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PHASE 2 CHEMICAL AND CONTAMINATION ASSESSMENT REPORT

Mr. Doherty

LAND ADJACENT TO HIGHFIELD PARK

ARBORFIELD, WOKINGHAM, RG2 9PP

March 2026

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(i) Factual Report dated 17th July 2025

1 INTRODUCTION

This investigation was carried out for Mr. Doherty with respect to the site at the Land adjacent to Highfield Park, Arborfield, Wokingham, RG2 9PP. Jaxx Engineering Consultancy (JEC) Ltd carried out the site investigation and the laboratory testing. The aim was to investigate the ground conditions and carry out laboratory tests to inform design decisions. Chemical laboratory tests were carried out on samples for assessment of potential ground contamination risks. The investigations included intrusive trial pit/borehole sampling for the laboratory testing.

The aim of this report is to interpret the factual data obtained from the ground investigation and relate it to potential land contamination risks, if any exist. The explorative material logs and laboratory test results are presented in this report at Appendix A (Factual Report).

It has been assumed that the ground investigation was carried out using intrusive ground investigation techniques in general accordance with the recommendations of BS5930: 1999 Code of Practice for Site Investigations (including Amendment A2, 2010). Whilst every attempt has been made to record full details of the strata encountered in the exploratory holes, borehole techniques and sampling methods will inevitably lead to disturbance, mixing or loss of material in some soils and rocks.

All information, comments and opinions given in this report are based on the ground conditions encountered during the site work, and on the results of laboratory and field tests performed during and after the ground investigation. However, there may be circumstances and conditions at the site that may not have been obvious, such as unpredictable soil strata, contaminant concentrations and water conditions between or below exploratory holes. The information search cannot be exhaustive and there may be records that have not come to light. It should be noted that groundwater levels, gas concentrations and gas flows, if present, usually vary due to seasonal, atmospheric and/or other ground effects and may, on occasion, differ to those measured during the investigation.

This report has been prepared for the sole and exclusive use by Mr. Doherty and persons acting on his behalf in response to particular instructions. Any other parties using the information contained in this report do so at their own risk and any duty of care to those parties is excluded.

2 SITE DESCRIPTION

2.1 Location and Site Conditions

The site is roughly 6 ha in area and would be described as rectangular in shape.

Figure 1. Aerial plan of site (Source: Client)



A site visit was carried out on 17th March 2026. During the site visit full access was granted to us and all site was available for investigation. The site is extremely difficult to access on both foot and from vehicles directly from the road.

From walking over the site and from taking samples, there were some visual signs of potential contamination present such as burn spots, bunds, pottery and waste building products. No olfactory signs of contamination were noted across the site. Samples were incorporated to test areas of potential visual contamination with results attached.

3.0 GEOLOGY

The geology beneath the site, as summarised in Table 1 below, has been established from the British Geological Survey digital geology map, which utilises the most up to date names for geological units (www.bgs.ac.uk/data).

Table 1. Summary of Site Geology

Deposit	Geological Unit Name	Description
Superficial / Drift Geology	None recorded	
Bedrock / Solid Geology	London Clay	Clay, silt and sand

4.0 CONSULTATION AND ENQUIRIES

Other agencies and individuals have not been directly contacted for records as part of this study.

5.0 PREVIOUS INVESTIGATIONS, REPORTS AND REMEDIATION WORKS

The results of any previously completed ground or contamination investigations reports or remediation measures or works at this location has not been included in this report.

6.0 FIELDWORK

6.1 Trial Pits

The scope of works for the fieldwork included the following:

- a. **Trial Pits.** 3no Trial pits were dug to obtain soil samples for laboratory testing with continuation boreholes continued to 2m

Site Works were carried out 17th March 2026. Details of the locations, boreholes logs and other test results can be seen at Appendix A.

6.2 Sampling

13no Disturbed samples were taken from the trial pits at various depths. These samples were retained for chemical laboratory testing. Samples were taken from MADE GROUND.

6.3 Sample Obstructions

Hardstanding / Asphalt of historic or potential pavement (road) meant samples TP1 & TP2 had to be relocated. These are still however referenced as TP1 & TP2.

7.0 GROUND CONDITIONS

7.1 General

Full details of the ground conditions encountered are presented on the material records at Appendix A and can be summarised in general descending sequence of strata as shown in Table 2 below. The ground conditions encountered during the ground investigation confirms the published geology of the bed rock on the site. The published records for the superficial geology allows direct comparison to be made. Based on the evidence provided in the trial pit logs the locally established published superficial geology may be changeable so would not be reliable to use for design purposes alone.

Table 2. Summary of Ground Lithology

Description of Strata	Depth range to top of stratum (m) bgl	Average depth to bottom of stratum (m) bgl
Overgrown medium dense Weeds and Shrubs over MADE GROUND / FILL. Slightly clayey, sandy fine to coarse gravel (and occasional cobbles) of concrete, brick, ceramic and plastic	0.0	0.7
Weeds over MADE GROUND / FILL. Slightly clayey, sandy fine to coarse gravel (and occasional cobbles) of concrete, brick, ceramic and plastic	0.0	0.7
Soft to firm very gravelly sandy silty light brown to grey CLAY. Sand is fine to medium, gravel is sub angular to sub rounded fine to medium river deposits.	0.5	1.0
Firm gravelly sandy silty light brown mottled grey CLAY. Sand is fine to medium, gravel is sub angular to sub rounded fine to medium river deposits.	1.0	2.0

7.2 Groundwater

Ground water was not observed in any trial pits. It should be noted that groundwater levels may change due to seasonal or other variations such change in water level of adjacent water bodies. Consequently, future excavations or boreholes may show the presence of groundwater at different depths. Surface water run-off from rainfall may also enter excavations or boreholes during construction or fieldwork.

7.3 Plants Roots

No significant plants roots were observed in the any of the Trial Pits. Although hairlike and fibrous and some shrubs/weeds of up to 2/4mm were encountered but not felt to offer any structural or arboriculture significance.

7.4 Indications of Contamination

There were some observations of visual indication of potential soil contamination at the time of the intrusive site investigations.

7.5 Archaeological Hazards

Archaeological information has not been sought as part of this geotechnical report and it is assumed that the Client has not identified it as an issue. Some local authorities require at least an initial archaeological appraisal for development sites. Archaeological investigations occasionally reveal ground related problems from ancient times (prior to the 1st Edition OS maps) and on rare occasions cause foundation and contamination hazards that can result in delays to construction works.

7.6 Ecological Hazards, Protected Species and Invasive Plant Species

Jaxx Engineering Consultancy Ltd is not a specialist in this area and has not conducted such a survey. In some cases, and as an additional precaution, some clients prefer to consult ecological specialists prior to development on site to confirm that there are no ecological hazards or adverse ecological impact as a result of the development.

8.0 INSITU AND LABORATORY TESTING (CHEMICAL)

8.1 Chemical Laboratory Testing and Results

8.1.1 Soil Sample Testing. 3no samples were tested for a large range suitable suite of chemical testing for potential contaminations determinants were carried out for Aromatic Hydrocarbons and Aliphatic Hydrocarbons (TPH), PAH, Heavy Metals such as lead, zinc, arsenic, mercury, nickel, chromium among others. The results were assessed using the ATRISK Contaminated Land Screening Values (SSV) derived using, CLEA Soil Guideline Values (SGV), S4UL /LQM - CIEH Generic Assessment Criteria. The results indicate that none of the determinants tested exceeded the threshold for residential use with plant uptake nor the threshold value for residential use without plant uptake.

8.1.2 DEFRA/EA previously published a number of Soil Guideline Values (SGVs) for certain determinants, (common toxic metals), which were generic guideline criteria for assessing the risks to human health from chronic exposure to soil contamination for standard land- use functions. However, these were withdrawn in late 2008 and DEFRA/EA have now issued a new set of guidance documents. With regard to the ENV1 standard suite of tests, currently SGV figures have only been issued for Arsenic, Cadmium, Mercury, Nickel, Phenols and Selenium.

8.1.3 In the absence of currently published SGV values for the remaining contaminants, Messrs. WS Atkins have derived ATRISK Soil Screening Values (SSVs) based on the new 2009 guidance (SC050021/SR3 (the CLEA Report) and SC050021/SR2 (the TOX report)) for commercial/industrial, residential without homegrown produce, residential with homegrown produce and allotment land uses. These have been based on the default assumptions provided in the CLEA report which it is understood will be used in the development of future Soil Guideline Values by DEFRA and the Environment Agency. Atkins SSVs have been derived in line with the new guidance using CLEA model v1.04. As the inhalation of vapour pathway contributes less than ten percent of total exposure, this is unlikely to significantly affect

the combined assessment criterion and the SSV values used are the combined assessment criterion given by CLEA if free product is not observed.

8.1.4 Neither CLEA or ATRISK currently publish values for Hexavalent Chromium. Therefore, both Total Chromium and Hexavalent Chromium values have been compared against the Land Quality Management/Chartered Institute of Environmental Health (LQM/CIEH) Generic Assessment Criteria published in 2009 and based on CLEA v1.04 with Total Chromium values based on Chromium III.

8.1.5 Result Summary When the results are compared against CLEA threshold, residential with homegrown produce, there are no undue concentrations of any of the determinants tested against. The results indicate that none of the determinants tested exceeded the threshold for residential use with plant uptake nor the threshold value for residential use without plant uptake.

8.1.6 Asbestos Screening. Asbestos Screening was carried out for soil samples. The results indicated that asbestos was not present in the soil samples tested.

8.2 Off-site Disposal of Surplus Soil

All excavated material and excess spoil, or imported fill, must be classified for waste disposal or fill acceptance purposes prior to off-site disposal at landfill or for use as construction material. Under the Landfill (England and Wales) Regulations 2002 (as amended in 2005), prior to disposal all wastes must be classified as:

- 'inert', or
- 'non-hazardous', / 'stable non-reactive hazardous waste'
- 'hazardous'.

The Environment Agency's Technical Guidance WM3 *Waste Classification: Guidance on the classification and assessment of waste*, document outlines the methodology for classifying wastes. Currently, the majority of wastes may require an assessment or pre-treatment prior to disposal at landfills. It is important to note that landfill operators often have their own assessment tools and can often come to different conclusions. Thus, some landfill operators could even refuse to take apparently suitable waste. It is worth engaging with landfill operators prior to the commencement of groundworks.

We carried out single stage chemical laboratory tests for Waste Acceptance Criteria (WAC) for potential off-site disposals of surplus soil. The tests results indicate that potential surplus soil from the site may be classed as 'inert waste' for the tested determinants.

9 UPDATED CONCEPTUAL SITE MODEL

Table 3: Updated Conceptual Site Model

Source	Potential Contaminants	Potential Pathways	Potential Receptors	Possible / Significant Pollutant Linkages
Electrical Features (On and Off site)	Heavy Metals, fuels and oils, solvents	Dust ingestion, dust inhalation and dermal contact Leachate generation and vertical migration of contaminants. Ground water	Human health, buildings in the vicinity	Significant if concentrations detected.
MADE GROUND Potential for inorganic and low volatility organic contaminants to be present within the sub-surface soils Potential for volatile organic contaminants to be present within the sub-surface soils	Potential for contamination from historical land uses and activities resulting in impacted surface water from Hydrocarbons (TPH, PAH, BTEX)	Dust ingestion, dust inhalation and dermal contact Leachate generation and vertical migration of contaminants. Ground water	Human health, buildings and water body Major aquifer	Potentially significant linkage due to high leaching potential of soil and high permeability of the sand and gravel layer underlying the site.
Asbestos Containing Materials	Asbestos	Moving of sheets	Human health, buildings in the vicinity	Significant if concentrations detected

10 UPDATED POST INVESTIGATION CONTAMINATION RISK ASSESSMENT

The risk of significant harm from above has been assessed qualitatively as low, medium or high using the criteria shown in Appendix D. A risk estimation matrix for all pollutant linkages identified is shown in Table 10 below.

Table 10: Contamination risk assessment

Receptor	Potential Sources	Pathways	Risk	Comments
Human Health				
Existing site workers	Contaminated soils	Direct contact / ingestion, inhalation.	Negligible	There is historical likelihood of potential historical sources of contamination. However no undue concentrations of contaminated material was found on site through the samples tested. No Asbestos fibres were detected.
Future site users including construction and ground workers	Contaminated soils.	Direct contact / ingestion, inhalation.	Negligible	There is historical likelihood of potential historical sources of contamination. However no undue concentrations of contaminated material was found on site through the samples tested. No Asbestos fibres were detected.
Adjacent properties users	Contaminated groundwater and vapour.	Migration through Aquifer, direct contact, inhalation, ingestion.	Negligible	There is historical likelihood of potential historical sources of contamination. However no undue concentrations of contaminated material was found on site through the samples tested. No Asbestos fibres were detected.
Property (Buildings)				
Adjacent structures	Contaminated soils and groundwater	Migration through groundwater.	Negligible	There is historical likelihood of potential historical sources of contamination. However no undue concentrations of contaminated material was found on site through the samples tested. No Asbestos fibres were detected.
Property (Crops and Pets)				
Crops and Pets	Contaminated soils.	Migration through Aquifer strata, direct contact, inhalation, ingestion.	Negligible	There is historical likelihood of potential historical sources of contamination. However no undue concentrations of contaminated material was found on site through the samples tested

11 CONCLUSIONS

11.1.1 The site would be classified as low to negligible risk. Due to the **low** chemical concentrations identified, any excavated material at this site may pose a '**low**' hazard to ground workers as far as Health and Safety is concerned. However, we would recommend that standard Health and Safety precautions be taken with regard to ground workers at this site. These should include PPE equipment such as gloves, overalls etc. to prevent prolonged dermal contact with the soils. Welfare facilities should be made available on-site by contractors to reduce extended contact with site soils. During the construction phase, the contractor should determine whether dust suppression measures are required as these will minimize potential inhalation of dust by neighbours or ground workers

11.1.2 Imported soils should be such that it will not present a hazard to users of the garden area and comply with BS 3882 and adhere to the Contaminated Land Exposure Assessment (CLEA) guidelines on determining the suitability of topsoil.

11.1.3 Garden areas should be provided with topsoil to a thickness of not less than 100mm.

11.1.4 Any upper ground excavated during the development of the site that cannot be reused on this site should be removed off-site to an appropriate waste disposal facility.

11.1.5 Old foundations, concrete bases and similar obstructions occurring within 300mm of the finished ground surface should be removed. Construction rubbish and debris should be removed from garden and other areas around the home

APPENDIX A

- (i) Factual Report dated 17th March 2026

APPENDIX A – PHOTOGRAPHS







Land adjacent to Highfield Park
Arborfield, Wokingham
RG2 9PP

 Trial Pit / Borehole carried out



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Client: Mr. Doherty	Scale: N.T.S.	Sheet No: 1 of 1	Date: 17/03/26
Location: Land adjacent to Highfield Park Arborfield, Wokingham, RG2 9PP	Job No: 3694	Trial Pit No: TP1	Weather: Fine
Excavation Method: Hand		Drawn by: MB	Checked by: GW
Top of Bund 600 200 Overgrown medium dense Weeds and Shrubs over MADE GROUND / FILL. Slightly clayey, sandy fine to coarse gravel (and occasional cobbles) of concrete, brick, ceramic and plastic Soft to firm gravelly sandy silty CLAY gravel is sub angular to sub rounded fine to medium river deposits.			
Remarks: Trial Pit completed to 0.8m		Key: D Small disturbed sample B Bulk disturbed sample U Undisturbed sample (U100) N Standard Penetration Test Blow Count J Jar sample V Pilcon Vane (kPa) M Mackintosh Probe W Water Sample	

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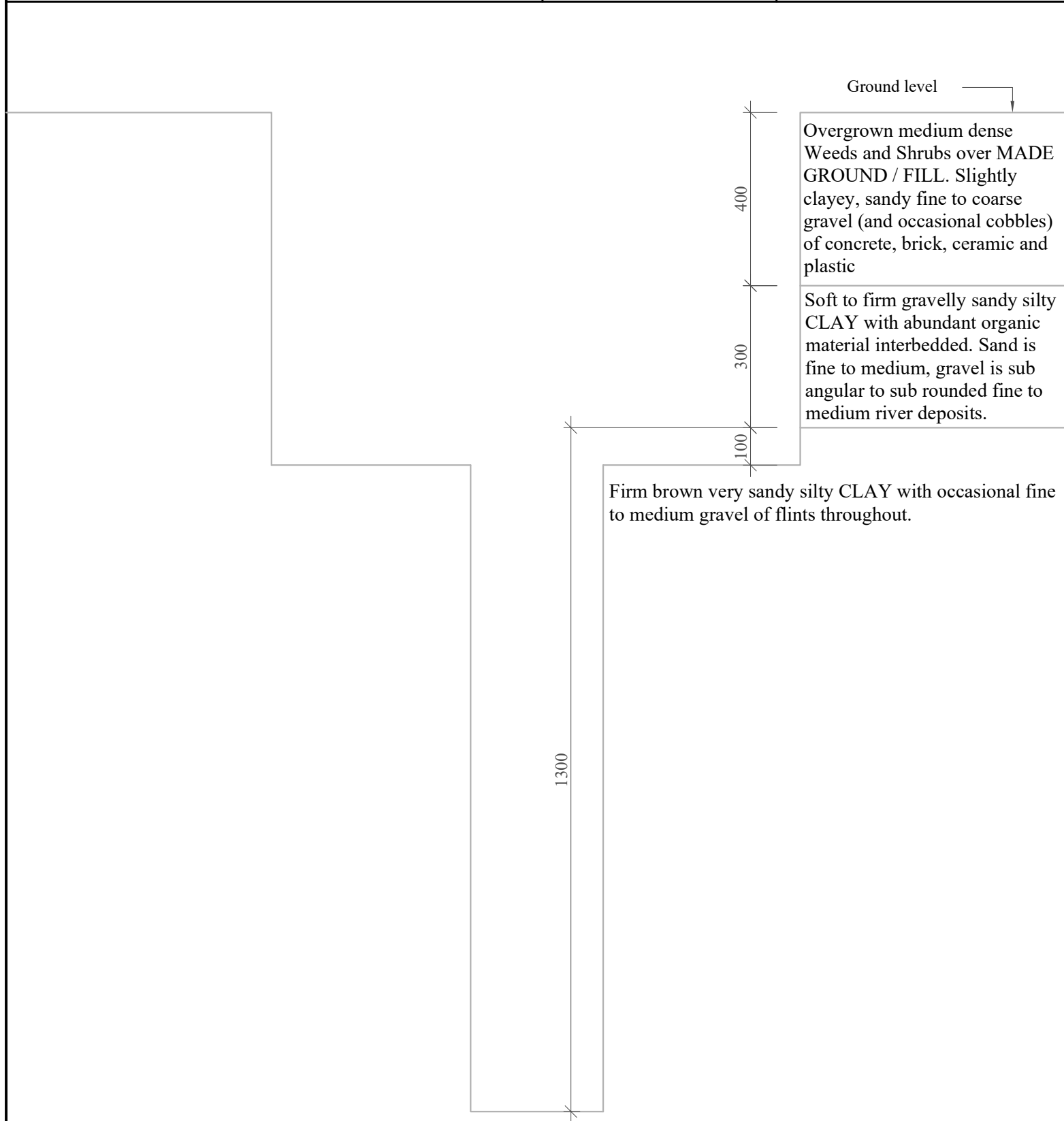
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Client: Mr. Doherty	Scale: N.T.S.	Sheet No: 1 of 1	Date: 17/03/26
Location: Land adjacent to Highfield Park Arborfield, Wokingham, RG2 9PP	Job No: 3694	Trial Pit No: TP2	Weather: Fine
Excavation Method: Hand		Drawn by: MB	Checked by: GW
Top of Bund 600 200 Overgrown medium dense Weeds and Shrubs over MADE GROUND / FILL. Slightly clayey, sandy fine to coarse gravel (and occasional cobbles) of concrete, brick, ceramic and plastic Soft to firm gravelly sandy silty CLAY gravel is sub angular to sub rounded fine to medium river deposits.			
Remarks: Trial Pit completed to 0.8m		Key: D Small disturbed sample B Bulk disturbed sample U Undisturbed sample (U100) N Standard Penetration Test Blow Count J Jar sample V Pilcon Vane (kPa) M Mackintosh Probe W Water Sample	



Client: Mr. Doherty	Scale: N.T.S.	Sheet No: 1 of 1	Date: 17/03/26
Location: Land adjacent to Highfield Park Arborfield, Wokingham, RG2 9PP	Job No: 3694	Trial Pit No: TP3	Weather: Fine
Excavation Method: Hand & CFA Drill		Drawn by: MB	Checked by: GW



Remarks: Trial Pit completed to 0.8m Borehole completed to 2.0m	Key: D Small disturbed sample B Bulk disturbed sample U Undisturbed sample (U100) N Standard Penetration Test Blow Count		J Jar sample V Pilcon Vane (kPa) M Mackintosh Probe W Water Sample

Lab number			3694-1	3694-2	3694-3				
Sample id			TP1	TP2	TP3				
Depth (m)			0.50	0.50	0.35				
Date sampled			17/03/2026	17/03/2026	17/03/2026				
Test	Method	Units							
Boron (water soluble)	CE063 U	mg/kg B	19.9	8.6	13.8				
Arsenic	\$ M	mg/kg	12.3	15.5	18.8				
Cadmium	\$ M	mg/kg	3.4	5.2	3.2				
Chromium	\$ M	mg/kg	16.7	16.3	23.8				
Copper	\$ M	mg/kg	19.9	34.0	13.9				
Lead	\$ M	mg/kg	16.9	24.7	21.5				
Mercury	\$ M	mg/kg	22.2	20.6	24.2				
Nickel	\$ M	mg/kg	11.9	11.9	11.8				
Selenium	\$ M	mg/kg	9.5	11.4	14.3				
Zinc	\$ M	mg/kg	157.0	149.1	126.9				
pH	CE004 M	units	8.7	7.8	8.6				
Sulphate (2:1 water soluble)	CE061 U	mg/l SO4	22.3	29.0	64.6				
Cyanide (total)	CE077	mg/kg CN	<1	<1	<1				
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5	<0.5				
Total Organic Carbon (TOC)	CE197	% w/w C	1.2	1.0	2.7				
Estimate of OMC (calculated from TOC)	CE197	% w/w	14.7	13.2	10.6				
PAH									
Naphthalene	CE087 M	mg/kg	4.0	5.6	4.0				
Acenaphthylene	CE087 M	mg/kg	19.5	17.2	14.8				
Acenaphthene	CE087 M	mg/kg	222.4	134.4	96.3				
Fluorene	CE087 U	mg/kg	231.0	181.4	213.6				
Phenanthrene	CE087 M	mg/kg	23.9	23.9	11.2				
Anthracene	CE087 U	mg/kg	2328.3	1567.0	1791.7				
Fluoranthene	CE087 M	mg/kg	182.3	213.6	261.3				
Pyrene	CE087 M	mg/kg	122.6	237.9	189.9				
Benzo(a)anthracene	CE087 U	mg/kg	12.5	10.4	6.5				
Chrysene	CE087 M	mg/kg	18.2	22.3	16.6				
Benzo(b)fluoranthene	CE087 M	mg/kg	11.3	6.2	4.3				
Benzo(k)fluoranthene	CE087 M	mg/kg	5.1	11.9	19.2				
Benzo(a)pyrene	CE087 U	mg/kg	1.2	1.6	1.5				
Indeno(123cd)pyrene	CE087 M	mg/kg	23.6	21.5	9.9				
Dibenz(ah)anthracene	CE087 M	mg/kg	1.9	1.9	1.1				
Benzo(ghi)perylene	CE087 M	mg/kg	133.4	109.8	151.7				
PAH (total of USEPA 16)	CE087	mg/kg	3341.2	2566.7	2793.4				
BTEX & TPH									
MTBE	CE192 U	mg/kg	<0.02	<0.02	<0.02				
Benzene	CE192 U	mg/kg	<0.01	<0.01	<0.01				
Toluene	CE192 U	mg/kg	<0.01	<0.01	<0.01				
Ethylbenzene	CE192 U	mg/kg	<0.01	<0.01	<0.01				
m & p-Xylene	CE192 U	mg/kg	<0.02	<0.02	<0.02				
o-Xylene	CE192 U	mg/kg	<0.01	<0.01	<0.01				



Lab number			3694-1	3694-2	3694-3				
Sample id			TP1	TP2	TP3				
Depth (m)			0.50	0.50	0.35				
Date sampled			17/03/2026	17/03/2026	17/03/2026				
Test	Method	Units							
VPH (>C5-C7)	CE067	mg/kg	<0.1	<0.1	<0.1				
VPH (>C7-C8)	CE067	mg/kg	4.0	8.6	10.8				
VPH (>C8-C10)	CE067	mg/kg	12.0	10.2	9.9				
EPH (>C10-C12)	CE033 U	mg/kg	24.8	13.0	13.6				
EPH (>C12-C16)	CE033 M	mg/kg	181.1	168.5	141.1				
EPH (>C16-C21)	CE033 M	mg/kg	20.6	16.7	17.7				
EPH (>C21-C35)	CE033 M	mg/kg	14.5	18.3	18.8				
EPH (>C35-C44)	CE033 M	mg/kg	<10	<10	<10				
Subcontracted Analysis									
Asbestos (qualitative)	\$	-	NAD	NAD	NAD				