

Our Ref: DE/14396/GARDEN VAL

Your Ref:

Contact: David Emanuel

3rd September 2021

Morganstone Construction Limited

For the attn. of Mr Geoff Elcock

Dear Mr Elcock

VALIDATION OF IMPORTED CAPPING SOILS: PLOTS 15 – 16, PARC NEWYDD, BRITON FERRY

Terra Firma Wales Ltd were retained by Morganstone Construction Limited to assess the chemistry and thickness of soils imported for the purpose of capping at Plots 15 - 16, Parc Newydd, Briton Ferry.

Terra Firma Wales Ltd attended site on 24th August 2021. Terra Firma Wales Ltd observed >600mm of capping soil underlain by a high visibility 'No-Dig' layer (See **Plate 01**). One sample of soil was taken from the garden area for chemical analysis for a broad suite of determinants. The results of the testing were compared to residential Generic Assessment Criteria (**Table 01.**).

Project: 14396 Parc Newydd							
Client: Terra Firma (Wales) Ltd	Chemtest Job No.:						21-29667
Quotation No.:	Chemtest Sample ID.:				Guideline	Source	1267453
	Sample Location:						Plot 15 - 16
	Sample Type:						SOIL
	Top Depth (m):						0.30
	Asbestos Lab:						DURHAM
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			7.1
Soil Colour	N	2040		N/A			Brown
Other Material	N	2040		N/A			Stones, Roots and Wood
Soil Texture	N	2040		N/A			Sand
pH	M	2010		4.0			8.2
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	290	S4UL	1.3
Cyanide (Total)	M	2300	mg/kg	0.50	8	CLEA (Withdrawn)	< 0.50
Sulphate (Acid Soluble)	M	2430	%	0.010			0.036
Arsenic	M	2450	mg/kg	1.0	37	S4UL	4.7
Cadmium	M	2450	mg/kg	0.10	11	S4UL	0.13
Chromium	M	2450	mg/kg	1.0			19
Mercury Low Level	M	2450	mg/kg	0.05	40	S4UL	0.10
Copper	M	2450	mg/kg	0.50	2400	S4UL	21
Nickel	M	2450	mg/kg	0.50	130	S4UL	31
Lead	M	2450	mg/kg	0.50	200	C4SL	18
Selenium	M	2450	mg/kg	0.20	250	S4UL	< 0.20
Zinc	M	2450	mg/kg	0.50	3700	S4UL	68
Chromium (Trivalent)	N	2490	mg/kg	1.0	910	S4UL	19
Chromium (Hexavalent)	N	2490	mg/kg	0.50	6	S4UL	< 0.50
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	42	S4UL	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	100	S4UL	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	27	S4UL	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	130	S4UL	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	1100	S4UL	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	65000	S4UL	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	65000	S4UL	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	65000	S4UL	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0			< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	70	S4UL	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	130	S4UL	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	34	S4UL	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	74	S4UL	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	140	S4UL	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	260	S4UL	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	1100	S4UL	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	1100	S4UL	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0			< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0			< 10
Naphthalene	M	2700	mg/kg	0.10	2.3	S4UL	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	170	S4UL	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	210	S4UL	< 0.10
Fluorene	M	2700	mg/kg	0.10	170	S4UL	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	95	S4UL	< 0.10
Anthracene	M	2700	mg/kg	0.10	2400	S4UL	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	280	S4UL	0.57
Pyrene	M	2700	mg/kg	0.10	620	S4UL	0.26
Benzo[a]anthracene	M	2700	mg/kg	0.10	7.2	S4UL	0.24
Chrysene	M	2700	mg/kg	0.10	15	S4UL	0.42
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	2.6	S4UL	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	77	S4UL	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	2.2	S4UL	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	27	S4UL	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	0.24	S4UL	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	320	S4UL	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0			< 2.0
Total Phenols	M	2920	mg/kg	0.10	120	S4UL	< 0.10
Organic Matter BS1377	N	2930	%	0.10			3.4

Table 01. Summary of Soil Chemical Testing and GACs

It can be seen from **Table 01** that all determinants tested were at concentrations below the corresponding GACs. Soil Chemical Test Results are presented in **Annex A**.

We 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 us.

Yours sincerely

for: Terra Firma (Wales) Ltd

David Emanuel

ANNEX A – Soil Chemical Test Results



Final Report

Report No.: 21-29667-1
Initial Date of Issue: 02-Sep-2021
Client Terra Firma (Wales) Ltd
Client Address: 5 Deryn Court
Wharfedale Road
Pentwyn
Cardiff
CF23 7HA

Contact(s): Dave Emanuel

Project 14396 Parc Newydd

Quotation No.: **Date Received:** 26-Aug-2021

Order No.: **Date Instructed:** 26-Aug-2021

No. of Samples: 1

Turnaround (Wkdays): 5 **Results Due:** 02-Sep-2021

Date Approved: 02-Sep-2021

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: 14396 Parc Newydd

Client: Terra Firma (Wales) Ltd		Chemtest Job No.:		21-29667	
Quotation No.:		Chemtest Sample ID.:		1267453	
		Sample Location:		Plot 15 - 16	
		Sample Type:		SOIL	
		Top Depth (m):		0.30	
		Asbestos Lab:		DURHAM	
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	7.1
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	Stones, Roots and Wood
Soil Texture	N	2040		N/A	Sand
pH	M	2010		4.0	[A] 8.2
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	[A] 1.3
Cyanide (Total)	M	2300	mg/kg	0.50	[A] < 0.50
Sulphate (Acid Soluble)	M	2430	%	0.010	[A] 0.036
Arsenic	M	2450	mg/kg	1.0	4.7
Cadmium	M	2450	mg/kg	0.10	0.13
Chromium	M	2450	mg/kg	1.0	19
Mercury Low Level	M	2450	mg/kg	0.05	0.10
Copper	M	2450	mg/kg	0.50	21
Nickel	M	2450	mg/kg	0.50	31
Lead	M	2450	mg/kg	0.50	18
Selenium	M	2450	mg/kg	0.20	< 0.20
Zinc	M	2450	mg/kg	0.50	68
Chromium (Trivalent)	N	2490	mg/kg	1.0	19
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[A] < 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	[A] < 1.0

Results - Soil

Project: 14396 Parc Newydd

Client: Terra Firma (Wales) Ltd	Chemtest Job No.:		21-29667		
Quotation No.:	Chemtest Sample ID.:		1267453		
	Sample Location:		Plot 15 - 16		
	Sample Type:		SOIL		
	Top Depth (m):		0.30		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[A] < 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[A] < 10
Naphthalene	M	2700	mg/kg	0.10	[A] < 0.10
Acenaphthylene	M	2700	mg/kg	0.10	[A] < 0.10
Acenaphthene	M	2700	mg/kg	0.10	[A] < 0.10
Fluorene	M	2700	mg/kg	0.10	[A] < 0.10
Phenanthrene	M	2700	mg/kg	0.10	[A] < 0.10
Anthracene	M	2700	mg/kg	0.10	[A] < 0.10
Fluoranthene	M	2700	mg/kg	0.10	[A] 0.57
Pyrene	M	2700	mg/kg	0.10	[A] 0.26
Benzo[a]anthracene	M	2700	mg/kg	0.10	[A] 0.24
Chrysene	M	2700	mg/kg	0.10	[A] 0.42
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	[A] < 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	[A] < 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	[A] < 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	[A] < 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	[A] < 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	[A] < 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	[A] < 2.0
Total Phenols	M	2920	mg/kg	0.10	< 0.10
Organic Matter BS1377	N	2930	%	0.10	[A] 3.4

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1267453			Plot 15 - 16		A	Amber Glass 250ml
1267453			Plot 15 - 16		A	Plastic Tub 1000g

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	Alkaline 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.
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.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	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-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
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

Plate 01 & 02. Capping Soils and Barrier at >600mm bgl.

