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Tarago Air Quality Monitoring Report

September 2023

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Description **Data collected from 18 October 2022 to 10 August 2023 for the air quality monitoring program at Tarago, NSW**

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1. Overview

Ramboll Australia Pty Ltd (Ramboll) has been commissioned by Transport for New South Wales (TfNSW) to recommence an air quality monitoring (AQM) program to inform air quality impacts resulting from retained lead-containing ore within the Goulburn - Bombala rail corridor in the Tarago Area.

Ramboll has provided assessment and management advice for contamination at and originating from the Tarago Rail Siding which was historically used to load-out ore concentrates. The Tarago Lead Management Action Plan (Ramboll, 2022) was developed to address risks related to exposure to lead from the site.

The Action Plan prescribed:

- Controls including application of a polymer sealant over exposed contaminated soils and application of stabilised sand over a stockpile of spoil generated during rail works; and
- Routine monitoring of contaminant concentrations in surface water and air surrounding the site as lines of evidence for assessing the effectiveness of controls described in the Action Plan.

Ramboll implemented and maintained an AQM program from April 2020 to August 2021 for a previous client and has now been commissioned to recommence the program. The focus of this monitoring program is lead in particulate form, both for ambient airborne fractions and deposited dust. This program was commissioned during late October 2022, and this report presents results from the data collected since monitoring commenced (18 October 2022).

Previous reports delivered by Ramboll during this program are listed below:

- 318001376-004 Tarago Air Quality Monitoring Report 2022-11 dated 7 December 2022, summarising data collect to 17 November 2022.
- 318001376-004 Tarago Air Quality Monitoring Report 2022-12 dated 13 February 2023, summarising data collect to 15 December 2022.
- 318001376-004 Tarago Air Quality Monitoring Report 2023-01 dated 17 February 2023, summarising data collect to 12 January 2022.

A map of the monitoring locations is shown in Figure 1-1.

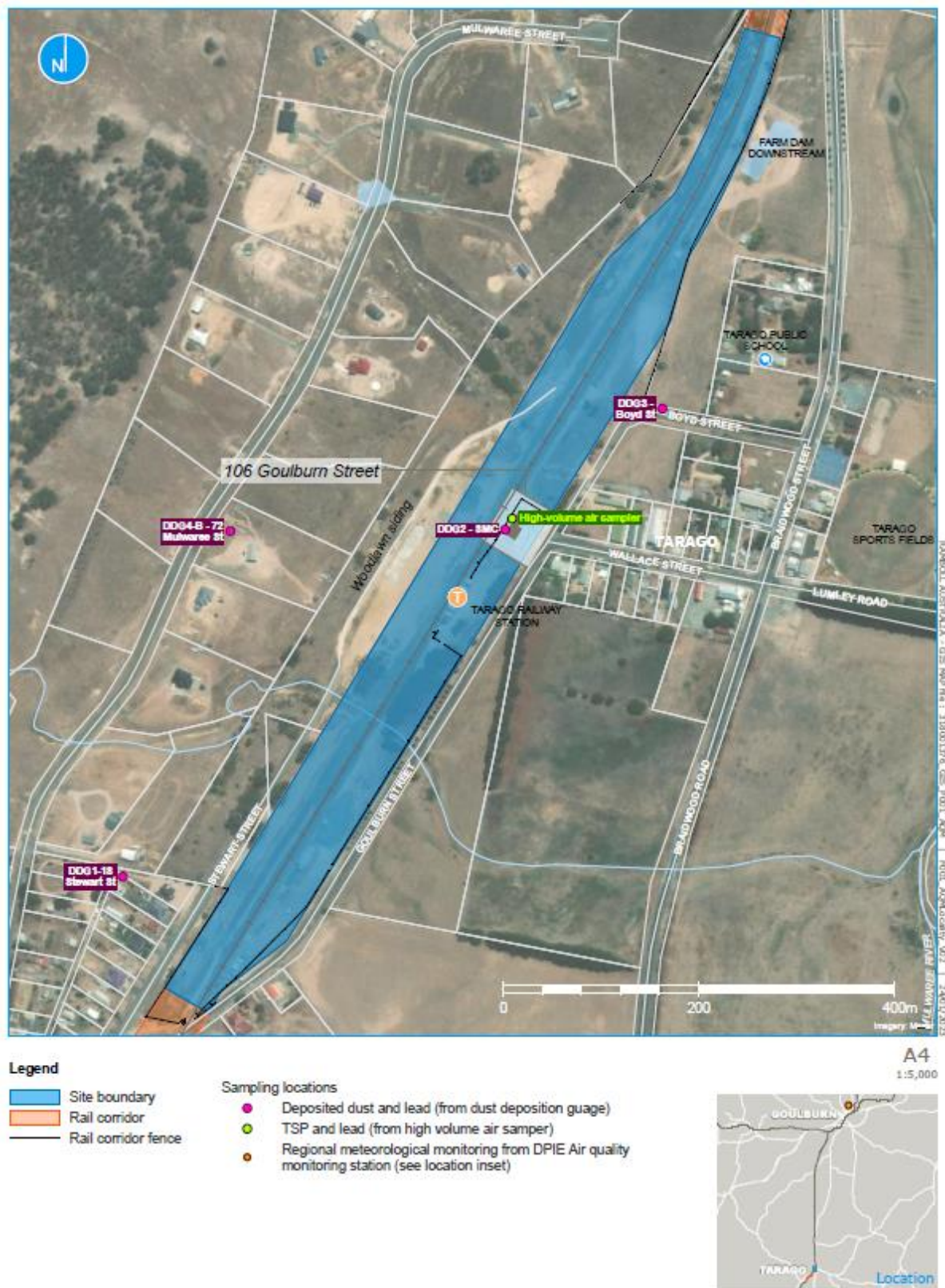


Figure 1-1: Map of air quality monitoring locations within Tarago

2. Methodology

2.1 Approach

The AQM program consists of two dust monitoring techniques interpreted in conjunction with meteorological data collected by the Department of Planning, Industry and Environment (DPIE) in Goulburn, approximately 38 km to the north-north-east. These techniques are:

- Deposited dust and lead measured continuously throughout each month (**Section 2.1.1**); and
- Total suspended particulates (TSP) including lead contained within the TSP measured for a 24-hour period completed every one day in six days (**Section 2.1.2**).

Siting of all equipment was completed, as far as practicable, in accordance with the recommendations of *AS/NZS 3580.1.1:2016 Methods for sampling and analysis of ambient air Guide to siting air monitoring equipment* (Standards Australia and Standards New Zealand, 2016a). Locations of all equipment are shown in **Figure 1-1** and images of the monitoring equipment in-situ are shown in **Appendix 1**. Siting was weighed against technical and practical considerations and the fence is considered a minor obstruction to the contaminated site, where one of the instrument sampling inlets is below the fence-line.

Sampling location DDG4 during the 2020 to 2021 monitoring campaign was located at 96 Mulwaree St, Tarago. The resident declined to have the equipment reinstated, so access was sought and granted for monitoring at 72 Mulwaree St, Tarago. The new monitoring locations, now referred to as DDG4-B, is approximately 200m to the south-south-west of the DDG4. Both monitoring locations are considered to be representative of potential impacts to the west of the rail siding.

2.1.1 Deposited dust and lead

Deposited dust is particulate matter that settles out of the air onto the ground or surfaces. It generally consists of larger, heavier particles from a local source and is considered a nuisance impact rather than a health concern. These particles contain a variety of components such as nitrates, sulphates, organic chemicals, metals, soil or dust particles and allergens.

For this study, sampling and analysis was conducted in accordance with the recommendations of *AS/NZS 3580.10.1:2016 Methods for sampling and analysis of ambient air Determination of particulate matter - Deposited matter - Gravimetric method* (Standards Australia and Standards New Zealand, 2016b). Each gauge is installed to collect deposited matter in a glass bottle together with rainwater through a funnel over a period of 30 days +/- 2 days at a mounted height of approximately 2 m above ground surface. The samples are analysed for insoluble solids (including ash and combustible matter) and lead by inductively coupled plasma mass spectrometry (ICP-MS).

Four dust deposition gauges were placed to assess deposited dust and lead in residential areas east, west, and south-east of the source area and at 106 Goulburn Street (the nearest sensitive receptor).

2.1.2 TSP and lead

TSP are solid particles and water droplets less than approximately 50 to 100 µm in aerodynamic diameter. This parameter is dominated by larger entrained particles which are generally considered a nuisance dust compared to finer particles such as PM₁₀ and PM_{2.5} which are known to be hazardous to human health. The Australian Standard to measure lead in particulates—*AS/NZS 3580.9.15:2014 Methods for sampling and analysis of ambient air Method 9.15: Determination of suspended particulate matter — Particulate metals high or low volume sampler gravimetric collection — Inductively coupled plasma (ICP) spectrometric method* (Standards Australia and Standards New Zealand, 2014)—requires measurement of the TSP fraction to analyse for lead content.

Sampling and analysis for this program has been conducted in accordance with the Australian Standard. Calibration has been completed by Ramboll, consistent with the Australian Standard and manufacturers recommendations. The program utilises a high-volume air sampler (Hi-Vol 3000) with a TSP head, that has a reported cut-point for particles of 50 µm diameter or less. The sampler draws a known volume of air across a pre-weighed filter for 24-hours. The filters are weighed following sampling to determine the weight of the particulate matter captured and further analysed for lead concentration using ICP-MS. To compare particulate lead to the air quality annual standard, lead sampling must be carried out for a period of 24 hours at least every sixth day, the approach applied for this program.

TSP including lead contained within the TSP were measured at 106 Goulburn Street identified as the nearest sensitive receptor to the source area.

2.1.3 PM₁₀ and PM_{2.5}

The previous monitoring program during 2020 to 2021 included collection of continuous particulate matter at less than 10 microns in aerodynamic diameter (i.e. PM₁₀) and less than 2.5 microns (i.e. PM_{2.5}). This measurement was also included in the Tarago Lead Management Action Plan (Ramboll, 2022), but not included in the scope of works to reinstate the monitoring program on the basis of low correlation with lead values measured previously.

Continuous particle monitoring may be reinstated at a later date to inform proactive response to potential emissions during remediation.

2.2 Regional meteorological monitoring

The Department of Planning, Industry and Environment (DPIE) maintains a state-wide network of air quality monitoring stations, including one commissioned in late 2019 in Goulburn, NSW. The station measures meteorological parameters, of which wind speed, wind direction, temperature, humidity, and rainfall are of interest to this program. One-hourly averaged data have been analysed to determine prevailing conditions. DPIE do not monitor lead routinely as part of their state-wide air quality monitoring program.

A limitation of using meteorological data from the Goulburn station is its different location, terrain, and consequent micro-conditions to the studied site. Comparison with CSIRO's The Air Pollution Model (TAPM) predicted meteorological data centred on Tarago was done in the previous AQM program (Ramboll, 2021). Both datasets showed prevailing westerly winds, with a secondary

easterly component, while the TAPM data predicted higher wind speeds in Tarago than measured in Goulburn. It is noted there are limitations to both datasets, where the Goulburn data is collected at distance and influenced by different terrain influences, whereas the modelled data has inherent uncertainty and assumptions, and the technique is limited in its prediction of calm conditions. Therefore, for this assessment the DPIE Goulburn station data was used and is deemed appropriate for a macro understanding of the weather of the region in the absence of local monitored meteorological data.

2.3 Relevant air quality criteria

Air quality criteria relevant to the program are presented in **Figure 2-1**.

Figure 2-1: Air quality criteria relevant to Tarago air quality monitoring program

Pollutant	Averaging period	Criteria	Source
Lead	Annual	0.5 µg/m ³	NEPC (2021)
TSP	Annual	90 µg/m ³	NHMRC (1996)
Deposited dust (as insoluble solids)	Annual	4 g/m ² /month	NERDDC (1988), NSW EPA (2022)

3. Results

3.1 Deposited dust and lead

Deposited dust (insoluble solids) were below the annual average criterion of 4 g/m²/month at all locations except at DDG4-B sampled in Dec/Jan 2023; however, the rolling annual average remains below the criterion at all locations. No lead was measured above the detection limit (1 µg) in any monitoring location. On commissioning the program, the DDG4 sample (Mulwaree Street) was relocated to a different location (i.e. DDG4-B), so was only exposed for one week during the initial monitoring month. These data are captured in the averaging in the subsequent month. Results are presented in **Table 3-1**.

Table 3-1: Measured lead content in deposited dust and deposited dust at four properties around Tarago, NSW

Month	DDG1, Stewart St		DDG2, Station Masters Cottage		DDG3, Boyd St		DDG4-B, Mulwaree St	
	Lead (µg)	Insoluble solids (g/m ² /month)	Lead (µg)	Insoluble solids (g/m ² /month)	Lead (µg)	Insoluble solids (g/m ² /month)	Lead (µg)	Insoluble solids (g/m ² /month)
Oct/Nov 2022	<1	0.3	<1	0.5	<1	1.2	^a N/A	
Nov/Dec 2022	<1	0.9	<1	1.3	<1	2.2	<1	2.2
Dec/Jan 2023	<1	<0.1	<1	0.3	<1	1.2	<1	4.7
Jan/Feb 2023	<1	0.4	<1	0.5	<1	0.7	<1	0.7
Feb/Mar 2023	<1	0.9	<1	1.5	<1	1.1	<1	0.7
Jun/Jul 2023	<1	0.1	<1	0.3	<1	0.1	<1	0.4
Jul/Aug 2023	<1	0.3	<1	0.9	<1	0.6	<1	0.9
Rolling annual average	<1	0.4	<1	0.8	<1	1.0	<1	1.6

Limit of reporting = 1 µg for lead and 0.1 g/m²/month for insoluble solids

^a Averaged in next report (short exposure period during November)

3.2 TSP and lead

Lead was detected in all TSP samples collected since program commissioning in October 2022. In all cases, the concentrations were below the annual average criterion for lead (**Figure 3-2**); similarly, TSP measured during the period was below the annual average criterion (**Figure 3-1**). Correlation between TSP and lead in the same sample is weak, as shown in **Figure 3-3**.

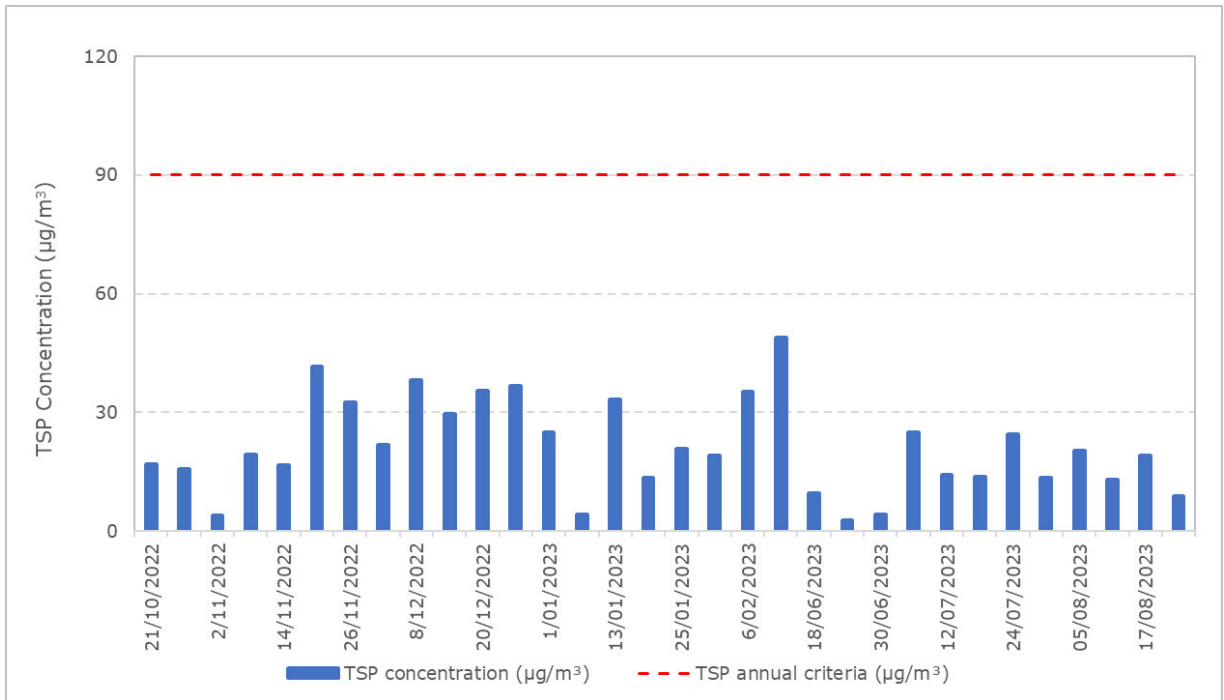


Figure 3-1: Measured 24-hour average TSP concentrations, one day in six since program commissioning

Note. Monitoring was temporarily paused from April to May and recommenced in June.

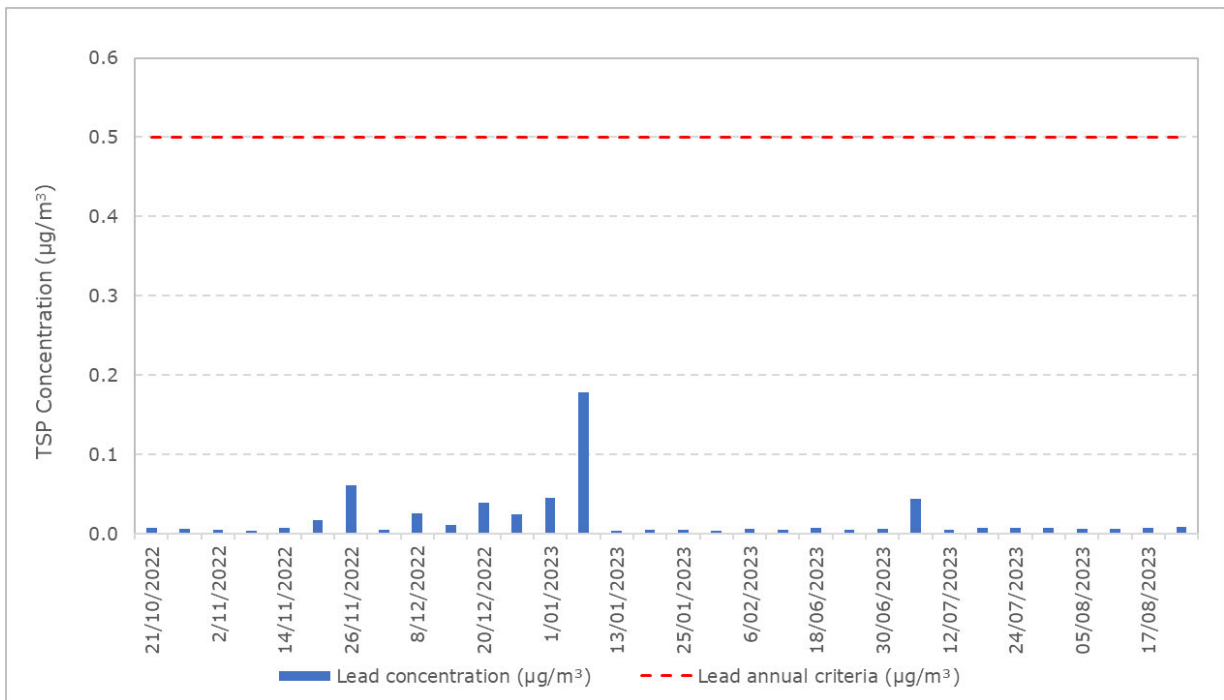


Figure 3-2: Measured 24-hour average lead concentrations, one day in six since program commissioning

Note. Monitoring was temporarily paused from April to May and recommenced in June.

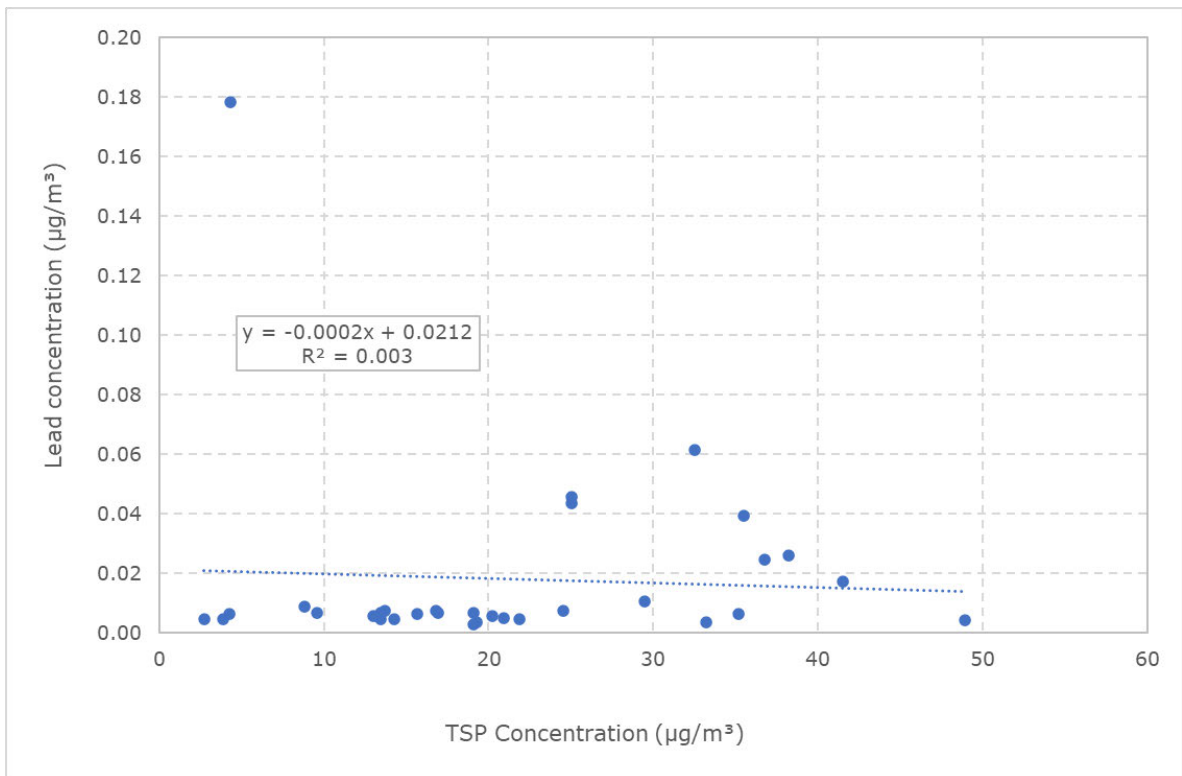


Figure 3-3: Correlation between 24-hour average TSP concentrations and lead concentrations from the same sample, one day in six since program commissioning

3.3 Regional meteorological monitoring

Rainfall contributes to suppressing dust. Total daily rainfall measured in Goulburn since program commissioning in October 2022 is presented in **Figure 3-4**. October and November 2022 had comparatively higher amount of rainfall compared to January, June, July and August 2023.

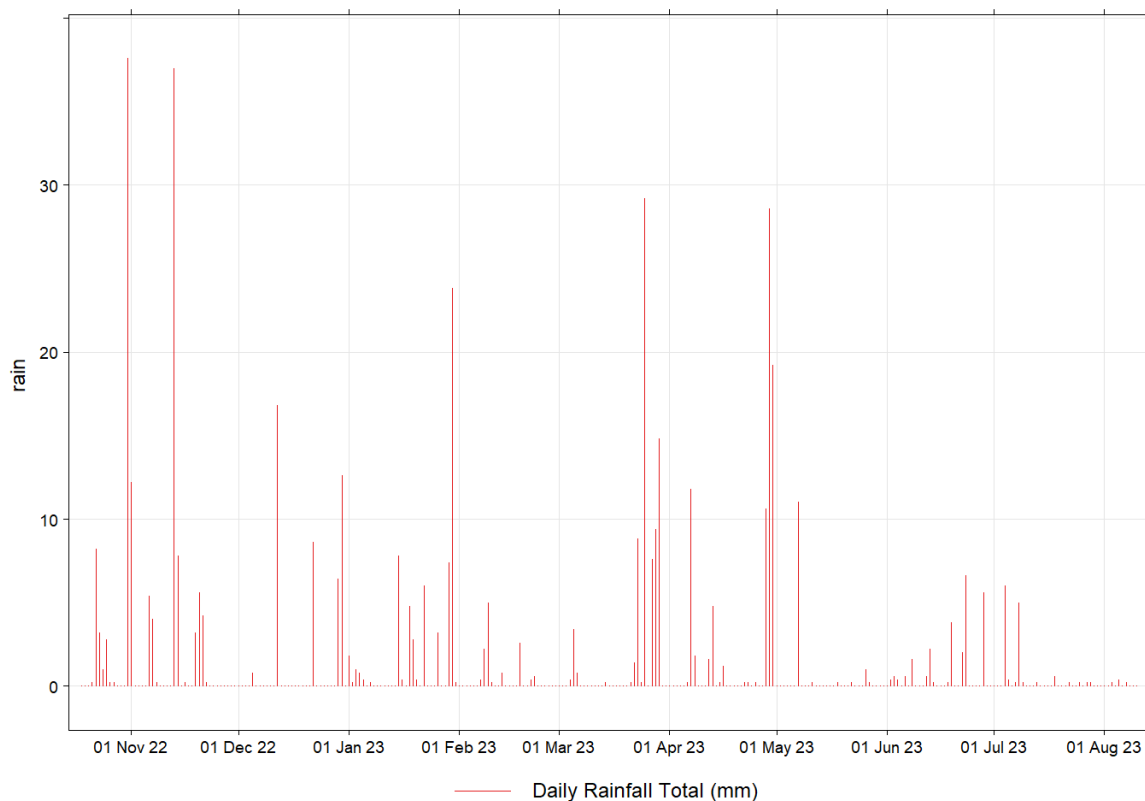


Figure 3-4: 24-hour total rainfall (mm) measured in Goulburn during the monitoring period

Analysis of monitored meteorological data indicates that regional winds during the monitoring period were predominantly from the west during autumn to early summer (October to December 2022) and winter to early spring (June to August 2023). A during summer into early autumn wind were predominantly from the east (Figure 3-5). Winds ranged in speed, where the strongest winds of over 4 m/s prevailed from the west. Whilst strong winds can generate elevated concentrations of particulate matter through the wind erosion of sources, calm winds also have an important influence on pollutant dispersion in the atmosphere. Calm conditions can result in elevated concentrations of pollutants from low level fugitive sources near to the source. Over the entire monitoring period, calm winds of less than 2 m/s occurred evenly from the east and west. Analysis of the wind on the TSP and lead sampled days shows a similar pattern to the overall wind characteristics with higher occurrence of north-west winds (**Figure 3-6**).

Figure 3-7 shows the measured 24-hour average TSP and lead concentrations and the recorded prevailing wind on those days. Analysis of this plot suggests that most part of lead-containing TSP travelled with the prevailing westerly winds in the first two months. Comparatively higher lead concentrations were recorded in the third month (Dec/Jan 23) when prevailing winds were coming from the east. In the final three months, westerly winds contributed to low levels of potentially lead-containing TSP. The bivariate polar plot and pollution rose in **Figure 3-8** shows that the sample with highest lead concentration (07 January 2023) was from a day with regional winds coming from the south-east. Bivariate polar plot and pollution roses can be useful for source identification with longer datasets.

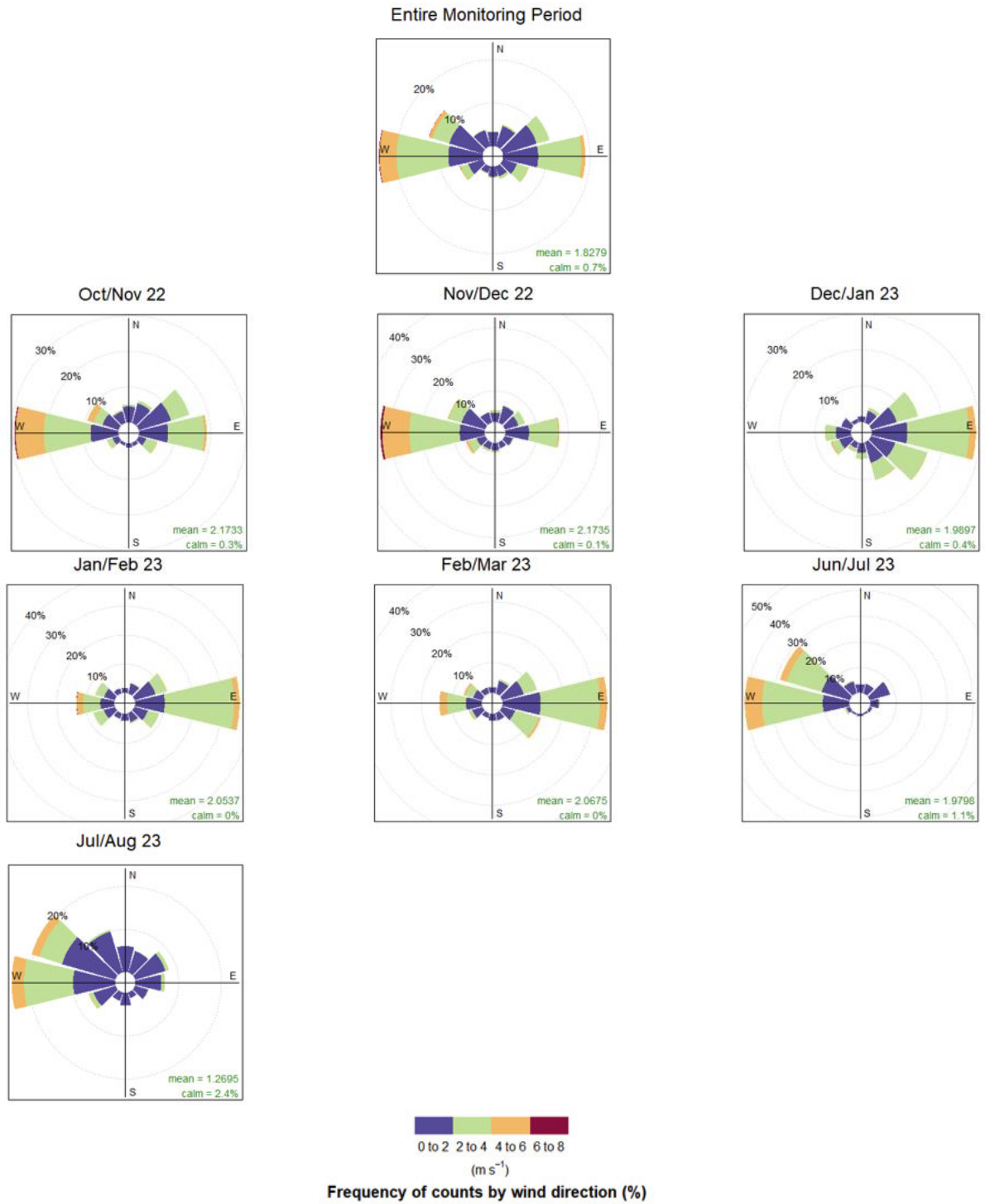


Figure 3-5: Wind roses with meteorological data from the entire monitoring period and monitoring months

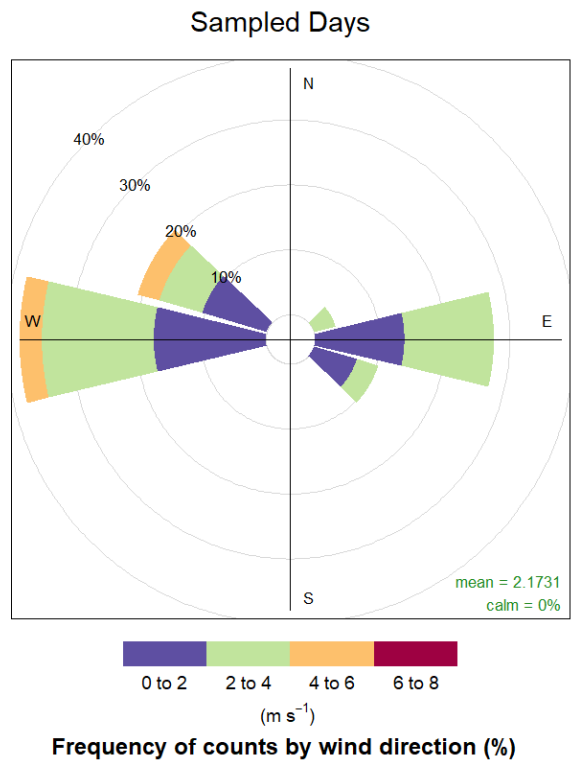


Figure 3-6: Wind rose with meteorological data from the TSP and lead sampled days

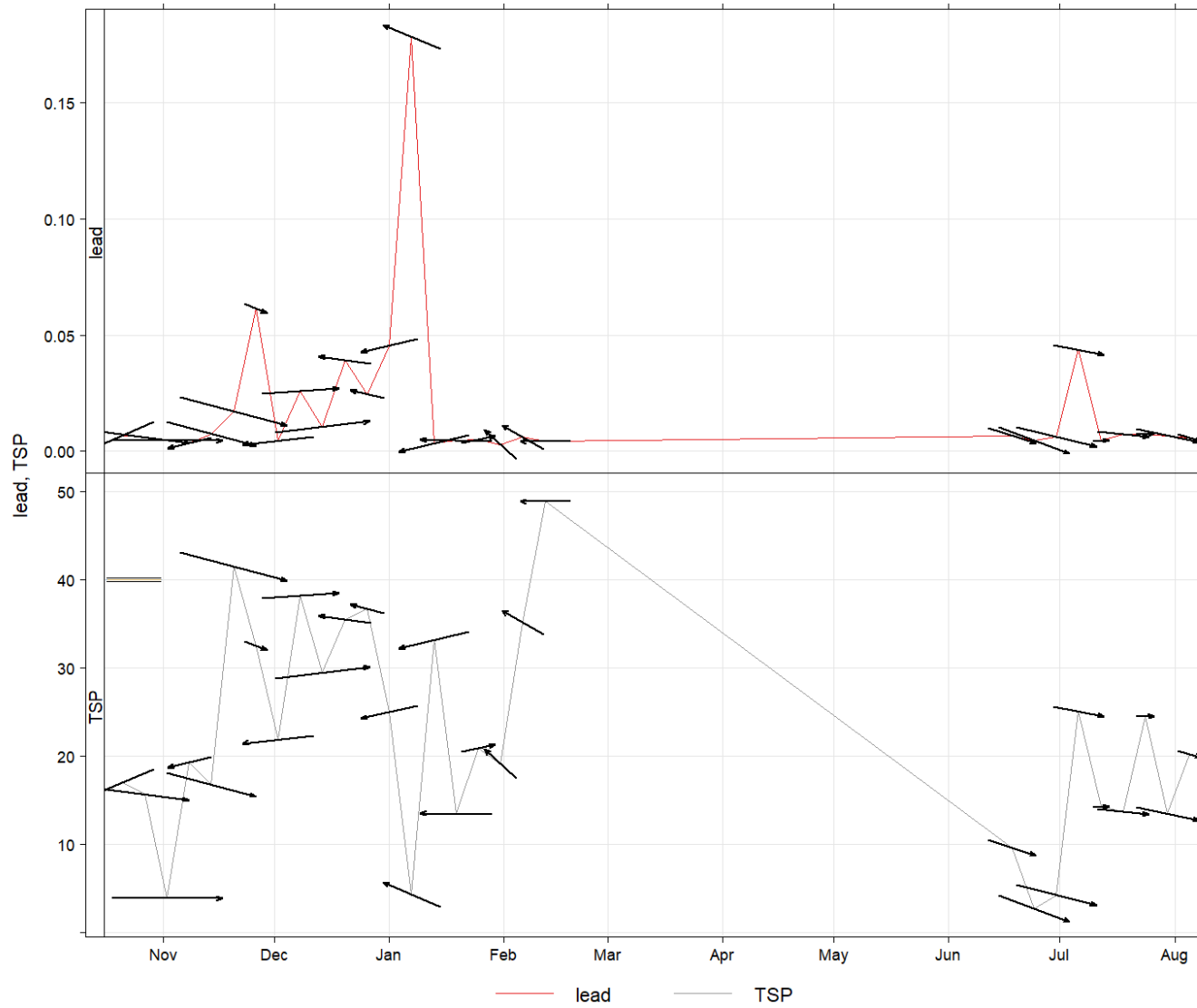


Figure 3-7: Measured 24-hour average TSP and lead concentrations and prevailing winds on the day

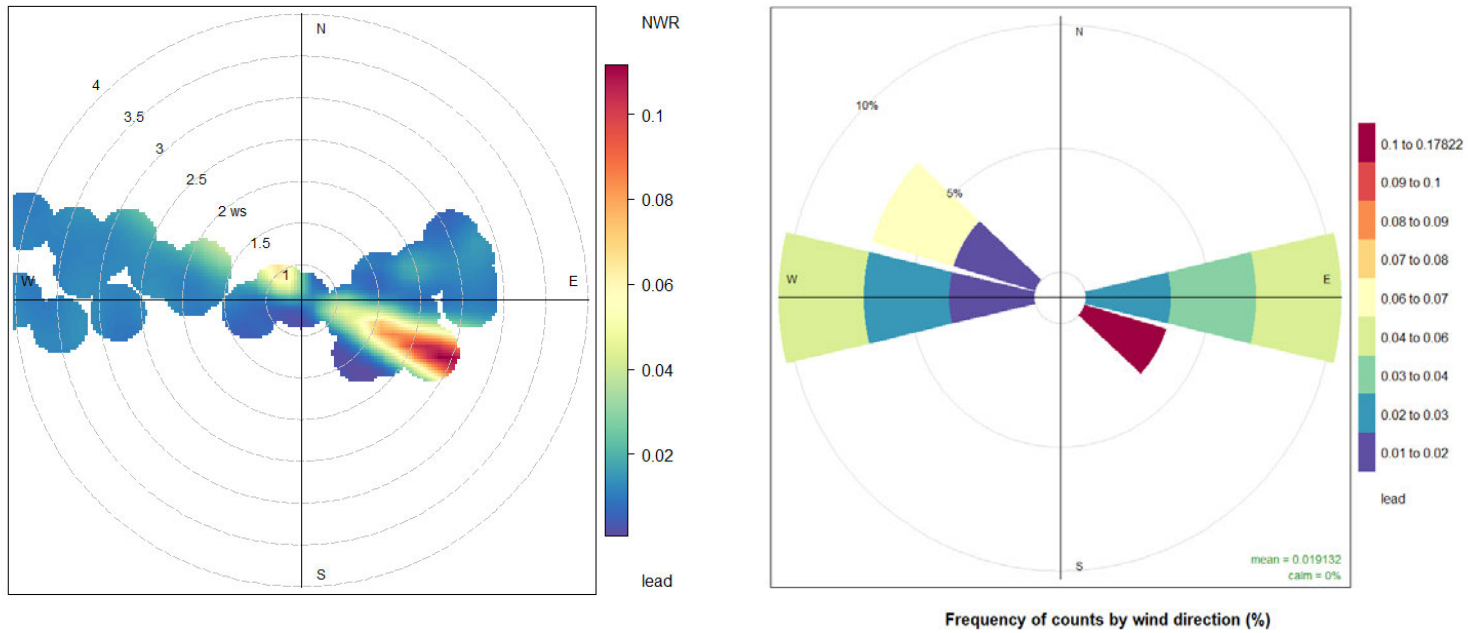


Figure 3-8: Polar plot (left) and pollution rose (right) showing 24-hour lead concentration and 24-hour average wind speed and direction for the TSP and lead sampled days

4. Summary

This report presents results of the air quality monitoring program in Tarago, NSW since program commissioning on 18 October 2022. The program consists of dust deposition monitoring at four locations and TSP and lead sampling by high-volume air sampler at one location.

No lead was detected in deposited dust above the limit of reporting. The rolling annual average concentrations of deposited dust as insoluble solids remain below the annual average dust deposition criterion at all locations. Lead was detected in all 24-hour average TSP samples, but in all cases the concentrations were below the annual average criterion.

Regional winds measured in Goulburn during the monitoring period prevailed from the east and west. Data collected to date suggests that lead-containing TSP originates from the west of the monitoring location, that is, the direction of the rail siding. However, the sample with highest lead concentration (07 January 2023) was from a day with regional winds coming from the south-east. Lead and particulate matter concentrations were below the relevant air quality criteria on all sampling days since the program was commissioned.

5. Limitations

This document is issued in confidence to TfNSW for the purposes of assessing air quality impacts from lead containing ore within the Goulburn – Bombala rail corridor in the Tarago Area. It should not be used for any other purpose.

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6. References

- NEPC, 2021. National Environment Protection (Ambient Air Quality) Measure. National Environment Protection Council.
- NERDDC, 1988. Air Pollution from Surface Coal Mining: Measurement, Modelling and Community Perception, Project No. 921. National Energy Research Development and Demonstration Council, Canberra.
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- Standards Australia, Standards New Zealand, 2016b. AS/NZS 3580.10.1:2016 Methods for sampling and analysis of ambient air Determination of particulate matter - Deposited matter - Gravimetric method. Australian/New Zealand Standard.
- Standards Australia, Standards New Zealand, 2014. AS/NZS 3580.9.15:2014 Methods for sampling and analysis of ambient air Method 9.15: Determination of suspended particulate matter — Particulate metals high or low volume sampler gravimetric collection — Inductively coupled plasma (ICP) spectrometric method. Australian/New Zealand Standard.

Appendix 1 Images of Air Quality Monitoring Instruments in-Situ



Figure A: Dust deposition gauge DDG2 and high-volume air sampler at Station Masters Cottage, 106 Goulburn St, Tarago NSW



Figure B: Dust deposition gauge DDG1, 18 Stewart St, Tarago NSW; DDG3, Boyd St, Tarago NSW; and DDG4, 96 Mulwaree St, Tarago NSW

Appendix 2 Laboratory Reports

Ramboll Australia Pty Ltd
 Level 3/100 Pacific Highway
 North Sydney
 NSW 2060



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: Greer Laing

Report 964787-A
 Project name TARAGO AQM
 Project ID 318001376-004
 Received Date Feb 14, 2023

Client Sample ID			HVS1695	HVS1712	HVS1704	HVS1727
Sample Matrix			Filter paper	Filter paper	Filter paper	Filter paper
Eurofins Sample No.			M23-Fe0041795	M23-Fe0041796	M23-Fe0041797	M23-Fe0041798
Date Sampled			Feb 12, 2023	Feb 06, 2023	Jan 31, 2023	Jan 25, 2023
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	1	Total ug	6.9	10	4.8	8.2
Particulates - Final weighing	0.01	mg	2826.5	2776.9	2746.8	2754.4
Particulates - Initial weighing	0.01	mg	2746.9	2719.70	2715.70	2720.40

Client Sample ID			HVS1717	HVS1645
Sample Matrix			Filter paper	Filter paper
Eurofins Sample No.			M23-Fe0041799	M23-Fe0041800
Date Sampled			Jan 19, 2023	Jan 13, 2023
Test/Reference	LOR	Unit		
Heavy Metals				
Lead	1	Total ug	7.6	5.5
Particulates - Final weighing	0.01	mg	2739.2	2599.3
Particulates - Initial weighing	0.01	mg	2717.30	2545.30

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Feb 20, 2023	28 Days
Particulates - Final weighing - Method: Filters weighed according to AS 3640 (Inhalable), AS 2985 (Respirable), AS4323 3 (Stack Filters)	Field	Feb 17, 2023	30 Days
Particulates - Initial weighing - Method: Filters weighed according to AS 3640 (Inhalable), AS 2985 (Respirable), AS4323 3 (Stack Filters) & QS-INS-4033 (HVAS - Non NATA Endorsed).	Field	Feb 20, 2023	30 Days

Company Name:	Ramboll Australia Pty Ltd	Order No.:	318001376-004	Received:	Feb 14, 2023 3:31 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	964787	Due:	Feb 21, 2023
Project Name:	TARAGO AQM	Phone:	02 9954 8118	Priority:	5 Day
Project ID:	318001376-004	Fax:	02 9954 8150	Contact Name:	Greer Laing

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Lead	Particulates - Final weighing	Particulates - Initial weighing
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	HVS1695	Feb 12, 2023		Filter paper	M23-Fe0041795	X	X	X
2	HVS1712	Feb 06, 2023		Filter paper	M23-Fe0041796	X	X	X
3	HVS1704	Jan 31, 2023		Filter paper	M23-Fe0041797	X	X	X
4	HVS1727	Jan 25, 2023		Filter paper	M23-Fe0041798	X	X	X
5	HVS1717	Jan 19, 2023		Filter paper	M23-Fe0041799	X	X	X
6	HVS1645	Jan 13, 2023		Filter paper	M23-Fe0041800	X	X	X
Test Counts						6	6	6

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg milligrams per kilogram	mg/L milligrams per litre	µg/L micrograms per litre
ppm parts per million	ppb parts per billion	% Percentage
org/100 mL Organisms per 100 millilitres	NTU Nephelometric Turbidity Units	MPN/100 mL Most Probable Number of organisms per 100 millilitres
CFU Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6 2 FTSA, 8 2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term " NT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Comments**Sample Integrity**

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Adam Bateup	Analytical Services Manager
Mary Makarios	Senior Analyst-Metal



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Ramboll Australia Pty Ltd
 Level 3/100 Pacific Highway
 North Sydney
 NSW 2060



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: Greer Laing

Report 964368-A-V2
 Project name [TARAGO AQM](#)
 Project ID 318001376-004
 Received Date Feb 14, 2023

Client Sample ID			DD1 - STEWART STREET	DDG2 - SMC	DDG3 - BOYD STREET	DDG4 - MULWAREE STREET
Sample Matrix			Dust Deposition	Dust Deposition	Dust Deposition	Dust Deposition
Eurofins Sample No.			S23-Fe0037656	S23-Fe0037657	S23-Fe0037658	S23-Fe0037659
Date Sampled			Feb 13, 2023	Feb 13, 2023	Feb 13, 2023	Feb 13, 2023
Test/Reference	LOR	Unit				
Dust Deposition						
Combustible Solids	0.1	g/m2/mth	0.3	0.4	0.6	0.5
Soluble Solids	0.1	g/m2/mth	3.7	5.2	3.2	5.5
Total Solids Dried at 103 °C to 105 °C	0.1	g/m2/mth	4.0	5.7	3.9	6.2
Volume (total)*	0.1	mL	800	1500	1300	1300
Ash*	0.1	g/m2/mth	< 0.1	< 0.1	0.1	0.1
Insoluble Solids	0.1	g/m2/mth	0.4	0.5	0.7	0.7
Heavy Metals						
Lead	1	Total ug	< 1	< 1	< 1	< 1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Dust Deposition - Method: LTM-INO-4160 Determination of Dust Deposition of Ambient Air	Sydney	Feb 16, 2023	5 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Mar 01, 2023	28 Days

Melbourne
6 Monterey Road
Dandenong South
VIC 3175
Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

Geelong
19/8 Lewalan Street
Grovedale
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Tel: +61 3 8564 5000
NATA# 1261 Site# 25403

Sydney
179 Magowar Road
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Canberra
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NATA# 1261 Site# 25466

Brisbane
1/21 Smallwood Place
Murarrie
QLD 4172
Tel: +61 7 3902 4600
NATA# 1261 Site# 20794

Newcastle
1/2 Frost Drive
Mayfield West NSW 2304
Tel: +61 2 4968 8448
NATA# 1261
Site# 25079 & 25289

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
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Tel: +64 9 526 45 51
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Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: 0800 856 450
IANZ# 1290

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Company Name:	Ramboll Australia Pty Ltd	Order No.:	318001376-004	Received:	Feb 14, 2023 3:31 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	964368	Due:	Mar 3, 2023
Project Name:	TARAGO AQM	Phone:	02 9954 8118	Priority:	5 Day
Project ID:	318001376-004	Fax:	02 9954 8150	Contact Name:	Greer Laing

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Lead	Dust Deposition
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	DD1 - STEWART STREET	Feb 13, 2023		Dust Deposition	S23-Fe0037656	X	X
2	DDG2 - SMC	Feb 13, 2023		Dust Deposition	S23-Fe0037657	X	X
3	DDG3 - BOYD STREET	Feb 13, 2023		Dust Deposition	S23-Fe0037658	X	X
4	DDG4 - MULWAREE STREET	Feb 13, 2023		Dust Deposition	S23-Fe0037659	X	X
Test Counts						4	4

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg milligrams per kilogram	mg/L milligrams per litre	µg/L micrograms per litre
ppm parts per million	ppb parts per billion	% Percentage
org/100 mL Organisms per 100 millilitres	NTU Nephelometric Turbidity Units	MPN/100 mL Most Probable Number of organisms per 100 millilitres
CFU Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6 2 FTSA, 8 2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "NT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	S23-Fe0037659	CP	%	88			75-125	Pass	

Comments

V2- new version to add lead on all samples that was missed originally.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Andrew Black	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal
Ryan Phillips	Senior Analyst-Inorganic



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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 Level 3/100 Pacific Highway
 North Sydney
 NSW 2060



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Site Number 1254

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Attention: Stephen Maxwell

Report 1020643-A
 Project name TARAGO AQM
 Project ID 318001376-007
 Received Date Aug 25, 2023

Client Sample ID			HVS 3018	HVS 3014	HVS 2019	HVS 2008
Sample Matrix			Filter paper	Filter paper	Filter paper	Filter paper
Eurofins Sample No.			S23- Au0069666	S23- Au0069667	S23- Au0069668	S23- Au0069669
Date Sampled			Aug 23, 2023	Aug 17, 2023	Aug 11, 2023	Aug 05, 2023
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	1	Total ug	14	11	9.3	9.4
Particulates - Final weighing	0.01	mg	2771.8	2713.2	2699.9	2715.1
Particulates - Initial weighing	0.01	mg	2757.5	2682.1	2678.7	2682.2

Client Sample ID			HVS 2026	HVS 2041	HVS2052	HVS2034
Sample Matrix			Filter paper	Filter paper	Filter paper	Filter paper
Eurofins Sample No.			S23- Au0069670	S23- Au0069671	S23- Au0069672	S23- Au0069673
Date Sampled			Jul 30, 2023	Jul 24, 2023	Jul 18, 2023	Jul 12, 2023
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	1	Total ug	11	12	12	7.5
Particulates - Final weighing	0.01	mg	2695.3	2735.7	2704.8	2729.9
Particulates - Initial weighing	0.01	mg	2673.4	2695.8	2682.5	2706.7

Client Sample ID			HVS 2040	HVS 1956	HVS 1970	HVS 1969
Sample Matrix			Filter paper	Filter paper	Filter paper	Filter paper
Eurofins Sample No.			S23- Au0069674	S23- Au0069675	S23- Au0069676	S23- Au0069677
Date Sampled			Jul 06, 2023	Jun 30, 2023	Jun 24, 2023	Jun 18, 2023
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	1	Total ug	71	10	7.4	11
Particulates - Final weighing	0.01	mg	2747.9	2690.3	2669	2690.7
Particulates - Initial weighing	0.01	mg	2707.1	2683.4	2664.6	2675.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Aug 30, 2023	28 Days
Particulates - Final weighing - Method: Filters weighed according to AS 3640 (Inhalable), AS 2985 (Respirable), AS4323 3 (Stack Filters)	Field	Aug 28, 2023	30 Days
Particulates - Initial weighing - Method: Filters weighed according to AS 3640 (Inhalable), AS 2985 (Respirable), AS4323 3 (Stack Filters) & QS-INS-4033 (HVAS - Non NATA Endorsed).	Field	Aug 28, 2023	30 Days

Melbourne 6 Monterey Road Dandenong South VIC 3175 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Geelong 19/8 Lewalan Street Grovedale VIC 3216 Tel: +61 3 8564 5000 NATA# 1261 Site# 25403	Sydney 179 Magowar Road Girraween NSW 2145 Tel: +61 2 9900 8400 NATA# 1261 Site# 18217	Canberra Unit 1,2 Dacre Street Mitchell ACT 2911 Tel: +61 2 6113 8091 NATA# 1261 Site# 25466	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Tel: +61 7 3902 4600 NATA# 1261 Site# 20794	Newcastle 1/2 Frost Drive Mayfield West NSW 2304 Tel: +61 2 4968 8448 NATA# 1261 Site# 25079 & 25289
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Perth 46-48 Banksia Road Welshpool WA 6106 Tel: +61 8 6253 4444 NATA# 2377 Site# 2370
--

Auckland 35 O'Rorke Road Penrose, Auckland 1061 Tel: +64 9 526 4551 IANZ# 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Tel: +64 3 343 5201 IANZ# 1290	Tauranga 1277 Cameron Road, Gate Pa, Tauranga 3112 Tel: +64 9 525 0568 IANZ# 1402
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Company Name: Ramboll Australia Pty Ltd
Address: Level 3/100 Pacific Highway
 North Sydney
 NSW 2060

Order No.: 318001376-007
Report #: 1020643
Phone: 02 9954 8118
Fax: 02 9954 8150

Received: Aug 25, 2023 1:31 PM
Due: Sep 1, 2023
Priority: 5 Day
Contact Name: Stephen Maxwell

Project Name: TARAGO AQM
Project ID: 318001376-007

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Lead	Particulates - Final weighing	Particulates - Initial weighing
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	HVS 3018	Aug 23, 2023		Filter paper	S23-Au0069666	X	X	X
2	HVS 3014	Aug 17, 2023		Filter paper	S23-Au0069667	X	X	X
3	HVS 2019	Aug 11, 2023		Filter paper	S23-Au0069668	X	X	X
4	HVS 2008	Aug 05, 2023		Filter paper	S23-Au0069669	X	X	X
5	HVS 2026	Jul 30, 2023		Filter paper	S23-Au0069670	X	X	X
6	HVS 2041	Jul 24, 2023		Filter paper	S23-Au0069671	X	X	X
7	HVS2052	Jul 18, 2023		Filter paper	S23-Au0069672	X	X	X
8	HVS2034	Jul 12, 2023		Filter paper	S23-Au0069673	X	X	X
9	HVS 2040	Jul 06, 2023		Filter paper	S23-Au0069674	X	X	X
10	HVS 1956	Jun 30, 2023		Filter paper	S23-Au0069675	X	X	X
11	HVS 1970	Jun 24, 2023		Filter paper	S23-Au0069676	X	X	X
12	HVS 1969	Jun 18, 2023		Filter paper	S23-Au0069677	X	X	X
Test Counts						12	12	12

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg milligrams per kilogram	mg/L milligrams per litre	µg/L micrograms per litre
ppm parts per million	ppb parts per billion	% Percentage
org/100 mL Organisms per 100 millilitres	NTU Nephelometric Turbidity Units	MPN/100 mL Most Probable Number of organisms per 100 millilitres
CFU Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPa, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Lead	Total ug	< 1			1	Pass	

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Andrew Black	Analytical Services Manager
Mary Makarios	Senior Analyst-Metal


Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Ramboll Australia Pty Ltd
 Level 3/100 Pacific Highway
 North Sydney
 NSW 2060



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: Stephen Maxwell

Report 1020854-A
 Project name TARAGO AQM
 Project ID 318001376-007
 Received Date Aug 25, 2023

Client Sample ID			DDG1 - STEWART STREET	DDG2 - SMC	DDG3 - BOYD STREET	DDG4 - MULWAREE STREET
Sample Matrix			Dust Deposition	Dust Deposition	Dust Deposition	Dust Deposition
Eurofins Sample No.			S23-Au0071835	S23-Au0071836	S23-Au0071837	S23-Au0071838
Date Sampled			Aug 10, 2023	Aug 10, 2023	Aug 10, 2023	Aug 10, 2023
Test/Reference	LOR	Unit				
Dust Deposition						
Combustible Solids	0.1	g/m2/mth	0.1	0.3	0.2	0.3
Soluble Solids	0.1	g/m2/mth	1.9	0.2	0.1	1.1
Total Solids Dried at 103 °C to 105 °C	0.1	g/m2/mth	2.2	1.1	0.7	1.9
Volume (total)*	0.1	mL	200	200	200	200
Ash*	0.1	g/m2/mth	0.2	0.6	0.4	0.6
Insoluble Solids	0.1	g/m2/mth	0.3	0.9	0.6	0.9
Heavy Metals						
Lead	1	Total ug	< 1	< 1	< 1	< 1

Client Sample ID			DDG1 - STEWART STREET	DDG2 - SMC	DDG3 - BOYD STREET	DDG4 - MULWAREE STREET
Sample Matrix			Dust Deposition	Dust Deposition	Dust Deposition	Dust Deposition
Eurofins Sample No.			S23-Au0071839	S23-Au0071840	S23-Au0071841	S23-Au0071842
Date Sampled			Jul 13, 2023	Jul 13, 2023	Jul 13, 2023	Jul 13, 2023
Test/Reference	LOR	Unit				
Dust Deposition						
Combustible Solids	0.1	g/m2/mth	< 0.1	0.1	< 0.1	0.1
Soluble Solids	0.1	g/m2/mth	3.4	3.2	3.2	3.3
Total Solids Dried at 103 °C to 105 °C	0.1	g/m2/mth	3.5	3.5	3.3	3.7
Volume (total)*	0.1	mL	500	400	450	400
Ash*	0.1	g/m2/mth	< 0.1	0.1	< 0.1	0.2
Insoluble Solids	0.1	g/m2/mth	< 0.1	0.3	0.1	0.4
Heavy Metals						
Lead	1	Total ug	< 1	< 1	< 1	< 1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Dust Deposition - Method: LTM-INO-4160 Determination of Dust Deposition of Ambient Air	Sydney	Aug 29, 2023	5 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Sep 07, 2023	28 Days

Melbourne 6 Monterey Road Dandenong South VIC 3175 Tel: +61 3 8564 5000 NATA# 1261 Site# 1254	Geelong 19/8 Lewalan Street Grovedale VIC 3216 Tel: +61 3 8564 5000 NATA# 1261 Site# 25403	Sydney 179 Magowar Road Girraween NSW 2145 Tel: +61 2 9900 8400 NATA# 1261 Site# 18217	Canberra Unit 1,2 Dacre Street Mitchell ACT 2911 Tel: +61 2 6113 8091 NATA# 1261 Site# 25466	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Tel: +61 7 3902 4600 NATA# 1261 Site# 20794	Newcastle 1/2 Frost Drive Mayfield West NSW 2304 Tel: +61 2 4968 8448 NATA# 1261 Site# 25079 & 25289
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Auckland 35 O'Rorke Road Penrose, Auckland 1061 Tel: +64 9 526 4551 IANZ# 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Tel: +64 3 343 5201 IANZ# 1290	Tauranga 1277 Cameron Road, Gate Pa, Tauranga 3112 Tel: +64 9 525 0568 IANZ# 1402
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Company Name:	Ramboll Australia Pty Ltd	Order No.:	318001376-007	Received:	Aug 25, 2023 1:31 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	1020854	Due:	Sep 1, 2023
Project Name:	TARAGO AQM	Phone:	02 9954 8118	Priority:	5 Day
Project ID:	318001376-007	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Dust Deposition
Sydney Laboratory - NATA # 1261 Site # 18217						X
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	DDG1 - STEWART STREET	Aug 10, 2023		Dust Deposition	S23-Au0071835	X
2	DDG2 - SMC	Aug 10, 2023		Dust Deposition	S23-Au0071836	X
3	DDG3 - BOYD STREET	Aug 10, 2023		Dust Deposition	S23-Au0071837	X
4	DDG4 - MULWAREE STREET	Aug 10, 2023		Dust Deposition	S23-Au0071838	X
5	DDG1 - STEWART STREET	Jul 13, 2023		Dust Deposition	S23-Au0071839	X
6	DDG2 - SMC	Jul 13, 2023		Dust Deposition	S23-Au0071840	X
7	DDG3 - BOYD	Jul 13, 2023		Dust	S23-Au0071841	X



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Eurofins Analytical Services Manager : Andrew Black					

Sample Detail					Dust Deposition
Sydney Laboratory - NATA # 1261 Site # 18217					X
	STREET			Deposition	
8	DDG4 - MULWAREE STREET	Jul 13, 2023		Dust Deposition	S23-Au0071842 X
Test Counts					8

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg milligrams per kilogram	mg/L milligrams per litre	µg/L micrograms per litre
ppm parts per million	ppb parts per billion	% Percentage
org/100 mL Organisms per 100 millilitres	NTU Nephelometric Turbidity Units	MPN/100 mL Most Probable Number of organisms per 100 millilitres
CFU Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPa, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Comments**Sample Integrity**

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Adam Bateup	Analytical Services Manager
Dilani Samarakoon	Senior Analyst-Inorganic
Fang Yee Tan	Senior Analyst-Metal



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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