JM Environments
0427 893 668
37 Tooke St
COOKS HILL NSW 2300
ABN 67 166 341 288

JME21022-2 21 SUNSET DRIVE THORNTON

Preliminary Ambient Air Quality Assessment

24 May 2021

For and on behalf of JM Environments

James McMahon PhD (Chem)
Principal Environmental Scientist
Certified Environmental Practitioner No 1235
Site Contamination Specialist No SC41110
Licensed Asbestos Assessor LAA001286

james@jmenvironments.com
Mobile: 0427 893 668

JM Environments
0427 893 668
37 Tooke St
COOKS HILL NSW 2300
ABN 67 166 341 288

Revision	Details	Date	Amended By	Issued To
	JME21022-2 21 Sunset Drive Thornton Preliminary Ambient Air Quality Assessment.pdf	24 May 2021	JMc	AC

EXECUTIVE SUMMARY

This report presents the findings of a Preliminary Ambient Air Quality Assessment (PAAQA) of 21 Sunset Drive, Thornton NSW undertaken by JM Environments (JME). The PAAQA was commissioned by LandLink Pty Ltd (LandLink). The site is identified as a portion of Lot 428 DP1262858. The site location is shown in Figure 1.

LandLink are planning to redevelop the site as a childcare facility. The purpose of this assessment is to provide a support for the development application for the redevelopment.

The objective of this assessment is to assess the ambient air quality of the site.

The proposed scope of work was prepared in accordance with the following guidelines and documents:

- Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (Department of Environment and Conservation (2005));

The scope of work was:

- Supply, install and collect 2 summa canisters to collect ambient air samples of an eight-hour period.
- Supply and install a directional dust deposition gauge to collect depositional dust over a four-week period;
- Laboratory analysis of the collected air samples; and
- Preparation of an Ambient Air Assessment report.

Based on the analytical data presented within the report, JME considers that the proximity of the classified road to the site does not pose a significant risk of health impacts via inhalation of volatile organic compounds or particulates generated by car exhausts by potential users of the childcare centre. The analytical results infer that future significant increases in road traffic would be unlikely to pose a significant risk of health impacts via inhalation car exhausts by potential users of the childcare centre.

Contents

Attachments

Figures

Appendix A: Laboratory Documentation

ACRONYMS

ACM	asbestos containing material
AEC	Area of Environmental Concern
ASS	acid sulfate soils
BTEX	benzene, toluene, ethylbenzene and xylenes
BTEXN	benzene, toluene, ethylbenzene, xylenes and naphthalene
CLM Act	NSW Contaminated Land Management Act 1997
COC	Contaminant of Concern
CSM	conceptual site model
DP	Deposited Plan
EPA	Environment Protection Authority
JME	JM Environments
NEPM	National Environment Protection (assessment of Site Contamination) Measure 1999 (updated 2013)
OCP	Organochlorine pesticides
PAH	polycyclic aromatic hydrocarbons
PCA	Preliminary Contamination Assessment
PCB	Polychlorinated biphenyls
POEO Act	NSW Protection of the Environment Operations Act 1997
TRH	total recoverable hydrocarbons
VOC	volatile organic compounds

1 INTRODUCTION

This report presents the findings of a Preliminary Ambient Air Quality Assessment (PAAQA) of 21 Sunset Drive, Thornton NSW undertaken by JM Environments (JME). The PAAQA was commissioned by LandLink Pty Ltd (LandLink). The site is identified as a portion of Lot 428 DP1262858. The site location is shown in Figure 1 (attached).

LandLink are planning to redevelop the site as a childcare facility. The purpose of this assessment is to provide a support for the development application for the redevelopment.

2 SCOPE OF WORK

2.1 Objectives

The objective of this assessment is to assess the ambient air quality of the site.

2.2 Scope of Work

The proposed scope of work was prepared in accordance with the following guidelines and documents:

- Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (Department of Environment and Conservation (2005));

The proposed scope of work is:

- Supply, install and collect 2 summa canisters to collect ambient air samples of an eight-hour period.
- Supply and install a directional dust deposition gauge to collect depositional dust over a four-week period;
- Laboratory analysis of the collected air samples; and
- Preparation of an Ambient Air Assessment report.

3 SITE IDENTIFICATION

General site information is provided in Table 1. The site location is shown in Figure 1.

TABLE 1 – SUMMARY OF SITE DETAILS

Site Address:	21 Sunset Drive Thornton NSW
Site Area:	Approximately 3,195m^2
Site Identification	Portion of Lot 428 DP1262858. Local Government Area of Maitland Parish of Gosforth County of Northumberland
Current Land Use:	Rural residential
Previous Land Use:	Rural residential
Proposed Land Use:	Childcare

Adjoining Site Uses:	Residential to the east Rural residential to the north, south and west

4 AMBIENT AIR SAMPLING

4.1 Site Location and Topography

The site is located on the southern side of Raymond Terrace Road which the Maitland Local Environmental Plan (2011) defines as "a classified road". A topographic map (maps.six.nsw.gov.au) indicates that the site lies mid top lower slope of a shallow gully and gently slopes down to the south. The site's elevation is approximately 15m-20m AHD.

4.2 Air Pollutants

Based on the site's proximity to a classified road, the pollutants of concern were those related to vehicle exhaust, namely:

- Benzene, toluene, ethylbenzene and xylene (BTEX);
- Total recoverable hydrocarbons (TRH); and
- Particulates.

4.3 Sampling Methods

BTEX and TRH were sampled using two Summa Cannisters fitted with passive samplers calibrated for an 8 hour sampling run.

Particulates were sampled using a direction dust gauge in to assess the particulate loading from the road compared to the surrounding background.

4.4 Sampling Locations and Timing

The Summa Cannister were attached to the existing barbed wire fence approximately 1m from the road and 1.2m above the ground (see photographs 1 and 2). Sampling was undertaken from approximately 10am to 6 pm, 13 April 2021.

The dust deposition gauge was mounted on to a 2m tall stand and placed approximately 5m inside the barbed wire fence (see photograph 3). Sampling was undertaken from 13 April – 10 May 2021.

Photograph 1: Summa Cannister "West"

Photograph 2: Summa Cannister "East"

Photograph 3: Dust Deposition Gauge 13 April 2021

5 METEOROLOGY

Maitland Airport All Weather Station (AWS) is located approximately 15km west north west of site. Wind speed and direction for 13 April 2021 at the Maitland Airport AWS {station 061428) was purchased from the Bureau of Meteorology. The wind direction and speed at half hour intervals between 10am and 6pm is summarised in Figure 2 below.

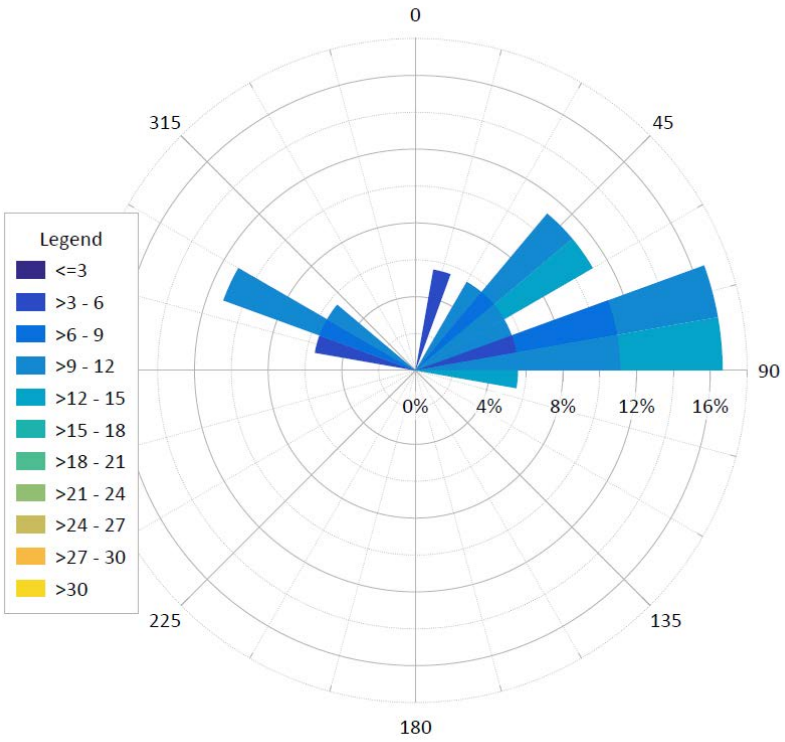

Figure 2: Windrose for 10am 6pm 13 April.

Figure 2 shows that wind direction during the Summa Canister sample had mainly some northerly aspect to it and fumes generated from car exhaust would move toward the samplers.

6 LABORATORY ANALYSIS

The Summa Cannisters were transported to SGS Australia Pty Ltd (SGS) under chain of custody conditions. The Summa Cannister were analysed by SGS for BTEX and TRH. SGS utilised the USEPA TO15 (Air Toxics) method to analyse the air samples. SGS is NATA accredited for the BTEX analysis.

The directional dust gauge samples were delivered to ALS Environmental Laboratories (ALS). ALS are NATA accredited for the analysis of directional dust gauges.

7 RESULTS AND DISCUSSION

7.1 Meteorology

7.2 Ambient Air Assessment Criteria

The ambient air assessment criteria were established from the NSW EPA Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (AMMAAP) and are summarised in Table 2.

TABLE 2 –AMBIENT AIR ASSESSMENT CRITERIA

Pollutant	Units	Averaging Period	Impact Assessment Criteria
Benzene	mg/m^3	1 hour	0.029
Toluene	mg/m^3	I hour	0.36
Ethylbenzene	mg/m^3	I hour	8.0
Xylenes	mg/m^3	I hour	0.19
TRH	No criterion	No criterion	No criterion
Deposited Dust	g/m^2/month	1 year	2[a], 4[b]

a. Maximum increase in deposited dust level.
b. Maximum total deposited dust level.

7.3 Quality Control and Quality Assurance

Summa Cannisters supplied by SGS were certified as clean and the evacuated. Prior to deploying and collecting the Summa Cannisters, their vacuums was checked by a JME environmental scientist. Both "East" and "West" cannister had a field vacuum reading of >-30 inches Hg. At the completion of the sampling, the "East" cannister had a field vacuum reading of -6inches Hg, indicating there were no significant leaks in the sampling train. The "West" cannister had a field vacuum reading of 0 inches Hg indicating a potential leak in the sampling train which may lead to lower concentrations of analytes in the sample.

The SGS report indicates that the uncertainty in the analytical results is ±20%. The Summa Cannister were analysed within the recommended holding times.

7.4 Summa Cannister Results

The Summa Cannister Results are summarised in Table 3 below. The laboratory results were reported in parts per billion per volume (ppbv) and were converted to AMMAAP guidelines units (mg/m^3) using the USA Environmental Protection Agency's *EPA On-line Tools for Site Assessment Calculation* website at standard temperature (25°C) and pressure (101.3kPa).

TABLE 2 –AMBIENT AIR ASSESSMENT CRITERIA

Pollutant	Impact Assessment Criteria	East Cannister		West Cannister	
		ppbv	mg/m^3	pbbv	mg/m^3
Benzene	0.029 mg/m^3	<0.4	<0.00016	<0.4	<0.00016
Toluene	0.36 mg/m^3	7.7	0.0036	4.2	0.002

Ethylbenzene	8.0 mg/m^3	0.4	0.0002	<0.4	<0.0002
Xylenes	0.19 mg/m^3	1.7	0.0009	1.3	0.0007
TRH	No criterion	<100	-	<100	-
Deposited Dust	2[a], 4[b]				

a. Maximum increase in deposited dust level.
b. Maximum total deposited dust level.

As shown in Table 3, the analytical results for common pollutants found in vehicle exhausts are at least orders of magnitude below the adopted guideline values.

7.5 Dust Deposition Results

8 CONCLUSION AND RECOMMENDATIONS

Based on the analytical data presented above, JME considers that the proximity of the classified road to the site does not pose a significant risk of health impacts via inhalation of volatile organic compounds or particulates generated by car exhausts by potential users of the childcare centre. The analytical results infer that future significant increases in road traffic would be unlikely to pose a significant risk of health impacts via inhalation car exhausts by potential users of the childcare centre.

REFERENCES

Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (Department of Environment and Conservation (2005))

USEPA TO15 Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/ Mass Spectrometry (GC/MS)

AS/NZS 3580.10.2:2013 Methods for sampling and analysis of ambient air Determination of particulate matter - Impinged matter - Gravimetric method

USA Environmental Protection Agency's *EPA On-line Tools for Site Assessment Calculation* website

LIMITATIONS

In preparing this report, current guidelines for assessment of air quality were followed. This work has been conducted in good faith, in accordance with JM Environments' understanding of the client's brief and general accepted practice for environmental consulting.

This report was prepared for the LandLink Pty Ltd with the objective of assessing the potential impact of car exhaust generated by vehicles using Raymond Terrace Road on the air quality at a proposed childcare centre. It is important to note that roadside air quality is transient in nature and can vary from day to day. The results reported in this report are specific to a certain period of time and may not reflect the air quality at all other times. No warranty, expressed or implied, is made as to the information and professional advice included in this report. The report is not intended for other parties or other uses, with the exception of Maitland City Council for the purpose of supporting the Development Application for the proposed childcare. Anyone using this document does so at their own risk and should satisfy themselves concerning its applicability and, where necessary, should seek expert advice in relation to the particular situation at the time.

JM Environments
0427 893 668
37 Tooke St
COOKS HILL NSW 2300
ABN 67 166 341 288

Figures

ENVIRONMENTS	N	CLIENT: **LandLink Pty Ltd**	PROJECT:	JME21022	DESIGNED:	JMc	FIGURE TITLE:
			DWG #:	1	DRAWN:	JMc	**Approximate Site Location Plan**
			REVISION:	1	STATUS:	NFC	
		PROJECT TITLE: **Proposed Childcare Facility**	SCALE:	NTS			
		21 SUNSET DRIVE THORNTON	DATE:	24/05/2021			FIGURE NUMBER: **1**

Appendix A

Laboratory Documentation

CHAIN OF CUSTODY & ANALYSIS REQUEST

SBO 33496

SGS Environmental Services Sydney
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Facsimile No: (02) 85940499
Telephone No: (02) 85940400
Email:
au.samplereceipt.sydney@sgs.com

Sample Date:	**13/04/2021**		
Company Name:	JM Environments	Project Name/No:	JME21022
Address:	37 Tooke St	Purchase Order No:	JME21022
	COOKS HILL NSW 2300	Results Required By:	21/04/2021
Contact Name:	James McMahon	Telephone:	0427 893 6688
Telephone	0427 893 668	Email:	james@jmenvironments.com

Reliquinshed by: J McMahon	Date /Time 14/4/21 10pm	Received by:	TNT	Date /Time	
Reliquinshed by:	Date /Time	Received by:		Date /Time	
Samples intact: Yes/No	Temperature	Sample Cooler Sealed	Yes/No	Labortaory Quotation	

Lab ID	Lab Sample ID	Water	Soil	Other	Preservative	No. of Containers	BTEX/TPH												Comments
1	East			x			x												C 4511
2	West			x			x												C 4292
																			+

AUSTRALIA - ENVIRONMENTAL SERVICES – METHOD TO-15
DETERMINATION OF VOLATILE ORGANIC COMPOUNDDS (VOCs) IN AIR
COLLECTED IN SPECIALLY-PREPARED CANISTERS AND ANALYZED BY
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)

Approved: P. Bamford

APPENDIX 9: The Canister Sampling and Custody Record Template

Telephone Number: (61 2) 8594 0400 Facsimile Number: (61 2) 8594 0499

CANISTER SAMPLING AND CUSTODY RECORD

Company: James Environments

Project Name: ~~Rod~~ Thornton COC No 06/

Sample ID: ~~West~~ East Project Manager James McMahon

Canister ID: 4511 Date Cleaned: 08/04/2021

1. Vacuum - <-30 in Hg Date/Time: 09/04/2021
   Before shipment (SGS). Initials: AP
2. Vacuum - <-30 in Hg Start Date/Time: 13/04/2021, 9:50am
   Before sampling (field) Initials:
3. Vacuum/pressure - -6 in Hg/psig Stop Date/Time: 13/4/2021, 5:10pm
   After sampling (field) Initials:
4. Vacuum/pressure - in Hg/psig Date/Time:
   After receipt by SGS 12.1/24. Initials:

CANISTER 4511

Relinquished by:	Date/Time	Received by:	Date/Time:
AP	09/04/2021		12/04/2021..

SAMPLE GAUGE passive collator 2627. flowrate 12.4 ml/min
Flow Rate 8/24hr Sampler Issued/ Returned Serial Number:

Relinquished by:	Date/Time	Received by:	Date/Time:
AP	09/04/2021		

AUSTRALIA - ENVIRONMENTAL SERVICES – METHOD TO-15
DETERMINATION OF VOLATILE ORGANIC COMPOUNDDS (VOCs) IN AIR
COLLECTED IN SPECIALLY-PREPARED CANISTERS AND ANALYZED BY
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)

Approved: P. Bamford

APPENDIX 9: The Canister Sampling and Custody Record Template

Telephone Number: (61 2) 8594 0400 Facsimile Number: (61 2) 8594 0499

CANISTER SAMPLING AND CUSTODY RECORD

Company: ~~James~~ JVM Environments

Project Name: Thornton COC No 06/

Sample ID: E West. Project Manager James McMahon

Canister ID: 4292 Date Cleaned: 08/04/2021

1. Vacuum - <-30 in Hg Date/Time: 09/04/2021
   Before shipment (SGS). Initials: AB
2. Vacuum - <-30 in Hg Start Date/Time: 13/04/2021 9:50am
   Before sampling (field) Initials:
3. Vacuum/pressure - 0 in Hg/psig Stop Date/Time: 13/04/2021 @ 5:10 pm
   After sampling (field) Initials:
4. Vacuum/pressure - _____ in Hg/psig Date/Time: _____
   After receipt by SGS 14.7/22 Initials:

CANISTER 4292

Relinquished by:	Date/Time	Received by:	Date/Time:
AB	09/04/2021		

SAMPLE GAUGE Passive collector 2714, flow rate 12.5 ml/min

Flow Rate Relinquished by:	8/24hr Sampler Issued/ Returned Date/Time	Received by:	Serial Number: Date/Time:
AB	09/04/2021		12/04/2021

SAMPLE RECEIPT ADVICE

SP033496

CLIENT DETAILS

Contact	James McMahon
Client	JM ENVIRONMENTS
Address	37 TOOKE STREET COOKS HILL NSW 2300
Telephone	0427 893 668
Facsimile	(Not specified)
Email	james@jmenvironments.com
Project	**JME21022 Thornton**
Order Number	**JME21022**
Samples	2

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Mon 19/4/2021
Report Due	Wed 21/4/2021
SGS Reference	**SP033496**

SUBMISSION DETAILS

This is to confirm that 2 samples were received on Monday 19/4/2021. Results are expected to be ready by COB Wednesday 21/4/2021. Please quote SGS reference SP033496 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	NA
Samples received in correct containers	Yes	Sample counts by matrix	2 Canister
Date documentation received	19/4/2021	Type of documentation received	COC
Number of eskies/boxes received	NA	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	NA
Sufficient sample for analysis	Yes	Turnaround time requested	Two Days

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

Due date listed is indicative only and may be subject to changes. Please contact your SGS representative for an update on the job status and anticipated completion date.

SAMPLE RECEIPT ADVICE

SP033496

CLIENT DETAILS

Client JM ENVIRONMENTS

Project JME21022 Thornton

SUMMARY OF ANALYSIS

No.	Sample ID	VOCs in Air by Passivated Cannister Collection
001	East C 4511	6
002	West C 4292	6

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS		LABORATORY DETAILS	
Contact	James McMahon	Manager	Huong Crawford
Client	JM ENVIRONMENTS	Laboratory	SGS Alexandria Environmental
Address	37 TOOKE STREET COOKS HILL NSW 2300	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	0427 893 668	Telephone	+61 2 8594 0400
Facsimile	(Not specified)	Facsimile	+61 2 8594 0499
Email	james@jmenvironments.com	Email	au.environmental.sydney@sgs.com
Project	**JME21022 Thornton**	SGS Reference	**SP033496 R0**
Order Number	**JME21022**	Date Received	19 Apr 2021
Samples	2	Date Reported	20 Apr 2021

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

All samples were analysed within 30 days.
Uncertainty is at +/- 20 %.

SIGNATORIES

Minh NGUYEN
Technical Development Mananger

Parameter	Units	LOR	Sample Number: SP033496.001 Sample Matrix: Canister Sample Date: 13 Apr 2021 Sample Name: East C 4511	Sample Number: SP033496.002 Sample Matrix: Canister Sample Date: 13 Apr 2021 Sample Name: West C 4292
VOCs in Air by Passivated Cannister Collection GCMS	**Method: AN449/USEPA TO15**		**Tested: 19/4/2021**	
Monocyclic Aromatic Hydrocarbons				
Benzene	ppbv	0.4	<0.4	<0.4
Toluene	ppbv	0.4	**7.7**	**4.2**
Ethylbenzene	ppbv	0.4	**0.4**	<0.4
m/p-xylene	ppbv	0.8	**1.1**	**0.8**
o-xylene	ppbv	0.4	**0.6**	**0.5**
Surrogates				
4-Bromofluorobenzene (Surrogate)	%	-	**102**	**101**

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

VOCs in Air by Passivated Cannister Collection GCMS **Method: ME-(AU)-[ENV]AN449/USEPA TO15**

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	DUP %RPD	LCS %Recovery
Benzene	LB222886	ppbv	0.4	0%	92%
Toluene	LB222886	ppbv	0.4	5%	108%
Ethylbenzene	LB222886	ppbv	0.4	0%	92%
m/p-xylene	LB222886	ppbv	0.8	0%	94%
o-xylene	LB222886	ppbv	0.4	18%	95%

Surrogates

Parameter	QC Reference	Units	LOR	DUP %RPD	LCS %Recovery
4-Bromofluorobenzene (Surrogate)	LB222886	%	-	11%	113%

METHOD	METHODOLOGY SUMMARY
AN449/USEPA TO15	Air samples are collected in clean passivated 3 or 6 litre canisters. A measured volume of the air sample is taken through a solid multisorbent concentrator and the VOC's are trapped. After elimination of much of the water and carbon dioxide the VOC's are focused in a small volume then released by thermal desorption, separated by capillary gas chromatography and identified and quantitated by Mass Spectrometry.

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	NATA accreditation does not cover the performance of this service.	QFH	QC result is above the upper tolerance
		QFL	QC result is below the lower tolerance
**	Indicative data, theoretical holding time exceeded.	-	The sample was not analysed for this analyte
***	Indicates that both * and ** apply.	NVL	Not Validated

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calcuated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

STATEMENT OF QA/QC PERFORMANCE

SP033496 R0

CLIENT DETAILS

Contact	James McMahon
Client	JM ENVIRONMENTS
Address	37 TOOKE STREET COOKS HILL NSW 2300
Telephone	0427 893 668
Facsimile	(Not specified)
Email	james@jmenvironments.com
Project	**JME21022 Thornton**
Order Number	**JME21022**
Samples	2

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SP033496 R0**
Date Received	19 Apr 2021
Date Reported	20 Apr 2021

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met (within the SGS Alexandria Environmental laboratory).

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	NA
Samples received in correct containers	Yes	Sample counts by matrix	2 Canister
Date documentation received	19/4/2021	Type of documentation received	COC
Number of eskies/boxes received	NA	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	NA
Sufficient sample for analysis	Yes	Turnaround time requested	Two Days

HOLDING TIME SUMMARY

SP033496 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

VOCs in Air by Passivated Cannister Collection GCMS — **Method: ME-(AU)-[ENV]AN449/USEPA TO15**

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
East C 4511	SP033496.001	LB222886	13 Apr 2021	19 Apr 2021	13 May 2021	19 Apr 2021	13 May 2021	20 Apr 2021
West C 4292	SP033496.002	LB222886	13 Apr 2021	19 Apr 2021	13 May 2021	19 Apr 2021	13 May 2021	20 Apr 2021

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOCs in Air by Passivated Cannister Collection GCMS — **Method: ME-(AU)-[ENV]AN449/USEPA TO15**

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
4-Bromofluorobenzene (Surrogate)	East C 4511	SP033496.001	%	60 - 130%	102
	West C 4292	SP033496.002	%	60 - 130%	101

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Sample Number	Parameter	Units	LOR

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

VOCs in Air by Passivated Cannister Collection GCMS — **Method: ME-(AU)-[ENV]AN449/USEPA TO15**

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SP033496.002	LB222886.005	Monocyclic	Benzene	ppbv	0.4	<0.4	<0.4	200	0
		Aromatic	Toluene	ppbv	0.4	4.2	4.0	32	5
			Ethylbenzene	ppbv	0.4	<0.4	<0.4	200	0
			m/p-xylene	ppbv	0.8	0.8	0.8	43	0
			o-xylene	ppbv	0.4	0.5	0.6	48	18
		Surrogates	4-Bromofluorobenzene (Surrogate)	%	-	100	110	30	11

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Air by Passivated Cannister Collection GCMS — **Method: ME-(AU)-[ENV]AN449/USEPA TO15**

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB222886.002	Monocyclic Aromatic	Benzene	ppbv	0.4	2.3	2.5	70 - 130	92
		Toluene	ppbv	0.4	2.7	2.5	70 - 130	108
		Ethylbenzene	ppbv	0.4	2.3	2.5	70 - 130	92
		m/p-xylene	ppbv	0.8	4.7	5	70 - 130	94
		o-xylene	ppbv	0.4	2.4	2.5	70 - 130	95
	Surrogates	4-Bromofluorobenzene (Surrogate)	%	-	110	100	70 - 130	113

MATRIX SPIKES

SP033496 R0

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spikes were required for this job.

MATRIX SPIKE DUPLICATES

SP033496 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
***	Indicates that both * and ** apply.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.
①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.

ANALYTICAL REPORT

Customer:	James McMahon JM Environments
Your Reference:	TRH Analysis of 2 air samples
SGS Report Number:	SP033496
Date of Receipt of Sample:	14/04/2021
Date of Analyses:	19/04/2021
Sample/work Description:	Two Air Samples for volatile TRH

This work has been carried out in accordance with your instructions. The results and associated information are contained in the following pages of the report. Should you have any queries regarding this report please contact the undersigned.

Reported by: Minh Nguyen

Date: 20/04/2021

Report authorised by: Peter Novella

Date: 20/04/2021

Sample Description:

Two air samples collected in 6L canister were received by SGS on 14/04/2021. The samples were logged in as follows:

Table 1: Sample ID

SGS Alexandria Sample ID	Your reference
SP033496-1	East, C4511
SP033496-2	West, C4292

Method Used:

The samples were pressurized and analysed using US EPA TO15 method.

Analytical Results:

Table 2: TRH Analytical results

Analytes	units	33496-1	33496-2
TRH C5-C12	ppb v/v	<100	<100

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com

☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com

☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: JM Environments	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: 37 Tooke St COOKS HILL		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: JME17107	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle)	Free ice/frozen ice brick present upon receipt? Yes / No / N/A
ORDER NUMBER: JME17107		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt:
PROJECT MANAGER: James McMahon CONTACT PH: 0427 853 608		OF: 1 2 3 4 5 6 7	Other comments:

SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY: / RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):			
Email Reports to (will default to PM if no other addresses are listed):		DATE/TIME: 10/5/21. 3pm	DATE/TIME: 10/5/21 15:08	DATE/TIME: / DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed): admin@jmenvironments.com				

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	Total Solids								
1	J. North	13/4 - 10/5	D		1									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
2	East	13/4 - 10/5			1									
3	West	13/4 - 10/5			1									
4	South	13/4 - 10/5	D		1									
				TOTAL										

Environmental Division Newcastle
Work Order Reference
EN2103886

Telephone : +61 2 4014 2500

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EN2103886**	Page	: 1 of 2
Client	: **JM ENVIRONMENTS**	Laboratory	: Environmental Division Newcastle
Contact	: MR JAMES MCMAHON	Contact	:
Address	: 37 TOOKE STREET COOKS HILL NSW 2300	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: JME17107	Date Samples Received	: 10-May-2021 15:08
Order number	: JME17107	Date Analysis Commenced	: 12-May-2021
C-O-C number	: ----	Issue Date	: 19-May-2021 17:00
Sampler	: ----		
Site	: ----		
Quote number	: SYBQ/292/17		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Zoran Grozdanovski	Laboratory Operator	Newcastle - Inorganics, Mayfield West, NSW

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.

- Sample exposure period is 27 days which is outside the typical exposure period of 30 +/- 2 days as per AS3580.10.1.
- Directional dust analysis as per AS3580.10.2-2013. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.

Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)			Sample ID	**North 13/04/21 - 10/05/21**	**East 13/04/21 - 10/05/21**	**West 13/04/21 - 10/05/21**	**South 13/04/21 - 10/05/21**	**----**
			Sampling date / time	10-May-2021 00:00	10-May-2021 00:00	10-May-2021 00:00	10-May-2021 00:00	----
Compound	*CAS Number*	*LOR*	*Unit*	**EN2103886-001**	**EN2103886-002**	**EN2103886-003**	**EN2103886-004**	**--------**
				Result	Result	Result	Result	----
EA142I: Total Solids								
Total Solids	----	0.1	g/m².month	**0.3**	**0.4**	**0.7**	**0.3**	**----**
Total Solids (mg)	----	1	mg	**4**	**5**	**9**	**4**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EN2103886**	Page	: 1 of 3
Client	: **JM ENVIRONMENTS**	Laboratory	: Environmental Division Newcastle
Contact	: MR JAMES MCMAHON	Contact	:
Address	: 37 TOOKE STREET COOKS HILL NSW 2300	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: JME17107	Date Samples Received	: 10-May-2021
Order number	: JME17107	Date Analysis Commenced	: 12-May-2021
C-O-C number	: ----	Issue Date	: 19-May-2021
Sampler	: ----		
Site	: ----		
Quote number	: SYBQ/292/17		
No. of samples received	: 4		
No. of samples analysed	: 4		

ilac-MRA NATA
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	*Position*	*Accreditation Category*
Zoran Grozdanovski	Laboratory Operator	Newcastle - Inorganics, Mayfield West, NSW

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) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA142I: Total Solids (QCLot: 3673655)								
EA142I: Total Solids (mg)	----	1	mg	<1	64.65 mg	92.8	70.0	130

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.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EN2103886**	Page	: 1 of 4
Client	: **JM ENVIRONMENTS**	Laboratory	: Environmental Division Newcastle
Contact	: MR JAMES MCMAHON	Telephone	: +61 2 4014 2500
Project	: JME17107	Date Samples Received	: 10-May-2021
Site	: ----	Issue Date	: 19-May-2021
Sampler	: ----	No. of samples received	: 4
Order number	: JME17107	No. of samples analysed	: 4

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.**
- **NO 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**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA142I: Total Solids							
Directional Dust Gauge - Unpreserved (EA142I)							
North - 13/04/21 - 10/05/21, East - 13/04/21 - 10/05/21, West - 13/04/21 - 10/05/21, South - 13/04/21 - 10/05/21	**10-May-2021**	**----**	----	----	**12-May-2021**	06-Nov-2021	✓

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*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS)							
Total Solids (TS)	EA142I	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Solids (TS)	EA142I	1	4	**25.00**	**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
Total Solids (TS)	EA142I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Solids in deposited dust.