

REPORT ON A SITE INVESTIGATION

Site

**ABBOTSMEAD PLACE, CAVERSHAM,
READING, BEKSHIRE RG4 8BB**

Client

HDS LIMITED

Consulting Engineers

COLONY ARCHITECTS

Report Ref

21/12016/KJC

Issued

JANUARY 2021



ALBURY S.I. LTD

Geotechnical and Environmental Consultants

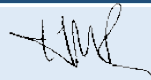
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DOCUMENT CONTROL			
Report Title	Report on a Site Investigation		
Contract	Abbotsmead Place, Caversham		
Report Reference	21/12016/KJC		
Client	HDS Limited		
Prepared by	K J Clark BSc Hons Director		
Reviewed by	G C D Owens BSc MSc FGS MEnvSc Director		
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0	Final	26/01/2021	

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This Report is prepared for the specific purpose stated and in relation to the development proposals or usage indicated to Albury S.I. Limited at the time of preparation. The recommendations should not be used for adjacent schemes and may not be appropriate for alternative proposals.

The recommendations made and opinions expressed in this Report are based on the strata conditions revealed by the fieldworks as indicated on the exploratory records, together with an assessment of the data from in situ and laboratory tests. No liability can be accepted for conditions which have not been revealed by the fieldworks, for example, between exploratory positions. While this Report may offer opinions on the possible configuration of strata, both between the excavations and below the maximum depth achieved by the investigation, these comments are for guidance only and no liability can be accepted for their accuracy. The data obtained relate to the conditions which are relevant at the time of the investigation.

The groundwater observations entered on exploratory records are those noted at the time of the investigation. The normal rate of progress does not usually permit the recording of any equilibrium water level for any one water strike. It should be noted that groundwater levels are prone to seasonal variation and to changes in local drainage conditions. The word 'none' indicates that groundwater was sealed off by the borehole casing or that no water was observed in the exploratory hole upon completion.

REPORT REF: 21/12016/KJC
CONTRACT: ABBOTSMEAD PLACE, CAVERSHAM

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- 1 Exploratory Records
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1 INTRODUCTION

Albury S.I. Limited was approached by Colony Architects to provide a geo-environmental land contamination assessment of the site.

The Client is in the process of completing a residential development of the site at Abbotsmead Place, Caversham ("the site"). Consequently, an intrusive investigation has been undertaken in order to ascertain the nature of the soils underlying the proposed development area to assist in a geo-environmental appraisal of the site.

The programme of this investigation comprised the construction of seven boreholes using hand-held window sampling techniques. During this work samples were recovered for further examination and laboratory testing. This report describes the work undertaken, presents the information obtained and discusses the ground conditions with respect to potential contamination.

2 FIELDWORKS

The boreholes were constructed on 8th January 2021 at locations as shown on the site plan, drawing no. 21/12016/1, which is presented as Figure 1. The exploratory positions were located in order to provide adequate site coverage taking into account the proposed layout, as shown in Figure 1.

The depths and descriptions of the strata encountered in the boreholes are given on the records which comprise Appendix 1 to this report. These records note the depths at which samples were taken and any groundwater observations noted at the time of the fieldworks.

Photographs which give an impression of the site at the time of the site works are presented below.



3 GROUND CONDITIONS

3.1 Geology

Reference has been made to the published 1:50,000 scale British Geological Survey (BGS) digital mapping of the area. The site is indicated as being underlain by the Langley Silt Member and Taplow Gravel Member of geologically Recent age. At depth the Seaford Chalk Formation and Newhaven Chalk Formation are shown to be present.

3.2 Stratigraphy

Consideration of the borehole records indicates that made ground varying from brown sandy clay with gravel and brick fragments to dark brown sand with concrete fragments and roots was present at the exploratory locations. The made ground was noted to extend to between 0.2m and 0.7m. No visual or olfactory evidence of contamination was noted during sampling.

Brown sandy clay with gravel or clayey sand with gravel was exposed beneath the made ground at the investigatory locations, with the exception of borehole 5, and was proved to between 0.7m and 1.2m. It is suggested that these soils represent the Langley Silt Member.

Brown sand and gravel was encountered upon penetration of the made ground in borehole 5 and the Langley Silt Member. These granular soils are thought to be associated with the Taplow Gravel Member and were shown to extend to 2.1m.

3.3 Groundwater

During the construction of the exploratory positions no groundwater strikes were encountered. Consequently, no short-term standing water levels upon completion of the boreholes were recorded.

4 GEOCHEMICAL TESTING

Geochemical testing has been completed at the UKAS accredited laboratories operated by i2 Analytical Ltd on selected samples of the made ground. The testing comprises a suite of typical inorganic and organic priority contaminants including metals, PAH, TPH CWG and an asbestos screen. The test results are presented as Appendix 2 to this report. In one instance asbestos quantification was automatically undertaken due to positive screening in borehole 7 at 0.1m.

5 GROUND CONTAMINATION

5.1 Human Health

A generic assessment of the chronic or long-term risk to human health from soil contamination has been made using the available generic screening criteria. The screening values include the Category 4 Screening Levels [C4SLs] (DEFRA, 2014) and Suitable for Use Levels [S4ULs] (LQM/CIEH, 2014) derived using the CLEA software. It should be appreciated that these do not consider the short-term or acute risks, such as to construction workers or SI personnel.

The results have been compared against the GAC for the proposed land-use category Residential (with home-grown produce) and SOM of 2.5%. A study of the data reveals no exceedances and, therefore, remedial measures will not be required as part of the redevelopment.

Amosite asbestos in the form of loose fibres was detected in the sample at 0.1m depth at the location of borehole 7. The sample was subjected to quantitative analysis and a result of <0.001% was established, which is a 'trace' or very low level. Reference has been made to the Western Australia Guidelines (2009) for asbestos, as no UK soil generic criteria exist. The level of <0.001% w/w asbestos for fibrous asbestos is below the criteria of 0.001% and specific action at this site is not considered necessary. However, the agreement of the Local Authority should be sought for this approach..

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LIST OF ABBREVIATIONS

AOD	-	Above Ordnance Datum
ACM	-	Asbestos-containing Material
AST	-	Above-ground Storage Tank
BGS	-	British Geological Survey
BH	-	Borehole
BRE	-	Building Research Establishment
BSI	-	British Standards Institution
BS	-	British Standard
C4SL	-	Category Four Screening Level
CIRIA	-	Construction Industry Research and Information Association
CP	-	Cable Percussive
DPH	-	Dynamic Probing Heavy
DPSH	-	Dynamic Probing Super Heavy
EA	-	Environment Agency
GAC	-	Generic Assessment Criteria
LL	-	Liquid Limit
mAOD	-	Metres Above Ordnance Datum
mBGL	-	Metres Below Ground Level
mOD	-	Metres Ordnance Datum
OS	-	Ordnance Survey
PAH	-	Polycyclic Aromatic Hydrocarbons
PCB	-	Polychlorinated Biphenyl
PID	-	Photo Ionisation Detector
PL	-	Plastic Limit
PSD	-	Particle Size Distribution
SGV	-	Soil Guideline Value
SOM	-	Soil Organic Matter
SPT	-	Standard Penetration Test
SPZ	-	Source Protection Zone
SVOC	-	Semi-volatile Organic Compounds
TPH	-	Total Petroleum Hydrocarbon
UST	-	Underground Storage Tank
UXB	-	Unexploded Bombs
UXO	-	Unexploded Ordnance
VOC	-	Volatile Organic Compound

FIGURE 1

PROPOSED LAYOUT

APPENDIX 1

EXPLORATORY RECORDS

**ALBURY S.I. LTD**

Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

BOREHOLE**1****Contract**

Abbotsmead Place, Caversham

Report Ref

21/12016/KJC

Client

HDS Limited

Date

08/01/2021

Site AddressAbbotsmead Place, Caversham, Reading, Berkshire
RG4 8BB**Ground Level****Type of excavator:**

Window Sampler

Water level after completion, m

dry

Water strikes, m

Dimensions, m

Ease of excavation, m

1

none

Diameter

0.06

Very easy

Difficult

0.50-2.10

2

Moderate GL-0.50

Very hard

Remarks**Samples or tests****Shear
Strength
kPa****Depth****Legend****Strata Description****Type****Depth, m**

D

0.10

D

0.30

D

0.50

0.50

D

1.00

1.00

1.20

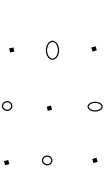
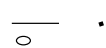
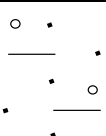
D

1.50

D

2.00

2.10



MADE GROUND (scrub over dark brown clayey SAND with concrete fragments and roots)

Dark brown very sandy CLAY with roots and gravel

Brown very sandy CLAY with gravel and occasional roots

Brown sandy GRAVEL

END OF BOREHOLE

 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		BOREHOLE	2																																																																
Contract	Abbotsmead Place, Caversham		Report Ref																																																																
Client	HDS Limited		Date																																																																
Site Address	Abbotsmead Place, Caversham, Reading, Berkshire RG4 8BB		Ground Level																																																																
Type of excavator:		Window Sampler	Water level after completion, m dry																																																																
Water strikes, m		Dimensions, m	Ease of excavation, m																																																																
1	none	Diameter 0.06	Very easy Difficult 0.50-2.10																																																																
2			Moderate GL-0.50 Very hard																																																																
Remarks																																																																			
<table border="1"> <thead> <tr> <th colspan="2">Samples or tests</th> <th rowspan="2">Shear Strength kPa</th> <th rowspan="2">Depth</th> <th rowspan="2"></th> <th rowspan="2">Legend</th> <th rowspan="2">Strata Description</th> </tr> <tr> <th>Type</th> <th>Depth, m</th> </tr> </thead> <tbody> <tr> <td>D</td> <td>0.10</td> <td></td> <td rowspan="3">0.20</td> <td></td> <td></td> <td>MADE GROUND (scrub over dark brown silty SAND with concrete fragments and roots)</td> </tr> <tr> <td>D</td> <td>0.30</td> <td></td> <td></td> <td></td> <td>Dark brown sandy CLAY with roots and occasional gravel</td> </tr> <tr> <td>D</td> <td>0.50</td> <td></td> <td rowspan="3">0.50</td> <td></td> <td>Brown sandy CLAY with roots</td> </tr> <tr> <td>D</td> <td>1.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>D</td> <td>1.50</td> <td></td> <td rowspan="3">1.20</td> <td></td> <td>Brown SAND AND GRAVEL</td> </tr> <tr> <td>D</td> <td>2.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>D</td> <td>2.10</td> <td></td> <td rowspan="3">2.10</td> <td></td> <td>END OF BOREHOLE</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description	Type	Depth, m	D	0.10		0.20			MADE GROUND (scrub over dark brown silty SAND with concrete fragments and roots)	D	0.30				Dark brown sandy CLAY with roots and occasional gravel	D	0.50		0.50		Brown sandy CLAY with roots	D	1.00					D	1.50		1.20		Brown SAND AND GRAVEL	D	2.00					D	2.10		2.10		END OF BOREHOLE												
Samples or tests		Shear Strength kPa	Depth		Legend						Strata Description																																																								
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D	2.00																																																																		
D	2.10			2.10		END OF BOREHOLE																																																													
																																																																			
																																																																			

**ALBURY S.I. LTD**

Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

BOREHOLE**3****Contract**

Abbotsmead Place, Caversham

Report Ref

21/12016/KJC

Client

HDS Limited

Date

08/01/2021

Site AddressAbbotsmead Place, Caversham, Reading, Berkshire
RG4 8BB**Ground Level****Type of excavator:**

Window Sampler

Water level after completion, m

dry

Water strikes, m

Dimensions, m

Ease of excavation, m

1

none

Diameter

0.06

Very easy

Difficult

0.50-2.10

2

Moderate

GL-0.50

Very hard

Remarks**Samples or tests****Shear
Strength
kPa****Depth****Legend****Strata Description****Type****Depth, m**

D

0.10

D

0.30

D

0.50

D

1.00

D

1.50

D

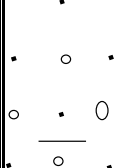
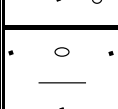
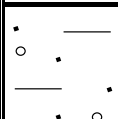
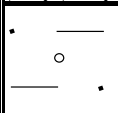
2.00

0.30

0.70

1.20

2.10



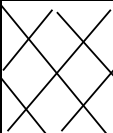
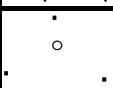
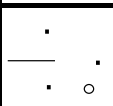
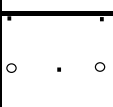
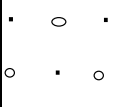
MADE GROUND (scrub over dark brown silty SAND with concrete fragments and roots)

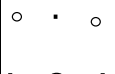
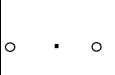
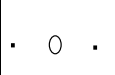
Dark brown sandy CLAY with gravel

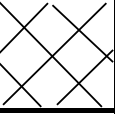
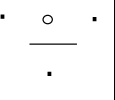
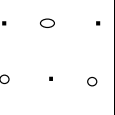
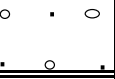
Brown very sandy CLAY with gravel

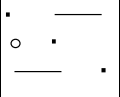
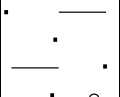
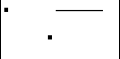
Brown clayey SAND AND GRAVEL

END OF BOREHOLE

 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH				BOREHOLE		4			
Contract		Abbotsmead Place, Caversham				Report Ref		21/12016/KJC	
Client		HDS Limited				Date		08/01/2021	
Site Address		Abbotsmead Place, Caversham, Reading, Berkshire RG4 8BB				Ground Level			
Type of excavator:		Window Sampler		Water level after completion, m		dry			
Water strikes, m		Dimensions, m		Ease of excavation, m					
1	none	Diameter	0.06	Very easy		Difficult		GL-1.00	
2				Moderate		Very hard		1.00-2.10	
Remarks									
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description			
Type	Depth, m								
D	0.10					MADE GROUND (shingle over dark grey-brown silty SAND with gravel and extensive roots)			
D	0.30								
D	0.50		0.50						
				0.80		Grey-brown SAND with rare gravel			
D	1.00			1.20		Brown very sandy CLAY with rare gravel			
						Brown SAND AND GRAVEL			
D	1.50								
D	2.00			2.10		END OF BOREHOLE			

 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH				BOREHOLE		5			
Contract		Abbotsmead Place, Caversham				Report Ref		21/12016/KJC	
Client		HDS Limited				Date		08/01/2021	
Site Address		Abbotsmead Place, Caversham, Reading, Berkshire RG4 8BB				Ground Level			
Type of excavator:		Window Sampler		Water level after completion, m		dry			
Water strikes, m		Dimensions, m		Ease of excavation, m					
1 none		Diameter 0.06		Very easy		Difficult		GL-0.80	
2				Moderate 0.80-2.10		Very hard			
Remarks									
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description			
Type	Depth, m								
D	0.10					MADE GROUND (dark brown silty SAND with gravel)			
D	0.30								
D	0.50		0.50			MADE GROUND (drak grey/brown very sandy CLAY with gravel)			
			0.70						
						Brown SAND AND GRAVEL			
D	1.00								
									
D	1.50								
									
D	2.00								
			2.10			END OF BOREHOLE			

 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		BOREHOLE	6			
Contract	Abbotsmead Place, Caversham		Report Ref	21/12016/KJC		
Client	HDS Limited		Date	08/01/2021		
Site Address	Abbotsmead Place, Caversham, Reading, Berkshire RG4 8BB		Ground Level			
Type of excavator:	Window Sampler	Water level after completion, m dry				
Water strikes, m	Dimensions, m		Ease of excavation, m			
1 none	Diameter	0.06	Very easy	Difficult GL-0.80		
2			Moderate 0.80-2.10	Very hard		
Remarks						
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description
Type	Depth, m					
D	0.10				 MADE GROUND (brown sandy CLAY with gravel and occasional brick fragments)	
D	0.30		0.40			
D	0.50			 Brown clayey SAND with gravel		
			0.80		 Brown SAND AND GRAVEL	
D	1.00					
D	1.50					
D	2.00		2.10		 END OF BOREHOLE	

 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH					BOREHOLE		7			
Contract		Abbotsmead Place, Caversham					Report Ref		21/12016/KJC	
Client		HDS Limited					Date		08/01/2021	
Site Address		Abbotsmead Place, Caversham, Reading, Berkshire RG4 8BB					Ground Level			
Type of excavator:		Window Sampler		Water level after completion, m		dry				
Water strikes, m		Dimensions, m		Ease of excavation, m						
1	none	Diameter	0.06	Very easy		Difficult		GL-1.00		
2				Moderate		Very hard		1.00-2.10		
Remarks										
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description				
Type	Depth, m									
D	0.10					MADE GROUND (dark brown silty SAND with occasional gravel and roots)				
D	0.30		0.30							
D	0.50					Dark brown very sandy CLAY with gravel and roots				
			0.70							
						Brown very sandy CLAY with rare gravel				
D	1.00									
			1.40			Brown SAND AND GRAVEL				
D	1.50									
						END OF BOREHOLE				
D	2.00		2.10							

APPENDIX 2

LABORATORY TEST RESULTS

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Analytical Report Number : 21-50296

Project / Site name:	Abbotsmead Place Caversham	Samples received on:	11/01/2021
Your job number:	21 12016 KJC	Samples instructed on/ Analysis started on:	11/01/2021
Your order number:	13888	Analysis completed by:	18/01/2021
Report Issue Number:	1	Report issued on:	18/01/2021
Samples Analysed:	7 soil samples		

Signed: *Karolina Marek*

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 21-50296
 Project / Site name: Abbotsmead Place Caversham
 Your Order No: 13888

Lab Sample Number	1733706	1733707	1733708	1733709	1733710
Sample Reference	1	2	3	4	5
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.10	0.10	0.10	0.10-0.30	0.10-0.30
Date Sampled	08/01/2021	08/01/2021	08/01/2021	08/01/2021	08/01/2021
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	18	13
Total mass of sample received	kg	0.001	NONE	0.5	0.5

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	8.5	9.2	8.1	9.8
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	630	440	1200	870	1700
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	46	26	300	170	360
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.023	0.013	0.15	0.087	0.18
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	23.2	13	151	87.2	178
Sulphide	mg/kg	1	MCERTS	9.2	4.9	8.8	37	200
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Organic Carbon (TOC)	%	0.1	MCERTS	3.7	1.1	3.4	3.8	3.4

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.37	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.53	< 0.05	0.54	0.95	0.76
Pyrene	mg/kg	0.05	MCERTS	0.49	< 0.05	0.49	0.84	0.76
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.29	< 0.05	0.3	0.64	0.68
Chrysene	mg/kg	0.05	MCERTS	0.33	< 0.05	0.26	0.58	0.4
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.34	< 0.05	0.3	1.0	0.63
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.28	< 0.05	0.16	0.3	0.43
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.35	< 0.05	0.27	0.76	0.59
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.38	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.47	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	2.61	< 0.80	2.32	6.32	4.25
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Analytical Report Number: 21-50296
Project / Site name: Abbotsmead Place Caversham
Your Order No: 13888

Lab Sample Number	1733706	1733707	1733708	1733709	1733710
Sample Reference	1	2	3	4	5
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.10	0.10	0.10	0.10-0.30	0.10-0.30
Date Sampled	08/01/2021	08/01/2021	08/01/2021	08/01/2021	08/01/2021
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	7.3	16	15	12
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.63	0.3	0.51	0.69	0.68
Boron (water soluble)	mg/kg	0.2	MCERTS	2.6	1.2	2.4	3.2	2.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	21	12	22	20	21
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	12	22	21	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	35	14	33	37	84
Lead (aqua regia extractable)	mg/kg	1	MCERTS	79	9.9	31	82	64
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	580	91	410	490	440
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.5	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	6.2	17	19	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.2	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	35	21	38	35	30
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	27	69	150	120

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH C6 - C40	mg/kg	10	NONE	28	< 10	460	200	200
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TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	3.4	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	9.4	< 2.0	8.7	4.9	4.3
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	30	9.8	9.5
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	17	< 8.0	93	69	81
TPH-CWG - Aliphatic >EC21 - EC40	mg/kg	10	NONE	19	< 10	170	93	120
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	150	55	57
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	30	< 10	130	87	95
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	30	< 10	280	140	150

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	5.7	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	16	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	93	59	40
TPH-CWG - Aromatic >EC21 - EC40	mg/kg	10	NONE	< 10	< 10	230	87	69
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	220	77	53
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	110	72	41
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	< 10	< 10	330	150	93

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-50296
Project / Site name: Abbotsmead Place Caversham
Your Order No: 13888

Lab Sample Number				1733711	1733712
Sample Reference				6	7
Sample Number				None Supplied	None Supplied
Depth (m)				0.10-0.30	0.10
Date Sampled				08/01/2021	08/01/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)					
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	11	13
Total mass of sample received	kg	0.001	NONE	0.5	0.5

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	7.8
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	380	470
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	64	39
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.032	0.02
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	32.1	19.5
Sulphide	mg/kg	1	MCERTS	1.6	2.5
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	< 5.0
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.8	1.7

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.5	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.3	0.63
Pyrene	mg/kg	0.05	MCERTS	1.1	0.57
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.71	0.43
Chrysene	mg/kg	0.05	MCERTS	0.67	0.32
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.79	0.55
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.5	0.22
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.79	0.47
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.35	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.39	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	7.11	3.19
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Analytical Report Number: 21-50296
Project / Site name: Abbotsmead Place Caversham
Your Order No: 13888

Lab Sample Number				1733711	1733712
Sample Reference				6	7
Sample Number				None Supplied	None Supplied
Depth (m)				0.10-0.30	0.10
Date Sampled				08/01/2021	08/01/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	15
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.75	0.74
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	1.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	22	23
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31	49
Lead (aqua regia extractable)	mg/kg	1	MCERTS	58	87
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	650	520
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	38	40
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	83	95

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH C6 - C40	mg/kg	10	NONE	< 10	42
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TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC40	mg/kg	10	NONE	< 10	< 10
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	28
TPH-CWG - Aromatic >EC21 - EC40	mg/kg	10	NONE	< 10	42
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	27
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	36
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	< 10	63

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-50296
Project / Site name: Abbotsmead Place Caversham
Your Order No: 13888

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1733712	7	0.10	159	Loose Fibres	Amosite	< 0.001	< 0.001

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 21-50296

Project / Site name: Abbotsmead Place Caversham

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1733706	1	None Supplied	0.1	Brown loam and clay with gravel and vegetation.
1733707	2	None Supplied	0.1	Brown loam and sand with gravel and vegetation.
1733708	3	None Supplied	0.1	Brown loam with gravel and vegetation.
1733709	4	None Supplied	0.10-0.30	Brown loam with gravel and vegetation.
1733710	5	None Supplied	0.10-0.30	Brown loam with gravel and vegetation.
1733711	6	None Supplied	0.10-0.30	Brown loam and clay with gravel.
1733712	7	None Supplied	0.1	Brown loam with fibrous material and vegetation.

Analytical Report Number : 21-50296

Project / Site name: Abbotsmead Place Caversham

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L0738-PL	W	MCERTS
TPH Chromatogram in Soil	TPH Chromatogram in Soil.	In-house method	L064-PL	D	NONE

Analytical Report Number : 21-50296
Project / Site name: Abbotsmead Place Caversham

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

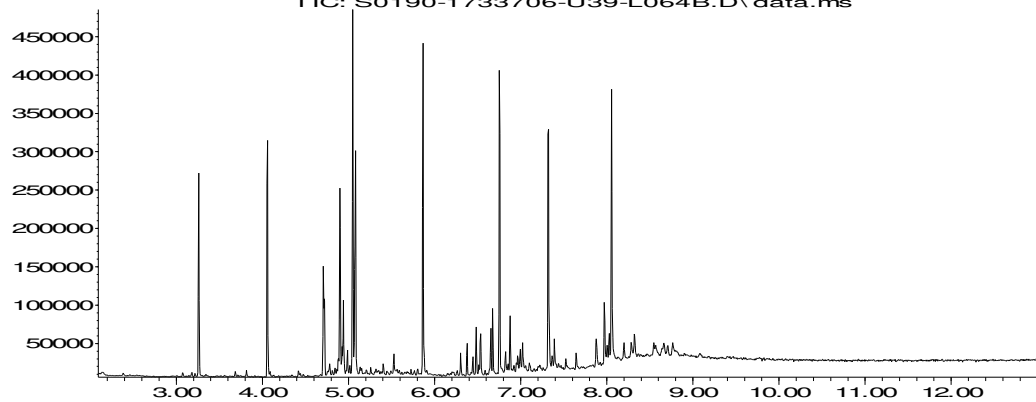
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Abundance

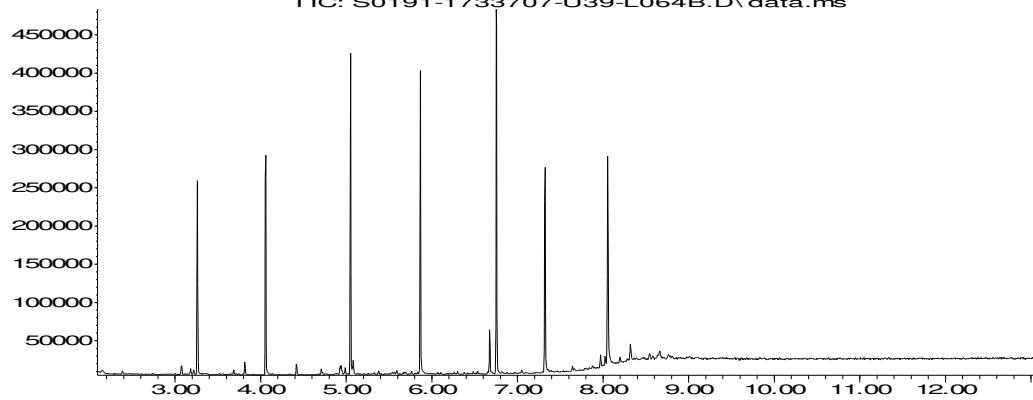
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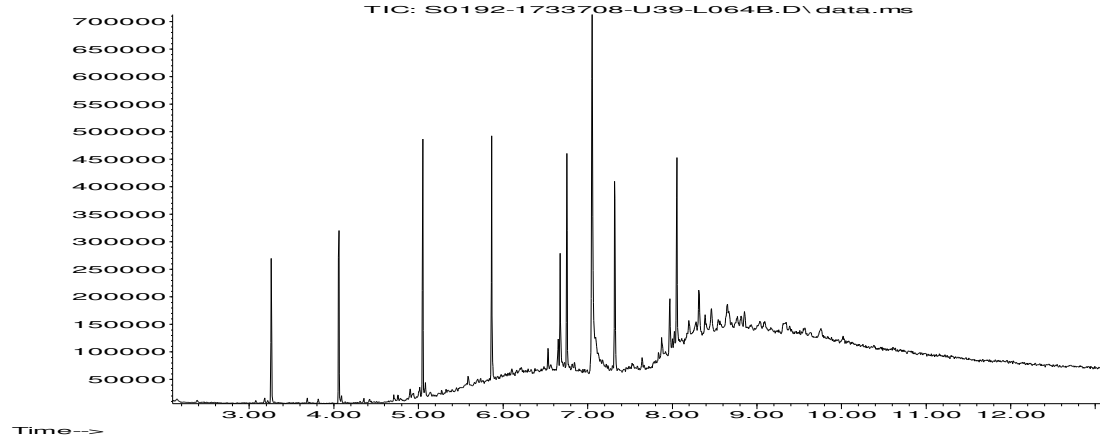
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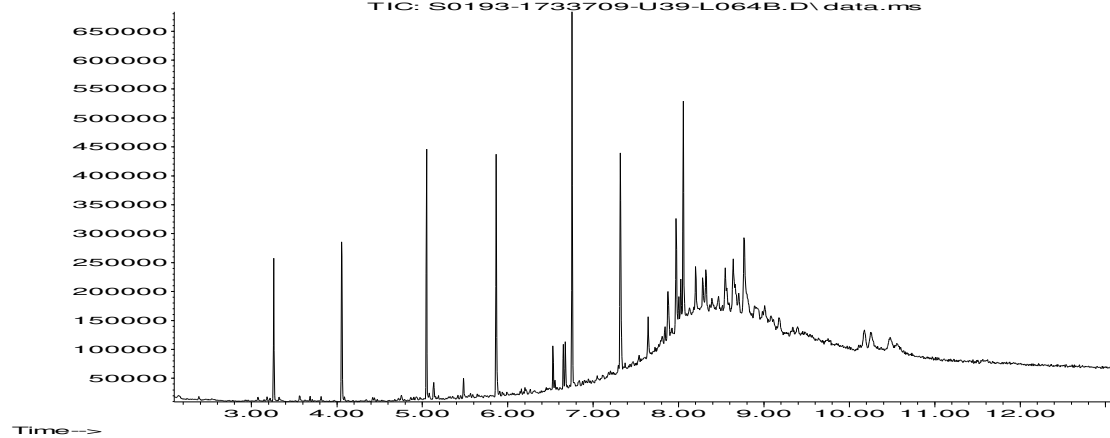
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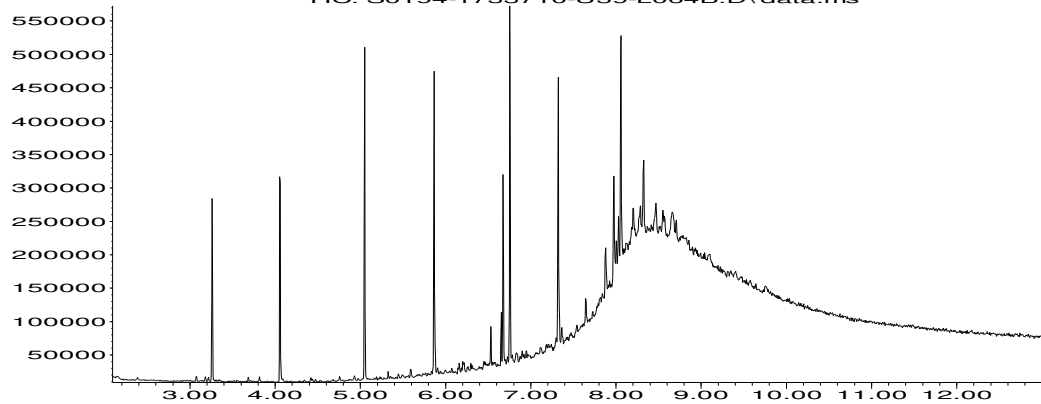
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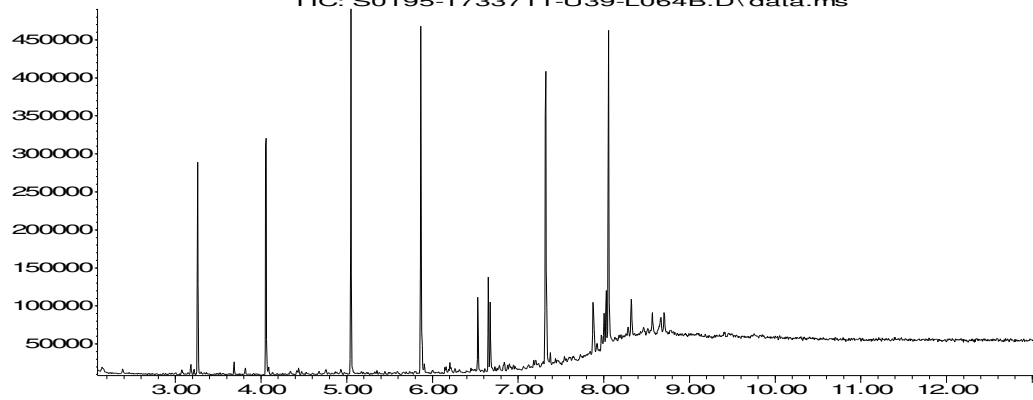
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