# Department of Jobs, Precincts and Regions

# Woodvale Evaporation Ponds- Dust Monitoring Report- January-June, 2021

30 August 2021



### **Executive Summary**

# This environmental monitoring report provides a summary of available dust monitoring results for Woodvale Evaporation Ponds for January to June (inclusive) 2021.

The Woodvale Evaporation Ponds, Dalys Rd, Woodvale, (the site), are located approximately 13 kilometres north of Bendigo. The site has been used by mining companies to hold groundwater extracted from underground mining operations. The former mining licence holder (Kralcopic Pty Ltd) at the site went into voluntary administration.

On the 23<sup>rd</sup> of April 2021, Earth Resources Regulation (ERR) of the Department of Jobs, Precincts and Regions (DJPR) inherited the responsibility to rehabilitate the site. DJPR commissioned dust monitoring to be carried out at the site from the beginning of 2021, for the purpose of collecting baseline data for, if and when, ERR inherited the site to rehabilitate.

The scope of the monitoring included monthly collection of dust deposition samples from six locations (WVDD01 – WVDD06), predominantly located on the perimeter of the Woodvale Evaporation Ponds. The sampling locations, sampling procedures and analysis methodology, were comparable to works historically undertaken by Kralcopic Pty Ltd in Quarter 4 of 2018. Samples were collected and assessed by Australian Laboratory Services (ALS), under instruction by DJPR.

CDM Smith Australia Pty Ltd (CDM Smith) was engaged by DJPR to provide a summary of dust monitoring results in the vicinity of the site. Quarter 1 and Quarter 2 dust monitoring results for 2021 are presented in this report.

Review of dust monitoring information included:

- Assessment of results against the adopted dust monitoring criteria (where available).
- Comparison of current dust monitoring results (January to June 2021) to historical data from the site, Oct-Dec 2018 (Kralcopic 2018).

Results were reviewed to support addressing the following key questions:

Did the dust deposition rates, reported in Q1 and Q2 of 2021, exceed the adopted dust deposition criteria of 4 g/m<sup>2</sup>.month (measured as total insoluble matter)?

On average the dust deposition rate (2.0 g/m<sup>2</sup>.month) is comparable to the accepted background levels (2 g/m<sup>2</sup>.month).

At individual sampling locations, four of the 36 measurements reported, dust deposition at a rate above the adopted criteria of 4 g/m<sup>2</sup>.month. Three of four of these measurements are at different monitoring points; WVDD01, during March 2021 (5.4 g/m<sup>2</sup>.month) and during June 2021 (19.3 g/m<sup>2</sup>.month), WVDD03, during May 2021 (5.9 g/m<sup>2</sup>.month), and WVDD06, during June 2021 (4.2 g/m<sup>2</sup>.month).

Is dust deposition greater downwind of Woodvale Evaporation Ponds (compared to upwind of the ponds)?

The results suggest a potential net increase in dust deposition rates north of the site (when the wind is blowing across the site from the south) but no net increase in dust deposition was observed when wind is blowing from the north. The reasons for this disparity is not yet understood and could be due many environmental or measurement factors. Further monitoring would be needed to understand if the observed net increase north of the site is representative of a long term trend or representative of short term variability in results.

Are dust deposition rates reported in Q1 and Q2 of 2021 comparable to available historic results in this area?

On average dust deposition rates recorded in Q1 and Q2 2021 were lower than historic dust deposition rates recorded from the same monitoring locations in Q4 2018.

Arsenic is considered a key contaminant of concern at the site (Peter Ramsay 2018). To assist in the review of the monitoring results for arsenic, in regards to risk to the surrounding areas the following questions were posed.

• Are arsenic concentrations reported in deposited dust in Q1 and Q2 of 2021 comparable to available historic results in this area?

Total arsenic concentration and insoluble fraction of arsenic in dust collected during Q1 and Q2 2021 were within the historic ranges, reported in Q4 2018.

Total arsenic concentrations in deposited dust, during Q1 and Q2 2021, ranged from 3 to <39 mg/kg, with a median across all stations for Q1 and Q2 of 9 mg/kg. Concentrations of arsenic in deposited dust (calculated based on total arsenic/total deposited matter) were comparable to reported average arsenic concentrations in local soils (from offsite), median of 10 mg/kg (Senversa, 2015).

In the absence of human health criteria for arsenic concentrations in deposited dust, a comparison to the soil criteria for human health in a residential land use setting (of 100 mg/kg) is provided. It is emphasised that this is not a health assessment. The reported total arsenic in deposited dust is not a direct measure of concentration of arsenic compounds that may be present in the atmosphere. It is for this reason that care must be taken when interpreting the monitoring data.

Is the concentration of arsenic in dust greater downwind of Woodvale Evaporation Ponds (compared to upwind of the ponds)?

During Q1 2021 high variability was reported in net gains and losses in arsenic downwind of the site. During Q2, low net increases and net losses in arsenic downwind of the site were reported. The current directional dust deposition results do not clearly indicate that the site is a source of increased arsenic downwind of the site (as measured north and south of the site).



# **Table of Contents**

Execut	itive Summary	ii
Sectio	on 1 Introduction	1
1.1	Background	1
1.2	Scope and Objective	1
1.3	Regulatory Environment	1
1.4	What is dust?	2
Sectio	on 2 Measurement of Dust	3
2.1	Deposited Matter	3
2.1.1	Directional Deposited Dust Monitoring	
2.1.2	Metals/Metalloids Monitoring in Dust	5
2.1.3	Ash Content	5
2.2	Dust monitoring standards	5
2.3	Comparison of the scope of current and historical dust monitoring	6
Sectio	on 3 Dust Deposition Results	8
3.1	Woodvale Evaporation Ponds – Q1 and Q2 2021	8
3.1.4	Woodvale Directional Dust Deposition	
3.2	Review of Quality Assurance and Quality Control	13
Sectio	on 4 Summary of Results	14
Sectio	on 5 Further Considerations	16
Sectio	on 6 References	17
Sectio	on 7 Disclaimer and Limitations	1 <u>8</u>

# **Figures**

Figure 2-1	Woodvale Evaporation Ponds – Dust Monitoring Locations, Kralcopic (2018)	3
Figure 2-2	Example of dust deposition gauge at WVDD04	4
Figure 2-3	Example of directional dust gauge	5
Figure 3-1	Woodvale Dust Total Insoluble Matter (g/m <sup>2</sup> .month) Comparison between 2018 (previous data) and 2021 (Curre data), dashed line shows adopted criteria	nt 8
Figure 3-2	Woodvale Dust Ash Content (g/m <sup>2</sup> .month), comparison between 2018 (previous data) and 2021 (current data). Asterisk (*) represents the results where the sample was recorded as less than the limit of reporting " <x". "<x"="" as="" been="" for="" graphical="" has="" of="" presentation="" presented="" td="" the="" value="" x.<=""><td> 9</td></x".>	9
Figure 3-3	Woodvale Dust Ash Content/Total Insoluble Matter, comparison between 2018 (previous data) and 2021 (currer data)	t 9
Figure 3-4	Woodvale total arsenic/total solids (mg/kg) comparison between 2018 (previous data) and 2021 (current data). Asterisk (*) represents the results where the sample was recorded as less than the limit of reporting ( <x). for="" the<br="">sake of graphical presentation <x as="" been="" has="" of="" taken="" td="" the="" value="" x.<=""><td>≩  10</td></x></x).>	≩ 10
Figure 3-5	Net gain or loss in dust deposition (total solids) downwind of the site compared to upwind of the site, for both no facing and south facing gauges.	orth 12



Figure 3-6	Net gain or loss in total arsenic (mg) down gradient of the site for north facing and south facing gauges. Asterisk (	*)
	represents the results where a sample was recorded as less than "x" ( <x). <x="" are="" of="" results="" td="" the="" value="" was<="" where="" x=""><td></td></x).>	
	adopted	. 12

# **Tables**

Table 2-1	Relevant Dust Criteria	6
Table 2-2	Overview of dust monitoring data – Historical & Current data	6
Table 4-1	Summary of Results1	4

# Appendices

Appendix A Tables
Appendix B Supplementary Data
Appendix C Laboratory Reports



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## **Section 1 Introduction**

### 1.1 Background

The Woodvale Evaporation Ponds, Daly Rd (the site), are located approximately 13 kilometres north of Bendigo, Victoria. The site has been used by mining companies to hold groundwater extracted from underground mining operations. Environmental assessments undertaken at the site have identified enrichment of metals/metalloids (in particular arsenic, barium and manganese), cyanide, sulfate and salts in pond sediment (Peter Ramsay and Associates, 2018), compared to regional background soil concentrations and/or subsurface soil concentrations.

The former mining licence holder (Kralcopic Pty Ltd) at the site has gone into voluntary administration. On the 23<sup>rd</sup> of April 2021, Earth Resource Regulation (ERR) of Department of Jobs, Precincts and Regions (DJPR) inherited the responsibility to rehabilitate the site.

DJPR commissioned dust monitoring to be carried out from the beginning of 2021, for the purpose of collecting baseline data for, if and when, ERR inherited the site to rehabilitate. The scope of the monitoring included use of dust deposition gauges in similar locations as historically assessed by Kralcopic and adoption of comparable sampling procedures and analysis methodology.

CDM Smith Australia Pty Ltd (CDM Smith) was engaged by DJPR to provide a summary of dust monitoring results in the vicinity of the site. Quarter 1 and Quarter 2 dust monitoring results for 2021 are presented in this report.

### 1.2 Scope and Objective

The scope of this assessment included collation and reporting of dust deposition sample results from six locations (WVDD01 – WVDD06), predominantly located adjacent to the boundary of the Woodvale Evaporation Ponds site. Samples were collected and assessed by Australian Laboratory Services (ALS), under instruction by DJPR.

The objective of this work was to provide an understanding of current dust deposition rate and composition, post mining operations and prior to mine rehabilitation. Results were compared to historical data ranges, as assessed by Kralcopic in quarter 4 (Q4) of 2018 (Kralcopic 2018). We understand that the purpose of these works is to inform air quality management practices at the site including assisting in understanding the following:

- Did the dust deposition rates, reported in Q1 and Q2 of 2021, exceed the adopted dust deposition criteria of 4 g/m<sup>2</sup>.month (measured as total insoluble matter)?
- Is dust deposition greater downwind of Woodvale Evaporation Ponds (compared to upwind of the ponds)?
- Are dust deposition rates reported in Q1 and Q2 of 2021 comparable to available historic results in this area?
- Are arsenic concentrations reported in deposited dust in Q1 and Q2 of 2021 comparable to available historic results in this area?
- Is the concentration of arsenic in dust greater downwind of Woodvale Evaporation Ponds (compared to upwind of the ponds)?

### 1.3 Regulatory Environment

The air environment in Victoria is protected by the Environment Protection Act 2017 (the Act). The Environmental Reference Standard (ERS) is a tool to support the Act. The ERS:

- identifies environmental values that the Victorian community want to achieve and maintain; and
- provides a way to assess those environmental values in locations across Victoria.



The environmental values of ambient air, as described in the ERS, are:

- Life, health and well-being of humans
- Life, health and well-being of other forms of life, including the protection of ecosystems and biodiversity
- Local amenity and aesthetic enjoyment
- Visibility
- The useful life and aesthetic appearance of buildings, structures, property and materials
- Climate systems that are consistent with human development, the life, health and well-being of humans, and the
  protection of ecosystems and biodiversity

The ERS presents indicators and objectives (or thresholds) which can be used to identify if environmental values may be impacted. The ERS generally incorporates the Ambient Air Quality National Environment Protection Measure (NEPM) standards and the associated goals and monitoring and reporting protocols.

In addition, EPA (Vic) publication 1191, protocol for Environmental Management Mining & Extractive Industries, provides guidance for air quality monitoring in relation to the operation of mines and quarries.

All mining and extractive sites have a requirement to comply with the ERS. An Air Quality Assessment in accordance with this Protocol for Environmental Management (PEM), (EPA Publication 1191, 2007), is required only for proposals requiring an Environment Effects Statement or an EPA Works Approval and Licence or where specifically required by DPI (now DJPR). DJPR are likely to request an air quality assessment only when activities that are likely to generate increased emissions of the indicators specified in this PEM or will have significantly increased impact at sensitive locations. The PEM states that, for mines and quarries with less than 50,000 tonnes/year extraction, no modelling assessment of air quality is required but emissions on site must be controlled by the application of best practice site management.

No mine extraction works are underway at the site.

### 1.4 What is dust?

Dust is typically classified based on its particle size and includes the following:

- 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 30µm (0.03 mm) equivalent aerodynamic diameter or less. Larger particles tend not to become suspended.
- PM<sub>10</sub> particles 10 μm equivalent aerodynamic diameter or less.
- PM<sub>2.5</sub> particles 2.5 μm equivalent aerodynamic diameter or less.

Dust particle size is an important factor influencing dispersion and transport in the atmosphere and potential effects on human health.

The PEM classifies indicators of dust based on its hazardous properties.  $PM_{10}$  is identified as a Class 1 indicator under the SEPP (AQM) and  $PM_{2.5}$  a Class 2 indicator. Respirable crystalline silica ( $PM_{2.5}$  fraction) and arsenic are Class 3 indicators. TSP is an unclassified indicator. The PEM provides Assessment Criteria for these indicators where an Air Quality Assessment is required. The requirement for an Air Quality Assessment is determined by the size of the proposed operation and its location in relation to identified sensitive receptors (e.g. houses).

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 (Environment Australia, 1998).



### **Section 2 Measurement of Dust**

Australian Laboratory Services (ALS) collected deposited matter from dust deposition gauges at locations WVDD01-WVDD06 (Figure 2-1), dust monitoring locations as presented by Kralcopic (2018). Directional dust deposition measurement, was undertaken by ALS from the approximate location of WVDG03 and WVDG05.



#### Figure 2-1 Woodvale Evaporation Ponds – Dust Monitoring Locations, Kralcopic (2018)

We understand that collection of dust samples was undertaken in general in accordance with GBM Environmental Monitoring Procedure PRO\_25\_04\_K dust deposition sampling. CDM Smith was not engaged to review the sample collection methodology.

Sample collection and analysis for current data (Q2 2021 data) was conducted by ALS Environmental.

Assessment included analysis of the following:

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

### 2.1 Deposited Matter

Deposited matter was collected from standard dust deposition gauges, over monthly periods.

Dust deposition gauges measure dust deposition rate; that is the amount of material, in grams, that falls onto a known surface area over the period of one month. As such the results are expressed in  $g/m^2/month$  (i.e. the calculated mass



of dust deposited per square metre over the period of month). This method involves the passive deposition and capture of dust utilising a funnel and bottle arrangement.

This method enables determination of the relative 'dustiness' of sampling locations. It does not provide data on relative dust concentrations in ambient air or enable definitive determination of dust levels from a particular event or source.

As well as collecting dust deposition out of the ambient air, dust deposition gauges may also collect rainwater and other material such as insects, bird dropping and leaf litter, etc. It is acknowledged that bird droppings can significantly impact on individual monitoring results but tend not have any material impact when the data is viewed in context of long-term trends.

#### 2.1.1 Directional Deposited Dust Monitoring

The use of directional dust gauges facilitates 360<sup>o</sup> directional interpretation of windborne dust concentrations by providing discrete sample collection in four directional quadrants, (North, South, East and West) (Figure 2-3).

Under direction of DJPR, two directional dust deposition gauges were installed at Woodvale on 27 January 2016 at existing sampling locations WVDD03 and WVDD05. The directional dust gauges are understood to be co-located with standard depositional dust gauges at the locations described and can provide comparative assessment of dust loading entering the site and leaving the site with respect to dominant wind directions (upwind and downwind).

It is understood that the siting of depositional dust monitoring equipment was undertaken in accordance with AS3580.1.1 (and consistent with Kralcopic description provided in report Q4 2018 Kralcopic).

We note that the directional gauges will pick up dust that blows in from any direction, including material that is air borne on gusty changes in wind direction (i.e. dust that is collected in the southern facing quarter of the gauge is used to represent dust generated from land south of the gauge, however dust from other directions that has been mixed around whilst in suspension may also be deposited on this quadrant).



Figure 2-2 Example of dust deposition gauge at WVDD04





Figure 2-3 Example of directional dust gauge

#### 2.1.2 Metals/Metalloids Monitoring in Dust

The concentration of arsenic, barium and manganese was reported for insoluble matter, soluble matter and ash matter and compared against historical results.

Total metal/metalloid concentrations were derived based on the sum of the insoluble metal/metalloid concentration and soluble metal concentration.

The inclusion of metals and metalloid analysis in deposited dust samples can assist in identifying possible dust sources. We understand that there are no specified threshold values for metals and metalloids in deposited dust either in the former Mining Licence conditions or within the ERS.

#### 2.1.3 Ash Content

Ash content is the matter that remains after the sample has been combusted in the laboratory. The ash component is can be used as a proxy for the mineral portion of the dust (Kralcopic, 2018).

The ashing process removes combustible organic contaminants such as bird dropping and plants material (i.e. pollen, seeds, leaf matter).

The reported total arsenic in deposited dust is not a direct measure of the concentration of arsenic compounds that may be present in the atmosphere. It is for this reason that care must be taken when interpreting the data.

### 2.2 Dust monitoring standards

Results were compared against relevant dust deposition rate criteria described by EPA Victoria (Publication 1191, dated December 2007), as shown below:



#### Table 2-1 Relevant Dust Criteria

Averaging period	Maximum increase above background (2g/m²/month) in deposited dust level	Maximum total deposited dust level	
Annual	2g/m <sup>2</sup> /month	4g/m²/month	

The following points apply to the criteria:

- Results of monitoring should not exceed 4g/m<sup>2</sup> /month (no more than 2g/m<sup>2</sup> /month above background) as a monthly average.
- The 2g/m<sup>2</sup>/month criteria are used when baseline data on deposited dust levels exist, while the 4g/m<sup>2</sup>/month criteria is used when no baseline data exists.
- The criteria refer to all sources of deposited matter (including sources from mines, agriculture, unsealed roads, etc) and cumulative impacts.
- The criteria suggest that in some cases a mine may increase deposited dust levels by up to 2g/m<sup>2</sup>/month.
   However, the total deposited dust level (including sources from mines, agriculture, unsealed roads, etc) must not exceed 4g/m<sup>2</sup>/month.

Deposited matter (dust) can be used as an indicator of the effectiveness of site management practices and the potential for offsite nuisance (fugitive dust). Deposited dust monitoring, when conducted over a period of time, is useful for examining trends and evaluating deviation from long term trends with respect to site activities. It does not give an indication of the potential health effects of the dust because it does not measure the amount of fine and very fine particles in the atmosphere.

### 2.3 Comparison of the scope of current and historical dust monitoring

The scope of the dust monitoring program in Q1 and Q2 2021 differed from the scope of the historic assessment undertaken in Q4 2018, as described in Table 2-2.

Analysis	Analysis Undertaken		Comment	
	Q4 2018	Q1-Q2 2021		
Measurement of Deposited Matter	Yes	Yes	Dust deposition data was collected at 6 monitoring stations. Samples were assessed for total solids (insoluble + soluble matter), ash content and combustible matter.	
Measurement of metalloid in Dust	Yes	Yes	Dust deposition samples (from 6 monitoring stations) were assessed for metalloids/metals (arsenic, barium and manganese) in the soluble, insoluble and ash fraction of dust.	
Directional Dust Deposition data	Yes	Yes	Directional monitoring data was collected from two stations (WVDG03 and WVDG05), each with four direction data (North, South, East, West)	
Measurement of Particulate Matter	Yes	No	In Q4 2018, TSP, $PM_{10}$ and Arsenic in $PM_{10}$ were measured at WVDD01 – WVDD06 (by a subcontractor).	
Measurement of Background dust data	Yes	No	In Q4 2018, a background gauge was located at Raywood. No background data was collected by DJPR for Q1 or Q2 2021 monitoring.	

Table 2-2	<b>Overview of dust monitoring data – Historical &amp; Current data</b>
	<b>0</b>



Analysis	Analysis Undertaken		Comment	
	Q4 2018	Q1-Q2 2021		
Meteorological Data Collection	Yes	No	In Q4 2018, Kralcopic included assessment of meteorological observations at Woodvale Evaporation Ponds, to support assessment of wind direction.	



### **Section 3 Dust Deposition Results**

### 3.1 Woodvale Evaporation Ponds – Q1 and Q2 2021

Dust deposition analytical results are presented in Table A1, Appendix A. Laboratory records of sample analysis are presented in Appendix C.

No background monitoring data was provided for this current monitoring dataset. Dust results were compared against available data from the most recent previous dust monitoring rounds (Q4 2018). We understand that no dust monitoring was undertaken between December 2018 and January 2021.

Where results were reported as "less than" (<) a specified number (the laboratory reporting limit), the number specified was adopted for graphical display of results, for example if the result was reported as "<50 g/m<sup>2</sup>.month" the result was graphically displayed as 50 g/m<sup>2</sup>.month. This is considered a conservative estimate of the result.

#### 3.1.1 Deposition of total insoluble matter

Total insoluble matter met criteria in 32 of 36 measurements during the Q1 and Q2 2021, assessment period, Figure 3-1.

Dust deposition rates exceeded the adopted assessment criteria at three monitoring stations:

- WVDD01, during March 2021 (5.4 g/m<sup>2</sup>/month) and during June 2021 (19.3 g/m<sup>2</sup>/month).
- WVDD03, during May 2021 (5.9 g/m<sup>2</sup>/month).
- WVDD06, during June 2021 (4.2 g/m<sup>2</sup>/month).

When data for all locations and all measured time points is averaged (from Q1 to Q2 2021), the average of all results for total insoluble matter is  $2.0 \text{ g/m}^2/\text{month}$ ), which is at inferred background levels as suggested within the EPA publication 1191.







### 3.1.2 Mineral content in dust

The fraction of dust measured as ash content (and considered indicative of the mineral portion of the dust) is presented in Figure 3-2. Spikes (or elevated results in total insoluble matter, as shown in Figure 3-1) corresponded with elevated ash content, suggesting increased total insoluble matter (above 4 g/m<sup>2</sup>.month) was driven by increased deposition of mineral dust.







Figure 3-3 Woodvale Dust Ash Content/Total Insoluble Matter, comparison between 2018 (previous data) and 2021 (current data)

### 3.1.3 Metals/metalloids in dust

Graphical presentation of soluble and insoluble arsenic, barium and manganese concentrations are provided in Appendix B. Insoluble barium, manganese and arsenic concentrations were generally within the historical range (as reported in Q4 2018), with average (mean) insoluble and soluble arsenic, barium and manganese being comparable or lower to the average results reported in Q4 2018.

For the purpose of providing an understanding of total arsenic concentrations measured in dust relative to arsenic concentrations measured in soils in the assessment region, total arsenic is presented as mg/kg (based on the sum of soluble and insoluble arsenic  $\mu$ g/m<sup>2</sup>.month divided by total solids g/m<sup>2</sup>.month), Figure 3-4.



# Figure 3-4 Woodvale total arsenic/total solids (mg/kg) comparison between 2018 (previous data) and 2021 (current data). Asterisk (\*) represents the results where the sample was recorded as less than the limit of reporting ( <x). For the sake of graphical presentation <x has been taken as the value of x.

Total arsenic concentrations in deposited dust, during Q1 and Q2 2021, ranged from 3 to <39 mg/kg, with a mean (average) across all stations for Q1 and Q2 of 10 mg/kg and a median of 9 mg/kg.

There was no consistent pattern of arsenic concentration at any one monitoring station over the time period assessed. The variability in arsenic deposition across the monitoring locations and monitoring events, indicates that arsenic concentrations in dust are likely influenced by multiple factors and are and unlikely to be due to a single point source. Arsenic concentrations in dust (across the 6 month monitoring period) were highest at WVDD04 (mean of 16 mg/kg) and WVDD05 (mean of 14 mg/kg), located east and south east of Pond 7 area, compared to the other monitoring locations.

Assessment of surface soils at properties surrounding the site (from 50 sample locations) suggest median arsenic concentrations in the local area are 10 mg/kg (Senversa 2015a). Concentrations of arsenic in deposited dust (calculated based on total arsenic/total deposited matter) were comparable to reported average arsenic concentrations in local soils (from offsite).

In the absence of human health criteria for arsenic concentrations in deposited dust, a comparison to the soil criteria for human health in a residential land use setting (of 100 mg/kg) is provided. It is emphasised that this is not a health assessment. The reported total arsenic in deposited dust is not a direct measure of concentration of arsenic compounds that may be present in the atmosphere. It is for this reason that care must be taken when interpreting the monitoring data.

### 3.1.4 Woodvale Directional Dust Deposition

Table A2 attached (Appendix A) presents the directional dust deposition results for the site. It is noted that samples collected from directional dust gauges typically give laboratory results that are lower than standards deposited dust gauges. This artefact is a result of the design of the gauges (each gauge has four collection bottles with chocked orifices to regulate the sample collection directional range; four bottles corresponding to four quadrants North, East, South and West).

To assess if the site is likely adding dust (relative to background conditions) a comparative assessment was made between dust deposition rates at upwind and downwind of the site, as measured at monitoring locations WVDD003 (north of the site) and WVDD05 south of the site, using direction dust gauges.

When the wind is blowing from the north WVD003 is considered to be located upwind of the site. Total dust deposition in the north facing quadrant at WVD003 would be considered a proxy of upwind dust, and was subtracted from dust deposition in the north facing quadrant of WWD005 considered downwind of the site.

The results for comparative dust deposition during northly and southerly dust deposition events is shown below (Figure 3-5).

The Q1 and Q2 results suggest a potential net increase in dust deposition rates when the wind is blowing across the site from the south (i.e. southerly winds) but no clear net increase in dust deposition when wind is blowing from the north. The reasons for this disparity is not yet understood and could be due to many environmental or measurement factors such as changes in site topography, the difference in strength of winds from either direction.

The concentration of total arsenic in dust (calculated as total as/ total solids) was also compared upwind and downwind of the site.

During Q1 2021, high variability was reported in net gains and losses in arsenic down wind and upwind of the site. During Q2, low net increases and net losses in arsenic downwind of the site were reported. The current directional results do not clearly indicate that the site is a source of increased arsenic downwind of the site.





Figure 3-5 Net gain or loss in dust deposition (total solids) downwind of the site compared to upwind of the site, for both north facing and south facing gauges.







### 3.2 Review of Quality Assurance and Quality Control

CDM Smith has not reviewed or audited the sampling or analysis methodology and/or equipment or the sampling techniques. We understand that methods and sample locations are generally consistent with those undertaken in 2018 and therefore comparison of results is considered appropriate.

ALS Environmental laboratory is NATA accredited for the analysis undertaken with the exception of analysis of metals/metalloids in dust deposition. CDM Smith has reviewed the internal laboratory quality control measures and notes the following:

- The January 2021 sampling period (from 23/12/2020 to 01/02/2021) was 40 days, which is outside the recommended 30 +/- 2 day window for monthly sampling and may have resulted in increased total dust deposition (i.e. increased deposition duration by 33%).
- The May 2021 sampling period (from 30/04/2021-02/06/2021) was 33 days, which is marginally outside the recommended 30 +/- 2-day window for monthly sampling, and may have resulted in increased total dust deposition (i.e. increased deposition duration by 3.3%).
- 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).

### **Section 4 Summary of Results**

The Q1 and Q2 2021 dust monitoring results for Woodvale Evaporation Ponds are summarised below.

Analysis	Interpretation
Dust Deposition rate	Average dust deposition rate, measured as Total Insoluble matter (across all monitoring stations, from Q1 to Q2 2021) was 2.0 g/m <sup>2</sup> /month, which is at the inferred background level as defined in EPA Publication 1191 (2 g/m <sup>2</sup> /month).
	Dust deposition, measured as Total insoluble Matter at individual sampling locations, met the adopted criteria in 32 of 36 measurements during the Q1 and Q2 2021, assessment period, Figure 3-1. Dust deposition rates exceeded the adopted assessment criteria at three monitoring stations:
	<ul> <li>WVDD01, during March 2021 (5.4 g/m<sup>2</sup>.month) and during June 2021 (19.3 g/m<sup>2</sup>.month).</li> </ul>
	<ul> <li>WVDD03, during May 2021 (5.9 g/m<sup>2</sup>.month).</li> </ul>
	<ul> <li>WVDD06, during June 2021 (4.2 g/m<sup>2</sup>.month).</li> </ul>
Ash Content	The fraction of dust measured as ash content (and considered indicative of the mineral portion of the dust) is presented in Figure 3-2.
	Reported exceedances of dust deposition rate criteria (as measured by total insoluble matter) during Q1 and Q2 2021, corresponded with elevated ash content, suggesting increased total insoluble matter (above 4 g/m <sup>2</sup> .month) was driven by increased deposition of mineral dust rather than increased deposition of organic materials.
Arsenic Content	Arsenic concentrations (on average) in the soluble fraction and insoluble fraction were within (or less than) historical results, as reported in Q4 2018. Concentrations of arsenic in deposited dust (calculated based on total arsenic/total deposited matter) were comparable to reported average arsenic concentrations in local surface soils (from offsite).
Barium Content	Barium concentrations (soluble and insoluble faction) were generally within historical ranges (as measured in Q4 2018).
Manganese Content	Manganese (soluble and insoluble faction) were generally within historical ranges (as measured in Q4 2018).

Table 4-1Summary of Results

The results are discussed with regard to addressing the following key questions:

Did the dust deposition rates, reported in Q1 and Q2 of 2021, exceed the adopted dust deposition criteria of 4 g/m<sup>2</sup>.month (measured as total insoluble matter)?

On average the dust deposition rate (2.0 g/m<sup>2</sup>.month) is comparable to the inferred background levels (2 g/m<sup>2</sup>.month).

At individual sampling locations, four of the 36 measurements reported, dust deposition at a rate above the adopted criteria of 4 g/m<sup>2</sup>.month. Three of four of these measurements are at different monitoring points; WVDD01, during March 2021 (5.4 g/m<sup>2</sup>.month) and during June 2021 (19.3 g/m<sup>2</sup>.month), WVDD03, during May 2021 (5.9 g/m<sup>2</sup>.month), and WVDD06, during June 2021 (4.2 g/m<sup>2</sup>.month).

Is dust deposition greater downwind of Woodvale Evaporation Ponds (compared to upwind of the ponds)?

The results suggest a potential net increase in dust deposition rates north of the site (when the wind is blowing across the site from the south) but no net increase in dust deposition was observed when wind is blowing from the north. The reasons for this disparity is not yet understood and could be due many environmental or measurement factors. Further monitoring would be needed to understand if the observed net increase north of the site is representative of a long term trend or representative of short term variability in results.

Are dust deposition rates reported in Q1 and Q2 of 2021 comparable to available historic results in this area?



On average dust deposition rates recorded in Q1 and Q2 2021 were lower than historic dust deposition rates recorded from the same monitoring locations in Q4 2018.

Arsenic is considered a key contaminant of concern at the site (Peter Ramsay 2018). To assist in the review of the monitoring results for arsenic, in regards to risk to the surrounding areas the following questions were posed.

• Are arsenic concentrations reported in deposited dust in Q1 and Q2 of 2021 comparable to available historic results in this area?

Total arsenic concentration and insoluble fraction of arsenic in dust collected during Q1 and Q2 2021 were within the historic ranges, reported in Q4 2018.

Total arsenic concentrations in deposited dust, during Q1 and Q2 2021, ranged from 3 to <39 mg/kg, with a median across all stations for Q1 and Q2 of 9 mg/kg. Concentrations of arsenic in deposited dust (calculated based on total arsenic/total deposited matter) were comparable to reported average arsenic concentrations in local soils (from offsite), median of 10 mg/kg (Senversa, 2015a).

In the absence of human health criteria for arsenic concentrations in deposited dust, a comparison to the soil criteria for human health in a residential land use setting (of 100 mg/kg) is provided. It is emphasised that this is not a health assessment. The reported total arsenic in deposited dust is not a direct measure of concentration of arsenic compounds that may be present in the atmosphere. It is for this reason that care must be taken when interpreting the monitoring data.

Is the concentration of arsenic in dust greater downwind of Woodvale Evaporation Ponds (compared to upwind of the ponds)?

During Q1 2021 high variability was reported in net gains and losses in arsenic downwind of the site. During Q2, low net increases and net losses in arsenic downwind of the site were reported. The current directional dust deposition results do not clearly indicate that the site is a source of increased arsenic downwind of the site (as measured north and south of the site).



### **Section 5 Further Considerations**

CDM Smith has not reviewed or audited the sampling or analysis practices, methodology or equipment. We understand that methods and sample locations applied in Q1 2021 are generally consistent with those undertaken in Q4 2018 and therefore comparison of results is considered appropriate.

The quality and representativeness of data collected is dependent on the sampling approach, sampling methods and the applied quality assurance and quality control (QA/QC) measures. National and Victorian guidance provides information on appropriate sampling techniques and QA/QC practices. It is a Victorian Government requirement that ambient air quality monitoring, sampling and analysis is conducted by a NATA accredited laboratory.



### **Section 6 References**

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Victorian Government (2021), Environment Protection Act 2017, Environment Reference Standard, Victorian Government Gazette, No. S 245, 26 May 2021



### **Section 7 Disclaimer and Limitations**

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If further information becomes available, or additional assumptions need to be made, CDM Smith reserves its right to amend this report.



# **Appendix A Tables**

Arsenic	Barium	Manganese	Total Solids	Ash Content	Ash Content (mg)	Combustible Matter	Combustible Matter (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Solids (mg)	Total Soluble Matter	Total Soluble Matter (mg)
µg/m².month	µg/m².month	µg/m².month	g/m².month	g/m².month	mg	g/m².month	mg	g/m².month	mg	mg	g/m².month	mg
				0.1	1		1	0.1	1	1	0.1	1
4.13	82	150	-	-	-	-	-	-	-	-	-	-
<12	<83	<244	-	-	-	-	-	-	-	-	-	-
5.24	<51	91.7	-	-	-	-	-	-	-	-	-	-
<1.8	77.7	48.3	-	-	-	-	-	-	-	-	-	-
4.25	F0 9	60.2										

	4	ш
	µg/m².month	µg/m².month
QL		

Description	Location	Quarter	Month	Lab Report Number													
WVDD01 (Insoluble)	WVDD01	Q4 2018	Oct-18	Kralcopic_Historic	4.13	82	150	-	-	-	-	-	-	-	-	-	-
			Nov-18	Kralcopic Historic	<12	<83	<244	-	-	-	-	-	-	-	-	-	-
			Dec-18	Kralcopic Historic	5.24	<51	91.7	-	-	-	-	-	-	-	-	-	-
		01 2021	lan-21	EM2101404	<1.8	77.7	48.3	-	-	-	-	-	-	-	-	-	-
		~~~~~	Feb-21	EM2103691	4 25	59.8	69.3	-	-	-	-	-	-	-	-	_	-
			Mar-21	EM2105891	11.6	1 360	245										
		02 2021	Apr 21	EM2103031	2 70	416	127										
		Q2 2021	Apr-21	EM2107370	3.70	410	02.0	-	-	-	-	-	-	-	-	-	-
			Iviay-21	EM2110737	3.50	<04.0	95.9	-	-	-	-	-	-	-	-	-	-
			Jun-21	EM2112733	85.6	<2,340	2,240	-	-	-	-	-	-	-	-	-	-
WVDD01 (Soluble)	WVDD01	Q4 2018	Oct-18		40.5	57.7	154	-	-	-	-	-	-	-	-	-	-
			Nov-18	Kralcopic_Historic	8.96	367	1,140	-	-	-	-	-	-	-	-	-	-
			Dec-18	Kralcopic_Historic	9.94	227	713	-	-	-	-	-	-	-	-	-	-
		Q1 2021	Jan-21	EM2101404	22.8	312	1,570	-	-	-	-	-	-	-	-	-	-
			Feb-21	EM2103691	3.06	184	294	-	-	-	-	-	-	-	-	-	-
			Mar-21	EM2105891	27.7	306	492	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	EM2107970	3.48	279	281	-	-	-	-	-	-	-	-	-	-
			May-21	EM2110737	3.42	110	273	-	-	-	-	-	-	-	-	-	-
			Jun-21	EM2112733	108	1,750	2,580	-	-	-	-	-	-	-	-	-	-
WVDD01 (Ash)	WVDD01	Q4 2018	Oct-18	Kralcopic_Historic	-	-	-										
			Nov-18	Kralcopic_Historic	-	-	-										
			Dec-18	Kralcopic Historic	-	-	-										
		O1 2021	Jan-21	EM2101404	<1.8	58.3	28.2										
		~	Feb-21	EM2103691	3.11	60.0	45.6										
			Mar-21	EM2105891	9.11	819	204										
		02 2021	Apr-21	EM2107970	3 19	223	102										
		QZ 2021	Apr-21 May 21	EM210737	2.64	-64.6	102										
			lviay-21	EN42110737	2.04	<04.0	45.1										
MA/DD01		04 2018	Jun-21		05.8	<2,540	1,090	Γ.4	0.4		2.2		2.6			2.0	
		Q4 2018	000-18					5.4	0.4	-	2.2	-	2.0	-	-	2.8	-
			NOV-18	Kraicopic_Historic				4.3	0.6	-	1.1	-	1.7	-	-	2.6	-
			Dec-18					6.8	0.4	-	0.7	-	1.1	-	-	5.7	-
		Q1 2021	Jan-21	EM2101404				2.5	0.3	/	1.3	31	1.6	38	59	0.9	21
			Feb-21	EM2103691				1.6	0.1	2	0.9	16	1.0	18	29	0.6	11
			Mar-21	EM2105891				7.5	0.9	16	4.5	76	5.4	92	128	2.1	36
		Q2 2021	Apr-21	EM2107970				2.4	0.2	4	0.7	12	0.9	16	41	1.5	25
			May-21	EM2110737				0.6	0.2	3	0.3	6	0.5	9	10	0.1	1
			Jun-21	EM2112733				32.5	5.4	90	13.9	228	19.3	318	535	13.2	217
WVDD02 (Insoluble)	WVDD02	Q4 2018	Oct-18	Kralcopic_Historic	<14	<211	<425	-	-	-	-	-	-	-	-	-	-
			Nov-18	Kralcopic_Historic	<18	<136	<318	-	-	-	-	-	-	-	-	-	-
			Dec-18	Kralcopic_Historic	52.3	<112	<206	-	-	-	-	-	-	-	-	-	-
		Q1 2021	Jan-21	EM2101404	7.96	27.3	44.5	-	-	-	-	-	-	-	-	-	-
			Feb-21	EM2103691	6.97	<87.2	78.6	-	-	-	-	-	-	-	-	-	-
			Mar-21	EM2105891	7.41	75.6	71.8	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	EM2107970	<8.6	159	50.3	-	-	-	-	-	-	-	-	-	-
			May-21	EM2110737	3.11	<56.6	86.3	-	-	-	-	-	-	-	-	-	-
			Jun-21	EM2112733	2.67	<65.1	50.2	-	-	-	-	-	-	-	-	-	-
WVDD02 (Soluble)	WVDD02	O4 2018	Oct-18	Kralcopic Historic	51.3	180	1.400	-	-	-	-	-	-	-	-	-	-
			Nov-18	Kralcopic Historic	177	255	1.060	-	-	-	-	-	-	_	-	-	-
			Dec-18	Kralcopic Historic	27.5	259	832	-	-	-	-	-	-	_	-	-	-
		01 2021	lan 21	EM2101404	<0.05	/52	1 010									_	
		Q1 2021	Jall-21	EM2102404	2 20	455	206	-	-	-	-		-	-		-	-
			reb-21	EIVI2103091	5.29	205	290	-	-	-	-	-	-	-	-	-	-
		02.2024	iviar-21	EIVI2105891	12.3	2/1	435	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	EWI210/9/0	3.59	186	266	-	-	-	-	-	-	-	-	-	-
			May-21	EM2110737	2.10	68.0	237	-	-	-	-	-	-	-	-	-	-
			Jun-21	EM2112733	43.7	87.1	222	-	-	-	-	-	-	-	-	-	-



Arsenic	Barium	Manganese	Total Solids	Ash Content	Ash Content (mg)	Combustible Matter	Combustible Matter (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Solids (mg)	Total Soluble Matter	Total Soluble Matter (mg)
μg/m².month	μg/m².month	μg/m².month	g/m².month	g/m².month	mg	g/m².month	mg	g/m².month	mg	mg	g/m².month	mg
				0.1	T		L	0.1	1	1	0.1	1
-	-	-										
-	-	-										
- 5.91	26.2	- 19.9										
5.07	<87.2	58.4										
5.55	44.4	39.3										
<8.6	89.4	27.3										
1.93	<56.6	46.5										
2.07	<05.1	50.0	8.4	0.9	-	2.5	-	3.4	-	-	5	-
			9.5	0.8	-	1.8	-	2.6	-	-	6.9	-
			10.8	0.7	-	1.7	-	2.4	-	-	8.4	-
			5.4	0.2	6	1.3	30	1.5	36	128	3.9	92
			1.6	0.3	5	1.0	18 22	1.3	23	29 80	0.3	6
			1.2	0.2	2	0.7	12	0.8	14	20	0.4	6
			0.4	0.1	2	0.2	2	0.3	5	8	0.1	3
			3.5	0.1	2	0.1	2	0.2	4	58	3.3	54
134	<180	<319	-	-	-	-	-	-	-	-	-	-
12.8	156	333	-	-	-	-	-	-	-	-	-	-
<6.96	<35.2	67.3	-	-	-	-	-	-	-	-	-	-
<8.6	<71.2	64.2	-	-	-	-	-	-	-	-	-	-
2.86	56.7	46.3	-	-	-	-	-	-	-	-	-	-
6.23	203	75.6	-	-	-	-	-	-	-	-	-	-
21.3	<691	753	-	-	-	-	-	-	-	-	-	-
427	343	1 410	-	-	-	-	-	-	-	-	-	-
14.3	936	1,030	-	-	-	-	-	-	-	-	-	-
12.1	775	1,460	-	-	-	-	-	-	-	-	-	-
< 0.05	1,470	603	-	-	-	-	-	-	-	-	-	-
2.84	156	344	-	-	-	-	-	-	-	-	-	-
19.4	410	1,620	-	-	-	-	-	-	-	-	-	-
18.9	658	1,700	-	-	-	-	-	-	-	-	-	-
49.8	412	924	-	-	-	-	-	-	-	-	-	-
-	-	-										
-	-	-										
<6.96	<35.2	- 51.7										$\vdash$
<8.60	<71.2	37.1										
2.43	51.8	35.6										
4.29	115	53.0										
17.9 8 aa	<691	622 276										<u> </u>
0.55	1040	270	8.2	0.8	-	2.7	-	3.5	-	-	4.7	-
			4.8	0.6	-	1.2	-	1.8	-	-	3	-
			7.7	0.5	-	0.9	-	1.4	-	-	6.3	-
			4.1	0.3	7	1.5	35	1.8	42	97	2.3	55
			1.3 5 2	0.2	ડ ર	0.9	10 18	1.1	19 21	90	<u> </u>	5 69
			3.1	0.2	3	1.0	17	1.2	20	53	1.9	33
			6.4	1.4	26	4.5	88	5.9	114	124	0.5	10
			5.3	0.7	11	1.6	27	2.3	38	87	3.0	49
315	<476	<896	-	-	-	-	-	-	-	-	-	-
35.3	71.6	182	-	-	-	-	-	-	-	-	-	-
15.7	31.0	59.6	-	-	-	-	-	-	-	-	-	-
29.6	<137	86.6	-	-	-	-	-	-	-	-	-	-
3.91	31.7	40.8	-	-	-	-	-	-	-	-	-	-
11.1	<111	<51.5	-	-	-	-	-	-	-	-	-	-
<5.10 13 1	<118	90.9	-	-	-	-	-	-	-	-	-	-
10.1	101.0											

					υ υ υ υ υ υ υ υ υ υ υ υ υ υ υ υ υ υ υ	Ε  gg μg/m².month	es es au gau g μg/m².month	Total Solids g/m².month	tunto Syncontent g/m².month	3 Ash Content (mg)	Combustible Matter g/m <sup>2</sup> .month	Ecombustible Matter (mg)	Total Insoluble Matter <sup>2</sup> /m <sup>2</sup>	Total Insoluble Matter (mg)	ਤੋਂ Total Solids (mg)	Total Soluble Matter g/m <sup>2</sup> .month	Total Soluble Matter (mg)
EQL									0.1	1		1	0.1	1	1	0.1	1
Description	Location	Quarter	Month	Lab Report Number													
WVDD02 (Ash)	WVDD02	Q4 2018	Oct-18	Kralcopic_Historic	-	-	-										
			Nov-18	Kralcopic_Historic	-	-	-										<u> </u>
		01 2021	Dec-18	Kralcopic_Historic	- 5.91	- 26.2	- 19.9										
		Q1 2021	Feb-21	EM2103691	5.07	<87.2	58.4										
			Mar-21	EM2105891	5.55	44.4	39.3										
		Q2 2021	Apr-21	EM2107970	<8.6	89.4	27.3										<u> </u>
			May-21	EM2110737 FM2112733	1.93	<56.6	46.5										
WVDD02	WVDD02	Q4 2018	Oct-18	Kralcopic_Historic	2.07	<0J.1	50.0	8.4	0.9	-	2.5	-	3.4	-	-	5	-
			Nov-18	Kralcopic_Historic				9.5	0.8	-	1.8	-	2.6	-	-	6.9	-
			Dec-18	Kralcopic_Historic				10.8	0.7	-	1.7	-	2.4	-	-	8.4	-
		Q1 2021	Jan-21	EM2101404				5.4	0.2	6	1.3	30	1.5	36	128	3.9	92
			Mar-21	EM2105891				5.2	0.2	3	1.0	23	1.5	26	89	3.7	63
		Q2 2021	Apr-21	EM2107970				1.2	0.1	2	0.7	12	0.8	14	20	0.4	6
			May-21	EM2110737				0.4	0.1	2	0.2	2	0.3	5	8	0.1	3
W///DD02 (Incolubio)		04 2019	Jun-21	EM2112733	124	~190	~210	3.5	0.1	2	0.1	2	0.2	4	58	3.3	54
	WVDD03	Q4 2018	Nov-18	Kralcopic_Historic	12.8	156	333	-	-	-	-	-	-	-	-	-	-
			Dec-18	Kralcopic_Historic	7.73	55.5	123	-	-	-	-	-	-	-	-	-	-
		Q1 2021	Jan-21	EM2101404	<6.96	<35.2	67.3	-	-	-	-	-	-	-	-	-	-
			Feb-21	EM2103691	<8.6	<71.2	64.2	-	-	-	-	-	-	-	-	-	-
		02 2021	Mar-21	EM2105891 EM2107970	2.86	203	46.3	-	-	-	-	-	-	-	-	-	-
		QZ 2021	May-21	EM210737	21.3	<691	753	-	-	-	-	-	-	-	-	-	-
			Jun-21	EM2112733	12.4	<343	358	-	-	-	-	-	-	-	-	-	-
WVDD03 (Soluble)	WVDD03	Q4 2018	Oct-18	Kralcopic_Historic	427	370	1,410	-	-	-	-	-	-	-	-	-	-
			Nov-18	Kralcopic_Historic	14.3	936	1,030	-	-	-	-	-	-	-	-	-	-
		01 2021	Jan-21	EM2101404	<0.05	1.470	603	-	-	-	-	-	-	-	-	-	-
		~~~~~	Feb-21	EM2103691	2.84	156	344	-	-	-	-	-	-	-	-	-	-
			Mar-21	EM2105891	19.4	1,080	1,620	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	EM2107970	8.87	410	853	-	-	-	-	-	-	-	-	-	-
			May-21	EM2110737 FM2112733	18.9	658 412	1,700	-	-	-	-	-	-	-	-	-	-
WVDD03 (Ash)	WVDD03	Q4 2018	Oct-18	Kralcopic_Historic	-	-	-										
			Nov-18	Kralcopic_Historic	-	-	-										
			Dec-18	Kralcopic_Historic	-	-	-										
		Q1 2021	Jan-21	EM2101404	<6.96	<35.2	51.7										┥──┤
			Mar-21	EM2105891	2.43	51.8	35.6										+
		Q2 2021	Apr-21	EM2107970	4.29	115	53.0										
			May-21	EM2110737	17.9	<691	622										
		04 2019	Jun-21	EM2112733 Kralconic Historic	8.99	<343	276	<b>Q</b> 2	0.0		2 7		2 5			17	<u>+                                    </u>
	WV DD03	Q4 2018	Nov-18	Kralcopic_Historic				4.8	0.8	-	1.2	-	1.8	-	-	4.7	-
			Dec-18	Kralcopic_Historic				7.7	0.5	-	0.9	-	1.4	-	-	6.3	-
		Q1 2021	Jan-21	EM2101404				4.1	0.3	7	1.5	35	1.8	42	97	2.3	55
			Feb-21	EM2103691				1.3	0.2	3	0.9	16	1.1	19	22	0.2	3
		02 2021	Apr-21	EM2107970				5.2 3.1	0.2	3	1.0	18	1.2	21	90 53	4.0	33
			May-21	EM2110737				6.4	1.4	26	4.5	88	5.9	114	124	0.5	10
			Jun-21	EM2112733				5.3	0.7	11	1.6	27	2.3	38	87	3.0	49
WVDD04 (Insoluble)	WVDD04	Q4 2018	Oct-18	Kralcopic_Historic	315	<476	<896	-	-	-	-	-	-	-	-	-	-
			Nov-18	Kralcopic_Historic	<87	135	<227	-	-	-	-	-	-	-	-	-	-
		Q1 2021	Jan-21	EM2101404	15.7	31.0	59.6	-	-	-	-	-	-	-	-	-	-
			Feb-21	EM2103691	29.6	<137	86.6	-	-	-	-	-	-	-	-	-	-
			Mar-21	EM2105891	3.91	31.7	40.8	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	EM2107970	11.1	<111	<51.5	-	-	-	-	-	-	-	-	-	-
			May-21	EWI2110/3/	<5.10	<118	90.9	-	-	-	-	-	-	-	-	-	
			5011-21		13.1	(01.5	1 110	_	_		_		-				

FOI					υ se se y μg/m².month	μg/m².month	es es gau gau gau gau μg/m².month	g/m².month	tu By Content g/m².month	고 Bah Content (mg)	Combustible Matter g/m <sub>5</sub> -wouth	Combustible Matter	g/m <sup>2</sup> .month	Total Insoluble Matter (mg)	Total Solids (mg)	g/m <sup>2</sup> .month	Total Soluble Matter (mg)
									0.1	<u> </u>		1	0.1	-	-	0.1	
Description	Location	Quarter	Month	Lab Report Number	1	ſ	1	1	-			_					<b></b>
WVDD02 (Ash)	WVDD02	Q4 2018	Oct-18	Kralcopic_Historic	-	-	-									<b></b>	
			NOV-18 Dec-18		-	-	-										+
		Q1 2021	Jan-21	EM2101404	5.91	26.2	19.9										
			Feb-21	EM2103691	5.07	<87.2	58.4										
			Mar-21	EM2105891	5.55	44.4	39.3										
		Q2 2021	Apr-21	EM2107970	<8.6	89.4	27.3										<u> </u>
			May-21	EM2110737	1.93	<56.6	46.5									i	
WVDD02	WVDD02	04 2018	Oct-18	Kralcopic Historic	2.07	<0J.1	50.0	8.4	0.9	-	2.5	-	3.4	-	-	5	-
		Q+ 2010	Nov-18	Kralcopic_Historic				9.5	0.8	-	1.8	-	2.6	-	-	6.9	-
			Dec-18	Kralcopic_Historic				10.8	0.7	-	1.7	-	2.4	-	-	8.4	-
		Q1 2021	Jan-21	EM2101404				5.4	0.2	6	1.3	30	1.5	36	128	3.9	92
			Feb-21	EM2103691				1.6	0.3	5	1.0	18	1.3	23	29	0.3	6
		02 2021	Mar-21	FM2105891				5.2	0.2	3	1.3 0.7	23 12	1.5 0.8	26	89 20	3./	6
		Q2 2021	Mav-21	EM210737				0.4	0.1	2	0.2	2	0.3	5	8	0.1	3
			Jun-21	EM2112733				3.5	0.1	2	0.1	2	0.2	4	58	3.3	54
WVDD03 (Insoluble)	WVDD03	Q4 2018	Oct-18	Kralcopic_Historic	134	<180	<319	-	-	-	-	-	-	-	-	-	-
			Nov-18	Kralcopic_Historic	12.8	156	333	-	-	-	-	-	-	-	-	-	-
		01 2021	Dec-18	Kralcopic_Historic	7.73	55.5	123	-	-	-	-	-	-	-	-	-	-
		Q1 2021	Jan-21 Feb-21	EM2101404	< 8.6	<35.2	64.2	-	-	-	-	-	-	-	-	-	-
			Mar-21	EM2105891	2.86	56.7	46.3	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	EM2107970	6.23	203	75.6	-	-	-	-	-	-	-	-	-	-
			May-21	EM2110737	21.3	<691	753	-	-	-	-	-	-	-	-	-	-
			Jun-21	EM2112733	12.4	<343	358	-	-	-	-	-	-	-	-	-	-
WVDD03 (Soluble)	WVDD03	Q4 2018	Oct-18	Kralcopic_Historic	427	370	1,410	-	-	-	-	-	-	-	-	-	-
			Dec-18	Kralcopic_Historic	14.5	775	1,030	-	-	-	-	-	-	-	-	-	-
		Q1 2021	Jan-21	EM2101404	< 0.05	1,470	603	-	-	-	-	-	-	-	-	-	-
			Feb-21	EM2103691	2.84	156	344	-	-	-	-	-	-	-	-	-	-
			Mar-21	EM2105891	19.4	1,080	1,620	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	EM2107970	8.87	410	853	-	-	-	-	-	-	-	-	-	-
			May-21	EM2110737	18.9	658	1,700	-	-	-	-	-	-	-	-	-	-
WVDD03 (Ash)	WVDD03	04 2018	Oct-18	Kralcopic Historic	-	-	-	-	-	-	-	-	-	-	-		
			Nov-18	Kralcopic_Historic	-	-	-										+
			Dec-18	Kralcopic_Historic	-	-	-										
		Q1 2021	Jan-21	EM2101404	<6.96	<35.2	51.7										
			Feb-21	EM2103691	<8.60	<71.2	37.1										<b></b>
		02 2021	Apr-21	EN2105891	2.43 <u>4</u> 29	51.8 115	35.0 53.0										╂───┤
			May-21	EM2110737	17.9	<691	622										++
			Jun-21	EM2112733	8.99	<343	276										
WVDD03	WVDD03	Q4 2018	Oct-18	Kralcopic_Historic				8.2	0.8	-	2.7	-	3.5	-	-	4.7	-
			Nov-18	Kralcopic_Historic				4.8	0.6	-	1.2	-	1.8	-	-	3	-
		01 2021	Dec-18	Kraicopic_Historic				/./	0.5	- 7	0.9	- 35	1.4	-	- 97	b.3	- 55
		QI 2021	Feb-21	EM2101404				1.3	0.3	3	0.9	16	1.8	19	22	0.2	3
			Mar-21	EM2105891				5.2	0.2	3	1.0	18	1.2	21	90	4.0	69
		Q2 2021	Apr-21	EM2107970				3.1	0.2	3	1.0	17	1.2	20	53	1.9	33
			May-21	EM2110737				6.4	1.4	26	4.5	88	5.9	114	124	0.5	10
	14/1/0004	04 2010	Jun-21	EM2112733	215	<a7c< td=""><td>-900</td><td>5.3</td><td>0.7</td><td>11</td><td>1.6</td><td>27</td><td>2.3</td><td>38</td><td>87</td><td>3.0</td><td>49</td></a7c<>	-900	5.3	0.7	11	1.6	27	2.3	38	87	3.0	49
wvbbb4 (Insoluble)	WVDD04	Q4 2018	Oct-18	Kralcopic_Historic	315	<476 135	<896	-	-	-	-	-	-	-	-	-	
			Dec-18	Kralcopic_Historic	35.3	71.6	182	-	-	-	-	-	-	-	-	-	-
		Q1 2021	Jan-21	EM2101404	15.7	31.0	59.6	-	-	-	-	-	-	-	-	-	-
			Feb-21	EM2103691	29.6	<137	86.6	-	-	-	-	-	-	-	-	-	-
			Mar-21	EM2105891	3.91	31.7	40.8	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	EM2107970	11.1	<111	<51.5	-	-	-	-	-	-	-	-	-	-
			lun-21	FM2110737	13.1	<118	90.9	-	-	-	-	-	-	-	-	-	
			2011/21		10.1	-O1.5	110										



Arsenic	Barium	Manganese	Total Solids	Ash Content	Ash Content (mg)	Combustible Matter	Combustible Matter (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Solids (mg)	Total Soluble Matter	Total Soluble Matter (mg)
µg/m².month	µg/m².month	µg/m².month	g/m².month	g/m².month	mg	g/m².month	mg	g/m².month	mg	mg	g/m².month	mg
				0.1	1		1	0.1	1	1	0.1	1

	Arse	Bariu	Man	
	µg/m².month	µg/m².month	µg/m².month	g
EQL				

Description	Location	Quarter	Month	Lab Report Number													
WVDD04 (Soluble)	WVDD04	04 2018	Oct-18	Kralcopic Historic	53.2	302	1.220	-	-	-	-	-	-	-	-	-	-
		2	Nov-18	Kralcopic Historic	25.8	864	1.120	-	-	-	-	-	-	-	-	-	-
			Dec-18	Kralcopic Historic	11.4	748	844	-	-	-	-	-	-	-	-	-	-
		01 2021	lan-21	EM2101404	2.89	727	1.070	-	-	-	-	-	-	-	-	-	-
			Feb-21	EM2103691	13.8	104	514	-	-	-	-	-	-	-	-	-	-
			Mar-21	EM2105891	13.1	96.0	139	-	-	-	-	-	-	-	-	-	-
		02 2021	Apr-21	EM2107970	20.75	94.7	355	-	-	-	-	-	-	-	-	-	-
		Q	May-21	EM2110737	18.5	192	519	-	-	-	-	-	-	-	-	-	-
			lun-21	FM2112733	126	241	992	-	-	-	-	-	-	-	-	-	-
WVDD04 (Ash)	WVDD04	04 2018	Oct-18	Kralcopic Historic	-	-	-										
		2.2020	Nov-18	Kralcopic Historic	-	-	-										
			Dec-18	Kralcopic Historic	-	-	-										
		01 2021	Jan-21	EM2101404	10.2	28.3	32.3										
		~	Feb-21	EM2103691	24.4	<137	86.5										
			Mar-21	EM2105891	2.29	30.9	23.5										
		Q2 2021	Apr-21	EM2107970	10.4	<111	<51.5										
			Mav-21	EM2110737	<5.10	<117	70.3										
			Jun-21	EM2112733	4.90	<81.9	84.2										
WVDD04	WVDD04	Q4 2018	Oct-18	Kralcopic Historic				9	1.2	-	3.6	-	4.8	-	-	4.2	-
	_		Nov-18	Kralcopic Historic				6.4	1	-	2.7	-	3.7	-	-	2.7	-
			Dec-18	Kralcopic_Historic				5.2	0.5	-	1.1	-	1.6	-	-	3.6	-
		Q1 2021	Jan-21	EM2101404				2.7	0.2	4	0.9	21	1.1	25	62	1.6	37
			Feb-21	EM2103691				5.1	0.6	10	2.2	40	2.8	50	90	2.3	40
			Mar-21	EM2105891				4.7	<0.1	1	1.4	24	1.5	25	80	3.2	55
		Q2 2021	Apr-21	EM2107970				2.1	0.3	4	0.9	16	1.2	20	36	0.9	16
			May-21	EM2110737				0.6	0.2	4	0.4	8	0.6	12	13	<0.1	1
			Jun-21	EM2112733				5.5	0.1	2	0.6	9	0.7	11	90	4.8	79
WVDD05 (Insoluble)	WVDD05	Q4 2018	Oct-18	Kralcopic_Historic	<55	<120	<210	-	-	-	-	-	-	-	-	-	-
			Nov-18	Kralcopic_Historic	<21	<118	<255	-	-	-	-	-	-	-	-	-	-
			Dec-18	Kralcopic_Historic	<10	<93	127	-	-	-	-	-	-	-	-	-	-
		Q1 2021	Jan-21	EM2101404	5.14	37.9	66.4	-	-	-	-	-	-	-	-	-	-
			Feb-21	EM2103691	5.89	<61.1	54.3	-	-	-	-	-	-	-	-	-	-
			Mar-21	EM2105891	18.6	<78.6	95.4	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	EM2107970	14.5	156	<53.9	-	-	-	-	-	-	-	-	-	-
			May-21	EM2110737	3.41	<66.4	54.3	-	-	-	-	-	-	-	-	-	-
		_	Jun-21	EM2112733	2.60	<65.6	45.9	-	-	-	-	-	-	-	-	-	-
WVDD05 (Soluble)	WVDD05	Q4 2018	Oct-18	Kralcopic_Historic	7.27	432	803	-	-	-	-	-	-	-	-	-	-
			Nov-18	Kralcopic_Historic	15.49	331	1,140	-	-	-	-	-	-	-	-	-	-
			Dec-18	Kralcopic_Historic	12.9	270	842	-	-	-	-	-	-	-	-	-	-
		Q1 2021	Jan-21	EM2101404	< 0.05	637	393	-	-	-	-	-	-	-	-	-	-
			Feb-21	EM2103691	17.9	107	334	-	-	-	-	-	-	-	-	-	-
		00.0004	Mar-21	EMI2105891	53.4	16/	685	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	EM2107970	98.7	131	341	-	-	-	-	-	-	-	-	-	-
			Iviay-21	EIVI2110/3/	4.14	114	291	-	-	-	-	-	-	-	-	-	-
		04 2019	Oct 19	Kralconic Historic	47.0	104	433	-	-	-	-	-	-	-	-	-	-
		Q4 2010	Nov 19	Kralconic Historic	-	-	-			+							+
			Dec-19	Kralconic Historic			-										+
		01 2021	lan_21	FM2101404	4.40	36.3	28.7										
		Q1 2021	Feb-21	FM2103691	4.31	<61.1	50.2										+
			Mar-21	EM2105891	11.7	<78.6	83.2										
		02 2021	Apr-21	EM2107970	13.2	115	<53.9										
		~~~~~	May-21	EM2110737	3.16	<66.4	38.8										
			Jun-21	EM2112733	2.28	<65.6	44.5										
WVDD05	WVDD05	Q4 2018	Oct-18	Kralcopic Historic				4	0.5	-	1.2	-	1.7	-	-	2.3	-
			Nov-18	Kralcopic Historic	1			6.2	0.8	-	1.4	-	2.2	-	-	4	-
			Dec-18	Kralcopic Historic	1			6.7	0.5	-	1.1	-	1.6	-	-	5.1	-
		Q1 2021	Jan-21	EM2101404	1			2.6	0.2	6	0.5	14	0.8	20	63	1.8	43
		, <b>-</b>	Feb-21	EM2103691	1			2.7	0.2	3	1.0	18	1.2	21	47	1.5	26
			Mar-21	EM2105891	1			5.4	0.6	10	2.3	39	2.9	49	91	2.5	42
		Q2 2021	Apr-21	EM2107970	1			3.2	0.3	6	0.8	12	1.1	18	54	2.1	36
			May-21	EM2110737				0.6	0.2	3	0.2	5	0.4	8	12	0.2	4
			Jun-21	EM2112733	1			5.1	0.1	2	0.1	2	0.2	4	85	4.9	81
			-											-			



Arsenic	Barium	Manganese	Total Solids	Ash Content	Ash Content (mg)	Combustible Matter	Combustible Matter (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Solids (mg)	Total Soluble Matter	Total Soluble Matter (mg)
µg/m².month	µg/m².month	µg/m².month	g/m².month	g/m².month	mg	g/m².month	mg	g/m².month	mg	mg	g/m².month	mg
				0.1	1		1	0.1	1	1	0.1	1

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EQL	

Description	Location	Quarter	Month	Lab Report Number													
WVDD06 (Insoluble)	WVDD06	Q4 2018	Oct-18	Kralcopic_Historic	<17	<470	<564	-	-	-	-	-	-	-	-	-	-
			Nov-18	Kralcopic_Historic	<36	<252	<397	-	-	-	-	-	-	-	-	-	-
			Dec-18	Kralcopic_Historic	140	<1,270	<722	-	-	-	-	-	-	-	-	-	-
		Q1 2021	Jan-21	EM2101404	<5.80	<64.9	86.2	-	-	-	-	-	-	-	-	-	-
			Feb-21	EM2103691	3.70	<60.0	63.8	-	-	-	-	-	-	-	-	-	-
			Mar-21	EM2105891	8.72	132	122	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	EM2107970	7.71	117	91.0	-	-	-	-	-	-	-	-	-	-
			May-21	EM2110737	8.08	173	130	-	-	-	-	-	-	-	-	-	-
			Jun-21	EM2112733	<16.6	<551	225	-	-	-	-	-	-	-	-	-	-
WVDD06 (Soluble)	WVDD06	Q4 2018	Oct-18	Kralcopic_Historic	30.2	547	1,030	-	-	-	-	-	-	-	-	-	-
			Nov-18	Kralcopic_Historic	200	1,120	1,940	-	-	-	-	-	-	-	-	-	-
			Dec-18	Kralcopic_Historic	925	1,860	3,320	-	-	-	-	-	-	-	-	-	-
		Q1 2021	Jan-21	EM2101404	< 0.05	1,160	751	-	-	-	-	-	-	-	-	-	-
			Feb-21	EM2103691	4.59	209	369	-	-	-	-	-	-	-	-	-	-
			Mar-21	EM2105891	11.9	1,100	688	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	EM2107970	10.1	203	361	-	-	-	-	-	-	-	-	-	-
			May-21	EM2110737	7.77	351	387	-	-	-	-	-	-	-	-	-	-
			Jun-21	EM2112733	131	714	1,430	-	-	-	-	-	-	-	-	-	-
WVDD06 (Ash)	WVDD06	Q4 2018	Oct-18	Kralcopic_Historic	-	-	-										
			Nov-18	Kralcopic_Historic	-	-	-										
			Dec-18	Kralcopic_Historic	-	-	-										
		Q1 2021	Jan-21	EM2101404	<5.80	<64.9	64.9										
			Feb-21	EM2103691	3.05	<60.0	47.9										
			Mar-21	EM2105891	6.33	76.0	78.7										
		Q2 2021	Apr-21	EM2107970	5.35	71.6	64.5										
			May-21	EM2110737	6.14	158	75.5										
			Jun-21	EM2112733	<16.6	<551	226										
WVDD06	WVDD06	Q4 2018	Oct-18	Kralcopic_Historic				8.6	1.1	-	4.6	-	5.7	-	-	2.9	-
			Nov-18	Kralcopic_Historic				7.4	1.6	-	3	-	4.6	-	-	2.8	-
			Dec-18	Kralcopic_Historic				20.9	4	-	6.2	-	10.2	-	-	10.7	-
		Q1 2021	Jan-21	EM2101404				3.2	0.5	11	1.5	37	2.0	48	77	1.2	29
			Feb-21	EM2103691				4.1	0.2	4	0.8	15	1.1	20	74	3.0	54
			Mar-21	EM2105891				2.9	0.4	6	1.8	32	2.2	38	50	0.7	12
		Q2 2021	Apr-21	EM2107970				1.9	0.2	4	0.6	9	0.8	13	32	1.1	19
			May-21	EM2110737				1.5	0.4	7	0.5	10	0.9	17	30	0.6	13
			Jun-21	EM2112733				10.2	1.2	20	3.0	50	4.2	70	168	6.0	98



						Arsenic	Barium	Manganese	Total Solids	Ash Content	Ash Content (mg)	Combustible Matter	Combustible Matter (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Solids (mg)	Total Soluble Matter	Total Soluble Matter (mg)
r						µg/m².month	µg/m².month	µg/m².month	g/m².month	g/m².month	mg	g/m².month	mg	g/m².month	mg	mg	g/m².month	i mg
EQL										0.1	1		1	0.1	1	1	0.1	1
Location Code	E de la	Owenter	<b>N A</b>	Data Carriela Carla	Lab Davaset Normalian													
		Quarter	Wonth	Date Sample Code	Lab Report Number	4.10	105	201								<u> </u>		
WVDGU3E	WVDG03E	Q1 2021	Jan-21	1/02/2021 EM2102004018	EM2102004	4.19	195	281	-	-	-	-	-	-	-	<u> </u>	-	-
(Insoluble)			Feb-21	3/03/2021 EM2103090018	EIVI2103090	1.10	23.8	37.3	-	-	-	-	-	-	-	┝╧┥	-	-
		02 2021	Iviar-21	20/04/2021 EM2103892018	EN12103032	1.04	20.6	25.1	-	-	-	-	-	-	-	<u>⊢</u> -+	-	-
		Q2 2021	Apr-21	2/06/2021 EM210/3/1018	ENV2107971	2.04	59.0 47.4	25.1	-	-	-	-	-	-	-	<u> </u> −-+	-	-
			IVIdy-21	20/06/2021 EM2110733018	EN12110755	2.07	47.4	24 5	-	-	-	-	-	-	-	$\vdash$	-	-
		01 2021	Jun-21	1/02/2021 EM210200/010	EM2102004	0.129	458	55.3	-	-	-	-	-	-	-		-	-
(Soluble)	W V DG03E	Q1 2021	Jan-21	3/03/2021 EM2102004010	EM2102004	0.123	438 15 <i>A</i>	15 1		-		-		_				
(5010512)			Mar-21	1/04/2021 EM2105892010	EM2105892	3.24	44.5	61.5	-	-	<u> </u>	-	_		_			
		02 2021	Δnr-21	30/04/2021 EM2103052010	FM2107971	0.813	86.7	20.4	-	-	-	-	-	-	-			
		Q2 2021	May-21	2/06/2021 EM210733010	FM2110733	1 92	11.9	44.2	-	-	-	-	-	-	-			-
			Jun-21	30/06/2021 EM2112734010	EM2112734	1.60	16.7	21.6	-	-	-	-	-	-	_	_ +	-	-
WVDG03E (Ash	WVDG03E	04 2018	Oct-18	1/10/2018 WVDG03E stand	Kralcopic Directional	7.65	-	-	-	0.3	-	-	-	0.4	-	┟╼╋		-
Content)			Nov-18	1/11/2018 WVDG03E stand	Kralcopic Directional	5.97	-	_	-	0.2	-	-	-	0.3	-	_ †		-
			Dec-18	1/12/2018 WVDG03E stand	Kralcopic Directional	5.76	-	-	-	<0.1	-	-	-	0.3	-	-		-
		Q1 2021	Jan-21	1/02/2021 EM2102004002	EM2102004	2.85	191	185	1.4	0.2	2	0.1	2	0.3	4	19	1.1	15
			Feb-21	3/03/2021 EM2103690002	EM2103690	0.654	5.7	19.4	0.4	<0.1	<1	0.2	4	0.3	5	6	0.1	1
			Mar-21	1/04/2021 EM2105892002	EM2105892	<3.23	<133	<60.6	1.1	0.2	2	0.3	5	0.5	7	16	0.6	9
		Q2 2021	Apr-21	30/04/2021 EM2107971002	EM2107971	0.81	26.0	15.4	1.9	0.1	2	0.8	11	0.9	13	27	1.0	14
			May-21	2/06/2021 EM2110733002	EM2110733	1.45	34.0	30.1	0.9	<0.1	1	0.3	5	0.4	6	14	0.5	8
			, Jun-21	30/06/2021 EM2112734002	EM2112734	< 0.05	1.53	0.463	1.0	<0.1	1	0.5	7	0.6	8	13	0.4	5
WVDG03N	WVDG03N	Q1 2021	Jan-21	1/02/2021 EM2102004017	EM2102004	5.40	<237	235	-	-	-	-	-	-	-	-	-	-
(Insoluble)			Feb-21	3/03/2021 EM2103690017	EM2103690	1.77	<67.0	59.6	-	-	-	-	-	-	-	-	-	-
			Mar-21	1/04/2021 EM2105892017	EM2105892	1.62	119	31.7	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	30/04/2021 EM2107971017	EM2107971	2.01	119	27.3	-	-	-	-	-	-	-	-	-	-
			May-21	2/06/2021 EM2110733017	EM2110733	<1.90	<40.8	<33.9	-	-	-	-	-	-	-	-	-	-
			Jun-21	30/06/2021 EM2112734017	EM2112734	<1.20	<40.2	<40.0	-	-	-	-	-	-	-	-	-	-
WVDG03N	WVDG03N	Q1 2021	Jan-21	1/02/2021 EM2102004009	EM2102004	0.052	5.03	2.44	-	-	-	-	-	-	-	-	-	-
(Soluble)			Feb-21	3/03/2021 EM2103690009	EM2103690	0.322	28.6	21.7	-	-	-	-	-	-	-	-	-	-
			Mar-21	1/04/2021 EM2105892009	EM2105892	4.81	87.2	40.7	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	30/04/2021 EM2107971009	EM2107971	0.468	136	19.2	-	-	-	-	-	-	-	-	-	-
			May-21	2/06/2021 EM2110733009	EM2110733	0.406	4.21	8.92	-	-	-	-	-	-	-	-	-	-
			Jun-21	30/06/2021 EM2112734009	EM2112734	0.087	5.34	8.69	-	-	-	-	-	-	-	-	-	-
WVDG03N (Ash	WVDG03N	Q4 2018	Oct-18	1/10/2018 WVDG03N_stand_	Kralcopic_Directional	<0.05	-	-	-	0.2	-	-	-	0.3	-	-		-
Content)			Nov-18	1/11/2018 WVDG03N_stand_	Kralcopic_Directional	108	-	-	-	2.9	-	-	-	11.8	-	-	-	-
			Dec-18	1/12/2018 WVDG03N_stand_	Kralcopic_Directional	8.02	-	-	-	0.1	-	-	-	0.3	-	-		-
		Q1 2021	Jan-21	1/02/2021 EM2102004001	EM2102004	5.18	<237	180	0.4	0.3	4	0.1	1	0.4	5	5	<0.1	<1
			Feb-21	3/03/2021 EM2103690001	EM2103690	1.76	<67.0	38.6	0.7	<0.1	1	0.5	8	0.6	9	10	0.1	1
			Mar-21	1/04/2021 EM2105892001	EM2105892	1.28	81.7	17.8	0.9	<0.1	1	0.4	6	0.5	7	14	0.4	7
		Q2 2021	Apr-21	30/04/2021 EM2107971001	EM2107971	1.07	94.0	21.6	1.3	<0.1	1	0.8	13	0.9	14	20	0.4	6
			May-21	2/06/2021 EM2110733001	EM2110733	<1.90	<40.8	<33.9	0.8	<0.1	1	0.6	11	0.7	12	13	0.1	1
			Jun-21	30/06/2021 EM2112734001	EM2112734	<1.20	<40.2	<40.0	0.7	<0.1	1	0.5	8	0.6	9	10	0.1	1
WVDG03S	WVDG03S	Q1 2021	Jan-21	1/02/2021 EM2102004019	EM2102004	<18.7	<215	183	-	-	-	-	-	-	-	<u> </u>	-	-
(Insoluble)			Feb-21	3/03/2021 EM2103690019	EM2103690	1.52	61.9	39.4	-	-	-	-	-	-	-	<u> </u>	-	
			Mar-21	1/04/2021 EM2105892019	EM2105892	2.91	<49.8	60.8	-	-	-	-	-	-	-		-	-
		Q2 2021	Apr-21	30/04/2021 EM2107971019	EM2107971	<1.1	25.5	20.0	-	-	-	-	-	-	-	-	-	-



							Arsenic	Barium	Manganese	Total Solids	Ash Content	Ash Content (mg)	Combustible Matter	Combustible Matter (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Solids (mg)	Total Soluble Matter	Total Soluble Matter (mg)
			May-21	2/06/2021	FM2110733019	FM2110733	μg/m <sup>-</sup> .month	μg/mmonth	μg/mmonth	g/mmonth	g/mmonth	mg	g/mmonth	mg	g/mmonth	mg	mg	g/mmonth	mg
			lun-21	30/06/2021	FM2112734019	FM2112734	1 26	29.8	28.1		-	-		-	-	-	-	-	-
WVDG03S	WVDG03S	01 2021	Jan-21	1/02/2021	EM2102004011	EM2102004	0.160	62.0	10.8	-	-	-	-	-	-	-	-	_	-
(Soluble)			Feb-21	3/03/2021	EM2103690011	EM2103690	0.277	23.2	16.8	-	-	-	-	-	-	-	-	_	-
(,			Mar-21	1/04/2021	EM2105892011	EM2105892	2.85	20.2	34.6	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	30/04/2021	EM2107971011	EM2107971	0.421	26.0	23.2	-	-	-	-	-	-	-	-	-	-
			May-21	2/06/2021	EM2110733011	EM2110733	0.767	9.98	21.9	-	-	-	-	-	-	-	-	-	-
			Jun-21	30/06/2021	EM2112734011	EM2112734	0.873	15.7	15.9	-	-	-	-	-	-	-	-	-	-
WVDG03S (Ash	WVDG03S	Q4 2018	Oct-18	1/10/2018	WVDG03S_stand	_Kralcopic_Directional	14.9	-	-	-	0.6	-	-	-	1.2	-	-	-	-
Content)			Nov-18	1/11/2018	WVDG03S_stand	_Kralcopic_Directional	10.3	-	-	-	0.5	-	-	-	0.8	-	-	-	-
			Dec-18	1/12/2018	WVDG03S_stand	_Kralcopic_Directional	39.6	-	-	-	1	-	-	-	2	-	-	-	-
		Q1 2021	Jan-21	1/02/2021	EM2102004003	EM2102004	<18.7	<215	152	0.4	0.3	4	<0.1	<1	0.3	4	6	0.1	2
			Feb-21	3/03/2021	EM2103690003	EM2103690	0.932	49.9	26.0	0.6	<0.1	<1	0.4	6	0.5	7	8	0.1	1
			Mar-21	1/04/2021	EM2105892003	EM2105892	2.65	<49.8	42.2	0.8	<0.1	1	0.4	7	0.5	8	12	0.3	4
		Q2 2021	Apr-21	30/04/2021	EM2107971003	EM2107971	<1.1	21.5	14.4	1.1	<0.1	1	0.5	8	0.6	9	17	0.5	8
			May-21	2/06/2021	EM2110733003	EM2110733	<2.10	<57.9	<20.6	1.1	<0.1	<1	0.8	12	0.8	13	18	0.3	5
			Jun-21	30/06/2021	EM2112734003	EM2112734	0.604	26.5	23.3	2.8	<0.1	<1	2.6	37	2.6	37	40	0.2	3
WVDG03W	WVDG03W	Q1 2021	Jan-21	1/02/2021	EM2102004020	EM2102004	11.2	<375	428	-	-	-	-	-	-	-	-	-	-
(Insoluble)			Feb-21	3/03/2021	EM2103690020	EM2103690	2.35	81.7	39.8	-	-	-	-	-	-	-	-	-	-
		00.0004	Mar-21	1/04/2021	EM2105892020	EM2105892	1.23	<41.2	33.4	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	30/04/2021	EM210/9/1020	EM210/9/1	2.91	31.8	20.7	-	-	-	-	-	-	-	-	-	-
			Iviay-21	2/06/2021	EIVI2110733020	EIVIZI10733	1.57	<38.3	33.4	-	-	-	-	-	-	-	-	-	-
		01 2021	Juli-21	1/02/2021	EM2102004012	EM2102004	<0.040	72.8	57.6		_	-		_	_		_		-
(Soluble)		Q1 2021	Feb-21	3/03/2021	EM2102004012	FM2102004	5 32	22.0	26.1			_		_			_		-
			Mar-21	1/04/2021	EM2105892012	FM2105892	2 37	20.3	38.5	-	-	-	-	-	-	_	-	-	-
		02 2021	Apr-21	30/04/2021	EM2107971012	EM2107971	0.603	14.8	17.7	-	-	-	-	-	-	-	-	_	-
			May-21	2/06/2021	EM2110733012	EM2110733	0.340	4.35	5.73	-	-	-	-	-	-	-	-	_	-
			Jun-21	30/06/2021	EM2112734012	EM2112734	0.170	9.16	13.0	-	-	-	-	-	-	-	-	-	-
WVDG03W (Ash	WVDG03W	Q4 2018	Oct-18	1/10/2018	WVDG03W_stan	d Kralcopic_Directional	9.93	-	-	-	0.3	-	-	-	0.7	-	-	-	-
Content)			Nov-18	1/11/2018	WVDG03W_stan	d Kralcopic_Directional	93.6	-	-	-	3.1	-	-	-	8.5	-	-	-	-
			Dec-18	1/12/2018	WVDG03W_stan	d Kralcopic_Directional	203	-	-	-	0.8	-	-	-	2.7	-	-	-	-
		Q1 2021	Jan-21	1/02/2021	EM2102004004	EM2102004	11.3	<375	341	0.8	0.7	9	0.1	2	0.8	11	11	<0.1	<1
			Feb-21	3/03/2021	EM2103690004	EM2103690	2.02	50.1	27.3	0.6	<0.1	<1	0.4	5	0.4	6	8	0.2	2
			Mar-21	1/04/2021	EM2105892004	EM2105892	1.12	<41.2	23.7	0.6	<0.1	<1	0.1	2	0.2	3	9	0.4	6
		Q2 2021	Apr-21	30/04/2021	EM2107971004	EM2107971	1.37	23.1	16.0	1.6	0.1	2	1.0	14	1.1	16	24	0.5	8
			May-21	2/06/2021	EM2110733004	EM2110733	1.59	<38.3	30.1	0.5	0.1	2	0.4	6	0.5	8	9	<0.1	1
			Jun-21	30/06/2021	EM2112734004	EM2112734	0.599	20.4	13.2	2.3	<0.1	<1	2.2	32	2.2	32	34	0.1	2
WVDG05E	WVDG05E	Q1 2021	Jan-21	1/02/2021	EM2102004022	EM2102004	4.13	139	187	-	-	-	-	-	-	-	-	-	-
(Insoluble)			Feb-21	3/03/2021	EM2103690022	EM2103690	<1.70	<113	39.1	-	-	-	-	-	-	-	-	-	-
		02.2024	Mar-21	1/04/2021	EM2105892022	EM2105892	1.58	<42.2	32.1	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	30/04/2021	EN211079/1022	EN2110722	0.700	<37.5	<21.7	-	-	-	-	-	-	-	-	-	-
			Iviay-21	2/06/2021	EN2112724022	EN2110733	<1.90	<76.4	<13.3	-	-	-	-	-	-	-	-	-	-
W/VDG055	W/VDC0FF	01 2021	Jun-21	1/02/2021	EM2102004014	EM2102004	1.07	22.0	11.7	-	-	-	-	-	-	-	-	-	
(Soluble)	W V DGUSE	Q1 2021	Feb-21	3/02/2021	FM2102004014	FM2102004	0.200	230	16.5	-	-	-	-	-	-	-			-
(Soluble)			Mar-21	1/04/2021	FM2105892014	FM2105892	3.205	25.4	42.5	_	-	-	_		-	_	_	_	-
		02 2021	Apr-21	30/04/2021	EM2107971014	EM2107971	0.089	16.1	11.0	-	-	-	-	-	-	-	-	-	-
			May-21	2/06/2021	EM2110733014	EM2110733	0.993	6.93	10.5	-	-	-	-	-	-	-	-	-	-
			, .=																



					Arsenic	Barium	Manganese	Total Solids	Ash Content	Ash Content (mg)	Combustible Matter	Combustible Matter (mg)	Total Insoluble Matter	Total Insoluble Matter (mg) Total Solids (mg)	Total Soluble Matter	Total Soluble Matter (mg)
					µg/m².month	μg/m².month	μg/m².month	g/m².month	g/m².month	mg	g/m².month	mg	g/m².month	mg mį	g g/m².month	mg
			Jun-21	30/06/2021 EM2112734014 EM2112734	0.212	4.81	6.73	-	-	-	-	-	-		-	-
WVDG05E (Ash	WVDG05E	Q4 2018	Oct-18	1/10/2018 WVDG05E_stand_Kraicopic_Directional	7.95	-	-	-	0.2	-	-	-	0.4		-	-
Content)			NOV-18	1/11/2018 WVDG05E_stand_Kraicopic_Directional	9.28	-	-	-	0.3	-	-	-	0.6		-	
		01 2021	Dec-18		0.72	- 110	- 140	-	0.1	-	- 0.1	-	4.9		- 0.2	-
		Q1 2021	Jail-21	3/03/2021 EM2102004000 EM2102004	<1.70	<113	140	0.0	<0.2	21	0.1	5	0.3	6 7	0.3	4
			Mar-21	1/04/2021 EM2105892006 EM2105892	1.70	<113	40.0	0.5	<0.1	1	<0.1	1	0.4	2 17	/ 10	15
		02 2021	Δnr-21	30/04/2021 EM2103852000 EM2103852	0.0688	<37.5	<21.7	1.1	0.1	$\frac{1}{2}$	0.7	10	0.1	12 10	0.4	7
		Q2 2021	May-21	2/06/2021 EM210/3/1000 EM210/3/1	<1.90	<76.4	<13.3	0.3	<0.1	<1	0.7	3	0.0	3 5	0.4	2
			lun-21	30/06/2021 EM2110733006 EM2110733	0.463	8 90	9.29	0.5	<0.1	1	0.2	4	0.2	5 6	0.1	1
WVDG05N	WVDG05N	01 2021	lan-21	1/02/2021 EM2102004021 EM2102004	3.71	<103	52.4	-	-	-	-	-	-		-	-
(Insoluble)	WVD GOSIN	Q1 2021	Feb-21	3/03/2021 EM2103690021 EM2103690	2.38	<123	54.2	-	-	-	-	-	-		-	-
(insoluble)			Mar-21	1/04/2021 EM2105892021 EM2105892	<1.53	<35.5	23.1	-	-	-	-	-	-		-	-
		02 2021	Apr-21	30/04/2021 EM2107971021 EM2107971	0.897	<29.0	16.7	-	-	-	-	-	_		-	-
			May-21	2/06/2021 EM2110733021 EM2110733	1.58	29.6	19.9	-	_	-	-	-	-		-	-
			Jun-21	30/06/2021 EM2112734021 EM2112734	0.912	33.0	27.0	-	-	-	-	-	-		-	-
WVDG05N	WVDG05N	Q1 2021	Jan-21	1/02/2021 EM2102004013 EM2102004	< 0.05	29.6	20.6	-	-	-	-	-	-		-	-
(Soluble)			Feb-21	3/03/2021 EM2103690013 EM2103690	0.730	23.7	22.3	-	-	-	-	-	-		-	-
			Mar-21	1/04/2021 EM2105892013 EM2105892	4.17	37.7	48.8	-	-	-	-	-	-		-	-
		Q2 2021	Apr-21	30/04/2021 EM2107971013 EM2107971	0.193	13.7	12.3	-	-	-	-	-	-		-	-
			May-21	2/06/2021 EM2110733013 EM2110733	0.938	2.66	5.86	-	-	-	-	-	-		-	-
			Jun-21	30/06/2021 EM2112734013 EM2112734	0.382	8.69	11.7	-	-	-	-	-	-		-	-
WVDG05N (Ash	WVDG05N	Q4 2018	Oct-18	1/10/2018 WVDG05N_stand Kralcopic_Directional	18.9	-	-	-	0.5	-	-	-	1		-	-
Content)			Nov-18	1/11/2018 WVDG05N_stand_Kralcopic_Directional	18.1	-	-	-	0.4	-	-	-	0.9		-	-
			Dec-18	1/12/2018 WVDG05N_stand_Kralcopic_Directional	6.61	-	-	-	0.1	-	-	-	5.8		-	-
		Q1 2021	Jan-21	1/02/2021 EM2102004005 EM2102004	2.42	<103	42.9	0.2	0.2	2	<0.1	<1	0.2	22	<0.1	<1
			Feb-21	3/03/2021 EM2103690005 EM2103690	2.40	<123	52.8	0.6	0.1	2	0.4	6	0.5	89	0.1	1
			Mar-21	1/04/2021 EM2105892005 EM2105892	<1.53	<35.5	20.7	0.8	<0.1	<1	<0.1	1	0.1	2 12	0.7	10
		Q2 2021	Apr-21	30/04/2021 EM2107971005 EM2107971	0.653	<29.0	15.4	1.3	<0.1	1	0.8	12	0.9	13 19	0.4	6
			May-21	2/06/2021 EM2110733005 EM2110733	1.04	23.4	15.7	0.4	<0.1	<1	0.3	4	0.3	56	0.1	1
			Jun-21	30/06/2021 EM2112734005 EM2112734	0.764	32.2	27.0	0.5	<0.1	<1	0.4	6	0.4	67	0.1	1
WVDG05S	WVDG05S	Q1 2021	Jan-21	1/02/2021 EM2102004023 EM2102004	11.3	<127	152	-	-	-	-	-	-		-	-
(Insoluble)			Feb-21	3/03/2021 EM2103690023 EM2103690	1.99	<146	48.9	-	-	-	-	-	-		-	-
		00.0004	Mar-21	1/04/2021 EM2105892023 EM2105892	0.962	24.5	14.2	-	-	-	-	-	-		-	-
		Q2 2021	Apr-21	30/04/2021 EM210/9/1023 EM210/9/1	1.07	<41.2	19.5	-	-	-	-	-	-		-	
			Iviay-21	2/06/2021 EW2110/33023 EW2110/33	< 0.87	10.9	9.75	-	-	-	-	-	-		-	
	WUDCOES	01 2021	Jun-21	1/02/2021 EM2102004015 EM2102004	1.69	19.8	25.1	-	-	-	-	-	-		-	-
(Solublo)	W VDG055	Q1 2021	Jaii-21	2/02/2021 EM2102004015 EM2102004	0.251	210	22.4	-	-	-	-	-	-		-	-
(Soluble)			Mar-21	1/04/2021 EM2105090015 EM2105090	3.01	20.8	22.4									
		02 2021	Δnr-21	30/04/2021 EM2103032015 EM2103032	0.550	31.6	15.6			<u> </u>						
			May-21	2/06/2021 EM210733015 FM210733	0.607	5.97	10.6	-	-	-	-	-	-		-	-
			Jun-21	30/06/2021 EM2112734015 EM2112734	0.728	12.8	13.1	-	-	-	-	-	-		-	-
WVDG05S (Ash	WVDG05S	Q4 2018	Oct-18	1/10/2018 WVDG05S stand Kralcopic Directional	6.43	-	-	-	0.2	-	-	-	0.4		-	-
Content)			Nov-18	1/11/2018 WVDG05S stand Kralcopic Directional	17.3	-	-	-	0.5	-	-	-	1.1		-	-
			Dec-18	1/12/2018 WVDG05S stand Kralcopic Directional	9.89	-	-	-	0.1	-	-	-	20.7		-	-
		Q1 2021	Jan-21	1/02/2021 EM2102004007 EM2102004	7.99	<127	119	0.4	0.2	2	<0.1	1	0.2	3 5	0.2	2
			Feb-21	3/03/2021 EM2103690007 EM2103690	2.04	<146	47.3	0.2	<0.1	1	<0.1	1	0.1	2 4	0.1	2
			Mar-21	1/04/2021 EM2105892007 EM2105892	0.724	20.3	9.65	0.7	<0.1	<1	0.2	3	0.3	4 10	0.4	6
WVDG05S (Ash Content)	WVDG05S	Q2 2021 Q4 2018 Q1 2021	Apr-21 May-21 Jun-21 Oct-18 Nov-18 Dec-18 Jan-21 Feb-21 Mar-21	30/04/2021         EM2107971015         EM2107971           2/06/2021         EM2110733015         EM2110733           30/06/2021         EM2112734015         EM2112734           1/10/2018         WVDG05S_stand_         Kralcopic_Directional           1/11/2018         WVDG05S_stand_         Kralcopic_Directional           1/12/2018         WVDG05S_stand_         Kralcopic_Directional           1/12/2018         EM2102004007         EM2102004           3/03/2021         EM2103690007         EM2103690           1/04/2021         EM2105892007         EM2105892	0.550           0.607           0.728           6.43           17.3           9.89           7.99           2.04           0.724	31.6 5.97 12.8 - - <127 <146 20.3	15.6 10.6 13.1 - - - 119 47.3 9.65	- - - - - - 0.4 0.2 0.7	- - 0.2 0.5 0.1 0.2 <0.1 <0.1	- - - - - - - 2 1 <1	- - - - - - - - - - - - - - - - - - -	- - - - - 1 1 3	- - 0.4 1.1 20.7 0.2 0.1 0.3	    3 5 2 4 4 10	- - - - - - - 0.2 0.1 0.4	



							Arsenic	Barium	Manganese	Total Solids	Ash Content	Ash Content (mg)	Combustible Matter	Combustible Matter (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Solids (mg)	Total Soluble Matter	Total Soluble Matter (mg)
							µg/m².month	µg/m².month	µg/m².month	g/m².month	g/m².month	mg	g/m².month	mg	g/m².month	mg	mg	g/m².month	mg
		Q2 2021	Apr-21	30/04/2021	EM2107971007	EM2107971	0.478	<41.2	15.7	1.4	<0.1	<1	1.0	14	1.0	15	21	0.4	6
			May-21	2/06/2021	EM2110733007	EM2110733	< 0.87	28.7	7.80	0.3	<0.1	<1	0.1	2	0.1	2	6	0.2	4
			Jun-21	30/06/2021	EM2112734007	EM2112734	0.201	2.67	30.00	0.5	<0.1	1	0.2	3	0.3	4	7	0.2	3
WVDG05W	WVDG05W	Q1 2021	Jan-21	1/02/2021	EM2102004024	EM2102004	3.48	199	137	-	-	-	-	-	-	-	-	-	-
(Insoluble)			Feb-21	3/03/2021	EM2103690024	EM2103690	<1.80	135	48.5	-	-	-	-	-	-	-	-	-	-
			Mar-21	1/04/2021	EM2105892024	EM2105892	2.70	<72.9	56.1	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	30/04/2021	EM2107971024	EM2107971	<7.5	69.7	29.6	-	-	-	-	-	-	-	-	-	-
			May-21	2/06/2021	EM2110733024	EM2110733	<1.18	85.8	<17.8	-	-	-	-	-	-	-	-	-	-
			Jun-21	30/06/2021	EM2112734024	EM2112734	1.12	32.3	17.1	-	-	-	-	-	-	-	-	-	-
WVDG05W	WVDG05W	Q1 2021	Jan-21	1/02/2021	EM2102004016	EM2102004	< 0.05	34.4	20.3	-	-	-	-	-	-	-	-	-	-
(Soluble)			Feb-21	3/03/2021	EM2103690016	EM2103690	0.073	18.5	23.1	-	-	-	-	-	-	-	-	-	-
			Mar-21	1/04/2021	EM2105892016	EM2105892	9.32	71.9	133	-	-	-	-	-	-	-	-	-	-
		Q2 2021	Apr-21	30/04/2021	EM2107971016	EM2107971	0.515	24.4	15.3	-	-	-	-	-	-	-	-	-	-
			May-21	2/06/2021	EM2110733016	EM2110733	0.412	6.66	11.0	-	-	-	-	-	-	-	-	-	-
			Jun-21	30/06/2021	EM2112734016	EM2112734	0.321	14.4	7.09	-	-	-	-	-	-	-	-	-	-
WVDG05W (Ash	WVDG05W	Q4 2018	Oct-18	1/10/2018	WVDG05W_stand	Kralcopic_Directional	6.65	-	-	-	0.4	-	-	-	0.5	-	-	-	-
Content)			Nov-18	1/11/2018	WVDG05W_stand	Kralcopic_Directional	54.7	-	-	-	2.8	-	-	-	3.7	-	-	-	-
			Dec-18	1/12/2018	WVDG05W_stand	Kralcopic_Directional	< 0.05	-	-	-	0.1	-	-	-	3.4	-	-	-	-
		Q1 2021	Jan-21	1/02/2021	EM2102004008	EM2102004	3.55	189	100	0.5	0.3	4	0.2	2	0.5	6	6	<0.1	<1
			Feb-21	3/03/2021	EM2103690008	EM2103690	<1.80	118	47.4	0.6	<0.1	<1	0.4	6	0.5	7	8	0.1	1
			Mar-21	1/04/2021	EM2105892008	EM2105892	2.84	<72.9	46.2	1.4	0.2	3	0.5	7	0.7	10	20	0.7	10
		Q2 2021	Apr-21	30/04/2021	EM2107971008	EM2107971	<7.50	65.2	26.8	1.8	<0.1	<1	1.1	16	1.1	17	27	0.7	10
			May-21	2/06/2021	EM2110733008	EM2110733	<1.18	62.1	<17.8	0.5	<0.1	<1	0.2	3	0.2	4	9	0.3	5
			Jun-21	30/06/2021	EM2112734008	EM2112734	0.771	21.1	8.29	0.4	<0.1	1	0.2	3	0.3	4	6	0.1	2



## **Appendix B Supplementary Data**

Graphs for Metals in Soluble and Insoluble Fractions

















#### B.1.2 Barium

Figure B3 Woodvale Barium in Soluble Fraction (ug/m2.month) Comparison between 2018 (previous data) and 2021 (Current data)



Figure B4 Woodvale Barium in Insoluble Fraction (ug/m2.month) Comparison between 2018 (previous data) and 2021 (Current data). Asterisk (\*) represents the results where the sample was recorded as <x. For the sake of graphing <x has been taken as the value of x.


#### B.1.3 Manganese

Figure B5 Woodvale Manganese in Soluble Fraction (ug/m2.month) Comparison between 2018 (previous data) and 2021 (Current data)



Figure 7-6 Woodvale Manganese in Insoluble Fraction (ug/m2.month) Comparison between 2018 (previous data) and 2021 (Current data). Asterisk (\*) represents the results where the sample was recorded as <x. For the sake of graphing <x has been taken as the value of x.



## Appendix C Laboratory Reports



### **CERTIFICATE OF ANALYSIS**

Work Order	EM2107970	Page	: 1 of 8
Client	ALS WATER RESOURCES GROUP	Laboratory	Environmental Division Melbourne
Contact	: ROHAN OLIVER	Contact	: Customer Services EM
Address	: 94 KERANG-KOONDROOK ROAD	Address	: 4 Westall Rd Springvale VIC Australia 3171
	KERANG 3579		
Telephone		Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 03-May-2021 13:45
Order number	:	Date Analysis Commenced	: 07-May-2021
C-O-C number	:	Issue Date	13-May-2021 13:28
Sampler	: KV		Hac-MRA NATA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 30		Accredited for compliance with
No. of samples analysed	: 30		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
Nikki Stepniewski	Senior Inorganic Instrument Chemist	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 Contact 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

ø = 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.
- 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 g/m<sup>2</sup>.mth as sampling data was provided by the client.
- Sampling Period:01/04/2021-30/04/2021.
- Sample exposure period is within the typical exposure period of 30+/-2 days as per AS3580.10.1
- Dust samples have been dosed with Copper Sulphate prior to sample collection and a copper correction factor of 0.055g has been used for calculations.

# Page : 3 of 8 Work Order : EM2107970 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
		Sampli	ng date / time	30-Apr-2021 10:50	30-Apr-2021 10:40	30-Apr-2021 09:50	30-Apr-2021 10:10	30-Apr-2021 10:15
Compound	CAS Number	LOR	Unit	EM2107970-001	EM2107970-002	EM2107970-003	EM2107970-004	EM2107970-005
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content		0.1	g/m².month	0.2	0.1	0.2	0.3	0.3
Ash Content (mg)		1	mg	4	2	3	4	6
EA125: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.7	0.7	1.0	0.9	0.8
Combustible Matter (mg)		1	mg	12	12	17	16	12
EA139: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	1.5	0.4	1.9	0.9	2.1
Total Soluble Matter (mg)		1	mg	25	6	33	16	36
EA141: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.9	0.8	1.2	1.2	1.1
Total Insoluble Matter (mg)		1	mg	16	14	20	20	18
EA142: Total Solids								
Total Solids		0.1	g/m².month	2.4	1.2	3.1	2.1	3.2
Total Solids (mg)		1	mg	41	20	53	36	54
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	3.19	<8.6	4.29	10.4	13.2
øBarium	7440-39-3	0.05	µg/m².month	223	89.4	115	<111	115
Ø Manganese	7439-96-5	0.05	µg/m².month	102	27.3	53.0	<51.5	<53.9

# Page : 4 of 8 Work Order : EM2107970 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDD06	KF1	KF2	KF3	KF4
		Sampli	ng date / time	30-Apr-2021 11:00	30-Apr-2021 11:30	30-Apr-2021 11:50	30-Apr-2021 11:40	30-Apr-2021 12:00
Compound	CAS Number	LOR	Unit	EM2107970-006	EM2107970-007	EM2107970-008	EM2107970-009	EM2107970-010
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content		0.1	g/m².month	0.2	0.2	0.1	0.2	0.1
Ash Content (mg)		1	mg	4	4	2	3	2
EA125: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.6	0.9	0.7	1.0	0.8
Combustible Matter (mg)		1	mg	9	15	11	17	13
EA139: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	1.1	1.1	2.2	0.7	2.4
Total Soluble Matter (mg)		1	mg	19	18	37	12	42
EA141: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.8	1.1	0.8	1.2	0.9
Total Insoluble Matter (mg)		1	mg	13	19	13	20	15
EA142: Total Solids								
Total Solids		0.1	g/m².month	1.9	2.2	3.0	1.9	3.3
Total Solids (mg)		1	mg	32	37	50	32	57
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	5.35	5.36	162	19.1	<15.6
øBarium	7440-39-3	0.05	µg/m².month	71.6	<58.3	49.0	<43.7	<41.0
Ø Manganese	7439-96-5	0.05	µg/m².month	64.5	47.1	41.5	<62.1	41.6



Sub-Matrix: DUST		Sample ID		WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
(Matrix: AIR)				Soluble As, Ba, Mn				
	Sampli	ng date / time	30-Apr-2021 00:00	30-Apr-2021 00:00	30-Apr-2021 00:00	30-Apr-2021 00:00	30-Apr-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2107970-011	EM2107970-012	EM2107970-013	EM2107970-014	EM2107970-015
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	3.48	3.59	8.87	20.75	98.7
ØBarium	7440-39-3	0.05	µg/m².month	279	186	410	94.7	131
ø Manganese	7439-96-5	0.05	µg/m².month	281	266	853	355	341



Sub-Matrix: DUST		Sample ID		WVDD06	KF1	KF2	KF3	KF4
(Matrix: AIR)				Soluble As, Ba, Mn				
	Sampli	ng date / time	30-Apr-2021 00:00	30-Apr-2021 00:00	30-Apr-2021 00:00	30-Apr-2021 00:00	30-Apr-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2107970-016	EM2107970-017	EM2107970-018	EM2107970-019	EM2107970-020
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	10.1	6.51	20.8	8.02	8.38
ØBarium	7440-39-3	0.05	µg/m².month	203	80.0	48.6	57.9	81.3
ø Manganese	7439-96-5	0.05	µg/m².month	361	300	191	223	151



Sub-Matrix: DUST		Sample ID		WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
(Matrix: AIR)				Insoluble As, Ba, Mn				
	Sampli	ng date / time	30-Apr-2021 00:00	30-Apr-2021 00:00	30-Apr-2021 00:00	30-Apr-2021 00:00	30-Apr-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2107970-021	EM2107970-022	EM2107970-023	EM2107970-024	EM2107970-025
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	3.70	<8.6	6.23	11.1	14.5
ØBarium	7440-39-3	0.05	µg/m².month	416	159	203	<111	156
ø Manganese	7439-96-5	0.05	µg/m².month	122	50.3	75.6	<51.5	<53.9

# Page : 8 of 8 Work Order : EM2107970 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST	Sample ID			WVDD06	KF1	KF2	KF3	KF4
(Matrix: AIR)				Insoluble As, Ba, Mn				
	Sampli	ng date / time	30-Apr-2021 00:00	30-Apr-2021 00:00	30-Apr-2021 00:00	30-Apr-2021 00:00	30-Apr-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2107970-026	EM2107970-027	EM2107970-028	EM2107970-029	EM2107970-030
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	7.71	6.10	179	19.8	<15.6
ØBarium	7440-39-3	0.05	µg/m².month	117	<58.3	54.9	<43.7	<41.0
ø Manganese	7439-96-5	0.05	µg/m².month	91.0	69.5	73.7	<62.1	48.1



### **CERTIFICATE OF ANALYSIS**

Work Order	EM2107971	Page	: 1 of 7
Client	ALS WATER RESOURCES GROUP	Laboratory	Environmental Division Melbourne
Contact	: ROHAN OLIVER	Contact	: Customer Services EM
Address	: 94 KERANG-KOONDROOK ROAD	Address	: 4 Westall Rd Springvale VIC Australia 3171
	KERANG 3579		
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 03-May-2021 13:45
Order number	:	Date Analysis Commenced	: 07-May-2021
C-O-C number	:	Issue Date	13-May-2021 14:24
Sampler	: KV		Hac-MRA NATA
Site			
Quote number	: ME/968/20		Apprediction No. 825
No. of samples received	: 24		Accredited for compliance with
No. of samples analysed	: 24		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
Nikki Stepniewski	Senior Inorganic Instrument Chemist	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 Contact 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
  - ø = 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.
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- Sampling Period:01/04/2021-30/04/2021.
- Dust samples were not dosed with Copper Sulphate prior to sample collection and no Copper correction factor has been used during calculation.
- Sample exposure period is within the typical exposure period of 30+/-2 days as per AS3580.10.2
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- Analysis as per AS3580.10.2-2013. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m<sup>2</sup>.mth.

# Page : 3 of 7 Work Order : EM2107971 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST			Sample ID	WVDG03N	WVDG03E	WVDG03S	WVDG03W	WVDG05N
		Sampli	ing date / time	30-Apr-2021 09:45	30-Apr-2021 09 <sup>.</sup> 46	30-Apr-2021 09:47	30-Apr-2021 09:48	30-Apr-2021 10:20
Compound	CAS Number	LOR	Unit	EM2107971-001	EM2107971-002	EM2107971-003	EM2107971-004	EM2107971-005
	or to Mamber			Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content		0.1	g/m².month	<0.1	0.1	<0.1	0.1	<0.1
Ash Content (mg)		1	mg	1	2	1	2	1
EA125I: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.8	0.8	0.5	1.0	0.8
Combustible Matter (mg)		1	mg	13	11	8	14	12
EA139: Total Soluble Matter								
Total Soluble Matter (mg)		1	mg	6	14	8	8	6
EA139I: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.4	1.0	0.5	0.5	0.4
EA141: Total Insoluble Matter								
Total Insoluble Matter (mg)		1	mg	14	13	9	16	13
EA141I: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.9	0.9	0.6	1.1	0.9
EA142: Total Solids								
Total Solids (mg)		1	mg	20	27	17	24	19
EA142I: Total Solids								
Total Solids		0.1	g/m².month	1.3	1.9	1.1	1.6	1.3
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	1.07	0.81	<1.1	1.37	0.653
ØBarium	7440-39-3	0.05	µg/m².month	94.0	26.0	21.5	23.1	<29.0
ø Manganese	7439-96-5	0.05	µg/m².month	21.6	15.4	14.4	16.0	15.4



Sub-Matrix: DUST			Sample ID	WVDG05E	WVDG05S	WVDG05W	WVDG03N	WVDG03E
							soluble metals	soluble metals
		Sampl	ing date / time	30-Apr-2021 10:21	30-Apr-2021 10:22	30-Apr-2021 10:23	30-Apr-2021 00:00	30-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EM2107971-006	EM2107971-007	EM2107971-008	EM2107971-009	EM2107971-010
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content		0.1	g/m².month	0.1	<0.1	<0.1		
Ash Content (mg)		1	mg	2	<1	<1		
EA125I: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.7	1.0	1.1		
Combustible Matter (mg)		1	mg	10	14	16		
EA139: Total Soluble Matter								
Total Soluble Matter (mg)		1	mg	7	6	10		
EA139I: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.4	0.4	0.7		
EA141: Total Insoluble Matter								
Total Insoluble Matter (mg)		1	mg	12	15	17		
EA141I: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.8	1.0	1.1		
EA142: Total Solids								
Total Solids (mg)		1	mg	19	21	27		
EA142I: Total Solids								
Total Solids		0.1	g/m².month	1.2	1.4	1.8		
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	0.0688	0.478	<7.50	0.468	0.813
ØBarium	7440-39-3	0.05	µg/m².month	<37.5	<41.2	65.2	136	86.7
øManganese	7439-96-5	0.05	µg/m².month	<21.7	15.7	26.8	19.2	20.4



Sub-Matrix: DUST			Sample ID	WVDG03S	WVDG03W	WVDG05N	WVDG05E	WVDG05S
(Matrix: AIR)				soluble metals				
		Sampli	ng date / time	30-Apr-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2107971-011	EM2107971-012	EM2107971-013	EM2107971-014	EM2107971-015
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	0.421	0.603	0.193	0.089	0.550
ØBarium	7440-39-3	0.05	µg/m².month	26.0	14.8	13.7	16.1	31.6
ø Manganese	7439-96-5	0.05	µg/m².month	23.2	17.7	12.3	11.0	15.6



Sub-Matrix: DUST		Sample ID		WVDG05W	WVDG03N	WVDG03E	WVDG03S	WVDG03W
(Matrix: AIR)				soluble metals	insoluble metals	insoluble metals	insoluble metals	insoluble metals
		Sampli	ng date / time	30-Apr-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2107971-016	EM2107971-017	EM2107971-018	EM2107971-019	EM2107971-020
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	0.515	2.01	1.04	<1.1	2.91
ØBarium	7440-39-3	0.05	µg/m².month	24.4	119	39.6	25.5	31.8
ø Manganese	7439-96-5	0.05	µg/m².month	15.3	27.3	25.1	20.0	20.7



Sub-Matrix: DUST			Sample ID	WVDG05N	WVDG05E	WVDG05S	WVDG05W	
(Matrix: AIR)				insoluble metals	insoluble metals	insoluble metals	insoluble metals	
		Sampli	ng date / time	30-Apr-2021 00:00	30-Apr-2021 00:00	30-Apr-2021 00:00	30-Apr-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2107971-021	EM2107971-022	EM2107971-023	EM2107971-024	
				Result	Result	Result	Result	
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	0.897	0.700	1.07	<7.5	
ØBarium	7440-39-3	0.05	µg/m².month	<29.0	<37.5	<41.2	69.7	
ø Manganese	7439-96-5	0.05	µg/m².month	16.7	<21.7	19.5	29.6	



### **CERTIFICATE OF ANALYSIS**

Work Order	: EM2110733	Page	: 1 of 7
Client	ALS WATER RESOURCES GROUP	Laboratory	Environmental Division Melbourne
Contact	: ROHAN OLIVER	Contact	: Customer Services EM
Address	: 94 KERANG-KOONDROOK ROAD	Address	: 4 Westall Rd Springvale VIC Australia 3171
	KERANG 3579		
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 07-Jun-2021 12:20
Order number	:	Date Analysis Commenced	: 08-Jun-2021
C-O-C number	:	Issue Date	: 15-Jun-2021 12:45
Sampler	: RO		Hac-MRA NAIA
Site	:		
Quote number	: ME/968/20		Accreditation No. 925
No. of samples received	: 24		Accredited for compliance with
No. of samples analysed	: 24		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	Senior Inorganic Chemist	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 Contact 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
  - ø = 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.
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- Sampling period: 30/04/2021 02/06/2021
- EM2110733 #2-4, #6-8: Sample 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 33 days which is outside the typical exposure period of 30 +/- 2 days as per AS3580.10.2
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- Analysis as per AS3580.10.2-2013. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m<sup>2</sup>.mth.

# Page : 3 of 7 Work Order : EM2110733 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST			Sample ID	WVDG03N	WVDG03E	WVDG03S	WVDG03W	WVDG05N
		Sampli	na date / time	02-Jun-2021 14:20	02-Jun-2021 14:25	02-Jun-2021 14:10	02-Jun-2021 14:15	02-Jun-2021 14:50
Compound	CAS Number	LOR	Unit	EM2110733-001	EM2110733-002	EM2110733-003	EM2110733-004	EM2110733-005
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content		0.1	g/m².month	<0.1	<0.1	<0.1	0.1	<0.1
Ash Content (mg)		1	mg	1	1	<1	2	<1
EA125I: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.6	0.3	0.8	0.4	0.3
Combustible Matter (mg)		1	mg	11	5	12	6	4
EA139: Total Soluble Matter								
Total Soluble Matter (mg)		1	mg	1	8	5	1	1
EA139I: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.1	0.5	0.3	<0.1	0.1
EA141: Total Insoluble Matter								
Total Insoluble Matter (mg)		1	mg	12	6	13	8	5
EA141I: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.7	0.4	0.8	0.5	0.3
EA142: Total Solids								
Total Solids (mg)		1	mg	13	14	18	9	6
EA142I: Total Solids								
Total Solids		0.1	g/m².month	0.8	0.9	1.1	0.5	0.4
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	<1.90	1.45	<2.10	1.59	1.04
ØBarium	7440-39-3	0.05	µg/m².month	<40.8	34.0	<57.9	<38.3	23.4
ø Manganese	7439-96-5	0.05	µg/m².month	<33.9	30.1	<20.6	30.1	15.7



Sub-Matrix: DUST			Sample ID	WVDG05E	WVDG05S	WVDG05W	WVDG03N	WVDG03E
							soluble metals	soluble metals
		Sampl	ing date / time	02-Jun-2021 14:55	02-Jun-2021 14:40	02-Jun-2021 14:45	02-Jun-2021 00:00	02-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EM2110733-006	EM2110733-007	EM2110733-008	EM2110733-009	EM2110733-010
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content		0.1	g/m².month	<0.1	<0.1	<0.1		
Ash Content (mg)		1	mg	<1	<1	<1		
EA125I: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.2	0.1	0.2		
Combustible Matter (mg)		1	mg	3	2	3		
EA139: Total Soluble Matter								
Total Soluble Matter (mg)		1	mg	2	4	5		
EA139I: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.1	0.2	0.3		
EA141: Total Insoluble Matter								
Total Insoluble Matter (mg)		1	mg	3	2	4		
EA141I: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.2	0.1	0.2		
EA142: Total Solids								
Total Solids (mg)		1	mg	5	6	9		
EA142I: Total Solids								
Total Solids		0.1	g/m².month	0.3	0.3	0.5		
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	<1.90	<0.87	<1.18	0.406	1.92
ØBarium	7440-39-3	0.05	µg/m².month	<76.4	28.7	62.1	4.21	11.9
ø Manganese	7439-96-5	0.05	µg/m².month	<13.3	7.80	<17.8	8.92	44.2



Sub-Matrix: DUST			Sample ID	WVDG03S	WVDG03W	WVDG05N	WVDG05E	WVDG05S
(Matrix: AIR)				soluble metals				
		Sampli	ng date / time	02-Jun-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2110733-011	EM2110733-012	EM2110733-013	EM2110733-014	EM2110733-015
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	0.767	0.340	0.938	0.993	0.607
ØBarium	7440-39-3	0.05	µg/m².month	9.98	4.35	2.66	6.93	5.97
ø Manganese	7439-96-5	0.05	µg/m².month	21.9	5.73	5.86	10.5	10.6



Sub-Matrix: DUST			Sample ID	WVDG05W	WVDG03N	WVDG03E	WVDG03S	WVDG03W
(Matrix: AIR)				soluble metals	insoluble metals	insoluble metals	insoluble metals	insoluble metals
		Sampli	ng date / time	02-Jun-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2110733-016	EM2110733-017	EM2110733-018	EM2110733-019	EM2110733-020
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	0.412	<1.90	2.07	<2.10	1.57
ØBarium	7440-39-3	0.05	µg/m².month	6.66	<40.8	47.4	<57.9	<38.3
ø Manganese	7439-96-5	0.05	µg/m².month	11.0	<33.9	35.4	<20.6	33.4



Sub-Matrix: DUST			Sample ID	WVDG05N	WVDG05E	WVDG05S	WVDG05W	
(Matrix: AIR)				insoluble metals	insoluble metals	insoluble metals	insoluble metals	
		Sampli	ng date / time	02-Jun-2021 00:00	02-Jun-2021 00:00	02-Jun-2021 00:00	02-Jun-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2110733-021	EM2110733-022	EM2110733-023	EM2110733-024	
				Result	Result	Result	Result	
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	1.58	<1.90	<0.87	<1.18	
ØBarium	7440-39-3	0.05	µg/m².month	29.6	<76.4	72.9	85.8	
ø Manganese	7439-96-5	0.05	µg/m².month	19.9	<13.3	9.75	<17.8	



### **CERTIFICATE OF ANALYSIS**

Work Order	EM2110737	Page	: 1 of 8	
Client	ALS WATER RESOURCES GROUP	Laboratory	: Environmental Division Mel	lbourne
Contact	: ROHAN OLIVER	Contact	: Customer Services EM	
Address	: 94 KERANG-KOONDROOK ROAD	Address	: 4 Westall Rd Springvale VI	C Australia 3171
	KERANG 3579			
Telephone	:	Telephone	: +61-3-8549 9600	
Project	: MV214940	Date Samples Received	: 07-Jun-2021 14:45	ANUUL.
Order number	:	Date Analysis Commenced	: 10-Jun-2021	
C-O-C number	:	Issue Date	: 17-Jun-2021 16:14	
Sampler	: ROHAN OLIVER, ROHAN OLIVER			Hac-MRA NAIA
Site	:			
Quote number	: ME/968/20			Accreditation No. 825
No. of samples received	: 30			Accredited for compliance with
No. of samples analysed	: 30			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	Senior Inorganic Chemist	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 Contact 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

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EA139, EA141, EA142: EM2110737#3: Sample is discoloured –Brown, and is higher in suspended solids than rest of work order.
- ALS is not NATA accredited for the analysis of metals in dust deposition gauge.
- 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 g/m<sup>2</sup>.mth as sampling data was provided by the client.
- Sampling Period: 30/04/2021-02/06/2021.
- Sample exposure period is 33 days which is outside the typical exposure period of 30+/-2 days as per AS3580.10.1

# Page : 3 of 8 Work Order : EM2110737 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
	Sampli	ng date / time	02-Jun-2021 16:05	02-Jun-2021 14:00	02-Jun-2021 14:05	02-Jun-2021 14:30	02-Jun-2021 14:35	
Compound	CAS Number	LOR	Unit	EM2110737-001	EM2110737-002	EM2110737-003	EM2110737-004	EM2110737-005
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content		0.1	g/m².month	0.2	0.1	1.4	0.2	0.2
Ash Content (mg)		1	mg	3	2	26	4	3
EA125: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.3	0.2	4.5	0.4	0.2
Combustible Matter (mg)		1	mg	6	2	88	8	5
EA139: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.1	0.1	0.5	<0.1	0.2
Total Soluble Matter (mg)		1	mg	1	3	10	1	4
EA141: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.5	0.3	5.9	0.6	0.4
Total Insoluble Matter (mg)		1	mg	9	5	114	12	8
EA142: Total Solids								
Total Solids		0.1	g/m².month	0.6	0.4	6.4	0.6	0.6
Total Solids (mg)		1	mg	10	8	124	13	12
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	2.64	1.93	17.9	<5.10	3.16
øBarium	7440-39-3	0.05	µg/m².month	<64.6	<56.6	<691	<117	<66.4
Ø Manganese	7439-96-5	0.05	µg/m².month	45.1	46.5	622	70.3	38.8

# Page : 4 of 8 Work Order : EM2110737 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDD06	KF1	KF2	KF3	KF4
	Sampli	ng date / time	02-Jun-2021 16:15	02-Jun-2021 13:00	02-Jun-2021 13:15	02-Jun-2021 13:10	02-Jun-2021 13:30	
Compound	CAS Number	LOR	Unit	EM2110737-006	EM2110737-007	EM2110737-008	EM2110737-009	EM2110737-010
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content		0.1	g/m².month	0.4	0.3	0.2	0.3	0.2
Ash Content (mg)		1	mg	7	5	4	6	4
EA125: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.5	0.4	0.4	0.5	0.3
Combustible Matter (mg)		1	mg	10	9	7	9	6
EA139: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.6	<0.1	0.2	0.2	0.2
Total Soluble Matter (mg)		1	mg	13	<1	3	3	3
EA141: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.9	0.7	0.6	0.8	0.5
Total Insoluble Matter (mg)		1	mg	17	14	11	15	10
EA142: Total Solids								
Total Solids		0.1	g/m².month	1.5	0.7	0.8	1.0	0.7
Total Solids (mg)		1	mg	30	14	14	18	13
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	6.14	8.05	<46.8	<40.3	<12.3
øBarium	7440-39-3	0.05	µg/m².month	158	<91.3	<96.3	<157	<93.6
Ø Manganese	7439-96-5	0.05	µg/m².month	75.5	74.6	71.5	133	68.2



Sub-Matrix: DUST		Sample ID		WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
(Matrix: AIR)				Soluble As, Ba, Mn				
		Sampli	ng date / time	02-Jun-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2110737-011	EM2110737-012	EM2110737-013	EM2110737-014	EM2110737-015
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	3.42	2.10	18.9	18.5	4.14
ØBarium	7440-39-3	0.05	µg/m².month	110	68.0	658	192	114
ø Manganese	7439-96-5	0.05	µg/m².month	273	237	1700	519	291

# Page : 6 of 8 Work Order : EM2110737 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST		Sample ID		WVDD06	KF1	KF2	KF3	KF4
(Matrix: AIR)				Soluble As, Ba, Mn				
		Sampli	ng date / time	02-Jun-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2110737-016	EM2110737-017	EM2110737-018	EM2110737-019	EM2110737-020
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	7.77	6.95	22.2	17.6	5.59
ØBarium	7440-39-3	0.05	µg/m².month	351	80.9	68.3	54.2	107
ø Manganese	7439-96-5	0.05	µg/m².month	387	306	258	315	270



Sub-Matrix: DUST		Sample ID		WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
(Matrix: AIR)				Insoluble As, Ba, Mn				
		Sampli	ng date / time	02-Jun-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2110737-021	EM2110737-022	EM2110737-023	EM2110737-024	EM2110737-025
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	3.56	3.11	21.3	<5.10	3.41
ØBarium	7440-39-3	0.05	µg/m².month	<64.6	<56.6	<691	<118	<66.4
ø Manganese	7439-96-5	0.05	µg/m².month	93.9	86.3	753	90.9	54.3



Sub-Matrix: DUST			Sample ID	WVDD06	KF1	KF2	KF3	KF4
(Matrix: AIR)				Insoluble As, Ba, Mn				
		Sampli	ng date / time	02-Jun-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2110737-026	EM2110737-027	EM2110737-028	EM2110737-029	EM2110737-030
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	8.08	10.0	<46.8	<40.3	<12.3
ØBarium	7440-39-3	0.05	µg/m².month	173	<91.3	<96.3	<157	<93.6
ø Manganese	7439-96-5	0.05	µg/m².month	130	121	106	136	71.9



### **CERTIFICATE OF ANALYSIS**

Work Order	EM2112733	Page	: 1 of 8
Client	ALS WATER RESOURCES GROUP	Laboratory	Environmental Division Melbourne
Contact	: ROHAN OLIVER	Contact	: Customer Services EM
Address	: 94 KERANG-KOONDROOK ROAD	Address	: 4 Westall Rd Springvale VIC Australia 3171
	KERANG 3579		
Telephone		Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 02-Jul-2021 11:20
Order number	:	Date Analysis Commenced	: 06-Jul-2021
C-O-C number	:	Issue Date	: 13-Jul-2021 15:12
Sampler	: KV		Hac-MRA NAIA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 30		Accredited for compliance with
No. of samples analysed	: 30		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
Nikki Stepniewski	Senior Inorganic Instrument Chemist	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 Contact 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

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- Sampling period: 02/06/2021 30/06/21
- ALS is not NATA accredited for the analysis of metals in dust deposition gauge.
- 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 g/m<sup>2</sup>.mth as sampling data was provided by the client.
- EM2112733 #1: Sample has been visually observed to be turbid.
- Sample exposure period is within the typical exposure period of 30+/-2 days as per AS3580.10.1

# Page : 3 of 8 Work Order : EM2112733 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
	Sampli	ng date / time	30-Jun-2021 11:17	30-Jun-2021 11:25	30-Jun-2021 11:35	30-Jun-2021 12:00	30-Jun-2021 12:10	
Compound	CAS Number	LOR	Unit	EM2112733-001	EM2112733-002	EM2112733-003	EM2112733-004	EM2112733-005
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content		0.1	g/m².month	5.4	0.1	0.7	0.1	0.1
Ash Content (mg)		1	mg	90	2	11	2	2
EA125: Combustible Matter								
Combustible Matter		0.1	g/m².month	13.9	0.1	1.6	0.6	0.1
Combustible Matter (mg)		1	mg	228	2	27	9	2
EA139: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	13.2	3.3	3.0	4.8	4.9
Total Soluble Matter (mg)		1	mg	217	54	49	79	81
EA141: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	19.3	0.2	2.3	0.7	0.2
Total Insoluble Matter (mg)		1	mg	318	4	38	11	4
EA142: Total Solids								
Total Solids		0.1	g/m².month	32.5	3.5	5.3	5.5	5.1
Total Solids (mg)		1	mg	535	58	87	90	85
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	65.8	2.67	8.99	4.90	2.28
øBarium	7440-39-3	0.05	µg/m².month	<2340	<65.1	<343	<81.9	<65.6
Ø Manganese	7439-96-5	0.05	µg/m².month	1690	50.0	276	84.2	44.5

# Page : 4 of 8 Work Order : EM2112733 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDD06	KF1	KF2	KF3	KF4
	Sampli	ng date / time	30-Jun-2021 11:00	30-Jun-2021 13:00	30-Jun-2021 13:10	30-Jun-2021 13:15	30-Jun-2021 13:25	
Compound	CAS Number	LOR	Unit	EM2112733-006	EM2112733-007	EM2112733-008	EM2112733-009	EM2112733-010
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content		0.1	g/m².month	1.2	0.2	0.2	0.2	0.2
Ash Content (mg)		1	mg	20	3	3	3	4
EA125: Combustible Matter								
Combustible Matter		0.1	g/m².month	3.0	0.2	<0.1	<0.1	0.2
Combustible Matter (mg)		1	mg	50	3	1	1	2
EA139: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	6.0	1.7	2.3	1.5	0.7
Total Soluble Matter (mg)		1	mg	98	29	38	25	12
EA141: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	4.2	0.4	0.2	0.2	0.4
Total Insoluble Matter (mg)		1	mg	70	6	4	4	6
EA142: Total Solids								
Total Solids		0.1	g/m².month	10.2	2.1	2.5	1.7	1.1
Total Solids (mg)		1	mg	168	35	42	29	18
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	<16.6	4.56	<13.4	<49.5	12.9
øBarium	7440-39-3	0.05	µg/m².month	<551	<67.7	<67.3	<62.3	<91.0
Ø Manganese	7439-96-5	0.05	µg/m².month	226	64.3	62.2	53.0	84.6


Sub-Matrix: DUST			Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
(Matrix: AIR)				Soluble As, Ba, Mn				
		Sampli	ng date / time	30-Jun-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2112733-011	EM2112733-012	EM2112733-013	EM2112733-014	EM2112733-015
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	108	43.7	49.8	126	47.8
ø Barium	7440-39-3	0.05	µg/m².month	1750	87.1	412	241	104
ø Manganese	7439-96-5	0.05	µg/m².month	2580	222	924	992	433



Sub-Matrix: DUST			Sample ID	WVDD06	KF1	KF2	KF3	KF4
(Matrix: AIR)				Soluble As, Ba, Mn				
	Sampli	ng date / time	30-Jun-2021 00:00	30-Jun-2021 00:00	30-Jun-2021 00:00	30-Jun-2021 00:00	30-Jun-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2112733-016	EM2112733-017	EM2112733-018	EM2112733-019	EM2112733-020
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	131	10.0	26.8	25.3	12.8
ØBarium	7440-39-3	0.05	µg/m².month	714	114	72.1	109	241
ø Manganese	7439-96-5	0.05	µg/m².month	1430	402	290	330	301



Sub-Matrix: DUST			Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
(Matrix: AIR)				Insoluble As, Ba, Mn				
	Sampli	ng date / time	30-Jun-2021 00:00	30-Jun-2021 00:00	30-Jun-2021 00:00	30-Jun-2021 00:00	30-Jun-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2112733-021	EM2112733-022	EM2112733-023	EM2112733-024	EM2112733-025
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	85.6	2.67	12.4	13.1	2.60
Ø Barium	7440-39-3	0.05	µg/m².month	<2340	<65.1	<343	<81.9	<65.6
ø Manganese	7439-96-5	0.05	µg/m².month	2240	50.2	358	110	45.9



Sub-Matrix: DUST			Sample ID	WVDD06	KF1	KF2	KF3	KF4
(Matrix: AIR)				Insoluble As, Ba, Mn				
	Sampli	ng date / time	30-Jun-2021 00:00	30-Jun-2021 00:00	30-Jun-2021 00:00	30-Jun-2021 00:00	30-Jun-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2112733-026	EM2112733-027	EM2112733-028	EM2112733-029	EM2112733-030
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	<16.6	7.15	<13.4	<49.5	14.7
ØBarium	7440-39-3	0.05	µg/m².month	<551	<67.7	<67.3	<62.3	<91.0
ø Manganese	7439-96-5	0.05	µg/m².month	225	91.0	97.5	98.3	89.6



## **CERTIFICATE OF ANALYSIS**

Work Order	: EM2112734	Page	: 1 of 7
Client	ALS WATER RESOURCES GROUP	Laboratory	Environmental Division Melbourne
Contact	: ROHAN OLIVER	Contact	: Customer Services EM
Address	: 94 KERANG-KOONDROOK ROAD	Address	: 4 Westall Rd Springvale VIC Australia 3171
	KERANG 3579		
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 02-Jul-2021 11:20
Order number	:	Date Analysis Commenced	: 06-Jul-2021
C-O-C number	:	Issue Date	: 13-Jul-2021 13:23
Sampler	:		Hac-MRA NATA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 24		Accredited for compliance with
No. of samples analysed	: 24		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	Senior Inorganic Chemist	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 Contact 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

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- Sampling period: 02/06/2021- 30/06/2021
- ALS is not NATA accredited for the analysis of metals in dust deposition gauge.
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- EM2112734 #3-5 and #7-8: Sample 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
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- 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 g/m<sup>2</sup>.mth as sampling data was provided by the client.

# Page : 3 of 7 Work Order : EM2112734 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST (Matrix: AIR)	Sample ID			WVDG03N	WVDG03E	WVDG03S	WVDG03W	WVDG05N
		Sampli	ing date / time	30-Jun-2021 11:50	30-Jun-2021 11:51	30-Jun-2021 11:52	30-Jun-2021 11:53	30-Jun-2021 12:20
Compound	CAS Number	LOR	Unit	EM2112734-001	EM2112734-002	EM2112734-003	EM2112734-004	EM2112734-005
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content		0.1	g/m².month	<0.1	<0.1	<0.1	<0.1	<0.1
Ash Content (mg)		1	mg	1	1	<1	<1	<1
EA125I: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.5	0.5	2.6	2.2	0.4
Combustible Matter (mg)		1	mg	8	7	37	32	6
EA139: Total Soluble Matter								
Total Soluble Matter (mg)		1	mg	1	5	3	2	1
EA139I: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.1	0.4	0.2	0.1	0.1
EA141: Total Insoluble Matter								
Total Insoluble Matter (mg)		1	mg	9	8	37	32	6
EA141I: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.6	0.6	2.6	2.2	0.4
EA142: Total Solids								
Total Solids (mg)		1	mg	10	13	40	34	7
EA142I: Total Solids								
Total Solids		0.1	g/m².month	0.7	1.0	2.8	2.3	0.5
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	<1.20	<0.05	0.604	0.599	0.764
ØBarium	7440-39-3	0.05	µg/m².month	<40.2	1.53	26.5	20.4	32.2
ø Manganese	7439-96-5	0.05	µg/m².month	<40.0	0.463	23.3	13.2	27.0



Sub-Matrix: DUST			Sample ID	WVDG05E	WVDG05S	WVDG05W	WVDG03N	WVDG03E
							soluble metals	soluble metals
		Sampl	ing date / time	30-Jun-2021 12:21	30-Jun-2021 12:22	30-Jun-2021 12:23	30-Jun-2021 00:00	30-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EM2112734-006	EM2112734-007	EM2112734-008	EM2112734-009	EM2112734-010
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content		0.1	g/m².month	<0.1	<0.1	<0.1		
Ash Content (mg)		1	mg	1	1	1		
EA125I: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.3	0.2	0.2		
Combustible Matter (mg)		1	mg	4	3	3		
EA139: Total Soluble Matter								
Total Soluble Matter (mg)		1	mg	1	3	2		
EA139I: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.1	0.2	0.1		
EA141: Total Insoluble Matter								
Total Insoluble Matter (mg)		1	mg	5	4	4		
EA141I: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.4	0.3	0.3		
EA142: Total Solids								
Total Solids (mg)		1	mg	6	7	6		
EA142I: Total Solids								
Total Solids		0.1	g/m².month	0.5	0.5	0.4		
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	0.463	0.201	0.771	0.087	1.60
ØBarium	7440-39-3	0.05	µg/m².month	8.90	2.67	21.1	5.34	16.7
øManganese	7439-96-5	0.05	µg/m².month	9.29	30.00	8.29	8.69	21.6



Sub-Matrix: DUST			Sample ID	WVDG03S	WVDG03W	WVDG05N	WVDG05E	WVDG05S
(Matrix: AIR)				soluble metals	soluble metals	soluble metals	soluble metals	soluble metals
	Sampli	ng date / time	30-Jun-2021 00:00					
Compound	CAS Number	LOR	Unit	EM2112734-011	EM2112734-012	EM2112734-013	EM2112734-014	EM2112734-015
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	0.873	0.170	0.382	0.212	0.728
ØBarium	7440-39-3	0.05	µg/m².month	15.7	9.16	8.69	4.81	12.8
ø Manganese	7439-96-5	0.05	µg/m².month	15.9	13.0	11.7	6.73	13.1



Sub-Matrix: DUST			Sample ID	WVDG05W	WVDG03N	WVDG03E	WVDG03S	WVDG03W
(Matrix: AIR)				soluble metals	insoluble metals	insoluble metals	insoluble metals	insoluble metals
	Sampli	ng date / time	30-Jun-2021 00:00					
Compound	CAS Number	LOR	Unit	EM2112734-016	EM2112734-017	EM2112734-018	EM2112734-019	EM2112734-020
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	0.321	<1.20	1.60	1.26	0.640
ØBarium	7440-39-3	0.05	µg/m².month	14.4	<40.2	126	29.8	24.6
ø Manganese	7439-96-5	0.05	µg/m².month	7.09	<40.0	24.5	28.1	14.8



Sub-Matrix: DUST			Sample ID	WVDG05N	WVDG05E	WVDG05S	WVDG05W	
(Matrix: AIR)				insoluble metals	insoluble metals	insoluble metals	insoluble metals	
	Samplii	ng date / time	30-Jun-2021 00:00	30-Jun-2021 00:00	30-Jun-2021 00:00	30-Jun-2021 00:00		
Compound	CAS Number	LOR	Unit	EM2112734-021	EM2112734-022	EM2112734-023	EM2112734-024	
				Result	Result	Result	Result	
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	0.912	0.546	0.618	1.12	
ØBarium	7440-39-3	0.05	µg/m².month	33.0	22.0	19.8	32.3	
ø Manganese	7439-96-5	0.05	µg/m².month	27.0	11.7	13.9	17.1	



## **QUALITY CONTROL REPORT**

Work Order	: EM2107970	Page	: 1 of 3
Client Contact	: ALS WATER RESOURCES GROUP : ROHAN OLIVER	Laboratory Contact	: Environmental Division Melbourne : Customer Services EM
Address	94 KERANG-KOONDROOK ROAD KERANG 3579	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 03-May-2021
Order number	:	Date Analysis Commenced	: 07-May-2021
C-O-C number	:	Issue Date	13-May-2021
Sampler	: KV		Hac-MRA NATA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 30		Accredited for compliance with
No. of samples analysed	: 30		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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

#### 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.

Nikki Otenniewski	Carias Incorrection Instrument Chamiet	
Signatories	Position	Accreditation Category

Nikki Stepniewski

Senior Inorganic Instrument Chemist

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

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

RPD = Relative Percentage Difference

# = Indicates failed QC

#### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

• No Laboratory Duplicate (DUP) Results are required to be reported.



### Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: AIR				Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EA139: Total Soluble Matter (QCLot: 3665410)									
EA139: Total Soluble Matter		0.1	g/m².month	<0.1	1.66 g/m <sup>2</sup> .month	102	70.0	130	
EA139: Total Soluble Matter (mg)		1	mg	<1	29.3 mg	102	70.0	130	
EA141: Total Insoluble Matter (QCLot: 3665411)									
EA141: Total Insoluble Matter		0.1	g/m².month	<0.1	5.66 g/m <sup>2</sup> .month	90.1	66.8	134	
EA141: Total Insoluble Matter (mg)		1	mg	<1	100 mg	91.0	67.5	125	
EA142: Total Solids (QCLot: 3665409)									
EA142: Total Solids		0.1	g/m².month	<0.1					
EA142: Total Solids (mg)		1	mg	<1	129.3 mg	93.6	68.4	126	
EG020T: Total Metals by ICP-MS (QCLot: 3670894)									
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050					
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050					
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050					
EG020T: Total Metals by ICP-MS (QCLot: 3670895)									
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050					
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050					
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050					

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



QA/QC Compliance Assessment to assist with Quality Review							
Work Order	EM2107970	Page	: 1 of 5				
Client	ALS WATER RESOURCES GROUP	Laboratory	: Environmental Division Melbourne				
Contact	: ROHAN OLIVER	Telephone	: +61-3-8549 9600				
Project	: MV214940	Date Samples Received	: 03-May-2021				
Site	:	Issue Date	: 13-May-2021				
Sampler	: KV	No. of samples received	: 30				
Order number	:	No. of samples analysed	: 30				

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

## Summary of Outliers

#### **Outliers : Quality Control Samples**

This report highlights outliers flagged in the Quality Control (QC) Report.

- NO Method Blank value outliers occur.
- NO Duplicate outliers occur. •
- <u>NO</u> Laboratory Control outliers occur.
- NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

#### **Outliers : Analysis Holding Time Compliance**

• NO Analysis Holding Time Outliers exist.

#### **Outliers : Frequency of Quality Control Samples**

• NO Quality Control Sample Frequency Outliers exist.



## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: AIR					Evaluatior	n: 🗴 = Holding time	breach ; 🗸 = Withi	n holding tim
Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA120: Ash Content								
Dust Gauge (Bottle) - Copper Sulfate (	EA120)							
WVDD01,	WVDD02,	30-Apr-2021				07-May-2021	27-Oct-2021	<ul> <li>✓</li> </ul>
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA125: Combustible Matter								
Dust Gauge (Bottle) - Copper Sulfate (	EA125)							
WVDD01,	WVDD02,	30-Apr-2021				07-May-2021	27-Oct-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA139: Total Soluble Matter								
Dust Gauge (Bottle) - Copper Sulfate (	EA139)							
WVDD01,	WVDD02,	30-Apr-2021				07-May-2021	27-Oct-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA141: Total Insoluble Matter								
Dust Gauge (Bottle) - Copper Sulfate (	EA141)							
WVDD01,	WVDD02,	30-Apr-2021				07-May-2021	27-Oct-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3.	KF4							

Page	: 3 of 5
Work Order	: EM2107970
Client	: ALS WATER RESOURCES GROUP
Project	: MV214940



Matrix: AIR					Evaluation	i: × = Holding time	breach ; 🗸 = With	in holding time
Method		Sample Date	E	ktraction / Preparation			Analysis	
Container / Client Sample ID(s)	/ Client Sample ID(s)			Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA142: Total Solids								
Dust Gauge (Bottle) - Copper Sulfate (EA142)								
WVDD01,	WVDD02,	30-Apr-2021				07-May-2021	27-Oct-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EG020T: Total Metals by ICP-MS								
Dust Residue (EG020TUG)								
WVDD01,	WVDD02,	30-Apr-2021				11-May-2021	27-Oct-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4,							
WVDD01 - Soluble As, Ba, Mn,	WVDD02 - Soluble As, Ba, Mn,							
WVDD03 - Soluble As, Ba, Mn,	WVDD04 - Soluble As, Ba, Mn,							
WVDD05 - Soluble As, Ba, Mn,	WVDD06 - Soluble As, Ba, Mn,							
KF1 - Soluble As, Ba, Mn,	KF2 - Soluble As, Ba, Mn,							
KF3 - Soluble As, Ba, Mn,	KF4 - Soluble As, Ba, Mn,							
WVDD01 - Insoluble As, Ba, Mn,	WVDD02 - Insoluble As, Ba, Mn,							
WVDD03 - Insoluble As, Ba, Mn,	WVDD04 - Insoluble As, Ba, Mn,							
WVDD05 - Insoluble As, Ba, Mn,	WVDD06 - Insoluble As, Ba, Mn,							
KF1 - Insoluble As, Ba, Mn,	KF2 - Insoluble As, Ba, Mn,							
KF3 - Insoluble As, Ba, Mn,	KF4 - Insoluble As, Ba, Mn							



## **Quality Control Parameter Frequency Compliance**

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: AIR				Evaluation	n: × = Quality Co	ontrol frequency r	not within specification ; $\checkmark$ = Quality Control frequency within specification.
Quality Control Sample Type		Co	ount	Rate (%)			Quality Control Specification
Analytical Methods	Method	00	Reaular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS)							
Total Insoluble Matter (TIM)	EA141	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139	1	17	5.88	4.76	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Insoluble Matter (TIM)	EA141	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals - ICP-MS (mass/filter)	EG020TUG	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139	1	17	5.88	4.76	✓	NEPM 2013 B3 & ALS QC Standard



## **Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Insoluble solids in deposited
			dust.
Total Solids (TS)	EA142	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* EG020TUG	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by
			ICPMS and reported as ug of the TIM.



## **QUALITY CONTROL REPORT**

Work Order	: EM2107971	Page	: 1 of 3
Client Contact	: ALS WATER RESOURCES GROUP	Laboratory Contact	: Environmental Division Melbourne
Address	94 KERANG-KOONDROOK ROAD KERANG 3579	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 03-May-2021
Order number	:	Date Analysis Commenced	: 07-May-2021
C-O-C number	:	Issue Date	13-May-2021
Sampler	: KV		Hac-MRA NATA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 24		Accredited for compliance with
No. of samples analysed	: 24		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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

#### 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.

Nildi Otaaniawali	Conice Incomentia Instrument Ob emist	
Signatories	Position	Accreditation Category

Nikki Stepniewski

Senior Inorganic Instrument Chemist

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

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

RPD = Relative Percentage Difference

# = Indicates failed QC

#### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

• No Laboratory Duplicate (DUP) Results are required to be reported.



### Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: AIR				Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EA139I: Total Soluble Matter (QCLot: 3665414)									
EA139I: Total Soluble Matter		0.1	g/m².month	<0.1	1.66 g/m <sup>2</sup> .month	108	70.0	130	
EA139I: Total Soluble Matter (mg)		1	mg	<1	29.3 mg	92.2	70.0	130	
EA141I: Total Insoluble Matter (QCLot: 3665413)									
EA141I: Total Insoluble Matter		0.1	g/m².month	<0.1	5.66 g/m <sup>2</sup> .month	120	70.0	130	
EA141I: Total Insoluble Matter (mg)		1	mg	<1	100 mg	104	70.0	130	
EA142I: Total Solids (QCLot: 3665412)									
EA142I: Total Solids		0.1	g/m².month	<0.1	7.32 g/m <sup>2</sup> .month	117	70.0	130	
EA142I: Total Solids (mg)		1	mg	<1	129.3 mg	101	70.0	130	
EG020T: Total Metals by ICP-MS (QCLot: 3670895)									
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050					
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050					
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050					
EG020T: Total Metals by ICP-MS (QCLot: 3670896)									
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050					
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050					
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050					

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



#### QA/QC Compliance Assessment to assist with Quality Review : EM2107971 Work Order Page : 1 of 5 : Environmental Division Melbourne : ALS WATER RESOURCES GROUP Laboratory : ROHAN OLIVER Telephone :+61-3-8549 9600 : MV214940 **Date Samples Received** : 03-May-2021 **Issue Date** : -----: 13-May-2021 : KV No. of samples received : 24 Order number : -----No. of samples analysed : 24

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

## Summary of Outliers

Client

Project

Site

Contact

Sampler

#### **Outliers : Quality Control Samples**

This report highlights outliers flagged in the Quality Control (QC) Report.

- <u>NO</u> Method Blank value outliers occur.
- NO Duplicate outliers occur. ۰
- <u>NO</u> Laboratory Control outliers occur.
- ٠ NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

#### **Outliers : Analysis Holding Time Compliance**

NO Analysis Holding Time Outliers exist.

#### **Outliers : Frequency of Quality Control Samples**

• NO Quality Control Sample Frequency Outliers exist.



## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Evaluation: ×	: =	Holding	time	breach	• 🗸	=	Within	holding	time
		Tioluling	une	Dieach		_	•••••	norung	une.

Matrix: AIR Evaluation: * = Holding					: × = Holding time	breach ; ✓ = Withi	n holding time.	
Method		Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA120I: Ash Content								
Directional Dust Gauge - Plastic - A	Algitrol Algaecide (EA120I)							
WVDG03N,	WVDG03E,	30-Apr-2021				07-May-2021	27-Oct-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA125I: Combustible Matter								
Directional Dust Gauge - Plastic - A	Algitrol Algaecide (EA125I)							
WVDG03N,	WVDG03E,	30-Apr-2021				07-May-2021	27-Oct-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA139: Total Soluble Matter								
Directional Dust Gauge - Plastic - A	Algitrol Algaecide (EA139I)							
WVDG03N,	WVDG03E,	30-Apr-2021				07-May-2021	27-Oct-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA139I: Total Soluble Matter								
Directional Dust Gauge - Plastic - A	Algitrol Algaecide (EA139I)							
WVDG03N,	WVDG03E,	30-Apr-2021				07-May-2021	27-Oct-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA141: Total Insoluble Matter								
Directional Dust Gauge - Plastic - A	Algitrol Algaecide (EA141I)							
WVDG03N,	WVDG03E,	30-Apr-2021				07-May-2021	27-Oct-2021	<ul> <li>✓</li> </ul>
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							

Page	: 3 of 5
Work Order	: EM2107971
Client	: ALS WATER RESOURCES GROUP
Project	: MV214940



Matrix: AIR Evaluation: × = Holding time breach; ✓ =					breach ; 🗸 = Withi	n holding time.		
Method		Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA141I: Total Insoluble Matter								
Directional Dust Gauge - Plastic - Algitrol	Algaecide (EA141I)							
WVDG03N,	WVDG03E,	30-Apr-2021				07-May-2021	27-Oct-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA142: Total Solids								
Directional Dust Gauge - Plastic - Algitrol	Algaecide (EA142I)							
WVDG03N,	WVDG03E,	30-Apr-2021				07-May-2021	27-Oct-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA142I: Total Solids								
Directional Dust Gauge - Plastic - Algitrol	Algaecide (EA142I)							
WVDG03N,	WVDG03E,	30-Apr-2021				07-May-2021	27-Oct-2021	$\checkmark$
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EG020T: Total Metals by ICP-MS								
Dust Residue (EG020TUG)								
WVDG03N,	WVDG03E,	30-Apr-2021				11-May-2021	27-Oct-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W,							
WVDG03N - soluble metals,	WVDG03E - soluble metals,							
WVDG03S - soluble metals,	WVDG03W - soluble metals,							
WVDG05N - soluble metals,	WVDG05E - soluble metals,							
WVDG05S - soluble metals,	WVDG05W - soluble metals,							
WVDG03N - insoluble metals,	WVDG03E - insoluble metals,							
WVDG03S - insoluble metals,	WVDG03W - insoluble metals,							
WVDG05N - insoluble metals,	WVDG05E - insoluble metals,							
WVDG05S - insoluble metals,	WVDG05W - insoluble metals							



## **Quality Control Parameter Frequency Compliance**

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: AIR					Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.			
Quality Control Sample Type		Co	ount		Rate (%)		Quality Control Specification	
Analytical Methods	Method	00	Reaular	Actual	Expected	Evaluation		
Laboratory Control Samples (LCS)								
Total Insoluble Matter (TIM)	EA141I	1	8	12.50	5.00	$\checkmark$	NEPM 2013 B3 & ALS QC Standard	
Total Solids (TS)	EA142I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Soluble Matter (SM)	EA139I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Method Blanks (MB)								
Total Insoluble Matter (TIM)	EA141I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Metals - ICP-MS (mass/filter)	EG020TUG	2	34	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Solids (TS)	EA142I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Soluble Matter (SM)	EA139I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard	



## **Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Insoluble solids in deposited
			dust.
Total Solids (TS)	EA142I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* EG020TUG	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by
			ICPMS and reported as ug of the TIM.



## QUALITY CONTROL REPORT

Work Order	: EM2110733	Page	: 1 of 3
Client Contact	ALS WATER RESOURCES GROUP	Laboratory Contact	: Environmental Division Melbourne : Customer Services EM
Address	94 KERANG-KOONDROOK ROAD KERANG 3579	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 07-Jun-2021
Order number	:	Date Analysis Commenced	:08-Jun-2021
C-O-C number	:	Issue Date	: 15-Jun-2021
Sampler	: RO		Hac-MRA NATA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 24		Accredited for compliance with
No. of samples analysed	: 24		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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

#### 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

Dilani Fernando

Senior Inorganic Chemist

Position

Accreditation Category

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

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

RPD = Relative Percentage Difference

# = Indicates failed QC

#### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

• No Laboratory Duplicate (DUP) Results are required to be reported.



### Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: AIR			Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA139I: Total Soluble Matter (QCLot: 3723910)								
EA139I: Total Soluble Matter		0.1	g/m².month	<0.1	1.66 g/m <sup>2</sup> .month	114	70.0	130
EA139I: Total Soluble Matter (mg)		1	mg	<1	29.3 mg	102	70.0	130
EA141I: Total Insoluble Matter (QCLot: 3723900)								
EA141I: Total Insoluble Matter		0.1	g/m².month	<0.1	5.66 g/m <sup>2</sup> .month	117	70.0	130
EA141I: Total Insoluble Matter (mg)		1	mg	<1	100 mg	104	70.0	130
EA142I: Total Solids (QCLot: 3723909)								
EA142I: Total Solids		0.1	g/m².month	<0.1	7.32 g/m <sup>2</sup> .month	116	70.0	130
EA142I: Total Solids (mg)		1	mg	<1	129.3 mg	104	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 3730295)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				
EG020T: Total Metals by ICP-MS (QCLot: 3730296)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



## QA/QC Compliance Assessment to assist with Quality Review

Work Order	EM2110733	Page	: 1 of 5
Client	ALS WATER RESOURCES GROUP	Laboratory	: Environmental Division Melbourne
Contact	: ROHAN OLIVER	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 07-Jun-2021
Site	:	Issue Date	: 15-Jun-2021
Sampler	: RO	No. of samples received	: 24
Order number	:	No. of samples analysed	: 24

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

## **Summary of Outliers**

#### **Outliers : Quality Control Samples**

This report highlights outliers flagged in the Quality Control (QC) Report.

- <u>NO</u> Method Blank value outliers occur.
- <u>NO</u> Duplicate outliers occur.
- <u>NO</u> Laboratory Control outliers occur.
- <u>NO</u> Matrix Spike outliers occur.
- For all regular sample matrices, <u>NO</u> surrogate recovery outliers occur.

#### **Outliers : Analysis Holding Time Compliance**

• <u>NO</u> Analysis Holding Time Outliers exist.

#### **Outliers : Frequency of Quality Control Samples**

• <u>NO</u> Quality Control Sample Frequency Outliers exist.



## Analysis Holding Time Compliance

Matrix: AIR

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for <u>VOC in soils</u> vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive <u>or</u> Vinyl Chloride and Styrene are not key analytes of interest/concern.

Evaluation:	$\mathbf{x} = Holding$	time breach	· 🗸 =	Within	holding	time
	~ - Holding	une breach	, • <del>-</del>		noiung	ume.

Method		Sample Date	Ex	traction / Preparation		Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA120I: Ash Content									
Directional Dust Gauge - Plastic - Alg	itrol Algaecide (EA120I)								
WVDG03N,	WVDG03E,	02-Jun-2021				08-Jun-2021	29-Nov-2021	1	
WVDG03S.	WVDG03W.								
WVDG05N	WVDG05E								
WVDG05S.	WVDG05W								
EA1251: Combustible Matter						1			
Directional Duct Course Blactic Ala	itrol Algoosido (EA1251)								
	WVDG03E	02-Jun-2021				08-Jun-2021	29-Nov-2021		
WVDG03S	WVDG03W							•	
	WVDC05E								
WVDG055,	WVDG05W								
EA139: Total Soluble Matter									
Directional Dust Gauge - Plastic - Alg	itrol Algaecide (EA139I)								
WVDG03N,	WVDG03E,	02-Jun-2021				08-Jun-2021	29-Nov-2021	✓	
WVDG03S,	WVDG03W,								
WVDG05N,	WVDG05E,								
WVDG05S,	WVDG05W								
EA139I: Total Soluble Matter									
Directional Dust Gauge - Plastic - Alg	itrol Algaecide (EA139I)								
WVDG03N,	WVDG03E,	02-Jun-2021				08-Jun-2021	29-Nov-2021	✓	
WVDG03S,	WVDG03W,								
WVDG05N,	WVDG05E,								
WVDG05S,	WVDG05W								
EA141: Total Insoluble Matter									
Directional Dust Gauge - Plastic - Alg	itrol Algaecide (EA141I)								
WVDG03N,	WVDG03E,	02-Jun-2021				08-Jun-2021	29-Nov-2021	<ul> <li>✓</li> </ul>	
WVDG03S,	WVDG03W,								
WVDG05N,	WVDG05E,								
WVDG05S.	WVDG05W								

Page	: 3 of 5
Work Order	: EM2110733
Client	: ALS WATER RESOURCES GROUP
Project	: MV214940



Matrix: AIR		Evaluation: × = Holding time breach ; ✓ = Within holding time.								
Method		Sample Date	Ex	traction / Preparation			Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation		
EA141I: Total Insoluble Matter										
Directional Dust Gauge - Plastic - Algitrol	I Algaecide (EA141I)									
WVDG03N,	WVDG03E,	02-Jun-2021				08-Jun-2021	29-Nov-2021	✓		
WVDG03S,	WVDG03W,									
WVDG05N,	WVDG05E,									
WVDG05S,	WVDG05W									
EA142: Total Solids										
Directional Dust Gauge - Plastic - Algitrol	I Algaecide (EA142I)									
WVDG03N,	WVDG03E,	02-Jun-2021				08-Jun-2021	29-Nov-2021	✓		
WVDG03S,	WVDG03W,									
WVDG05N,	WVDG05E,									
WVDG05S,	WVDG05W									
EA142I: Total Solids										
Directional Dust Gauge - Plastic - Algitrol	I Algaecide (EA142I)									
WVDG03N,	WVDG03E,	02-Jun-2021				08-Jun-2021	29-Nov-2021	<ul> <li>✓</li> </ul>		
WVDG03S,	WVDG03W,									
WVDG05N,	WVDG05E,									
WVDG05S,	WVDG05W									
EG020T: Total Metals by ICP-MS										
Dust Residue (EG020TUG)										
WVDG03N,	WVDG03E,	02-Jun-2021				11-Jun-2021	29-Nov-2021	✓		
WVDG03S,	WVDG03W,									
WVDG05N,	WVDG05E,									
WVDG05S,	WVDG05W,									
WVDG03N - soluble metals,	WVDG03E - soluble metals,									
WVDG03S - soluble metals,	WVDG03W - soluble metals,									
WVDG05N - soluble metals,	WVDG05E - soluble metals,									
WVDG05S - soluble metals,	WVDG05W - soluble metals,									
WVDG03N - insoluble metals,	WVDG03E - insoluble metals,									
WVDG03S - insoluble metals,	WVDG03W - insoluble metals,									
WVDG05N - insoluble metals,	WVDG05E - insoluble metals,									
WVDG05S - insoluble metals,	WVDG05W - insoluble metals									



## **Quality Control Parameter Frequency Compliance**

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: AIR				Evaluation	n: × = Quality Co	ntrol frequency n	ot within specification ; $\checkmark$ = Quality Control frequency within specification.
Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	OC	Reaular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS)							
Total Insoluble Matter (TIM)	EA141I	1	20	5.00	5.00	$\checkmark$	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Insoluble Matter (TIM)	EA141I	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals - ICP-MS (mass/filter)	EG020TUG	2	25	8.00	5.00	$\checkmark$	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard



## **Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Insoluble solids in deposited
			dust.
Total Solids (TS)	EA142I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* EG020TUG	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by
			ICPMS and reported as ug of the TIM.



## QUALITY CONTROL REPORT

Work Order	: EM2110737	Page	: 1 of 3
Client Contact Address	: ALS WATER RESOURCES GROUP : ROHAN OLIVER : 94 KERANG-KOONDROOK ROAD	Laboratory Contact Address	: Environmental Division Melbourne : Customer Services EM : 4 Westall Rd Springvale VIC Australia 3171
Telephone	KERANG 3579	Telephone	+ +61 3 8540 0600
Project	: MV214940	Date Samples Received	: 07-Jun-2021
Order number C-O-C number	:	Date Analysis Commenced Issue Date	: 10-Jun-2021 : 17-Jun-2021
Sampler	ROHAN OLIVER, ROHAN OLIVER		Hac-MRA NAIA
Site Quote number No. of samples received No. of samples analysed	: : ME/968/20 : 30 : 30		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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

#### 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

Dilani Fernando

Senior Inorganic Chemist

Position

Accreditation Category

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

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

RPD = Relative Percentage Difference

# = Indicates failed QC

#### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

• No Laboratory Duplicate (DUP) Results are required to be reported.



#### Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: AIR				Method Blank (MB)		Laboratory Control Spike (LC	S) Report	
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA139: Total Soluble Matter (QCLot: 3729174)								
EA139: Total Soluble Matter		0.1	g/m².month	<0.1	1.66 g/m <sup>2</sup> .month	102	70.0	130
EA139: Total Soluble Matter (mg)		1	mg	<1	29.3 mg	106	70.0	130
EA141: Total Insoluble Matter (QCLot: 3729175)								
EA141: Total Insoluble Matter		0.1	g/m².month	<0.1	5.66 g/m <sup>2</sup> .month	76.0	66.8	134
EA141: Total Insoluble Matter (mg)		1	mg	<1	100 mg	78.0	67.5	125
EA142: Total Solids (QCLot: 3729173)								
EA142: Total Solids		0.1	g/m².month	<0.1				
EA142: Total Solids (mg)		1	mg	<1	129.3 mg	84.3	68.4	126
EG020T: Total Metals by ICP-MS (QCLot: 3738143)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				
EG020T: Total Metals by ICP-MS (QCLot: 3738144)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				
EG020T: Total Metals by ICP-MS (QCLot: 3738145)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				

#### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



|--|

Work Order	: EM2110737	Page	: 1 of 5
Client	: ALS WATER RESOURCES GROUP	Laboratory	: Environmental Division Melbourne
Contact	: ROHAN OLIVER	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 07-Jun-2021
Site	:	Issue Date	: 17-Jun-2021
Sampler	: ROHAN OLIVER, ROHAN OLIVER	No. of samples received	: 30
Order number	:	No. of samples analysed	: 30

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

# **Summary of Outliers**

#### **Outliers : Quality Control Samples**

This report highlights outliers flagged in the Quality Control (QC) Report.

- <u>NO</u> Method Blank value outliers occur.
- <u>NO</u> Duplicate outliers occur.
- <u>NO</u> Laboratory Control outliers occur.
- <u>NO</u> Matrix Spike outliers occur.
- For all regular sample matrices, <u>NO</u> surrogate recovery outliers occur.

#### **Outliers : Analysis Holding Time Compliance**

• <u>NO</u> Analysis Holding Time Outliers exist.

#### **Outliers : Frequency of Quality Control Samples**

• <u>NO</u> Quality Control Sample Frequency Outliers exist.



## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: AIR					Evaluation	: × = Holding time	breach ; 🗸 = Withi	n holding tim
Method		Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA120: Ash Content								
Dust Gauge (Bottle) - Copper Sulfate (I	EA120)							
WVDD01,	WVDD02,	02-Jun-2021				10-Jun-2021	29-Nov-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA125: Combustible Matter								
Dust Gauge (Bottle) - Copper Sulfate (I	EA125)							
WVDD01,	WVDD02,	02-Jun-2021				10-Jun-2021	29-Nov-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA139: Total Soluble Matter								
Dust Gauge (Bottle) - Copper Sulfate (I	EA139)							
WVDD01,	WVDD02,	02-Jun-2021				10-Jun-2021	29-Nov-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA141: Total Insoluble Matter								
Dust Gauge (Bottle) - Copper Sulfate (I	EA141)							
WVDD01,	WVDD02,	02-Jun-2021				10-Jun-2021	29-Nov-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KE3	KF4							

Page	: 3 of 5
Work Order	: EM2110737
Client	: ALS WATER RESOURCES GROUP
Project	: MV214940



Matrix: AIR					Evaluation	n: × = Holding time	e breach ; ✓ = With	in holding time
Method		Sample Date	E	ktraction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA142: Total Solids								
Dust Gauge (Bottle) - Copper Sulfate (EA142)								
WVDD01,	WVDD02,	02-Jun-2021				10-Jun-2021	29-Nov-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EG020T: Total Metals by ICP-MS								
Dust Residue (EG020TUG)								
WVDD01,	WVDD02,	02-Jun-2021				16-Jun-2021	29-Nov-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4,							
WVDD01 - Soluble As, Ba, Mn,	WVDD02 - Soluble As, Ba, Mn,							
WVDD03 - Soluble As, Ba, Mn,	WVDD04 - Soluble As, Ba, Mn,							
WVDD05 - Soluble As, Ba, Mn,	WVDD06 - Soluble As, Ba, Mn,							
KF1 - Soluble As, Ba, Mn,	KF2 - Soluble As, Ba, Mn,							
KF3 - Soluble As, Ba, Mn,	KF4 - Soluble As, Ba, Mn,							
WVDD01 - Insoluble As, Ba, Mn,	WVDD02 - Insoluble As, Ba, Mn,							
WVDD03 - Insoluble As, Ba, Mn,	WVDD04 - Insoluble As, Ba, Mn,							
WVDD05 - Insoluble As, Ba, Mn,	WVDD06 - Insoluble As, Ba, Mn,							
KF1 - Insoluble As, Ba, Mn,	KF2 - Insoluble As, Ba, Mn,							
KF3 - Insoluble As, Ba, Mn,	KF4 - Insoluble As, Ba, Mn							



# **Quality Control Parameter Frequency Compliance**

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: AIR				Evaluation	n: × = Quality Co	ontrol frequency r	not within specification ; $\checkmark$ = Quality Control frequency within specification.
Quality Control Sample Type		Co	ount		Rate (%)		Quality Control Specification
Analytical Methods	Method	OC	Reaular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS)							
Total Insoluble Matter (TIM)	EA141	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139	1	10	10.00	4.76	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Insoluble Matter (TIM)	EA141	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals - ICP-MS (mass/filter)	EG020TUG	3	30	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139	1	10	10.00	4.76	✓	NEPM 2013 B3 & ALS QC Standard



# **Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Insoluble solids in deposited
			dust.
Total Solids (TS)	EA142	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* EG020TUG	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by
			ICPMS and reported as ug of the TIM.



# **QUALITY CONTROL REPORT**

Work Order	: EM2112733	Page	: 1 of 3
Client Contact	: ALS WATER RESOURCES GROUP : ROHAN OLIVER	Laboratory Contact	: Environmental Division Melbourne : Customer Services EM
Address	: 94 KERANG-KOONDROOK ROAD KERANG 3579	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 02-Jul-2021
Order number	:	Date Analysis Commenced	: 06-Jul-2021
C-O-C number	:	Issue Date	13-Jul-2021
Sampler	: KV		Hac-MRA NATA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 30		Accredited for compliance with
No. of samples analysed	: 30		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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

#### 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.

Nilli Otaariaashi		
Signatories	Position	Accreditation Category

Nikki Stepniewski

Senior Inorganic Instrument Chemist

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

Key: Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

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

RPD = Relative Percentage Difference

# = Indicates failed QC

#### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

• No Laboratory Duplicate (DUP) Results are required to be reported.



#### Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: AIR				Method Blank (MB)		Laboratory Control Spike (LC	S) Report	
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA139: Total Soluble Matter (QCLot: 3775249)								
EA139: Total Soluble Matter		0.1	g/m².month	<0.1	1.66 g/m <sup>2</sup> .month	114	70.0	130
EA139: Total Soluble Matter (mg)		1	mg	<1	29.3 mg	113	70.0	130
EA141: Total Insoluble Matter (QCLot: 3775246)								
EA141: Total Insoluble Matter		0.1	g/m².month	<0.1	5.66 g/m <sup>2</sup> .month	90.1	66.8	134
EA141: Total Insoluble Matter (mg)		1	mg	<1	100 mg	90.0	67.5	125
EA142: Total Solids (QCLot: 3775248)								
EA142: Total Solids		0.1	g/m².month	<0.1				
EA142: Total Solids (mg)		1	mg	<1	129.3 mg	95.1	68.4	126
EG020T: Total Metals by ICP-MS (QCLot: 3786259)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				
EG020T: Total Metals by ICP-MS (QCLot: 3786260)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				

#### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



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12112733	Page	: 1 of 5	
S WATER RESOURCES GROUP	Laboratory	: Environmental Division Melbourne	
HAN OLIVER	Telephone	: +61-3-8549 9600	
214940	Date Samples Received	: 02-Jul-2021	
	Issue Date	: 13-Jul-2021	
	No. of samples received	: 30	
	No. of samples analysed	: 30	
	<b>I2112733</b> S WATER RESOURCES GROUP HAN OLIVER 214940	I2112733       Page         S WATER RESOURCES GROUP       Laboratory         HAN OLIVER       Telephone         214940       Date Samples Received         Issue Date       No. of samples received         No. of samples analysed       No. of samples analysed	

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

## Summary of Outliers

#### **Outliers : Quality Control Samples**

This report highlights outliers flagged in the Quality Control (QC) Report.

- NO Method Blank value outliers occur.
- NO Duplicate outliers occur. ٠
- <u>NO</u> Laboratory Control outliers occur.
- NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

#### **Outliers : Analysis Holding Time Compliance**

• NO Analysis Holding Time Outliers exist.

#### **Outliers : Frequency of Quality Control Samples**

• NO Quality Control Sample Frequency Outliers exist.



## Analysis Holding Time Compliance

Matrix: AIR

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for <u>VOC in soils</u> vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Evaluation:	: 🗴 = Holding	time breach ; 🗸	=	Within holding time	•
					-

						<b>J</b> =		<u> </u>
Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA120: Ash Content								
Dust Gauge (Bottle) - Copper Sulfate (EA120)								
WVDD01,	WVDD02,	30-Jun-2021				06-Jul-2021	27-Dec-2021	<ul> <li>✓</li> </ul>
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA125: Combustible Matter								
Dust Gauge (Bottle) - Copper Sulfate (EA125)								
WVDD01,	WVDD02,	30-Jun-2021				06-Jul-2021	27-Dec-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA139: Total Soluble Matter								
Dust Gauge (Bottle) - Copper Sulfate (EA139)								
WVDD01,	WVDD02,	30-Jun-2021				06-Jul-2021	27-Dec-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA141: Total Insoluble Matter								
Dust Gauge (Bottle) - Copper Sulfate (EA141)								
WVDD01,	WVDD02,	30-Jun-2021				06-Jul-2021	27-Dec-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							

Page	: 3 of 5
Work Order	: EM2112733
Client	: ALS WATER RESOURCES GROUP
Project	: MV214940



Matrix: AIR					Evaluation: * = Holding time breach ; < = Within holding time					
Method		Sample Date	E	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation		
EA142: Total Solids										
Dust Gauge (Bottle) - Copper Sulfate (EA142)										
WVDD01,	WVDD02,	30-Jun-2021				06-Jul-2021	27-Dec-2021	✓		
WVDD03,	WVDD04,									
WVDD05,	WVDD06,									
KF1,	KF2,									
KF3,	KF4									
EG020T: Total Metals by ICP-MS										
Dust Residue (EG020TUG)										
WVDD01,	WVDD02,	30-Jun-2021				12-Jul-2021	27-Dec-2021	✓		
WVDD03,	WVDD04,									
WVDD05,	WVDD06,									
KF1,	KF2,									
KF3,	KF4,									
WVDD01 - Soluble As, Ba, Mn,	WVDD02 - Soluble As, Ba, Mn,									
WVDD03 - Soluble As, Ba, Mn,	WVDD04 - Soluble As, Ba, Mn,									
WVDD05 - Soluble As, Ba, Mn,	WVDD06 - Soluble As, Ba, Mn,									
KF1 - Soluble As, Ba, Mn,	KF2 - Soluble As, Ba, Mn,									
KF3 - Soluble As, Ba, Mn,	KF4 - Soluble As, Ba, Mn,									
WVDD01 - Insoluble As, Ba, Mn,	WVDD02 - Insoluble As, Ba, Mn,									
WVDD03 - Insoluble As, Ba, Mn,	WVDD04 - Insoluble As, Ba, Mn,									
WVDD05 - Insoluble As, Ba, Mn,	WVDD06 - Insoluble As, Ba, Mn,									
KF1 - Insoluble As, Ba, Mn,	KF2 - Insoluble As, Ba, Mn,									
KF3 - Insoluble As. Ba. Mn.	KF4 - Insoluble As. Ba. Mn									



# **Quality Control Parameter Frequency Compliance**

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: AIR		Evaluation: * = Quality Control frequency not within specification ; - + = Quality Control frequency within specification					
Quality Control Sample Type		Co	ount		Rate (%)		Quality Control Specification
Analytical Methods	Method	00	Reaular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS)							
Total Insoluble Matter (TIM)	EA141	1	18	5.56	5.00	$\checkmark$	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139	1	12	8.33	4.76	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Insoluble Matter (TIM)	EA141	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals - ICP-MS (mass/filter)	EG020TUG	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139	1	12	8.33	4.76	✓	NEPM 2013 B3 & ALS QC Standard



# **Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Insoluble solids in deposited
			dust.
Total Solids (TS)	EA142	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* EG020TUG	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by
			ICPMS and reported as ug of the TIM.



# QUALITY CONTROL REPORT

Work Order	: EM2112734	Page	: 1 of 3
Client Contact	: ALS WATER RESOURCES GROUP : ROHAN OLIVER	Laboratory Contact	: Environmental Division Melbourne : Customer Services EM
Address	© 94 KERANG-KOONDROOK ROAD KERANG 3579	Address	
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 02-Jul-2021
Order number	:	Date Analysis Commenced	: 06-Jul-2021
C-O-C number	:	Issue Date	: 13-Jul-2021
Sampler	:		Hac-MRA NATA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 24		Accredited for compliance with
No. of samples analysed	: 24		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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

#### 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

Dilani Fernando

Senior Inorganic Chemist

Position

Accreditation Category

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

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

RPD = Relative Percentage Difference

# = Indicates failed QC

#### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

• No Laboratory Duplicate (DUP) Results are required to be reported.



#### Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: AIR			Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA139I: Total Soluble Matter (QCLot: 3775251)								
EA139I: Total Soluble Matter		0.1	g/m².month	<0.1	1.66 g/m <sup>2</sup> .month	108	70.0	130
EA139I: Total Soluble Matter (mg)		1	mg	<1	29.3 mg	92.2	70.0	130
EA141I: Total Insoluble Matter (QCLot: 3775247)								
EA141I: Total Insoluble Matter		0.1	g/m².month	<0.1	5.66 g/m <sup>2</sup> .month	108	70.0	130
EA141I: Total Insoluble Matter (mg)		1	mg	<1	100 mg	93.0	70.0	130
EA142I: Total Solids (QCLot: 3775250)								
EA142I: Total Solids		0.1	g/m².month	<0.1	7.32 g/m <sup>2</sup> .month	108	70.0	130
EA142I: Total Solids (mg)		1	mg	<1	129.3 mg	92.8	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 3786260)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				
EG020T: Total Metals by ICP-MS (QCLot: 3786261)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				

#### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



#### QA/QC Compliance Assessment to assist with Quality Review : EM2112734 Work Order Page : 1 of 5 : Environmental Division Melbourne : ALS WATER RESOURCES GROUP Laboratory : ROHAN OLIVER Telephone :+61-3-8549 9600 : MV214940 Date Samples Received : 02-Jul-2021 **Issue Date** : 13-Jul-2021 : -----: 24 · \_\_\_\_ No. of samples received Order number No. of samples analysed : 24 · \_\_\_\_

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

# Summary of Outliers

Client

Project

Site

Contact

Sampler

#### **Outliers : Quality Control Samples**

This report highlights outliers flagged in the Quality Control (QC) Report.

- <u>NO</u> Method Blank value outliers occur.
- NO Duplicate outliers occur. ۰
- <u>NO</u> Laboratory Control outliers occur.
- ٠ NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

#### **Outliers : Analysis Holding Time Compliance**

NO Analysis Holding Time Outliers exist.

#### **Outliers : Frequency of Quality Control Samples**

• NO Quality Control Sample Frequency Outliers exist.



## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Evaluation:	¥ =	Holding	time	breach		<pre>&lt; =</pre>	Within	holding	time
Evaluation.	~ -	noiuing	ume	breach	, <b>v</b>	-	VVILIIIII	noiuing	ume.

Matrix: AIR Evaluation: × = Holding time brea						breach ; 🗸 = Withi	in holding time.	
Method		Sample Date	E	xtraction / Preparation		Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Ig time breach ; ✓ = Within hol Analysis ysed Due for analysis Ev 1021 27-Dec-2021 2021 27-Dec-2021 2021 27-Dec-2021 2021 27-Dec-2021 2021 27-Dec-2021	Evaluation
EA120I: Ash Content								
Directional Dust Gauge - Unpreserved (EA120I	)							
WVDG03N,	WVDG03E,	30-Jun-2021				06-Jul-2021	27-Dec-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA125I: Combustible Matter								
Directional Dust Gauge - Unpreserved (EA125I	)							
WVDG03N,	WVDG03E,	30-Jun-2021				06-Jul-2021	27-Dec-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA139: Total Soluble Matter								
Directional Dust Gauge - Unpreserved (EA139I	)							
WVDG03N,	WVDG03E,	30-Jun-2021				06-Jul-2021	27-Dec-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA139I: Total Soluble Matter								
Directional Dust Gauge - Unpreserved (EA139I	)							
WVDG03N,	WVDG03E,	30-Jun-2021				06-Jul-2021	27-Dec-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA141: Total Insoluble Matter								
Directional Dust Gauge - Unpreserved (EA141	)							
WVDG03N,	WVDG03E,	30-Jun-2021				06-Jul-2021	27-Dec-2021	<ul> <li>✓</li> </ul>
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							

Page	: 3 of 5
Work Order	: EM2112734
Client	: ALS WATER RESOURCES GROUP
Project	: MV214940



Matrix: AIR			i: × = Holding time	ne breach ; 🗸 = Within holding time				
Method		Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA141I: Total Insoluble Matter								
Directional Dust Gauge - Unpreserved (EA141I)								
WVDG03N,	WVDG03E,	30-Jun-2021				06-Jul-2021	27-Dec-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA142: Total Solids								
Directional Dust Gauge - Unpreserved (EA142I)								
WVDG03N,	WVDG03E,	30-Jun-2021				06-Jul-2021	27-Dec-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA142I: Total Solids								
Directional Dust Gauge - Unpreserved (EA142I)								
WVDG03N,	WVDG03E,	30-Jun-2021				06-Jul-2021	27-Dec-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EG020T: Total Metals by ICP-MS								
Dust Residue (EG020TUG)								
WVDG03N,	WVDG03E,	30-Jun-2021				12-Jul-2021	27-Dec-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W,							
WVDG03N - soluble metals,	WVDG03E - soluble metals,							
WVDG03S - soluble metals,	WVDG03W - soluble metals,							
WVDG05N - soluble metals,	WVDG05E - soluble metals,							
WVDG05S - soluble metals,	WVDG05W - soluble metals,							
WVDG03N - insoluble metals,	WVDG03E - insoluble metals,							
WVDG03S - insoluble metals,	WVDG03W - insoluble metals,							
WVDG05N - insoluble metals,	WVDG05E - insoluble metals,							
WVDG05S - insoluble metals,	WVDG05W - insoluble metals							



# **Quality Control Parameter Frequency Compliance**

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: AIR				Evaluation: 🗴 = Quality Control frequency not within specification ; 🗸 = Quality Control frequency within specification						
Quality Control Sample Type		Co	ount		Rate (%)		Quality Control Specification			
Analytical Methods	Method	00	Reaular	Actual	Expected	Evaluation				
Laboratory Control Samples (LCS)										
Total Insoluble Matter (TIM)	EA141I	1	16	6.25	5.00	~	NEPM 2013 B3 & ALS QC Standard			
Total Solids (TS)	EA142I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Total Soluble Matter (SM)	EA139I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Method Blanks (MB)										
Total Insoluble Matter (TIM)	EA141I	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Total Metals - ICP-MS (mass/filter)	EG020TUG	2	34	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Total Solids (TS)	EA142I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Total Soluble Matter (SM)	EA139I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard			



# **Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Insoluble solids in deposited
			dust.
Total Solids (TS)	EA142I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* EG020TUG	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by
			ICPMS and reported as ug of the TIM.



# **CERTIFICATE OF ANALYSIS**

Work Order	EM2101404	Page	: 1 of 8
Client	ALS WATER RESOURCES GROUP	Laboratory	: Environmental Division Melbourne
Contact	: ROHAN OLIVER	Contact	: Customer Services EM
Address	: 94 Kerang-Koondrook Road	Address	: 4 Westall Rd Springvale VIC Australia 3171
	Kerang 3579		
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 02-Feb-2021 11:35
Order number	:	Date Analysis Commenced	: 03-Feb-2021
C-O-C number	:	Issue Date	: 09-Feb-2021 15:26
Sampler	: KV		HALA NALA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 30		Accredited for compliance with
No. of samples analysed	: 30		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	Senior Inorganic Chemist	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 Contact 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

ø = 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.
- Insoluble and soluble metals conducted as per AS 3580.10.1:2016 Appendix A. Insoluble, soluble and ash arsenic have been reported as ug/m2.month. This is not consistent with Appendix A units of ug, ug/m2.day or mg/m2.month. Limit of reporting will vary from sample to sample based on sample volume, solid residual collected and sampling period.
- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m<sup>2</sup>.mth.
- Sampling period: 23/12/2020 01/02/2021
- Sample exposure period is 40 days which is outside the typical exposure period of 30+/-2 days as per AS3580.10.1
- Dust samples have been dosed with Copper Sulphate prior to sample collection and a copper correction factor of 0.055g has been used for calculations.

# Page : 3 of 8 Work Order : EM2101404 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST Sample ID (Matrix: AIR)				WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
		Sampli	ing date / time	01-Feb-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2101404-001	EM2101404-002	EM2101404-003	EM2101404-004	EM2101404-005
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content		0.1	g/m².month	0.3	0.2	0.3	0.2	0.2
Ash Content (mg)		1	mg	7	6	7	4	6
EA125: Combustible Matter								
Combustible Matter		0.1	g/m².month	1.3	1.3	1.5	0.9	0.5
Combustible Matter (mg)		1	mg	31	30	35	21	14
EA139: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.9	3.9	2.3	1.6	1.8
Total Soluble Matter (mg)		1	mg	21	92	55	37	43
EA141: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m <sup>2</sup> .month	1.6	1.5	1.8	1.1	0.8
Total Insoluble Matter (mg)		1	mg	38	36	42	25	20
EA142: Total Solids								
Total Solids		0.1	g/m <sup>2</sup> .month	2.5	5.4	4.1	2.7	2.6
Total Solids (mg)		1	mg	59	128	97	62	63
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	<1.8	5.91	<6.96	10.2	4.40
øBarium	7440-39-3	0.05	µg/m².month	58.3	26.2	<35.2	28.3	36.3
Ø Manganese	7439-96-5	0.05	µg/m².month	28.2	19.9	51.7	32.3	28.7

# Page : 4 of 8 Work Order : EM2101404 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST Sample ID (Matrix: AIR)				WVDD06	KF1	KF2	KF3	KF4
		Sampli	ng date / time	01-Feb-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2101404-006	EM2101404-007	EM2101404-008	EM2101404-009	EM2101404-010
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content		0.1	g/m².month	0.5	0.2	0.4	0.4	0.4
Ash Content (mg)		1	mg	11	4	9	9	8
EA125: Combustible Matter								
Combustible Matter		0.1	g/m².month	1.5	1.2	1.7	1.6	1.3
Combustible Matter (mg)		1	mg	37	29	40	39	33
EA139: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	1.2	1.3	0.6	0.7	0.9
Total Soluble Matter (mg)		1	mg	29	30	13	15	21
EA141: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	2.0	1.4	2.1	2.0	1.7
Total Insoluble Matter (mg)		1	mg	48	33	49	48	41
EA142: Total Solids								
Total Solids		0.1	g/m².month	3.2	2.7	2.7	2.7	2.6
Total Solids (mg)		1	mg	77	63	62	63	62
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	<5.80	<4.95	<820	<372	<170
øBarium	7440-39-3	0.05	µg/m².month	<64.9	<25.1	<95.7	<71.4	<77.9
Ø Manganese	7439-96-5	0.05	µg/m².month	64.9	21.1	<90.9	79.2	58.3



Sub-Matrix: DUST			Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
(Matrix: AIR)				Soluble As, Ba, Mn				
	Sampling date / time				01-Feb-2021 00:00	01-Feb-2021 00:00	01-Feb-2021 00:00	01-Feb-2021 00:00
Compound	CAS Number	LOR	Unit	EM2101404-011	EM2101404-012	EM2101404-013	EM2101404-014	EM2101404-015
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	22.8	<0.05	<0.05	2.89	<0.05
ØBarium	7440-39-3	0.05	µg/m².month	312	453	1470	727	637
ø Manganese	7439-96-5	0.05	µg/m².month	1570	1010	603	1070	393



Sub-Matrix: DUST			Sample ID	WVDD06	KF1	KF2	KF3	KF4
(Matrix: AIR)				Soluble As, Ba, Mn				
Sampling date / time				01-Feb-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2101404-016	EM2101404-017	EM2101404-018	EM2101404-019	EM2101404-020
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	<0.05	0.18	<0.05	<0.05	<0.05
ØBarium	7440-39-3	0.05	µg/m².month	1160	70.6	1190	309	696
ø Manganese	7439-96-5	0.05	µg/m².month	751	90.6	528	697	437



Sub-Matrix: DUST		Sample ID		WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
(Matrix: AIR)				Insoluble As, Ba, Mn				
	Sampli	ng date / time	01-Feb-2021 00:00	01-Feb-2021 00:00	01-Feb-2021 00:00	01-Feb-2021 00:00	01-Feb-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2101404-021	EM2101404-022	EM2101404-023	EM2101404-024	EM2101404-025
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	<1.8	7.96	<6.96	15.7	5.14
ØBarium	7440-39-3	0.05	µg/m².month	77.7	27.3	<35.2	31.0	37.9
ø Manganese	7439-96-5	0.05	µg/m².month	48.3	44.5	67.3	59.6	66.4



Sub-Matrix: DUST			Sample ID	WVDD06	KF1	KF2	KF3	KF4
(Matrix: AIR)				Insoluble As, Ba, Mn				
	Sampli	ng date / time	01-Feb-2021 00:00	01-Feb-2021 00:00	01-Feb-2021 00:00	01-Feb-2021 00:00	01-Feb-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2101404-026	EM2101404-027	EM2101404-028	EM2101404-029	EM2101404-030
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	<5.80	<4.95	<820	<372	<170
ØBarium	7440-39-3	0.05	µg/m².month	<64.9	<25.1	<95.7	<71.4	<77.9
ø Manganese	7439-96-5	0.05	µg/m².month	86.2	31.7	<90.9	143	98.0



# QUALITY CONTROL REPORT

Work Order	: EM2101404	Page	: 1 of 3
Client	: ALS WATER RESOURCES GROUP	Laboratory	: Environmental Division Melbourne
Address	94 Kerang-Koondrook Road Kerang 3579	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 02-Feb-2021
Order number	:	Date Analysis Commenced	:03-Feb-2021
C-O-C number	:	Issue Date	09-Feb-2021
Sampler	: KV		Hac-MRA NAIA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 30		Accredited for compliance with
No. of samples analysed	: 30		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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

#### 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

Dilani Fernando

Senior Inorganic Chemist

Position

Accreditation Category

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

Key: Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

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

RPD = Relative Percentage Difference

# = Indicates failed QC

#### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

• No Laboratory Duplicate (DUP) Results are required to be reported.



#### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: AIR				Method Blank (MB)	Laboratory Control Spike (LCS) Report			
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA139: Total Soluble Matter (QCLot: 3491420)								
EA139: Total Soluble Matter		0.1	g/m².month	<0.1	1.66 g/m <sup>2</sup> .month	102	70.0	130
EA139: Total Soluble Matter (mg)		1	mg	<1	29.3 mg	99.0	70.0	130
EA139: Total Soluble Matter (QCLot: 3491425)								
EA139: Total Soluble Matter		0.1	g/m².month	<0.1	1.66 g/m <sup>2</sup> .month	102	70.0	130
EA139: Total Soluble Matter (mg)		1	mg	<1	29.3 mg	99.0	70.0	130
EA141: Total Insoluble Matter (QCLot: 3491421)								
EA141: Total Insoluble Matter		0.1	g/m².month	<0.1	5.66 g/m <sup>2</sup> .month	110	66.8	134
EA141: Total Insoluble Matter (mg)		1	mg	<1	100 mg	110	67.5	125
EA141: Total Insoluble Matter (QCLot: 3491422)								
EA141: Total Insoluble Matter		0.1	g/m².month	<0.1	5.66 g/m <sup>2</sup> .month	93.6	66.8	134
EA141: Total Insoluble Matter (mg)		1	mg	<1	100 mg	93.0	67.5	125
EA142: Total Solids (QCLot: 3491419)								
EA142: Total Solids		0.1	g/m².month	<0.1				
EA142: Total Solids (mg)		1	mg	<1	129.3 mg	108	68.4	126
EA142: Total Solids (QCLot: 3491423)								
EA142: Total Solids		0.1	g/m².month	<0.1				
EA142: Total Solids (mg)		1	mg	<1	129.3 mg	94.4	68.4	126
EG020T: Total Metals by ICP-MS (QCLot: 3498630)								
EG020TUG: Arsenic	7440-38-2	0.05	hð	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				
EG020T: Total Metals by ICP-MS (QCLot: 3498631)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



# QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM2101404	Page	: 1 of 5
Client	ALS WATER RESOURCES GROUP	Laboratory	: Environmental Division Melbourne
Contact	: ROHAN OLIVER	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 02-Feb-2021
Site	:	Issue Date	: 09-Feb-2021
Sampler	: KV	No. of samples received	: 30
Order number	:	No. of samples analysed	: 30

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

# **Summary of Outliers**

#### **Outliers : Quality Control Samples**

This report highlights outliers flagged in the Quality Control (QC) Report.

- <u>NO</u> Method Blank value outliers occur.
- <u>NO</u> Duplicate outliers occur.
- <u>NO</u> Laboratory Control outliers occur.
- <u>NO</u> Matrix Spike outliers occur.
- For all regular sample matrices, <u>NO</u> surrogate recovery outliers occur.

#### **Outliers : Analysis Holding Time Compliance**

• <u>NO</u> Analysis Holding Time Outliers exist.

#### **Outliers : Frequency of Quality Control Samples**

• <u>NO</u> Quality Control Sample Frequency Outliers exist.



Evaluation

 $\checkmark$ 

 $\checkmark$ 

 $\checkmark$ 

1

## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: AIR					Evaluation: * = Holding time breach ; = With</th						
Method			Sample Date	Extraction / Preparation			Analysis				
Container / Client Sample ID(s)				Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis			
EA120: Ash Content											
Dust Gauge (Bottle) - Copper Sulfate (EA120)											
WVDD01,	WVDD02,		01-Feb-2021				03-Feb-2021	31-Jul-2021			
WVDD03,	WVDD04,										
WVDD05,	WVDD06,										
KF1,	KF2,										
KF3,	KF4										
EA125: Combustible Matter											
Dust Gauge (Bottle) - Copper Sulfate (EA125)											
WVDD01,	WVDD02,		01-Feb-2021				03-Feb-2021	31-Jul-2021			
WVDD03,	WVDD04,										
WVDD05,	WVDD06,										
KF1,	KF2,										
KF3,	KF4										
EA139: Total Soluble Matter											
Dust Gauge (Bottle) - Copper Sulfate (EA139)											
WVDD01,	WVDD02,		01-Feb-2021				03-Feb-2021	31-Jul-2021			
WVDD03,	WVDD04,										
WVDD05,	WVDD06,										
KF1,	KF2,										
KF3,	KF4										
EA141: Total Insoluble Matter											
Dust Gauge (Bottle) - Copper Sulfate (EA141)											
WVDD01,	WVDD02,		01-Feb-2021				03-Feb-2021	31-Jul-2021			
WVDD03,	WVDD04,										
WVDD05,	WVDD06,										
KF1,	KF2,										
KF3,	KF4										

in holding time.
Page	: 3 of 5
Work Order	: EM2101404
Client	: ALS WATER RESOURCES GROUP
Project	: MV214940



Matrix: AIR					Evaluation	: × = Holding time	breach ; ✓ = With	in holding time
Method		Sample Date	E	ktraction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA142: Total Solids								
Dust Gauge (Bottle) - Copper Sulfate (EA142)								
WVDD01,	WVDD02,	01-Feb-2021				03-Feb-2021	31-Jul-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EG020T: Total Metals by ICP-MS								
Dust Residue (EG020TUG)								
WVDD01,	WVDD02,	01-Feb-2021				08-Feb-2021	31-Jul-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4,							
WVDD01 - Soluble As, Ba, Mn,	WVDD02 - Soluble As, Ba, Mn,							
WVDD03 - Soluble As, Ba, Mn,	WVDD04 - Soluble As, Ba, Mn,							
WVDD05 - Soluble As, Ba, Mn,	WVDD06 - Soluble As, Ba, Mn,							
KF1 - Soluble As, Ba, Mn,	KF2 - Soluble As, Ba, Mn,							
KF3 - Soluble As, Ba, Mn,	KF4 - Soluble As, Ba, Mn,							
WVDD01 - Insoluble As, Ba, Mn,	WVDD02 - Insoluble As, Ba, Mn,							
WVDD03 - Insoluble As, Ba, Mn,	WVDD04 - Insoluble As, Ba, Mn,							
WVDD05 - Insoluble As, Ba, Mn,	WVDD06 - Insoluble As, Ba, Mn,							
KF1 - Insoluble As, Ba, Mn,	KF2 - Insoluble As, Ba, Mn,							
KF3 - Insoluble As, Ba, Mn,	KF4 - Insoluble As, Ba, Mn							



## **Quality Control Parameter Frequency Compliance**

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: AIR				Evaluation: * = Quality Control frequency not within specification ; 🗸 = Quality Control frequency within specification.			
Quality Control Sample Type		Co	ount		Rate (%)		Quality Control Specification
Analytical Methods	Method	00	Reaular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS)							
Total Insoluble Matter (TIM)	EA141	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139	2	23	8.70	4.76	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Insoluble Matter (TIM)	EA141	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals - ICP-MS (mass/filter)	EG020TUG	2	30	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139	2	23	8.70	4.76	✓	NEPM 2013 B3 & ALS QC Standard



## **Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Insoluble solids in deposited
			dust.
Total Solids (TS)	EA142	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* EG020TUG	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by
			ICPMS and reported as ug of the TIM.



## **CERTIFICATE OF ANALYSIS**

Work Order	EM2103691	Page	: 1 of 8
Client	ALS WATER RESOURCES GROUP	Laboratory	Environmental Division Melbourne
Contact	: ROHAN OLIVER	Contact	: Customer Services EM
Address	: 94 Kerang-Koondrook Road	Address	: 4 Westall Rd Springvale VIC Australia 3171
	Kerang 3579		
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 04-Mar-2021 09:00
Order number	:	Date Analysis Commenced	: 10-Mar-2021
C-O-C number	:	Issue Date	: 17-Mar-2021 12:55
Sampler	: KV		Hac-MRA NATA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 30		Accredited for compliance with
No. of samples analysed	: 30		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	Senior Inorganic Chemist	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 Contact 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

ø = 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.
- Insoluble and soluble metals conducted as per AS 3580.10.1:2016 Appendix A. Insoluble, soluble and ash arsenic have been reported as ug/m2.month. This is not consistent with Appendix A units of ug, ug/m2.day or mg/m2.month. Limit of reporting will vary from sample to sample based on sample volume, solid residual collected and sampling period.
- 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 g/m<sup>2</sup>.mth as sampling data was provided by the client.

• Sampling Period: 01/02/2021-03/03/2021.

• Sample exposure period is within the typical exposure period of 30+/-2 days as per AS3580.10.1

# Page : 3 of 8 Work Order : EM2103691 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
		Sampli	ng date / time	03-Mar-2021 13:00	03-Mar-2021 12:55	03-Mar-2021 12:00	03-Mar-2021 12:25	03-Mar-2021 12:30
Compound	CAS Number	LOR	Unit	EM2103691-001	EM2103691-002	EM2103691-003	EM2103691-004	EM2103691-005
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content		0.1	g/m².month	0.1	0.3	0.2	0.6	0.2
Ash Content (mg)		1	mg	2	5	3	10	3
EA125: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.9	1.0	0.9	2.2	1.0
Combustible Matter (mg)		1	mg	16	18	16	40	18
EA139: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.6	0.3	0.2	2.3	1.5
Total Soluble Matter (mg)		1	mg	11	6	3	40	26
EA141: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	1.0	1.3	1.1	2.8	1.2
Total Insoluble Matter (mg)		1	mg	18	23	19	50	21
EA142: Total Solids								
Total Solids		0.1	g/m².month	1.6	1.6	1.3	5.1	2.7
Total Solids (mg)		1	mg	29	29	22	90	47
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	3.11	5.07	<8.60	24.4	4.31
øBarium	7440-39-3	0.05	µg/m².month	60.0	<87.2	<71.2	<137	<61.1
Ø Manganese	7439-96-5	0.05	µg/m².month	45.6	58.4	37.1	86.5	50.2

# Page : 4 of 8 Work Order : EM2103691 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDD06	KF1	KF2	KF3	KF4
		Sampli	ng date / time	03-Mar-2021 13:10	03-Mar-2021 10:00	03-Mar-2021 10:50	03-Mar-2021 10:40	03-Mar-2021 11:00
Compound	CAS Number	LOR	Unit	EM2103691-006	EM2103691-007	EM2103691-008	EM2103691-009	EM2103691-010
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content		0.1	g/m².month	0.2	0.2	0.2	0.2	0.2
Ash Content (mg)		1	mg	4	4	4	4	3
EA125: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.8	0.9	1.0	0.9	1.0
Combustible Matter (mg)		1	mg	15	16	18	17	19
EA139: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	3.0	3.0	2.8	0.1	3.1
Total Soluble Matter (mg)		1	mg	54	53	49	1	54
EA141: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	1.1	1.1	1.2	1.2	1.2
Total Insoluble Matter (mg)		1	mg	20	20	22	22	22
EA142: Total Solids								
Total Solids		0.1	g/m².month	4.1	4.1	4.0	1.3	4.3
Total Solids (mg)		1	mg	74	73	71	23	76
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	3.05	8.11	64.3	<152	<57.1
øBarium	7440-39-3	0.05	µg/m².month	<60.0	56.7	53.8	<73.6	45.9
Ø Manganese	7439-96-5	0.05	µg/m².month	47.9	54.0	59.9	74.9	53.6



Sub-Matrix: DUST			Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
(Matrix: AIR)				Soluble As, Ba, Mn				
	Sampli	ng date / time	03-Mar-2021 00:00	03-Mar-2021 00:00	03-Mar-2021 00:00	03-Mar-2021 00:00	03-Mar-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2103691-011	EM2103691-012	EM2103691-013	EM2103691-014	EM2103691-015
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	3.06	3.29	2.84	13.8	17.9
ØBarium	7440-39-3	0.05	µg/m².month	184	265	156	104	107
ø Manganese	7439-96-5	0.05	µg/m².month	294	296	344	514	334



Sub-Matrix: DUST			Sample ID	WVDD06	KF1	KF2	KF3	KF4
(Matrix: AIR)				Soluble As, Ba, Mn				
	Sampli	ng date / time	03-Mar-2021 00:00	03-Mar-2021 00:00	03-Mar-2021 00:00	03-Mar-2021 00:00	03-Mar-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2103691-016	EM2103691-017	EM2103691-018	EM2103691-019	EM2103691-020
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	4.59	4.50	12.6	20.1	6.96
ØBarium	7440-39-3	0.05	µg/m².month	209	122	91.6	103	142
ø Manganese	7439-96-5	0.05	µg/m².month	369	290	327	341	285



Sub-Matrix: DUST			Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
(Matrix: AIR)				Insoluble As, Ba, Mn				
	Sampling date / time					03-Mar-2021 00:00	03-Mar-2021 00:00	03-Mar-2021 00:00
Compound	CAS Number	LOR	Unit	EM2103691-021	EM2103691-022	EM2103691-023	EM2103691-024	EM2103691-025
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	4.25	6.97	<8.6	29.6	5.89
ØBarium	7440-39-3	0.05	µg/m².month	59.8	<87.2	<71.2	<137	<61.1
ø Manganese	7439-96-5	0.05	µg/m².month	69.3	78.6	64.2	86.6	54.3



Sub-Matrix: DUST			Sample ID	WVDD06	KF1	KF2	KF3	KF4
(Matrix: AIR)				Insoluble As, Ba, Mn				
	Sampli	ng date / time	03-Mar-2021 00:00	03-Mar-2021 00:00	03-Mar-2021 00:00	03-Mar-2021 00:00	03-Mar-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2103691-026	EM2103691-027	EM2103691-028	EM2103691-029	EM2103691-030
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	3.70	11.6	96.7	<152	<57.1
ØBarium	7440-39-3	0.05	µg/m².month	<60.0	57.2	162	<73.6	55.8
ø Manganese	7439-96-5	0.05	µg/m².month	63.8	86.5	100	93.9	78.9



## QUALITY CONTROL REPORT

Work Order	: EM2103691	Page	: 1 of 3
Client	ALS WATER RESOURCES GROUP	Laboratory	: Environmental Division Melbourne
Contact	: ROHAN OLIVER	Contact	: Customer Services EM
Address	: 94 Kerang-Koondrook Road Kerang 3579	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 04-Mar-2021
Order number	:	Date Analysis Commenced	: 10-Mar-2021
C-O-C number	:	Issue Date	17-Mar-2021
Sampler	: KV		HOC-MRA INA A
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 30		Accredited for compliance with
No. of samples analysed	: 30		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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

#### 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

Dilani Fernando

Senior Inorganic Chemist

Position

Accreditation Category

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

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

RPD = Relative Percentage Difference

# = Indicates failed QC

#### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

• No Laboratory Duplicate (DUP) Results are required to be reported.



### Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: AIR	-Matrix: AIR				Laboratory Control Spike (LCS) Report			
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA139: Total Soluble Matter (QCLot: 3555649)								
EA139: Total Soluble Matter		0.1	g/m².month	<0.1	1.66 g/m <sup>2</sup> .month	120	70.0	130
EA139: Total Soluble Matter (mg)		1	mg	<1	29.3 mg	119	70.0	130
EA141: Total Insoluble Matter (QCLot: 3555647)								
EA141: Total Insoluble Matter		0.1	g/m².month	<0.1	5.66 g/m <sup>2</sup> .month	108	66.8	134
EA141: Total Insoluble Matter (mg)		1	mg	<1	100 mg	107	67.5	125
EA142: Total Solids (QCLot: 3555648)								
EA142: Total Solids		0.1	g/m².month	<0.1				
EA142: Total Solids (mg)		1	mg	<1	129.3 mg	110	68.4	126
EG020T: Total Metals by ICP-MS (QCLot: 3565698)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				
EG020T: Total Metals by ICP-MS (QCLot: 3565699)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



: KV

: -----

#### QA/QC Compliance Assessment to assist with Quality Review : EM2103691 Page : 1 of 5 : Environmental Division Melbourne : ALS WATER RESOURCES GROUP Laboratory : ROHAN OLIVER Telephone : +61-3-8549 9600 : MV214940 Date Samples Received : 04-Mar-2021 **Issue Date** : -----· 17-Mar-2021

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

No. of samples received

No. of samples analysed

: 30

: 30

Brief method summaries and references are also provided to assist in traceability.

## **Summary of Outliers**

Work Order

Client

Project

Site

Contact

Sampler

Order number

#### **Outliers : Quality Control Samples**

This report highlights outliers flagged in the Quality Control (QC) Report.

- <u>NO</u> Method Blank value outliers occur.
- <u>NO</u> Duplicate outliers occur.
- <u>NO</u> Laboratory Control outliers occur.
- <u>NO</u> Matrix Spike outliers occur.
- For all regular sample matrices, <u>NO</u> surrogate recovery outliers occur.

#### **Outliers : Analysis Holding Time Compliance**

• <u>NO</u> Analysis Holding Time Outliers exist.

#### **Outliers : Frequency of Quality Control Samples**

• <u>NO</u> Quality Control Sample Frequency Outliers exist.



## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: AIR					Evaluation	n: × = Holding time	breach ; 🗸 = Withi	in holding tim
Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA120: Ash Content								
Dust Gauge (Bottle) - Copper Sulfate (	EA120)							
WVDD01,	WVDD02,	03-Mar-2021				10-Mar-2021	30-Aug-2021	<ul> <li>✓</li> </ul>
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA125: Combustible Matter							•	
Dust Gauge (Bottle) - Copper Sulfate (	EA125)							
WVDD01,	WVDD02,	03-Mar-2021				10-Mar-2021	30-Aug-2021	<ul> <li>✓</li> </ul>
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA139: Total Soluble Matter								
Dust Gauge (Bottle) - Copper Sulfate (	EA139)							
WVDD01,	WVDD02,	03-Mar-2021				10-Mar-2021	30-Aug-2021	<ul> <li>✓</li> </ul>
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA141: Total Insoluble Matter								
Dust Gauge (Bottle) - Copper Sulfate (	EA141)							
WVDD01,	WVDD02,	03-Mar-2021				10-Mar-2021	30-Aug-2021	<ul> <li>✓</li> </ul>
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3.	KF4							

Page	: 3 of 5
Work Order	: EM2103691
Client	: ALS WATER RESOURCES GROUP
Project	: MV214940



Matrix: AIR					Evaluation	n: 🗴 = Holding time	e breach ; ✓ = With	in holding time	
Method		Sample Date	E	ktraction / Preparation		Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA142: Total Solids									
Dust Gauge (Bottle) - Copper Sulfate (EA142)									
WVDD01,	WVDD02,	03-Mar-2021				10-Mar-2021	30-Aug-2021	✓	
WVDD03,	WVDD04,								
WVDD05,	WVDD06,								
KF1,	KF2,								
KF3,	KF4								
EG020T: Total Metals by ICP-MS									
Dust Residue (EG020TUG)									
WVDD01,	WVDD02,	03-Mar-2021				16-Mar-2021	30-Aug-2021	✓	
WVDD03,	WVDD04,								
WVDD05,	WVDD06,								
KF1,	KF2,								
KF3,	KF4,								
WVDD01 - Soluble As, Ba, Mn,	WVDD02 - Soluble As, Ba, Mn,								
WVDD03 - Soluble As, Ba, Mn,	WVDD04 - Soluble As, Ba, Mn,								
WVDD05 - Soluble As, Ba, Mn,	WVDD06 - Soluble As, Ba, Mn,								
KF1 - Soluble As, Ba, Mn,	KF2 - Soluble As, Ba, Mn,								
KF3 - Soluble As, Ba, Mn,	KF4 - Soluble As, Ba, Mn,								
WVDD01 - Insoluble As, Ba, Mn,	WVDD02 - Insoluble As, Ba, Mn,								
WVDD03 - Insoluble As, Ba, Mn,	WVDD04 - Insoluble As, Ba, Mn,								
WVDD05 - Insoluble As, Ba, Mn,	WVDD06 - Insoluble As, Ba, Mn,								
KF1 - Insoluble As, Ba, Mn,	KF2 - Insoluble As, Ba, Mn,								
KF3 - Insoluble As, Ba, Mn,	KF4 - Insoluble As, Ba, Mn								



## **Quality Control Parameter Frequency Compliance**

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: AIR				Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.				
Quality Control Sample Type			ount	Rate (%)			Quality Control Specification	
Analytical Methods	Method	00	Reaular	Actual	Expected	Evaluation		
Laboratory Control Samples (LCS)								
Total Insoluble Matter (TIM)	EA141	1	20	5.00	5.00	~	NEPM 2013 B3 & ALS QC Standard	
Total Solids (TS)	EA142	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Soluble Matter (SM)	EA139	1	21	4.76	4.76	✓	NEPM 2013 B3 & ALS QC Standard	
Method Blanks (MB)								
Total Insoluble Matter (TIM)	EA141	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Metals - ICP-MS (mass/filter)	EG020TUG	2	30	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Solids (TS)	EA142	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Soluble Matter (SM)	EA139	1	21	4.76	4.76	✓	NEPM 2013 B3 & ALS QC Standard	



## **Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Insoluble solids in deposited
			dust.
Total Solids (TS)	EA142	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* EG020TUG	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by
			ICPMS and reported as ug of the TIM.



## **CERTIFICATE OF ANALYSIS**

Work Order	EM2105891	Page	: 1 of 8
Client	ALS WATER RESOURCES GROUP	Laboratory	: Environmental Division Melbourne
Contact	: ROHAN OLIVER	Contact	: Customer Services EM
Address	: 94 Kerang-Koondrook Road	Address	: 4 Westall Rd Springvale VIC Australia 3171
	Kerang 3579		
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 06-Apr-2021 07:45
Order number	:	Date Analysis Commenced	: 15-Apr-2021
C-O-C number	:	Issue Date	21-Apr-2021 13:12
Sampler	: KV		Hac-MRA NATA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 30		Accredited for compliance with
No. of samples analysed	: 30		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	Senior Inorganic Chemist	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 Contact 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

ø = 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.
- Insoluble and soluble metals conducted as per AS 3580.10.1:2016 Appendix A. Insoluble, soluble and ash arsenic have been reported as ug/m2.month. This is not consistent with Appendix A units of ug, ug/m2.day or mg/m2.month. Limit of reporting will vary from sample to sample based on sample volume, solid residual collected and sampling period.
- 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 g/m<sup>2</sup>.mth as sampling data was provided by the client.
- Sampling Period: 03/03/2021-01/04/2021.
- Sample exposure period is within the typical exposure period of 30+/-2 days as per AS3580.10.1

# Page : 3 of 8 Work Order : EM2105891 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
		Sampli	ing date / time	01-Apr-2021 13:05	01-Apr-2021 12:55	01-Apr-2021 11:50	01-Apr-2021 12:10	01-Apr-2021 12:15
Compound	CAS Number	LOR	Unit	EM2105891-001	EM2105891-002	EM2105891-003	EM2105891-004	EM2105891-005
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content		0.1	g/m².month	0.9	0.2	0.2	<0.1	0.6
Ash Content (mg)		1	mg	16	3	3	1	10
EA125: Combustible Matter								
Combustible Matter		0.1	g/m².month	4.5	1.3	1.0	1.4	2.3
Combustible Matter (mg)		1	mg	76	23	18	24	39
EA139: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	2.1	3.7	4.0	3.2	2.5
Total Soluble Matter (mg)		1	mg	36	63	69	55	42
EA141: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m <sup>2</sup> .month	5.4	1.5	1.2	1.5	2.9
Total Insoluble Matter (mg)		1	mg	92	26	21	25	49
EA142: Total Solids								
Total Solids		0.1	g/m <sup>2</sup> .month	7.5	5.2	5.2	4.7	5.4
Total Solids (mg)		1	mg	128	89	90	80	91
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	9.11	5.55	2.43	2.29	11.7
øBarium	7440-39-3	0.05	µg/m <sup>2</sup> .month	819	44.4	51.8	30.9	<78.6
Ø Manganese	7439-96-5	0.05	µg/m².month	204	39.3	35.6	23.5	83.2

# Page : 4 of 8 Work Order : EM2105891 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDD06	KF1	KF2	KF3	KF4
		Sampli	ng date / time	01-Apr-2021 13:20	01-Apr-2021 10:10	01-Apr-2021 10:30	01-Apr-2021 10:25	01-Apr-2021 10:40
Compound	CAS Number	LOR	Unit	EM2105891-006	EM2105891-007	EM2105891-008	EM2105891-009	EM2105891-010
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content		0.1	g/m².month	0.4	0.2	0.2	0.4	0.2
Ash Content (mg)		1	mg	6	3	3	6	3
EA125: Combustible Matter								
Combustible Matter		0.1	g/m².month	1.8	1.2	1.3	1.7	1.2
Combustible Matter (mg)		1	mg	32	21	23	30	21
EA139: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.7	3.4	2.4	1.1	1.7
Total Soluble Matter (mg)		1	mg	12	58	41	18	29
EA141: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	2.2	1.4	1.5	2.1	1.4
Total Insoluble Matter (mg)		1	mg	38	24	26	36	24
EA142: Total Solids								
Total Solids		0.1	g/m².month	2.9	4.8	3.9	3.2	3.1
Total Solids (mg)		1	mg	50	82	67	54	53
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	6.33	<11.7	93.4	<74.7	<19.9
øBarium	7440-39-3	0.05	µg/m².month	76.0	<48.7	<40.2	<97.8	<46.2
Ø Manganese	7439-96-5	0.05	µg/m².month	78.7	45.5	29.8	68.4	48.4



Sub-Matrix: DUST			Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
(Matrix: AIR)				Soluble As, Ba, Mn				
		Sampli	ng date / time	01-Apr-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2105891-011	EM2105891-012	EM2105891-013	EM2105891-014	EM2105891-015
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	27.7	12.3	19.4	13.1	53.4
ØBarium	7440-39-3	0.05	µg/m².month	306	271	1080	96.0	167
ø Manganese	7439-96-5	0.05	µg/m².month	492	435	1620	139	685



Sub-Matrix: DUST			Sample ID	WVDD06	KF1	KF2	KF3	KF4
(Matrix: AIR)				Soluble As, Ba, Mn				
Sampling date / time			01-Apr-2021 00:00	01-Apr-2021 00:00	01-Apr-2021 00:00	01-Apr-2021 00:00	01-Apr-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2105891-016	EM2105891-017	EM2105891-018	EM2105891-019	EM2105891-020
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	11.9	20.6	54.0	53.3	10.9
ØBarium	7440-39-3	0.05	µg/m².month	1100	194	96.7	186	513
ø Manganese	7439-96-5	0.05	µg/m².month	688	309	222	451	178



Sub-Matrix: <b>DUST</b> (Matrix: <b>AIR</b> )			Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
				Insoluble As, Ba, Mn				
Sampling date / time			01-Apr-2021 00:00	01-Apr-2021 00:00	01-Apr-2021 00:00	01-Apr-2021 00:00	01-Apr-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2105891-021	EM2105891-022	EM2105891-023	EM2105891-024	EM2105891-025
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	11.6	7.41	2.86	3.91	18.6
ØBarium	7440-39-3	0.05	µg/m².month	1360	75.6	56.7	31.7	<78.6
ø Manganese	7439-96-5	0.05	µg/m².month	245	71.8	46.3	40.8	95.4



Sub-Matrix: DUST		Sample ID		WVDD06 KF1		KF2	KF3	KF4
(Matrix: AIR)				Insoluble As, Ba, Mn				
Sampling date / time			01-Apr-2021 00:00	01-Apr-2021 00:00	01-Apr-2021 00:00	01-Apr-2021 00:00	01-Apr-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2105891-026	EM2105891-027	EM2105891-028	EM2105891-029	EM2105891-030
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	8.72	<11.7	94.4	<74.7	<19.9
ØBarium	7440-39-3	0.05	µg/m².month	132	<48.7	<40.2	<97.8	<46.2
ø Manganese	7439-96-5	0.05	µg/m².month	122	78.2	69.1	85.8	67.1



## QUALITY CONTROL REPORT

Work Order	: EM2105891	Page	: 1 of 3
Client	ALS WATER RESOURCES GROUP	Laboratory	: Environmental Division Melbourne
Contact	: ROHAN OLIVER	Contact	: Customer Services EM
Address	: 94 Kerang-Koondrook Road Kerang 3579	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 06-Apr-2021
Order number	:	Date Analysis Commenced	: 15-Apr-2021
C-O-C number	:	Issue Date	21-Apr-2021
Sampler	: KV		HOC-MRA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 30		Accredited for compliance with
No. of samples analysed	: 30		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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

#### 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

Dilani Fernando

Senior Inorganic Chemist

Position

Accreditation Category

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

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

RPD = Relative Percentage Difference

# = Indicates failed QC

#### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

• No Laboratory Duplicate (DUP) Results are required to be reported.



### Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

ıb-Matrix: AIR			Method Blank (MB)	Laboratory Control Spike (LCS) Report							
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)			
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High			
EA139: Total Soluble Matter (QCLot: 3622490)											
EA139: Total Soluble Matter		0.1	g/m².month	<0.1	1.66 g/m <sup>2</sup> .month	96.4	70.0	130			
EA139: Total Soluble Matter (mg)		1	mg	<1	29.3 mg	102	70.0	130			
EA141: Total Insoluble Matter (QCLot: 3622491)											
EA141: Total Insoluble Matter		0.1	g/m².month	<0.1	5.66 g/m <sup>2</sup> .month	86.6	66.8	134			
EA141: Total Insoluble Matter (mg)		1	mg	<1	100 mg	90.0	67.5	125			
EA142: Total Solids (QCLot: 3622489)											
EA142: Total Solids		0.1	g/m².month	<0.1							
EA142: Total Solids (mg)		1	mg	<1	129.3 mg	92.8	68.4	126			
EG020T: Total Metals by ICP-MS (QCLot: 3630754)											
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050							
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050							
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050							
EG020T: Total Metals by ICP-MS (QCLot: 3630755)											
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050							
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050							
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050							

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



#### QA/QC Compliance Assessment to assist with Quality Review : EM2105891 Work Order Page : 1 of 5 : Environmental Division Melbourne : ALS WATER RESOURCES GROUP Laboratory Contact : ROHAN OLIVER Telephone : +61-3-8549 9600 : MV214940 **Date Samples Received** : 06-Apr-2021 **Issue Date** : -----: 21-Apr-2021 : KV : 30 Sampler No. of samples received Order number : -----No. of samples analysed : 30

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

## Summary of Outliers

Client

Project

Site

#### **Outliers : Quality Control Samples**

This report highlights outliers flagged in the Quality Control (QC) Report.

- <u>NO</u> Method Blank value outliers occur.
- NO Duplicate outliers occur. ۰
- <u>NO</u> Laboratory Control outliers occur.
- ٠ NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

#### **Outliers : Analysis Holding Time Compliance**

NO Analysis Holding Time Outliers exist.

#### **Outliers : Frequency of Quality Control Samples**

• NO Quality Control Sample Frequency Outliers exist.



Evaluation:  $\mathbf{x}$  = Holding time breach ;  $\mathbf{y}$  = Within holding time.

## Analysis Holding Time Compliance

Matrix: AIR

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Sample Date	Ex	traction / Preparation		Analysis			
	Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
01-Apr-2021			<b>15-Apr-2021</b> 28-Sep-2021			~	

Wethou				action / Freparation		Allalysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA120: Ash Content								
Dust Gauge (Bottle) - Copper Sulfate (EA120)								
WVDD01,	WVDD02,	01-Apr-2021				15-Apr-2021	28-Sep-2021	$\checkmark$
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA125: Combustible Matter								
Dust Gauge (Bottle) - Copper Sulfate (EA125)								
WVDD01,	WVDD02,	01-Apr-2021				15-Apr-2021	28-Sep-2021	$\checkmark$
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA139: Total Soluble Matter								
Dust Gauge (Bottle) - Copper Sulfate (EA139)								
WVDD01,	WVDD02,	01-Apr-2021				15-Apr-2021	28-Sep-2021	$\checkmark$
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EA141: Total Insoluble Matter								
Dust Gauge (Bottle) - Copper Sulfate (EA141)								
WVDD01,	WVDD02,	01-Apr-2021				15-Apr-2021	28-Sep-2021	$\checkmark$
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3.	KF4							

Page	: 3 of 5
Work Order	: EM2105891
Client	: ALS WATER RESOURCES GROUP
Project	: MV214940



Matrix: AIR					Evaluation	: × = Holding time	breach ; ✓ = With	in holding time
Method		Sample Date	E	ktraction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA142: Total Solids								
Dust Gauge (Bottle) - Copper Sulfate (EA142)								
WVDD01,	WVDD02,	01-Apr-2021				15-Apr-2021	28-Sep-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4							
EG020T: Total Metals by ICP-MS								
Dust Residue (EG020TUG)								
WVDD01,	WVDD02,	01-Apr-2021				20-Apr-2021	28-Sep-2021	✓
WVDD03,	WVDD04,							
WVDD05,	WVDD06,							
KF1,	KF2,							
KF3,	KF4,							
WVDD01 - Soluble As, Ba, Mn,	WVDD02 - Soluble As, Ba, Mn,							
WVDD03 - Soluble As, Ba, Mn,	WVDD04 - Soluble As, Ba, Mn,							
WVDD05 - Soluble As, Ba, Mn,	WVDD06 - Soluble As, Ba, Mn,							
KF1 - Soluble As, Ba, Mn,	KF2 - Soluble As, Ba, Mn,							
KF3 - Soluble As, Ba, Mn,	KF4 - Soluble As, Ba, Mn,							
WVDD01 - Insoluble As, Ba, Mn,	WVDD02 - Insoluble As, Ba, Mn,							
WVDD03 - Insoluble As, Ba, Mn,	WVDD04 - Insoluble As, Ba, Mn,							
WVDD05 - Insoluble As, Ba, Mn,	WVDD06 - Insoluble As, Ba, Mn,							
KF1 - Insoluble As, Ba, Mn,	KF2 - Insoluble As, Ba, Mn,							
KF3 - Insoluble As, Ba, Mn,	KF4 - Insoluble As, Ba, Mn							



## **Quality Control Parameter Frequency Compliance**

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: AIR		Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.								
Quality Control Sample Type		Co	ount		Rate (%)		Quality Control Specification			
Analytical Methods	Method	00	Reaular	Actual	Expected	Evaluation				
Laboratory Control Samples (LCS)										
Total Insoluble Matter (TIM)	EA141	1	10	10.00	5.00	$\checkmark$	NEPM 2013 B3 & ALS QC Standard			
Total Solids (TS)	EA142	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Total Soluble Matter (SM)	EA139	1	10	10.00	4.76	✓	NEPM 2013 B3 & ALS QC Standard			
Method Blanks (MB)										
Total Insoluble Matter (TIM)	EA141	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Total Metals - ICP-MS (mass/filter)	EG020TUG	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Total Solids (TS)	EA142	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard			
Total Soluble Matter (SM)	EA139	1	10	10.00	4.76	✓	NEPM 2013 B3 & ALS QC Standard			



## **Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Insoluble solids in deposited
			dust.
Total Solids (TS)	EA142	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* EG020TUG	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by
			ICPMS and reported as ug of the TIM.



## **CERTIFICATE OF ANALYSIS**

Work Order	EM2102004	Page	: 1 of 7
Client	ALS WATER RESOURCES GROUP	Laboratory	: Environmental Division Melbourne
Contact	: ROHAN OLIVER	Contact	: Customer Services EM
Address	: 94 Kerang-Koondrook Road	Address	: 4 Westall Rd Springvale VIC Australia 3171
	Kerang 3579		
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 02-Feb-2021 11:35
Order number	:	Date Analysis Commenced	: 11-Feb-2021
C-O-C number	:	Issue Date	: 19-Feb-2021 15:07
Sampler	: KV		Hac-MRA NATA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 24		Accredited for compliance with
No. of samples analysed	: 24		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
Nikki Stepniewski	Senior Inorganic Instrument Chemist	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 Contact 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

- ø = ALS is not NATA accredited for these tests.
- ~ = Indicates an estimated value.
- Sampling Period: 06/01/21 01/02/21.
- ALS is not NATA accredited for the analysis of metals in dust deposition gauge.
- EM2102004 #4-5 and #8: Sample 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 26 days which is outside the typical exposure period of 30 +/- 2 days as per AS3580.10.2
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- Analysis as per AS3580.10.2-2013. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m<sup>2</sup>.mth.

# Page : 3 of 7 Work Order : EM2102004 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST (Matrix: AIR)	Sample ID		WVDG03N	WVDG03E	WVDG03S	WVDG03W	WVDG05N	
		Sampl	ing date / time	01-Feb-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2102004-001	EM2102004-002	EM2102004-003	EM2102004-004	EM2102004-005
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content		0.1	g/m².month	0.3	0.2	0.3	0.7	0.2
Ash Content (mg)		1	mg	4	2	4	9	2
EA125I: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.1	0.1	<0.1	0.1	<0.1
Combustible Matter (mg)		1	mg	1	2	<1	2	<1
EA139: Total Soluble Matter								
Total Soluble Matter (mg)		1	mg	<1	15	2	<1	<1
EA139I: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	<0.1	1.1	0.1	<0.1	<0.1
EA141: Total Insoluble Matter								
Total Insoluble Matter (mg)		1	mg	5	4	4	11	2
EA141I: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.4	0.3	0.3	0.8	0.2
EA142: Total Solids								
Total Solids (mg)		1	mg	5	19	6	11	2
EA142I: Total Solids								
Total Solids		0.1	g/m².month	0.4	1.4	0.4	0.8	0.2
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	5.18	2.85	<18.7	11.3	2.42
ØBarium	7440-39-3	0.05	µg/m².month	<237	191	<215	<375	<103
ø Manganese	7439-96-5	0.05	µg/m².month	180	185	152	341	42.9



Sub-Matrix: DUST			Sample ID	WVDG05E	WVDG05S	WVDG05W	WVDG03N	WVDG03E
							soluble metals	soluble metals
		Sampl	ing date / time	01-Feb-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2102004-006	EM2102004-007	EM2102004-008	EM2102004-009	EM2102004-010
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content		0.1	g/m².month	0.2	0.2	0.3		
Ash Content (mg)		1	mg	3	2	4		
EA125I: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.1	<0.1	0.2		
Combustible Matter (mg)		1	mg	1	1	2		
EA139: Total Soluble Matter								
Total Soluble Matter (mg)		1	mg	4	2	<1		
EA139I: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.3	0.2	<0.1		
EA141: Total Insoluble Matter								
Total Insoluble Matter (mg)		1	mg	4	3	6		
EA141I: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.3	0.2	0.5		
EA142: Total Solids								
Total Solids (mg)		1	mg	8	5	6		
EA142I: Total Solids								
Total Solids		0.1	g/m².month	0.6	0.4	0.5		
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	3.15	7.99	3.55	0.052	0.129
ØBarium	7440-39-3	0.05	µg/m².month	119	<127	189	5.03	458
øManganese	7439-96-5	0.05	µg/m².month	140	119	100	2.44	55.3



Sub-Matrix: DUST		Sample ID		WVDG03S	WVDG03W	WVDG05N	WVDG05E	WVDG05S
(Matrix: AIR)				soluble metals				
		Samplii	ng date / time	01-Feb-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2102004-011	EM2102004-012	EM2102004-013	EM2102004-014	EM2102004-015
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	0.160	<0.05	<0.05	1.97	1.68
ØBarium	7440-39-3	0.05	µg/m².month	62.0	72.8	29.6	298	218
ø Manganese	7439-96-5	0.05	µg/m².month	10.8	57.6	20.6	42.4	35.1



Sub-Matrix: DUST		Sample ID		WVDG05W	WVDG03N	WVDG03E	WVDG03S	WVDG03W
(Matrix: AIR)				soluble metals	insoluble metals	insoluble metals	insoluble metals	insoluble metals
		Sampli	ng date / time	01-Feb-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2102004-016	EM2102004-017	EM2102004-018	EM2102004-019	EM2102004-020
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	<0.05	5.40	4.19	<18.7	11.2
ØBarium	7440-39-3	0.05	µg/m².month	34.4	<237	195	<215	<375
ø Manganese	7439-96-5	0.05	µg/m².month	20.3	235	281	183	428



Sub-Matrix: DUST	ix: DUST Sample I		Sample ID	WVDG05N	WVDG05E	WVDG05S	WVDG05W	
(Matrix: AIR)				insoluble metals	insoluble metals	insoluble metals	insoluble metals	
		Sampli	ng date / time	01-Feb-2021 00:00	01-Feb-2021 00:00	01-Feb-2021 00:00	01-Feb-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2102004-021	EM2102004-022	EM2102004-023	EM2102004-024	
				Result	Result	Result	Result	
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	3.71	4.13	11.3	3.48	
ØBarium	7440-39-3	0.05	µg/m².month	<103	139	<127	199	
ø Manganese	7439-96-5	0.05	µg/m².month	52.4	187	152	137	



# **QUALITY CONTROL REPORT**

Work Order	: EM2102004	Page	: 1 of 3
Client Contact	: ALS WATER RESOURCES GROUP : ROHAN OLIVER	Laboratory Contact	: Environmental Division Melbourne : Customer Services EM
Address	94 Kerang-Koondrook Road Kerang 3579	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 02-Feb-2021
Order number	:	Date Analysis Commenced	:11-Feb-2021
C-O-C number	:	Issue Date	19-Feb-2021
Sampler	: KV		Hac-MRA NAIA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 24		Accredited for compliance with
No. of samples analysed	: 24		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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

#### 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.

Nildi Otaaniawali	Conice Incomentia Instrument Ob emist	
Signatories	Position	Accreditation Category

Nikki Stepniewski

Senior Inorganic Instrument Chemist

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

Key: Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

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

RPD = Relative Percentage Difference

# = Indicates failed QC

#### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

• No Laboratory Duplicate (DUP) Results are required to be reported.



### Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

ub-Matrix: AIR				Method Blank (MB)		Laboratory Control Spike (LC	CS) Report		
				Report	Spike	Spike Recovery (%)	Recovery	Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EA139I: Total Soluble Matter (QCLot: 3506680)									
EA139I: Total Soluble Matter		0.1	g/m².month	<0.1	1.66 g/m <sup>2</sup> .month	120	70.0	130	
EA139I: Total Soluble Matter (mg)		1	mg	<1	29.3 mg	106	70.0	130	
EA141I: Total Insoluble Matter (QCLot: 3506679)									
EA141I: Total Insoluble Matter		0.1	g/m².month	<0.1	5.66 g/m <sup>2</sup> .month	98.9	70.0	130	
EA141I: Total Insoluble Matter (mg)		1	mg	<1	100 mg	86.0	70.0	130	
EA142I: Total Solids (QCLot: 3506681)									
EA142I: Total Solids		0.1	g/m².month	<0.1	7.32 g/m <sup>2</sup> .month	104	70.0	130	
EA142I: Total Solids (mg)		1	mg	<1	129.3 mg	90.5	70.0	130	
EG020T: Total Metals by ICP-MS (QCLot: 3515096)									
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050					
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050					
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050					
EG020T: Total Metals by ICP-MS (QCLot: 3515097)	EG020T: Total Metals by ICP-MS (QCLot: 3515097)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050					
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050					
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050					

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



# QA/QC Compliance Assessment to assist with Quality Review : EM2102004 Page : 1 of 5

Client	: ALS WATER RESOURCES GROUP	Laboratory	: Environmental Division Melbourne
Contact	: ROHAN OLIVER	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 02-Feh-2021
Site	:	Issue Date	: 19-Feb-2021
Sampler	: KV	No. of samples received	: 24
Order number	:	No. of samples analysed	: 24

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

## **Summary of Outliers**

Work Order

### **Outliers : Quality Control Samples**

This report highlights outliers flagged in the Quality Control (QC) Report.

- <u>NO</u> Method Blank value outliers occur.
- <u>NO</u> Duplicate outliers occur.
- <u>NO</u> Laboratory Control outliers occur.
- <u>NO</u> Matrix Spike outliers occur.
- For all regular sample matrices, <u>NO</u> surrogate recovery outliers occur.

#### **Outliers : Analysis Holding Time Compliance**

• <u>NO</u> Analysis Holding Time Outliers exist.

### **Outliers : Frequency of Quality Control Samples**

• <u>NO</u> Quality Control Sample Frequency Outliers exist.



## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Evaluation:	¥ =	Holding	time	breach		<pre>&lt; =</pre>	Within	holding	time
Evaluation.	~ -	noiuing	ume	breach	, <b>v</b>	-	VVILIIIII	noiuing	ume.

Matrix: AIR					Evaluation	i: × = Holding time	breach ; 🗸 = Withi	in holding time.
Method		Sample Date	E	xtraction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA120I: Ash Content								
Directional Dust Gauge - Unpreserved (EA120)	I)							
WVDG03N,	WVDG03E,	01-Feb-2021				11-Feb-2021	31-Jul-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA125I: Combustible Matter								
Directional Dust Gauge - Unpreserved (EA125	1)							
WVDG03N,	WVDG03E,	01-Feb-2021				11-Feb-2021	31-Jul-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA139: Total Soluble Matter								
Directional Dust Gauge - Unpreserved (EA139I	1)							
WVDG03N,	WVDG03E,	01-Feb-2021				11-Feb-2021	31-Jul-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA139I: Total Soluble Matter								
Directional Dust Gauge - Unpreserved (EA139I	I)							
WVDG03N,	WVDG03E,	01-Feb-2021				11-Feb-2021	31-Jul-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA141: Total Insoluble Matter								
Directional Dust Gauge - Unpreserved (EA141	1)							
WVDG03N,	WVDG03E,	01-Feb-2021				11-Feb-2021	31-Jul-2021	<ul> <li>✓</li> </ul>
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							

Page	: 3 of 5
Work Order	: EM2102004
Client	: ALS WATER RESOURCES GROUP
Project	: MV214940



Matrix: AIR		Evaluation: $\star$ = Holding time breach ; $\star$ = Within holding time.								
Method		Sample Date	Ex	traction / Preparation		Analysis				
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation		
EA141I: Total Insoluble Matter										
Directional Dust Gauge - Unpreserved (EA141I)										
WVDG03N,	WVDG03E,	01-Feb-2021				11-Feb-2021	31-Jul-2021	✓		
WVDG03S,	WVDG03W,									
WVDG05N,	WVDG05E,									
WVDG05S,	WVDG05W									
EA142: Total Solids										
Directional Dust Gauge - Unpreserved (EA142I)										
WVDG03N,	WVDG03E,	01-Feb-2021				11-Feb-2021	31-Jul-2021	✓		
WVDG03S,	WVDG03W,									
WVDG05N,	WVDG05E,									
WVDG05S,	WVDG05W									
EA142I: Total Solids										
Directional Dust Gauge - Unpreserved (EA142I)										
WVDG03N,	WVDG03E,	01-Feb-2021				11-Feb-2021	31-Jul-2021	✓		
WVDG03S,	WVDG03W,									
WVDG05N,	WVDG05E,									
WVDG05S,	WVDG05W									
EG020T: Total Metals by ICP-MS										
Dust Residue (EG020TUG)										
WVDG03N,	WVDG03E,	01-Feb-2021				17-Feb-2021	31-Jul-2021	✓		
WVDG03S,	WVDG03W,									
WVDG05N,	WVDG05E,									
WVDG05S,	WVDG05W,									
WVDG03N - soluble metals,	WVDG03E - soluble metals,									
WVDG03S - soluble metals,	WVDG03W - soluble metals,									
WVDG05N - soluble metals,	WVDG05E - soluble metals,									
WVDG05S - soluble metals,	WVDG05W - soluble metals,									
WVDG03N - insoluble metals,	WVDG03E - insoluble metals,									
WVDG03S - insoluble metals,	WVDG03W - insoluble metals,									
WVDG05N - insoluble metals,	WVDG05E - insoluble metals,									
WVDG05S - insoluble metals,	WVDG05W - insoluble metals									



# **Quality Control Parameter Frequency Compliance**

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: AIR				Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.							
Quality Control Sample Type		Count		Rate (%)			Quality Control Specification				
Analytical Methods	Method	00	Reaular	Actual	Expected	Evaluation					
aboratory Control Samples (LCS)											
Total Insoluble Matter (TIM)	EA141I	1	20	5.00	5.00	$\checkmark$	NEPM 2013 B3 & ALS QC Standard				
Total Solids (TS)	EA142I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Total Soluble Matter (SM)	EA139I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Method Blanks (MB)											
Total Insoluble Matter (TIM)	EA141I	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Total Metals - ICP-MS (mass/filter)	EG020TUG	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Total Solids (TS)	EA142I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard				
Total Soluble Matter (SM)	EA139I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard				



## **Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Insoluble solids in deposited
			dust.
Total Solids (TS)	EA142I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* EG020TUG	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by
			ICPMS and reported as ug of the TIM.



# **CERTIFICATE OF ANALYSIS**

Work Order	EM2103690	Page	: 1 of 7
Client	ALS WATER RESOURCES GROUP	Laboratory	Environmental Division Melbourne
Contact	: ROHAN OLIVER	Contact	: Customer Services EM
Address	: 94 Kerang-Koondrook Road	Address	: 4 Westall Rd Springvale VIC Australia 3171
	Kerang 3579		
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 04-Mar-2021 09:00
Order number	:	Date Analysis Commenced	: 10-Mar-2021
C-O-C number	:	Issue Date	: 16-Mar-2021 12:22
Sampler	: KV		Hac-MRA NATA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 24		Accredited for compliance with
No. of samples analysed	: 24		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	Senior Inorganic Chemist	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 Contact 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

ø = 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.
- Sampling Period:01/02/2021-03/03/2021.
- Dust samples have been dosed with Copper Sulphate prior to sample collection and a copper correction factor of 0.055g has been used for calculations.
- EM2103690 #1-8: Sample 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
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- Analysis as per AS3580.10.2-2013. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m<sup>2</sup>.mth.

# Page : 3 of 7 Work Order : EM2103690 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST			Sample ID	WVDG03N	WVDG03E	WVDG03S	WVDG03W	WVDG05N
		Sampli	ing date / time	03-Mar-2021 12:15	03-Mar-2021 12:20	03-Mar-2021 12:05	03-Mar-2021 12:10	03-Mar-2021 12:50
Compound	CAS Number	I OR		EM2103690-001	EM2103690-002	EM2103690-003	EM2103690-004	EM2103690-005
	CAS Number	2011	- Crint	Result	Result	Result	Result	Result
EA120I: Ash Content				Koouk	1 COURT	roour	1 Court	reout
Ash Content		0.1	g/m <sup>2</sup> .month	<0.1	<0.1	<0.1	<0.1	0.1
Ash Content (mg)		1	mg	1	<1	<1	<1	2
EA125I: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.5	0.2	0.4	0.4	0.4
Combustible Matter (mg)		1	mg	8	4	6	5	6
EA139: Total Soluble Matter								
Total Soluble Matter (mg)		1	mg	1	1	1	2	1
EA139I: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.1	0.1	0.1	0.2	0.1
EA141: Total Insoluble Matter								
Total Insoluble Matter (mg)		1	mg	9	5	7	6	8
EA141I: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m <sup>2</sup> .month	0.6	0.3	0.5	0.4	0.5
EA142: Total Solids								
Total Solids (mg)		1	mg	10	6	8	8	9
EA142I: Total Solids								
Total Solids		0.1	g/m².month	0.7	0.4	0.6	0.6	0.6
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	1.76	0.654	0.932	2.02	2.40
ØBarium	7440-39-3	0.05	µg/m².month	<67.0	5.7	49.9	50.1	<123
ø Manganese	7439-96-5	0.05	µg/m².month	38.6	19.4	26.0	27.3	52.8



Sub-Matrix: DUST			Sample ID	WVDG05E	WVDG05S	WVDG05W	WVDG03N	WVDG03E
							soluble metals	soluble metals
		Sampl	ing date / time	03-Mar-2021 12:35	03-Mar-2021 12:40	03-Mar-2021 12:45	03-Mar-2021 00:00	03-Mar-2021 00:00
Compound	CAS Number	LOR	Unit	EM2103690-006	EM2103690-007	EM2103690-008	EM2103690-009	EM2103690-010
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content		0.1	g/m².month	<0.1	<0.1	<0.1		
Ash Content (mg)		1	mg	<1	1	<1		
EA125I: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.3	<0.1	0.4		
Combustible Matter (mg)		1	mg	5	1	6		
EA139: Total Soluble Matter								
Total Soluble Matter (mg)		1	mg	1	2	1		
EA139I: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.1	0.1	0.1		
EA141: Total Insoluble Matter								
Total Insoluble Matter (mg)		1	mg	6	2	7		
EA141I: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.4	0.1	0.5		
EA142: Total Solids								
Total Solids (mg)		1	mg	7	4	8		
EA142I: Total Solids								
Total Solids		0.1	g/m².month	0.5	0.2	0.6		
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	<1.70	2.04	<1.80	0.322	0.215
ØBarium	7440-39-3	0.05	µg/m².month	<113	<146	118	28.6	15.4
øManganese	7439-96-5	0.05	µg/m².month	40.0	47.3	47.4	21.7	15.1



Sub-Matrix: DUST		Sample ID		WVDG03S	WVDG03W	WVDG05N	WVDG05E	WVDG05S
(Matrix: AIR)				soluble metals				
Sampling date / time				03-Mar-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2103690-011	EM2103690-012	EM2103690-013	EM2103690-014	EM2103690-015
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	0.277	5.32	0.730	0.209	0.351
ØBarium	7440-39-3	0.05	µg/m².month	23.2	22.0	23.7	32.2	36.4
ø Manganese	7439-96-5	0.05	µg/m².month	16.8	26.1	22.3	16.5	22.4



Sub-Matrix: DUST			Sample ID	WVDG05W	WVDG03N	WVDG03E	WVDG03S	WVDG03W
(Matrix: AIR)				soluble metals	insoluble metals	insoluble metals	insoluble metals	insoluble metals
		Sampli	ng date / time	03-Mar-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2103690-016	EM2103690-017	EM2103690-018	EM2103690-019	EM2103690-020
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	0.073	1.77	1.10	1.52	2.35
ØBarium	7440-39-3	0.05	µg/m².month	18.5	<67.0	53.8	61.9	81.7
ø Manganese	7439-96-5	0.05	µg/m².month	23.1	59.6	37.3	39.4	39.8



Sub-Matrix: DUST			Sample ID	WVDG05N	WVDG05E	WVDG05S	WVDG05W	
(Matrix: AIR)				insoluble metals	insoluble metals	insoluble metals	insoluble metals	
	Sampli	ng date / time	03-Mar-2021 00:00	03-Mar-2021 00:00	03-Mar-2021 00:00	03-Mar-2021 00:00		
Compound	CAS Number	LOR	Unit	EM2103690-021	EM2103690-022	EM2103690-023	EM2103690-024	
				Result	Result	Result	Result	
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	2.38	<1.70	1.99	<1.80	
ØBarium	7440-39-3	0.05	µg/m².month	<123	<113	<146	135	
ø Manganese	7439-96-5	0.05	µg/m².month	54.2	39.1	48.9	48.5	



# QUALITY CONTROL REPORT

Work Order	: EM2103690	Page	: 1 of 3
Client Contact	: ALS WATER RESOURCES GROUP : ROHAN OLIVER	Laboratory Contact	: Environmental Division Melbourne : Customer Services EM
Address	: 94 Kerang-Koondrook Road Kerang 3579	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 04-Mar-2021
Order number	:	Date Analysis Commenced	: 10-Mar-2021
C-O-C number	:	Issue Date	16-Mar-2021
Sampler	: KV		Hac-MRA NATA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 24		Accredited for compliance with
No. of samples analysed	: 24		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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

#### 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

Dilani Fernando

Senior Inorganic Chemist

Position

Accreditation Category

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

Key: Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

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

RPD = Relative Percentage Difference

# = Indicates failed QC

#### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

• No Laboratory Duplicate (DUP) Results are required to be reported.



### Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: AIR				Method Blank (MB)		Laboratory Control Spike (LC	S) Report			
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)		
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High		
EA139I: Total Soluble Matter (QCLot: 3554483)										
EA139I: Total Soluble Matter		0.1	g/m².month	<0.1	1.66 g/m <sup>2</sup> .month	126	70.0	130		
EA139I: Total Soluble Matter (mg)		1	mg	<1	29.3 mg	109	70.0	130		
EA141I: Total Insoluble Matter (QCLot: 3554481)										
EA141I: Total Insoluble Matter		0.1	g/m².month	<0.1	5.66 g/m <sup>2</sup> .month	117	70.0	130		
EA141I: Total Insoluble Matter (mg)		1	mg	<1	100 mg	101	70.0	130		
EA142I: Total Solids (QCLot: 3554482)										
EA142I: Total Solids		0.1	g/m².month	<0.1	7.32 g/m <sup>2</sup> .month	119	70.0	130		
EA142I: Total Solids (mg)		1	mg	<1	129.3 mg	103	70.0	130		
EG020T: Total Metals by ICP-MS (QCLot: 3560503)										
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050						
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050						
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050						
EG020T: Total Metals by ICP-MS (QCLot: 3560504)										
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050						
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050						
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050						

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



QA/QC Compliance Assessment to assist with Quality Review									
Work Order	EM2103690	Page	: 1 of 5						
Client	ALS WATER RESOURCES GROUP	Laboratory	: Environmental Division Melbourne						
Contact	: ROHAN OLIVER	Telephone	: +61-3-8549 9600						
Project	: MV214940	Date Samples Received	: 04-Mar-2021						
Site	:	Issue Date	: 16-Mar-2021						
Sampler	: KV	No. of samples received	: 24						
Order number	:	No. of samples analysed	: 24						

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

## Summary of Outliers

#### **Outliers : Quality Control Samples**

This report highlights outliers flagged in the Quality Control (QC) Report.

- <u>NO</u> Method Blank value outliers occur.
- <u>NO</u> Duplicate outliers occur.
- <u>NO</u> Laboratory Control outliers occur.
- <u>NO</u> Matrix Spike outliers occur.
- For all regular sample matrices, <u>NO</u> surrogate recovery outliers occur.

#### **Outliers : Analysis Holding Time Compliance**

• <u>NO</u> Analysis Holding Time Outliers exist.

#### **Outliers : Frequency of Quality Control Samples**

• <u>NO</u> Quality Control Sample Frequency Outliers exist.



## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Evaluation:	¥ =	Holding	time	breach		<pre>&lt; =</pre>	Within	holding	time
Evaluation.	~ -	noiuing	ume	breach	, <b>v</b>	-	VVILIIIII	noiuing	ume.

Matrix: AIR Evaluation: × = Holding time breach;									
Method		Sample Date	E	xtraction / Preparation		Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA120I: Ash Content									
Directional Dust Gauge - Unpreserved (EA12	:01)								
WVDG03N,	WVDG03E,	03-Mar-2021				10-Mar-2021	30-Aug-2021	✓	
WVDG03S,	WVDG03W,								
WVDG05N,	WVDG05E,								
WVDG05S,	WVDG05W								
EA125I: Combustible Matter									
Directional Dust Gauge - Unpreserved (EA12	251)								
WVDG03N,	WVDG03E,	03-Mar-2021				10-Mar-2021	30-Aug-2021	✓	
WVDG03S,	WVDG03W,								
WVDG05N,	WVDG05E,								
WVDG05S,	WVDG05W								
EA139: Total Soluble Matter									
Directional Dust Gauge - Unpreserved (EA13	91)								
WVDG03N,	WVDG03E,	03-Mar-2021				10-Mar-2021	30-Aug-2021	✓	
WVDG03S,	WVDG03W,								
WVDG05N,	WVDG05E,								
WVDG05S,	WVDG05W								
EA139I: Total Soluble Matter									
Directional Dust Gauge - Unpreserved (EA13	91)								
WVDG03N,	WVDG03E,	03-Mar-2021				10-Mar-2021	30-Aug-2021	✓	
WVDG03S,	WVDG03W,								
WVDG05N,	WVDG05E,								
WVDG05S,	WVDG05W								
EA141: Total Insoluble Matter									
Directional Dust Gauge - Unpreserved (EA14	11)								
WVDG03N,	WVDG03E,	03-Mar-2021				10-Mar-2021	30-Aug-2021	<ul> <li>✓</li> </ul>	
WVDG03S,	WVDG03W,								
WVDG05N,	WVDG05E,								
WVDG05S,	WVDG05W								

Page	: 3 of 5
Work Order	: EM2103690
Client	: ALS WATER RESOURCES GROUP
Project	: MV214940



Matrix: AIR			Evaluation: \star = Holding time breach ; 🗹 = Within holding time						
Method		Sample Date	Ex	traction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA141I: Total Insoluble Matter									
Directional Dust Gauge - Unpreserved (EA141I)									
WVDG03N,	WVDG03E,	03-Mar-2021				10-Mar-2021	30-Aug-2021	✓	
WVDG03S,	WVDG03W,								
WVDG05N,	WVDG05E,								
WVDG05S,	WVDG05W								
EA142: Total Solids									
Directional Dust Gauge - Unpreserved (EA142I)									
WVDG03N,	WVDG03E,	03-Mar-2021				10-Mar-2021	30-Aug-2021	✓	
WVDG03S,	WVDG03W,								
WVDG05N,	WVDG05E,								
WVDG05S,	WVDG05W								
EA142I: Total Solids									
Directional Dust Gauge - Unpreserved (EA142I)									
WVDG03N,	WVDG03E,	03-Mar-2021				10-Mar-2021	30-Aug-2021	$\checkmark$	
WVDG03S,	WVDG03W,								
WVDG05N,	WVDG05E,								
WVDG05S,	WVDG05W								
EG020T: Total Metals by ICP-MS									
Dust Residue (EG020TUG)									
WVDG03N,	WVDG03E,	03-Mar-2021				12-Mar-2021	30-Aug-2021	✓	
WVDG03S,	WVDG03W,								
WVDG05N,	WVDG05E,								
WVDG05S,	WVDG05W,								
WVDG03N - soluble metals,	WVDG03E - soluble metals,								
WVDG03S - soluble metals,	WVDG03W - soluble metals,								
WVDG05N - soluble metals,	WVDG05E - soluble metals,								
WVDG05S - soluble metals,	WVDG05W - soluble metals,								
WVDG03N - insoluble metals,	WVDG03E - insoluble metals,								
WVDG03S - insoluble metals,	WVDG03W - insoluble metals,								
WVDG05N - insoluble metals,	WVDG05E - insoluble metals,								
WVDG05S - insoluble metals,	WVDG05W - insoluble metals								



# **Quality Control Parameter Frequency Compliance**

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: AIR				Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification			
Quality Control Sample Type			Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	OC	Reaular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS)							
Total Insoluble Matter (TIM)	EA141I	1	16	6.25	5.00	~	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Insoluble Matter (TIM)	EA141I	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals - ICP-MS (mass/filter)	EG020TUG	2	24	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard



## **Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Insoluble solids in deposited
			dust.
Total Solids (TS)	EA142I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* EG020TUG	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by
			ICPMS and reported as ug of the TIM.



# **CERTIFICATE OF ANALYSIS**

Work Order	EM2105892	Page	: 1 of 7
Client	ALS WATER RESOURCES GROUP	Laboratory	Environmental Division Melbourne
Contact	: ROHAN OLIVER	Contact	: Customer Services EM
Address	≑94 Kerang-Koondrook Road	Address	: 4 Westall Rd Springvale VIC Australia 3171
	Kerang 3579		
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 06-Apr-2021 07:45
Order number	:	Date Analysis Commenced	: 15-Apr-2021
C-O-C number	:	Issue Date	21-Apr-2021 13:45
Sampler	: KV		Hac-MRA NATA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 24		Accredited for compliance with
No. of samples analysed	: 24		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	Senior Inorganic Chemist	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 Contact 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

ø = 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.
- Insoluble and soluble metals conducted as per AS 3580.10.1:2016 Appendix A. Insoluble, soluble and ash arsenic have been reported as ug/m2.month. This is not consistent with Appendix A units of ug, ug/m2.day or mg/m2.month. Limit of reporting will vary from sample to sample based on sample volume, solid residual collected and sampling period.
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- Sampling Period: 03/03/2021-01/04/2021.
- Dust samples were not dosed with Copper Sulphate prior to sample collection and no Copper correction factor has been used during calculation.
- EM2105892 #1, #4-5 and #7-8: Sample 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
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- 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/m<sup>2</sup>.mth as sampling data was provided by the client.
- Analysis as per AS3580.10.2-2013. Samples passed through a 1mm sieve prior to analysis. NATA accreditation is not held for results reported in g/m<sup>2</sup>.mth.

# Page : 3 of 7 Work Order : EM2105892 Client : ALS WATER RESOURCES GROUP Project : MV214940



Sub-Matrix: DUST (Matrix: AIR)			Sample ID	WVDG03N	WVDG03E	WVDG03S	WVDG03W	WVDG05N
		Sampli	ing date / time	01-Apr-2021 12:00	01-Apr-2021 12:05	01-Apr-2021 11:50	01-Apr-2021 11:55	01-Apr-2021 12:30
Compound	CAS Number	LOR	Unit	EM2105892-001	EM2105892-002	EM2105892-003	EM2105892-004	EM2105892-005
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content		0.1	g/m².month	<0.1	0.2	<0.1	<0.1	<0.1
Ash Content (mg)		1	mg	1	2	1	<1	<1
EA125I: Combustible Matter								
Combustible Matter		0.1	g/m².month	0.4	0.3	0.4	0.1	<0.1
Combustible Matter (mg)		1	mg	6	5	7	2	1
EA139: Total Soluble Matter								
Total Soluble Matter (mg)		1	mg	7	9	4	6	10
EA139I: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	0.4	0.6	0.3	0.4	0.7
EA141: Total Insoluble Matter								
Total Insoluble Matter (mg)		1	mg	7	7	8	3	2
EA141I: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.5	0.5	0.5	0.2	0.1
EA142: Total Solids								
Total Solids (mg)		1	mg	14	16	12	9	12
EA142I: Total Solids								
Total Solids		0.1	g/m².month	0.9	1.1	0.8	0.6	0.8
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	1.28	<3.23	2.65	1.12	<1.53
ØBarium	7440-39-3	0.05	µg/m².month	81.7	<133	<49.8	<41.2	<35.5
ø Manganese	7439-96-5	0.05	µg/m².month	17.8	<60.6	42.2	23.7	20.7



Sub-Matrix: DUST			Sample ID	WVDG05E	WVDG05S	WVDG05W	WVDG03N	WVDG03E
							soluble metals	soluble metals
		Sampl	ing date / time	01-Apr-2021 12:15	01-Apr-2021 12:20	01-Apr-2021 12:25	01-Apr-2021 00:00	01-Apr-2021 00:00
Compound	CAS Number	LOR	Unit	EM2105892-006	EM2105892-007	EM2105892-008	EM2105892-009	EM2105892-010
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content		0.1	g/m².month	<0.1	<0.1	0.2		
Ash Content (mg)		1	mg	1	<1	3		
EA125I: Combustible Matter								
Combustible Matter		0.1	g/m².month	<0.1	0.2	0.5		
Combustible Matter (mg)		1	mg	1	3	7		
EA139: Total Soluble Matter								
Total Soluble Matter (mg)		1	mg	15	6	10		
EA139I: Total Soluble Matter								
Total Soluble Matter		0.1	g/m².month	1.0	0.4	0.7		
EA141: Total Insoluble Matter								
Total Insoluble Matter (mg)		1	mg	2	4	10		
EA141I: Total Insoluble Matter								
Total Insoluble Matter		0.1	g/m².month	0.1	0.3	0.7		
EA142: Total Solids								
Total Solids (mg)		1	mg	17	10	20		
EA142I: Total Solids								
Total Solids		0.1	g/m².month	1.1	0.7	1.4		
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	1.44	0.724	2.84	4.81	3.24
ØBarium	7440-39-3	0.05	µg/m².month	<42.2	20.3	<72.9	87.2	44.5
øManganese	7439-96-5	0.05	µg/m².month	23.7	9.65	46.2	40.7	61.5



Sub-Matrix: DUST			Sample ID	WVDG03S	WVDG03W	WVDG05N	WVDG05E	WVDG05S
(Matrix: AIR)				soluble metals				
		Sampli	ng date / time	01-Apr-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2105892-011	EM2105892-012	EM2105892-013	EM2105892-014	EM2105892-015
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	2.85	2.37	4.17	3.22	3.01
ØBarium	7440-39-3	0.05	µg/m².month	20.2	20.3	37.7	25.4	20.8
ø Manganese	7439-96-5	0.05	µg/m².month	34.6	38.5	48.8	42.5	21.3



Sub-Matrix: DUST	Sample ID			WVDG05W	WVDG03N	WVDG03E	WVDG03S	WVDG03W
(Matrix: AIR)				soluble metals	insoluble metals	insoluble metals	insoluble metals	insoluble metals
Sampling date / time				01-Apr-2021 00:00				
Compound	CAS Number	LOR	Unit	EM2105892-016	EM2105892-017	EM2105892-018	EM2105892-019	EM2105892-020
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	9.32	1.62	<3.23	2.91	1.23
ØBarium	7440-39-3	0.05	µg/m².month	71.9	119	<133	<49.8	<41.2
ø Manganese	7439-96-5	0.05	µg/m².month	133	31.7	<60.6	60.8	33.4



Sub-Matrix: DUST	Sample ID			WVDG05N	WVDG05E	WVDG05S	WVDG05W	
(Matrix: AIR)				insoluble metals	insoluble metals	insoluble metals	insoluble metals	
Sampling date / time				01-Apr-2021 00:00	01-Apr-2021 00:00	01-Apr-2021 00:00	01-Apr-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2105892-021	EM2105892-022	EM2105892-023	EM2105892-024	
				Result	Result	Result	Result	
EG020T: Total Metals by ICP-MS								
ØArsenic	7440-38-2	0.05	µg/m².month	<1.53	1.58	0.962	2.70	
ØBarium	7440-39-3	0.05	µg/m².month	<35.5	<42.2	24.5	<72.9	
ø Manganese	7439-96-5	0.05	µg/m².month	23.1	32.1	14.2	56.1	


# QUALITY CONTROL REPORT

Work Order	: EM2105892	Page	: 1 of 3
Client Contact	: ALS WATER RESOURCES GROUP : ROHAN OLIVER	Laboratory Contact	: Environmental Division Melbourne : Customer Services EM
Address	94 Kerang-Koondrook Road Kerang 3579	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	:	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 06-Apr-2021
Order number	:	Date Analysis Commenced	: 15-Apr-2021
C-O-C number	:	Issue Date	21-Apr-2021
Sampler	: KV		Hac-MRA NATA
Site	:		
Quote number	: ME/968/20		Accreditation No. 825
No. of samples received	: 24		Accredited for compliance with
No. of samples analysed	: 24		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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

#### 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

Dilani Fernando

Senior Inorganic Chemist

Position

Accreditation Category

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

Key: Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

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

RPD = Relative Percentage Difference

# = Indicates failed QC

#### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

• No Laboratory Duplicate (DUP) Results are required to be reported.



## Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: AIR	Method Blank (MB)	Laboratory Control Spike (LCS) Report						
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA139I: Total Soluble Matter (QCLot: 3622494)								
EA139I: Total Soluble Matter		0.1	g/m².month	<0.1	1.66 g/m <sup>2</sup> .month	120	70.0	130
EA139I: Total Soluble Matter (mg)		1	mg	<1	29.3 mg	106	70.0	130
EA141I: Total Insoluble Matter (QCLot: 3622493)								
EA141I: Total Insoluble Matter		0.1	g/m².month	<0.1	5.66 g/m <sup>2</sup> .month	91.9	70.0	130
EA141I: Total Insoluble Matter (mg)		1	mg	<1	100 mg	83.0	70.0	130
EA142I: Total Solids (QCLot: 3622492)								
EA142I: Total Solids		0.1	g/m².month	<0.1	7.32 g/m <sup>2</sup> .month	98.4	70.0	130
EA142I: Total Solids (mg)		1	mg	<1	129.3 mg	88.2	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 3630755)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				
EG020T: Total Metals by ICP-MS (QCLot: 3630756)								
EG020TUG: Arsenic	7440-38-2	0.05	μg	<0.050				
EG020TUG: Barium	7440-39-3	0.05	μg	<0.050				
EG020TUG: Manganese	7439-96-5	0.05	μg	<0.050				

## Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



: KV

: -----

#### QA/QC Compliance Assessment to assist with Quality Review : EM2105892 Page : 1 of 5 : Environmental Division Melbourne : ALS WATER RESOURCES GROUP Laboratory : ROHAN OLIVER Telephone : +61-3-8549 9600 : MV214940 **Date Samples Received** : 06-Apr-2021 **Issue Date** : -----: 21-Apr-2021

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

No. of samples received

No. of samples analysed

: 24

: 24

Brief method summaries and references are also provided to assist in traceability.

# **Summary of Outliers**

Work Order

Client

Project

Site

Contact

Sampler

Order number

## **Outliers : Quality Control Samples**

This report highlights outliers flagged in the Quality Control (QC) Report.

- NO Method Blank value outliers occur.
- <u>NO</u> Duplicate outliers occur.
- <u>NO</u> Laboratory Control outliers occur.
- <u>NO</u> Matrix Spike outliers occur.
- For all regular sample matrices, <u>NO</u> surrogate recovery outliers occur.

#### **Outliers : Analysis Holding Time Compliance**

• <u>NO</u> Analysis Holding Time Outliers exist.

## **Outliers : Frequency of Quality Control Samples**

• <u>NO</u> Quality Control Sample Frequency Outliers exist.



## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: AIR					Evaluation	: × = Holding time	breach ; 🗸 = Withi	in holding time.
Method			E	xtraction / Preparation		Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA120I: Ash Content								
Directional Dust Gauge - Unpreserved (EA1	1201)							
WVDG03N,	WVDG03E,	01-Apr-2021				15-Apr-2021	28-Sep-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA125I: Combustible Matter								
Directional Dust Gauge - Unpreserved (EA1	1251)							
WVDG03N,	WVDG03E,	01-Apr-2021				15-Apr-2021	28-Sep-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA139: Total Soluble Matter								
Directional Dust Gauge - Unpreserved (EA1	1391)							
WVDG03N,	WVDG03E,	01-Apr-2021				15-Apr-2021	28-Sep-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA139I: Total Soluble Matter								
Directional Dust Gauge - Unpreserved (EA1	1391)							
WVDG03N,	WVDG03E,	01-Apr-2021				15-Apr-2021	28-Sep-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA141: Total Insoluble Matter								
Directional Dust Gauge - Unpreserved (EA1	1411)							
WVDG03N,	WVDG03E,	01-Apr-2021				15-Apr-2021	28-Sep-2021	<ul> <li>✓</li> </ul>
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							

Page	: 3 of 5
Work Order	: EM2105892
Client	: ALS WATER RESOURCES GROUP
Project	: MV214940



Matrix: AIR					Evaluation	i: 🗴 = Holding time	breach ; 🗸 = Withi	in holding time
Method	Sample Date	Ex	traction / Preparation		Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA141I: Total Insoluble Matter								
Directional Dust Gauge - Unpreserved (EA141I)								
WVDG03N,	WVDG03E,	01-Apr-2021				15-Apr-2021	28-Sep-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA142: Total Solids								
Directional Dust Gauge - Unpreserved (EA142I)								
WVDG03N,	WVDG03E,	01-Apr-2021				15-Apr-2021	28-Sep-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EA142I: Total Solids								
Directional Dust Gauge - Unpreserved (EA142I)								
WVDG03N,	WVDG03E,	01-Apr-2021				15-Apr-2021	28-Sep-2021	<ul> <li>✓</li> </ul>
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W							
EG020T: Total Metals by ICP-MS								
Dust Residue (EG020TUG)								
WVDG03N,	WVDG03E,	01-Apr-2021				20-Apr-2021	28-Sep-2021	✓
WVDG03S,	WVDG03W,							
WVDG05N,	WVDG05E,							
WVDG05S,	WVDG05W,							
WVDG03N - soluble metals,	WVDG03E - soluble metals,							
WVDG03S - soluble metals,	WVDG03W - soluble metals,							
WVDG05N - soluble metals,	WVDG05E - soluble metals,							
WVDG05S - soluble metals,	WVDG05W - soluble metals,							
WVDG03N - insoluble metals,	WVDG03E - insoluble metals,							
WVDG03S - insoluble metals,	WVDG03W - insoluble metals,							
WVDG05N - insoluble metals,	WVDG05E - insoluble metals,							
WVDG05S - insoluble metals,	WVDG05W - insoluble metals							



# **Quality Control Parameter Frequency Compliance**

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: AIR					Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification			
Quality Control Sample Type			Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	00	Reaular	Actual	Expected	Evaluation		
Laboratory Control Samples (LCS)								
Total Insoluble Matter (TIM)	EA141I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Solids (TS)	EA142I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Soluble Matter (SM)	EA139I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Method Blanks (MB)								
Total Insoluble Matter (TIM)	EA141I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Metals - ICP-MS (mass/filter)	EG020TUG	2	34	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Solids (TS)	EA142I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Soluble Matter (SM)	EA139I	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard	



# **Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Insoluble solids in deposited
			dust.
Total Solids (TS)	EA142I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* EG020TUG	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by
			ICPMS and reported as ug of the TIM.

