

APPENDIX D

Results of Geoenvironmental Analysis



7 - 11 Harding Street
Leicester
LE1 4DH

ACS

Unit 14b Blackhill Road West
Holton Heath Trading Park
Poole
BH16 6LE

Analytical Test Report: L23/03881/ACS - 23-35841 - Amendment B

Your Project Reference:	E/23-01909/6186		
Your Order Number:	E/23-01909/6186	Samples Received / Instructed:	27/07/2023 / 27/07/2023
Report Issue Number:	3	Sample Tested:	27/07 to 01/08/2023
Samples Analysed:	12 soil samples	Report issued:	31/08/2023

Signed

James Gane
Analytical Services Manager
CTS Group

Notes:

Amendment B 31/08/2023 - To include depths as requested by client

Amendment A 02/08/2023 - Report to include results for Coronene, as requested by client

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with CTS method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Asbestos

Please note: Where further analysis is required samples identified as containing asbestos are screened and tested on an as received basis. No correction is made for moisture content and these results are not covered by our accreditation

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

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 26.07.23

Issued by: J. Gane

Issue No: 4

Rev No: 2



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Project Reference - E/23-01909/6186

Analytical Test Results - Soil

Lab Reference			306741	306742	306743	306744	306745	306746	306747
Client Sample ID			WS01	WS01	WS02	WS02	WS02	WS03	WS04
Client Sample Location			-	-	-	-	-	-	-
Client Sample Type			-	-	-	-	-	-	-
Client Sample Number			75722	75723	75724	75725	75726	75727	75729
Depth - Top (m)			0.05	0.5	0.05	0.2	0.6	0.1	0.2
Depth - Bottom (m)			0.15	0.6	0.1	0.3	0.8	0.2	0.4
Date of Sampling			17/07/2023	17/07/2023	17/07/2023	17/07/2023	17/07/2023	17/07/2023	17/07/2023
Time of Sampling			-	-	-	-	-	-	-
Sample Matrix			Other	Clay	Other	Other	Clay	Other	Other
Determinant	Units	Accreditation							
Acenaphthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Acenaphthylene	(mg/kg)	UKAS	0.04	< 0.02	0.04	< 0.02	< 0.02	0.03	< 0.02
Anthracene	(mg/kg)	UKAS	0.07	< 0.02	0.07	< 0.02	< 0.02	0.12	0.04
Benzo (a) anthracene	(mg/kg)	MCERTS	0.29	0.11	0.31	0.10	< 0.02	0.49	0.13
Benzo (a) pyrene	(mg/kg)	MCERTS	0.38	0.12	0.38	0.11	< 0.02	0.47	0.15
Benzo (b) fluoranthene	(mg/kg)	MCERTS	0.48	0.17	0.51	0.15	< 0.02	0.57	0.18
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	0.26	0.07	0.25	0.07	< 0.02	0.25	0.11
Benzo (k) fluoranthene	(mg/kg)	MCERTS	0.17	0.06	0.18	0.05	< 0.02	0.20	0.06
Chrysene	(mg/kg)	MCERTS	0.34	0.13	0.36	0.11	< 0.02	0.47	0.16
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	0.06	< 0.02	0.06	< 0.02	< 0.02	0.06	< 0.02
Fluoranthene	(mg/kg)	MCERTS	0.54	0.25	0.55	0.18	< 0.02	0.95	0.30
Fluorene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	0.29	0.08	0.28	0.09	< 0.02	0.31	0.10
Naphthalene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	(mg/kg)	MCERTS	0.17	0.09	0.19	0.07	< 0.02	0.33	0.10
Pyrene	(mg/kg)	MCERTS	0.50	0.21	0.49	0.15	< 0.02	0.81	0.27
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	3.7	1.5	3.7	1.2	< 0.32	5.1	1.7
Coronene	(mg/kg)	u	0.08	< 0.02	0.08	< 0.02	< 0.02	0.06	0.04
PAH Content (PAH17)	(mg/kg)	u	3.7	1.5	3.8	1.3	< 0.34	5.2	1.8
Asbestos	-	UKAS	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected



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Analytical Test Results - Soil

Lab Reference			306748	306749	306750	306751	306752
Client Sample ID			WS05	WS06	WS06	WS07	WS07
Client Sample Location			-	-	-	-	-
Client Sample Type			-	-	-	-	-
Client Sample Number			75730	75732	75733	75734	75735
Depth - Top (m)			0.2	0.1	0.3	0.1	0.3
Depth - Bottom (m)			0.3	0.2	0.35	0.2	0.6
Date of Sampling			17/07/2023	17/07/2023	17/07/2023	17/07/2023	17/07/2023
Time of Sampling			-	-	-	-	-
Sample Matrix			Other	Other	Sand	Sand	Sand
Determinant	Units	Accreditation					
Acenaphthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Acenaphthylene	(mg/kg)	UKAS	< 0.02	0.04	< 0.02	< 0.02	< 0.02
Anthracene	(mg/kg)	UKAS	< 0.02	0.04	< 0.02	< 0.02	< 0.02
Benzo (a) anthracene	(mg/kg)	MCERTS	0.04	0.14	0.07	0.08	< 0.02
Benzo (a) pyrene	(mg/kg)	MCERTS	0.05	0.20	0.08	0.10	< 0.02
Benzo (b) fluoranthene	(mg/kg)	MCERTS	0.05	0.24	0.11	0.12	< 0.02
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	0.04	0.15	0.07	0.07	< 0.02
Benzo (k) fluoranthene	(mg/kg)	MCERTS	< 0.02	0.09	0.04	0.04	< 0.02
Chrysene	(mg/kg)	MCERTS	0.04	0.18	0.07	0.10	< 0.02
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 0.02	0.03	< 0.02	< 0.02	< 0.02
Fluoranthene	(mg/kg)	MCERTS	0.07	0.28	0.09	0.18	< 0.02
Fluorene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	0.03	0.13	0.06	0.06	< 0.02
Naphthalene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	(mg/kg)	MCERTS	< 0.02	0.09	0.02	0.06	< 0.02
Pyrene	(mg/kg)	MCERTS	0.06	0.25	0.08	0.16	< 0.02
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	0.57	1.9	0.83	1.1	< 0.32
Coronene	(mg/kg)	u	< 0.02	0.05	0.03	< 0.02	< 0.02
PAH Content (PAH17)	(mg/kg)	u	0.59	2.0	0.87	1.1	< 0.34
Asbestos	-	UKAS	-	No asbestos detected	No asbestos detected	-	No Asbestos Detected



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Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)
306741	WS01	-	-	75722	Brown silt with frequent rootlets	21	< 0.1
306742	WS01	-	-	75723	Brown silty clay with occasional rootlets	31	< 0.1
306743	WS02	-	-	75724	Brown silt with frequent rootlets	28	< 0.1
306744	WS02	-	-	75725	Dark brown silt with frequent rootlets	23	< 0.1
306745	WS02	-	-	75726	Light brown clay with rare rootlets	29	< 0.1
306746	WS03	-	-	75727	Brown slightly clayey silt with occasional rootlets with rare chalk	23	< 0.1
306747	WS04	-	-	75729	Brown gravelly sandy silt with occasional organic matter with rare plastic	16	< 0.1
306748	WS05	-	-	75730	Brown gravelly sandy silt with rare rootlets	16	< 0.1
306749	WS06	-	-	75732	Brown gravelly sandy silt with frequent rootlets	13	< 0.1
306750	WS06	-	-	75733	Brown gravelly slightly clayey sand with frequent rootlets	7.9	< 0.1
306751	WS07	-	-	75734	Light brown slightly gravelly slightly clayey sand with rare rootlets	17	< 0.1
306752	WS07	-	-	75735	Light brown clayey sand	18	< 0.1



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Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
306741	WS01	-	-	75722	
306742	WS01	-	-	75723	
306743	WS02	-	-	75724	
306744	WS02	-	-	75725	
306745	WS02	-	-	75726	
306746	WS03	-	-	75727	
306747	WS04	-	-	75729	
306748	WS05	-	-	75730	
306749	WS06	-	-	75732	
306750	WS06	-	-	75733	
306751	WS07	-	-	75734	
306752	WS07	-	-	75735	



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Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
ASB	MS - AS - Asbestos	-	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis



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Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided

C - Received in inappropriate container

H - Contains headspace

T - Temperature on receipt exceeds storage temperature

R - Date of sampling to receipt insufficient to allow analysis to be completed without deviation, Please note this is only a deviation if 'X' is also recorded against the sample

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
306741	WS01	-	-	75722	MS - CL - PAH (As Received)	R
306742	WS01	-	-	75723	MS - CL - PAH (As Received)	R
306743	WS02	-	-	75724	MS - CL - PAH (As Received)	R
306744	WS02	-	-	75725	MS - CL - PAH (As Received)	R
306745	WS02	-	-	75726	MS - CL - PAH (As Received)	R
306746	WS03	-	-	75727	MS - CL - PAH (As Received)	R
306747	WS04	-	-	75729	MS - CL - PAH (As Received)	R
306748	WS05	-	-	75730	MS - CL - PAH (As Received)	R
306749	WS06	-	-	75732	MS - CL - PAH (As Received)	R
306750	WS06	-	-	75733	MS - CL - PAH (As Received)	R
306751	WS07	-	-	75734	MS - CL - PAH (As Received)	R
306752	WS07	-	-	75735	MS - CL - PAH (As Received)	R

Certificate of Analysis

Certificate Number : 23-01909-Issue 1-Page: 1

Report Fao:	Alisha Wood
Site Address^:	Charville Lane
Client Order No:	CGK00808
Date of Sampling^:	17/07/2023
Date Received:	24/07/2023
Date of Analysis:	24/07/2023 - 14/08/2023
Report Date:	22/08/2023

Please find your certificates of test attached for your samples received in the laboratory on 24/07/2023 under our laboratory reference 23-01909.

Remarks:

None

Results reviewed by:


Craig Williams Senior Analyst

Test Certificates approved by:



*Any opinions or interpretations indicated are outside the scope of our UKAS accreditation.
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.
Excel copies of reports are valid only when accompanied by this PDF certificate.
Client's Sample Description / ACS Material Description are noted for reference only.*

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Registered Office

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ACSE Sample Number Sample ID	75721 WS01	75722 WS01	75723 WS01
Clients Sample Ref.^			
Location / Sample Depth (m)^	0.8-1.0	0.05-0.15	0.5-0.6
Date Sampled^ Time Sampled^	17/07/2023 0900	17/07/2023 0900	17/07/2023 0900
Sample deviating codes			
Client's Sample Description^			
ACS Testing Material Description^	CLAY	LOAM	LOAM

ACSE Material Description (Principal Matrix - As Received)

Determination	HWOL Acroynm	Units	Method	Prepared As	Result	AS	Result	AS	Result	AS
Anions										
Water Soluble Sulphate		mg/l	MT/ACSE/204	AD	148	*	5.28	*	27.2	*
BTEX										
Benzene	HS_1D_TOTAL	mg/kg	MT/ACSE/101	AR	----		< 0.10	*	< 0.10	*
Ethylbenzene	HS_1D_TOTAL	mg/kg	MT/ACSE/101	AR	----		< 0.10	*	< 0.10	*
m+p-xylene	HS_1D_TOTAL	mg/kg	MT/ACSE/101	AR	----		< 0.19	*	< 0.19	*
o-xylene	HS_1D_TOTAL	mg/kg	MT/ACSE/101	AR	----		< 0.10	*	< 0.10	*
Toluene	HS_1D_TOTAL	mg/kg	MT/ACSE/101	AR	----		< 0.10	*	< 0.10	*
Total BTEX	HS_1D_TOTAL	mg/kg	MT/ACSE/101	AR	----		< 0.60	*	< 0.60	*
Carbon										
TOC (Total Organic Carbon)		%	MT/ACSE/102	AR	----		4.04	*	1.46	*
Cyanide										
Free Cyanide_S		mg/kg	IHP	AR	----		S/C	*	S/C	*
Loss on Ignition										
Loss on Ignition (440 °C)		%	MT/ACSE/302	AD	----		----		6.4	*
Metals (Soil)										
Arsenic		mg/kg	MT/ACSE/201	AD	----		10.4	*#	10.5	*#
Cadmium		mg/kg	MT/ACSE/201	AD	----		2.79	*#	1.16	*#
Chromium		mg/kg	MT/ACSE/201	AD	----		64.2	*#	48.6	*#
Copper		mg/kg	MT/ACSE/201	AD	----		49.5	*#	30.2	*#
Mercury		mg/kg	MT/ACSE/202	AD	----		0.474	*#	0.247	*#
Nickel		mg/kg	MT/ACSE/201	AD	----		23.8	*#	19.7	*#
Lead		mg/kg	MT/ACSE/201	AD	----		116	*#	126	*#
Selenium		mg/kg	MT/ACSE/201	AD	----		< 6.00	*	< 6.00	*
Zinc		mg/kg	MT/ACSE/201	AD	----		191	*#	122	*#
Chromium Hexavalent		mg/kg	NAM/ACSE/X11	AD	----		< 0.20		< 0.20	
Boron (Hot Water Soluble)		mg/kg	NAM/ACSE/X08	AD	----		1.08		0.657	
pH and Conductivity										
pH (@ 20 °C)		units	MT/ACSE/301	AD	7.8	*	7.0	*	6.8	*
Phenols										
Monohydric Phenols		mg/kg	IHP	SC	----		< 2.00		< 2.00	
Poly Aromatic Hydrocarbons										
Total PAH		mg/kg	MT/ACSE/108	AR	----		----		S/C	*#
Total PAH		mg/kg	MT/ACSE/108	AR	----		S/C		S/C	
Polychlorinated Biphenyls (PCBs)										
PCB (7 Congeners)		mg/kg	MT/ACSE/110	AR	----		< 1.00	*	< 1.00	*
Speciated BTEX										
MTBE	HS_1D_TOTAL	mg/kg	NAM/ACSE/X12	AR	----		< 0.0100		< 0.0100	
Hexane	HS_1D_TOTAL	mg/kg	NAM/ACSE/X06	AR	----		< 0.0100		< 0.0100	
Heptane	HS_1D_TOTAL	mg/kg	NAM/ACSE/X06	AR	----		< 0.0100		< 0.0100	
Octane	HS_1D_TOTAL	mg/kg	NAM/ACSE/X06	AR	----		< 0.0100		< 0.0100	
Benzene	HS_1D_TOTAL	mg/kg	NAM/ACSE/X06	AR	----		< 0.0100		< 0.0100	
Toluene	HS_1D_TOTAL	mg/kg	NAM/ACSE/X06	AR	----		< 0.0100		< 0.0100	
Ethylbenzene	HS_1D_TOTAL	mg/kg	NAM/ACSE/X06	AR	----		< 0.0100		< 0.0100	

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