

Lendlease Communities Pty Ltd
c/- GLN Planning
Level 2, 88 Phillip Street
PARRAMATTA NSW 2150Project 94571.00
26 February 2020
R.001.Rev0
EMG
**Supplementary Investigation - Shed
Proposed Residential Subdivision
16 Chapman Street, Werrington, NSW****1. Introduction**

Douglas Partners Pty Ltd (DP) was commissioned by Lendlease Communities Pty Ltd c/- GLN Planning ('Lendlease') to undertake a supplementary contamination investigation of soils next to a shed in relation to the proposed residential subdivision of 16 Chapman Street, Werrington ('the site').

DP understands that Lendlease has submitted a development application (DA) to Council for the proposed development including previous contamination investigation reports for the site to address the requirements of State Environment Planning Policy 55 – Remediation of Land (SEPP 55). The findings of the previous reports of relevance to this investigation are provided in Section 3.3 of this report.

Council has submitted a Request for Information (RFI) to Lendlease with queries to inform the development application (DA) for the proposed residential subdivision including a request for additional assessment of impact identified by Geotesta Pty Ltd (see Section 3.3) associated with a shed and composting toilet at the site. This letter report documents the findings of the additional investigation of impact associated with the shed. It is noted that the shed and composting toilet are still located on site, therefore the additional assessment of the composting toilet will be undertaken once the structure is removed from the site.

2. Scope of Works

The scope of works carried out as part of the current investigation are as follows:

- A review of previous contamination reports was carried out (Section 3.3);
- Using hand tools, three surface soil samples were collected from next to the shed structure. The location of the soil samples collected is presented in Drawing 1, attached;

- Schedule soil samples for analysis for metals (including lead and chromium), total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and total xylenes (BTEX), polycyclic aromatic hydrocarbons (PAH), total phenols, organochlorine and organophosphorus pesticides (OC/OP), polychlorinated biphenyls (PCBs) and asbestos (presence/absence);
- Screen soil analytical results against human health and ecological criteria for low-density residential land use as presented in NSW EPA endorsed guidelines National Environment Protection Council (NEPC) *National Environment Protection (Assessment of Site Contamination) Measure* 1999, as amended 2013 (NEPC, 2013); and
- Present the findings of the investigation in this letter report.

3. Site Background

3.1 Site Description

The site is approximately 28 hectares in size and is located in the local government area of Penrith City Council.

The site is currently unoccupied and comprises cleared bushland in the east and west and low-lying bush/mature trees in the centre and northern portion.

3.2 Soils and Geology

Reference to the Soils Landscape 1:100,000 *Penrith Sheet* indicates that the northern part of the site is located on the erosional Luddenham soil landscape and the southern part by alluvial South Creek podzolic soils/solodic soils and clays.

Reference to the Geological Series 1:100,000 *Penrith Sheet 9030* (1991) indicates that the site is underlain by Wianamatta Group Bringelly Shales of Triassic Age. This formation consists of shale, claystone, laminate and minor coal bands which are typically overlain by stiff residual clay soil.

3.3 Previous investigations

DP understands that Council has received several documents to address SEPP 55 including a report prepared by Geotesta Pty Ltd (Geotesta) titled *Environmental Data Gap Assessment Report for Proposed Residential Development - 16 Chapman Street, Werrington, NSW*, dated 20 October 2017, Ref: NE211 (Geotesta, 2017).

The Geotesta investigation was undertaken to further assess soil conditions below and surrounding the existing composting toilet and shed whilst the structures were still *in situ*. The scope of the investigation included a review of previous investigations, collection and analysis of nine surface samples and reporting. Of the nine samples, eight were analysed for select contaminants of potential concern (COPC).

Analytical results were assessed by Geotesta and identified elevated metals (lead and chromium) in one soil sample (BH7) which was collected from surface materials (but not soils) on the shed slab floor. Pathogens were also recorded above the laboratory limit of reporting in one sample collected by Geotesta from the toilet compost (BH9).

A comprehensive description of material sampled from BH7 was not available. Because the hard-standing shed floor was still in situ at the time of the Geotesta investigation and based on the information presented in the Geotesta report, 'surface materials' sampled by Geotesta will likely comprise residual material and dust accumulated on the shed floor, and not soils. Such surface materials are likely to be highly concentrated in metals and other contaminants when compared to soils. As such, assessment of results for BH7 against NEPC (2013) criteria is inappropriate.

As with BH7, a comprehensive description of material sampled from BH9 was not available. The sample type was described by Geotesta as 'toilet compost' which indicates that material inside the toilet was sampled by Geotesta. It is reasonable to assume that material inside the toilet includes faecal material which would also be impacted with pathogens. DP assumes that the toilet and its contents (i.e. the toilet compost) will be removed from the site prior to bulk earthworks. DP considers that the sampling and analysis of such material for a contamination investigation for the proposed development is inappropriate.

4. Results

4.1 Field Work Observations

The field work was carried out by a DP environmental scientist on 21 January 2020. The surface material sampled comprised (topsoil) brown silty clay with trace organics (leaf litter and rootlets). No odours or staining indicating potential contamination were observed at any of the sampling locations. Soil sampling locations are presented on Drawing 2.

4.2 Analytical Results

Soil analytical results have been summarised and screened against human health and ecological criteria for urban and residential land use as sourced from NEPC (2013) guidelines. The laboratory analytical reports as well as a summary table showing the results and adopted SAC are attached to this report. All soil analytical results were below the laboratory practical quantitation limit (PQL) and/or the adopted SAC.

5. Discussion and Conclusions

The scope of the current investigation included targeted sampling of surface soils next to a shed located on the site. The purpose of the investigation is to ascertain whether or not exceedances observed by Geotesta (2017) pose an actual unacceptable risk to human health and the environment with respect to the proposed residential development.

DP has undertaken a review of the Geotesta (2017) report as part of the current investigation and considers that the surface materials likely comprise dust and other residual materials that have, over time, accumulated on the shed floor. Assessment of such materials against soil criteria is inappropriate.

Soil analytical results from surface sampling undertaken next to the shed as part of the current investigation do not exceed the adopted NEPC (2013) criteria. Based on the findings of this investigation, DP considers that soil conditions surrounding the shed are suitable for the proposed residential development from a contamination perspective. As a precautionary measure, the shed and toilet including residual material present in the shed and the contents of the toilet should be removed from the site before bulk earthworks commences.

Additional sampling below the composting toilet should be undertaken at a later date once the structure has been removed from the site to confirm whether or not soils beneath the facility are impacted with pathogens.

6. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at 16 Chapman Street, Werrington, NSW in accordance with DP's proposal NWS200003 dated 21 February 2020 and acceptance received from Daniel Nay of Lendlease dated 21 January 2020. The agreement for the works forms part of a larger contract currently being negotiated with Lendlease. This report is provided for the exclusive use of Lendlease for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

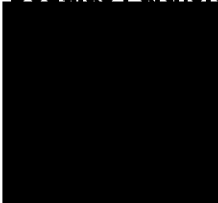
This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Comments section of this report, as an extension to the current scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the environmental components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully
Douglas Partners Pty Ltd



Reviewed by

Dean Woods
Senior Associate

Attachments: About this Report
 Drawings 1 and 2
 Laboratory Analytical Report
 Summary Tables

About this Report

Douglas Partners



Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

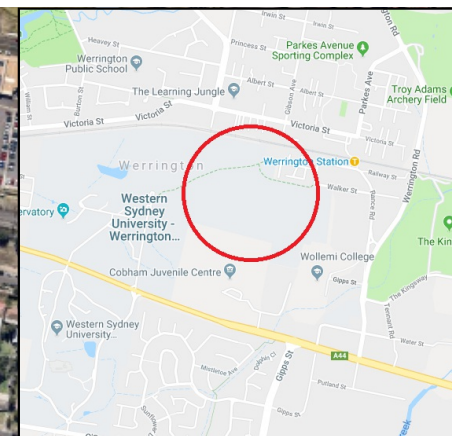
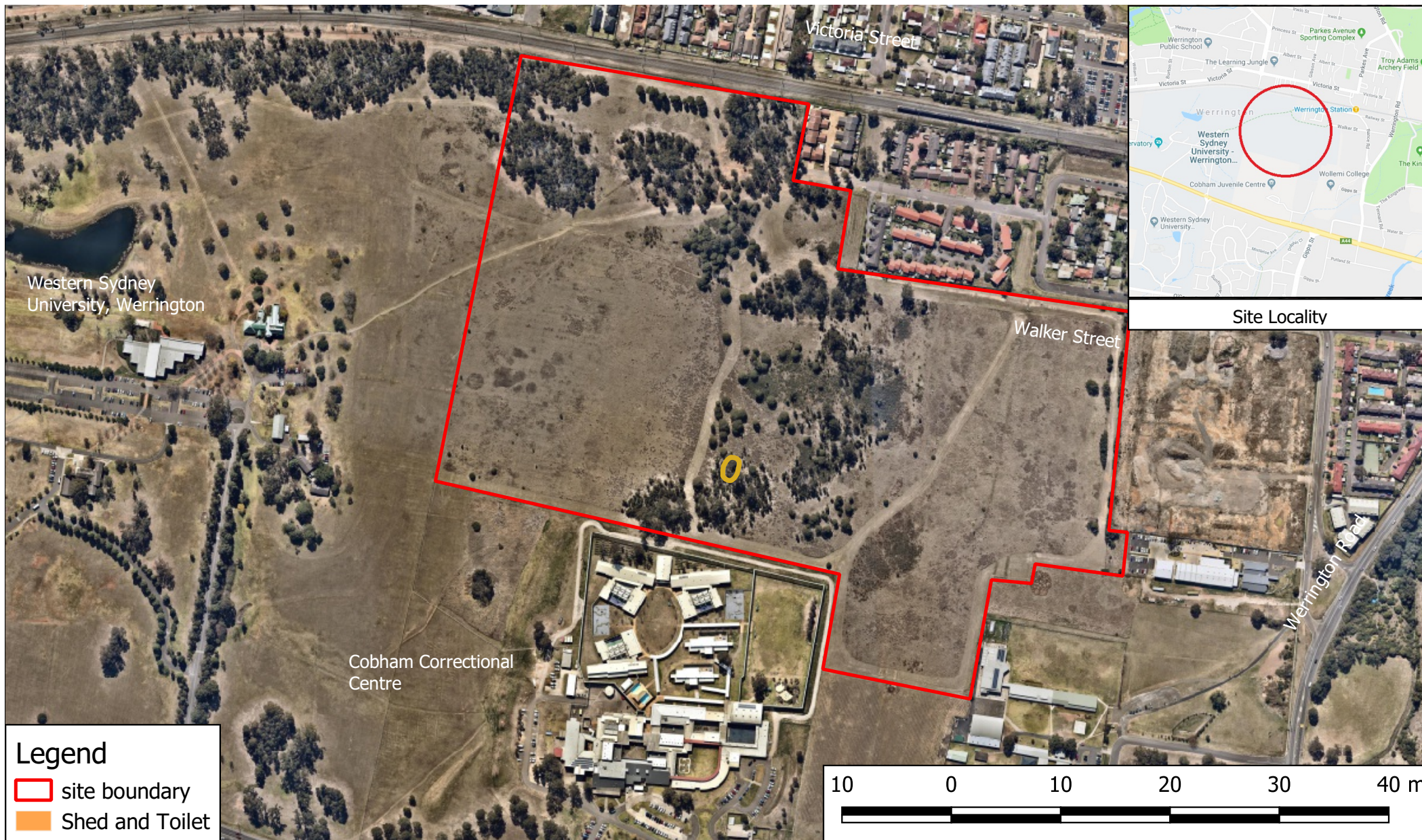
In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.



Site Locality



Douglas Partners
Geotechnics | Environment | Groundwater

TITLE: **Site Layout**
Supplementary Investigation
16 Chapman Street, Werrington



MGA

CLIENT: Lendlease Communities Pty Ltd

PROJECT No.: 94571.01

SCALE: As shown

DRAWING No:

1

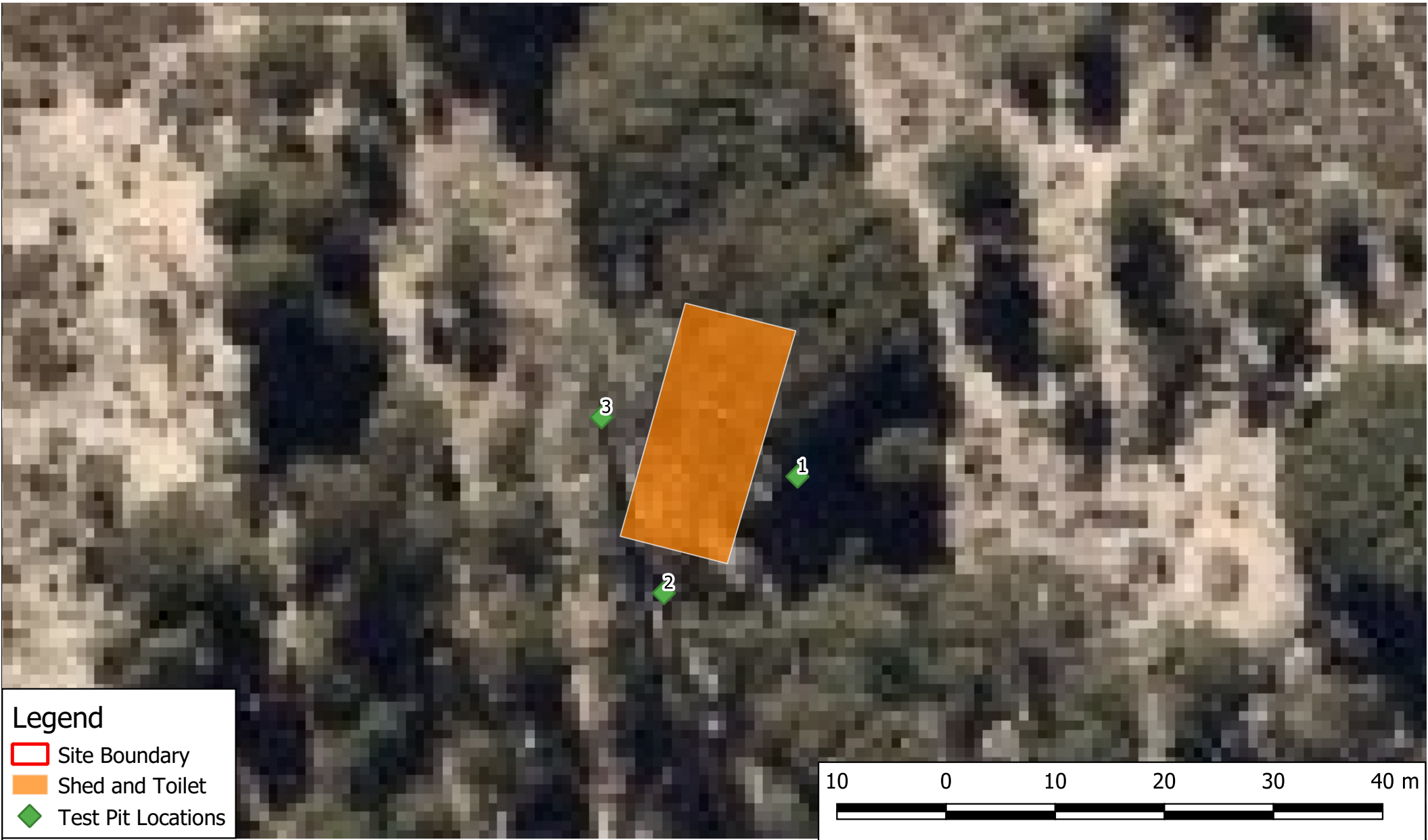
OFFICE: Macarthur

DRAWN BY: EMG

DATE: 25/9/19



REVISION:

1



Legend

-  Site Boundary
-  Shed and Toilet
-  Test Pit Locations

<div></div> <div>Douglas Partners Geotechnics Environment Groundwater</div>	TITLE: Test Pit Locations Supplementary Investigation 16 Chapman Street, Werrington			<div> MGA</div>
CLIENT: Lendlease Communities Pty Ltd	PROJECT No.: 94571.01	SCALE: As shown	DRAWING No:	2
OFFICE: Macarthur <small>Document Set ID: 9941667</small>	DRAWN BY: ERN	DATE: 14/2/20	REVISION:	1

CERTIFICATE OF ANALYSIS 234894

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Erin Leslie, Emily McGinty
Address	18 Waler Crescent, Smeaton Grange, NSW, 2567

Sample Details

Your Reference	<u>Council RFI Werrington</u>
Number of Samples	5 Soil
Date samples received	20/01/2020
Date completed instructions received	20/01/2020

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	28/01/2020
Date of Issue	24/01/2020
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Diego Bigolin, Team Leader, Inorganics
 Josh Williams, Senior Chemist
 Loren Bardwell, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		234894-1	234894-2	234894-3	234894-4	234894-5
Your Reference	UNITS	TP1	TP2	TP3	D1	TB
Date Sampled		20/01/2020	20/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/01/2020	22/01/2020	22/01/2020	22/01/2020	22/01/2020
Date analysed	-	22/01/2020	22/01/2020	22/01/2020	22/01/2020	22/01/2020
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	[NA]
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	114	112	119	109	116

svTRH (C10-C40) in Soil					
Our Reference		234894-1	234894-2	234894-3	234894-4
Your Reference	UNITS	TP1	TP2	TP3	D1
Date Sampled		20/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	22/01/2020	22/01/2020	22/01/2020	22/01/2020
Date analysed	-	23/01/2020	22/01/2020	22/01/2020	22/01/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	180	150	<100	210
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	180	130	<100	180
TRH >C ₃₄ -C ₄₀	mg/kg	130	120	<100	180
Total +ve TRH (>C10-C40)	mg/kg	320	250	<50	350
Surrogate o-Terphenyl	%	76	104	77	82

PAHs in Soil					
Our Reference		234894-1	234894-2	234894-3	234894-4
Your Reference	UNITS	TP1	TP2	TP3	D1
Date Sampled		20/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	22/01/2020	22/01/2020	22/01/2020	22/01/2020
Date analysed	-	22/01/2020	22/01/2020	22/01/2020	22/01/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	98	98	92	94

Organochlorine Pesticides in soil					
Our Reference		234894-1	234894-2	234894-3	234894-4
Your Reference	UNITS	TP1	TP2	TP3	D1
Date Sampled		20/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	22/01/2020	22/01/2020	22/01/2020	22/01/2020
Date analysed	-	22/01/2020	22/01/2020	22/01/2020	22/01/2020
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	119	117	110	110

Organophosphorus Pesticides in Soil					
Our Reference		234894-1	234894-2	234894-3	234894-4
Your Reference	UNITS	TP1	TP2	TP3	D1
Date Sampled		20/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	22/01/2020	22/01/2020	22/01/2020	22/01/2020
Date analysed	-	22/01/2020	22/01/2020	22/01/2020	22/01/2020
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	119	117	110	110

PCBs in Soil					
Our Reference		234894-1	234894-2	234894-3	234894-4
Your Reference	UNITS	TP1	TP2	TP3	D1
Date Sampled		20/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	22/01/2020	22/01/2020	22/01/2020	22/01/2020
Date analysed	-	22/01/2020	22/01/2020	22/01/2020	22/01/2020
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	119	117	110	110

Acid Extractable metals in soil					
Our Reference		234894-1	234894-2	234894-3	234894-4
Your Reference	UNITS	TP1	TP2	TP3	D1
Date Sampled		20/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	22/01/2020	22/01/2020	22/01/2020	22/01/2020
Date analysed	-	22/01/2020	22/01/2020	22/01/2020	22/01/2020
Arsenic	mg/kg	8	7	7	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	23	21	19	19
Copper	mg/kg	13	12	9	12
Lead	mg/kg	30	25	18	22
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	6	5	6
Zinc	mg/kg	81	46	95	49

Misc Soil - Inorg			
Our Reference		234894-1	234894-2
Your Reference	UNITS	TP1	TP2
Date Sampled		20/01/2020	20/01/2020
Type of sample		Soil	Soil
Date prepared	-	22/01/2020	22/01/2020
Date analysed	-	22/01/2020	22/01/2020
Total Phenolics (as Phenol)	mg/kg	<5	<5

Client Reference: Council RFI Werrington

Moisture					
Our Reference		234894-1	234894-2	234894-3	234894-4
Your Reference	UNITS	TP1	TP2	TP3	D1
Date Sampled		20/01/2020	20/01/2020	20/01/2020	20/01/2020
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	22/01/2020	22/01/2020	22/01/2020	22/01/2020
Date analysed	-	23/01/2020	23/01/2020	23/01/2020	23/01/2020
Moisture	%	20	20	12	27

Method ID	Methodology Summary
AT-008	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS.
Org-012/017	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS and/or GC-MS/MS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-012/017	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.</p> <p>For soil results:-</p> <ol style="list-style-type: none"> 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. <p>Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.</p>
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	<p>Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.</p> <p>Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.</p>

Client Reference: Council RFI Werrington

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
Date analysed	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	93	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	88	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	88	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	97	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	122	[NT]	[NT]	[NT]	[NT]	121	[NT]

Client Reference: Council RFI Werrington

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
Date analysed	-			23/01/2020	[NT]	[NT]	[NT]	[NT]	23/01/2020	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	80	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	81	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	80	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	81	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	88	[NT]
Surrogate o-Terphenyl	%		Org-003	77	[NT]	[NT]	[NT]	[NT]	82	[NT]

Client Reference: Council RFI Werrington

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
Date analysed	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
Naphthalene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Acenaphthylene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Phenanthrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Pyrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	<0.05	[NT]	[NT]	[NT]	[NT]	116	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	92	[NT]	[NT]	[NT]	[NT]	95	[NT]

Client Reference: Council RFI Werrington

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
Date analysed	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
alpha-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
HCB	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
gamma-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
delta-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
gamma-Chlordane	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Dieldrin	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Endrin	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Endosulfan II	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Methoxychlor	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	106	[NT]	[NT]	[NT]	[NT]	108	[NT]

Client Reference: Council RFI Werrington

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
Date analysed	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
Dichlorvos	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Dimethoate	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Fenitrothion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Malathion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	85	[NT]
Chlorpyrifos	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Parathion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Bromophos-ethyl	mg/kg	0.1	AT-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	106	[NT]	[NT]	[NT]	[NT]	108	[NT]

Client Reference: Council RFI Werrington

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
Date analysed	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-006	106	[NT]	[NT]	[NT]	[NT]	108	[NT]

Client Reference: Council RFI Werrington

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
Date analysed	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	103	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	97	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]

Client Reference: Council RFI Werrington

QUALITY CONTROL: Misc Soil - Inorg					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
Date analysed	-			22/01/2020	[NT]	[NT]	[NT]	[NT]	22/01/2020	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	101	[NT]

Result Definitions

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

Quality Control Definitions

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	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.
Matrix Spike	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.
LCS (Laboratory Control Sample)	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.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

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 (not SPOCAS); 60-140% for organics/SPOCAS (+/-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, Envirolab 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 Envirolab 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.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Document Set ID: 9941667 Form CDC 02
Version: 1, Version Date: 10/03/2022

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Erin Leslie, Emily McGinty

Sample Login Details

Your reference	Council RFI Werrington
Envirolab Reference	234894
Date Sample Received	20/01/2020
Date Instructions Received	20/01/2020
Date Results Expected to be Reported	28/01/2020

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	5 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	19.2
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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Fax: 02 9910 6201	Fax: 02 9910 6201
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Analysis Underway, details on the following page:



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Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metals in soil	Misc Soil - Inorg	Asbestos ID - soils
TP1	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP2	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP3	✓	✓	✓	✓	✓	✓	✓		✓
D1	✓	✓	✓	✓	✓	✓	✓		✓
TB	✓								

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Table 1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH

			Metals								TRH						BTEX				PAH			
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene ^b	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
		PQL	4	0.4	1	1	1	0.1	1	1	25	50	25	50	100	100	0.2	0.5	1	1	1	0.05	0.5	0.05
Sample ID	Depth	Sampled Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
TP1	0m	20/01/2020	8 100 100	<0.4 20 NC	23 100 640	13 6000 55	30 300 1100	<0.1 40 NC	6 400 35	81 7400 150	<25 NC NC	<50 NC NC	<25 50 180	<50 280 120	180 NC 1300	130 NC 5600	<0.2 0.7 65	<0.5 480 105	<1 NL 125	<1 110 45	<1 5 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC
TP2	0m	20/01/2020	7 100 100	<0.4 20 NC	21 100 640	12 6000 55	25 300 1100	<0.1 40 NC	6 400 35	46 7400 150	<25 NC NC	<50 NC NC	<25 50 180	<50 280 120	130 NC 1300	120 NC 5600	<0.2 0.7 65	<0.5 480 105	<1 NL 125	<1 110 45	<1 5 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC
D1	0m	20/01/2020	7 100 100	<0.4 20 NC	19 100 640	12 6000 55	22 300 1100	<0.1 40 NC	6 400 35	49 7400 150	<25 NC NC	<50 NC NC	<25 50 180	<50 280 120	180 NC 1300	180 NC 5600	<0.2 0.7 65	<0.5 480 105	<1 NL 125	<1 110 45	<1 5 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC
TP3	0m	20/01/2020	7 100 100	<0.4 20 NC	19 100 640	9 6000 55	18 300 1100	<0.1 40 NC	5 400 35	95 7400 150	<25 NC NC	<50 NC NC	<25 50 180	<50 280 120	<100 NC 1300	<100 NC 5600	<0.2 0.7 65	<0.5 480 105	<1 NL 125	<1 110 45	<1 5 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC

Lab result

HIL/HSL valueEIL/ESL value

HIL/HSL exceedance

EIL/ESL exceedance

HIL/HSL and EIL/ESL exceedance

ML exceedance

ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab below the PQL, refer to the lab reportBlue = DC exceedance

Bold = Lab detectionsNT = Not testedNL = Non limitingNC = No criteriaNA = Not applicableNAD = No asbestos detected

- Notes:
- HIL/HSL/DC

NEPC, Schedule B1 - HIL A (Residential / Low - High Density), HSL A/B (Residential / Low - High Density), DC HSL A (Direct contact HSL A Residential (Low density))
- EIL/ESL

NEPC, Schedule B1 - EIL UR/POS (Urban Residential and Public Open Space), ESL UR/POS (Urban Residential and Public Open Space)
- ML

NEPC, Schedule B1 - ML R/P/POS (Residential, Parkland and Public Open Space)
- a

QA/QC replicate of sample listed directly below the primary sample
- b

reported naphthalene laboratory result obtained from BTEXN suite
- c

criteria applies to DDT only

Table 2: Summary of Laboratory Results – Phenol, OCP, OPP, PCB

			Phenol	OCP											OPP	PCB
			Phenol	DDT+DDE+DDD ^c	DDD	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Total Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Chlorpyrifos	Total PCB
		PQL	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Sample ID	Depth	Sampled Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
TP1	0m	20/01/2020	<5 100 NC	<0.1 240 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 6 NC	<0.1 50 NC	<0.1 270 NC	<0.1 10 NC	<0.1 6 NC	<0.1 10 NC	<0.1 300 NC	<0.1 160 NC	<0.1 1 NC
TP2	0m	20/01/2020	<5 100 NC	<0.1 240 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 6 NC	<0.1 50 NC	<0.1 270 NC	<0.1 10 NC	<0.1 6 NC	<0.1 10 NC	<0.1 300 NC	<0.1 160 NC	<0.1 1 NC
D1	0m	20/01/2020	NT 100 NC	<0.1 240 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 6 NC	<0.1 50 NC	<0.1 270 NC	<0.1 10 NC	<0.1 6 NC	<0.1 10 NC	<0.1 300 NC	<0.1 160 NC	<0.1 1 NC
TP3	0m	20/01/2020	NT 100 NC	<0.1 240 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 6 NC	<0.1 50 NC	<0.1 270 NC	<0.1 10 NC	<0.1 6 NC	<0.1 10 NC	<0.1 300 NC	<0.1 160 NC	<0.1 1 NC

Lab result
HIL/HSL value EIL/ESL value

■ HIL/HSL exceedance
 ■ EIL/ESL exceedance
 ■ HIL/HSL and EIL/ESL exceedance
 ■ ML exceedance
 ■ ML and HIL/HSL or EIL/ESL exceedance
■ Indicates that asbestos has been detected by the lab below the PQL, refer to the lab report ■ Blue = DC exceedance
Bold = Lab detections NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable NAD = No asbestos detected

Notes:

HIL/HSL/DC NEPC, Schedule B1 - HIL A (Residential / Low - High Density), HSL A/B (Residential / Low - High Density), DC HSL A (Direct contact HSL A Residential (Low density))
 EIL/ESL NEPC, Schedule B1 - EIL UR/POS (Urban Residential and Public Open Space), ESL UR/POS (Urban Residential and Public Open Space)
 ML NEPC, Schedule B1 - ML R/P/POS (Residential, Parkland and Public Open Space)
 a QA/QC replicate of sample listed directly below the primary sample
 b reported naphthalene laboratory result obtained from BTEXN suite
 c criteria applies to DDT only