terra firma
Geotechnical & Geoenvironmental Specialists
www.terrafirmawales.co.uk

Our Ref: 12032/Phase 3 Piling Mat

Your Ref:

Contact: Ruth Howells

6th October 2023

Equans Regeneration Limited
Equinox North
Great Park Road
Almondsbury
Bristol
BS32 4QL

For the attn. of Richard Mackin

Dear Richard

HERBERT ROAD PHASE 3 - VALIDATION OF IMPORTED PILING MAT MATERIAL

I confirm that we have now completed the required sampling and analysis of the imported piling mat soils and report as follows.

1.0 Introduction

Equans is currently completing the residential development of Phase 3 of the Herbert Road development, Newport, on behalf of Pobl Group.

Prior to construction of the houses north of the drainage reen, it is understood that a 900mm thick piling cap layer was deposited across this entire area, comprising imported material. The source and exact volume of soils imported is unknown. An imported volume of approximately 7500m^3 has been assumed.

TFW Group Limited advised Equans that retrospective testing of the imported material should be performed to ensure that it was suitable for use and did not present a risk to human health or controlled waters.

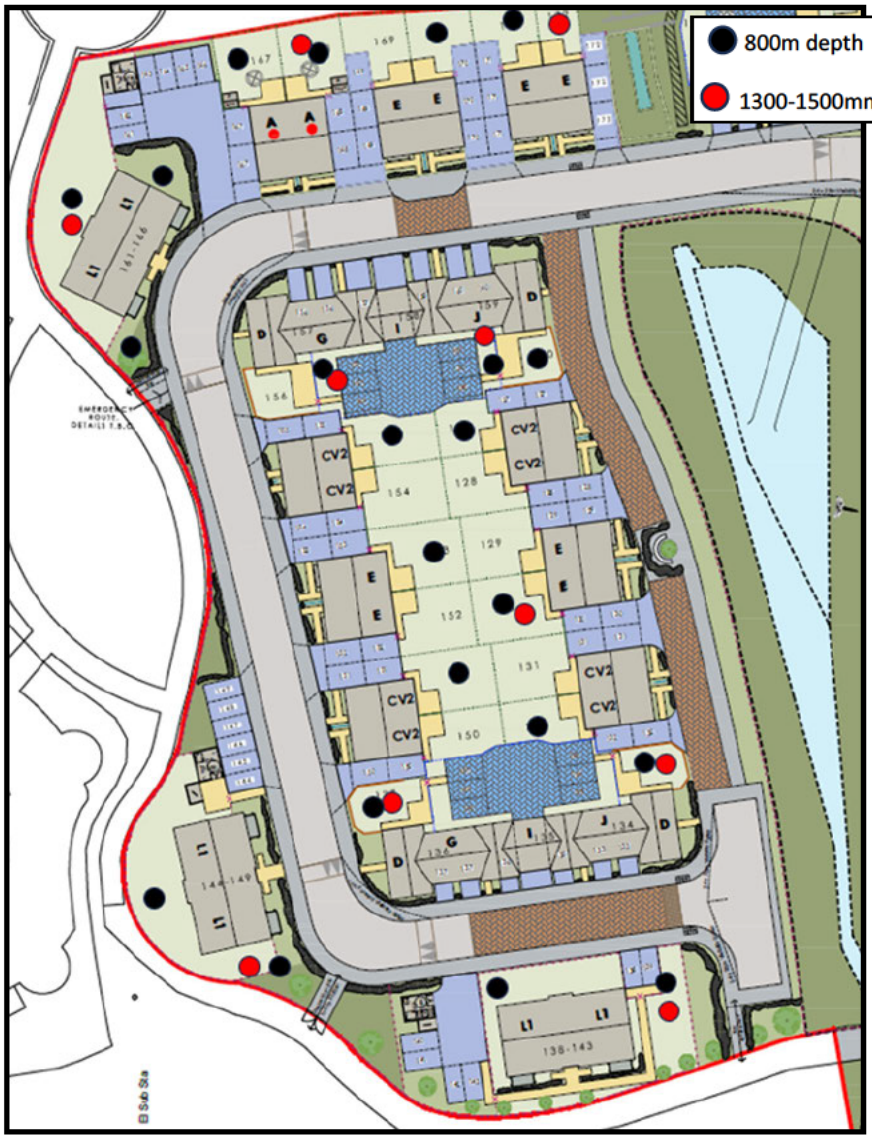
TFW Group Limited contacted the senior scientific officer at Newport City Council and agreed a testing regime of 30 samples. A number of trial holes were subsequently excavated in garden and landscaped/public open space areas to retrieve representative samples, over four visits.

A 600mm capping layer comprising topsoil and subsoil has been laid above the piling mat in all garden and landscaped areas except around the apartment block Plots 144-149 and 161-166.

2.0 Soil Sampling

Samples were taken from the following locations at 800mm and 1300-1500mm below ground level, taken into account the overlying 600mm capping layer.

For consistency, the sample depths quoted for Plots 144-149 and 161-166 are proposed and take into account a required reduction in level of 200mm prior to importation of 600mm capping soils.



Plot	800m sample	1300-1500mm sample
127	x	
130	x	x
132	x	
133	x	x
137	x	x
138-143 north	x	
138-143 south	x	x
144-149 west	x	x
144-149 north	x	
151	x	
153	x	
155	x	
156	x	
157	x	x
159	x	x
160	x	
161-166 west	x	
161-166 north	x	x
161-166 southeast	x	
167	x	
168	x	x
170	x	
171	x	
172		x

Figure 2.1 Soil Sampling Regime

All samples were submitted to the laboratories of Eurofins Chemtest for a suite of metals, inorganics, PAH, TPHCWG and asbestos, in accordance with publication 'Requirements for the Chemical testing of Imported Materials for Various End Uses and Validation of Cover Systems'

Twelve samples, taken from 0.8m depth, were also screened for PCBs.

3.0 Soil Test Results

Comparison of the analytical results has been made with the 2015 Suitable for Use Levels (S4UL) provided by the Land Quality Management (LQM) Limited and the Chartered Institute of Environmental Health (CIEH), or Category 4 Screening Levels (C4SL), for a residential (without plant uptake) scenario.

For assessment of PCBs, results have be compared to the CLEA SGV for dioxins, furans and dioxin-like PCBs.

Identified contamination in these samples is summarised in **Table 3.1** below.

Substance	Plot	Sample Depth (mbgl)	Threshold Value (mg/kg)	Measured Concentration (mg/kg)
Lead	161-166 southeast	800	310*	320
	166-166 north	1500		2900
Benzo(b)fluoranthene	144-149 west	1300	4.0*	12
Benzo(a)pyrene	144-149 west	1300	3.2*	8.4
Dibenzo(ah)anthracene	133	1300	0.31 – 0.32*	0.38
	144-149 west	800		0.5
		1300		1.3
	157	1300		0.48
	161-166 north	1500		0.41
	172	1300		0.38
PCB 28	137	800	0.008	0.022
	168			0.009
PCB 52	130	800	0.008	0.011
	133			0.033
	137			0.011
	155			0.012
	168			0.011
PCB 90+101	130	800	0.008	0.022
	133			0.055
	137			0.01
	168			0.009
	155			0.012
PCB 118	130	800	0.008	0.022
	133			0.033
	155			0.023
PCB 138	130	800	0.008	0.044
	133			0.044
	138-143			0.01
	155			0.035
	156			0.013
	168			0.011

PCB 153	130	800	0.008	0.044
	133			0.033
	137			0.010
	138-143			0.012
	155			0.035
	156			0.017
	168			0.021
PCB 180	130	800	0.008	0.12
	133			0.022
	137			0.009
	138-143			0.010
	155			0.047
	156			0.027
	168			0.038
Chrysotile Asbestos fibres/clumps	137	1300	-	-
	144-149 west	1300		
	166-166 north	800		
		1500		
	172	1300		
Asbestos chrysotile cement fragment	166-166 north	Found on the surface, i.e. prior to 200mm level reduction before 600mm cap	-	-

*Guidelines according to sample SOM

Laboratory certificates are enclosed.

4.0 Conclusions

Results highlighted contamination by a number of substances.

The probability of PCBs being present in soils imported to site is low, and PCBs were a known contaminant on this area prior to development. It is therefore concluded that the soils tested were almost certainly the original made ground and not imported 'piling mat' material.

There is a 600mm capping layer already in place across all garden and landscaped areas, with the exception of around apartment the three apartment blocks.

The capping layer is deemed an adequate barrier between future site users and the piling mat to protect against lead and PAHs and PCBs. The contamination is not deemed sufficiently severe to warrant the requirement of a no-dig barrier between piling mat soil and overlying capping soils.

Only one of five occurrences of asbestos fibres was noted in samples at 800mm depth (200mm below the capping layer). This sample was retrieved from the rear of Plots 161-166. Asbestos was also noted in the piling mat material in a sample taken at 1500mm depth in the same location. A piece of ACM was also picked from the surface in this area.

The area around Plots 161-166 must be reduced by approximately 200mm to accommodate the capping layer. It is recommended that once this has been achieved, that a double no-dig barrier be laid prior to placement of the 600mm of capping soils. This should comprise a geogrid layer and overlying orange geotextile.

The contaminants found are not considered to present a risk to controlled waters. Concentrations are mostly minor, and would be subject to the effects of dilution and attenuation.

All new properties have a vapour protection against PCBs installed.

I trust that the above is to your satisfaction, however, if you have any queries or require any further information please do not hesitate to contact me.

Yours sincerely
for: TFW Group Ltd

[redacted]

Mrs Ruth Howells

Enc.

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-25654-1
Initial Date of Issue:	07-Aug-2023
Re-Issue Details:	
Client	Terra Firma (Wales) Ltd
Client Address:	5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA
Contact(s):	[redacted]
Project	Herbert Road (H.Road) North of Reen

Quotation No.:		**Date Received:**	31-Jul-2023
Order No.:	12032 - P3N - RH	**Date Instructed:**	31-Jul-2023
No. of Samples:	26		
Turnaround (Wkdays):	5	**Results Due:**	04-Aug-2023
Date Approved:	07-Aug-2023		

Approved By:

[redacted]

Details: Stuart Henderson, Technical Manager

Bulk Identification Certificate

Client: Terra Firma (Wales) Ltd

Site Address:

Date Sampled: 28-Jul-2023

Date Received: 31-Jul-2023

Your Ref.:

Project: Herbert Road (H.Road) North of Reen

Job Number: 23-25654

No Samples:

Date Reported: 07-Aug-2023

Sample No.	Sample ID	Sample Ref.	Description	Top (m)	Bottom (m)	SOP	Accred.	Laboratory	Material	Result
1681243	PLOTS 161 - 166	161-166 north - surface sample				2185	U	NEW-ASB	Cement	Chrysotile

The in-house procedure SOP2185 is in accordance with the requirements of Appendix 2 of the Analyst Guide (HSG 248)
The results relate only to items tested as supplied by the client.
Comments and interpretations are beyond the scope of UKAS accreditation.
Samples associated with asbestos in building surveys are retained for six months (HSG 264 refers)

Results - Soil

Project: Herbert Road (H.Road) North of Reen

Client: Terra Firma (Wales) Ltd				**Chemtest Job No.:**	23-25654	23-25654	23-25654	23-25654	23-25654	23-25654	23-25654	23-25654	23-25654
Quotation No.:				**Chemtest Sample ID.:**	1681221	1681222	1681225	1681227	1681230	1681234	1681236	1681239	1681242
Order No.: 12032 - P3N - RH				Client Sample Ref.:	PLOT 157	PLOT 127	PLOTS 161 - 166	PLOT 168	PLOT 132	PLOT 171	PLOT 153	PLOTS 144 - 149	PLOTS 138-143 south
				Client Sample ID.:	PLOT 157	PLOT 127	PLOT 161 - 166 southeast	PLOT 168	PLOT 132	PLOT 171	PLOT 153	PLOTS 144-149 north	PLOTS 138-143 south
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8
				Date Sampled:	28-Jul-2023	28-Jul-2023	28-Jul-2023	28-Jul-2023	28-Jul-2023	28-Jul-2023	28-Jul-2023	28-Jul-2023	28-Jul-2023
				Time Sampled:	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-	-	-	-	-
Moisture	N	2030	%	0.020	15	12	17	18	19	17	17	9.1	21
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones and Roots	Stones	Stones and Roots	N	Stones	Stones and Roots	Stones	Stones
Soil Texture	N	2040		N/A	Clay	Sand	Clay	Clay	Clay	Clay	Clay	Clay	Clay
pH	M	2010		4.0	8.6	8.5	8.8	8.8	8.8	8.5	9.2	8.5	8.4
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	1.5	1.7	5.0	1.9	2.1	1.4	2.8	< 0.40	2.7
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.50
Sulphate (Acid Soluble)	U	2430	%	0.010	0.093	0.038	0.45	0.35	0.37	0.21	0.63	0.13	0.50
Arsenic	M	2455	mg/kg	0.5	12	8.4	22	12	11	8.4	14	5.2	22
Cadmium	M	2455	mg/kg	0.10	1.1	0.15	7.6	5.1	4.4	0.90	8.6	7.1	8.3
Chromium	M	2455	mg/kg	0.5	45	18	200	30	29	17	38	9.0	40
Mercury Low Level	M	2450	mg/kg	0.05	0.13	0.07	0.09	0.76	0.44	0.12	0.85	0.06	1.3
Copper	M	2455	mg/kg	0.50	76	12	980	110	80	98	180	34	620
Nickel	M	2455	mg/kg	0.50	31	11	130	25	24	20	28	8.5	47
Lead	M	2455	mg/kg	0.50	73	30	320	120	98	66	170	240	280
Selenium	M	2455	mg/kg	0.25	0.66	0.82	0.66	1.6	0.62	0.34	0.81	< 0.25	1.1
Zinc	M	2455	mg/kg	0.50	210	46	2600	420	390	180	670	350	650
Chromium (Trivalent)	N	2490	mg/kg	1.0	45	18	200	30	29	17	38	9.0	40
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.11	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.11	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	3.1	3.4	< 2.0	< 2.0	2.3	3.1	< 2.0	< 2.0	2.2
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	1.6	1.1	< 1.0	2.0	< 1.0	2.0	2.2	< 1.0	1.2
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	3.5	< 2.0	< 2.0	3.7	< 2.0	< 2.0	4.6	< 2.0	2.5
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	30	7.4	5.2	42	39	23	31	12	21
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	13	< 10	< 10	12	< 10	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	38	14	6.8	49	43	28	39	15	27

Results - Soil

Project: Herbert Road (H.Road) North of Reen

Client: Terra Firma (Wales) Ltd				**Chemtest Job No.:**	23-25654	23-25654	23-25654	23-25654	23-25654	23-25654	23-25654	23-25654	23-25654
Quotation No.:				**Chemtest Sample ID.:**	1681221	1681222	1681225	1681227	1681230	1681234	1681236	1681239	1681242
Order No.: 12032 - P3N - RH				Client Sample Ref.:	PLOT 157	PLOT 127	PLOTS 161 - 166	PLOT 168	PLOT 132	PLOT 171	PLOT 153	PLOTS 144 - 149	PLOTS 138-143 south
				Client Sample ID.:	PLOT 157	PLOT 127	PLOT 161 - 166 southeast	PLOT 168	PLOT 132	PLOT 171	PLOT 153	PLOTS 144-149 north	PLOTS 138-143 south
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8
				Date Sampled:	28-Jul-2023	28-Jul-2023	28-Jul-2023	28-Jul-2023	28-Jul-2023	28-Jul-2023	28-Jul-2023	28-Jul-2023	28-Jul-2023
				Time Sampled:	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred**	**SOP**	**Units**	**LOD**									
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	9.7	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	8.6	2.5	20	29	40	21	7.4	3.5	18
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	67	27	2.6	34	53	42	52	24	87
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	13	4.7	< 1.0	4.4	6.5	4.5	7.0	1.2	2.1
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	77	30	23	62	93	72	60	27	110
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	120	44	29	110	140	100	99	43	130
Naphthalene	M	2800	mg/kg	0.10	0.28	0.31	0.20	0.19	0.20	0.36	0.21	0.14	0.40
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.14
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	0.17	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.11
Phenanthrene	M	2800	mg/kg	0.10	1.6	0.36	0.23	0.48	0.54	0.73	0.59	0.15	0.87
Anthracene	M	2800	mg/kg	0.10	0.37	< 0.10	< 0.10	0.13	0.14	0.18	0.16	< 0.10	0.24
Fluoranthene	M	2800	mg/kg	0.10	2.0	0.34	0.42	0.84	0.94	1.2	1.2	0.30	1.7
Pyrene	M	2800	mg/kg	0.10	1.4	0.28	0.36	0.70	0.78	0.97	0.97	0.21	1.5
Benzo[a]anthracene	M	2800	mg/kg	0.10	0.88	0.21	0.22	0.47	0.48	0.63	0.54	0.17	0.90
Chrysene	M	2800	mg/kg	0.10	0.88	0.24	0.22	0.54	0.65	0.82	0.52	0.18	1.0
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	1.0	0.23	0.34	0.82	0.67	0.99	0.86	0.18	1.6
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	0.37	< 0.10	< 0.10	0.23	0.18	0.37	0.30	< 0.10	0.48
Benzo[a]pyrene	M	2800	mg/kg	0.10	0.71	0.21	< 0.10	0.52	0.47	0.64	0.51	< 0.10	0.77
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	0.48	0.21	< 0.10	0.45	0.50	0.53	0.44	0.15	0.89
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.12	0.11	< 0.10	0.16	0.13	0.13	0.10	< 0.10	0.20
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	0.49	0.21	< 0.10	0.44	0.40	0.50	0.40	0.13	0.89
Total Of 16 PAH's	N	2800	mg/kg	2.0	11	2.7	< 2.0	6.0	6.1	8.1	6.8	< 2.0	12
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Organic Matter BS1377	N	2930	%	0.10	2.4	1.1	0.50	1.9	2.7	2.0	2.7	0.20	2.8

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2185	Asbestos	Asbestos	Polarised light microscopy
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by ‘Aquakem 600’ Discrete Analyser using 1,5-diphenylcarbazide.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
2930	Organic Matter	Organic Matter	Acid Dichromate digestion/Titration

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	23-27734-2		
Initial Date of Issue:	29-Aug-2023	**Date of Re-Issue:**	19-Sep-2023
Re-Issue Details:	This report has been revised and directly supersedes 23-27734-1 in its entirety		
Client	Terra Firma (Wales) Ltd		
Client Address:	5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		
Contact(s):	[redacted]		
Project	Herbert Rd.		
Quotation No.:		**Date Received:**	18-Aug-2023
Order No.:	12032 SO	**Date Instructed:**	18-Aug-2023
No. of Samples:	14		
Turnaround (Wkdays):	25	**Results Due:**	22-Sep-2023
Date Approved:	19-Sep-2023		
Approved By:	[redacted]		
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: Herbert Rd.

Client: Terra Firma (Wales) Ltd					**Chemtest Job No.:**	23-27734	23-27734	23-27734	23-27734	23-27734	23-27734	23-27734
Quotation No.:					**Chemtest Sample ID.:**	1690130	1690131	1690132	1690133	1690134	1690135	1690136	1690137
					Client Sample ID.:	172	170	167	Plots 161-166 north	Plots 161-166 north	Plots 161-166 west	157	159
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	1.3	0.8	0.8	0.8	1.5	0.8	1.3	0.8
					Date Sampled:	17-Aug-2023	17-Aug-2023	17-Aug-2023	17-Aug-2023	17-Aug-2023	17-Aug-2023	17-Aug-2023	17-Aug-2023
					Time Sampled:	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A		Fibres/Clumps	-	-	Fibres/Clumps	Fibres/Clumps	-	-	-
Asbestos Identification	U	2192		N/A		Chrysotile	No Asbestos Detected	No Asbestos Detected	Chrysotile	Chrysotile	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A		Stereo Microscopy	-	-	Stereo Microscopy	Stereo Microscopy	-	-	-
Moisture	N	2030	%	0.020		8.9	12	8.9	17	21	12	17	11
Soil Colour	N	2040		N/A		Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A		Stones	20% Roots and Stones	20% Stones	Stones and Glass	Stones	Stones	Stones	Stones and Roots
Soil Texture	N	2040		N/A		Loam	Loam	Loam	Clay	Clay	Loam	Loam	Loam
pH	M	2010		4.0		8.3	8.7	10.2	8.6	8.4	10.3	8.9	8.9
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40		1.6	1.6	3.7	1.9	1.4	2.5	1.4	1.0
Cyanide (Total)	M	2300	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphate (Acid Soluble)	U	2430	%	0.010		0.042	0.20	0.86	0.12	0.12	0.49	0.17	0.14
Arsenic	M	2455	mg/kg	0.5		12	19	11	10	11	8.3	15	9.5
Cadmium	M	2455	mg/kg	0.10		1.6	4.0	6.6	1.3	0.80	7.4	1.8	1.5
Chromium	M	2455	mg/kg	0.5		28	49	24	26	26	25	31	29
Mercury Low Level	M	2450	mg/kg	0.05		0.23	1.0	0.34	0.20	0.18	0.28	0.30	0.13
Copper	M	2455	mg/kg	0.50		100	89	190	56	66	78	120	33
Nickel	M	2455	mg/kg	0.50		24	44	23	29	29	15	34	24
Lead	M	2455	mg/kg	0.50		94	110	150	120	2900	130	160	55
Selenium	M	2455	mg/kg	0.25		0.66	0.85	0.57	1.3	0.91	0.51	0.92	1.0
Zinc	M	2455	mg/kg	0.50		300	450	740	210	320	440	440	250
Chromium (Trivalent)	N	2490	mg/kg	1.0		28	49	24	26	26	25	31	29
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50	< 0.50	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05		< 0.05	0.19	0.21	0.25	0.21	0.24	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25		< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.7	2.6	2.5
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00		1.9	2.5	< 1.0	3.6	< 1.0	4.7	4.0	5.5
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00		3.8	2.2	< 2.0	6.2	< 2.0	4.7	2.2	6.1
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00		16	6.3	13	22	15	29	4.0	22
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00		23	12	15	33	16	41	13	36

Results - Soil

Project: Herbert Rd.

Client: Terra Firma (Wales) Ltd					Chemtest Job No.:	23-27734	23-27734	23-27734	23-27734	23-27734	23-27734	23-27734
Quotation No.:					Chemtest Sample ID.:	1690130	1690131	1690132	1690133	1690134	1690135	1690136	1690137
					Client Sample ID.:	172	170	167	Plots 161-166 north	Plots 161-166 north	Plots 161-166 west	157	159
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	1.3	0.8	0.8	0.8	1.5	0.8	1.3	0.8
					Date Sampled:	17-Aug-2023	17-Aug-2023	17-Aug-2023	17-Aug-2023	17-Aug-2023	17-Aug-2023	17-Aug-2023	17-Aug-2023
					Time Sampled:	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25		< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00		< 1.0	< 1.0	< 1.0	1.6	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00		24	19	18	53	32	4.7	5.2	5.0
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00		92	33	19	190	140	27	61	51
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00		13	6.2	3.7	48	23	5.2	27	3.1
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00		120	52	37	250	180	32	66	56
Total VPH >C5-C10	U	2780	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00		140	64	52	280	190	73	79	92
Naphthalene	M	2800	mg/kg	0.10		0.38	0.28	0.19	0.27	0.27	0.13	0.43	0.20
Acenaphthylene	N	2800	mg/kg	0.10		0.25	< 0.10	< 0.10	0.14	0.20	< 0.10	0.20	< 0.10
Acenaphthene	M	2800	mg/kg	0.10		0.21	0.15	< 0.10	< 0.10	0.12	< 0.10	0.21	< 0.10
Fluorene	M	2800	mg/kg	0.10		0.27	0.13	< 0.10	0.12	0.16	< 0.10	0.22	< 0.10
Phenanthrene	M	2800	mg/kg	0.10		1.8	0.94	0.31	0.75	1.0	0.31	2.2	0.31
Anthracene	M	2800	mg/kg	0.10		0.61	0.24	< 0.10	0.24	0.37	< 0.10	0.56	0.10
Fluoranthene	M	2800	mg/kg	0.10		3.3	1.6	0.53	1.8	2.5	0.50	4.3	0.58
Pyrene	M	2800	mg/kg	0.10		2.8	1.2	0.42	1.4	2.0	0.40	3.8	0.45
Benzo[a]anthracene	M	2800	mg/kg	0.10		1.8	0.87	0.22	0.96	1.5	0.18	2.3	0.33
Chrysene	M	2800	mg/kg	0.10		2.1	0.91	0.30	1.0	1.9	0.18	2.8	0.36
Benzo[b]fluoranthene	M	2800	mg/kg	0.10		2.7	1.3	0.39	2.1	2.7	0.34	3.8	0.59
Benzo[k]fluoranthene	M	2800	mg/kg	0.10		0.90	0.40	0.11	0.68	0.91	< 0.10	1.1	0.17
Benzo[a]pyrene	M	2800	mg/kg	0.10		1.8	0.89	0.24	1.2	1.8	< 0.10	2.6	0.29
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10		1.3	0.73	< 0.10	1.1	1.6	< 0.10	2.0	0.28
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10		0.38	0.18	< 0.10	0.31	0.41	< 0.10	0.48	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10		1.4	0.69	< 0.10	1.3	1.6	0.18	1.9	0.30
Total Of 16 PAH's	N	2800	mg/kg	2.0		22	11	2.7	13	19	2.2	29	4.0
Total Phenols	M	2920	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Organic Matter BS1377	N	2930	%	0.10		1.9	1.6	1.0	3.0	3.0	2.1	2.6	1.5

Results - Soil

Project: Herbert Rd.

Client: Terra Firma (Wales) Ltd				**Chemtest Job No.:**	23-27734	23-27734	23-27734	23-27734	23-27734
Quotation No.:				**Chemtest Sample ID.:**	1690138	1690139	1690140	1690141	1690143
				Client Sample ID.:	159	Plots 144-149 west	144-149 west	Plots 138-143 north	138-143 south
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	1.3	0.8	1.3	0.8	1.3
				Date Sampled:	17-Aug-2023	17-Aug-2023	17-Aug-2023	17-Aug-2023	17-Aug-2023
				Time Sampled:	12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
ACM Type	U	2192		N/A	-	-	Fibres/Clumps	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	Chrysotile	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	Stereo Microscopy	-	-
Moisture	N	2030	%	0.020	10	8.3	18	12	12
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones and Glass	Stones and Glass	Stones	Stones and metal	30% Stones
Soil Texture	N	2040		N/A	Loam	Loam	Loam	Clay	Loam
pH	M	2010		4.0	9.1	8.8	8.3	10.3	8.2
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	1.5	1.4	2.1	1.7	1.3
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	0.50	0.70	< 0.50	< 0.50
Sulphate (Acid Soluble)	U	2430	%	0.010	0.22	0.12	0.18	0.35	0.16
Arsenic	M	2455	mg/kg	0.5	14	13	12	13	16
Cadmium	M	2455	mg/kg	0.10	1.3	5.6	2.5	4.7	1.0
Chromium	M	2455	mg/kg	0.5	30	39	18	28	29
Mercury Low Level	M	2450	mg/kg	0.05	0.35	0.25	0.25	0.47	0.31
Copper	M	2455	mg/kg	0.50	88	400	110	170	2400
Nickel	M	2455	mg/kg	0.50	32	52	26	27	44
Lead	M	2455	mg/kg	0.50	110	290	130	150	230
Selenium	M	2455	mg/kg	0.25	1.0	0.63	0.69	0.91	1.1
Zinc	M	2455	mg/kg	0.50	230	470	270	440	340
Chromium (Trivalent)	N	2490	mg/kg	1.0	30	39	18	28	29
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	< 2.0	2.0	2.4	2	< 2.0
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	3.1	2.2	5	4.1	2.9
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	2.1	< 2.0	6.2	4.6	3.2
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	15	3.3	40	28	17
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	22	7.9	53	38	25

Results - Soil

Project: Herbert Rd.

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		23-27734	23-27734	23-27734	23-27734	23-27734
Quotation No.:			**Chemtest Sample ID.:**		1690138	1690139	1690140	1690141	1690143
			Client Sample ID.:		159	Plots 144-149 west	144-149 west	Plots 138-143 north	138-143 south
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.3	0.8	1.3	0.8	1.3
			Date Sampled:		17-Aug-2023	17-Aug-2023	17-Aug-2023	17-Aug-2023	17-Aug-2023
			Time Sampled:		12:00	12:00	12:00	12:00	12:00
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	6.4	4.6	9.7	6.9	21
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	47	18	140	190	140
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	1.1	< 1.0	22	38	10
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	54	23	150	200	160
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	75	30	200	240	190
Naphthalene	M	2800	mg/kg	0.10	0.52	0.18	0.38	0.27	0.30
Acenaphthylene	N	2800	mg/kg	0.10	0.16	< 0.10	0.92	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	0.17	< 0.10	0.18	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	0.21	< 0.10	0.76	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	1.2	0.57	23	0.82	1.1
Anthracene	M	2800	mg/kg	0.10	0.27	0.16	9.3	0.21	0.21
Fluoranthene	M	2800	mg/kg	0.10	2.0	2.4	40	1.4	1.8
Pyrene	M	2800	mg/kg	0.10	1.7	2.5	27	1.1	1.5
Benzo[a]anthracene	M	2800	mg/kg	0.10	1.2	1.8	11	0.77	0.97
Chrysene	M	2800	mg/kg	0.10	1.4	2.3	9.0	0.98	1.0
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	2.0	4.2	12	1.4	1.9
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	0.60	1.4	4.3	0.40	0.60
Benzo[a]pyrene	M	2800	mg/kg	0.10	1.4	2.6	8.4	0.87	1.2
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	1.0	2.4	6.2	0.66	0.93
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.21	0.50	1.3	0.17	0.20
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	1.2	2.6	6.2	0.67	0.93
Total Of 16 PAH's	N	2800	mg/kg	2.0	15	24	160	9.7	13
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Organic Matter BS1377	N	2930	%	0.10	2.7	2.3	3.4	2.4	3.1

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by ‘Aquakem 600’ Discrete Analyser using 1,5-diphenylcarbazide.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
2930	Organic Matter	Organic Matter	Acid Dichromate digestion/Titration

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	23-28639-3		
Initial Date of Issue:	17-Sep-2023	**Date of Re-Issue:**	20-Sep-2023
Re-Issue Details:	This report has been revised and directly supersedes 23-28639-2 in its entirety		
Client	Terra Firma (Wales) Ltd		
Client Address:	5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		
Contact(s):	[redacted]		
Project	Herbert Road		
Quotation No.:	Q20-21666	**Date Received:**	25-Aug-2023
Order No.:	13683 SO	**Date Instructed:**	25-Aug-2023
No. of Samples:	14		
Turnaround (Wkdays):	20	**Results Due:**	22-Sep-2023
Date Approved:	20-Sep-2023		
Approved By:	[redacted]		
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: Herbert Road

Client: Terra Firma (Wales) Ltd				**Chemtest Job No.:**	23-28639	23-28639	23-28639	23-28639	23-28639	23-28639	23-28639	23-28639	23-28639
Quotation No.: Q20-21666				**Chemtest Sample ID.:**	1693532	1693533	1693534	1693535	1693536	1693537	1693538	1693539	1693540
				Client Sample ID.:	155	151	137	137	130	130	133	133	160
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.8	0.8	0.8	1.3	0.8	1.3	0.8	1.3	0.8
				Date Sampled:	23-Aug-2023	23-Aug-2023	23-Aug-2023	23-Aug-2023	23-Aug-2023	23-Aug-2023	23-Aug-2023	23-Aug-2023	23-Aug-2023
				Time Sampled:	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-	-	Fibres/Clumps	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	Chrysotile	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	Stereo Microscopy	-	-	-	-	-
Moisture	N	2030	%	0.020	14	4.7	8.6	12	9.1	8.2	9.6	8.7	8.0
Soil Colour	N	2040		N/A	Brown	Beige	Brown	Grey	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	20% Stones and Roots	Roots	20% Stones and Roots	Stones and Glass	15% Stones and Roots	15% Stones and Roots	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Loam	Loam	Loam	Loam	Clay	Loam	Sand	Sand	Sand
pH	M	2010		4.0	7.9	8.1	8.2	9.1	8.0	8.7	8.2	8.7	8.3
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	1.6	1.6	< 0.40	2.7	< 0.40	3.3	0.42	1.7	0.47
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphate (Acid Soluble)	U	2430	%	0.010	0.12	0.050	0.039	1.0	0.076	0.21	0.024	0.24	0.028
Arsenic	M	2455	mg/kg	0.5	11	4.4	8.4	12	7.6	16	5.9	4.0	9.1
Cadmium	M	2455	mg/kg	0.10	1.3	0.22	0.83	16	1.2	13	0.73	0.10	4.4
Chromium	M	2455	mg/kg	0.5	31	13	19	27	18	38	11	22	18
Mercury Low Level	M	2450	mg/kg	0.05	0.07	< 0.05	0.10	0.51	0.14	1.4	0.29	0.13	0.36
Copper	M	2455	mg/kg	0.50	30	21	30	190	36	4500	21	16	84
Nickel	M	2455	mg/kg	0.50	27	23	29	25	25	28	20	24	20
Lead	M	2455	mg/kg	0.50	88	17	37	240	90	270	29	20	110
Selenium	M	2455	mg/kg	0.25	1.0	0.44	0.92	0.70	0.81	0.90	0.57	0.96	0.51
Zinc	M	2455	mg/kg	0.50	190	75	130	910	140	870	97	45	300
Chromium (Trivalent)	N	2490	mg/kg	1.0	31	13	19	27	18	38	11	22	18
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	1.3	1.8	1.9	1.1	< 1.0
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	5.5	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	< 3.0	< 3.0	< 3.0	9.1	< 3.0	31	< 3.0	8.5	< 3.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	< 5.0	< 5.0	< 5.0	9.1	< 5.0	40	5.1	11	< 5.0
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Results - Soil

Project: Herbert Road

Client: Terra Firma (Wales) Ltd					Chemtest Job No.:	23-28639	23-28639	23-28639	23-28639	23-28639	23-28639	23-28639	23-28639	23-28639
Quotation No.: Q20-21666					Chemtest Sample ID.:	1693532	1693533	1693534	1693535	1693536	1693537	1693538	1693539	1693540
					Client Sample ID.:	155	151	137	137	130	130	133	133	160
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.8	0.8	0.8	1.3	0.8	1.3	0.8	1.3	0.8
					Date Sampled:	23-Aug-2023	23-Aug-2023	23-Aug-2023	23-Aug-2023	23-Aug-2023	23-Aug-2023	23-Aug-2023	23-Aug-2023	23-Aug-2023
					Time Sampled:	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25		< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00		34	30	32	33	3.8	4.6	2.7	4.8	3.5
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00		2.8	< 2.0	< 2.0	9.9	4.4	34	9.3	33	2.5
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00		< 1.0	< 1.0	< 1.0	< 1.0	1.5	4.1	< 1.0	1.4	1
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00		36	31	32	43	8.1	39	12	38	6
Total VPH >C5-C10	U	2780	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00		38	31	32	52	11	79	17	48	< 10
Naphthalene	M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.45	< 0.10	0.37	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.38	< 0.10	0.20	< 0.10
Acenaphthene	M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.21	< 0.10
Fluorene	M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.44	< 0.10	0.26	< 0.10
Phenanthrene	M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	0.83	< 0.10	3.0	< 0.10	1.9	< 0.10
Anthracene	M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.88	< 0.10	0.46	< 0.10
Fluoranthene	M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	1.3	< 0.10	3.0	< 0.10	3.7	< 0.10
Pyrene	M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	1.1	< 0.10	2.3	< 0.10	2.9	< 0.10
Benzo[a]anthracene	M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	0.71	< 0.10	1.4	< 0.10	2.1	< 0.10
Chrysene	M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	0.77	< 0.10	1.8	< 0.10	1.8	< 0.10
Benzo[b]fluoranthene	M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	1.2	< 0.10	1.9	< 0.10	3.0	< 0.10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.78	< 0.10	1.1	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	0.98	< 0.10	1.5	< 0.10	2.2	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	0.72	< 0.10	0.88	< 0.10	1.6	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.38	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.99	< 0.10	1.5	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0		< 2.0	< 2.0	< 2.0	7.6	< 2.0	20	< 2.0	24	< 2.0
PCB 28	U	2815	mg/kg	0.010		< 0.010	< 0.010	< 0.010		< 0.010		< 0.010		
PCB 52	U	2815	mg/kg	0.010		0.012	< 0.010	< 0.010		0.011		0.033		
PCB 90+101	U	2815	mg/kg	0.010		0.012	< 0.010	< 0.010		0.022		0.055		
PCB 118	U	2815	mg/kg	0.010		0.023	0.010	< 0.010		0.022		0.033		
PCB 153	U	2815	mg/kg	0.010		0.035	0.010	0.011		0.044		0.033		
PCB 138	U	2815	mg/kg	0.010		0.035	0.010	0.011		0.044		0.044		
PCB 180	U	2815	mg/kg	0.010		0.047	0.010	0.011		0.12		0.022		
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10		0.16	< 0.10	< 0.10		0.26		0.22		
Total Phenols	M	2920	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Organic Matter BS1377	N	2930	%	0.10		3.8	0.70	0.80	18	0.50	3.1	1.2	1.4	1.1

Results - Soil

Project: Herbert Road

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		23-28639
Quotation No.: Q20-21666			**Chemtest Sample ID.:**		1693542
			Client Sample ID.:		168
			Sample Type:		SOIL
			Top Depth (m):		1.3
			Date Sampled:		23-Aug-2023
			Time Sampled:		12:00
			Asbestos Lab:		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-
Moisture	N	2030	%	0.020	16
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	Stones
Soil Texture	N	2040		N/A	Sand
pH	M	2010		4.0	8.3
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	1.8
Cyanide (Total)	M	2300	mg/kg	0.50	1.6
Sulphate (Acid Soluble)	U	2430	%	0.010	0.21
Arsenic	M	2455	mg/kg	0.5	9.1
Cadmium	M	2455	mg/kg	0.10	4.9
Chromium	M	2455	mg/kg	0.5	18
Mercury Low Level	M	2450	mg/kg	0.05	0.52
Copper	M	2455	mg/kg	0.50	130
Nickel	M	2455	mg/kg	0.50	24
Lead	M	2455	mg/kg	0.50	120
Selenium	M	2455	mg/kg	0.25	0.53
Zinc	M	2455	mg/kg	0.50	370
Chromium (Trivalent)	N	2490	mg/kg	1.0	18
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	4.0
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	3.4
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	3.9
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	58
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	70
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05

Results - Soil

Project: Herbert Road

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		23-28639
Quotation No.: Q20-21666			**Chemtest Sample ID.:**		1693542
			Client Sample ID.:		168
			Sample Type:		SOIL
			Top Depth (m):		1.3
			Date Sampled:		23-Aug-2023
			Time Sampled:		12:00
			Asbestos Lab:		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	8.2
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	130
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	9.6
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	140
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	210
Naphthalene	M	2800	mg/kg	0.10	0.25
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	0.57
Anthracene	M	2800	mg/kg	0.10	0.14
Fluoranthene	M	2800	mg/kg	0.10	0.94
Pyrene	M	2800	mg/kg	0.10	0.85
Benzo[a]anthracene	M	2800	mg/kg	0.10	0.76
Chrysene	M	2800	mg/kg	0.10	0.73
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	1.3
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	0.50
Benzo[a]pyrene	M	2800	mg/kg	0.10	0.92
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	0.73
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.28
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	0.83
Total Of 16 PAH's	N	2800	mg/kg	2.0	8.8
PCB 28	U	2815	mg/kg	0.010	
PCB 52	U	2815	mg/kg	0.010	
PCB 90+101	U	2815	mg/kg	0.010	
PCB 118	U	2815	mg/kg	0.010	
PCB 153	U	2815	mg/kg	0.010	
PCB 138	U	2815	mg/kg	0.010	
PCB 180	U	2815	mg/kg	0.010	
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10	
Total Phenols	M	2920	mg/kg	0.10	< 0.10
Organic Matter BS1377	N	2930	%	0.10	2.2

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by ‘Aquakem 600’ Discrete Analyser using 1,5-diphenylcarbazide.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
2930	Organic Matter	Organic Matter	Acid Dichromate digestion/Titration

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Ruth Howells
Terra Firma Wales Ltd
5 Deryn Court
Wharfedale Road
Pentwyn
Cardiff
CF23 7HA

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 23-12113

Site Reference:	Herbert Road
Project / Job Ref:	12032
Order No:	12032RH
Sample Receipt Date:	27/09/2023
Sample Scheduled Date:	27/09/2023
Report Issue Number:	1
Reporting Date:	05/10/2023

Authorised by:

[redacted]

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - PCB (7 Congeners)						
DETS Report No: 23-12113	**Date Sampled**	22/09/23	21/09/23	22/09/23	22/09/23	22/09/23
Terra Firma Wales Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Herbert Road	**TP / BH No**	Plot 137	Plot 138 - 143	Plot 144 - 149	Plot 156	Plot 161 - 166
Project / Job Ref: 12032	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 12032RH	**Depth (m)**	0.80	0.80	0.80	0.80	0.80
Reporting Date: 05/10/2023	**DETS Sample No**	677185	677186	677187	677188	677189

Determinand	**Unit**	**RL**	**Accreditation**					(n)
PCB Congener 28	mg/kg	< 0.008	NONE	0.022	< 0.008	< 0.008	0.010	< 0.008
PCB Congener 52	mg/kg	< 0.008	NONE	0.011	< 0.008	< 0.008	< 0.008	< 0.008
PCB Congener 101	mg/kg	< 0.008	NONE	0.010	0.010	< 0.008	0.010	< 0.008
PCB Congener 118	mg/kg	< 0.008	NONE	< 0.008	0.008	< 0.008	< 0.008	< 0.008
PCB Congener 138	mg/kg	< 0.008	NONE	< 0.008	0.010	< 0.008	0.013	< 0.008
PCB Congener 153	mg/kg	< 0.008	NONE	0.010	0.012	< 0.008	0.017	< 0.008
PCB Congener 180	mg/kg	< 0.008	NONE	0.009	0.010	< 0.008	0.027	< 0.008
Total PCB (7 Congeners)	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - PCB (7 Congeners)						
DETS Report No: 23-12113	**Date Sampled**	22/09/23	21/09/23			
Terra Firma Wales Ltd	**Time Sampled**	None Supplied	None Supplied			
Site Reference: Herbert Road	**TP / BH No**	Plot 168	Plot 171			
Project / Job Ref: 12032	**Additional Refs**	None Supplied	None Supplied			
Order No: 12032RH	**Depth (m)**	0.80	0.80			
Reporting Date: 05/10/2023	**DETS Sample No**	677190	677191			

Determinand	**Unit**	**RL**	**Accreditation**	(n)				
PCB Congener 28	mg/kg	< 0.008	NONE	0.009	< 0.008			
PCB Congener 52	mg/kg	< 0.008	NONE	0.011	< 0.008			
PCB Congener 101	mg/kg	< 0.008	NONE	0.009	< 0.008			
PCB Congener 118	mg/kg	< 0.008	NONE	< 0.008	< 0.008			
PCB Congener 138	mg/kg	< 0.008	NONE	0.011	< 0.008			
PCB Congener 153	mg/kg	< 0.008	NONE	0.021	< 0.008			
PCB Congener 180	mg/kg	< 0.008	NONE	0.038	< 0.008			
Total PCB (7 Congeners)	mg/kg	< 0.1	NONE	< 0.1	< 0.1			

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - Sample Descriptions
DETS Report No: 23-12113
Terra Firma Wales Ltd
Site Reference: Herbert Road
Project / Job Ref: 12032
Order No: 12032RH
Reporting Date: 05/10/2023

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
677185	Plot 137	None Supplied	0.80	14.8	Brown sandy clay with stones
677186	Plot 138 - 143	None Supplied	0.80	15.5	Brown sandy clay with stones
677187	Plot 144 - 149	None Supplied	0.80	9.6	Brown sandy clay with stones
677188	Plot 156	None Supplied	0.80	12.7	Brown sandy clay with brick
677189	Plot 161 - 166	None Supplied	0.80	12.9	Brown sandy gravel with stones and concrete
677190	Plot 168	None Supplied	0.80	10.5	Brown sandy gravel with stones and concrete
677191	Plot 171	None Supplied	0.80	14.8	Brown sandy clay

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 23-12113
Terra Firma Wales Ltd
Site Reference: Herbert Road
Project / Job Ref: 12032
Order No: 12032RH
Reporting Date: 05/10/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

List of HWOL Acronyms and Operators
DETS Report No: 23-12113
Terra Firma Wales Ltd
Site Reference: Herbert Road
Project / Job Ref: 12032
Order No: 12032RH
Reporting Date: 05/10/2023

Acronym	**Description**
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym