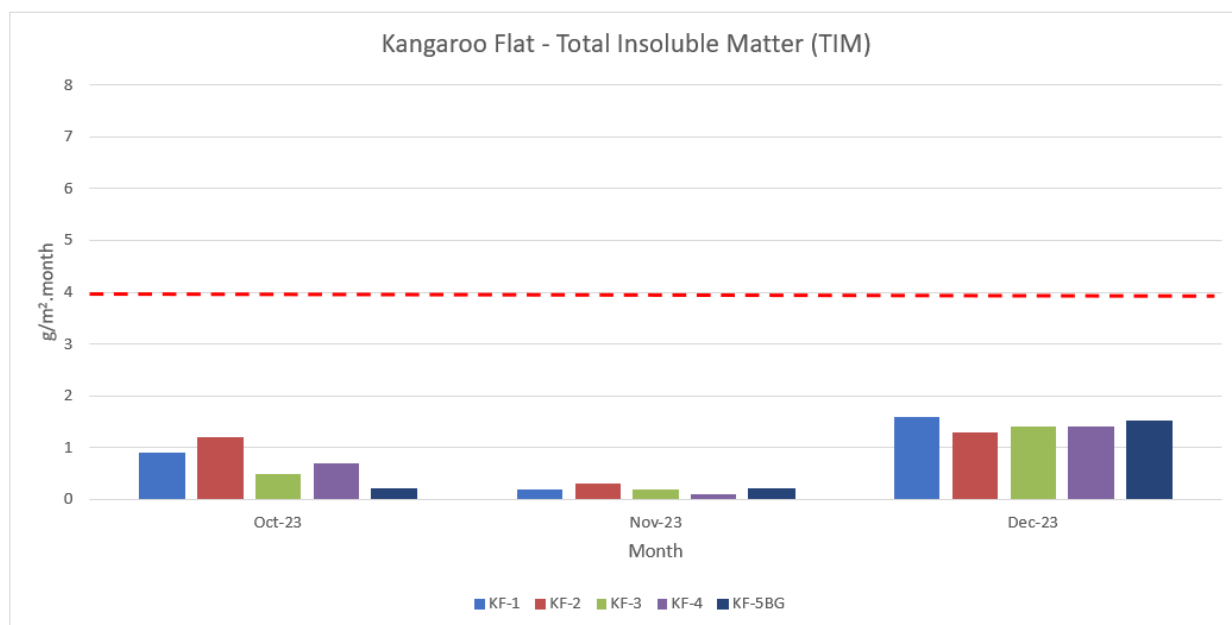


Figure 5 - Kangaroo Flat - Total Insoluble Matter (TIM) g/m²/month – Q4 2023
Red dotted line is the criteria used for the purpose of this report.

4.1.2 Mineral Content in Dust

The fraction of dust measured as ash content is displayed below in [Figure 6](#). The values recorded during Q4 were all between 0.1 g/m²/month and 0.3 g/m²/month.

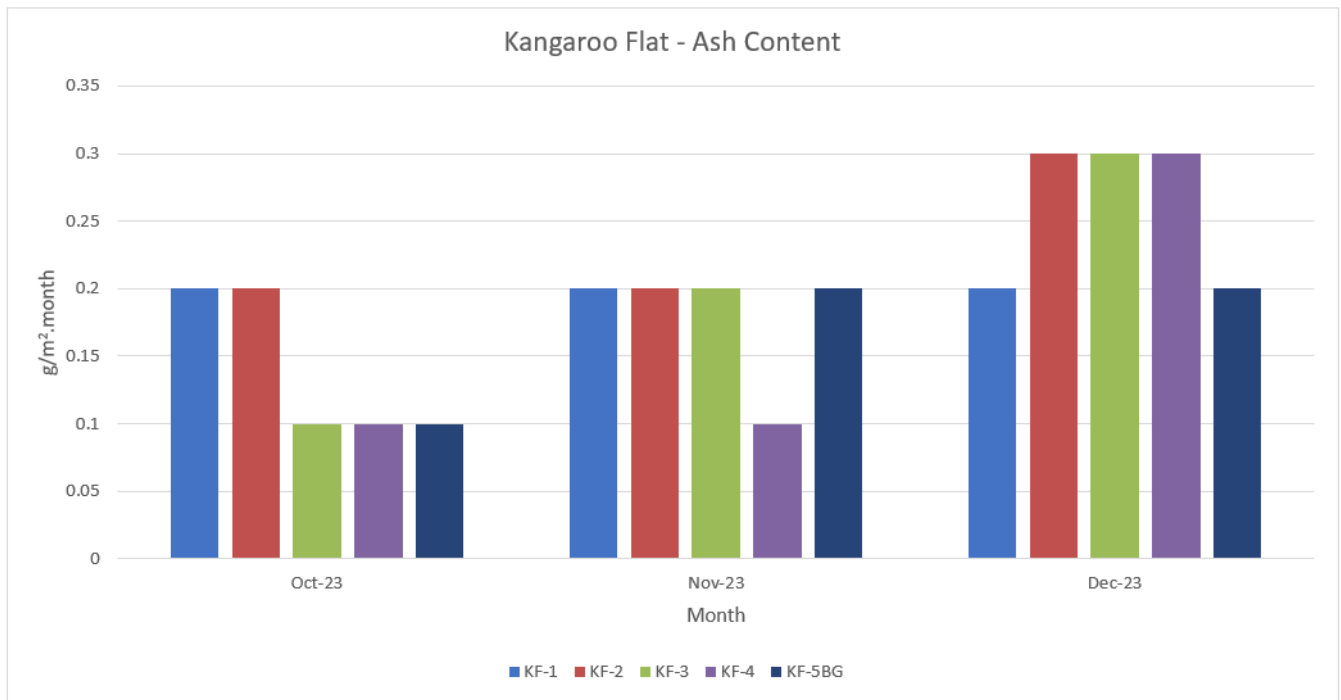


Figure 6 - Kangaroo Flat - Total Ash Content g/m²/month – Q4 2023

To gain a general understanding of what proportion of the sample is ash content i.e., mineral dust, the ratio of total ash content and TIM has been plotted in [Error! Reference source not found.](#)

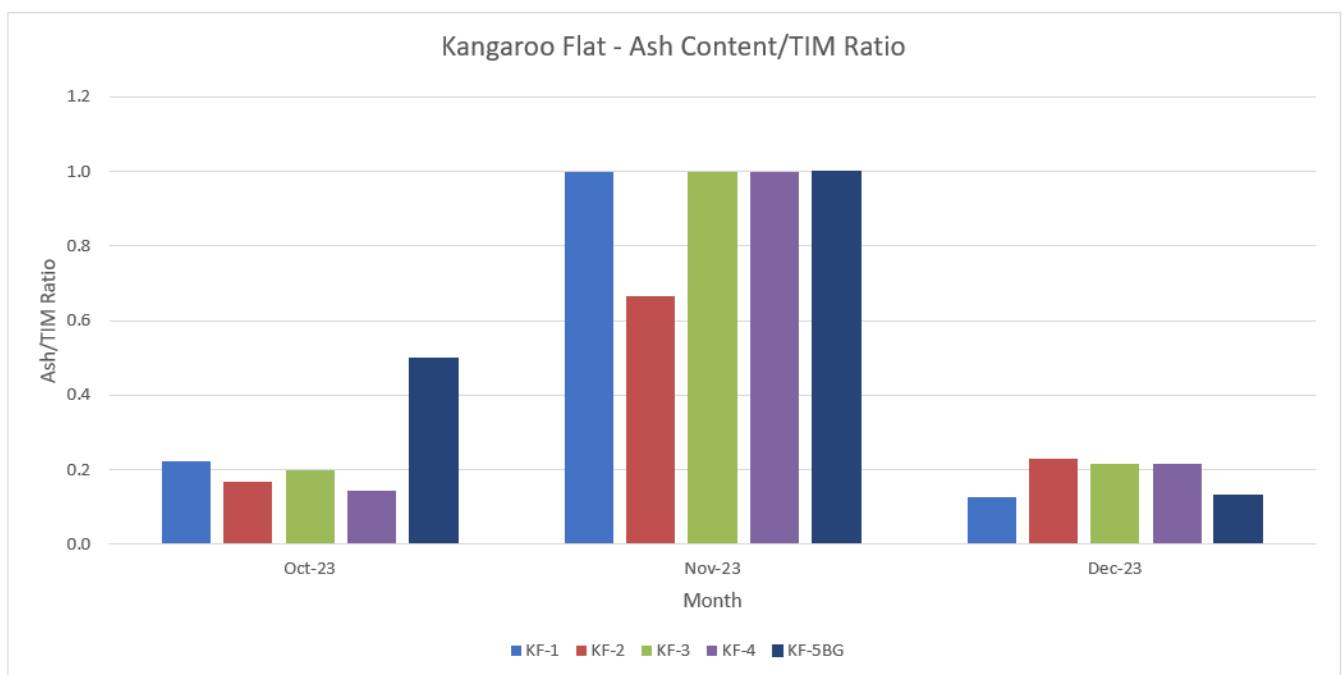


Figure 7 - Kangaroo Flat - Ash Content/TIM Ratio – Q4 2023

Error! Reference source not found. shows that ash content in the samples throughout Q4 2023 were generally low and any increases were also seen at the background site. The results above are also representative of the background site.

4.1.3 Metals/Metalloids in Dust

Graphical presentations of soluble and insoluble metals (arsenic, barium and manganese) are provided in **Section 9** of this report. Arsenic and Manganese results for Q4 2023 were within historical ranges, historical data sets from 2022 and Q1-Q3 2023 have been reported in section 9.1, 9.2 and 9.3 and are trending within similar ranges.

To provide an understanding of total arsenic concentrations measured in dust relative to concentrations measured in soils within the region, total arsenic concentration has been displayed below in **Figure 8** mg/kg. This is calculated by adding soluble and insoluble arsenic $\mu\text{g}/\text{m}^2/\text{month}$ dividing by the total solids $\text{g}/\text{m}^2/\text{month}$.

This ratio is being plotted because this provides a figure which could be compared to the figures quoted in the guideline, Contaminated Sites Management Series - Assessment Levels for Soil, Sediment and Water. The assessment level for soil for arsenic is 100 mg/kg for standard residential areas in this guideline.

Total arsenic concentrations for Q4 ranged from 6.2 to 154.5 mg/kg (KF2) with a mean of 43.6mg/kg across all source monitoring sites excluding the KF5 (BG) site. The mean is below the 100 mg/kg assessment level.

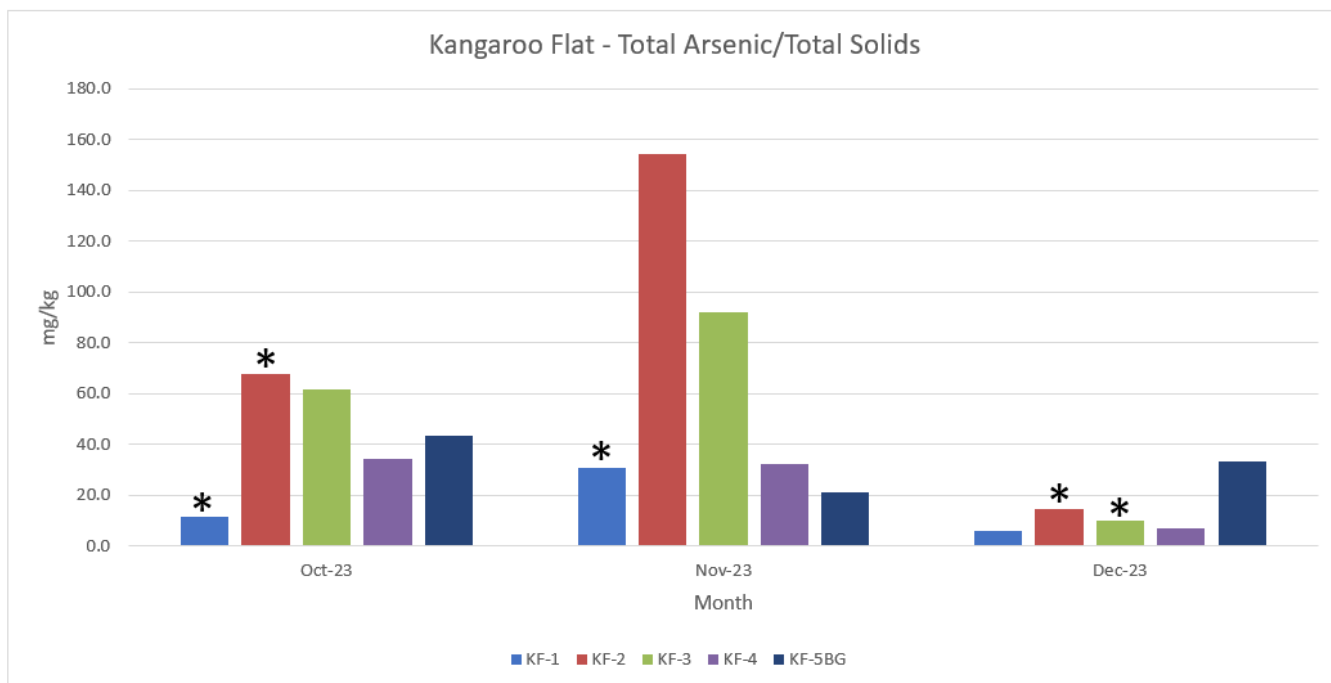


Figure 8 - Kangaroo Flat - Total Arsenic/Total Solids(mg/kg) – Q4 2023

During November, the predominate wind direction and speed can be seen in Figure 12 which was coming from a South Westerly direction, this may have influenced the elevated level of dust collected at KF2 (E).

The readings for Q4 2023 (average 43.6 mg/kg not including BG site) were slightly higher in comparison with last quarter Q3 2023 (average 40.7mg/kg).

DEECA(ERR) undertakes regular inspections to identify any dust issues at site. This assists with promptly identifying and addressing issues (e.g., by the maintenance and enhancement of dust control measures). However, at times climatic conditions such as wind speed, direction and rainfall can cause elevated readings.

4.2 Quality Assurance and Quality Control

Field sampling and analysis was undertaken in accordance with the following Standards:

- Australian Standard AS/NZS 3580.10.1 (2016), Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method. **(AS/NZS 3580.10.1)**
- Australian Standard AS/NZS 3580.10.2 (2013), Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Impinged Matter - Gravimetric Method. **(AS/NZS 3580.10.2)**

Sampling methodology and locations are consistent with sampling previously undertaken to maintain continuity and comparability of results.

ALS Environmental Laboratory has NATA accreditation for the following Ambient Air Parameters:

ISO/IEC 17025 (2017) Environment				
SERVICE	PRODUCT	DETERMINANT	TECHNIQUE	PROCEDURE
Analysis for physical and chemical characteristics	Air - Ambient	Particulate matter	Gravimetric	AS 3580.10.2 and in-house EA120I, EA125I, EA139I, EA141I and EA142I
		Deposited matter	Gravimetric	AS 3580.10.1 and in-house EA120-142

ALS currently does not have NATA accreditation for metals analysis of ambient air but is in the process of gaining accreditation. Nevertheless, ALS is operating as though this accreditation is in place and expects to finalise the accreditation process in 2023.

Internal laboratory quality control measures note the following:

- No Method Blank value outliers occurred.
- No laboratory control outliers occurred.
- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) results reported.
- No laboratory duplicate results reported.
- No holding time outliers occurred.
- No quality control sample frequency outliers occurred (based on NEPM 2013 B3 quality control specification).

5 Weather Station Results Kangaroo Flat Q4

ALS installed a Weather Station at the Kangaroo Flat site and allocated it a new Site Number - 407811A Kangaroo Flat weather station. Parameters collected include Rainfall, Air Temperature, Relative Humidity, Wind Direction, Wind Velocity and Solar Radiation.

Data for these parameters shown below include October - December 2023 data. RF totals for October 2023 recorded 52.20mm, November 2023 recorded 62.40mm and December 96.40mm. The maximum wind velocity measured in meters/second was recorded on the 25/12/2023 with a recorded value of 8.670 m/s. Maximum air temperature was recorded on the 12/12/2023 at 36.36 degrees.

5.1 Stacked Data Plot Q4 October 2023

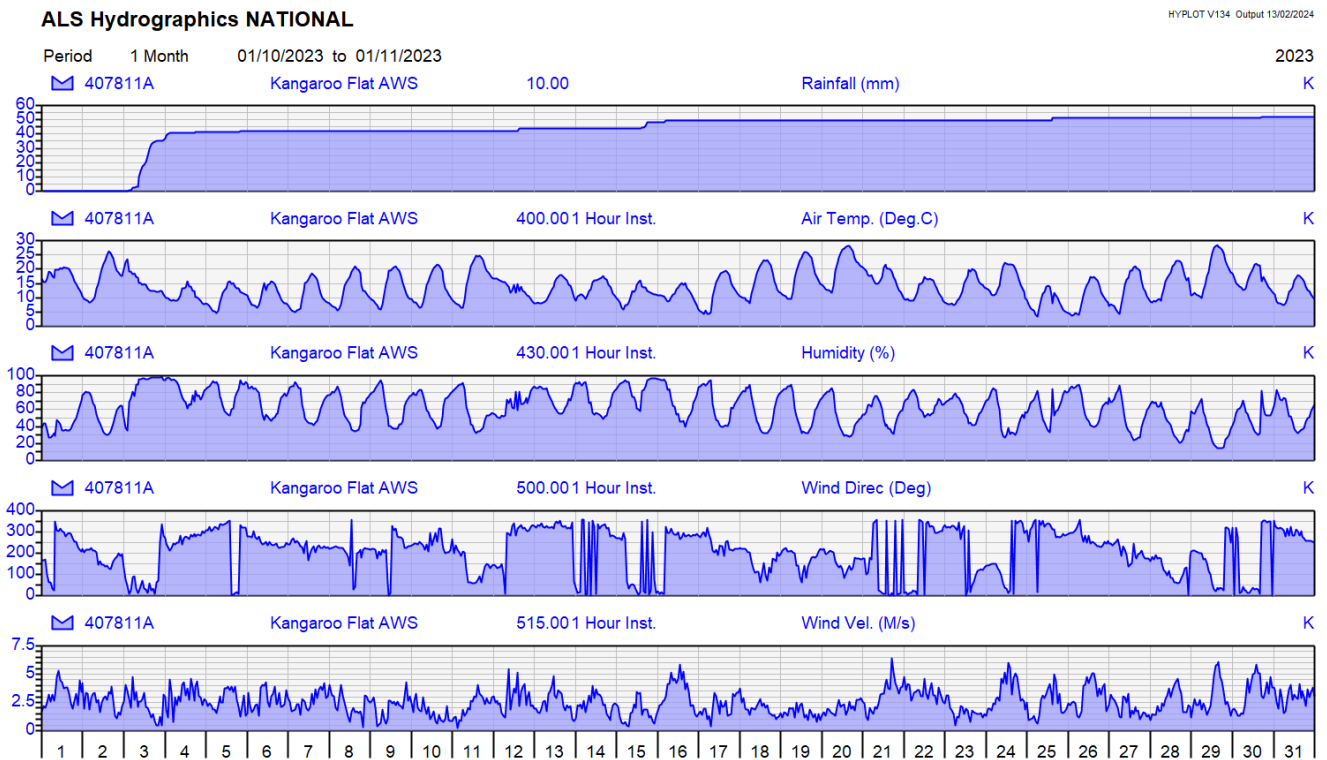


Figure 9 – Kangaroo Flat – Q4 2023 October 407811A Stacked data plot

5.2 Wind Rose Data Plot Q4 October 2023

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Site 407811A Kangaroo Flat AWS
 Start Time 00:00_01/10/2023
 End Time 00:00_01/11/2023

Wind Direction as Percentage of Time

- 0-0.5 m/s
- 0.5-1.0 m/s
- 1.0-3.0 m/s
- 3.0-5.0 m/s
- 5.0-7.0 m/s
- 7.0-10.0 m/s
- >10.0 m/s

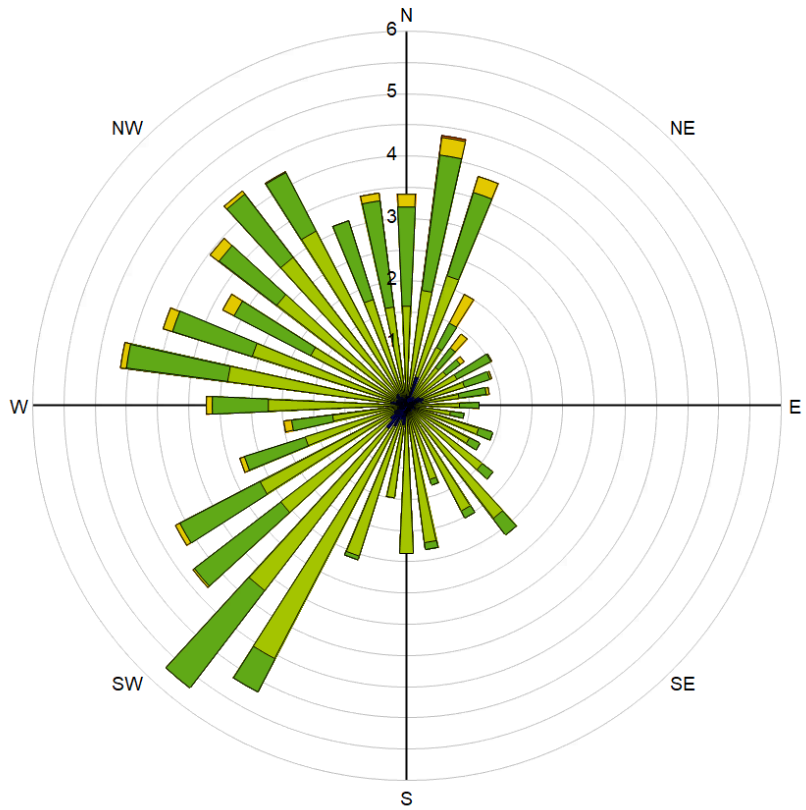


Figure 10 - 407811A Wind Rose Q4 October Kangaroo Flat Weather Station

5.3 Stacked Data Plot Q4 November 2023

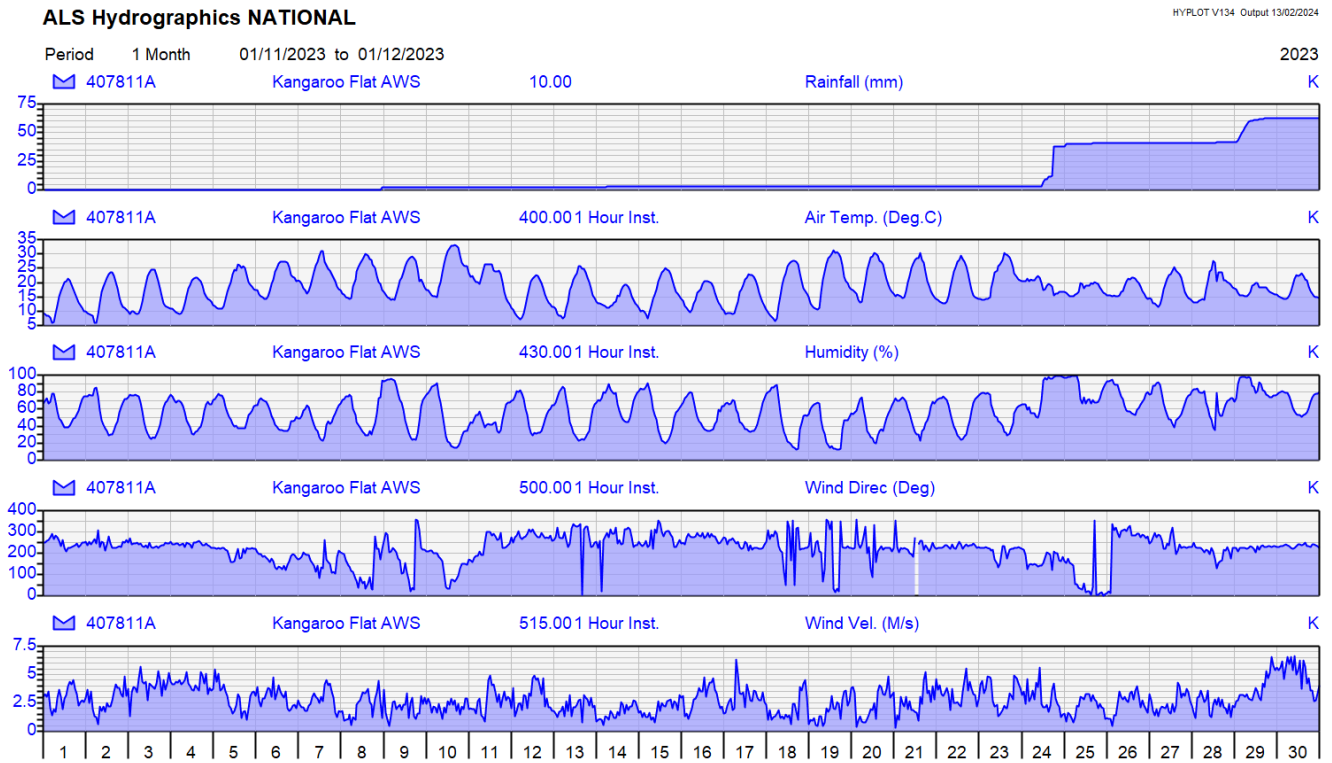


Figure 11 - Kangaroo Flat - Q4 2023 November 407811A Stacked data plot

5.4 Wind Rose Data Plot Q4 November 2023

ALS Hydrographics NATIONAL

HYWROSE V87 0ur

Site 407811A Kangaroo Flat AWS
Start Time 00:00_01/11/2023
End Time 00:00_01/12/2023
Wind Direction as Percentage of Time

- 0-0.5 m/s
- 0.5-1.0 m/s
- 1.0-3.0 m/s
- 3.0-5.0 m/s
- 5.0-7.0 m/s
- 7.0-10.0 m/s
- >10.0 m/s

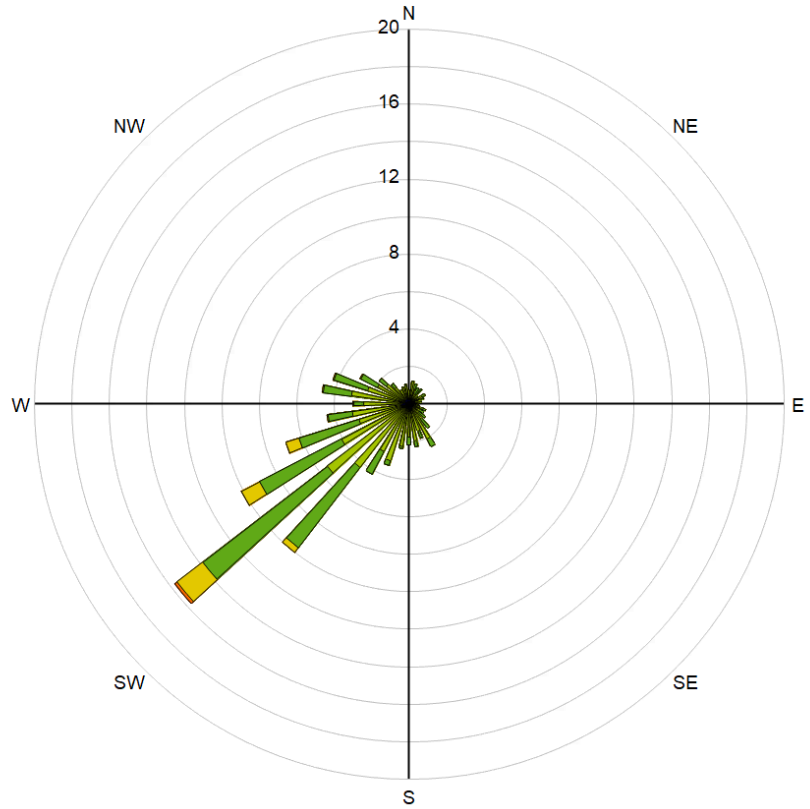


Figure 12 - 407811A Wind Rose Q4 November Kangaroo Flat Weather Station

5.5 Stacked Data Plot Q4 December 2023

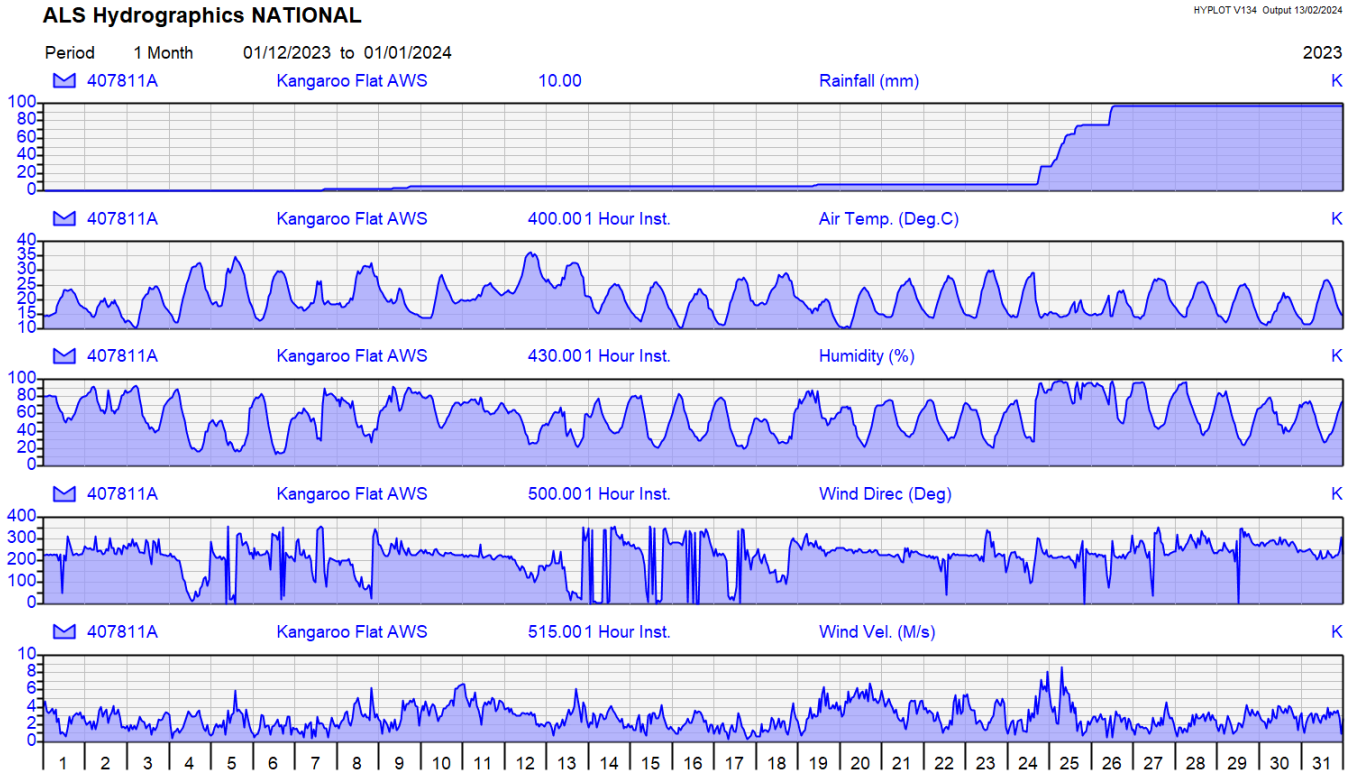


Figure 13 - Kangaroo Flat - Q4 2023 December 407811A Stacked data plot

5.6 Wind Rose Data Plot Q4 December 2023

ALS Hydrographics NATIONAL

HYWROSE V8

Site 407811A Kangaroo Flat AWS
Start Time 00:00_01/12/2023
End Time 00:00_01/01/2024

Wind Direction as Percentage of Time

- 0-0.5 m/s
- 0.5-1.0 m/s
- 1.0-3.0 m/s
- 3.0-5.0 m/s
- 5.0-7.0 m/s
- 7.0-10.0 m/s
- >10.0 m/s

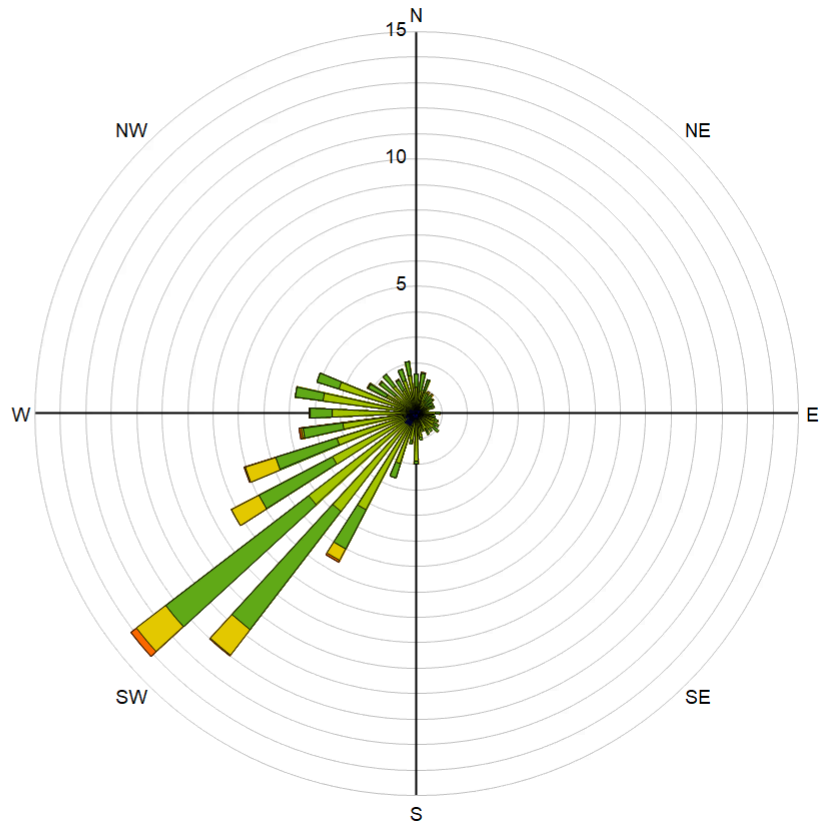


Figure 14 - 407811A Wind Rose Q4 December Kangaroo Flat Weather Station

6 Summary of Results

Results are discussed in detail throughout the relevant sections in this report. In summary, the overall results for Q4 2023 recorded under the 4 g/m²/month TIM level.

The key findings for Q4 2023 are as follows:

- There were no exceedances of the 4 g/m²/month criteria at depositional gauges monitoring the Kangaroo Flat former mine site in Q4 2023. There were 15 samples collected this quarter.
- The overall total arsenic mean value for all source monitoring sites for Q4 2023 was 43.6 mg/kg and well below the 100 mg/kg assessment level.
- One exceedance was recorded at KF2 (E) in November of 154.5 mg/kg.
- Barium and Manganese in soluble fraction generally recorded higher results during Q4 when averaged over the quarter and compared against Q3.
- Barium and Manganese in insoluble fraction also recorded higher results during Q4 when averaged over the quarter and compared against Q3.

7 Further Considerations

DEECA has advised that they will continue to monitor the site for dust emissions and ensure that a range of dust control measures are applied during this care and maintenance phase of the rehabilitation project. DEECA is also reviewing the effectiveness of dust control measures and monitoring on an ongoing basis and adopting a continuous improvement approach to dust minimisation and monitoring.

The installation of an onsite weather monitoring station has been completed and is providing information to ALS and DEECA(ERR) to support dust monitoring and management at the Kangaroo Flat site. Weather information applicable to the results are included in this report where a full quarter of data can be reviewed.

7 References

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- EPA (Vic) Publication 1191 (2007), Protocol for Environmental Management - Mining and Extractive Industries. **(Mining PEM)**
- EPA Publication 1961 (2022), Guideline for Assessing and Minimising Air Pollution in Victoria, February 2022. **(Assessing and Minimising Guideline)**
- EPA Publication 440.1 (2002), A Guide to the Sampling and Analysis of Air Emissions and Air Quality, December 2002. **(Sampling and Analysis Guideline)**
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- Victorian Government (2001), Statement of Environment Protection Policy (Air Quality Management), Victorian Government Gazette, No S 240, 21 December 2001. **(SEPP AQM)**
- Victorian Government (2016), State Environment Protection Policy (Ambient Air Quality), Original Policy including Two Variations, Victorian Gazette Nos S19, S240 and G30, published on 9 February 1999, 21 December 2001, and 28 July 2016, respectively. **(SEPP AAQ)**

- Victorian Government (2021), Environment Reference Standard, under the *Environment Protection Act 2017*, Victorian Government Gazette, No. S 245, 26 May 2021. **(ERS)**
- EPA NSW Publication, Approved Methods for the Modelling and Assessment of Air Pollutants in NSW, (2017)

8 Tables

Table 1 - Kangaroo Flat - Dust Deposition Data

					Arsenic	Barium	Manganese	Total Solids	Total Solids (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Soluble Matter	Total Soluble Matter (mg)	Combustible Matter	Combustible Matter (mg)	Ash Content	Ash Content (mg)
					ug/m2 month	ug/m2 month	ug/m2 month	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg
EQL									1	0.1	1	0.1	1	0.1	1	0.1	1
Description	Location	Quarter	Month	Lab Report Number													
KF1 (Insoluble)	KF1	Q4 2023	Oct-23	EM2319529	9.04	71	129										
			Nov-23	EM2321591	28.1	78.9	76.2										
			Dec-23	EM2400076	14.6	104	186										
KF1 (Soluble)	KF1	Q4 2023	Oct-23	EM2319529	11.4	80.1	389										
			Nov-23	EM2321591	12.1	85.5	260										
			Dec-23	EM2400076	8.16	172	589										
KF1 (Ash)	KF1	Q4 2023	Oct-23	EM2319529	9.04	71	81										
			Nov-23	EM2321591	28.1	78.9	64.5										
			Dec-23	EM2400076	9.88	104	84										

					Arsenic	Barium	Manganese	Total Solids	Total Solids (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Soluble Matter	Total Soluble Matter (mg)	Combustible Matter	Combustible Matter (mg)	Ash Content	Ash Content (mg)
					ug/m2 month	ug/m2 month	ug/m2 month	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg
EQL									1	0.1	1	0.1	1	0.1	1	0.1	1
Description	Location	Quarter	Month	Lab Report Number													
KF1	KF1	Q4 2023	Oct-23	EM2319529				1.8	32	0.9	16	0.9	16	0.7	12	0.2	4
			Nov-23	EM2321591				1.3	27	0.2	4	1.1	23	0.1	2	0.2	4
			Dec-23	EM2400076				3.7	64	1.6	27	2.1	37	1.4	24	0.2	3
KF2 (Insoluble)	KF2	Q4 2023	Oct-23	EM2319529	125	115	101.0										
			Nov-23	EM2321591	116	100	84.4										
			Dec-23	EM2400076	27.5	134	158										
KF2 (Soluble)	KF2	Q4 2023	Oct-23	EM2319529	44.3	58.8	238										
			Nov-23	EM2321591	53.9	93	232										
			Dec-23	EM2400076	16.5	198	848										
KF2 (Ash)	KF2	Q4 2023	Oct-23	EM2319529	125	115	82.8										
			Nov-23	EM2321591	113	100	61.1										

					Arsenic	Barium	Manganese	Total Solids	Total Solids (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Soluble Matter	Total Soluble Matter (mg)	Combustible Matter	Combustible Matter (mg)	Ash Content	Ash Content (mg)
					ug/m2 month	ug/m2 month	ug/m2 month	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg
EQL									1	0.1	1	0.1	1	0.1	1	0.1	1
Description	Location	Quarter	Month	Lab Report Number													
			Dec-23	EM2400076	27.5	134	100										
KF2	KF2	Q4 2023	Oct-23	EM2319529				2.5	46	1.2	22	1.3	24	1	18	0.2	4
			Nov-23	EM2321591				1.1	22	0.3	6	0.8	16	0.1	2	0.2	5
			Dec-23	EM2400076				3	51	1.3	23	1.7	28	1	18	0.3	5
KF3 (Insoluble)	KF3	Q4 2023	Oct-23	EM2319529	23	63	110										
			Nov-23	EM2321591	47.4	55.7	75.3										
			Dec-23	EM2400076	23.6	142	156										
KF3 (Soluble)	KF3	Q4 2023	Oct-23	EM2319529	26	75.8	259										
			Nov-23	EM2321591	44.8	72.3	269										
			Dec-23	EM2400076	6.75	193	555										
KF3 (Ash)	KF3	Q4 2023	Oct-23	EM2319529	21.2	63	57.4										

					Arsenic	Barium	Manganese	Total Solids	Total Solids (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Soluble Matter	Total Soluble Matter (mg)	Combustible Matter	Combustible Matter (mg)	Ash Content	Ash Content (mg)
					ug/m2 month	ug/m2 month	ug/m2 month	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg
EQL									1	0.1	1	0.1	1	0.1	1	0.1	1
Description	Location	Quarter	Month	Lab Report Number													
			Nov-23	EM2321591	23.8	55.7	48.1										
			Dec-23	EM2400076	23.6	142	108										
KF3	KF3	Q4 2023	Oct-23	EM2319529				0.8	16	0.5	9	0.3	6	0.4	7	0.1	2
			Nov-23	EM2321591				1	19	0.2	4	0.8	15	0.1	2	0.2	5
			Dec-23	EM2400076				3	51	1.4	24	1.6	27	1.1	18	0.3	6
KF4 (Insoluble)	KF4	Q4 2023	Oct-23	EM2319529	33.8	83.3	92.6										
			Nov-23	EM2321591	18.2	92	68.7										
			Dec-23	EM2400076	19.3	131	160										
KF4 (Soluble)	KF4	Q4 2023	Oct-23	EM2319529	17.4	124	210										
			Nov-23	EM2321591	20.5	223	227										
			Dec-23	EM2400076	3.87	474	572										

					Arsenic	Barium	Manganese	Total Solids	Total Solids (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Soluble Matter	Total Soluble Matter (mg)	Combustible Matter	Combustible Matter (mg)	Ash Content	Ash Content (mg)
					ug/m2 month	ug/m2 month	ug/m2 month	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg
EQL									1	0.1	1	0.1	1	0.1	1	0.1	1
Description	Location	Quarter	Month	Lab Report Number													
KF4 (Ash)	KF4	Q4 2023	Oct-23	EM2319529	33.8	83.3	59.7										
			Nov-23	EM2321591	15	92	55										
			Dec-23	EM2400076	13.2	131	87.9										
KF4	KF4	Q4 2023	Oct-23	EM2319529				1.5	26	0.7	12	0.8	14	0.6	9	0.1	2
			Nov-23	EM2321591				1.2	26	0.1	3	1.1	23	0.1	2	0.1	2
			Dec-23	EM2400076				3.3	57	1.4	24	1.9	33	1.1	19	0.3	5
KF5BG (Insoluble)	KF5BG	Q4 2023	Oct-23	EM2319529	5.15	52.3	73.3										
			Nov-23	EM2321591	8.32	59.4	60.2										
			Dec-23	EM2400076	7.77	109	139										
KF5BG (Soluble)	KF5BG	Q4 2023	Oct-23	EM2319529	16.6	60.1	200										
			Nov-23	EM2321591	10.9	152	255										

					Arsenic	Barium	Manganese	Total Solids	Total Solids (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Soluble Matter	Total Soluble Matter (mg)	Combustible Matter	Combustible Matter (mg)	Ash Content	Ash Content (mg)
					ug/m2 month	ug/m2 month	ug/m2 month	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg
EQL									1	0.1	1	0.1	1	0.1	1	0.1	1
Description	Location	Quarter	Month	Lab Report Number													
			Dec-23	EM2400076	102	230	619										
KF5BG (Ash)	KF5BG	Q4 2023	Oct-23	EM2319529	4.53	52.3	36.2										
			Nov-23	EM2321591	7.21	59.4	53.2										
			Dec-23	EM2400076	6.73	109	78.4										
KF5BG	KF5BG	Q4 2023	Oct-23	EM2319529				0.5	9	0.2	4	0.3	5	0.1	2	0.1	2
			Nov-23	EM2321591				1.2	26	0.1	3	1.1	23	0.1	2	0.2	4
			Dec-23	EM2400076				3.3	57	1.5	26	1.8	31	1.2	22	0.2	4

9 Supplementary Data

Graphs for Metals/Metalloids in Insoluble and Soluble Fractions including trends are presented below.

9.1 Arsenic

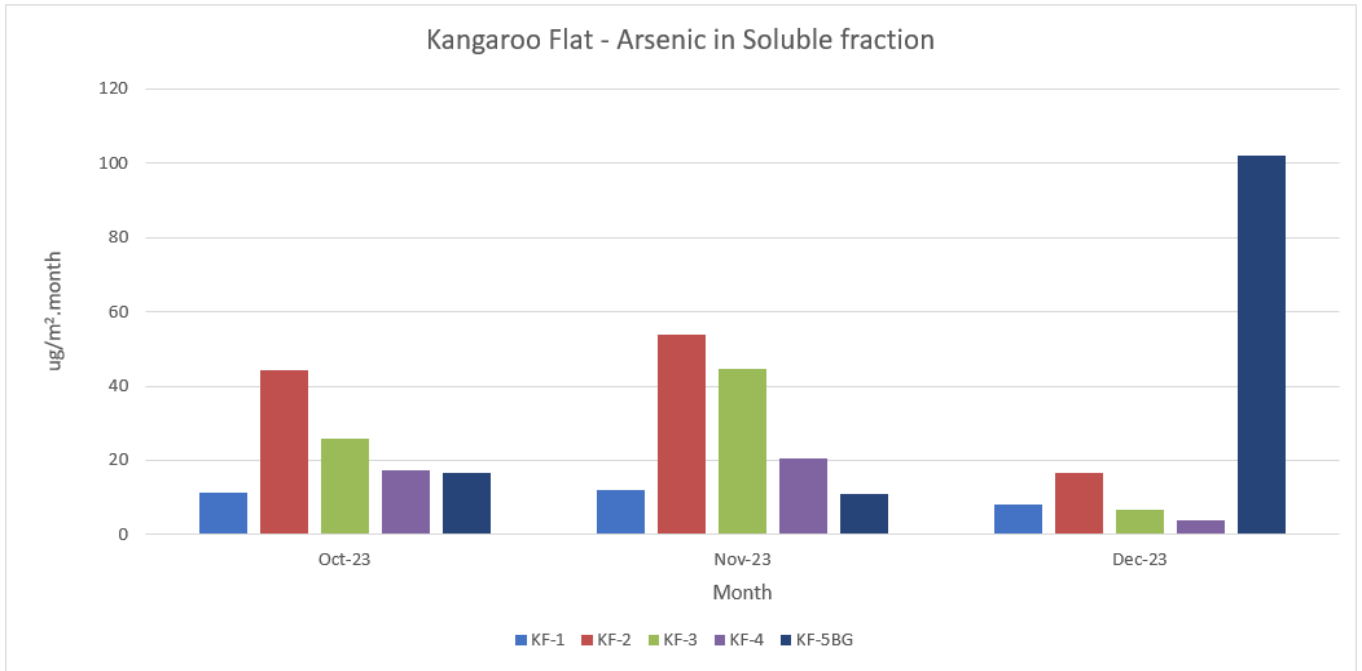


Figure 15 - Kangaroo Flat - Arsenic in Soluble Fraction – Q4 2023

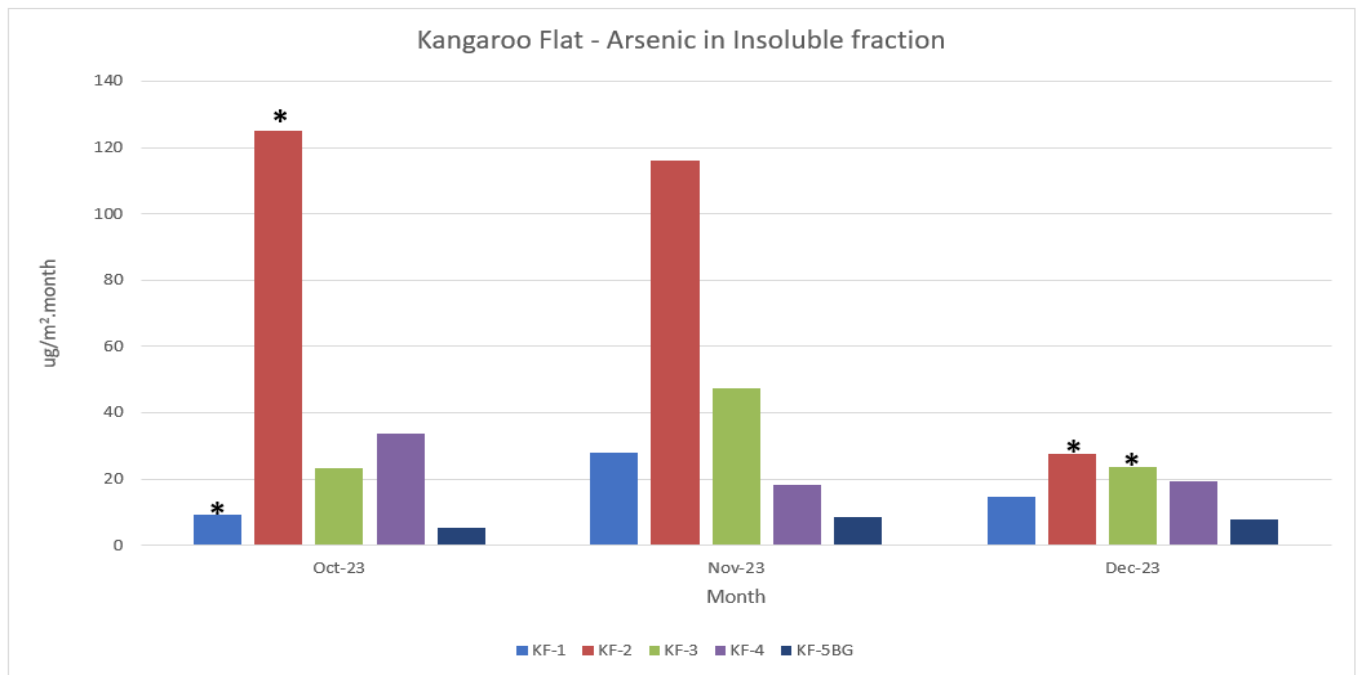


Figure 16 - Kangaroo Flat - Arsenic in Insoluble Fraction – Q4 2023

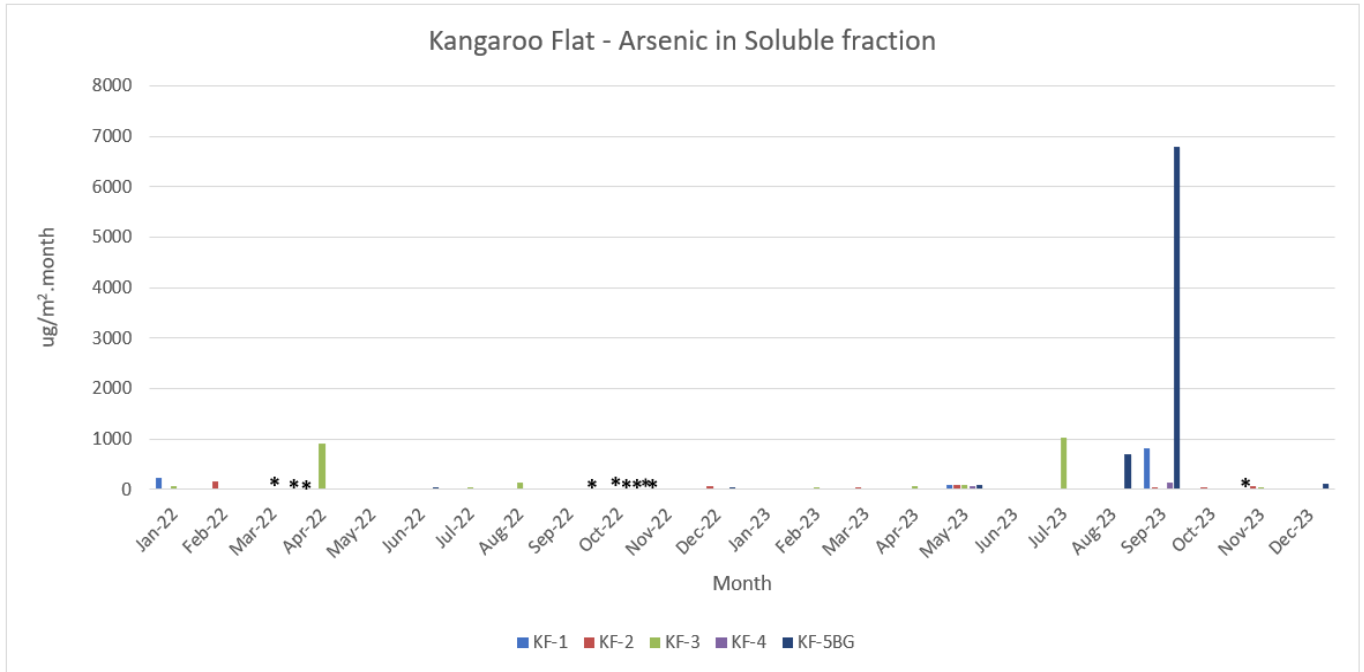


Figure 17 - Kangaroo Flat - Arsenic in Soluble Fraction - 2022-2023
 An asterisk (*) has been placed over the samples which record as less than (<) the value x displayed on the graph.

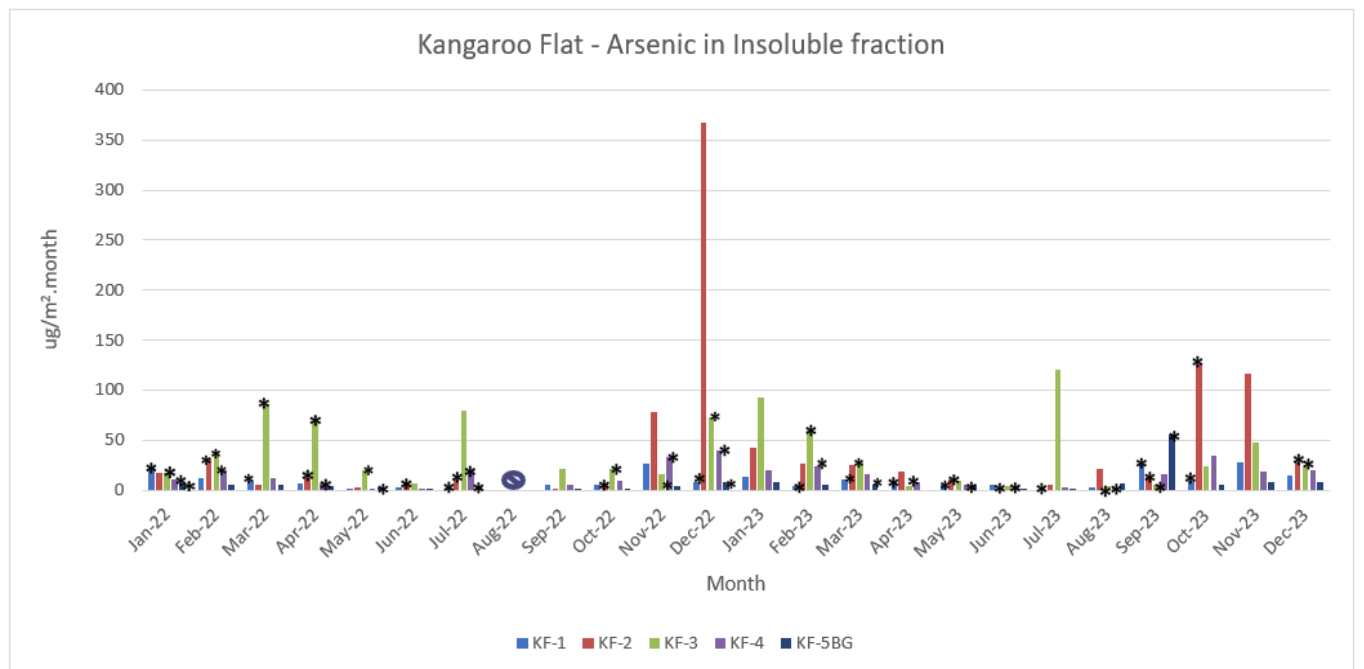


Figure 18 - Kangaroo Flat - Arsenic in Insoluble Fraction - 2022-2023
 An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

9.2 Barium

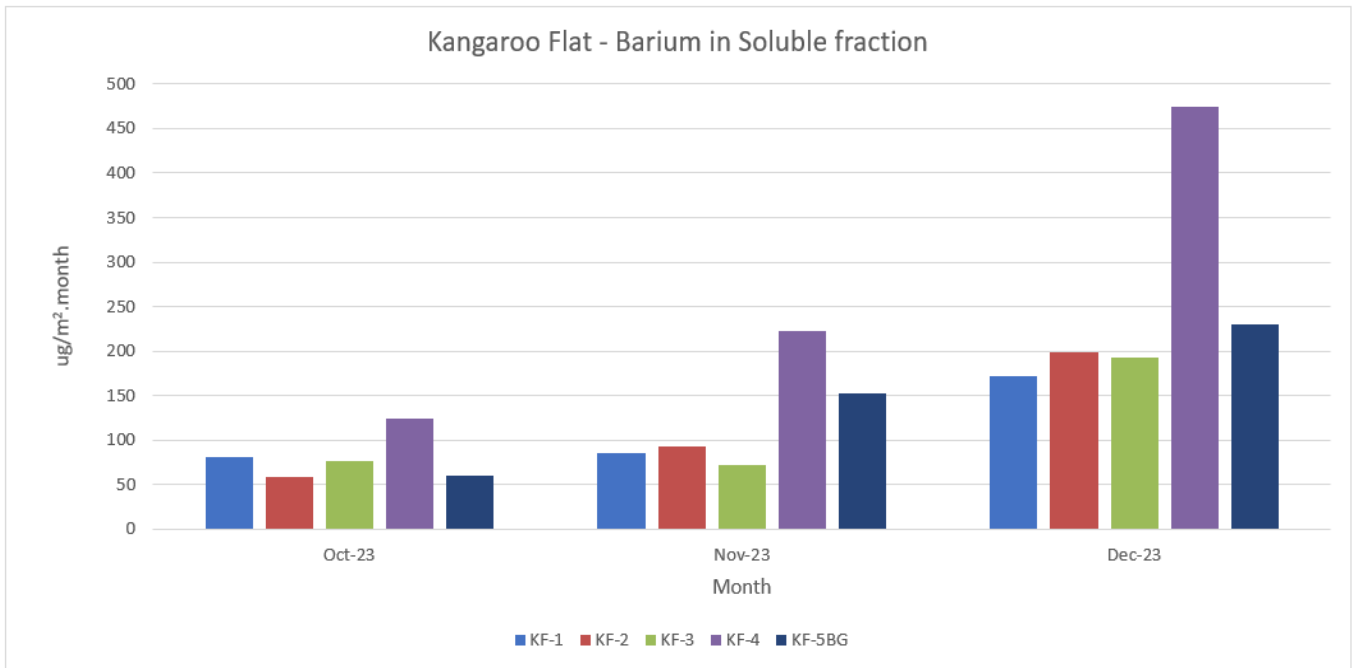


Figure 19 - Kangaroo Flat - Barium in Soluble Fraction – Q4 2023

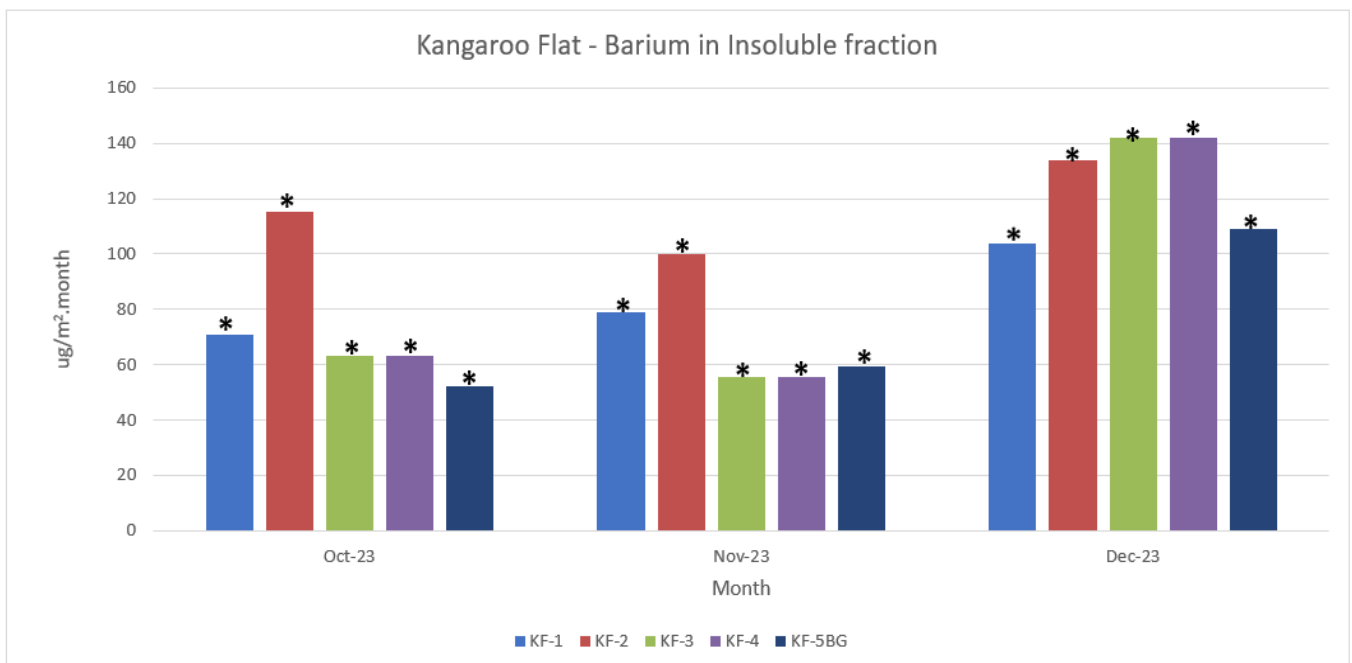


Figure 20 - Kangaroo Flat - Barium in Insoluble Fraction – Q4 2023

An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

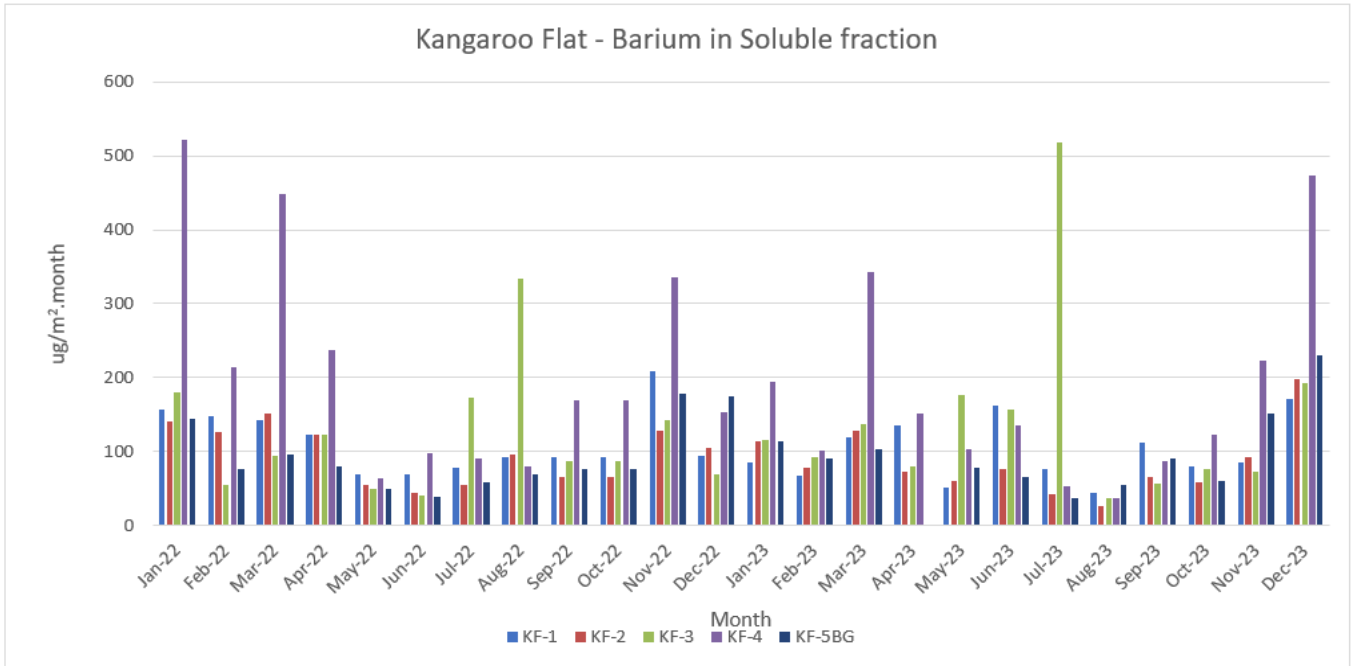


Figure 21 - Kangaroo Flat - Barium in Soluble Fraction - 2022-2023
 An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

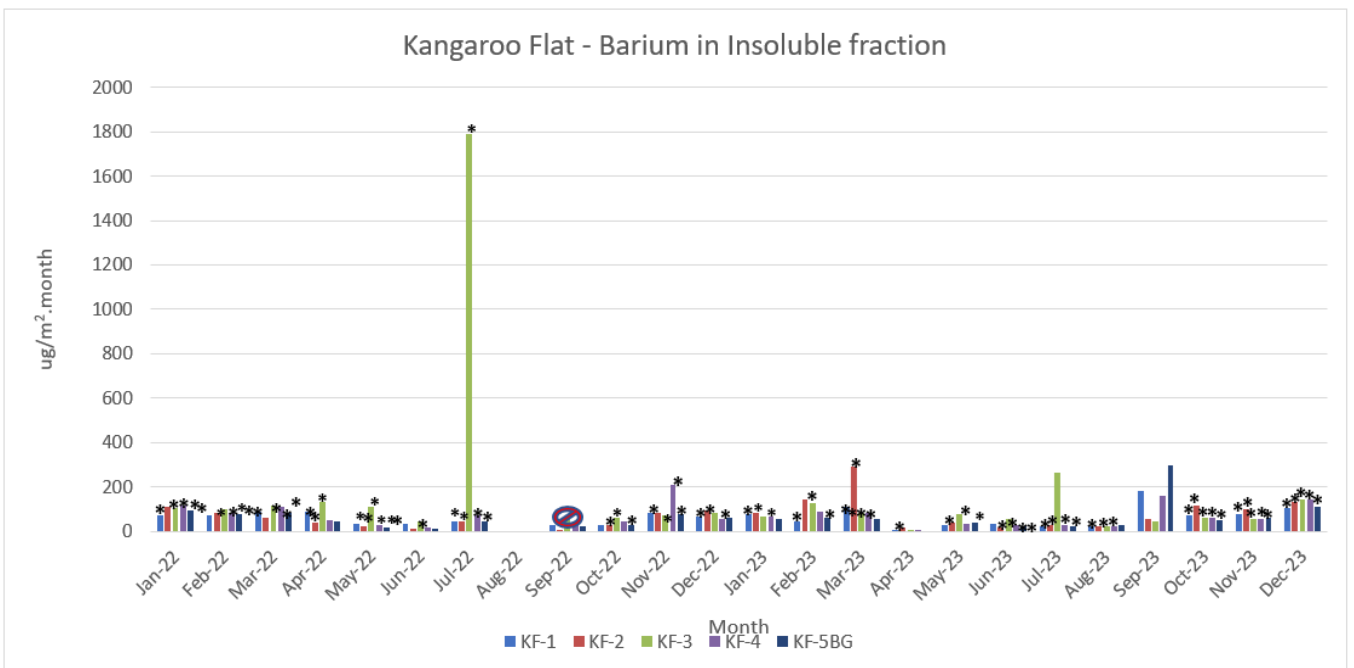


Figure 22 - Kangaroo Flat - Barium in Insoluble Fraction - 2022-2023
 An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

9.3 Manganese

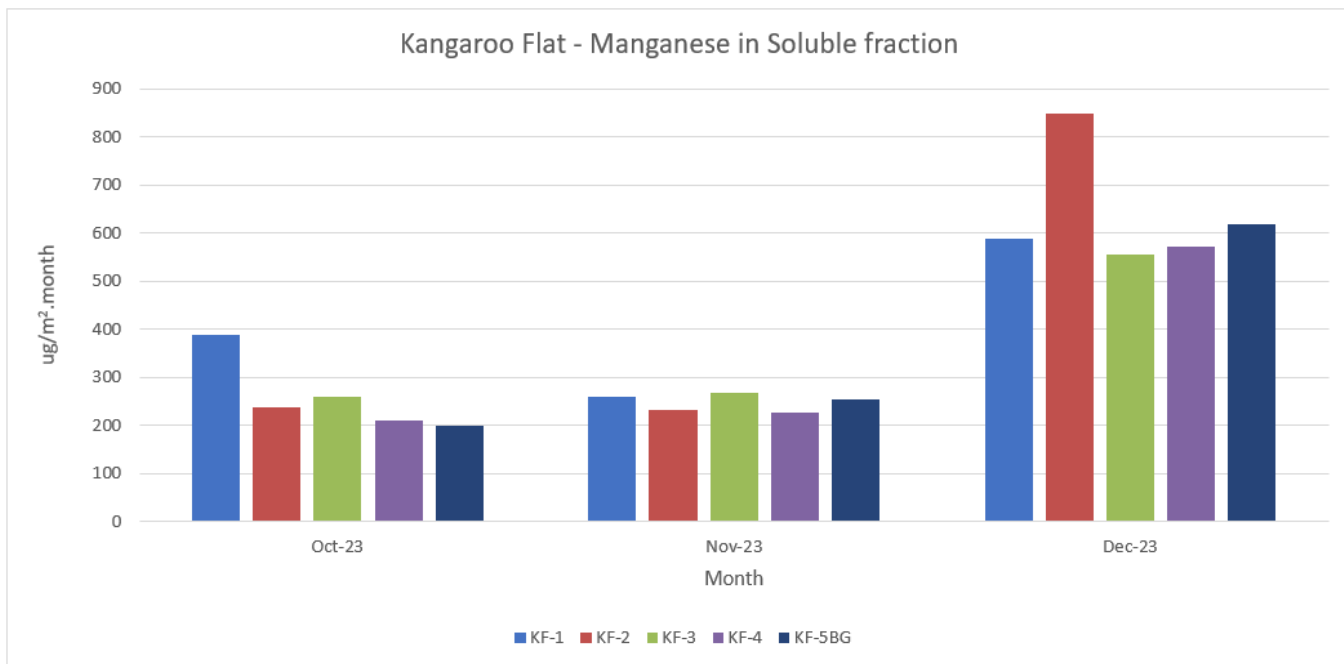


Figure 23 - Kangaroo Flat - Manganese in Soluble Fraction – Q4 2023

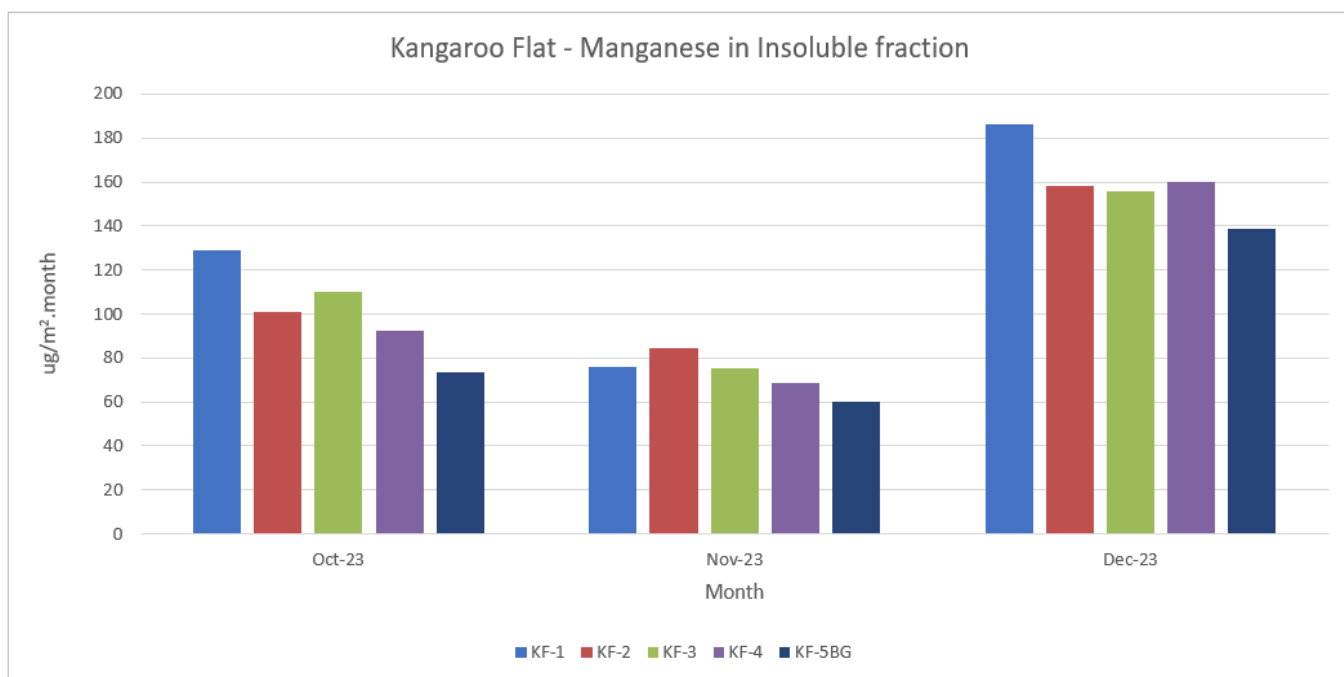


Figure 24 - Kangaroo Flat - Manganese in Insoluble Fraction – Q4 2023

An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

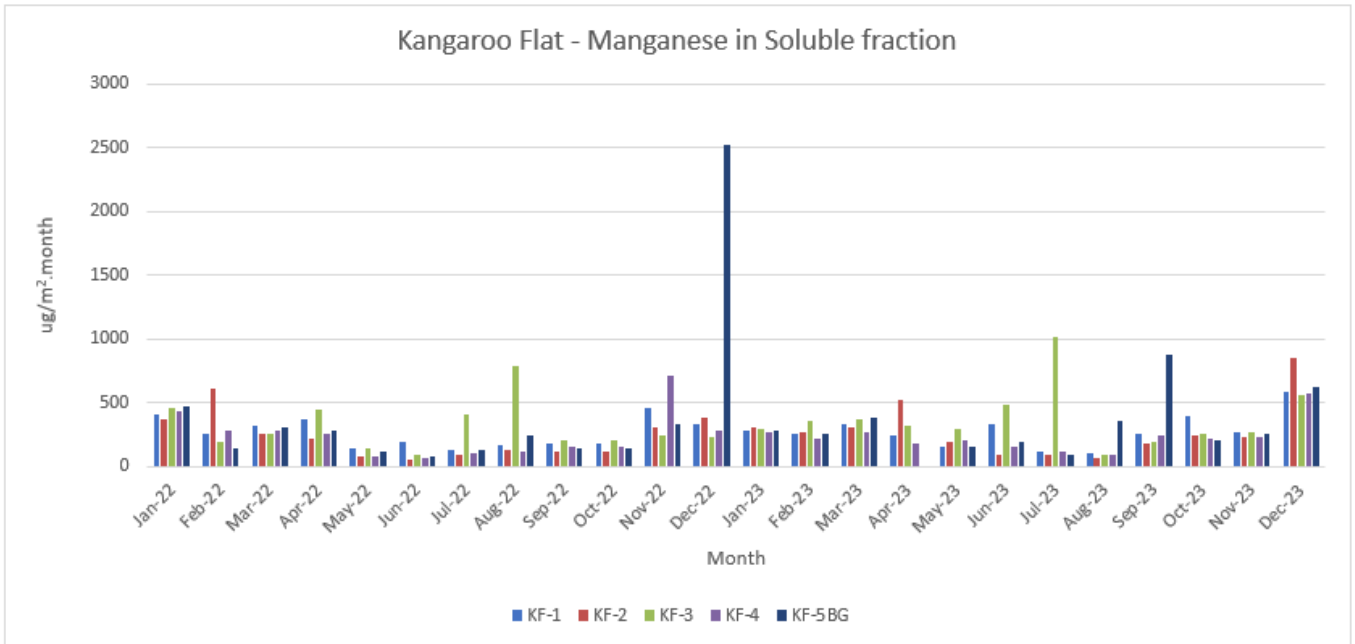


Figure 25 - Kangaroo Flat - Manganese in Soluble Fraction - 2022-2023

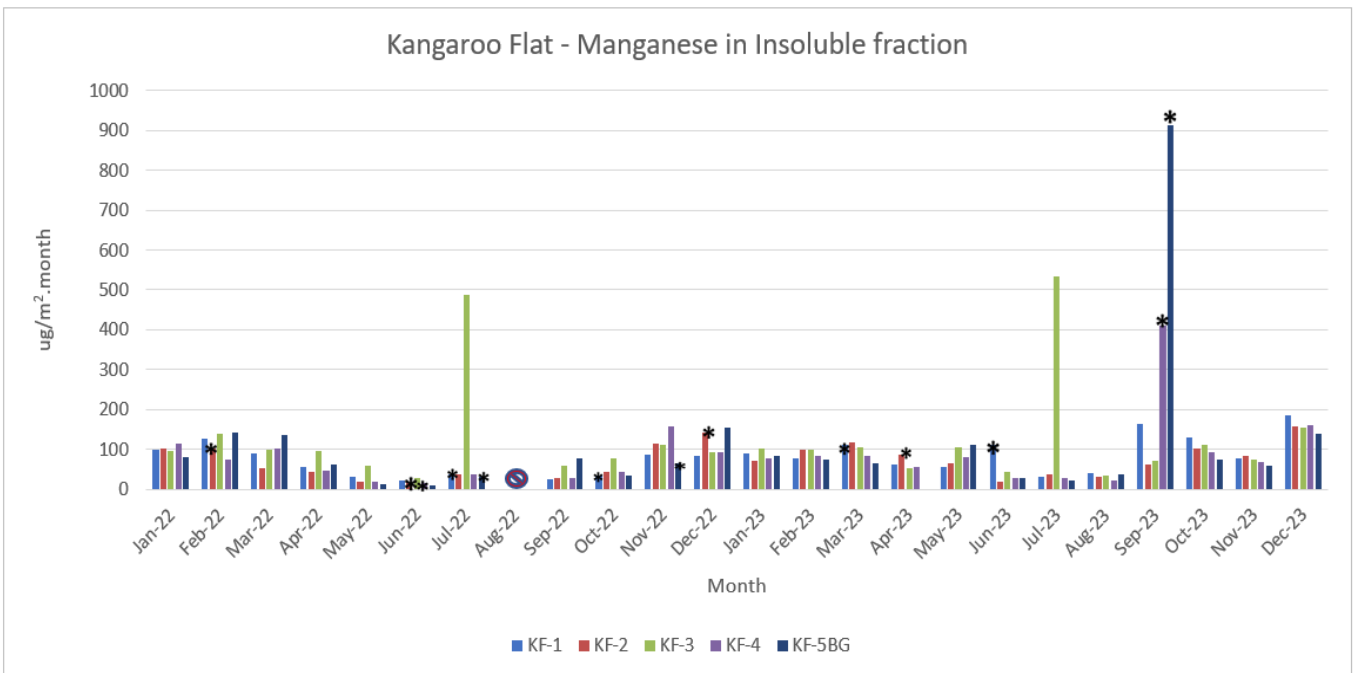


Figure 26 - Kangaroo Flat - Manganese in Insoluble Fraction - 2022-2023

An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

9.4 Trend Graphs

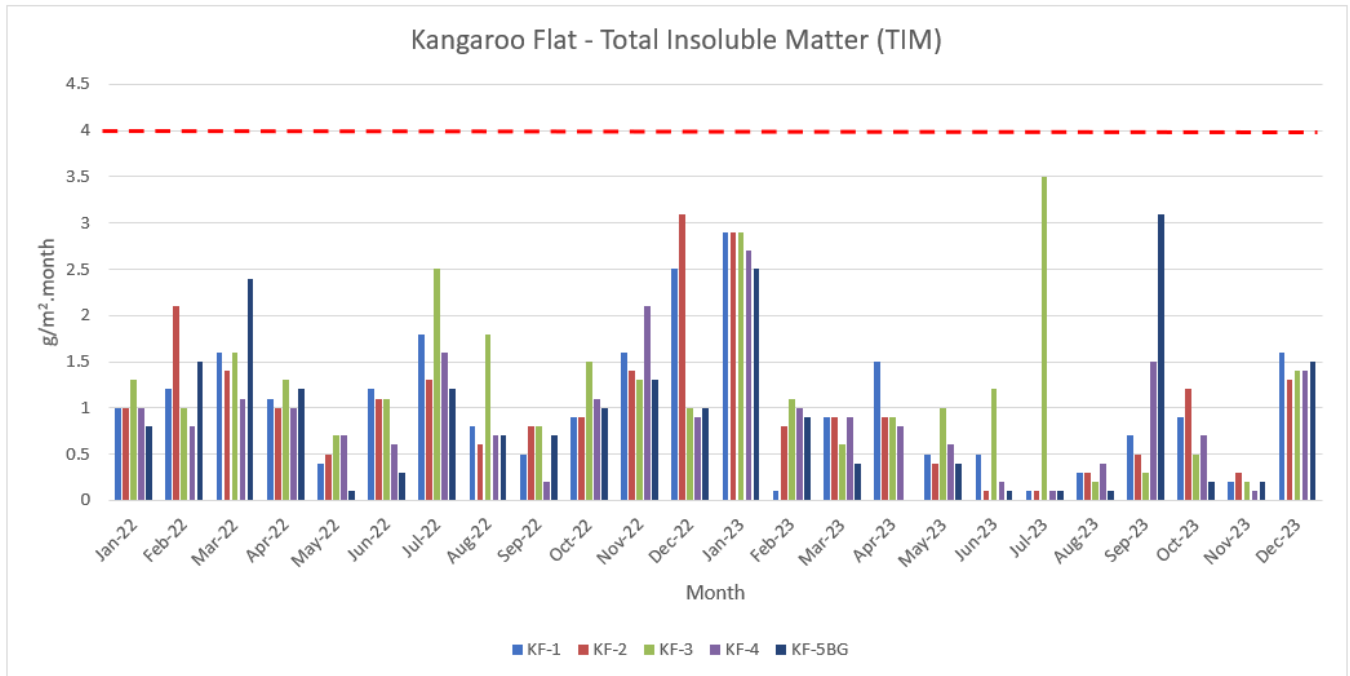


Figure 27 - Kangaroo Flat - Total Insoluble Matter (TIM) - 2022-2023

Figure 27 shows TIM from throughout 2022 and 2023. The chart shows no exceedances of the recommended PEM criteria occurred during the 2022 and Q1- Q4 2023 period. Overall average of reported TIM for 2022 recorded 1.2 g/m²/month and 0.92 g/m²/month for 2023. This is well below the exceedance criteria. (excludes the background data.)

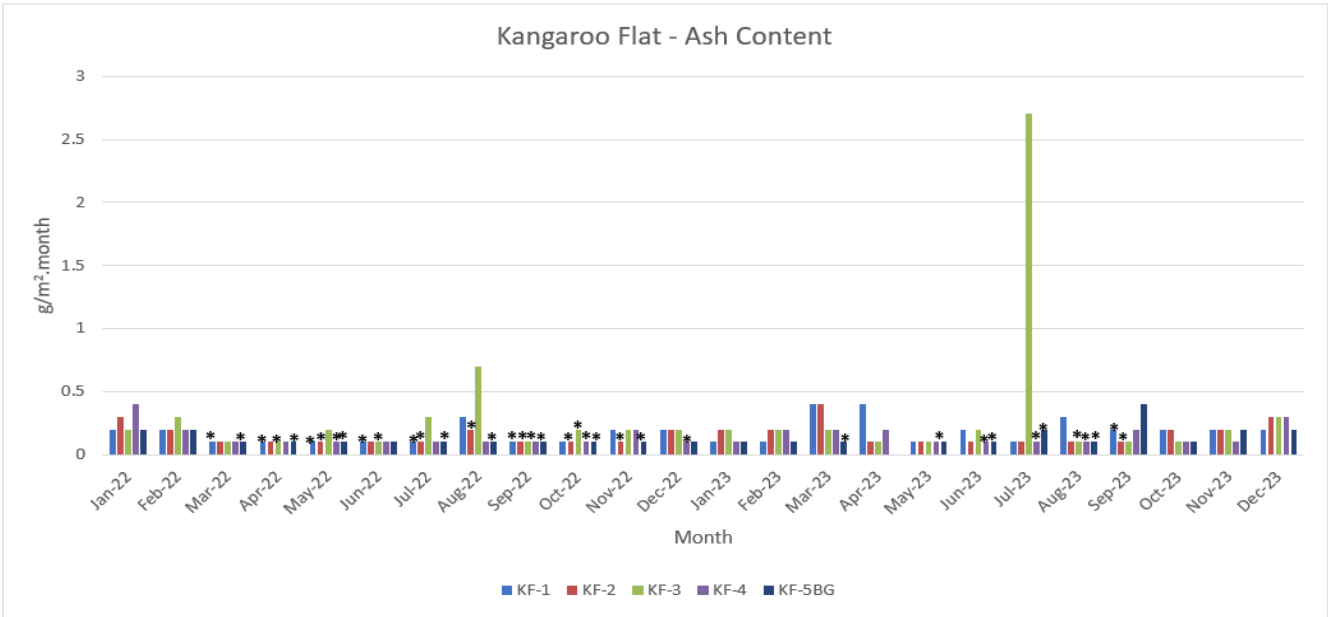


Figure 28 - Kangaroo Flat - Total Ash Content - 2022-2023

An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

Figure 28 provides graphical summary of total ash content throughout 2022 and 2023. As can be seen from this graph, most of the data for Q4 2023 was between 0.1 and 1.0 g/m²/month, not inclusive of the KF5 background site.

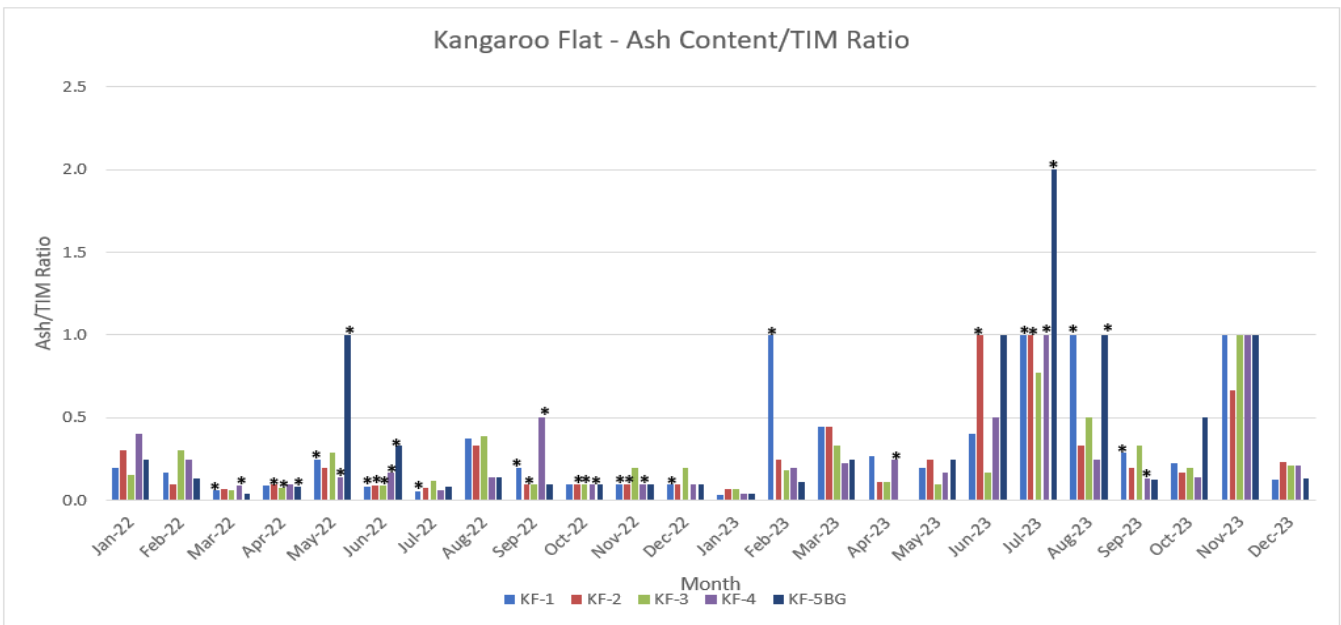


Figure 29 - Kangaroo Flat - Ash Content/TIM Ratio - 2022-2023

An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

Figure 29 shows the Ash Content/TIM Ratio for all months in 2022 and 2023. The ratio values for Q4 2023 were slightly lower when compared to other Q3 2023.

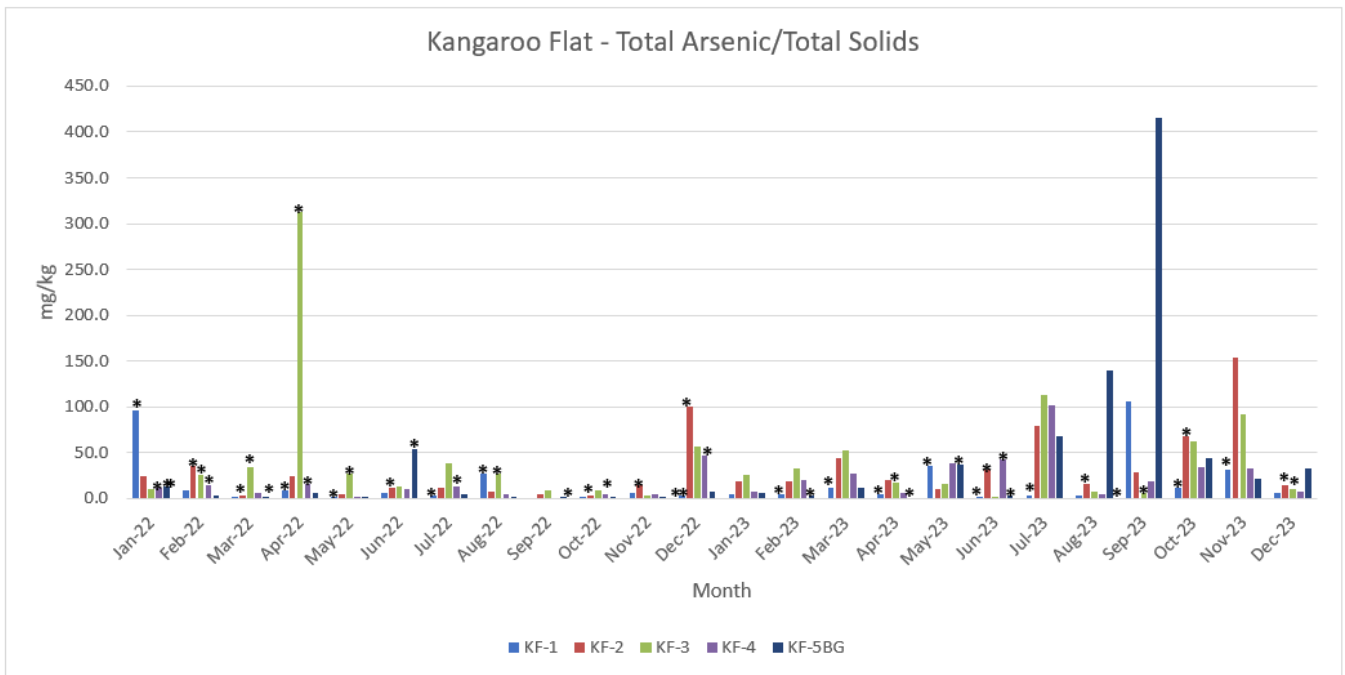


Figure 30 - Kangaroo Flat - Total Arsenic/Total Solids - 2022-2023
 An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

By comparing the graphs in Figure 29 and Figure 30 above, it can be concluded that these results for Q4 2023 are trending in line with previous results. The only exception to this was the outlier at KF 5 (BG) during September 2023.

Appendix A - Supplementary Information



Dust Sampling – Depositional Dust Gauge Work Procedure

1 Scope

Depositional Dust Gauges are used to collect samples of ambient airborne dust particles. The information is often used to monitor the levels of dust generated by industry activities. Monitoring stations are usually located near lease boundaries, at neighbouring receptor sites (neighbouring properties) or to specifically determine the airborne dust associated with a particular activity (eg. stockpiles). The samples are collected monthly and analysed.

2 Definitions

Dust Gauges	Comprises of a 150 mm diameter soda glass funnel with side angles of 60 degrees. The funnel is supported firmly in the neck of a wide mouth glass bottle. The funnel and bottle are positioned on a fixed stand with the top of the funnel being approximately 2 m above ground. Siting of gauges is as per AS 2922-1987.
Copper Sulfate	(CuSO ₄ .5H ₂ O) – 10ml of CuSO ₄ solution (7.8 g/L copper sulphate pentahydrate in de-ionised water matrix) placed into each of the sample collection flasks prior to placement in the field to inhibit algal growth.
Bottle Exchange	The sample collection period is not to exceed 30 day +/-2 days.

3 References

- AS / NZS 2922:1987 Ambient Air – Guide for the Siting of Sampling Units
- AS / NZS 3580.10.1:2003 Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method
- MAT-MAP3001 – ALS WRG Queensland Safety Management Plan

4 Procedure

4.1 **Location of Depositional Dust Gauges**

Depositional Dust Gauges should be located and installed as per AS / NZS 2922:1987.

4.2 **Bottle Collection & Deployment**

Depositional dust gauges should be collected and deployed as outlined below:

- Upon arrival at each site review any safety considerations such as JSA or “Take 5’s” based on site requirements.
- Remove the bottle and funnel from the stand being careful not to spill any of the liquid from the bottle.
- Rinse any deposited matter from the walls of the funnel into the bottle with distilled water and record the required observations on the appropriate Dust Field Forms.
- Remove the funnel and stopper from the bottle and affix the cap to the bottle.
- Record on the field sheet the site number (and bottle number) that has been removed and the time and date of removal.
- Clean the funnel of any residual grease or matter and inspect the stopper for damage or wear.
- Select a new bottle for the site (recording the bottle number if required), remove the cap and insert the funnel.
- Replace the bottle into stand and secure.



4.3 Sample Submission and Laboratory Testing

Submit the sampled deposit flask to a selected analytical laboratory for analysis to AS 3580.10.1 – 1991 as follows:

- Determination of Total Solids
- Insoluble Solids
- Soluble Solids
- Ash and Combustible Matter

Generally the receiving laboratory should report specified particulate parameters in grams/m²/month. Results should be reported to at least 1 decimal place. If required, the volume of liquid contained in each deposit flask should be recorded to give an indication of the rainfall for the exposure period.

The receiving laboratory must hold current NATA accreditation to perform and report the results of these analytical procedures.

5 Equipment

The following items of equipment are required to undertake the servicing of the sites:

- Suitably prepared exchange deposit flasks
- Wash bottle of distilled or de-ionised water
- Narrow bottle brush
- Clean rag or paper towel
- Permanent marker pen
- Insect spray

6 Recording of Results

Field observations shall be recorded on the Field Sheet Form.

Any uncharacteristic weather observations that are observed shall be entered onto the Field Sheet Form. These include any wet weather observations that are outside of what would be expected for the time of year that may impact on samples taken. These can include but are not limited to: Very strong winds, very high temperatures, heavy recent rainfall, very cold temperatures, hail, snow etc.

Appendix B - Laboratory Reports



CERTIFICATE OF ANALYSIS

Work Order
EM2319529

Page : 1 of 20

Client : **ALS WATER AND HYDROGRAPHICS PTY LTD**
Contact :
Addresses : 94 KERANG-KOONDROOK ROAD
KERANG 3579
: ----

Laboratory : Environmental Division Melbourne
: Customer Services EM
Contact : 4 Westall Rd Springvale VIC Australia 3171
Addresses : +61 3 8549 9600

Telephone

Telephone

Project C-O-C number
Order
number

: MV214940

Date Samples Received Sampler Site Quote number No. of samples received No. of samples analysed
: ----
: ----
: R. Oliver
: Woodvale & Kangaroo Flat
: ME/968/20
: 84
: 84

: 31-Oct-2023 12:50

Date Analysis Commenced : 02-Nov-2023
Issue Date : 23-Nov-2023 18:14



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC

right solutions. right partner



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed

procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts

: Service is a division of the American Chemical Society. LOR = Limit of reporting

^ = This result is computed from individual analyte detections

at or above the level of reporting \emptyset = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- ALS is not NATA accredited for the analysis of metals in dust deposition gauge.
- Dust analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in deposition units e.g., g/m².mth where the sampling procedure is not NATA accredited. ALS Mudgee laboratory is NATA accredited for dust sampling, therefore ALS Mudgee reported deposition units are accredited.
- EA120-142i (Particulate Matter Directional Dust): As Total Soluble Matter mass is less than algaecide correction mass results have been reported on as received basis. No Algaecide correction has been applied.
- Sampling period 27/9/2023 -27/10/2023
- EA120-EA142:EM2319529:Sample#1-12 exposure period is within the typical exposure period of 30+/-2 days as per AS3580.10.1
- EA120I-EA142I:EM2319529:Sample#13-20,22-24, container was received with no liquid. 100ml of DI water was used to dissolve contents, perform analysis and for calculation of results.
- EA120I-EA142I:EM2319529:Sample# 13-28, exposure period is within the typical exposure period of 30+/-2 days as per AS3580.10.2
- EA120-EA142:EM2319529:Sample # 1-12, have been dosed with Benzalkonium chloride prior to sample collection and a correction factor of 0.030g has been used for calculations.
- Directional dust analysis as per AS3580.10.2-2013. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.
- For dust analysis, the Limit of Reporting (LOR) referenced in the reports for deposited matter parameters represents the reporting increment rather than reporting limit.



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
Sampling date / time				27-Oct-2023 10:10	27-Oct-2023 10:30	27-Oct-2023 11:05	27-Oct-2023 11:25	27-Oct-2023 11:40
Compound	CAS Number	LOR	Unit	EM2319529-001	EM2319529-002	EM2319529-003	EM2319529-004	EM2319529-005
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.2	0.1	<0.1	0.1	0.1
Ash Content (mg)	----	2	mg	3	<2	<2	<2	2
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	5.2	0.4	0.3	0.4	1.0
Combustible Matter (mg)	----	2	mg	93	6	6	6	18
EA139: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	8.7	0.9	0.6	0.6	0.6
Total Soluble Matter (mg)	----	2	mg	153	16	11	10	10
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	5.4	0.5	0.4	0.5	1.1
Total Insoluble Matter (mg)	----	2	mg	96	8	7	8	20
EA142: Total Solids								
Total Solids	----	0.1	g/m ² .month	14.1	1.4	1.0	1.1	1.7
Total Solids (mg)	----	2	mg	249	24	18	18	30
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	<4.30	<1.70	----	----	<1.88
ø Arsenic	7440-38-2	0.050	µg/m ² .month	----	----	1.98	1.41	----
ø Barium	7440-39-3	0.05	µg/m ² .month	----	<42.2	<37.9	----	<33.3
ø Barium	7440-39-3	0.050	µg/m ² .month	130	----	----	20.1	----
ø Manganese	7439-96-5	0.050	µg/m ² .month	330	33.1	23.0	20.5	27.0



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST (Matrix: AIR)		Sample ID		WVDD07BG	WVDD08	KF1	KF2	KF3			
Sampling date / time		27-Oct-2023 09:40		27-Oct-2023 10:40		27-Oct-2023 13:40		27-Oct-2023 13:10		27-Oct-2023 13:20	
Compound	CAS Number	LOR	Unit	EM2319529-006	EM2319529-007	EM2319529-008	EM2319529-009	EM2319529-010			
				Result	Result	Result	Result	Result			
EA120: Ash Content											
Ash Content	----	0.1	g/m ² .month	0.2	0.1	0.2	0.2	0.1			
Ash Content (mg)	----	2	mg	3	<2	4	4	2			
EA125: Combustible Matter											
Combustible Matter	----	0.1	g/m ² .month	0.4	0.5	0.7	1.0	0.4			
Combustible Matter (mg)	----	2	mg	8	9	12	18	7			
EA139: Total Soluble Matter											
Total Soluble Matter	----	0.1	g/m ² .month	0.8	1.0	0.9	1.3	0.3			
Total Soluble Matter (mg)	----	2	mg	14	18	16	24	6			
EA141: Total Insoluble Matter											
Total Insoluble Matter	----	0.1	g/m ² .month	0.6	0.6	0.9	1.2	0.5			
Total Insoluble Matter (mg)	----	2	mg	11	11	16	22	9			
EA142: Total Solids											
Total Solids	----	0.1	g/m ² .month	1.4	1.6	1.8	2.5	0.8			
Total Solids (mg)	----	2	mg	25	29	32	46	15			
EG020T: Total Metals by ICP-MS											
Ø Arsenic	7440-38-2	0.05	µg/m ² .month	---	---	<9.04	<125	---			
Ø Arsenic	7440-38-2	0.050	µg/m ² .month	2.56	2.90	---	---	21.2			
Ø Barium	7440-39-3	0.05	µg/m ² .month	<69.0	<48.9	<71.0	<115	<63.0			
Ø Manganese	7439-96-5	0.050	µg/m ² .month	54.1	39.2	81.0	82.8	57.4			



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				KF4	KF5BG	WVDD01 - INSOLUBLE METALS INSOLUBLE METALS	WVDD02 - INSOLUBLE METALS INSOLUBLE METALS	WVDD03 - INSOLUBLE METALS INSOLUBLE METALS
Sampling date / time				27-Oct-2023 13:05	27-Oct-2023 12:55	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]
Compound	CAS Number	LOR	Unit	EM2319529-011	EM2319529-012	EM2319529-029	EM2319529-030	EM2319529-031
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.1	0.1	----	----	----
Ash Content (mg)	----	2	mg	2	<2	----	----	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.6	0.1	----	----	----
Combustible Matter (mg)	----	2	mg	9	2	----	----	----
EA139: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	0.8	0.3	----	----	----
Total Soluble Matter (mg)	----	2	mg	14	5	----	----	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.7	0.2	----	----	----
Total Insoluble Matter (mg)	----	2	mg	12	4	----	----	----
EA142: Total Solids								
Total Solids	----	0.1	g/m ² .month	1.5	0.5	----	----	----
Total Solids (mg)	----	2	mg	26	9	----	----	----
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	----	----	<4.30	<1.70	----
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	33.8	4.53	----	----	2.32
∅ Barium	7440-39-3	0.05	µg/m ² .month	<83.3	<52.3	----	<42.2	<37.9
∅ Barium	7440-39-3	0.050	µg/m ² .month	----	----	174	----	----
∅ Manganese	7439-96-5	0.050	µg/m ² .month	59.7	36.2	502	52.3	42.6



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				WVDD04 - INSOLUBLE METALS	WVDD05 - INSOLUBLE METALS	WVDD07BG - INSOLUBLE METALS	WVDD08 - INSOLUBLE METALS	KF1 - INSOLUBLE METALS
				INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS
Sampling date / time				[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]
Compound	CAS Number	LOR	Unit	EM2319529-032	EM2319529-033	EM2319529-034	EM2319529-035	EM2319529-036
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	---	<1.88	---	---	<9.04
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	1.60	---	2.94	6.44	---
∅ Barium	7440-39-3	0.05	µg/m ² .month	---	<33.5	<69.0	<48.9	<71.0
∅ Barium	7440-39-3	0.050	µg/m ² .month	24.0	---	---	---	---
∅ Manganese	7439-96-5	0.050	µg/m ² .month	34.1	49.9	87.8	56.1	129



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				KF2 - INSOLUBLE METALS INSOLUBLE METALS	KF3 - INSOLUBLE METALS INSOLUBLE METALS	KF4 - INSOLUBLE METALS INSOLUBLE METALS	KF5BG - INSOLUBLE METALS INSOLUBLE METALS	WVDD01 - SOLUBLE METALS SOLUBLE METALS
Sampling date / time				[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]
Compound	CAS Number	LOR	Unit	EM2319529-037	EM2319529-038	EM2319529-039	EM2319529-040	EM2319529-057
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	<125	---	---	---	---
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	---	23.3	33.8	5.15	26.8
∅ Barium	7440-39-3	0.05	µg/m ² .month	<115	<63.0	<83.3	<52.3	203.8
∅ Manganese	7439-96-5	0.050	µg/m ² .month	101	110	92.6	73.3	1530



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				WVDD02 - SOLUBLE METALS	WVDD03 - SOLUBLE METALS	WVDD04 - SOLUBLE METALS	WVDD05 - SOLUBLE METALS	WVDD07BG - SOLUBLE METALS
				SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS
				[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]
Compound	CAS Number	LOR	Unit	EM2319529-058	EM2319529-059	EM2319529-060	EM2319529-061	EM2319529-062
Sampling date / time				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	6.06	10.4	6.62	4.81	3.75
∅ Barium	7440-39-3	0.050	µg/m ² .month	78.8	56.9	41.9	51.0	84.1
∅ Manganese	7439-96-5	0.050	µg/m ² .month	340	195	150	253	459



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				WVDD08 - SOLUBLE METALS SOLUBLE METALS	KF1 - SOLUBLE METALS SOLUBLE METALS	KF2 - SOLUBLE METALS SOLUBLE METALS	KF3 - SOLUBLE METALS SOLUBLE METALS	KF4 - SOLUBLE METALS SOLUBLE METALS
Sampling date / time				[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]
Compound	CAS Number	LOR	Unit	EM2319529-063	EM2319529-064	EM2319529-065	EM2319529-066	EM2319529-067
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	10.9	11.4	44.3	26.0	17.4
∅ Barium	7440-39-3	0.050	µg/m ² .month	74.3	80.1	58.8	75.8	124
∅ Manganese	7439-96-5	0.050	µg/m ² .month	523	389	238	259	210



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				KF5BG - SOLUBLE METALS	----	----	----	----
				SOLUBLE METALS				
				Sampling date / time	[27-Oct-2023]	----	----	----
Compound	CAS Number	LOR	Unit	EM2319529-068	-----	-----	-----	-----
				Result	----	----	----	----
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	16.6	---	---	---	---
∅ Barium	7440-39-3	0.050	µg/m ² .month	60.1	---	---	---	---
∅ Manganese	7439-96-5	0.050	µg/m ² .month	200	---	---	---	---



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	WVDG03N	WVDG03E	WVDG03S	WVDG03W	WVDG04N
Sampling date / time				27-Oct-2023 11:05	27-Oct-2023 11:05	27-Oct-2023 11:05	27-Oct-2023 11:05	27-Oct-2023 11:25	
Compound	CAS Number	LOR	Unit	EM2319529-013	EM2319529-014	EM2319529-015	EM2319529-016	EM2319529-017	
				Result	Result	Result	Result	Result	
EA120I: Ash Content									
Ash Content	----	0.1	g/m ² .month	<0.1	<0.1	<0.1	<0.1	<0.1	
Ash Content (mg)	----	2	mg	<2	<2	<2	<2	<2	
EA125I: Combustible Matter									
Combustible Matter	----	0.1	g/m ² .month	0.1	0.3	0.3	0.3	0.2	
Combustible Matter (mg)	----	2	mg	<2	3	5	5	3	
EA139I: Total Soluble Matter									
Total Soluble Matter	----	0.1	g/m ² .month	0.6	0.6	0.9	0.3	0.5	
Total Soluble Matter (mg)	----	2	mg	10	9	14	5	7	
EA141I: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m ² .month	0.1	0.3	0.3	0.4	0.2	
Total Insoluble Matter (mg)	----	2	mg	<2	4	5	6	3	
EA142I: Total Solids									
Total Solids	----	0.1	g/m ² .month	0.7	0.9	1.2	0.7	0.7	
Total Solids (mg)	----	2	mg	11	13	19	11	10	
EG020T: Total Metals by ICP-MS									
Ø Arsenic	7440-38-2	0.05	µg/m ² .month	----	<6.04	----	----	<1.06	
Ø Arsenic	7440-38-2	0.050	µg/m ² .month	0.720	----	1.03	1.10	----	
Ø Barium	7440-39-3	0.05	µg/m ² .month	----	<36.4	<24.9	<22.6	----	
Ø Barium	7440-39-3	0.050	µg/m ² .month	46.5	----	----	----	13.9	
Ø Manganese	7439-96-5	0.05	µg/m ² .month	----	<21.8	----	----	----	
Ø Manganese	7439-96-5	0.050	µg/m ² .month	13.5	----	25.2	19.0	10.8	



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)		Sample ID		WVDG04E	WVDG04S	WVDG04W	WVDG05N	WVDG05E
Sampling date / time		27-Oct-2023 11:25		27-Oct-2023 11:25	27-Oct-2023 11:25	27-Oct-2023 11:40	27-Oct-2023 11:40	27-Oct-2023 11:40
Compound	CAS Number	LOR	Unit	EM2319529-018	EM2319529-019	EM2319529-020	EM2319529-021	EM2319529-022
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content	----	0.1	g/m ² .month	<0.1	<0.1	0.1	<0.1	<0.1
Ash Content (mg)	----	2	mg	<2	<2	2	<2	<2
EA125I: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.3	<0.1	0.2	0.2	0.1
Combustible Matter (mg)	----	2	mg	4	<2	3	4	<2
EA139I: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	0.3	0.2	0.3	0.6	0.8
Total Soluble Matter (mg)	----	2	mg	5	3	5	10	12
EA141I: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.3	<0.1	0.3	0.3	0.1
Total Insoluble Matter (mg)	----	2	mg	4	<2	5	5	<2
EA142I: Total Solids								
Total Solids	----	0.1	g/m ² .month	0.6	0.2	0.6	0.9	0.9
Total Solids (mg)	----	2	mg	9	3	10	15	13
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	<1.21	---	---	<4.69	<1.67
ø Arsenic	7440-38-2	0.050	µg/m ² .month	---	0.650	2.69	---	---
ø Barium	7440-39-3	0.05	µg/m ² .month	<20.0	<14.5	<41.3	<60.2	---
ø Barium	7440-39-3	0.050	µg/m ² .month	---	---	---	---	20.1
ø Manganese	7439-96-5	0.05	µg/m ² .month	---	---	---	<45.5	<18.4
ø Manganese	7439-96-5	0.050	µg/m ² .month	14.1	11.7	40.7	---	---



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)		Sample ID		WVDG05S	WVDG05W	WVDG08N	WVDG08E	WVDG08S
Sampling date / time				27-Oct-2023 11:40	27-Oct-2023 11:40	27-Oct-2023 10:40	27-Oct-2023 10:40	27-Oct-2023 10:40
Compound	CAS Number	LOR	Unit	EM2319529-023	EM2319529-024	EM2319529-025	EM2319529-026	EM2319529-027
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content	----	0.1	g/m ² .month	<0.1	<0.1	<0.1	<0.1	0.1
Ash Content (mg)	----	2	mg	<2	<2	<2	<2	<2
EA125I: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	<0.1	0.1	0.3	0.1	0.4
Combustible Matter (mg)	----	2	mg	<2	<2	5	<2	6
EA139I: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	0.4	0.3	0.2	2.1	4.1
Total Soluble Matter (mg)	----	2	mg	6	5	2	32	63
EA141I: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	<0.1	0.1	0.3	0.1	0.5
Total Insoluble Matter (mg)	----	2	mg	<2	<2	5	2	8
EA142I: Total Solids								
Total Solids	----	0.1	g/m ² .month	0.4	0.4	0.5	2.2	4.6
Total Solids (mg)	----	2	mg	6	6	7	34	71
EG020T: Total Metals by ICP-MS								
Ø Arsenic	7440-38-2	0.05	µg/m ² .month	<0.65	<0.61	<2.25	---	---
Ø Arsenic	7440-38-2	0.050	µg/m ² .month	---	---	---	1.33	1.87
Ø Barium	7440-39-3	0.05	µg/m ² .month	---	<18.4	<69.1	<63.3	<53.3
Ø Barium	7440-39-3	0.050	µg/m ² .month	14.5	---	---	---	---
Ø Manganese	7439-96-5	0.050	µg/m ² .month	13.2	16.6	32.8	26.3	64.0



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG08W	WVDG03N - INSOLUBLE METALS INSOLUBLE METALS	WVDG03E - INSOLUBLE METALS INSOLUBLE METALS	WVDG03S - INSOLUBLE METALS INSOLUBLE METALS	WVDG03W - INSOLUBLE METALS INSOLUBLE METALS
Sampling date / time				27-Oct-2023 10:40	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]
Compound	CAS Number	LOR	Unit	EM2319529-028	EM2319529-041	EM2319529-042	EM2319529-043	EM2319529-044
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.2	----	----	----	----
Ash Content (mg)	----	2	mg	3	----	----	----	----
EA125I: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.5	----	----	----	----
Combustible Matter (mg)	----	2	mg	8	----	----	----	----
EA139I: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	0.8	----	----	----	----
Total Soluble Matter (mg)	----	2	mg	12	----	----	----	----
EA141I: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.7	----	----	----	----
Total Insoluble Matter (mg)	----	2	mg	11	----	----	----	----
EA142I: Total Solids								
Total Solids	----	0.1	g/m ² .month	1.5	----	----	----	----
Total Solids (mg)	----	2	mg	23	----	----	----	----
EG020T: Total Metals by ICP-MS								
Ø Arsenic	7440-38-2	0.05	µg/m ² .month	<3.15	----	<6.04	----	----
Ø Arsenic	7440-38-2	0.050	µg/m ² .month	----	0.870	----	1.06	1.89
Ø Barium	7440-39-3	0.05	µg/m ² .month	<84.8	----	<36.4	<24.9	<22.6
Ø Barium	7440-39-3	0.050	µg/m ² .month	----	77.4	----	----	----
Ø Manganese	7439-96-5	0.05	µg/m ² .month	----	----	<21.8	----	----
Ø Manganese	7439-96-5	0.050	µg/m ² .month	106	29.9	----	29.7	33.2



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG04N - INSOLUBLE METALS INSOLUBLE METALS	WVDG04E - INSOLUBLE METALS INSOLUBLE METALS	WVDG04S - INSOLUBLE METALS INSOLUBLE METALS	WVDG04W - INSOLUBLE METALS INSOLUBLE METALS	WVDG05N - INSOLUBLE METALS INSOLUBLE METALS
Sampling date / time				[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]
Compound	CAS Number	LOR	Unit	EM2319529-045	EM2319529-046	EM2319529-047	EM2319529-048	EM2319529-049
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	<1.06	<1.21	----	----	<4.69
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	----	----	0.980	2.74	----
∅ Barium	7440-39-3	0.05	µg/m ² .month	----	<20.0	<14.5	<41.3	<60.2
∅ Barium	7440-39-3	0.050	µg/m ² .month	14.6	----	----	----	----
∅ Manganese	7439-96-5	0.05	µg/m ² .month	----	----	----	----	<45.5
∅ Manganese	7439-96-5	0.050	µg/m ² .month	13.2	18.3	99.6	47.4	----



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG05E - INSOLUBLE METALS INSOLUBLE METALS	WVDG05S - INSOLUBLE METALS INSOLUBLE METALS	WVDG05W - INSOLUBLE METALS INSOLUBLE METALS	WVDG08N - INSOLUBLE METALS INSOLUBLE METALS	WVDG08E - INSOLUBLE METALS INSOLUBLE METALS
Sampling date / time				[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]
Compound	CAS Number	LOR	Unit	EM2319529-050	EM2319529-051	EM2319529-052	EM2319529-053	EM2319529-054
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	<1.67	<0.65	<0.61	<2.25	----
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	----	----	----	----	1.46
∅ Barium	7440-39-3	0.05	µg/m ² .month	----	----	<18.4	<69.1	<63.3
∅ Barium	7440-39-3	0.050	µg/m ² .month	21.0	15.9	----	----	----
∅ Manganese	7439-96-5	0.05	µg/m ² .month	<18.4	----	----	----	----
∅ Manganese	7439-96-5	0.050	µg/m ² .month	----	17.1	17.7	48.2	41.0



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG08S - INSOLUBLE METALS INSOLUBLE METALS	WVDG08W - INSOLUBLE METALS INSOLUBLE METALS	WVDG03N - SOLUBLE METALS SOLUBLE METALS	WVDG03E - SOLUBLE METALS SOLUBLE METALS	WVDG03S - SOLUBLE METALS SOLUBLE METALS
Sampling date / time				[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]
Compound	CAS Number	LOR	Unit	EM2319529-055	EM2319529-056	EM2319529-069	EM2319529-070	EM2319529-071
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	---	<3.15	---	---	---
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	2.13	---	0.470	3.53	0.770
∅ Barium	7440-39-3	0.05	µg/m ² .month	<53.3	<84.8	---	---	---
∅ Barium	7440-39-3	0.050	µg/m ² .month	---	---	36.1	6.40	4.00
∅ Manganese	7439-96-5	0.050	µg/m ² .month	72.5	112	32.4	19.4	19.6



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG03W - SOLUBLE METALS	WVDG04N - SOLUBLE METALS	WVDG04E - SOLUBLE METALS	WVDG04S - SOLUBLE METALS	WVDG04W - SOLUBLE METALS
				SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS
Sampling date / time				[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]
Compound	CAS Number	LOR	Unit	EM2319529-072	EM2319529-073	EM2319529-074	EM2319529-075	EM2319529-076
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	0.550	2.20	2.01	0.670	1.13
∅ Barium	7440-39-3	0.050	µg/m ² .month	1.60	1.40	5.80	3.90	2.70
∅ Manganese	7439-96-5	0.050	µg/m ² .month	15.4	24.4	23.7	17.7	14.3



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG05N - SOLUBLE METALS	WVDG05E - SOLUBLE METALS	WVDG05S - SOLUBLE METALS	WVDG05W - SOLUBLE METALS	WVDG08N - SOLUBLE METALS
				SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS
Sampling date / time				[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]
Compound	CAS Number	LOR	Unit	EM2319529-077	EM2319529-078	EM2319529-079	EM2319529-080	EM2319529-081
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	2.13	0.660	0.100	1.14	0.380
∅ Barium	7440-39-3	0.050	µg/m ² .month	20.8	15.9	5.10	2.50	1.80
∅ Manganese	7439-96-5	0.050	µg/m ² .month	106	36.0	15.1	11.5	6.57



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG08E - SOLUBLE METALS	WVDG08S - SOLUBLE METALS	WVDG08W - SOLUBLE METALS	----	----
				SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS		
				[27-Oct-2023]	[27-Oct-2023]	[27-Oct-2023]	----	----
Compound	CAS Number	LOR	Unit	EM2319529-082	EM2319529-083	EM2319529-084	-----	-----
				Result	Result	Result	----	----
EG020T: Total Metals by ICP-MS								
Ø Arsenic	7440-38-2	0.050	µg/m ² .month	21.2	24.6	4.42	----	----
Ø Barium	7440-39-3	0.050	µg/m ² .month	19.1	13.5	20.9	----	----
Ø Manganese	7439-96-5	0.050	µg/m ² .month	294	674	261	----	----



CERTIFICATE OF ANALYSIS

Work Order :
EM2321591

Page : 1 of 20

Amendment : **3**
: **ALS WATER AND HYDROGRAPHICS PTY LTD**
Client :
Contact Address : 94 KERANG-KOONDROOK ROAD
KERANG 3579

Laboratory : Environmental Division Melbourne
: Customer Services EM
: 4 Westall Rd Springvale VIC Australia 3171

Contact
Addresses

Telephone : ----
Project : MV214940
Order number : ----
C-O-C number : ----
Sampler : ROHAN OLIVER
Site : Woodvale & Kangaroo Flat
Quote number : ME/968/20_V2
No. of samples received : 84
No. of samples analysed : 84

Telephone : +61 3 8549 9600
Date Samples Received : 04-Dec-2023 10:15
Date Analysis Commenced : 08-Dec-2023
Issue Date : 19-Feb-2024 10:31



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories

Position

Accreditation Category

Dilani Fernando

Laboratory Coordinator

Melbourne Inorganics, Springvale, VIC

Page : 22 of 113
Work Eric Chau : EM2319529
Order : ALS WATER AND HYDROGRAPHICS PTY LTD

Metals Team Leader

Melbourne Inorganics, Springvale, VIC



right solutions. right partner.



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed

procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society. LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
∅ = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- (16/02/2024) It is recognised that insoluble barium is less than ashed barium for samples 2 & 58. However, the difference is within experimental variation of the methods.
- (16/02/2024) EM2321591 #6&62, 17&73, 18&74, 19&75, 20&76, 22&78, 23&79, 24&80 and 27&83 comparison of insoluble and ash arsenic results has exceeded the expected RPD criteria. A cautious approach has been taken towards this and the higher ash results have been reported while LOR of the insoluble has been raised as a result. This is potentially due to the heterogeneity of the filtered matter distribution.
- (16/02/2024) EM2321591 #13&69, 17&73, 20&76, 22&78, 23&79, 24&80 and 27&83 comparison of insoluble and ash manganese results has exceeded the expected RPD criteria. A cautious approach has been taken towards this and the higher ash results have been reported while LOR of the insoluble has been raised as a result. This is potentially due to the heterogeneity of the filtered matter distribution.
- (16/02/2024) EM2321591 #1, 3-13, 15-17, 19-28, 57, 59-69, 71-73 and 75-84 comparison of insoluble and ash barium results has exceeded the expected RPD criteria. A cautious approach has been taken towards this and the higher ash results have been reported while LOR of the insoluble has been raised as a result. This is potentially due to the heterogeneity of the filtered matter distribution.
- ALS is not NATA accredited for the analysis of metals in dust deposition gauge.
- Dust analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in deposition units e.g., g/m².mth where the sampling procedure is not NATA accredited. ALS Mudgee laboratory is NATA accredited for dust sampling, therefore ALS Mudgee reported deposition units are accredited.
- (16/02/2024) It is recognised that insoluble arsenic is less than ashed arsenic for samples 5 & 61, 13 & 69, 21 & 77 and 26 & 82. However, the difference is within experimental variation of the methods.
- (16/02/2024) It is recognised that insoluble manganese is less than ashed manganese for samples 5 & 61, 19 & 75 and 21 & 77. However, the difference is within experimental variation of the methods.
- Amendment (16/02/2024): This report has been amended and re-released to allow additional pertinent comments regarding method EG020TUG to be added to the report.



- Amendment 13/02/2024: This report has been amended following a change to the sample ID and ash metal results for EG020TUG reported for sample EM2321591 #29-84 due to a transcription error. All details are recorded in client query 24MECC034 and a full investigation will be detailed in corrective action request 24MEC013.
- Amendment (08/01/2024): This report has been amended following the identification of an error in the LIMS quoting or reporting setup for this test. The quality system is being utilised to resolve this issue. The specific data affected includes container type for sample #6.
- Sampling period: 27/10/2023 - 30/11/2023
- EA120-EA142:EM2321591:Sample#1-12, exposure period is 34 days which is outside the typical exposure period of 30+/-2 days as per AS3580.10.1/AS3580.10.2
- EA120I-EA142I:EM2321591:Sample#13-28, Sample exposure period is 34 days which is outside the typical exposure period of 30 +/- 2 days as per AS3580.10.2
- EA120-EA142:EM2321591:Sample#1-12,Dust samples have been dosed with Benzalkonium chloride prior to sample collection and a correction factor of 0.030g has been used for calculations.
- EA120I-EA142I:EM2321591:Sample#13-28,Dust samples have been dosed with Benzalkonium chloride prior to sample collection and a correction factor of 0.030g has been used for calculations.
- Directional dust analysis as per AS3580.10.2-2013. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.
- For dust analysis, the Limit of Reporting (LOR) referenced in the reports for deposited matter parameters represents the reporting increment rather than reporting limit.



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
Sampling date / time				30-Nov-2023 10:20	30-Nov-2023 10:35	30-Nov-2023 10:45	30-Nov-2023 11:10	30-Nov-2023 11:30
Compound	CAS Number	LOR	Unit	EM2321591-001	EM2321591-002	EM2321591-003	EM2321591-004	EM2321591-005
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.2	<0.1	<0.1	0.2	0.2
Ash Content (mg)	----	2	mg	4	<2	<2	4	4
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	<0.1	<0.1	<0.1	<0.1	1.3
Combustible Matter (mg)	----	2	mg	<2	<2	<2	<2	26
EA139: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	5.7	0.7	1.2	3.1	8.0
Total Soluble Matter (mg)	----	2	mg	114	14	24	61	160
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.2	<0.1	<0.1	0.2	1.5
Total Insoluble Matter (mg)	----	2	mg	5	<2	<2	5	30
EA142: Total Solids								
Total Solids	----	0.1	g/m ² .month	5.9	0.7	1.2	3.3	9.5
Total Solids (mg)	----	2	mg	119	15	25	66	190
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	----	----	----	----	5.97
ø Arsenic	7440-38-2	0.050	µg/m ² .month	4.29	2.23	4.80	3.64	----
ø Barium	7440-39-3	0.05	µg/m ² .month	92.1	40.4	75.6	57.5	367
ø Manganese	7439-96-5	0.05	µg/m ² .month	----	----	----	----	168
ø Manganese	7439-96-5	0.050	µg/m ² .month	57.8	34.1	51.3	50.6	----



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

			WVDD07BG	WVDD08	KF1	KF2	KF3	
Sampling date / time			30-Nov-2023 10:00	30-Nov-2023 12:30	30-Nov-2023 14:30	30-Nov-2023 13:50	30-Nov-2023 14:00	
Compound	CAS Number	LOR	Unit	EM2321591-006	EM2321591-007	EM2321591-008	EM2321591-009	EM2321591-010
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.6	0.1	0.2	0.2	0.2
Ash Content (mg)	----	2	mg	11	2	4	5	3
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	1.4	<0.1	<0.1	<0.1	<0.1
Combustible Matter (mg)	----	2	mg	29	<2	<2	<2	<2
EA139: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	4.3	1.4	1.1	0.8	0.8
Total Soluble Matter (mg)	----	2	mg	86	28	23	16	15
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	2.0	0.1	0.2	0.3	0.2
Total Insoluble Matter (mg)	----	2	mg	40	2	4	6	4
EA142: Total Solids								
Total Solids	----	0.1	g/m ² .month	6.3	1.5	1.3	1.1	1.0
Total Solids (mg)	----	2	mg	126	30	27	22	19
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	6.02	----	28.1	----	----
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	----	2.97	----	113	23.8
∅ Barium	7440-39-3	0.05	µg/m ² .month	204	57.8	78.9	100	55.7
∅ Manganese	7439-96-5	0.050	µg/m ² .month	144	46.9	64.5	61.1	48.1



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				KF4	KF5BG	WVDD01 - SOLUBLE METALS	WVDD02 - SOLUBLE METALS	WVDD03 - SOLUBLE METALS
				SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS
Sampling date / time				30-Nov-2023 13:40	30-Nov-2023 13:30	30-Nov-2023 10:20	30-Nov-2023 10:35	30-Nov-2023 10:45
Compound	CAS Number	LOR	Unit	EM2321591-011	EM2321591-012	EM2321591-029	EM2321591-030	EM2321591-031
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.1	0.2	----	----	----
Ash Content (mg)	----	2	mg	2	4	----	----	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	<0.1	<0.1	----	----	----
Combustible Matter (mg)	----	2	mg	<2	<2	----	----	----
EA139: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	1.1	0.7	----	----	----
Total Soluble Matter (mg)	----	2	mg	23	14	----	----	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.1	0.2	----	----	----
Total Insoluble Matter (mg)	----	2	mg	3	4	----	----	----
EA142: Total Solids								
Total Solids	----	0.1	g/m ² .month	1.2	0.9	----	----	----
Total Solids (mg)	----	2	mg	26	18	----	----	----
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.050	µg/m ² .month	15.0	7.21	64.2	1.44	9.01
ø Barium	7440-39-3	0.05	µg/m ² .month	92	59.4	----	----	----
ø Barium	7440-39-3	0.050	µg/m ² .month	----	----	175	107	112
ø Manganese	7439-96-5	0.050	µg/m ² .month	55.0	53.2	145	224	285



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				WVDD04 - SOLUBLE METALS	WVDD05 - SOLUBLE METALS	WVDD07BG - SOLUBLE METALS	WVDD08 - SOLUBLE METALS	KF1 - SOLUBLE METALS
				SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS
Sampling date / time				30-Nov-2023 11:10	30-Nov-2023 11:30	30-Nov-2023 10:00	30-Nov-2023 12:30	30-Nov-2023 14:30
Compound	CAS Number	LOR	Unit	EM2321591-032	EM2321591-033	EM2321591-034	EM2321591-035	EM2321591-036
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	37.5	19.1	5.40	10.7	12.1
∅ Barium	7440-39-3	0.050	µg/m ² .month	236	1240	92.7	123	85.5
∅ Manganese	7439-96-5	0.050	µg/m ² .month	1090	518	1030	412	260



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				KF2 - SOLUBLE METALS	KF3 - SOLUBLE METALS	KF4 - SOLUBLE METALS	KF5BG - SOLUBLE METALS	WVDD01 - INSOLUBLE METALS
				SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	INSOLUBLE METALS
Sampling date / time				30-Nov-2023 13:50	30-Nov-2023 14:00	30-Nov-2023 13:40	30-Nov-2023 13:30	30-Nov-2023 10:20
Compound	CAS Number	LOR	Unit	EM2321591-037	EM2321591-038	EM2321591-039	EM2321591-040	EM2321591-057
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	53.9	44.8	20.5	10.9	4.49
∅ Barium	7440-39-3	0.05	µg/m ² .month	----	----	----	----	<92.1
∅ Barium	7440-39-3	0.050	µg/m ² .month	93.0	72.3	223	152	----
∅ Manganese	7439-96-5	0.050	µg/m ² .month	232	269	227	255	75.1



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				WVDD02 - INSOLUBLE METALS	WVDD03 - INSOLUBLE METALS	WVDD04 - INSOLUBLE METALS	WVDD05 - INSOLUBLE METALS	WVDD07BG - INSOLUBLE METALS
				INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS
Sampling date / time				30-Nov-2023 10:35	30-Nov-2023 10:45	30-Nov-2023 11:10	30-Nov-2023 11:30	30-Nov-2023 10:00
Compound	CAS Number	LOR	Unit	EM2321591-058	EM2321591-059	EM2321591-060	EM2321591-061	EM2321591-062
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	---	---	---	4.93	<6.02
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	3.62	5.39	3.99	---	---
∅ Barium	7440-39-3	0.05	µg/m ² .month	35.1	<75.6	<57.5	<367	<204
∅ Manganese	7439-96-5	0.05	µg/m ² .month	---	---	---	142	---
∅ Manganese	7439-96-5	0.050	µg/m ² .month	70.0	70.1	71.3	---	162



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				WVDD08 - INSOLUBLE METALS	KF1 - INSOLUBLE METALS	KF2 - INSOLUBLE METALS	KF3 - INSOLUBLE METALS	KF4 - INSOLUBLE METALS
				INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS
Sampling date / time				30-Nov-2023 12:30	30-Nov-2023 14:30	30-Nov-2023 13:50	30-Nov-2023 14:00	30-Nov-2023 13:40
Compound	CAS Number	LOR	Unit	EM2321591-063	EM2321591-064	EM2321591-065	EM2321591-066	EM2321591-067
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	---	<28.1	---	---	---
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	3.52	---	116	47.4	18.2
∅ Barium	7440-39-3	0.05	µg/m ² .month	<57.8	<78.9	<100	<55.7	<92.0
∅ Manganese	7439-96-5	0.050	µg/m ² .month	66.7	76.2	84.4	75.3	68.7



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

KF5BG - INSOLUBLE METALS	----	----	----	----
INSOLUBLE METALS	----	----	----	----

Sampling date / time 30-Nov-2023 13:30

Compound	CAS Number	LOR	Unit	EM2321591-068	-----	-----	-----	-----
				Result	----	----	----	----

EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.050	µg/m ² .month	8.32	----	----	----	----
ø Barium	7440-39-3	0.05	µg/m ² .month	<59.4	----	----	----	----
ø Manganese	7439-96-5	0.050	µg/m ² .month	60.2	----	----	----	----



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDG03N	WVDG03E	WVDG03S	WVDG03W	WVDG04N
Sampling date / time			30-Nov-2023 10:45	30-Nov-2023 10:45	30-Nov-2023 10:45	30-Nov-2023 10:45	30-Nov-2023 11:10	
Compound	CAS Number	LOR	Unit	EM2321591-013	EM2321591-014	EM2321591-015	EM2321591-016	EM2321591-017
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.1	<0.1	<0.1	<0.1	0.1
Ash Content (mg)	----	2	mg	2	<2	<2	<2	2
EA125I: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.1	0.1	<0.1	<0.1	0.1
Combustible Matter (mg)	----	2	mg	2	<2	<2	<2	<2
EA139I: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	<0.1	<0.1	<0.1	<0.1	<0.1
Total Soluble Matter (mg)	----	2	mg	<2	<2	<2	<2	<2
EA141I: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.2	0.1	0.1	0.1	0.2
Total Insoluble Matter (mg)	----	2	mg	4	<2	<2	2	3
EA142I: Total Solids								
Total Solids	----	0.1	g/m ² .month	<0.1	<0.1	<0.1	<0.1	<0.1
Total Solids (mg)	----	2	mg	<2	<2	<2	<2	<2
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	5.02	----	----	----	2.39
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	----	1.88	1.90	2.07	----
∅ Barium	7440-39-3	0.05	µg/m ² .month	1140	----	32.9	56.2	28
∅ Barium	7440-39-3	0.050	µg/m ² .month	----	27.7	----	----	----
∅ Manganese	7439-96-5	0.05	µg/m ² .month	71.0	----	----	----	27.2
∅ Manganese	7439-96-5	0.050	µg/m ² .month	----	32.3	37.4	38.2	----



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDG04E	WVDG04S	WVDG04W	WVDG05N	WVDG05E
Sampling date / time			30-Nov-2023 11:10	30-Nov-2023 11:10	30-Nov-2023 11:10	30-Nov-2023 11:30	30-Nov-2023 11:30	
Compound	CAS Number	LOR	Unit	EM2321591-018	EM2321591-019	EM2321591-020	EM2321591-021	EM2321591-022
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content	----	0.1	g/m ² .month	<0.1	<0.1	<0.1	0.1	<0.1
Ash Content (mg)	----	2	mg	<2	<2	<2	2	<2
EA125I: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	<0.1	0.1	0.2	0.2	<0.1
Combustible Matter (mg)	----	2	mg	<2	<2	3	3	<2
EA139I: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	0.2	<0.1	0.2	<0.1	<0.1
Total Soluble Matter (mg)	----	2	mg	4	<2	3	<2	<2
EA141I: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	<0.1	0.1	0.2	0.3	<0.1
Total Insoluble Matter (mg)	----	2	mg	<2	<2	3	5	<2
EA142I: Total Solids								
Total Solids	----	0.1	g/m ² .month	0.2	<0.1	0.4	<0.1	<0.1
Total Solids (mg)	----	2	mg	4	<2	6	<2	<2
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	2.12	0.87	2.41	2.37	2.09
ø Barium	7440-39-3	0.05	µg/m ² .month	----	13.5	14.8	41.4	35.2
ø Barium	7440-39-3	0.050	µg/m ² .month	16.9	----	----	----	----
ø Manganese	7439-96-5	0.05	µg/m ² .month	----	22.9	37.8	41.7	32.4
ø Manganese	7439-96-5	0.050	µg/m ² .month	26.5	----	----	----	----



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDG05S	WVDG05W	WVDG08N	WVDG08E	WVDG08S
Sampling date / time			30-Nov-2023 11:30	30-Nov-2023 11:30	30-Nov-2023 12:30	30-Nov-2023 12:30	30-Nov-2023 12:30	
Compound	CAS Number	LOR	Unit	EM2321591-023	EM2321591-024	EM2321591-025	EM2321591-026	EM2321591-027
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.1	0.1	<0.1	<0.1	<0.1
Ash Content (mg)	----	2	mg	2	<2	<2	<2	<2
EA125I: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	<0.1	<0.1	0.1	<0.1	0.1
Combustible Matter (mg)	----	2	mg	<2	<2	<2	<2	<2
EA139I: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	0.1	<0.1	<0.1	<0.1	<0.1
Total Soluble Matter (mg)	----	2	mg	<2	<2	<2	<2	<2
EA141I: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	<0.1	<0.1	0.1	0.1	0.1
Total Insoluble Matter (mg)	----	2	mg	<2	<2	<2	<2	<2
EA142I: Total Solids								
Total Solids	----	0.1	g/m ² .month	0.1	<0.1	<0.1	0.1	<0.1
Total Solids (mg)	----	2	mg	<2	<2	<2	<2	<2
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	2.72	1.96	----	1.70	1.54
ø Arsenic	7440-38-2	0.050	µg/m ² .month	----	----	1.94	----	----
ø Barium	7440-39-3	0.05	µg/m ² .month	60.7	42.0	36.1	25.7	22.5
ø Manganese	7439-96-5	0.05	µg/m ² .month	47.2	40.5	----	----	43.2
ø Manganese	7439-96-5	0.050	µg/m ² .month	----	----	47.3	107	----



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG08W	WVDG03N - SOLUBLE METALS	WVDG03E - SOLUBLE METALS	WVDG03S - SOLUBLE METALS	WVDG03W - SOLUBLE METALS
					SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS
					SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS
Sampling date / time				30-Nov-2023 12:30	30-Nov-2023 10:45	30-Nov-2023 10:45	30-Nov-2023 10:45	30-Nov-2023 10:45
Compound	CAS Number	LOR	Unit	EM2321591-028	EM2321591-041	EM2321591-042	EM2321591-043	EM2321591-044
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content	----	0.1	g/m ² .month	<0.1	----	----	----	----
Ash Content (mg)	----	2	mg	<2	----	----	----	----
EA125I: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.1	----	----	----	----
Combustible Matter (mg)	----	2	mg	<2	----	----	----	----
EA139I: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	<0.1	----	----	----	----
Total Soluble Matter (mg)	----	2	mg	<2	----	----	----	----
EA141I: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.1	----	----	----	----
Total Insoluble Matter (mg)	----	2	mg	<2	----	----	----	----
EA142I: Total Solids								
Total Solids	----	0.1	g/m ² .month	<0.1	----	----	----	----
Total Solids (mg)	----	2	mg	<2	----	----	----	----
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	1.39	----	----	----	----
ø Arsenic	7440-38-2	0.050	µg/m ² .month	----	8.94	0.360	0.320	29.2
ø Barium	7440-39-3	0.05	µg/m ² .month	30.6	----	----	----	----
ø Barium	7440-39-3	0.050	µg/m ² .month	----	7.40	2.40	1.90	5.70
ø Manganese	7439-96-5	0.050	µg/m ² .month	24.6	2.30	1.50	1.70	22.9



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG04N - SOLUBLE METALS	WVDG04E - SOLUBLE METALS	WVDG04S - SOLUBLE METALS	WVDG04W - SOLUBLE METALS	WVDG05N - SOLUBLE METALS
				SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS
Sampling date / time				30-Nov-2023 11:10	30-Nov-2023 11:10	30-Nov-2023 11:10	30-Nov-2023 11:10	30-Nov-2023 11:30
Compound	CAS Number	LOR	Unit	EM2321591-045	EM2321591-046	EM2321591-047	EM2321591-048	EM2321591-049
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	5.58	3.44	3.53	6.93	0.220
∅ Barium	7440-39-3	0.050	µg/m ² .month	40.2	19.0	19.8	39.0	0.300
∅ Manganese	7439-96-5	0.050	µg/m ² .month	112	51.2	43.0	73.7	0.790



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG05E - SOLUBLE METALS	WVDG05S - SOLUBLE METALS	WVDG05W - SOLUBLE METALS	WVDG08N - SOLUBLE METALS	WVDG08E - SOLUBLE METALS
				SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS
Sampling date / time				30-Nov-2023 11:30	30-Nov-2023 11:30	30-Nov-2023 11:30	30-Nov-2023 12:30	30-Nov-2023 12:30
Compound	CAS Number	LOR	Unit	EM2321591-050	EM2321591-051	EM2321591-052	EM2321591-053	EM2321591-054
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	0.270	4.06	0.100	1.25	16.1
∅ Barium	7440-39-3	0.050	µg/m ² .month	0.200	4.20	2.40	9.20	46.1
∅ Manganese	7439-96-5	0.050	µg/m ² .month	0.890	15.5	8.55	73.7	172



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG08S - SOLUBLE METALS SOLUBLE METALS	WVDG08W - SOLUBLE METALS SOLUBLE METALS	WVDG03N - INSOLUBLE METALS INOLUBLE METALS	WVDG03E - INSOLUBLE METALS INSOLUBLE METALS	WVDG03S - INSOLUBLE METALS INSOLUBLE METALS
Sampling date / time				30-Nov-2023 12:30	30-Nov-2023 12:30	30-Nov-2023 10:45	30-Nov-2023 10:45	30-Nov-2023 10:45
Compound	CAS Number	LOR	Unit	EM2321591-055	EM2321591-056	EM2321591-069	EM2321591-070	EM2321591-071
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	---	---	4.82	---	---
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	4.02	0.480	---	2.52	2.17
∅ Barium	7440-39-3	0.05	µg/m ² .month	---	---	<1140	---	<32.9
∅ Barium	7440-39-3	0.050	µg/m ² .month	24.9	5.20	---	38.7	---
∅ Manganese	7439-96-5	0.05	µg/m ² .month	---	---	<71.0	---	---
∅ Manganese	7439-96-5	0.050	µg/m ² .month	135	11.8	---	61.7	55.4



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG03W - INSOLUBLE METALS INSOLUBLE METALS	WVDG04N - INSOLUBLE METALS INSOLUBLE METALS	WVDG04E - INSOLUBLE METALS INSOLUBLE METALS	WVDG04S - INSOLUBLE METALS INSOLUBLE METALS	WVDG04W - INSOLUBLE METALS INSOLUBLE METALS
Sampling date / time				30-Nov-2023 10:45	30-Nov-2023 11:10	30-Nov-2023 11:10	30-Nov-2023 11:10	30-Nov-2023 11:10
Compound	CAS Number	LOR	Unit	EM2321591-072	EM2321591-073	EM2321591-074	EM2321591-075	EM2321591-076
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	---	<2.39	<2.12	<0.87	<2.41
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	4.07	---	---	---	---
∅ Barium	7440-39-3	0.05	µg/m ² .month	<56.2	<28.0	---	<13.5	<14.8
∅ Barium	7440-39-3	0.050	µg/m ² .month	---	---	17.5	---	---
∅ Manganese	7439-96-5	0.05	µg/m ² .month	---	<27.2	---	21.4	<37.8
∅ Manganese	7439-96-5	0.050	µg/m ² .month	55.0	---	30.0	---	---



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG05N - INSOLUBLE METALS INSOLUBLE METALS	WVDG05E - INSOLUBLE METALS INSOLUBLE METALS	WVDG05S - INSOLUBLE METALS INSOLUBLE METALS	WVDG05W - INSOLUBLE METALS INSOLUBLE METALS	WVDG08N - INSOLUBLE METALS INSOLUBLE METALS
Sampling date / time				30-Nov-2023 11:30	30-Nov-2023 11:30	30-Nov-2023 11:30	30-Nov-2023 11:30	30-Nov-2023 12:30
Compound	CAS Number	LOR	Unit	EM2321591-077	EM2321591-078	EM2321591-079	EM2321591-080	EM2321591-081
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	2.36	<2.09	<2.72	<1.96	----
∅ Arsenic	7440-38-2	0.050	µg/m ² .month	----	----	----	----	2.07
∅ Barium	7440-39-3	0.05	µg/m ² .month	<41.4	<35.2	<60.7	<42.0	<36.1
∅ Manganese	7439-96-5	0.05	µg/m ² .month	38.1	<32.4	<47.2	<40.5	----
∅ Manganese	7439-96-5	0.050	µg/m ² .month	----	----	----	----	56.0



Analytical Results EM2321591 Amendment 3

Order : ALS WATER AND HYDROGRAPHICS PTY LTD

Substrate: DUST

Sample ID

(Matrix: AIR)

				WVDG08E -	WVDG08S -	WVDG08W -		
				INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS		
				INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS		
<i>Sampling date / time</i>				30-Nov-2023 12:30	30-Nov-2023 12:30	30-Nov-2023 12:30	----	----
<i>Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	EM2321591-082	EM2321591-083	EM2321591-084	-----	-----
				Result	Result	Result	----	----
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	1.56	<1.54	1.23	----	----
∅ Barium	7440-39-3	0.05	µg/m ² .month	<25.7	<22.5	<30.6	----	----
∅ Manganese	7439-96-5	0.05	µg/m ² .month	----	<43.2	----	----	----
∅ Manganese	7439-96-5	0.050	µg/m ² .month	114	----	78.5	----	----



CERTIFICATE OF ANALYSIS

Work Order
EM2400076

Page : 1 of 20

Amendment : **1**
: ALS WATER AND HYDROGRAPHICS PTY LTD

Client :
Contact Address : 94 KERANG-KOONDROOK ROAD KERANG
3579
: ----

Telephone

Laboratory : Environmental Division Melbourne
: Customer Services EM
: 4 Westall Rd Springvale VIC Australia 3171
Contact Address : +61 3 8549 9600
s

Telephone

Project : MV214940
Order : ----
number : ----
C-O-C
number

Date Samples Received : 03-Jan-2024 10:10
Date Analysis Commenced : 11-Jan-2024
Issue Date : 31-Jan-2024 18:19

Sampler : R. Oliver
Site : Woodvale & Kangaroo Flat
Quote number : ME/968/20_V2
No. of samples : samples analysed
received No. of



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories

Position

Accreditation Category

Dilani Fernando

Laboratory Coordinator

Melbourne Inorganics, Springvale, VIC





General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed

procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society. LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
∅ = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- ALS is not NATA accredited for the analysis of metals in dust deposition gauge.
- Dust analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in deposition units e.g., g/m².mth where the sampling procedure is not NATA accredited. ALS Mudgee laboratory is NATA accredited for dust sampling, therefore ALS Mudgee reported deposition units are accredited.
- Amendment (31/01/2024): This report has been amended to allow the distribution of an Electronic Data Deliverable (EDD) not previously provided. All analysis results are as per the previous report.
- Sampling period 30/11/2023 to 29/12/2023.
- Sample exposure period is within the typical exposure period of 30+/-2 days as per AS3580.10.1
- EA1201 - 1421: EM2400076 #17 & #21 - container was received with no liquid. 100ml of DI water was used to dissolve contents, perform analysis and for calculation of results.
- Sample exposure period is within the typical exposure period of 30+/-2 days as per AS3580.10.2
- Dust samples have been dosed with Benzalkonium chloride prior to sample collection
- Directional dust analysis as per AS3580.10.2-2013. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.
- For dust analysis, the Limit of Reporting (LOR) referenced in the reports for deposited matter parameters represents the reporting increment rather than reporting limit.



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
Sampling date / time				29-Dec-2023 09:35	29-Dec-2023 09:50	29-Dec-2023 10:30	29-Dec-2023 10:55	29-Dec-2023 01:20
Compound	CAS Number	LOR	Unit	EM2400076-001	EM2400076-002	EM2400076-003	EM2400076-004	EM2400076-005
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.5	0.3	0.3	0.2	0.3
Ash Content (mg)	----	2	mg	9	5	5	4	4
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	4.8	1.0	1.1	1.1	1.2
Combustible Matter (mg)	----	2	mg	81	17	19	19	20
EA139: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	6.2	2.4	2.6	4.1	2.2
Total Soluble Matter (mg)	----	2	mg	106	41	45	69	37
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	5.3	1.3	1.4	1.3	1.5
Total Insoluble Matter (mg)	----	2	mg	90	22	24	23	25
EA142: Total Solids								
Total Solids	----	0.1	g/m ² .month	11.5	3.7	4.0	5.4	3.7
Total Solids (mg)	----	2	mg	196	63	69	92	62
EG020T: Total Metals by ICP-MS								
⌀ Arsenic	7440-38-2	0.05	µg/m ² .month	<7.77	6.71	5.22	6.42	<5.60
⌀ Barium	7440-39-3	0.05	µg/m ² .month	<265	<121	<420	<125	<120
⌀ Manganese	7439-96-5	0.05	µg/m ² .month	293	97.4	92.8	118	90.5



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

			WVDD07BG	WVDD08	KF1	KF2	KF3	
Sampling date / time			29-Dec-2023 12:20	29-Dec-2023 10:05	29-Dec-2023 13:40	29-Dec-2023 14:25	29-Dec-2023 13:50	
Compound	CAS Number	LOR	Unit	EM2400076-006	EM2400076-007	EM2400076-008	EM2400076-009	EM2400076-010
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.9	0.3	0.2	0.3	0.3
Ash Content (mg)	----	2	mg	15	5	3	5	6
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	6.2	1.3	1.4	1.0	1.1
Combustible Matter (mg)	----	2	mg	107	23	24	18	18
EA139: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	13.1	2.0	2.1	1.7	1.6
Total Soluble Matter (mg)	----	2	mg	224	34	37	28	27
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	7.1	1.6	1.6	1.3	1.4
Total Insoluble Matter (mg)	----	2	mg	122	28	27	23	24
EA142: Total Solids								
Total Solids	----	0.1	g/m ² .month	20.2	3.6	3.7	3.0	3.0
Total Solids (mg)	----	2	mg	346	62	64	51	51
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	<13.5	5.30	9.88	<27.5	<23.6
∅ Barium	7440-39-3	0.05	µg/m ² .month	<610	<129	<104	<134	<142
∅ Manganese	7439-96-5	0.05	µg/m ² .month	<900	90.0	84.0	100	108



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				KF4	KF5BG	WVDD01 - INSOLUBLE METALS	WVDD02 - INSOLUBLE METALS	WVDD03 - INSOLUBLE METALS
				INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS
Sampling date / time				29-Dec-2023 14:10	29-Dec-2023 13:25	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]
Compound	CAS Number	LOR	Unit	EM2400076-011	EM2400076-012	EM2400076-029	EM2400076-030	EM2400076-031
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.3	0.2	----	----	----
Ash Content (mg)	----	2	mg	5	4	----	----	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	1.1	1.2	----	----	----
Combustible Matter (mg)	----	2	mg	19	22	----	----	----
EA139: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	1.9	1.8	----	----	----
Total Soluble Matter (mg)	----	2	mg	33	31	----	----	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	1.4	1.5	----	----	----
Total Insoluble Matter (mg)	----	2	mg	24	26	----	----	----
EA142: Total Solids								
Total Solids	----	0.1	g/m ² .month	3.3	3.3	----	----	----
Total Solids (mg)	----	2	mg	57	57	----	----	----
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	13.2	6.73	<7.77	7.14	5.51
ø Barium	7440-39-3	0.05	µg/m ² .month	<131	<109	<265	<121	<420
ø Manganese	7439-96-5	0.05	µg/m ² .month	87.9	78.4	376	145	149



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				WVDD04 - INSOLUBLE METALS	WVDD05 - INSOLUBLE METALS	WVDD07BG - INSOLUBLE METALS	WVDD08 - INSOLUBLE METALS	KF1 - INSOLUBLE METALS
				INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS
Sampling date / time				[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]
Compound	CAS Number	LOR	Unit	EM2400076-032	EM2400076-033	EM2400076-034	EM2400076-035	EM2400076-036
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
Ø Arsenic	7440-38-2	0.05	µg/m ² .month	8.75	<5.60	<13.5	5.81	14.6
Ø Barium	7440-39-3	0.05	µg/m ² .month	<125	<120	<610	<129	<104
Ø Manganese	7439-96-5	0.05	µg/m ² .month	190	138	<900	149	186



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				KF2 - INSOLUBLE METALS	KF3 - INSOLUBLE METALS	KF4 - INSOLUBLE METALS	KF5BG - INSOLUBLE METALS	WVDD01 - SOLUBLE METALS
				INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS	INSOLUBLE METALS	SOLUBLE METALS
Sampling date / time				[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]
Compound	CAS Number	LOR	Unit	EM2400076-037	EM2400076-038	EM2400076-039	EM2400076-040	EM2400076-057
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
Ø Arsenic	7440-38-2	0.05	µg/m ² .month	<27.5	<23.6	19.3	7.77	6.09
Ø Barium	7440-39-3	0.05	µg/m ² .month	<134	<142	<131	<109	623
Ø Manganese	7439-96-5	0.05	µg/m ² .month	158	156	160	139	1840



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				WVDD02 - SOLUBLE METALS	WVDD03 - SOLUBLE METALS	WVDD04 - SOLUBLE METALS	WVDD05 - SOLUBLE METALS	WVDD07BG - SOLUBLE METALS
				SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS
Sampling date / time				[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]
Compound	CAS Number	LOR	Unit	EM2400076-058	EM2400076-059	EM2400076-060	EM2400076-061	EM2400076-062
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	10.9	5.66	78.0	0.77	10.8
ø Barium	7440-39-3	0.05	µg/m ² .month	581	838	416	211	633
ø Manganese	7439-96-5	0.05	µg/m ² .month	635	762	1522	636	3038



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				WVDD08 - SOLUBLE METALS	KF1 - SOLUBLE METALS	KF2 - SOLUBLE METALS	KF3 - SOLUBLE METALS	KF4 - SOLUBLE METALS
				SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS
Sampling date / time				[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]
Compound	CAS Number	LOR	Unit	EM2400076-063	EM2400076-064	EM2400076-065	EM2400076-066	EM2400076-067
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	14.1	8.16	16.5	6.75	3.87
ø Barium	7440-39-3	0.05	µg/m ² .month	276	172	198	193	474
ø Manganese	7439-96-5	0.05	µg/m ² .month	802	589	848	555	572



Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Sample ID

				KF5BG - SOLUBLE METALS	---	---	---	---
				SOLUBLE METALS	---	---	---	---
				[29-Dec-2023]	---	---	---	---
Compound	CAS Number	LOR	Unit	EM2400076-068	-----	-----	-----	-----
				Result	---	---	---	---
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	102	---	---	---	---
ø Barium	7440-39-3	0.05	µg/m ² .month	230	---	---	---	---
ø Manganese	7439-96-5	0.05	µg/m ² .month	619	---	---	---	---



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDG05N	WVDG05E	WVDG05S	WVDG05W	WVDG08N
Sampling date / time			29-Dec-2023 11:25	29-Dec-2023 11:30	29-Dec-2023 11:35	29-Dec-2023 11:40	29-Dec-2023 10:10	
Compound	CAS Number	LOR	Unit	EM2400076-013	EM2400076-014	EM2400076-015	EM2400076-016	EM2400076-017
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.4	<0.1	1.4	<0.1	<0.1
Ash Content (mg)	----	2	mg	6	<2	20	<2	<2
EA125I: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	1.9	0.8	2.5	0.6	0.4
Combustible Matter (mg)	----	2	mg	28	12	38	10	7
EA139I: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	0.4	0.4	0.6	0.8	0.3
Total Soluble Matter (mg)	----	2	mg	5	6	9	11	4
EA141I: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	2.3	0.8	3.9	0.7	0.5
Total Insoluble Matter (mg)	----	2	mg	34	12	58	11	8
EA142I: Total Solids								
Total Solids	----	0.1	g/m ² .month	2.7	1.2	4.5	1.5	0.8
Total Solids (mg)	----	2	mg	39	18	67	22	12
EG020T: Total Metals by ICP-MS								
⌀ Arsenic	7440-38-2	0.05	µg/m ² .month	3.82	<0.88	<9.57	1.00	0.27
⌀ Barium	7440-39-3	0.05	µg/m ² .month	<277	<40.3	<970	<29.5	8.90
⌀ Manganese	7439-96-5	0.05	µg/m ² .month	56.8	51.3	<141	32.0	12.9



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDG08E	WVDG08S	WVDG08W	WVDG03N	WVDG03E
Sampling date / time			29-Dec-2023 10:15	29-Dec-2023 10:20	29-Dec-2023 10:25	29-Dec-2023 10:35	29-Dec-2023 10:40	
Compound	CAS Number	LOR	Unit	EM2400076-018	EM2400076-019	EM2400076-020	EM2400076-021	EM2400076-022
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content	----	0.1	g/m ² .month	<0.1	0.2	0.2	<0.1	<0.1
Ash Content (mg)	----	2	mg	<2	2	2	<2	<2
EA125I: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	1.0	1.5	1.0	0.7	0.8
Combustible Matter (mg)	----	2	mg	14	23	15	10	12
EA139I: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	0.7	7.3	0.9	0.5	0.9
Total Soluble Matter (mg)	----	2	mg	11	109	13	7	13
EA141I: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	1.0	1.7	1.2	0.7	0.9
Total Insoluble Matter (mg)	----	2	mg	15	25	18	11	13
EA142I: Total Solids								
Total Solids	----	0.1	g/m ² .month	1.7	9.0	2.1	1.2	1.8
Total Solids (mg)	----	2	mg	26	134	31	18	26
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	1.21	3.02	<3.31	0.55	2.33
∅ Barium	7440-39-3	0.05	µg/m ² .month	<21.9	<68.7	<56.7	<10.7	<48.3
∅ Manganese	7439-96-5	0.05	µg/m ² .month	21.0	81.6	<193	13.0	41.2



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	WVDG03S	WVDG03W	WVDG04N	WVDG04E	WVDG04S
Sampling date / time				29-Dec-2023 10:45	29-Dec-2023 10:50	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	
Compound	CAS Number	LOR	Unit	EM2400076-023	EM2400076-024	EM2400076-025	EM2400076-026	EM2400076-027	
				Result	Result	Result	Result	Result	
EA120I: Ash Content									
Ash Content	----	0.1	g/m ² .month	<0.1	0.3	1.2	0.8	0.8	
Ash Content (mg)	----	2	mg	<2	4	17	11	11	
EA125I: Combustible Matter									
Combustible Matter	----	0.1	g/m ² .month	1.0	1.6	2.7	3.5	2.0	
Combustible Matter (mg)	----	2	mg	16	24	41	52	30	
EA139I: Total Soluble Matter									
Total Soluble Matter	----	0.1	g/m ² .month	1.5	2.8	1.4	0.9	1.4	
Total Soluble Matter (mg)	----	2	mg	22	41	21	14	21	
EA141I: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m ² .month	1.1	1.9	3.9	4.3	2.8	
Total Insoluble Matter (mg)	----	2	mg	17	28	58	63	41	
EA142I: Total Solids									
Total Solids	----	0.1	g/m ² .month	2.6	4.7	5.3	5.2	4.2	
Total Solids (mg)	----	2	mg	39	69	79	77	62	
EG020T: Total Metals by ICP-MS									
⌀ Arsenic	7440-38-2	0.05	µg/m ² .month	1.80	4.18	<8.31	4.98	4.17	
⌀ Barium	7440-39-3	0.05	µg/m ² .month	<46.3	<80.9	<982	<732	<1046	
⌀ Manganese	7439-96-5	0.05	µg/m ² .month	32.8	<70.5	<98.5	65.9	<65.5	



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG04W	WVDG05N - INSOLUBLE METALS	WVDG05E - INSOLUBLE METALS	WVDG05S - INSOLUBLE METALS	WVDG05W - INSOLUBLE METALS
Sampling date / time				[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]
Compound	CAS Number	LOR	Unit	EM2400076-028	EM2400076-041	EM2400076-042	EM2400076-043	EM2400076-044
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.2	----	----	----	----
Ash Content (mg)	----	2	mg	3	----	----	----	----
EA125I: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	1.2	----	----	----	----
Combustible Matter (mg)	----	2	mg	18	----	----	----	----
EA139I: Total Soluble Matter								
Total Soluble Matter	----	0.1	g/m ² .month	0.4	----	----	----	----
Total Soluble Matter (mg)	----	2	mg	5	----	----	----	----
EA141I: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	1.4	----	----	----	----
Total Insoluble Matter (mg)	----	2	mg	21	----	----	----	----
EA142I: Total Solids								
Total Solids	----	0.1	g/m ² .month	1.8	----	----	----	----
Total Solids (mg)	----	2	mg	26	----	----	----	----
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	7.10	5.38	<0.88	<9.57	1.52
ø Barium	7440-39-3	0.05	µg/m ² .month	<79.0	<277	<40.3	<970	<29.5
ø Manganese	7439-96-5	0.05	µg/m ² .month	53.7	72.4	55.4	<141	46.2



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG08N - INSOLUBLE METALS	WVDG08E - INSOLUBLE METALS	WVDG08S - INSOLUBLE METALS	WVDG08W - INSOLUBLE METALS	WVDG03N - INSOLUBLE METALS
Sampling date / time				[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]
Compound	CAS Number	LOR	Unit	EM2400076-045	EM2400076-046	EM2400076-047	EM2400076-048	EM2400076-049
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ² .month	0.32	1.72	3.43	<3.31	0.87
∅ Barium	7440-39-3	0.05	µg/m ² .month	12.8	<21.9	<68.7	<56.7	<10.7
∅ Manganese	7439-96-5	0.05	µg/m ² .month	13.1	31.3	85.3	<193	13.2



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG03E - INSOLUBLE METALS INSOLUBLE METALS	WVDG03S - INSOLUBLE METALS INSOLUBLE METALS	WVDG03W - INSOLUBLE METALS INSOLUBLE METALS	WVDG04N - INSOLUBLE METALS INSOLUBLE METALS	WVDG04E - INSOLUBLE METALS INSOLUBLE METALS
Sampling date / time				[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]
Compound	CAS Number	LOR	Unit	EM2400076-050	EM2400076-051	EM2400076-052	EM2400076-053	EM2400076-054
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	3.27	3.17	5.23	<8.31	10.4
ø Barium	7440-39-3	0.05	µg/m ² .month	<48.3	<46.3	<80.9	<982	<732
ø Manganese	7439-96-5	0.05	µg/m ² .month	46.0	43.0	<70.5	<98.5	103



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG04S - INSOLUBLE METALS INSOLUBLE METALS	WVDG04W - INSOLUBLE METALS INSOLUBLE METALS	WVDG05N - SOLUBLE METALS SOLUBLE METALS	WVDG05E - SOLUBLE METALS SOLUBLE METALS	WVDG05S - SOLUBLE METALS SOLUBLE METALS
Sampling date / time				[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]
Compound	CAS Number	LOR	Unit	EM2400076-055	EM2400076-056	EM2400076-069	EM2400076-070	EM2400076-071
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	4.27	11.6	<0.05	<0.05	<0.05
ø Barium	7440-39-3	0.05	µg/m ² .month	<1046	<79.0	7.30	2.30	15.8
ø Manganese	7439-96-5	0.05	µg/m ² .month	<65.5	69.2	3.90	5.00	4.50



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG05W - SOLUBLE METALS	WVDG08N - SOLUBLE METALS	WVDG08E - SOLUBLE METALS	WVDG08S - SOLUBLE METALS	WVDG08W - SOLUBLE METALS
				SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS
Sampling date / time				[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]
Compound	CAS Number	LOR	Unit	EM2400076-072	EM2400076-073	EM2400076-074	EM2400076-075	EM2400076-076
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	<0.05	<0.05	<0.05	16.0	<0.05
ø Barium	7440-39-3	0.05	µg/m ² .month	2.70	0.20	2.70	83.3	1.30
ø Manganese	7439-96-5	0.05	µg/m ² .month	15.8	1.20	3.70	509	34.0



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG03N - SOLUBLE METALS	WVDG03E - SOLUBLE METALS	WVDG03S - SOLUBLE METALS	WVDG03W - SOLUBLE METALS	WVDG04N - SOLUBLE METALS
				SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS	SOLUBLE METALS
Sampling date / time				[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]
Compound	CAS Number	LOR	Unit	EM2400076-077	EM2400076-078	EM2400076-079	EM2400076-080	EM2400076-081
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	0.88	1.95	0.68	9.27	<0.05
ø Barium	7440-39-3	0.05	µg/m ² .month	0.10	3.40	3.30	4.20	10.8
ø Manganese	7439-96-5	0.05	µg/m ² .month	2.50	9.16	12.5	15.0	15.0

Analytical Results

Sub-Matrix: DUST
(Matrix: AIR)

Sample ID

				WVDG04E- SOULUBLE METAL SOULUBLE METALS	WVDG04S - SOLUBLE METALS SOLUBLE METALS	WVDG04W - SOLUBLE METALS SOLUBLE METALS	----	----
Sampling date / time				[29-Dec-2023]	[29-Dec-2023]	[29-Dec-2023]	----	----
Compound	CAS Number	LOR	Unit	EM2400076-082	EM2400076-083	EM2400076-084	-----	-----
				Result	Result	Result	----	----
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m ² .month	<0.05	<0.05	<0.05	----	----
ø Barium	7440-39-3	0.05	µg/m ² .month	29.2	19.7	0.70	----	----
ø Manganese	7439-96-5	0.05	µg/m ² .month	5.48	14.8	3.56	----	----