

Job Name: Boorley Gardens School

Job Number: PO-23-014

Note Number: 01, V01

Date: 26th June 2024

Prepared By: K. Timkey

Approved By: P. Grgich

Subject: Boorley Gardens School Supplemental Contamination Investigation

1. Introduction & Background

Hampshire County Council is proposing the construction of a new educational development within land at Boorley Gardens, Hampshire. The proposed development will consist of a new school building, car parking, playing fields and a MUGA and associated infrastructure.

The site has been subject to a number of investigations leading up to its use as a site compound by a contractor appointed by Miller Homes and Bellway Homes who are constructing residential units to the east and south. A contractual agreement required the site to be returned to Hampshire County Council in a “clean” state.

Terra Firma undertook intrusive investigations in Summer 2023 (PO-23-104 Boorley Gardens GIR V02, March 2024) in order to characterise the geotechnical and geo-environmental properties of the site for the development of the proposed educational development. At that time, several locations were inaccessible due to:

- the presence of stockpiles
- areas in active use crushing of demolition arisings
- Intermittent storage to manage road sweeper waste

This investigation identified localised elevations of PAHs and heavy fraction hydrocarbons (TPH) within WS102 @ 0.2-0.4mbgl. It was thought that localised contamination was present as a result of ongoing site usage as a compound, although elevated PAHs appeared to be related to historic tarmac underlying Made Ground material. This can be seen in Figure 1 below.

On this basis, it was determined that additional investigations were required to ensure suitable remediation by contractor. This work was proposed to be undertaken coincidental with additional investigations in areas of the site not previously subject to intrusive investigations.



Figure 1 – WS102 core liner showing suspected tarmac material at 0.2mbgl

2. Additional Site Works

The additional investigation was scoped by Hampshire County Council. A total of nine supplementary window sample locations were proposed. However, at the time of the investigations the site was still partially occupied by the contractor resulting in access issues. Therefore, a limited scope of works was undertaken on 3rd June 2024 and comprised the following:

Exploratory hole number	Easting	Northing	Justification
WS1	450198	114939	General Coverage
WS2	450147	114927	General Coverage
WS3	450195	114882	Area of former stockpile
WS4	450264	114917	Crushing area; site of WS102
WS7	450165	114878	Sweeper pit

The locations were selected to obtain soil for laboratory contamination testing including head space testing using a photoionising detector (PID). The previously identified contamination in WS102 was to be removed for off-site disposal by the developer. WS4 was, therefore positioned at a similar location to WS102.

The investigation aimed to validate that this removal had been successfully completed as well as accessing areas not previously subject to investigation. Reference should be made to the Exploratory Hole Location Plan shown in Figure 2 below.

The full logs are reproduced in Annex A.



Figure 2: Exploratory Hole Location Plan

3. Evaluation of Laboratory Analysis

A total of 12no. soil samples were obtained and dispatched to the laboratories of Chemtest for chemical testing. For reference, the full laboratory report is provided in Annex B.

The following chemical testing was undertaken:

Table 3.1 - Summary of Chemical Testing Suites3		
Inorganics	Metals	Arsenic (As), Cadmium (Cd), Chromium (Cr), Hexavalent Chromium (CrVI), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Selenium (Se), Zinc (Zn)

Table 3.1 - Summary of Chemical Testing Suites³

	General	pH (acidity), Cyanide (CN ⁻), Thiocyanate (SCN ⁻), Ammoniacal Nitrogen (NH ₄ -N), Sulphide (S ²⁻), Sulphur (S), Organic Matter (OM), Total Organic Carbon (TOC)
	Organics	Phenol Poly-Aromatic Hydrocarbons (PAH) Petroleum Hydrocarbons (PH): EPH Benzene, Toluene, Ethylbenzene, Xylene (BTEX) Methyl tert-butyl ether (MTBE) Volatile Organic Compounds (VOCs)
	Miscellaneous	Asbestos ID / Quantification
	UKWIR	<u>Inorganics</u> : Conductivity, pH (acidity), Redox Potential <u>Organics</u> : EPH C ₁₀ -C ₂₀ , EPH C ₂₀ -C ₄₀ , Total VOCs, BTEX & MTBE, Total SVOCs, Phenols, Cresols & Chlorinated Phenols, TICs
	Topsoil Analysis	Soil Texture, Soil Fertility Properties, Phytotoxic Contaminants & Visible Contaminants

Laboratory analysis was compared against a range of Generic Assessment Criteria considering a Residential Without Plant Uptake scenario which is in keeping with previous site assessment. Comparison values and outputs are presented in Annex B.

Total PAHs were observed to exceed GAC for human health in a single sample (WS4 @0.2mbgl – 8.1mg/kg). Therefore, in order to accurately assess the risk from Total PAH, speciation was undertaken which splits the total PAH concentration into sixteen components.

Individual PAHs were all measured below the GAC threshold for human health.

In order to accurately assess the risk from Total PH, speciation was undertaken, which splits the Total PH concentration into carbon bandings in accordance with the Total Petroleum Hydrocarbon Criteria Working Group (TPH-CWG).

Speciated Petroleum Hydrocarbons were all found to be below the GAC values for human health.

Each soil sample obtained from the window sample holes was also subject to Head Space Testing using a PID. Three samples (WS7 @0.5mbg and WS4 @0.2 and 0.3mbgl) recorded nominal PID values as shown in the table below.

Location ID	Sample Top	Sample Base	Type	Sample Ref	Sample ID	Remarks (PID Results etc)
WS7	0.50		ES	1	WS7ES1	Stable PID = 60 (Peak = 64)
WS7	1.00		ES	2	WS7ES2	Stable PID = 00 (Peak = 00)_
WS7	1.50		ES	3	WS7ES3	Stable PID = 00 (Peak = 00)_
WS7	2.00		ES	4	WS7ES4	Stable PID = 00 (Peak = 00)_
WS7	3.00		ES	5	WS7ES5	Stable PID = 00 (Peak = 00)_
WS7	4.00		ES	6	WS7ES6	Stable PID = 00 (Peak = 00)_
WS4	0.20		ES	1	WS4ES1	Stable PID = 82 (Peak 82)
WS4	0.30		ES	2	WS4ES2	Stable PID = 82 (Peak 82)
WS4	1.50		ES	3	WS4ES3	Stable PID = 00 (Peak = 00)_
WS3	0.20		ES	1	WS3ES1	Stable PID = 00 (Peak = 00)_
WS2	0.30		ES	1	WS2ES1	Stable PID = 00 (Peak = 00)_
WS1	0.30		ES	1	WS1ES1	Stable PID = 00 (Peak = 00)_

Table 3.2: PID Results Table

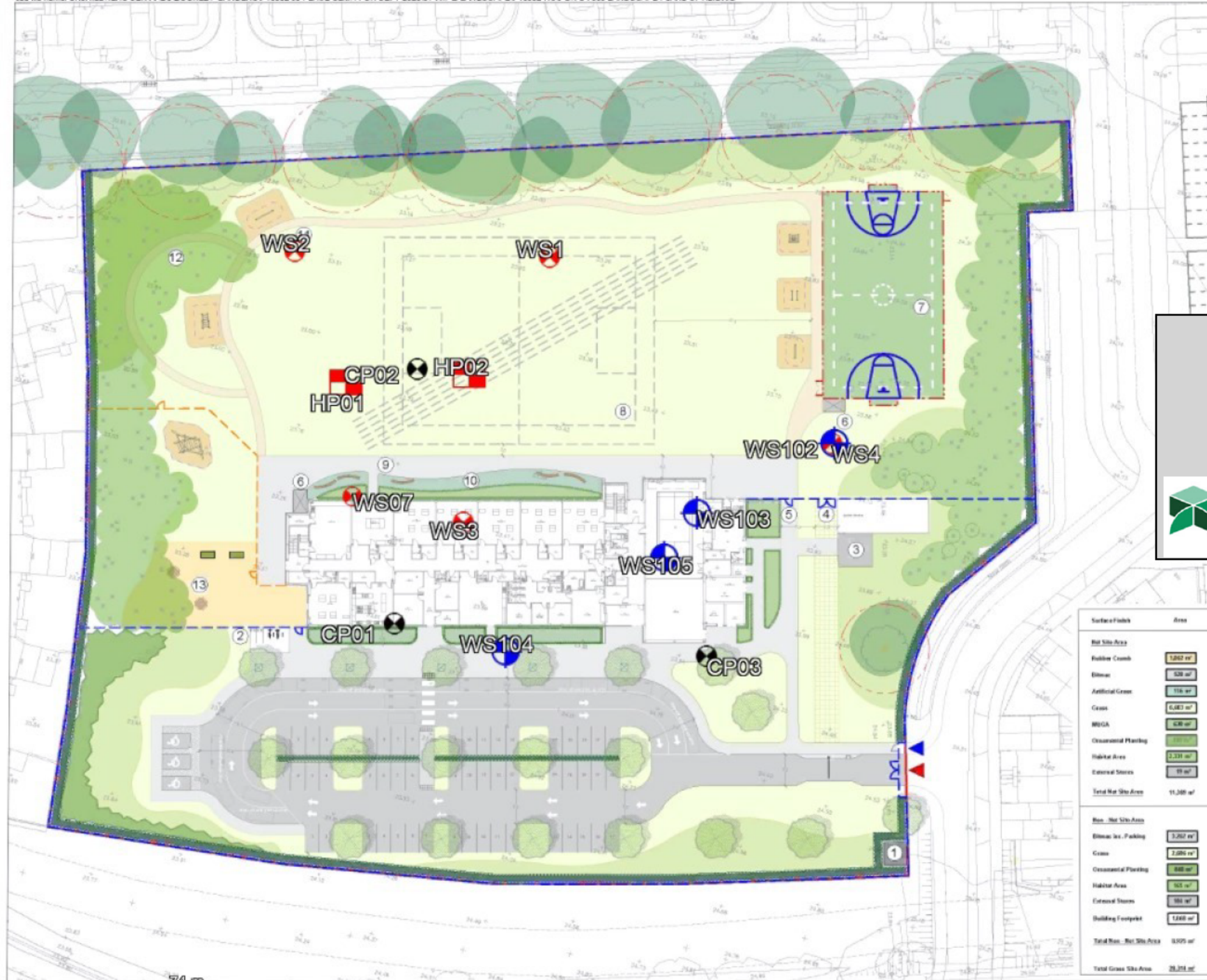
PID values broadly correlated with laboratory findings. There were no other recorded exceedances of contaminants of concern.

4. Discussion of Findings

Although total PAH exceeded the GAC in WS4 (the location of the previously recorded contamination), individual PAHs were found not to exceed GAC values. Additionally, although nominal concentrations of heavy fraction hydrocarbons were recorded in WS4 @ 0.2mbgl and lighter fractions in WS7 @ 0.5mbgl, these concentrations were below GAC for human health guidelines. The presence of hydrocarbons in these locations suggest that some residual contamination remains on site.

Despite this, all measured contaminants were recorded to effectively be below the appropriate guidance values and the site can be considered acceptable for its proposed use as a school. No further investigations or remediation is required at the site.

**Annex A: Exploratory Hole Logs
and
Exploratory Hole Location Plan**



- General Notes**
1. This drawing is to be used for the purpose of the proposed development and is not to be used for any other purpose.
 2. No dimensions are to be taken from this drawing. All dimensions are to be taken from the approved site plan and the approved site plan is to be used as the basis for the development.
 3. Existing trees to be retained are shown with a red circle and a red cross. Existing trees to be removed are shown with a red circle and a red dot.
 4. This drawing is to be used for the purpose of the proposed development and is not to be used for any other purpose.
- Approved
City Council



Key:

- Development Boundary
- Proposed Pedestrian Access
- Proposed Vehicular Access
- Substation
- 4 bicycle and 2 motorcycle parking spaces
- Bin store



Exploratory hole locations 2024



Exploratory hole locations 2023



PO-23-104 Boorley Gardens
Combined Exploratory Hole
Location Plan

Surface Finish	Area
Not Site Area	
Public Road	1,000 m ²
Bitmac	620 m ²
Artificial Grass	116 m ²
Grass	6,083 m ²
WEGA	6,000 m ²
Ornamental Planting	1,000 m ²
Habitat Area	2,230 m ²
External Stairs	10 m ²
Total Not Site Area	11,300 m²
Not Site Area	
Bitmac Int. Parking	1,200 m ²
Grass	2,000 m ²
Ornamental Planting	800 m ²
Habitat Area	500 m ²
External Stairs	10 m ²
Building Footprint	1,000 m ²
Total Not Site Area	5,500 m²
Total Green Site Area	28,370 m²

0 10m 20m

Rev	Description	Date	By	Rev
001	Issue for Approval	20/01/2020	JM	CL
002	Revised for Approval	20/01/2020	JM	CL

Project Manager
Boorley Gardens SEMH

Project Engineer
Boorley Gardens SEMH

PROJECT NAME
Boorley Gardens SEMH

PROJECT NUMBER
P13332-HCC-DR-L-7000

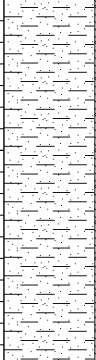
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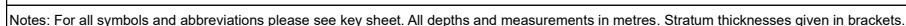
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20/01/2020

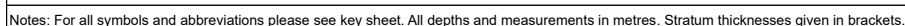
DESIGNER
JM

CHECKER
DN/CL

APPROVED
P02

		Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors Phone: 033 022 36380 Email: hello@tfwgroup.co.uk		Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. WS3 Sheet 1 of 1			
Project Name Boorley Green School				Project No. PO-23-014		Date 03/06/2024 to 03/06/2024				Hole Type WS			
Client Hampshire County Council				Co-ords E: 450195.00 N: 114882.00 L:		Water Strike Details Depth Strike After 20 mins Remarks				Logged By MB			
Contractor TFW Group			Plant Used Archway Dart						Approved By PG Scale 1:50				
Samples and Results			Depth, (Thickness)		Level		Stratum Description				Legend Well		
Results		Type	Depth										
		ES	0.20	(0.30) 0.30		Stiff greyish brown slightly gravelly sandy CLAY. Sand is fine to coarse, gravel is angular to subangular fine to coarse of brick, quartzite, flint. (Made Ground)							
				1 (1.70)		Soft orange sandy CLAY with bands of grey soft clay. Sand is medium (Wittering Formation)							
				2 2.00		End of Borehole at 2.00m							
				3									
				4									
				5									
				6									
Remarks										Borehole Diameter			
										Base Depth Diameter			
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.													





**Annex B: Chemical Laboratory Data
and
Analysis Tables**



Final Report

Report No.: 24-18282-1

Initial Date of Issue: 19-Jun-2024

Re-Issue Details:

Client Terra Firma

Client Address: 5 Deryn Court
Wharfedale Road
Pentwyn
Cardiff
CF23 7HA

Contact(s): Exeter Group

Project PO-23-014 Boorley Green School

Quotation No.: Q24-33609

Date Received: 11-Jun-2024

Order No.: PO-23-014

Date Instructed: 11-Jun-2024

No. of Samples: 12

Turnaround (Wkdays): 6

Results Due: 18-Jun-2024

Date Approved: 19-Jun-2024

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: PO-23-014 Boorley Green School

Client: Terra Firma		Chemtest Job No.:		24-18282	24-18282	24-18282	24-18282	24-18282	24-18282	24-18282	24-18282	24-18282	24-18282
Quotation No.: Q24-33609		Chemtest Sample ID.:		1819060	1819061	1819062	1819063	1819064	1819065	1819066	1819067	1819067	1819067
Order No.: PO-23-014		Client Sample Ref.:		1	1	1	3	2	3	5	6		
		Sample Location:		WS1	WS3	WS4	WS4	WS4	WS7	WS7	WS7		
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
		Top Depth (m):		0.30	0.20	0.20	1.50	0.30	1.50	3.00	4.00		
		Date Sampled:		03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024		
		Asbestos Lab:		NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB		
Determinand	HWOL Code	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
Moisture		N	2030	%	0.020	23	16	9.4	25	14	18	23	26
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material		N	2040		N/A	None	Stones	Stones	None	Stones	None	None	None
Soil Texture		N	2040		N/A	Clay	Clay	Sand	Clay	Clay	Clay	Clay	Clay
pH at 20C		M	2010		4.0	7.2	7.0	8.9	9.0	8.4	8.7	8.4	8.3
Total Sulphur		U	2175	%	0.010	< 0.010	0.015	0.25	< 0.010	0.012	< 0.010	0.018	0.28
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Thiocyanate		M	2300	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	5.1	2.7	4.3	4.9	2.5	2.8	4.6	3.4
Ammoniacal Nitrogen		M	2425	mg/kg	0.50	5.0	43	0.93	1.6	70	2.2	10	5.0
Sulphate (Total)		U	2430	%	0.010	0.076	0.066	0.58	0.037	0.082	0.076	0.11	0.86
Arsenic		M	2455	mg/kg	0.5	6.5	12	10	4.7	26	5.3	7.1	7.4
Cadmium		M	2455	mg/kg	0.10	< 0.10	< 0.10	0.79	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chromium		M	2455	mg/kg	0.5	42	32	18	25	41	22	24	26
Copper		M	2455	mg/kg	0.50	13	6.8	20	7.2	9.7	4.3	6.9	9.5
Mercury		M	2455	mg/kg	0.05	< 0.05	0.05	0.08	0.07	0.05	< 0.05	< 0.05	< 0.05
Nickel		M	2455	mg/kg	0.50	11	8.5	14	3.8	14	5.7	6.8	25
Lead		M	2455	mg/kg	0.50	19	17	54	11	36	12	21	17
Selenium		M	2455	mg/kg	0.25	0.59	0.41	0.29	0.32	0.78	0.32	0.41	0.36
Zinc		M	2455	mg/kg	0.50	50	31	110	15	45	29	34	80
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	HS_2D_AL	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25		< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00		3.0	< 1.0	< 1.0	< 1.0	3.9	< 1.0	< 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00		4.3	5.6	< 2.0	< 2.0	5.4	4.5	< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00		9.2	42	< 3.0	< 3.0	5.4	32	< 3.0
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00		< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00		18	48	< 5.0	< 5.0	16	38	< 5.0

Results - Soil

Project: PO-23-014 Boorley Green School

Client: Terra Firma		Chemtest Job No.:					24-18282	24-18282	24-18282	24-18282	24-18282	24-18282	24-18282
Quotation No.: Q24-33609		Chemtest Sample ID.:					1819060	1819061	1819062	1819063	1819064	1819065	1819067
Order No.: PO-23-014		Client Sample Ref.:					1	1	1	3	2	3	5
		Sample Location:					WS1	WS3	WS4	WS4	WS4	WS7	WS7
		Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):					0.30	0.20	0.20	1.50	0.30	1.50	4.00
		Date Sampled:					03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024
		Asbestos Lab:					NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD								
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00		18	48	< 10	< 10	16	38	< 10
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25		< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00		4.7	13	5.6	4.5	5.0	5.0	4.7
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00		19	26	< 2.0	< 2.0	< 2.0	9.7	< 2.0
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00		2.4	71	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00		24	40	5.6	6.1	5.2	15	5.2
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00		26	110	< 10	< 10	< 10	15	< 10
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00		42	88	< 10	< 10	21	53	< 10
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00		44	160	< 10	< 10	21	53	< 10
Organic Matter		M	2625	%	0.40	0.92	2.5	2.6	0.61	1.9	1.1	< 0.40	0.97
Total TPH >C6-C40	EH_1D_Total	M	2670	mg/kg	10	< 10	< 10	310	< 10	< 10	< 10	< 10	< 10
Benzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	28	< 1.0	< 1.0	< 1.0
Ethylbenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene		M	2800	mg/kg	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	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	0.64	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	0.22	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	1.6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	1.4	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	0.71	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene		M	2800	mg/kg	0.10	< 0.10	< 0.10	0.70	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	0.91	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	0.35	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	0.70	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	0.44	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenzo(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: PO-23-014 Boorley Green School

Client: Terra Firma		Chemtest Job No.:		24-18282	24-18282	24-18282	24-18282	24-18282	24-18282	24-18282	24-18282	24-18282
Quotation No.: Q24-33609		Chemtest Sample ID.:		1819060	1819061	1819062	1819063	1819064	1819065	1819066	1819067	1819067
Order No.: PO-23-014		Client Sample Ref.:		1	1	1	3	2	3	5	6	6
		Sample Location:		WS1	WS3	WS4	WS4	WS4	WS7	WS7	WS7	WS7
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		0.30	0.20	0.20	1.50	0.30	1.50	3.00	4.00	4.00
		Date Sampled:		03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024
		Asbestos Lab:		NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	< 0.10	0.45	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's		N	2800	mg/kg	2.0	< 2.0	< 2.0	8.1	< 2.0	< 2.0	< 2.0	< 2.0
Demeton-O		N	2820	mg/kg	0.20	< 0.20						
Phorate		N	2820	mg/kg	0.20	< 0.20						
Demeton-S		N	2820	mg/kg	0.20	< 0.20						
Disulfoton		N	2820	mg/kg	0.20	< 0.20						
Fenthion		N	2820	mg/kg	0.20	< 0.20						
Trichloronate		N	2820	mg/kg	0.20	< 0.20						
Prothiofos		N	2820	mg/kg	0.20	< 0.20						
Fensulphothion		N	2820	mg/kg	0.20	< 0.20						
Sulprofos		N	2820	mg/kg	0.20	< 0.20						
Azinphos-Methyl		N	2820	mg/kg	0.20	< 0.20						
Coumaphos		N	2820	mg/kg	0.20	< 0.20						
Atraton		N	2830	mg/kg	0.20	< 0.20						
Prometon		N	2830	mg/kg	0.20	< 0.20						
Simazine		N	2830	mg/kg	0.20	< 0.20						
Atrazine		N	2830	mg/kg	0.20	< 0.20						
Propazine		N	2830	mg/kg	0.20	< 0.20						
Terbuthylazine		N	2830	mg/kg	0.20	< 0.20						
Secbumeton		N	2830	mg/kg	0.20	< 0.20						
Simetryn		N	2830	mg/kg	0.20	< 0.20						
Ametryn		N	2830	mg/kg	0.20	< 0.20						
Prometryn		N	2830	mg/kg	0.20	< 0.20						
Terbutryn		N	2830	mg/kg	0.20	< 0.20						
Alpha-HCH		N	2840	mg/kg	0.20	< 0.20						
Gamma-HCH (Lindane)		N	2840	mg/kg	0.20	< 0.20						
Beta-HCH		N	2840	mg/kg	0.20	< 0.20						
Delta-HCH		N	2840	mg/kg	0.20	< 0.20						
Heptachlor		N	2840	mg/kg	0.20	< 0.20						
Aldrin		N	2840	mg/kg	0.20	< 0.20						
Heptachlor Epoxide		N	2840	mg/kg	0.20	< 0.20						
Gamma-Chlordane		N	2840	mg/kg	0.20	< 0.20						
Alpha-Chlordane		N	2840	mg/kg	0.20	< 0.20						
Endosulfan I		N	2840	mg/kg	0.20	< 0.20						
4,4-DDE		N	2840	mg/kg	0.20	< 0.20						
Dieldrin		N	2840	mg/kg	0.20	< 0.20						
Endrin		N	2840	mg/kg	0.20	< 0.20						
4,4-DDD		N	2840	mg/kg	0.20	< 0.20						

Results - Soil

Project: PO-23-014 Boorley Green School

Client: Terra Firma		Chemtest Job No.:						24-18282	24-18282	24-18282	24-18282	24-18282	24-18282	24-18282
Quotation No.: Q24-33609		Chemtest Sample ID.:						1819060	1819061	1819062	1819063	1819064	1819065	1819067
Order No.: PO-23-014		Client Sample Ref.:						1	1	1	3	2	3	5
		Sample Location:						WS1	WS3	WS4	WS4	WS4	WS7	WS7
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):						0.30	0.20	0.20	1.50	0.30	1.50	4.00
		Date Sampled:						03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024
		Asbestos Lab:						NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
Endosulfan II		N	2840	mg/kg	0.20	< 0.20								
Endrin Aldehyde		N	2840	mg/kg	0.20	< 0.20								
4,4-DDT		N	2840	mg/kg	0.20	< 0.20								
Endosulfan Sulphate		N	2840	mg/kg	0.20	< 0.20								
Methoxychlor		N	2840	mg/kg	0.20	< 0.20								
Endrin Ketone		N	2840	mg/kg	0.20	< 0.20								
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

Results - Soil

Project: PO-23-014 Boorley Green School

Client: Terra Firma		Chemtest Job No.:		24-18282	24-18282	24-18282	24-18282
Quotation No.: Q24-33609		Chemtest Sample ID.:		1819068	1819069	1819070	1819071
Order No.: PO-23-014		Client Sample Ref.:		4	2	1	
		Sample Location:		WS7	WS7	WS7	WS2
		Sample Type:		SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		2.00	1.00	0.50	0.30
		Date Sampled:		03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024
		Asbestos Lab:		NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
ACM Type		U	2192		N/A	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected
Moisture		N	2030	%	0.020	24	20
Soil Colour		N	2040		N/A	Brown	Brown
Other Material		N	2040		N/A	Roots	Stones and Roots
Soil Texture		N	2040		N/A	Clay	Clay
pH at 20C		M	2010		4.0	8.3	8.1
Total Sulphur		U	2175	%	0.010	< 0.010	0.019
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50
Thiocyanate		M	2300	mg/kg	5.0	< 5.0	< 5.0
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	3.4	3.9
Ammoniacal Nitrogen		M	2425	mg/kg	0.50	1.0	57
Sulphate (Total)		U	2430	%	0.010	0.044	0.083
Arsenic		M	2455	mg/kg	0.5	6.4	5.7
Cadmium		M	2455	mg/kg	0.10	< 0.10	< 0.10
Chromium		M	2455	mg/kg	0.5	26	16
Copper		M	2455	mg/kg	0.50	5.2	8.7
Mercury		M	2455	mg/kg	0.05	< 0.05	0.13
Nickel		M	2455	mg/kg	0.50	4.2	4.3
Lead		M	2455	mg/kg	0.50	10	27
Selenium		M	2455	mg/kg	0.25	0.25	< 0.25
Zinc		M	2455	mg/kg	0.50	24	32
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	62
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	< 1.0	220
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	4.9	200
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	4.4	79
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	13
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	14	82

Results - Soil

Project: PO-23-014 Boorley Green School

Client: Terra Firma		Chemtest Job No.:				24-18282	24-18282	24-18282	24-18282
Quotation No.: Q24-33609		Chemtest Sample ID.:				1819068	1819069	1819070	1819071
Order No.: PO-23-014		Client Sample Ref.:				4	2	1	
		Sample Location:				WS7	WS7	WS7	WS2
		Sample Type:				SOIL	SOIL	SOIL	SOIL
		Top Depth (m):				2.00	1.00	0.50	0.30
		Date Sampled:				03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024
		Asbestos Lab:				NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD				
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	14	92	580	
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0	17	
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0	60	
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	5.1	4.7	35	
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	< 2.0	7.0	49	
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	< 1.0	2.0	37	
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	6.9	12	160	
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	< 10	14	200	
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	21	94	730	
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	21	110	780	
Organic Matter		M	2625	%	0.40	0.75	2.1	3.2	0.69
Total TPH >C6-C40	EH_1D_Total	M	2670	mg/kg	10	< 10	< 10	< 10	< 10
Benzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	
Toluene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	
m & p-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	
o-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	
Naphthalene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.13
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: PO-23-014 Boorley Green School

Client: Terra Firma		Chemtest Job No.:		24-18282	24-18282	24-18282	24-18282
Quotation No.: Q24-33609		Chemtest Sample ID.:		1819068	1819069	1819070	1819071
Order No.: PO-23-014		Client Sample Ref.:		4	2	1	
		Sample Location:		WS7	WS7	WS7	WS2
		Sample Type:		SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		2.00	1.00	0.50	0.30
		Date Sampled:		03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024
		Asbestos Lab:		NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's		N	2800	mg/kg	2.0	< 2.0	< 2.0
Demeton-O		N	2820	mg/kg	0.20		< 0.20
Phorate		N	2820	mg/kg	0.20		< 0.20
Demeton-S		N	2820	mg/kg	0.20		< 0.20
Disulfoton		N	2820	mg/kg	0.20		< 0.20
Fenthion		N	2820	mg/kg	0.20		< 0.20
Trichloronate		N	2820	mg/kg	0.20		< 0.20
Prothiofos		N	2820	mg/kg	0.20		< 0.20
Fensulphothion		N	2820	mg/kg	0.20		< 0.20
Sulprofos		N	2820	mg/kg	0.20		< 0.20
Azinphos-Methyl		N	2820	mg/kg	0.20		< 0.20
Coumaphos		N	2820	mg/kg	0.20		< 0.20
Atraton		N	2830	mg/kg	0.20		< 0.20
Prometon		N	2830	mg/kg	0.20		< 0.20
Simazine		N	2830	mg/kg	0.20		< 0.20
Atrazine		N	2830	mg/kg	0.20		< 0.20
Propazine		N	2830	mg/kg	0.20		< 0.20
Terbuthylazine		N	2830	mg/kg	0.20		< 0.20
Secbumeton		N	2830	mg/kg	0.20		< 0.20
Simetryn		N	2830	mg/kg	0.20		< 0.20
Ametryn		N	2830	mg/kg	0.20		< 0.20
Prometryn		N	2830	mg/kg	0.20		< 0.20
Terbutryn		N	2830	mg/kg	0.20		< 0.20
Alpha-HCH		N	2840	mg/kg	0.20		< 0.20
Gamma-HCH (Lindane)		N	2840	mg/kg	0.20		< 0.20
Beta-HCH		N	2840	mg/kg	0.20		< 0.20
Delta-HCH		N	2840	mg/kg	0.20		< 0.20
Heptachlor		N	2840	mg/kg	0.20		< 0.20
Aldrin		N	2840	mg/kg	0.20		< 0.20
Heptachlor Epoxide		N	2840	mg/kg	0.20		< 0.20
Gamma-Chlordane		N	2840	mg/kg	0.20		< 0.20
Alpha-Chlordane		N	2840	mg/kg	0.20		< 0.20
Endosulfan I		N	2840	mg/kg	0.20		< 0.20
4,4-DDE		N	2840	mg/kg	0.20		< 0.20
Dieldrin		N	2840	mg/kg	0.20		< 0.20
Endrin		N	2840	mg/kg	0.20		< 0.20
4,4-DDD		N	2840	mg/kg	0.20		< 0.20

Results - Soil

Project: PO-23-014 Boorley Green School

Client: Terra Firma		Chemtest Job No.:		24-18282	24-18282	24-18282	24-18282
Quotation No.: Q24-33609		Chemtest Sample ID.:		1819068	1819069	1819070	1819071
Order No.: PO-23-014		Client Sample Ref.:		4	2	1	
		Sample Location:		WS7	WS7	WS7	WS2
		Sample Type:		SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		2.00	1.00	0.50	0.30
		Date Sampled:		03-Jun-2024	03-Jun-2024	03-Jun-2024	03-Jun-2024
		Asbestos Lab:		NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Endosulfan II		N	2840	mg/kg	0.20		< 0.20
Endrin Aldehyde		N	2840	mg/kg	0.20		< 0.20
4,4-DDT		N	2840	mg/kg	0.20		< 0.20
Endosulfan Sulphate		N	2840	mg/kg	0.20		< 0.20
Methoxychlor		N	2840	mg/kg	0.20		< 0.20
Endrin Ketone		N	2840	mg/kg	0.20		< 0.20
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	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 <30°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	
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
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.	
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.	
2425	Extractable Ammonium in soils	Ammonium	Extraction with potassium chloride solution / analysis by 'Aquakem 600' Discrete Analyser using sodium salicylate and sodium dichloroisocyanurate.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
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-diphenylcarbazine.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
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	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
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	
2820	Organophosphorus (O-P) Pesticides in Soils by GC-MS	Organophosphorus pesticide representative suite including Parathion, Malathion etc, plus client specific determinands	Dichloromethane extraction / GC-MS	

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2830	Organonitrogen (O-N) Pesticides in Soils by GC-MS	Organonitrogen pesticide representative suite including Triazines etc, plus client specific determinands	Dichloromethane extraction / GC-MS	
2840	Organochlorine (O-Cl) Pesticides in Soils by GC-MS	Organochlorine pesticide representative suite including DDT and its metabolites, 'drins' and HCH etc, plus client specific determinands	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.	

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

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

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 EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ 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.

Water Sample Category Key for Accreditation

- DW - Drinking Water
- GW - Ground Water
- LE - Land Leachate
- NA - Not Applicable

Report Information

PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

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
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

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

A summary of the Inorganic (Metals) soil chemical test results is shown in the table below.

Table 6.2 - Soil Chemical Test Results – Inorganics (Metals)						
Substance		Land Use / Guideline Values (mg/kg)	Measured Levels of Substances (mg/kg)		Number of exceedances	95% UCL
		R wo HP	Min	Max		
Arsenic	Total	40	4.7	26	0	-
	% Bio	-			0	-
Cadmium		150	0.1	0.79	0	-
Chromium		910	16	54	0	-
Chromium III		910	#N/A	#N/A	0	-
Chromium VI		21	0.5	0.5	0	-
Copper		7100	4.3	20	0	-
Lead		310	10	54	0	-
Mercury (Total)		56	0.05	0.13	0	-
Nickel		180	3.8	25	0	-
Selenium		430	0.25	0.99	0	-
Zinc		40000	15	140	0	-

Notes

- % Bio - Denotes Bio-Accessibility of arsenic as a percentage of the total (Gastric + Intestinal).
- C4SL - Provisional Category 4 Screening Levels
- S4UL - Suitable for Use Levels
- R_{wo}HP (Residential without Home-grown Produce)
- - No comparable Guideline Value
- A total of 12 representative soil samples were tested for these substances

A summary of the Inorganic (General) soil chemical test results is shown in the table below.

Table 6.3 - Soil Chemical Test Results – Inorganics (General)					
Substance	Land Use / Guideline Values (mg/kg)	Measured Levels of Substances (mg/kg)		Number of exceedances	95% UCL
	R wo HP	Min	Max		
Cyanide (Total)	8	0.5	0.5	0	-
Cyanide (Free)	0.1 (LoD)	0.5	0.5	0	-
Thiocyanate	-	5	5	0	-
Organic Matter	Considered in Organic Contaminant Guideline Value Assessment, BS3882 and/or BS8601	0.4	3.2	0	-
Ammoniacal Nitrogen	-	0.93	70	0	-
Sulphide	Considered in BRE SD1	2.5	6.8	0	-
Sulphur (%)	0.8 (LoD)	0.01	0.28	0	-
Sulphate (Total) (%)	Considered in BRE SD1	0.028	0.86	0	-

Notes

- **SGV** - Soil Guideline Value
- **GAC** - Generic Assessment Criteria
- BRE SD1: 2005 - Concrete in Aggressive Ground
- BS 3882: 2015 - Specification for Topsoil
- BS 8601: 2013 - Specification for Subsoil and requirements for use
- C665: 2007 - Assessing risks posed by hazardous ground gages to buildings
- BS 8485: 2007 – Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- UKWIR – Guidance for the Selection of Water Supply Pipe to be used in Brownfield Sites: 2010
- **R_{wo}HP** (Residential without Home-grown Produce)
- LoD - Limit of Detection
- * Based on Building Research Establishment (BRE) SD1
- - No comparable Guideline Value
- A total of 12 representative soil samples were tested for these substances

A summary of the Organic (General) soil chemical test results is shown in the table below.

Table 6.4 - Soil Chemical Test Results – Organics (General)

Substance		Land Use / Guideline Values (mg/kg)		Measured Levels of Substances (mg/kg)		Number of exceedances	95% UCL	
		R wo HP		Min	Max			
SOM								
Total Phenol	1	440		0.1	0.1	0	-	
	2.5	690				0		
	6	1200				0		
Total PAH*		2 (LoD)		2	8.1	1	3.4	
BTEX	Benzene		3.3		0.001	0.001	0	-
	Toluene	1	800		0.001	0.028	0	-
		2.5	1900				0	
		6	3900				0	
	Ethylbenzene	1	83		0.001	0.001	0	-
		2.5	190				0	
		6	440				0	
	Xylene***	1	79		0.001	0.001	0	-
		2.5	180				0	
		6	430				0	
Methyl tert-butyl ether (MTBE)	1	73		0.001	0.001	0	-	
	2.5	120				0		
	6	220				0		

Notes

- C4SL - Provisional Category 4 Screening Levels
- S4UL - Suitable for Use Levels
- SGV - Soil Guideline Value
- CL:AIRE - Generic Assessment Criteria (GAC)
- R_{wo}HP (Residential without Home-grown Produce)
- LoD - Limit of Detection
- SOM - Soil Organic Matter
- VOCs - Volatile Organic Compounds
- SVOCs - Semi Volatile Organic Compounds
- OCP/OPP - Organochlorine / Organophosphorus Pesticides
- * Total PAH - Poly-Aromatic Hydrocarbons, EPA 16 (See Speciated PAH Results Table)
- ** Total EPH – Extractable Petroleum Hydrocarbons, Ali/Aro (See Speciated PH Results Table)
- † Based on worse-case Aromatic C₁₀-C₁₂ fraction
- †† Based on worse-case Aliphatic C₁₀-C₁₂ fraction
- ††† Based on worse-case Aromatic C₁₆-C₂₁ fraction
- *** - Guideline Value based on worse case of O, M or P - Xylene
- **** Total PCB - Poly-Chlorinated Bi-phenols, Euro 7 (See Speciated PCB Results Table)
- - No comparable Guideline Value
- A total of 12 representative soil samples were tested for these substances

A summary of the Organic (Speciated PAH) soil chemical test results is shown in the table below.

Table 6.5 - Soil Chemical Test Results – Organics (Speciated PAH)						
Substance		Land Use / Guideline Values (mg/kg)	Measured Levels of Substances (mg/kg)		Number of exceedances	95% UCL
		R wo HP	Min	Max		
Naphthalene	SOM					
	1	2.3	0.1	0.13	0	-
	2.5	5.6			0	
	6	13			0	
Acenaphthylene	1	2900	0.1	0.1	0	-
	2.5	4600			0	
	6	6000			0	
Acenaphthene	1	3000	0.1	0.1	0	-
	2.5	4700			0	
	6	6000			0	
Fluorene	1	2800	0.1	0.1	0	-
	2.5	3800			0	
	6	4500			0	
Phenanthrene	1	1300	0.1	0.64	0	-
	2.5	1500			0	
	6	1500			0	
Anthracene	1	31000	0.1	0.22	0	-
	2.5	35000			0	
	6	37000			0	
Fluoranthene	1	1500	0.1	1.6	0	-
	2.5	1600			0	
	6	1600			0	
Pyrene	1	3700	0.1	1.4	0	-
	2.5	3800			0	
	6	3800			0	
Benzo(a)anthracene	1	11	0.1	0.71	0	-
	2.5	14			0	
	6	15			0	
Chrysene	1	30	0.1	0.7	0	-
	2.5	31			0	
	6	32			0	
Benzo(b)fluoranthene	1	3.9	0.1	0.91	0	-

Table 6.5 - Soil Chemical Test Results – Organics (Speciated PAH)

Substance		Land Use / Guideline Values (mg/kg)	Measured Levels of Substances (mg/kg)		Number of exceedances	95% UCL
		R wo HP	Min	Max		
	SOM					
	2.5	4			0	
	6	4			0	
Benzo(k)fluoranthene	1	110	0.1	0.35	0	-
	2.5	110			0	
	6	110			0	
Benzo(a)pyrene		5.3	0.1	0.7	0	-
Indeno(1,2,3-cd)pyrene	1	45	0.1	0.44	0	-
	2.5	46			0	
	6	46			0	
Dibenzo(a,h)anthracene	1	0.31	0.1	0.1	0	-
	2.5	0.32			0	
	6	0.32			0	
Benzo(g,h,i)perylene	1	360	0.1	0.45	0	-
	2.5	360			0	
	6	360			0	

Notes

- C4SL - Provisional Category 4 Screening Levels
- S4UL - Suitable for Use Levels
- R_{wo}HP (Residential without Home-grown Produce)
- SOM - Soil Organic Matter
- A total of 12 representative soil samples were tested for these substances

A summary of the Organic (Speciated PH) soil chemical test results is shown in the table below.

Table 6.6 - Soil Chemical Test Results – Organics (Speciated PH)							
Substance			Land Use / Guideline Values (mg/kg)	Measured Levels of Substances (mg/kg)		Number of exceedances	95% UCL
				Min	Max		
Aliphatic	VPH <C5-C6	SOM 1	42	0.05	0.05	0	-
		2.5	78			0	
		6	160			0	
	VPH <C6-C8	1	100	0.05	0.05	0	-
		2.5	230			0	
		6	530			0	
	VPH <C8-C10	1	27	0.05	0.05	0	-
		2.5	65			0	
		6	150			0	
		2.5	92000			0	
		6	110000			0	
Aromatic	VPH <C5-C7	1	370	0.05	0.05	0	-
		2.5	690			0	
		6	1400			0	
	VPH <C7-C8	1	860	0.05	0.05	0	-
		2.5	1800			0	
		6	3900			0	
	VPH <C8-C10	1	47	0.05	0.05	0	-
		2.5	110			0	
		6	270			0	
		2.5	1900			0	
		6	1900			0	

Notes

- S4UL - Suitable for Use Levels
- R_{wo}HP (Residential without Home-grown Produce)
- SOM - Soil Organic Matter
- VPH – Volatile Petroleum Hydrocarbons
- EPH – Extractable Petroleum Hydrocarbons
- + Based on worse-case Aliphatic C₁₆-C₃₅ fraction
- A total of 12 representative soil samples were tested for these substances

A summary of the Organic (VOCs) soil chemical test results is shown in the table below.

Table 6.7 - Soil Chemical Test Results – Organics (VOC's)						
Substance		Land Use / Guideline Values (mg/kg)	Measured Levels of Substances (mg/kg)		Number of exceedances	95% UCL
		R wo HP	Min	Max		
SOM						
Benzene		3.3	0.001	0.001	0	-
Toluene	1	800	0.001	0.028	0	-
	2.5	1900			0	
	6	3900			0	
	2.5	3.5			0	
	6	8.2			0	
Ethylbenzene	1	83	0.001	0.001	0	-
	2.5	190			0	
	6	440			0	
m+p-Xylene*	1	79	0.001	0.001	0	-
	2.5	180			0	
	6	430			0	
o-Xylene	1	88	0.001	0.001	0	-
	2.5	210			0	
	6	480			0	
	2.5	3.7			0	
	6	8.8			0	

Notes

- C4SL - Provisional Category 4 Screening Levels
- S4UL - Suitable for Use Levels
- CL:AIRE - Generic Assessment Criteria (GAC)
- R_{wo}HP (Residential without Home-grown Produce)
- SOM - Soil Organic Matter
- * - Guideline Value based on worse case of P – Xylene
- LoD - Limit of Detection
- A total of 12 representative soil samples were tested for these substances

A summary of the Miscellaneous (Asbestos) soil chemical test results is shown in the table below.

Table 6.8 - Soil Chemical Test Results – Miscellaneous (Asbestos)				
Sample No.		ID Result	Comments	Total Mass (%)
WS1	0.3	SOIL	No Asbestos Detected	-
WS2	0.3	SOIL	No Asbestos Detected	-
WS3	0.2	SOIL	No Asbestos Detected	-
WS4	0.2	SOIL	No Asbestos Detected	-
WS4	1.5	SOIL	No Asbestos Detected	-
WS4	0.3	SOIL	No Asbestos Detected	-
WS7	1.5	SOIL	No Asbestos Detected	-
WS7	3	SOIL	No Asbestos Detected	-
WS7	4	SOIL	No Asbestos Detected	-
WS7	2	SOIL	No Asbestos Detected	-
WS7	1	SOIL	No Asbestos Detected	-
WS7	0.5	SOIL	No Asbestos Detected	-

Notes:

- Total Mass (%) is based on Detailed Gravimetric Quantification