

By Email

Our Ref: 23-891.01L

Oak Tree Living
Teesside Grange
Eaglescliffe
Stockton On Tees
TS16 0QH

01st November 2023

Dear Sirs,

Re: Proposed Residential Development – Former Grey Horse, Shildon, DL4 1JQ

Please find attached the following documents:

Photographic Record Sheet
Laboratory Test Results (Chemtech Analytical Report Ref 127515)

As requested by Oak Tree Living, a site visit was undertaken on 10th October 2023, by a representative from Arc Environmental Ltd, to confirm the suitability and thickness of imported topsoil placed within the soft landscaping area at the above referenced site.

In order to negate any potential risk to future site users (i.e., human health), it was recommended that a minimum of 300mm imported topsoil / subsoil with a geotextile marker layer, be emplaced within the soft landscaping areas, where made ground was present, in accordance with the previous Remediation and Verification Strategy produced by Delta-Simons (Report Ref. 18-1069.04, August 2019).

During the site visit, five manually excavated pits (TS01 –TS05) were undertaken across the landscaping area which confirmed the placement of a minimum 300mm of imported topsoil (recovered as a dark brown / grey clayey locally very clayey sandy soil with fine rootlets and fine gravel of sandstone and occasional mudstone and coal.

In addition, an orange geotextile was also present below the placed topsoil. The location of the trial pit and the confirmation of the thickness of emplaced soils is included on the attached Photographic Record Sheets.

As part of the visit, a sample of the emplaced topsoil were also recovered from each trial pit during the visit in order to undertake confirmatory laboratory testing. The samples recovered during the site visit were stored at approximately c.2°C to c.8°C using cool boxes and ice packs prior to delivery to a UKAS / MCERTS accredited laboratory.

Three samples (TS01 –TS03) of the topsoil recovered were tested and the results can be found in the Chemtech Analytical Report (Ref. 127515), attached to this letter report, with the total analysis carried out summarised below.



Arc Environmental Ltd
Solum House
Unit 1 Elliott Court
St Johns Road
Meadowfield
Durham
DH7 8PN

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Registered in England No. 05539784



Re: Proposed Residential Development – Former Grey Horse, Shildon, DL4 1JQ (Cont'd)

3 no. soil samples screened for a generic (metals and non-organics) soil suite including Arsenic, Cadmium, Chromium (III & VI), Copper, Lead, Mercury, Nickel, Selenium, Zinc, Cyanide and Total Organic Carbon (TOC).

3 no. soil samples screened for Speciated Polycyclic Aromatic Hydrocarbons (PAH's) & Speciated Total Petroleum Hydrocarbons (based on full Aliphatic / Aromatic Split & BTEX).

3 no. samples screened for the presence of asbestos.

The soil screening results from have been assessed by comparing the maximum values (C_M) recorded for each analyte to the critical concentration values (C_C) adopted for this site i.e., based on a the most sensitive proposed end use of 'residential with home grown produce' and are summarised in Table 1 below and on the following page.

Table 1

Bold = result exceeds critical concentration

Analyte	Critical Conc. (C_C)	No. of Samples Screened	Max. Conc. (C_M) Recorded	No. of Samples > C_C
Arsenic	37 ⁽¹⁾	3	15	0
Cadmium	11 ⁽¹⁾	3	<2*	0
Chromium III	910 ⁽¹⁾	3	41	0
Chromium VI	6 ⁽¹⁾	3	<1*	0
Copper	2400 ⁽¹⁾	3	46	0
Lead	200 ⁽²⁾	3	115	0
Mercury	40 ⁽¹⁾	3	<2*	0
Nickel	130 ⁽¹⁾	3	28	0
Selenium	250 ⁽¹⁾	3	<3	0
Zinc	3700 ⁽¹⁾	3	219	0
Cyanide	34 ⁽³⁾	3	<1*	0
Speciated PAH's				
Acenaphthene	510 ⁽¹⁾	3	<0.02	0
Acenaphthylene	420 ⁽¹⁾	3	0.02	0
Anthracene	5400 ⁽¹⁾	3	0.10	0
Benzo(a)anthracene	11 ⁽¹⁾	3	0.34	0
Benzo(a)pyrene	2.7 ⁽¹⁾	3	0.26	0
Benzo(b)fluoranthene	3.3 ⁽¹⁾	3	0.29	0
Benzo(ghi)perylene	340 ⁽¹⁾	3	0.16	0
Benzo(k)fluoranthene	930 ⁽¹⁾	3	0.15	0
Chrysene	22 ⁽¹⁾	3	0.37	0
Dibenz(ah)anthracene	0.28 ⁽¹⁾	3	0.04	0
Fluoranthene	560 ⁽¹⁾	3	0.43	0
Fluorene	400 ⁽¹⁾	3	<0.02*	0
Indeno(123cd)pyrene	36 ⁽¹⁾	3	0.15	0
Naphthalene	5.6 ⁽¹⁾	3	<0.02*	0
Phenanthrene	220 ⁽¹⁾	3	0.36	0
Pyrene	1200 ⁽¹⁾	3	0.56	0

⁽¹⁾ = LQM/CIEH S4UL's -Residential with Homegrown Produce (2.5% SOM), ⁽²⁾ = CL:AIRE C4SLs -residential with homegrown produce, ⁽³⁾ = Atkins ATRISK SSV (Mar 2011). * = Site Value (C_M) less than analytical detection limit, NAD = No Asbestos Detected.

Re: Proposed Residential Development – Former Grey Horse, Shildon, DL4 1JQ (Cont'd)

Table 1 (Cont'd)

Bold = result exceeds critical concentration

Analyte	Critical Conc. (C _c)	No. of Samples Screened	Max. Conc. (C _M) Recorded	No. of Samples > C _c
Speciated TPH's				
VPH Aliphatic (>C5-C6)	78 ⁽¹⁾	3	<0.05*	0
VPH Aliphatic (>C6-C8)	230 ⁽¹⁾	3	<0.05*	0
VPH Aliphatic (>C8-C10)	65 ⁽¹⁾	3	<0.05*	0
EPH Aliphatic (>C10-C12)	330 ⁽¹⁾	3	<6*	0
EPH Aliphatic (>C12-C16)	2400 ⁽¹⁾	3	<6*	0
EPH Aliphatic (>C16-C35)	92000 ⁽¹⁾	3	<15*	0
EPH Aliphatic (>C35-C44)	92000 ⁽¹⁾	3	<10*	0
VPH Aromatic (>EC5-EC7)	140 ⁽¹⁾	3	<0.05*	0
VPH Aromatic (>EC7-EC8)	290 ⁽¹⁾	3	<0.05*	0
VPH Aromatic (>EC8-EC10)	83 ⁽¹⁾	3	<0.05*	0
EPH Aromatic (>EC10-EC12)	180 ⁽¹⁾	3	<10*	0
EPH Aromatic (>EC12-EC16)	330 ⁽¹⁾	3	34	0
EPH Aromatic (>EC16-EC21)	540 ⁽¹⁾	3	50	0
EPH Aromatic (>EC21-EC35)	1500 ⁽¹⁾	3	313	0
EPH Aromatic (>EC35-EC44)	1500 ⁽¹⁾	3	70	0
BTEX				
Ben zene	0.17 ⁽¹⁾	3	<0.001*	0
Toluene	290 ⁽¹⁾	3	<0.001*	0
Eth ylben zene	110 ⁽¹⁾	3	<0.001*	0
m & p-Xyle ne	130 ⁽¹⁾	3	<0.001*	0
o-Xyle ne	140 ⁽¹⁾	3	<0.001*	0
Asbestos	Presence	3	NAD	0

⁽¹⁾ = LQM/CIEH S4UL's -Residential with Homegrown Produce (2.5% SOM), ⁽²⁾ = CL:AIRE C4SLs -residential with homegrown produce,⁽³⁾ = Atkins ATRISK SSV (Mar 2011). * = Site Value (C_M) less than analytical detection limit, NAD = No Asbestos Detected.

The results have identified the following:

None of the Maximum Concentration (C_M) values exceed the Critical Concentration (C_c) values taken for the site.

No asbestos was detected within any of the soil samples tested.

From the results of the site visit, it has been confirmed that a minimum of 300mm of imported topsoil has been placed above a high visibility geotextile within the soft landscaping area. Testing of representative samples of the imported topsoil recovered during the site visit have confirmed that the emplaced topsoil is suitable for re-use within a residential end use setting

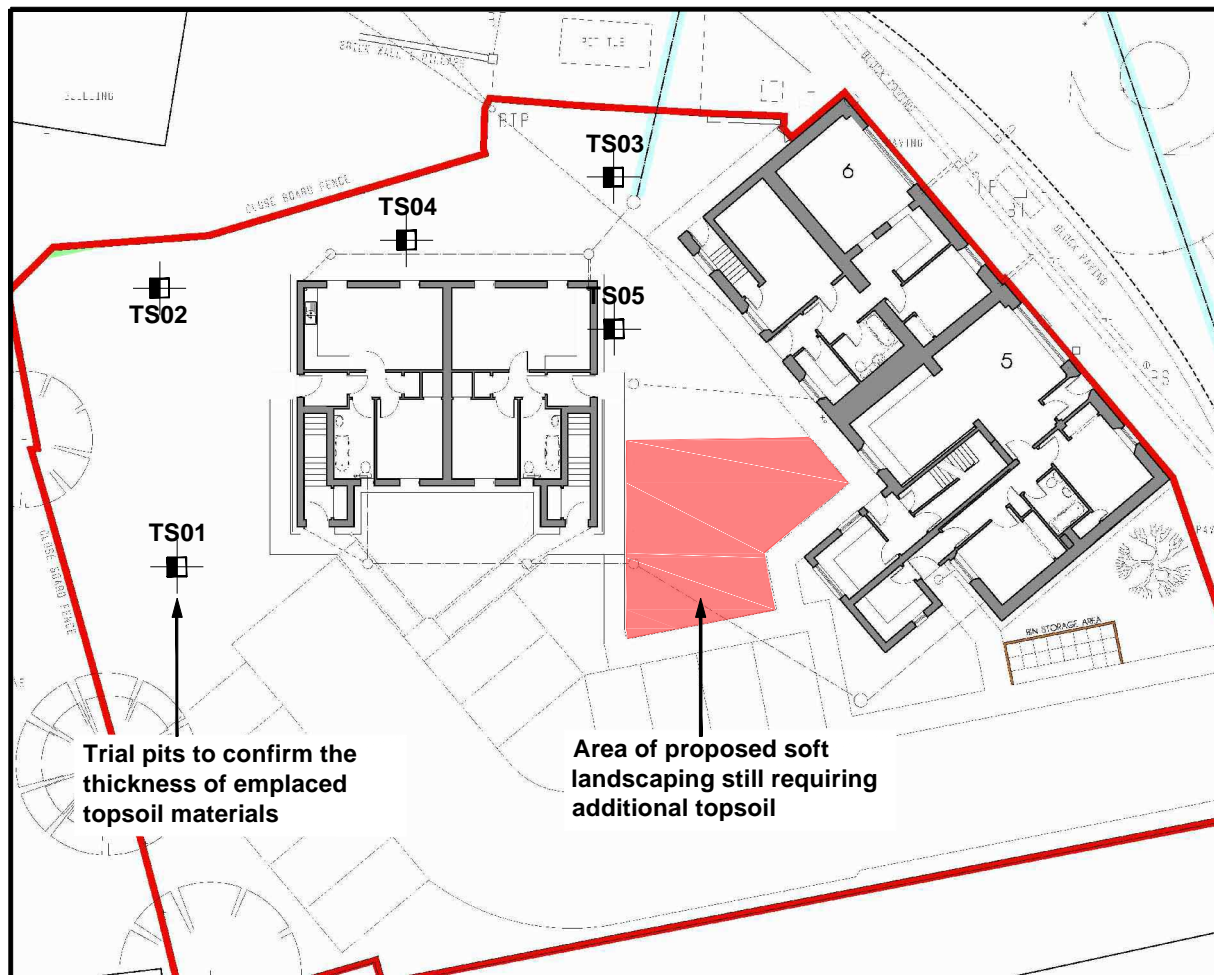
We trust this correspondence and attachments are of benefit and if you require any further information or clarification, please do not hesitate to contact us.

Yours sincerely,

For and on behalf of Arc Environmental Limited
Phillip Brown
Associate Director


Photographic Record Sheets

Laboratory Testing Results




ARC ENVIRONMENTAL LTD
 Solum House
 Unit 1 Elliott Court
 St. John's Road
 Meadowfield
 Durham, DH7 8PN
 Tel: (0191) 378 6380
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The contractor shall check all dimensions on site before commencement of any works. No dimensions to be scaled off this drawing.
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LEGEND	
	APPROXIMATE SITE BOUNDARY

rev.	date	amendments	drawn	chckd

Client:
OAK TREE LIVING

Project Title:
 Proposed Residential Development
 Former Grey Horse
 Shildon, DL4 1JQ

Drawing Title:
 Clean Cover Validation Record Sheet

Scale at A3: NTS @ A3	Date: 03.11.23	Drawn by: P.D	Approved by: P.B
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Job Ref: 23-891	Drg no: -	Rev: -
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ANALYTICAL TEST REPORT

Contract no: 127515

Contract name: Grey Horse, Shildon

Client reference: 23-891

Clients name: ARC Environmental

Clients address: Solum House, Unit 1 Elliott Court
St Johns Road
Meadowfield
DH7 8PN

Samples received: 13 October 2023

Analysis started: 13 October 2023

Analysis completed: 30 October 2023

Report issued: 30 October 2023

Key

- U UKAS accredited test
- M MCERTS & UKAS accredited test
- \$ Test carried out by an approved subcontractor
- I/S Insufficient sample to carry out test
- N/S Sample not suitable for testing
- NAD No Asbestos Detected

Approved by:



Abbie Neasham-Bourn
Senior Reporting Administrator

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
127515-1	TS01	-	Sandy Clayey Loam with Gravel & Roots	-	-	20.4
127515-2	TS02	-	Sandy Clayey Loam with Gravel & Roots	-	-	20.1
127515-3	TS03	-	Sandy Clayey Loam with Gravel & Roots	-	-	21.2

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SOILS

Lab number			127515-1	127515-2	127515-3
Sample id			TS01	TS02	TS03
Depth (m)			-	-	-
Date sampled			10/10/2023	10/10/2023	10/10/2023
Test	Method	Units			
Moisture Content	CE001	% w/w	20.4	20.1	21.2
Arsenic (total)	CE127 ^M	mg/kg As	15	13	11
Cadmium (total)	CE127 ^M	mg/kg Cd	<2	<2	<2
Chromium (total)	CE127 ^M	mg/kg Cr	41	39	34
Chromium (III)	CE208	mg/kg CrIII	41	39	34
Chromium (VI)	CE263	mg/kg CrVI	<1	<1	<1
Copper (total)	CE127 ^M	mg/kg Cu	46	33	30
Lead (total)	CE127 ^M	mg/kg Pb	115	87	79
Mercury (total)	CE127 ^M	mg/kg Hg	<2	<2	<2
Nickel (total)	CE127 ^M	mg/kg Ni	28	27	22
Selenium (total)	CE127 ^M	mg/kg Se	<3	<3	<3
Zinc (total)	CE127 ^M	mg/kg Zn	219	173	136
pH	CE004 ^M	units	7.6	7.7	7.5
Sulphate (2:1 water soluble)	CE061 ^U	mg/l SO ₄	51	54	72
Cyanide (free)	CE077	mg/kg CN	<1	<1	<1
Total Organic Carbon (TOC)	CE197	% w/w C	3.9	4.0	5.3
PAH					
Acenaphthene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02
Acenaphthylene	CE087 ^M	mg/kg	0.02	<0.02	<0.02
Anthracene	CE087 ^U	mg/kg	0.10	0.03	0.08
Benzo(a)anthracene	CE087 ^U	mg/kg	0.34	0.21	0.22
Benzo(a)pyrene	CE087 ^U	mg/kg	0.26	0.20	0.21
Benzo(b)fluoranthene	CE087 ^M	mg/kg	0.29	0.25	0.24
Benzo(ghi)perylene	CE087 ^M	mg/kg	0.15	0.16	0.15
Benzo(k)fluoranthene	CE087 ^M	mg/kg	0.15	0.11	0.12
Chrysene	CE087 ^M	mg/kg	0.37	0.26	0.27
Dibenz(ah)anthracene	CE087 ^M	mg/kg	0.04	0.03	0.03
Fluoranthene	CE087 ^M	mg/kg	0.73	0.43	0.42
Fluorene	CE087 ^U	mg/kg	<0.02	<0.02	<0.02
Indeno(123cd)pyrene	CE087 ^M	mg/kg	0.15	0.14	0.13
Naphthalene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02
Phenanthrene	CE087 ^M	mg/kg	0.36	0.19	0.16
Pyrene	CE087 ^M	mg/kg	0.56	0.35	0.34
PAH (total of USEPA 16)	CE087	mg/kg	3.53	2.35	2.36
BTEX & TPH					
Benzene	\$	mg/kg	<0.001	<0.001	<0.001
Toluene	\$	mg/kg	<0.001	<0.001	<0.001
Ethylbenzene	\$	mg/kg	<0.001	<0.001	<0.001
m & p-Xylene	\$	mg/kg	<0.001	<0.001	<0.001
o-Xylene	\$	mg/kg	<0.001	<0.001	<0.001
VPH Aliphatic (>C5-C6)	\$	mg/kg	<0.05	<0.05	<0.05

Chemtech Environmental Limited

SOILS

Lab number			127515-1	127515-2	127515-3
Sample id			TS01	TS02	TS03
Depth (m)			-	-	-
Date sampled			10/10/2023	10/10/2023	10/10/2023
Test	Method	Units			
VPH Aliphatic (>C6-C8)	\$	mg/kg	<0.05	<0.05	<0.05
VPH Aliphatic (>C8-C10)	\$	mg/kg	<0.05	<0.05	<0.05
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	<6	<6
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	<6	<6
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<15	<15	<15
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<10	<10	<10
VPH Aromatic (>EC5-EC7)	\$	mg/kg	<0.05	<0.05	<0.05
VPH Aromatic (>EC7-EC8)	\$	mg/kg	<0.05	<0.05	<0.05
VPH Aromatic (>EC8-EC10)	\$	mg/kg	<0.05	<0.05	<0.05
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	<10	<10
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	34	22	20
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	50	<1	<1
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	313	117	90
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	70	<1	<1
Subcontracted analysis					
Asbestos (qualitative)	\$	-	NAD	NAD	NAD

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE001	Moisture Content	Gravimetry	As received		0.1	% w/w
CE127	Arsenic (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg As
CE127	Cadmium (total)	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg Cd
CE127	Chromium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cr
CE208	Chromium (III)	Calculation: Cr (total) - Cr (VI)	Dry		1	mg/kg CrIII
CE263	Chromium (VI)	Discrete Analyser	Dry			mg/kg CrVI
CE127	Copper (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cu
CE127	Lead (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Pb
CE127	Mercury (total)	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg Hg
CE127	Nickel (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ni
CE127	Selenium (total)	Aqua regia digest, ICP-MS	Dry	M	0.3	mg/kg Se
CE127	Zinc (total)	Aqua regia digest, ICP-MS	Dry	M	5	mg/kg Zn
CE004	pH	Based on BS 1377, pH Meter	As received	M	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	U	10	mg/l SO ₄
CE077	Cyanide (free)	Extraction, Continuous Flow Colorimetry	As received		1	mg/kg CN
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE087	Acenaphthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg
\$	Benzene	Headspace GC-FID	As received	U	0.001	mg/kg
\$	Toluene	Headspace GC-FID	As received	U	0.001	mg/kg
\$	Ethylbenzene	Headspace GC-FID	As received	U	0.001	mg/kg
\$	m & p-Xylene	Headspace GC-FID	As received	U	0.001	mg/kg
\$	o-Xylene	Headspace GC-FID	As received	U	0.001	mg/kg
\$	VPH Aliphatic (>C5-C6)	Headspace GC-FID	As received	U	0.05	mg/kg
\$	VPH Aliphatic (>C6-C8)	Headspace GC-FID	As received	U	0.05	mg/kg
\$	VPH Aliphatic (>C8-C10)	Headspace GC-FID	As received	U	0.05	mg/kg
CE250	EPH Aliphatic (>C10-C12)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C12-C16)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C16-C35)	Solvent extraction, GCxGC-FID	As received		15	mg/kg

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE250	EPH Aliphatic (>C35-C44)	Solvent extraction, GCxGC-FID	As received		10	mg/kg
\$	VPH Aromatic (>EC5-EC7)	Headspace GC-FID	As received	U	0.05	mg/kg
\$	VPH Aromatic (>EC7-EC8)	Headspace GC-FID	As received	U	0.05	mg/kg
\$	VPH Aromatic (>EC8-EC10)	Headspace GC-FID	As received	U	0.05	mg/kg
CE250	EPH Aromatic (>EC10-EC12)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC12-EC16)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC16-EC21)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC21-EC35)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC35-EC44)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
\$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
127515-1	TS01	-	N	
127515-2	TS02	-	N	
127515-3	TS03	-	N	

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

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

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones, where applicable.