

Our Ref: DE/14396/GARDEN VAL

Your Ref:

Contact: David Emanuel

12th August 2021

Morganstone Construction Limited

For the attn. of Mr Geoff Elcock

Dear Mr Elcock

VALIDATION OF IMPORTED CAPPING SOILS: PLOTS 13-14 & 28-31, 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 13-14 & 28-31, Parc Newydd, Briton Ferry.

Terra Firma Wales Ltd attended site on 26th July 2021. Terra Firma Wales Ltd observed >600mm of imported capping soils. The soils were underlain by a high visibility 'No-Dig' layer (See **Plates 01 & 02**). Two samples of soil were taken from the gardens 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/A Parc Newydd									
Client: Terra Firma (Wales) Ltd					Chemtest Job No.:			21-25912	21-25912
Quotation No.:					Chemtest Sample ID.:			1249104	1249105
					Sample Location:			Plot 13 - 14	Plot 28 - 31
					Sample Type:			SOIL	SOIL
					Asbestos Lab:			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
ACM Detection Stage	U	2192		N/A				-	-
Moisture	N	2030	%	0.020				11	12
Soil Colour	N	2040		N/A				Black	Black
Other Material	N	2040		N/A					
Soil Texture	N	2040		N/A				Sand	Sand
pH	M	2010		4.0				8.4	8.3
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	290			1	0.71
Cyanide (Total)	M	2300	mg/kg	0.50	8			< 0.50	< 0.50
Sulphate (Acid Soluble)	M	2430	%	0.010				0.033	0.019
Arsenic	M	2450	mg/kg	1.0	37			9.0	9.3
Cadmium	M	2450	mg/kg	0.10	11			< 0.10	< 0.10
Chromium	M	2450	mg/kg	1.0				12	13
Mercury Low Level	M	2450	mg/kg	0.05	40			0.06	0.06
Copper	M	2450	mg/kg	0.50	2400			16	16
Nickel	M	2450	mg/kg	0.50	130			21	23
Lead	M	2450	mg/kg	0.50	200			20	21
Selenium	M	2450	mg/kg	0.20	250			< 0.20	< 0.20
Zinc	M	2450	mg/kg	0.50	3700			65	71
Chromium (Trivalent)	N	2490	mg/kg	1.0	910			12	13
Chromium (Hexavalent)	N	2490	mg/kg	0.50	6			< 0.50	< 0.50
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	42			< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	100			< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	27			< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	130			17	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	1100			< 1.0	5.8
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	65000			< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	65000			22	30
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	65000			< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0				39	36
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	70			< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	130			< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	34			< 1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	74			< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	140			< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	260			< 1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	1100			140	120
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	1100			12	15
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0				150	130
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0				190	170
Naphthalene	M	2700	mg/kg	0.10	2.3			< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	170			< 0.10	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	210			< 0.10	< 0.10
Fluorene	M	2700	mg/kg	0.10	170			< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	95			< 0.10	< 0.10
Anthracene	M	2700	mg/kg	0.10	2400			< 0.10	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	280			< 0.10	< 0.10
Pyrene	M	2700	mg/kg	0.10	620			< 0.10	< 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10	7.2			< 0.10	< 0.10
Chrysene	M	2700	mg/kg	0.10	15			< 0.10	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	2.6			< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	77			< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	2.2			< 0.10	< 0.10
Indeno[1,2,3-c,d]Pyrene	M	2700	mg/kg	0.10	27			< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	0.24			< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	320			< 0.10	< 0.10
Total Of 16 PAHs	M	2700	mg/kg	2.0				< 2.0	< 2.0
Total Phenols	M	2920	mg/kg	0.10	120			< 0.10	< 0.10
Organic Matter BS1377	N	2930	%	0.10				3.3	3

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. 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. Chemical Test Results



Final Report

Report No.: 21-25912-1
Initial Date of Issue: 04-Aug-2021
Client Terra Firma (Wales) Ltd
Client Address: 5 Deryn Court
Wharfedale Road
Pentwyn
Cardiff
CF23 7HA

Contact(s): Dave Emanuel

Project 14396/A Parc Newydd

Quotation No.: **Date Received:** 28-Jul-2021

Order No.: **Date Instructed:** 28-Jul-2021

No. of Samples: 2

Turnaround (Wkdays): 5 **Results Due:** 03-Aug-2021

Date Approved: 04-Aug-2021

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: 14396/A Parc Newydd

Client: Terra Firma (Wales) Ltd	Chemtest Job No.:				21-25912	21-25912
Quotation No.:	Chemtest Sample ID.:				1249104	1249105
	Sample Location:				Plot 13 - 14	Plot 28 - 31
	Sample Type:				SOIL	SOIL
	Asbestos Lab:				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
ACM Detection Stage	U	2192		N/A	-	-
Moisture	N	2030	%	0.020	11	12
Soil Colour	N	2040		N/A	Black	Black
Other Material	N	2040		N/A	Stones, Roots and rubbish	Stones, Roots, Wood and rubbish
Soil Texture	N	2040		N/A	Sand	Sand
pH	M	2010		4.0	[A] 8.4	[A] 8.3
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	[A] 1.0	[A] 0.71
Cyanide (Total)	M	2300	mg/kg	0.50	[A] < 0.50	[A] < 0.50
Sulphate (Acid Soluble)	M	2430	%	0.010	[A] 0.033	[A] 0.019
Arsenic	M	2450	mg/kg	1.0	9.0	9.3
Cadmium	M	2450	mg/kg	0.10	< 0.10	< 0.10
Chromium	M	2450	mg/kg	1.0	12	13
Mercury Low Level	M	2450	mg/kg	0.05	0.06	0.06
Copper	M	2450	mg/kg	0.50	16	16
Nickel	M	2450	mg/kg	0.50	21	23
Lead	M	2450	mg/kg	0.50	20	21
Selenium	M	2450	mg/kg	0.20	< 0.20	< 0.20
Zinc	M	2450	mg/kg	0.50	65	71
Chromium (Trivalent)	N	2490	mg/kg	1.0	12	13
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	[A] 17	[A] < 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	[A] < 1.0	[A] 5.8
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	[A] 22	[A] 30
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[A] 39	[A] 36
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	[A] 140	[A] 120

Results - Soil

Project: 14396/A Parc Newydd

Client: Terra Firma (Wales) Ltd	Chemtest Job No.:				21-25912	21-25912
Quotation No.:	Chemtest Sample ID.:				1249104	1249105
	Sample Location:				Plot 13 - 14	Plot 28 - 31
	Sample Type:				SOIL	SOIL
	Asbestos Lab:				DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] 12	[A] 15
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[A] 150	[A] 130
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[A] 190	[A] 170
Naphthalene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Acenaphthylene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Acenaphthene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Fluorene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Phenanthrene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Anthracene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Fluoranthene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Pyrene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Chrysene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	[A] < 2.0	[A] < 2.0
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10
Organic Matter BS1377	N	2930	%	0.10	[A] 3.3	[A] 3.0

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:
1249104			Plot 13 - 14		A	Amber Glass 60ml
1249104			Plot 13 - 14		A	Plastic Tub 1000g
1249105			Plot 28 - 31		A	Amber Glass 60ml
1249105			Plot 28 - 31		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-diphenylcarbazine.
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 & 2. Capping Soils and Barrier at 600mm bgl.



PLATE 01: >600mm capping in Plots 13-14



PLATE 02: >600mm capping in Plots 28 - 31