

0	QUALITY CONTRO	DL: Lead or	n filter			Du	plicate		Spike Rec	overy %
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			11/09/2019	(m)			-	11/09/2019	
Date analysed	-			11/09/2019					11/09/2019	
Lead	µg/filter	1	Metals-006	<1	- 6				99	

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NT	Not tested			
NA	Test not required			
INS	Insufficient sample for this test			
PQL	Practical Quantitation Limit			
<	Less than			
>	Greater than			
RPD	Relative Percent Difference			
LCS	Laboratory Control Sample			
NS	Not specified			
NEPM	National Environmental Protection Measure			
NR	Not Reported			
Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.			
Duplicate	samples. This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.			
	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.			
Matrix Spike	exist.			
LCS (Laboratory	exist. This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.			
Matrix Spike LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fo			

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Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, ______are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

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CERTIFICATE OF ANALYSIS 225772

Client Details		
Client	Robson Environmental Pty Ltd	
Attention	Results Email	
Address	PO Box 112, Fyshwick, ACT, 2609	

Sample Details		
Your Reference	T01035 - Yarralumla Primary School	
Number of Samples	4 filter	
Date samples received	10/09/2019	
Date completed instructions received	10/09/2019	

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details		
Date results requested by	11/09/2019	
Date of Issue	11/09/2019	
NATA Accreditation Number	This document shall not be reproduced except in full.	

Results Approved By	Authorised By	_
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Lead on filter					
Our Reference		225772-1	225772-2	225772-3	225772-4
Your Reference	UNITS	T01035- Pb76	T01035- Pb77	T01035- Pb78	T01035- Pb79
Date Sampled		07/09/2019	07/09/2019	07/09/2019	07/09/2019
Type of sample		filter	filter	filter	filter
Date prepared		11/09/2019	11/09/2019	11/09/2019	11/09/2019
Date analysed	-	11/09/2019	11/09/2019	11/09/2019	11/09/2019
Lead	µg/filter	<1	<1	<1	<1

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 Method ID
 Methodology Summary

 Metals-006
 Determination of various metals on filters by ICP-AES/MS and or CV/AAS.

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Document Reference: T01035_EAR_SA_Lead_20190927

Evan Byrne ACT Property Group

225 Canberra Avenue, Fyshwick, ACT 2609.

Evan.Byrne@act.gov.au

Friday, 27 September 2019

Dear Evan,

Re: T01035 – Lead in Soil Assessment – Yarralumla Primary School 24 Loftus street Yarralumla ACT 2600 (Block 12 Section 82 Yarralumla ACT 2600).

INTRODUCTION

ACT Property Group engaged Robson Environmental Pty Ltd (Robson) in August 2019 to undertake an assessment of soil for potential lead contamination in areas surrounding the Montessori School building located at Loftus street Yarralumla ACT 2600, herein referred to as 'the site'. The location of the site is shown on **Figure 1**.

It is understood that there is known lead based paint (greater than 0.1 percent weight/weight (%w/w) on certain buildings on the site. This paint had been assessed as being in a poor condition (flaking) and it has been recommended that the paint be removed to reduce exposure risk. On completion of abatement it has been requested that the soil within the footprint of the remediation activity be assessed for potential lead contamination.

OBJECTIVE

The objective of the assessment documented within this letter report was to assess the soil for potential lead contamination to determine the potential lead exposure risk to occupants of the site.

SCOPE OF WORK

The scope of work undertaken for the soil assessment included the following:

- Preparation of a safe work method statement (SWMS) for works on the site;
- Mobilisation of a suitably qualified environmental consultant (SQEC) to locate the sample locations and with the use of a stainless steel shovel collect near surface soil samples;
- In total twelve (12) sample locations were selected across the site to determine whether lead contamination was present within the footprint of the remediation activity;
- Based on the known source of the lead contamination (exterior paint on the buildings) the soil samples were taken from a depth of 0.0-0.2 meters below ground level (mbgl).
- The soil samples were submitted to National Association of Testing Authorities (NATA) accredited laboratory. Laboratory analysis of the soil samples included the following:
 - Analysis of twelve (12) primary soil samples; one (1) sample per location;
 - All primary samples were analysed for lead;







- As part of the QA/QC program the analysis of two (2) duplicate and two (2) rinsate samples were also collected for analysis;
- The duplicate and the rinsate samples were analysed as per the primary samples.
- Review and interpretation of field and laboratory results;
- Preparation of this assessment report detailing the findings of the soil assessment.

ADOPTED ASSESSMENT CRITERIA

The purpose of this soil assessment was to assess the soil for potential lead contamination. Therefore, the surface soil has been assessed against the criteria presented in the National Environment Protection Council (NEPC, 1999) 'National Environment Protection (Assessment of Site Contamination) Measure 1999' as amended in May 2013 (ASC NEPM, 2013) for both health-based investigation levels (HIL) as well as ecological investigation levels (EIL) for the protection of terrestrial ecosystems.

As a conservative approach it is considered that the most applicable criteria to assess the potential risk to human health from contaminant concentrations are the ASC NEPM (2013) HIL 'A' 'Residential with garden accessible soil (home grown produce less than 10% fruit and vegetable intake (no poultry), also includes childcare centres, preschools and primary schools' criteria.

The ASC NEPM (2013) indicates that the EIL should generally be applied to contaminants in the top 2 meters of soil at the finished surface/ground level for generic land use settings, therefore the ASC NEPM (2013) EIL urban residential/public open space criteria have also been considered.

SAMPLING METHODOLOGY

The sampling and assessment works were undertaken in accordance with the following the following ACT legislation and ACT EPA endorsed guidelines:

- ACT Environment Protection Act 1997;
- ACT Environment Protection Regulation 2005;
- Work Health and Safety Act 2011;
- Work Health and Safety Regulation 2011;
- ACT EPA (2017) 'Contaminated Sites Environment Protection Policy';
- Australian Standard AS4361.2-2017 'Guide to Hazardous Paint Management, Part 2: Lead Paint in Residential, Public and Commercial Buildings';
- Australian Standard AS4482.1-2005 'Guide to the sampling and investigation of potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds';
- NSW EPA (1995) 'Sampling Design Guidelines'.
- National Environment Protection Council (NEPC, 1999) '*National Environment Protection (Assessment of Site Contamination) Measure 1999*', amended 2013, herein referred to as the ASC NEPM (2013).



The number of sample locations required to assess the site was based on the area of targeted locations surrounding the Montessori School or where the presence of paint flakes had been observed on the soil surface. Due to the linear nature of the assessment area Robson considers a sampling density of one (1) sample every 5 linear meters (lm) appropriate for purposes of this assessment.

- The southern face of the Montessori School had an area of concern spanning approximately seventy eight (78) Im so ten (10) soil samples were taken;
- The western face of the Montessori School had an area of concern spanning approximately nine (9) Im so two (2) soil samples were taken.

Soil samples were collected in general accordance with Robson SOP 'Soil Sampling and Logging' (EAR-SOP003). At each location, primary soil samples were collected at the near surface (0.0-0.1 mbgl); the targeted depth.

Each sample was collected from the stainless steel shovel using a new, clean pair of nitrile gloves. Soil samples were placed into a clean laboratory-supplied glass jar marked with unique sample identification and sealed with a Teflon-lined screw cap, and immediately placed into a container for transport to a National Association of Testing Authorities (NATA) accredited laboratory. Chain of custody (COC) documentation was completed and accompanied the samples to the laboratory.

For quality assurance/quality control (QA/QC) purposes, two (2) duplicate samples were collected and analysed at a minimum rate of 1 in 20 samples. The duplicate samples were submitted to the primary laboratory and used to assess the reproducibility of the sampling and analytical methods. The QA/QC samples were labelled with no reference to the primary sample on the sample container or COCs to ensure the analytical results were not biased by the laboratories. In addition, as part of the QA/QC process a rinsate sample was collected. The objective of the rinsate sample was to assess the adequacy of decontamination procedure between sampling.

FIELDWORK AND OBSERVATIONS

An SQEC from Robson undertook the fieldwork on 18 August and 1 September 2019. The sample locations are shown on **Figure 2** and the field observations are summarised below and photographs are shown in **Attachment A**.

- SS27 to SS36 were located in the soil bed south of the Montessori School;
- SS25 and SS26 were located in the soil bed outside the western face of the Montessori School adjacent the main entrance to the school.

The soil present within the sample locations was observed to be fill and comprised of a dry silty sand, brown, loose with some rootlets and organic matter.

There were no odours or visual indications of contamination including asbestos containing material (ACM) observed.

A total of twelve (12) primary soil samples were collected from near the surface (0.0 - 0.2) at each location.



The QA/QC samples collected for the assessment included the following:

- Sample QC01 which is a duplicate of primary sample SS26 (0.0-0.2);
- Sample QC02 which is a duplicate of primary sample SS36 (0.0-0.2);
- A rinsate (identified as R01 specific to sampling on 1/09/2019).
 - Sample collected from stainless steel shovel following decontamination.

LABORATORY ANALYSIS

The primary samples, the duplicate, and rinsate were submitted to which is NATA accredited for the analysis performed.

All samples were analysed for lead.

Analytical Results

The analytical results are summarised in **Table 1** and the sample receipts, COC documentation and certified laboratory analytical reports are included in **Attachment B**.

In summary, the surface soil samples analysed returned lead concentrations below the ASC NEPM (2013) HIL 'A' and EIL residential and urban open space criteria of 300 milligrams per kilogram (mg/kg) and 1100 mg/kg respectively (most sensitive). The lead concentration in soil samples analysed ranged from 90 to 190 mg/kg.

QUALITY ASSURANCE AND QUALITY CONTROL RESULTS (QA/QC)

Field QA/QC

As indicated previously, a duplicate sample was collected and analysed to assess the reproducibility of the sampling procedures and the laboratory analytical methods used. This was assessed via calculation of the Relative Percentage Difference (RPD) for a primary soil sample and the corresponding field duplicate sample. The calculation of the RPDs is a method of normalising two (2) values and allows a comparison between values and represents the differences between the primary and QC sample, divided by the average of the two (2) results expressed as a percentage. The RPD is calculated using the following formula:

RPD = <u>Result No. 1 – Result No. 2 x 100</u> Mean result

Calculated RPD results would be considered acceptable when the value is less than 50 %. Also, when the analyte concentration is less than five (5) times the laboratory LOR any RPD is considered acceptable. Should the RPD value exceed 50%, then further investigation to the cause of the difference between the primary and QC results would be undertaken.

The analytical results and calculation of the RPDs for the duplicate pairs are presented in **Table 2.**

The analytical results for the rinsate sample R01 were below the laboratory detection limit and indicates that field decontamination procedures were effective and are therefore considered acceptable. A second rinsate sample was collected on 18/08/2019 but was not submitted to the laboratory analysis due to field error. This error was not considered to compromise the outcomes of this assessment.

The analytical results for the rinsate sample R01 are presented in **Table 3**.



Laboratory QA/QC

The results of the laboratory internal quality control program are included along with the laboratory reports in Attachment B. The acceptable limits for the laboratory QA/QC are presented below in Table A.

Sample Type	Acceptable Limits
Surrogate Spikes – Not required for this job	BTEX/VOC (soil) 70% - 130% Water 30% - 140%
Method Blanks	Less than the LOR
Duplicate Sample	Maximum allowable difference (MAD) criteria where: MAD = 100 x Statistical Detection Limit (SDL)/Mean + Limiting Repeatability (LR)
Laboratory Control Sample	80% - 120% (soil and water); 69%-131% (paint)
Matrix Spikes	70% - 130% (metals)

 Table A: Summary of Acceptable Laboratory QA/QC Limits

In summary the laboratory QA/QC results indicate the following:

- The concentrations of the laboratory blanks were below the LOR;
- The laboratory duplicate sample analyses were within the acceptable limits set by the laboratory with the exception of the following (Laboratory Report SE197178R1):
 - One (1) total recoverable element in soil/waste, solids/materials by inductively Coupled plasma optical emission spectrometry (ICPOES). Recovery failed acceptance criteria due to sample heterogeneity.
- The laboratory control samples were within acceptable QC limits set by the laboratory.
- The matrix spike recovery results were within the laboratory's acceptable range with the exception of the following (Laboratory Report SE197178R1):
 - One (1) total recoverable element in soil/waste, solids/materials by inductively Coupled plasma optical emission spectrometry (ICPOES). Recovery failed acceptance criteria due to sample heterogeneity.

Based on the results of the implemented field quality control and the results of the internal quality control implemented by the laboratory, Robson considers the analytical results provided in the laboratory reports to be acceptable for the purposes of this assessment.



CONCLUSIONS AND RECOMMENDATIONS

Based on the field observations and the analytical results Robson concludes the following:

 The soil present in areas surrounding the Montessori School following the lead paint abatement works pose a negligible lead exposure risk to the site occupants and further action is not required.

Please do not hesitate to contact the undersigned on should you have any queries regarding this letter.

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For and on behalf of Robson Environmental.

Attachments

Statement of Limitations Report Terms and Conditions

Figures

Figure 2: Sample Location Plan

Tables

- Table 1:Soil Analytical Results
- Table 2:Soil QA/QC Results
- Table 3: Water QA/QC Results

Attachments

Attachment A:	Photographs
Attachment B:	Sample Receipt Advice, COC Documentation and Laboratory Reports



STATEMENT OF LIMITATIONS

The findings contained within this report are the result of the interpretation of discrete/specific sampling methodologies used in accordance with normal practices and standards. To the best of Robson's knowledge, our assessment of the data represents a reasonable interpretation of the assessed material on the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the entire site. In addition, the assessment did not include the direct sampling and analysis of groundwater.

THIS LETTER REPORT MUST NOT BE REPRODUCED EXCEPT IN FULL AND MUST BE READ IN CONJUNCTION WITH THE REPORT TERMS AND CONDITIONS, INCLUDED AFTER THE STATEMENT OF LIMITATIONS SECTIONS IN THIS REPORT



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- 9. This report shall only be presented in full and may not be used to support any other objective than those set out in the report, except where written approval with comments are provided by Robson.

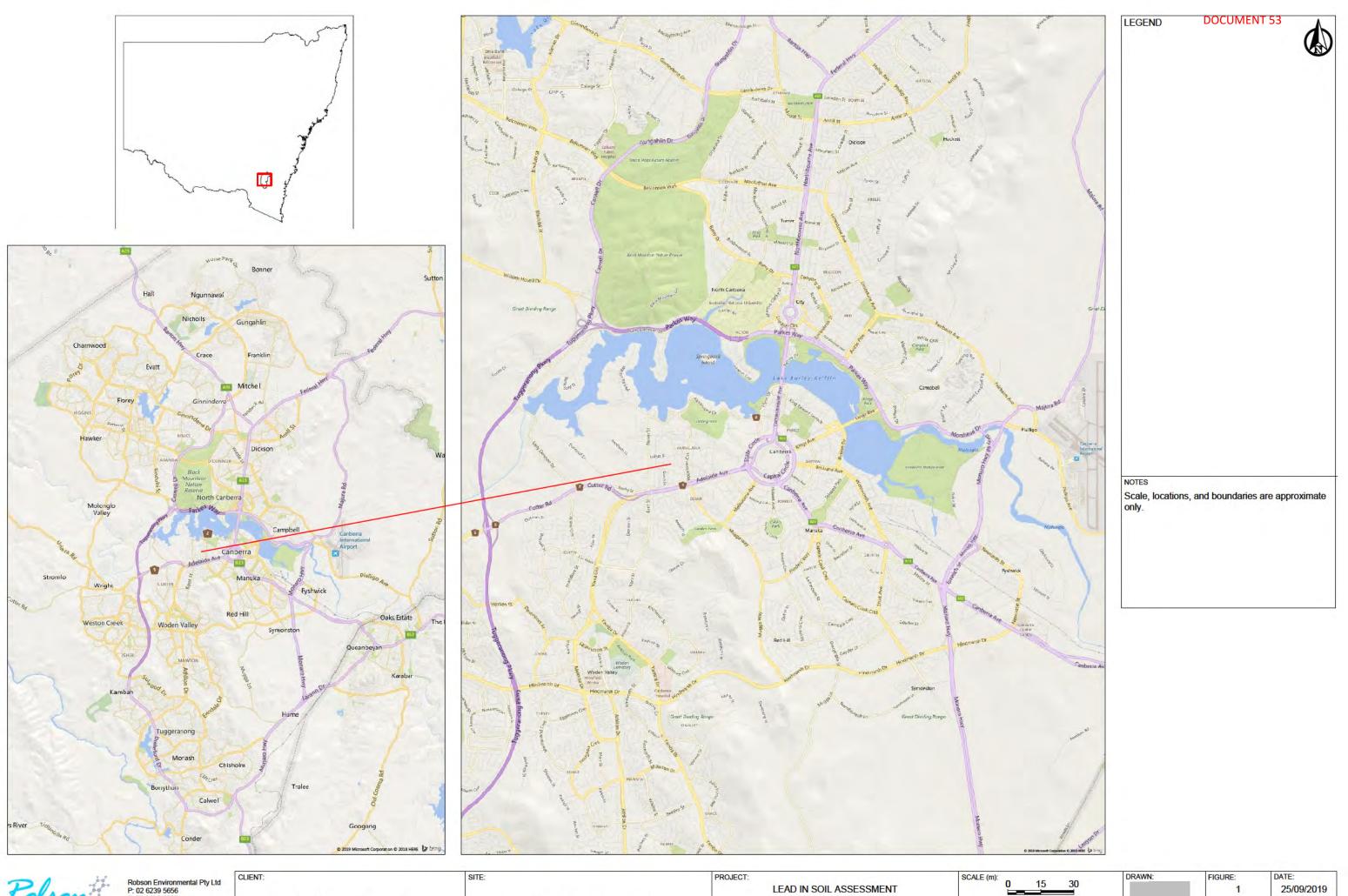
Third Party Laboratories

While Robson has taken all care to ensure that any report includes the most accurate information available, where it uses test results prepared by other persons it relies on the accuracy of the test results in preparing this report. In providing this report Robson does not warrant the accuracy of such third party test results.

HSEQ Management System			
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Environmental Excellence through Experience, Endeavor and Evaluation	-

Robson Environmental Pty Ltd P: 02 6239 5656 F: 02 6239 5669 E: admin@robsonenviro.com.au PO Box 112, Fyshwick ACT 2609 www robsonenviro com.au ABN: 55 008 660 900

ACT PROPERTY GROUP

YARRALUMLA MONTESSORI SCHOOL

TITLE:

LEAD IN SOIL ASSESSMENT	SCALE (m):	0
SITE LOCATION PLAN	REF:	MICI

IICROSOFT 2019 HERE 2019	CHECKED:	PROJECT: 43010 0	f 54 A
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