

15 April 2019

Your ref:
Planning ref:
Our ref: J11145/DB/c08

Mr B Slingo
Barratt David Wilson Southampton
Tollbar House
Tollbar Way
Hedge End
Southampton
Hampshire
SO30 2UH

Dear Mr Slingo,

RE: HAVANT ROAD SITE, WARBLINGTON, EMSWORTH
SUPPLEMENTARY GROUND INVESTIGATION WORKS WITHIN FORMER
FARM BUILDINGS AREA

Further to instruction from BDW Southampton in response to comments from the Local Authority Contaminated Land Team with respect to the findings of our initial phase of site wide ground investigation works, we have returned to site to carry out a further phase of focused contaminated land investigation within the central eastern part of the site that is indicated on historical maps as having been previously occupied by a number of agricultural buildings and a pump, that is assumed to be connected to a well.

Whilst the majority of the site is a true greenfield site and has not been previously developed, within the central eastern part of the site a selection of agricultural buildings are shown to have been present between 1952 and 1999. Historical aerial photography indicates that in 1999 these buildings are dilapidated, collapsed, overgrown and apparently disused for many years.

Below is a composite site plan showing the location of these buildings and the layout of the consented residential redevelopment scheme;



Scope of Work

Following the clearance of vegetation include dense areas of brambles and scrub vegetation the floor slabs to the former agricultural buildings were identified and removed together with various discarded agricultural waste materials including wheel barrows, rusted agricultural implements and the remains to timber and corrugated sheet metal that presumably formed part of the previous buildings. A series of trenches were also excavated through the near surface soils across this area.

A visual and olfactory inspection of the near surface soils was carried out together with the recovery of samples of the near surface soils. The made ground was found to be generally shallow to depths if between 0.20 m and 0.30 m below ground level and found to comprise predominantly brick, flint and tile fragments with sand and clay and occasional pockets of clinker. No indications of a well or pumphouse / pump equipment was identified as part of these works.

No visual or olfactory indications of ground contamination were noted. As part of these works, the existing relic concrete floor slabs to the former buildings were exposed, lifted and broken up. The concrete was inspected for any relic asbestos sheet material that can often be incorporated into the fill materials beneath the concrete, although no fragments were noted from detailed visual inspections.

Photographic records of the works carried out are provided below together with a plan showing the locations of the validation sampling





Soil Contamination Test Results

The results of comprehensive laboratory analyses carried out by an MCERTS accredited laboratory on soil samples recovered from the locations indicated above are enclosed. The significance of the measured concentrations of any chemicals of concern has been assessed in relation to the available Category 4 Screening Levels for the residential with plant uptake land use scenario together with the revised and updated values that have been adopted by the Chartered Institute of Environmental Health (CIEH)¹. Whilst the values that have been adopted by the CIEH are not statutory, they are widely accepted as providing a suitable initial screening value against which measured concentrations of potential contaminants can be assessed to determine the requirement for site specific quantitative risk assessment.

From a review of the enclosed results it is apparent that elevated concentrations of a wide range of potential soil contaminants have not been generally detected within the selected representative soil samples submitted to laboratory analyses, although raised concentrations of Chrysotile asbestos have been identified in samples V3 and V8. Sample V3 has also been identified as containing a raised concentration of PAH, which is consistent with the localised presence of clinker within some of the made ground. The locations of samples V3 and V8 which have identified the presence of asbestos fibres and localised PAH within the made ground are highlighted on the above plan in orange.

Contaminated Land Discussion

The historical and current use of the majority of the site as open agricultural land and grazing is not considered to present a potentially contaminative history or current use. The localised historical use of the central eastern part of the site as a farm yard with various buildings has been identified as being potentially contaminative.

The additional focused site investigation and soils testing carried out within this central eastern part of the site has indicated the presence of made ground associated with the former buildings and hardstanding areas. Whilst testing has indicated that these made ground soils are generally free from elevated

¹ The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd Edition) July 2009.

concentrations of a wide range of potential contaminants, locally elevated concentrations of asbestos fibres and PAH have been detected.

The location of the area of the former farm yard and in particular, the locations of the elevated concentrations of soil contaminants do not correspond with the locations of future garden areas and are in parts of the site that are to be excavated to allow the formation of new access roads, service corridors and soft landscaping.

The locally contaminated soils could be effectively managed during the construction programme with suitable controls and management of site works and segregation of waste materials and post completion validation testing. It has however been agreed with BDW Technical and Construction teams that it would be appropriate to carry out removal of the made ground in this part of the site and complete a validation exercise prior to commencement of construction in this part of the site. This approach will ensure the provision of a clean and remediated area of land and thereby mitigate the risk of any errors during construction resulting in the currently localised contaminated soils becoming more widespread and problematic across other parts of the site.

Remediation Proposals

Under direct supervision of Wilson Bailey Partnership, the locally contaminated made ground within this part of the site will be excavated and removed from site. The method of site working should be in accordance with guidelines set out by HSE² and CIRIA³.

Following completion of this soil removal the soils that remain will be subject to a regime of inspection and validation sampling to demonstrate their suitability to remain as part of a residential housing development.

Validation and Verification Plan Requirements

Following completion of the remediation works, the following information shall be provided as part of a validation and verification report to demonstrate the completion of works and suitability of the site for the consented residential development.

- Records of site works identifying plan extent and depth of soil removal;
- Waste disposal documentation for excavated soils removed from site;
- Results of post removal validation sampling on the basis of one sample per approximate 50m² reduced level excavation tested for asbestos fibres and poly-aromatic hydrocarbons;
- A discussion of the completed works and confirmation that the soils that remain are clean and suitable for the consented residential development such that no further precautions are required for the development at this site.

We trust that this letter provides sufficient information although please do not hesitate to contact me should you have any queries or questions.

Yours sincerely
Wilson Bailey Partnership

Dominic Brightman
BSc MSc DIC FGS CGeol ARSM

² HSE (1992) HS(G)66 Protection of workers and the general public during the development of contaminated land HMSO

³ CIRIA (1996) A guide for safe working on contaminated site Report 132, Construction Industry Research & Information Association



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DETS Report No: 19-02686

Site Reference: Saxon Corner, Emsworth

Project / Job Ref: None Supplied

Order No: None Supplied

Sample Receipt Date: 26/02/2019

Sample Scheduled Date: 26/02/2019

Report Issue Number: 1

Reporting Date: 04/03/2019

Authorised by:



Dave Ashworth
Deputy Quality Manager

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.

Soil Analysis Certificate						
DETS Report No: 19-02686	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Saxon Corner, Emsworth	TP / BH No	Farmyard V1	Farmyard V2	Farmyard V3	Farmyard V4	Farmyard V5
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 04/03/2019	DETS Sample No	392582	392583	392584	392585	392586

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Detected	Not Detected	Not Detected
Sample Matrix ^(S)	Material Type	N/a	NONE			Bundles of Chrysotile		
Asbestos Type ^(S)	PLM Result	N/a	ISO17025			Chrysotile		
Asbestos Quantification ^(S)	%	< 0.001	ISO17025			0.002		
pH	pH Units	N/a	MCERTS	5.7	5.5	4.9	5.1	5.2
Total Organic Carbon (TOC)	%	< 0.1	MCERTS	2.2	2	2.4	1.8	1.4
Arsenic (As)	mg/kg	< 2	MCERTS	12	8	10	8	8
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	1.1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.6	0.4	0.8	0.5	0.4
Chromium (Cr)	mg/kg	< 2	MCERTS	25	21	22	22	25
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	30	18	42	22	18
Lead (Pb)	mg/kg	< 3	MCERTS	74	42	207	49	42
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	21	15	23	18	18
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	491	236	665	289	238
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C.

Subcontracted analysis (S)

(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.

Soil Analysis Certificate						
DETS Report No: 19-02686	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Saxon Corner, Emsworth	TP / BH No	Farmyard V6	Farmyard V7	Farmyard V8	Blank Jar	Blank Jar
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 04/03/2019	DETS Sample No	392587	392588	392589	392590	392591

Determinand	Unit	RL	Accreditation	(n)				
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Detected	Not Detected	Not Detected
Sample Matrix ^(S)	Material Type	N/a	NONE			Chrysotile Present in visible cement		
Asbestos Type ^(S)	PLM Result	N/a	ISO17025			Chrysotile		
Asbestos Quantification ^(S)	%	< 0.001	ISO17025			0.421		
pH	pH Units	N/a	MCERTS	5.3	5.4	5.2	7.6	4.6
Total Organic Carbon (TOC)	%	< 0.1	MCERTS	1.6	1.7	2.1	0.4	2.4
Arsenic (As)	mg/kg	< 2	MCERTS	8	7	8	4	7
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.5	0.4	0.4	0.4	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	24	18	21	8	19
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	19	17	18	18	12
Lead (Pb)	mg/kg	< 3	MCERTS	36	35	41	8	21
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	19	13	15	6	16
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	338	201	195	61	78
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C.
Subcontracted analysis (S)



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Soil Analysis Certificate - Speciated PAHs

DETS Report No: 19-02686	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental L	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Saxon Corner, Emsworth	TP / BH No	Farmyard V1	Farmyard V2	Farmyard V3	Farmyard V4	Farmyard V5
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 04/03/2019	DETS Sample No	392582	392583	392584	392585	392586

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.18	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	0.41	0.65	2.04	1.15	0.78
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.52	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	0.90	1.08	6.03	1.89	1.21
Pyrene	mg/kg	< 0.1	MCERTS	0.74	0.84	5.70	1.51	0.94
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.40	0.40	3.91	0.52	0.35
Chrysene	mg/kg	< 0.1	MCERTS	0.45	0.53	4.66	0.80	0.53
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.58	0.67	5.58	0.81	0.51
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.20	0.20	1.66	0.25	0.16
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.38	0.40	4.10	0.45	0.31
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.26	0.28	2.38	0.25	0.17
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.39	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.20	0.24	1.92	0.19	0.12
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	4.5	5.3	39.1	7.8	5.1

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

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Soil Analysis Certificate - Speciated PAHs

DETS Report No: 19-02686	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Saxon Corner, Emsworth	TP / BH No	Farmyard V6	Farmyard V7	Farmyard V8	Blank Jar	Blank Jar
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 04/03/2019	DETS Sample No	392587	392588	392589	392590	392591

Determinand	Unit	RL	Accreditation	(n)				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	0.45	0.21	0.41	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	0.77	0.46	0.82	< 0.1	0.13
Pyrene	mg/kg	< 0.1	MCERTS	0.62	0.36	0.66	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.23	0.15	0.28	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	0.34	0.21	0.37	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.37	0.21	0.39	< 0.1	0.18
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.13	< 0.1	0.15	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.20	< 0.1	0.20	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	3.1	1.6	3.3	< 1.6	< 1.6

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 19-02686	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental L	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Saxon Corner, Emsworth	TP / BH No	Farmyard V1	Farmyard V2	Farmyard V3	Farmyard V4	Farmyard V5
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 04/03/2019	DETS Sample No	392582	392583	392584	392585	392586

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	16	< 10	< 10
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	3	< 2	< 2
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	24	5	3
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	91	24	< 10
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	118	29	< 21
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	134	< 42	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 19-02686	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental L	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Saxon Corner, Emsworth	TP / BH No	Farmyard V6	Farmyard V7	Farmyard V8	Blank Jar	Blank Jar
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 04/03/2019	DETS Sample No	392587	392588	392589	392590	392591

Determinand	Unit	RL	Accreditation	(n)					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21	< 21
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3	< 3
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21	< 21
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42	< 42	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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Soil Analysis Certificate - BTEX / MTBE

DETS Report No: 19-02686	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental L	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Saxon Corner, Emsworth	TP / BH No	Farmyard V1	Farmyard V2	Farmyard V3	Farmyard V4	Farmyard V5
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 04/03/2019	DETS Sample No	392582	392583	392584	392585	392586

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C.

(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.



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Soil Analysis Certificate - BTEX / MTBE

DETS Report No: 19-02686	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental L	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Saxon Corner, Emsworth	TP / BH No	Farmyard V6	Farmyard V7	Farmyard V8	Blank Jar	Blank Jar
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 04/03/2019	DETS Sample No	392587	392588	392589	392590	392591

Determinand	Unit	RL	Accreditation	(n)				
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C



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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 19-02686	
Wilson Bailey Geotechnical & Environmental Ltd	
Site Reference: Saxon Corner, Emsworth	
Project / Job Ref: None Supplied	
Order No: None Supplied	
Reporting Date: 04/03/2019	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
^ 392582	Farmyard V1	None Supplied	None Supplied	20.4	Brown loamy sand
^ 392583	Farmyard V2	None Supplied	None Supplied	20.4	Brown clayey sand
^ 392584	Farmyard V3	None Supplied	None Supplied	21.2	Brown clayey sand with vegetation
^ 392585	Farmyard V4	None Supplied	None Supplied	19.8	Brown clayey sand
^ 392586	Farmyard V5	None Supplied	None Supplied	18.2	Brown clayey sand
^ 392587	Farmyard V6	None Supplied	None Supplied	18.3	Brown clayey sand
^ 392588	Farmyard V7	None Supplied	None Supplied	25.4	Brown clay with stones
^ 392589	Farmyard V8	None Supplied	None Supplied	24.8	Brown clay with vegetation
^ 392590	Blank Jar	None Supplied	None Supplied	17.8	White chalk
^ 392591	Blank Jar	None Supplied	None Supplied	16.2	Brown clayey sand with vegetation

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{1/2}

Unsuitable Sample ^{1/2}

^ no sampling date provided; unable to confirm if samples are within acceptable holding times



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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 19-02686

Wilson Bailey Geotechnical & Environmental Ltd

Site Reference: Saxon Corner, Emsworth

Project / Job Ref: None Supplied

Order No: None Supplied

Reporting Date: 04/03/2019

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 diphénylcarbazide 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	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 @ 450°C	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 SO ₄) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO ₄) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO ₄) - 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