

Our Ref: ER/SKT/AM /J15857/20112024.let

20 November 2024

The Hunter Group
Nash Manor (Estate Office)
Nutbourne Lane
Nutbourne
West Sussex
RH20 2HS

Southern Testing Laboratories Ltd
Keeble House, Stuart Way
East Grinstead, West Sussex RH19 4QA
t 01342 333100 f 01342 410321
e info@southerntesting.co.uk w southerntesting.co.uk

Directors M W Stevenson BSc MBA CEng CEnv MICE CGeol FGS MconsE (Chairman)
Dr L D Mockett BSc PhD PGDip FGS (Joint Managing Director)
Dr J Kelly BSc PhD DIC (Joint Managing Director)
S F Pratt BSc MSc CGeol FGS DIC
P J Sugden BSc MSc FGS
C Lennard BEng
D Spearman BEng ACSM MSc CGeol FGS EurGeol RoGEP
Co. Secretary P L Noble
Consultant D Illingworth BSc FGS

For the attention of Lee Goossens
(By email: lg@thehuntergroup.co.uk)

Dear Sirs,

Re: Geoenvironmental Investigation at: Land to the West and South West Side of Stonehouse Farm Barn, Handcross Road, Plummers Plain, Horsham, West Sussex, RH13 6NZ
National Grid Reference: TQ 22692 28232
Geology: Made Ground, Upper Tunbridge Wells Sand

1 Authority

Our authority for carrying out this work is contained in a copy of our Project Order Form, which was completed and returned by Phillippa Hallett, on behalf of The Hunter Group, dated 9 October 2024.

2 Background and Objectives

Hunter Group have purchased Stonehouse Farm, with a view to retaining the majority of the land as open fields, or planting woodland, as part of a Habitat Management and Monitoring Plan (HMMP), under the government's Biodiversity Net Gain (BNG) strategy. It is understood that as part of the improvement of the site for wildlife, works may be required along the southern bank of the stream which runs through the centre of the farm.

It is understood that waste material (including building waste and demolition rubble) was historically imported and deposited in a number of areas across the farm, including to the east, the west and south sides of a large modern barn, located on the west side of the site..

It is also understood that a barn on the west side of the site is proposed to be retained, and possibly utilised as a green waste compost processing facility.

Part of the site, comprising the land to the immediate south of the stream, and the stockpiles to the west of the barn, have previously been the subject of intrusive site investigation works, undertaken by ourselves in January 2024, as detailed in our letters ref. ER/SKT/AM/J15630/20240925.let and SKT/LDM/J15630(Rev. 1), dated January 2024, to which the reader is referred.

The object of the investigation was to investigate the land to the side of the barn (west and south west side), in order to determine the nature and extent of the material which has been deposited.



3 Scope

This letter report presents our exploratory hole logs, laboratory test results and our interpretation of these data. As with any site there may be differences in soil conditions between exploratory hole positions.

Any contamination screening values used are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based upon them.

The findings and opinions conveyed via this Site Investigation Report are based on information obtained from a variety of sources as detailed within this report, and which Southern Testing Laboratories Limited believes are reliable. Nevertheless, Southern Testing Laboratories Limited cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

The site investigation was conducted and this report has been prepared for the sole internal use and reliance of The Hunter Group and their appointed Engineers. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Southern Testing Laboratories Limited. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

Recommendations contained in this report may not be appropriate to alternative development schemes.

4 Site Setting

The site is located on the north side of the B2110 Handcross Road, approximately 3.5 km southwest of the village of Handcross. The approximate National Grid Reference of the site is TQ 22692 28232. The site location is indicated on the enclosed Figure 1.

The area subject to this investigation (referred to from here as 'the site'), comprises part of a field, located on the west and south west side of the large barn. See enclosed Figure 2 for details.

4.1 Geology

The British Geological Survey Map No. 302 (1972) indicated that the site geology consists of Tunbridge Wells Sand. The Nuthurst Fault is shown running along the stream, with the Weald Clay, which overlies the Tunbridge Wells Sand, shown to the north.

Tunbridge Wells Sand Formation

The Tunbridge Wells Sand Formation comprises part of the Lower Cretaceous Wealden Group and consists predominantly of fine to medium grained sandstone, siltstone and silty sand rhythms with finely bedded mudstones and thin limestones.

In the western High Weald (between Haywards Heath and Tunbridge Wells) the formation can be divided into three, the informally named Lower and Upper Tunbridge Wells Sand and the intervening Grinstead Clay Member. The succession commences with rhythmically bedded sandstones, siltstones and mudstones of the lower part of the Lower Tunbridge Wells Sand which pass up into the massive sandstones of the Ardingly Sandstone Member. These are overlain by the finely-bedded mudstones, mudstones and silty mudstones with subordinate clay ironstones and shelly limestones of the Grinstead Clay Member. This clay member is itself locally divided into upper and lower parts by the cross-bedded fine sandstone of the Cuckfield Stone Bed. Above the Grinstead Clay Member, the Upper Tunbridge Wells Sand comprises a generally more argillaceous rhythmic succession, including mudstones, siltstones and silty sandstones.

Outside the western High Weald the Grinstead Clay Member is not recognisable and the succession is mapped as undivided Tunbridge Wells Sand Formation. There are a number of minor non-sequences or unconformities throughout the succession and a possible significant gap at the top of the formation that removes much of the Upper Tunbridge Wells Sand.

An important feature of the sandstone is that it is subject to "cambering". On and near steep hill slopes cracks and fissures have been formed because of movement in the underlying Wadhurst Clay. These are usually in two directions, parallel to, and at right angles to, the line of the escarpment, and range from a few mm wide, to a metre wide, or more. The fissures are often infilled with silt but are occasionally open (voids).

4.2 Hydrology and Hydrogeology

The sandstone within the Tunbridge Wells Sand is classified as a Secondary A aquifer, with soils of a high vulnerability, whilst the clay bands form unproductive strata. The site is not situated on or within the vicinity of a ground water source protection zone. Therefore, the groundwater beneath the site would not be considered to be particularly vulnerable.

The stream along the northern boundary of the area under investigation is unnamed. It flows in a westerly direction, forming a tributary to Golding's Stream, which itself flows west, into the River Arun. The stream is would be considered at potential risk from contaminated runoff and leachate arising from the site.

4.3 Site Investigation Works

A representative from Southern Testing attended site on the 21 October 2024, to undertake an intrusive investigation of the soils adjacent to the existing agricultural barn building. The area subject to investigation is shown on the enclosed Figure 2.

At the time of the site works, the area to the west and south of the barn comprised rough grass, the surface of which was uneven and boggy, with occasional pieces of protruding building rubble and areas of standing water.

There was a concrete area of hard standing to the south, which did not form part of the area to be investigated.

The barn was situated on a level area of ground. To the immediate west and south west of the barn, the ground was roughly surfaced with building rubble and gravel. This was overgrown with rough vegetation and grass.

To the rear of the barn the site sloped relatively steeply northwards, down towards the stream.

4.4 Soils as Found

A series of six machine excavated trial holes was dug, in the vicinity of the barn to the west and south west side.

The soils encountered are described in detail in the enclosed exploratory hole logs, but in general comprised a covering of topsoil or Made Ground over Tunbridge Wells Sand. A summary is given below.

Depth (mbgl)	Thickness (m)	Soil Type	Description
GL ≥ 0.5/2.2	0.5-2.2	MADE GROUND	Soft brown silty CLAY with fine to coarse angular to sub-angular flint, brick, concrete, occasional wood, plastic, ceramic tile, carpet, roof slate, concrete fragments and road surfacing.
0.5/2.2 – >2.4		Silty/fine sandy CLAY	Firm to stiff brown-grey mottled silty/fine sandy silty CLAY.

Evidence of possible contamination, in the form of Made Ground, was encountered in all of the trial holes.

Photographs showing these soils are enclosed. No visual or olfactory evidence of any petroleum hydrocarbon or other organic chemical contamination was noted, and no suspected asbestos containing materials were observed.

Groundwater was encountered, as slow groundwater seepages, noted in TP8 at 0.8mbgl, and TP10 at 1mbgl.

5 Laboratory Test Results

The analytical framework adopted for this investigation is made up of a number of procedures, which are outlined below. All of these are based on a Risk Assessment methodology centred on the identification and analysis of Source – Pathway – Receptor linkages.

The CLEA modelⁱ, provides a methodology for quantitative assessment of the long-term risks posed to human health by exposure to contaminated soils. Toxicological data is used to calculate a Soil Guideline Value (SGV) for an individual contaminant, based on the proposed site use; these represent minimal risk concentrations and may be used as screening values.

In the absence of any published SGVs for certain substances, Southern Testing have derived or adopted Tier 1 screening values for initial assessment of the soil, based on available current UK guidance including the LQM/CIEH S4UL'sⁱⁱ and CL:AIRE Soil Generic Assessment Criteriaⁱⁱⁱ. In addition, in 2014, DEFRA^{iv} published the results of a research programme to develop screening values to assist decision making under Part 2A of the Environmental Protection Act. Category 4 screening levels have been published for a number of substances, with reference to human health risk only. This guidance includes revisions of the CLEA exposure parameters, presenting parameters for public open space land use scenarios, and also of the toxicological approach. The screening levels represent a low risk scenario, based on a 'Low Level of Toxicological Concern' rather than the 'Minimal Risk' of CLEA, and the analytical results of this investigation may be considered relative to these levels.

The contamination screening values used are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based upon them. Their validity should be confirmed at the time of site development.

Laboratory test certificates are enclosed, with a summary of the test data provided below.

Made Ground

Six samples of the Made Ground, from depths of 0.3mbgl to 1mbgl, were subject to laboratory analysis for a range of common contaminants.

It is understood that this part of the site is to remain as open land, or possibly planted as woodland. There are no generic tier 1 screening values which apply directly to such a land use. Therefore, given the relatively low concentrations of contaminants present in the samples, the most stringent Tier 1 screening values, for a residential land use including the consumption of home-grown produce have been used for comparative purposes as an initial screening tool.

Contaminants	Units	Range	Mean	Tier 1 Screening Values Residential with home-grown produce consumption
Asbestos Containing Material	/	None detected		No asbestos containing materials (ACMs) or loose fibres.
Arsenic (As) [2] ¹	mg/kg	10-15	12	37
Cadmium (Cd) [2]	mg/kg	<0.2	<0.2	11
Trivalent Chromium (CrIII)* [2]	mg/kg	25-32	28	910
Hexavalent Chromium (CrVI) [2]	mg/kg	<1.8	<1.8	6
Lead (Pb) [3]	mg/kg	55 – 130	88	200
Mercury (Hg) [1,2,7]	mg/kg	<0.3-0.4	0.31	7.6-11
Selenium (Se) [2]	mg/kg	<1.0	<1.0	250
Nickel (Ni) [2,4]	mg/kg	13 – 19	16	130
Copper (Cu) [2,4]	mg/kg	20 – 49	29	2,400
Zinc (Zn) [2,4]	mg/kg	82 – 220	125	3,700
Phenol [1,2]	mg/kg	<1.0	<1.0	120-380
Benzo[a]pyrene [1,5]	mg/kg	2.2 – 4.5	3.1	1.7-2.4
Naphthalene [1,2]	mg/kg	0.08 – 0.24	0.12	2.3-13
Total Cyanide (CN) [6]	mg/kg	<1.0	<1.0	/
Acidity (pH values)	Units	8 – 9.7	8.5	/
Soil Organic Matter	%	2.2 – 3.1	2.7	/

* Assumed as Total Cr minus CrVI

The concentrations of potential contaminants in Made Ground are generally below the Tier 1 screening values for a Residential land use including home-grown produce consumption. The concentrations of potentially phytotoxic metals (copper, nickel and zinc) are also well below the values given in the British Standards for Topsoil and Subsoil (BS3882:2015 and BS8601:2013 respectively).

Levels of PAH compounds (benzo(a)pyrene) would be considered elevated for a residential setting, but as the site is not to be used for residential purposes this would be classed as low risk.

No asbestos containing materials, or loose fibres of asbestos, were detected by the laboratory in the soil samples that were subject to analysis.

No significant concentrations of petroleum hydrocarbons were recorded in the samples.

[1] Where ranges of values are given for organic contaminants the screening value is dependent on the Soil +Organic Matter.

[2] LQM/CIEH S4UL (2014). Copyright Land Quality Management Ltd. reproduced with permission; Publication Number S4UL 3116. All rights reserved.

[3] C4SL (DEFRA 2014).

[4] Copper, Zinc and Nickel may have phototoxic effects at the given concentrations. Alternative criteria should be adopted for importation of Topsoil or other soils for cultivation. BS3882:2015 and BS8601:2013 suggest values of 200 to 300mg/kg for Zn, 100 to 200mg/kg for Cu, and 60 to 110mg/kg for Ni, for topsoil and subsoil, depending on pH.

[5] Based on the Surrogate Marker approach and modelled using the modified exposure parameters of C4SL but retaining 'minimal risk' HCV.

[6] Screening criteria derived on a site specific basis if test results indicate.

[7] S4UL for Methyl Mercury, higher concentrations may be tolerable if inorganic mercury is the only species present. Lower concentrations apply for elemental Mercury.

6 Discussion

It is understood that it is proposed to undertake improvement works across the land as a whole, belonging to Stonehouse Farm, with a view to retaining the majority of the fields as open land, or planting woodland, as part of a Habitat Management and Monitoring Plan (HMMP), under the government's Biodiversity Net Gain (BNG) strategy.

6.1 Deposited Material (Made Ground)

The trial holes excavated to the west and south west side of the barn indicated that the imported material has been placed to depths of between 0.5mbgl to 2.2mbgl, with the depth of the material placed becoming deeper from east to west, in keeping with the anticipated natural topography of the area. The Made Ground layer is 0.5m – 2.2m thick, and was seen to be overlying the natural Tunbridge Wells Sand materials.

The Made Ground comprised re-worked soft brown silty clay with variable amounts of anthropogenic material, including flint, brick, concrete, occasional wood, plastic, ceramic tile, concrete fragments and road surfacing. It appears that this material had been loose tipped, with no obvious signs of any compaction being undertaken, or laying of different materials.

With the exception of the presence of anthropogenic material, no visual or olfactory evidence of potential contamination, such as asbestos containing material, petroleum hydrocarbons or other odorous or stained materials were found during the intrusive works. Laboratory analysis of selected samples of the Made Ground recorded low concentrations of the potential contaminants tested for, which (in the absence of any applicable generic screening values for the type of land use proposed for the site) were well below the most stringent tier 1 screening values. No asbestos containing materials, or loose asbestos fibres, were detected by the laboratory.

7 Conclusions

A significant volume of material, consisting of reworked clay with variable amounts of anthropogenic material, has been deposited across the site. The intrusive investigation works, and subsequent laboratory analysis of selected samples undertaken to date, have not identified any significant contamination within this material. However, it should be noted that given the significant volume of material, and its unknown origin, it is possible that more onerous contamination could be present in discreet pockets.

If you have any queries or we can be of further assistance, please do not hesitate to contact us.

Yours faithfully,



Eliza Richardson BSc (Hons) ARSM MSc FGS

For and on behalf of

Southern Testing Laboratories Limited

DDI: 01342 333 160

Email: erichardson@southerntesting.co.uk

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Figure 1 – Site location

Figure 2 – Site plan & trial hole locations

Photographs

Exploratory hole logs

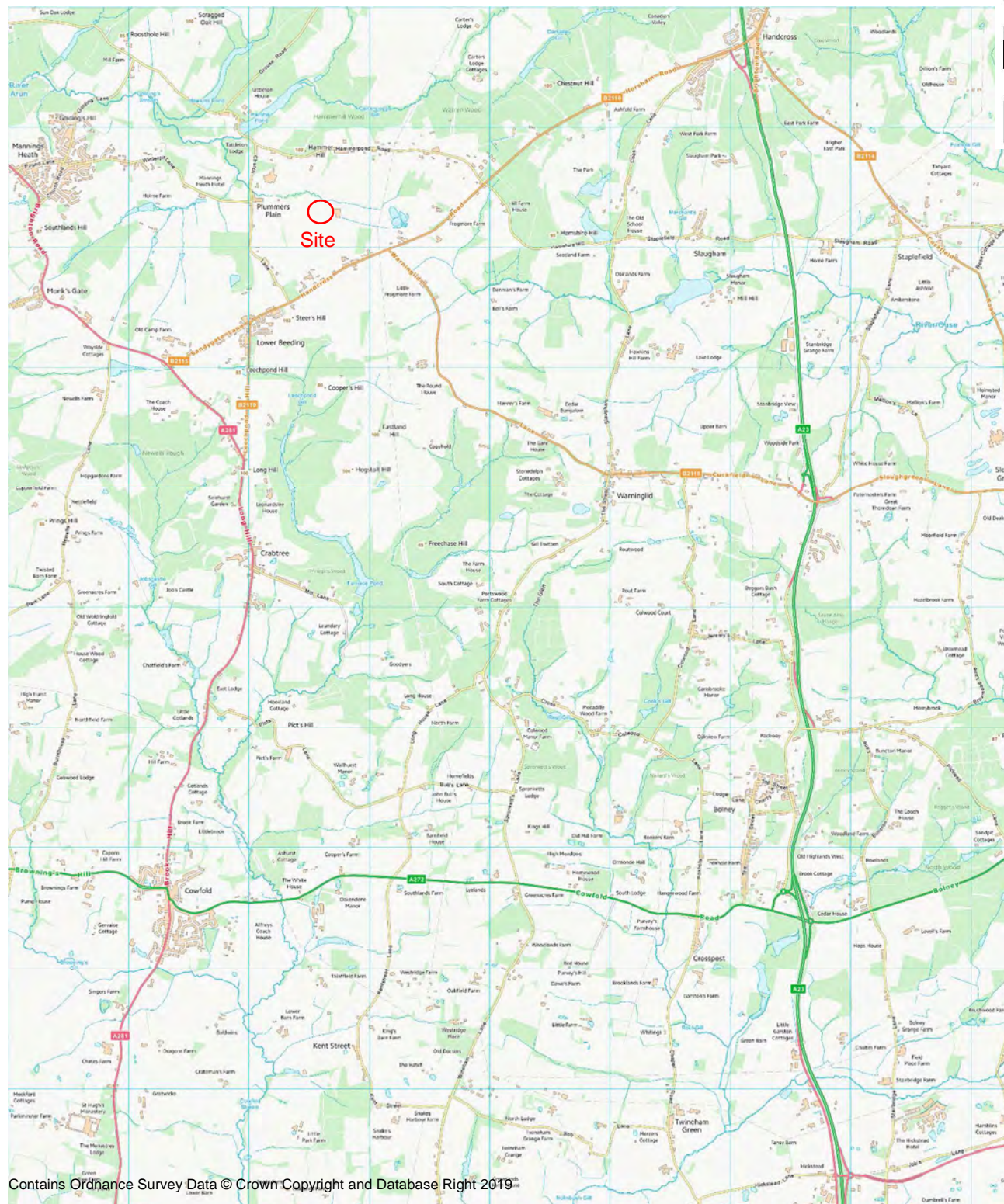
Laboratory test certificates

ⁱ Environment Agency, "Updated technical background to the CLEA model," 2009.

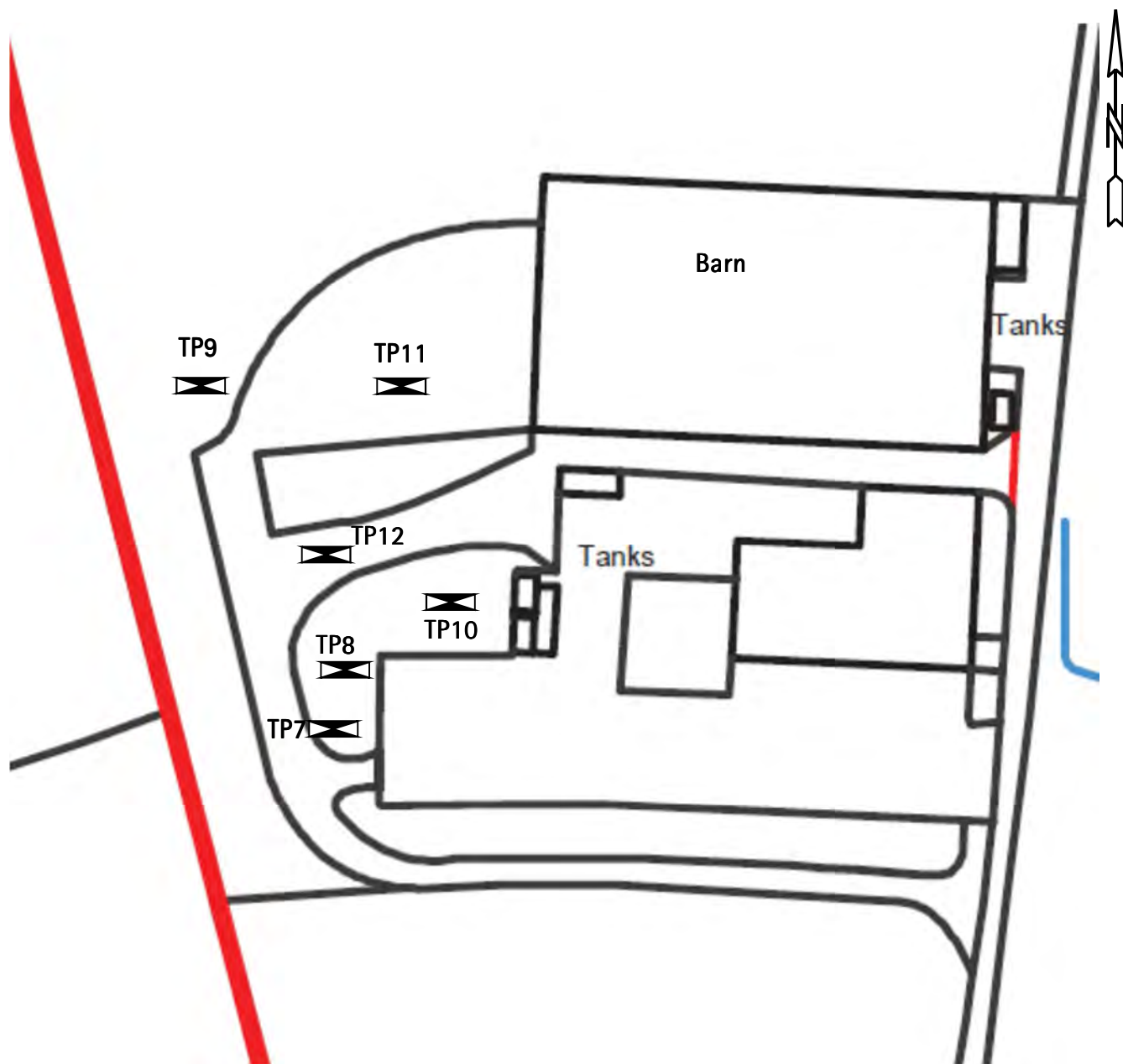
ⁱⁱ C. Nathanail, C. McCaffrey, A. Gillett and R. & N. J. Ogden, "The LQM/CIEH S4ULs for Human Health Risk Assessment," Land Quality Press, Nottingham, 2015.

ⁱⁱⁱ EIC/AGS/CL:AIRE, "Soil Generic Assessment Criteria for Human Health Risk Assessment," 2010

^{iv} DEFRA, "SP1010 Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination," 2014



Site:	Land to the South and South West of Stonehouse Farm, Handcross Road, Plummers Plain, Horsham, RH13 6NZ	Project ID	J15857
Figure 1	Site Location Plan	Date:	11/2024



 Trial pit location

NB: Positions of Trial Pits are only indicative unless dimensioned

Site: Land West and South West Stonehouse Farm Barn, Handcross Road,
Plummers Plain, Horsham, RH13 6NZ

STL: J15857

Fig No: 2

Date: 19 November 2024

Trial Hole Location Plan – Not to Scale

Land to the South Side of Stonehouse Farm Barn, Horsham



Plate 1: Hard standing to south of barns.



Plate 2: East.



Plate 3: Barn to north.



Plate 4: North.



Plate 5: West.



Plate 6: Inside barn, with floor levelled.

Land to the South Side of Stonehouse Farm Barn, Horsham



Plate 7: Corner of barn.



Plate 8: East.



Plate 9: West.



Plate 10: North.



Plate 11: North.



Plate 12: West side of barn.

Land to the South Side of Stonehouse Farm Barn, Horsham



Plate 13: North.



Plate 14: South east.



Plate 15: South side of site.

Land to the South Side of Stonehouse Farm Barn, Horsham



Plate 1: TP7.



Plate 2: TP8.



Plate 3: TP8 arisings.



Plate 4: TP9.



Plate 5: TP11.



Plate 6: TP11.

Land to the South Side of Stonehouse Farm Barn, Horsham



Plate 7: TP11 arisings.




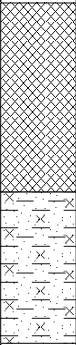
Plate 8: TP11 arisings.



Plate 9: TP10.




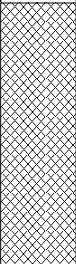
Plate 10: TP10 arisings.

				Start - End Date:		Project ID:		Hole Type:		TP7	
				21/10/2024		J15857		TP		Sheet 1 of 1	
Client:						Co-ordinates:		Level (m AOD)		Logger:	
Project Name:						Land to the South Side of Stonecross Farm		Location:		Stonecross Farm, Hand Cross, RH13	
Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description				
Depth (m bgl)	Type	Results									
0.30	ES	UCS(kPa)=300 UCS(kPa)=		(0.50) (0.40)		0.50 0.90	Soft brown sandy silty CLAY with some to frequent angular fine to coarse gravel of brick, concrete. flint and sandstone, occasional block, tile and slag noted Made Ground				
0.60	HP						Firm brown fissured silty CLAY				
0.70	ES										
0.80	HP						Pit terminated at 0.90m				
Pit Dimension (m)		Pit Stability:					Water Strikes				
		Weather:					Depth (m)		Date/Time		Remarks
Width:		Remarks:									
Length:											
Depth:	0.90										
Status:		FINAL		Log Print Date and Time:		11/11/2024 10:47		Log Approved By:			

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Stonecross Farm, Hand Cross, RH13

Pit Dimension (m)		Pit Stability:	unstable			Water Strikes		
		Weather:				Depth (m)	Date/Time	Remarks
Width:	0.60	Remarks: perched water/groundwater at 1.0mbgl, slow seepage				1.00	21/10/2024 00:00:00	slow
Length:	2.50							
Depth:	2.10							
Status:		FINAL	Log Print Date and Time:	11/11/2024 10:47		Log Approved By:		

<div></div>				Start - End Date:		Project ID:		Hole Type:		TP11		
				21/10/2024		J15857		TP		Sheet 1 of 1		
Client:						Co-ordinates:		Level (m AOD)		Logger:		
Project Name:						Land to the South Side of Stonecross Farm		Location:		Stonecross Farm, Hand Cross, RH13		
Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description					
Depth (m bgl)	Type	Results										
1.00	ES			(0.70)		0.70	Soft brown silty sandy CLAY with frequent fine to coarse angular gravel of brick, roof slate, concrete, wood Made Ground					
							Loose fine to coarse angular gravel of brick, cinder blocks, concrete, brickwork blocks Made Ground					
						(1.50)	2.20	Firm brown fissured silty CLAY				
								(0.20)	2.40	Pit terminated at 2.40m		
Pit Dimension (m)		Pit Stability:		unstable		Water Strikes						
		Weather:				Depth (m)		Date/Time		Remarks		
Width:	1.00	Remarks: concrete slab encountered, T shaped trial pit										
Length:	4.00											
Depth:	2.20											
Status:		FINAL		Log Print Date and Time:		11/11/2024 10:47		Log Approved By:				



Southern Testing Laboratories Ltd
Keeble House
Stuart Way
East Grinstead
West Sussex
RH19 4QA

t: 01342 333100
e: erichardson@southerntesting.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 24-049440-2B

Replaces Analytical Report Number: 24-049440, issue no. 1
Report format change.
Report split as per client request.

Project / Site name:	Land South Side of Stonehouse Farm Barn, Horsham	Samples received on:	23/10/2024
Your job number:	J15857	Samples instructed on/ Analysis started on:	23/10/2024
Your order number:	J15857_1A	Analysis completed by:	07/11/2024
Report Issue Number:	2B	Report issued on:	11/11/2024
Samples Analysed:	7 soil samples		

Signed: _____

Adan Cazas Garcia
Key Account Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



Analytical Report Number: 24-049440-2B
Project / Site name: Land South Side of Stonehouse Farm Barn, Horsham
Your Order No: J15857_1A

Lab Sample Number	356671	356672	356673	356674	356675
Sample Reference	TP3	TP8	TP8	TP9	TP10
Sample Number	ES	ES	ES	ES	ES
Depth (m)	0.70	0.30	0.70	0.30	1.00
Date Sampled	21/10/2024	21/10/2024	21/10/2024	21/10/2024	21/10/2024
Time Taken	1100	1100	1100	1130	1200
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	17	14	16	19	13
Total mass of sample received	kg	0.1	NONE	0.1	0.1	0.1	0.1	0.1

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SCA	MJN	MJN	MJN	MJN

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.4	8.2	8	8.8	8.4
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	4100	640	4300	1500	600
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	2.07	0.32	2.13	0.737	0.3
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	2070	320	2130	737	300
Sulphide	mg/kg	1	MCERTS	21	5.9	23	3.1	11
Organic Matter (automated)	%	0.1	MCERTS	2.7	2.6	2.9	3	2.2

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.08	0.08	0.18	0.2	0.13
Acenaphthylene	mg/kg	0.05	MCERTS	0.13	0.36	0.25	0.16	0.25
Acenaphthene	mg/kg	0.05	MCERTS	0.47	0.22	0.51	0.37	0.39
Fluorene	mg/kg	0.05	MCERTS	0.46	0.34	0.41	0.46	0.47
Phenanthrene	mg/kg	0.05	MCERTS	4.1	3.1	4.6	3.7	4.7
Anthracene	mg/kg	0.05	MCERTS	1.7	1	1.4	0.85	1.2
Fluoranthene	mg/kg	0.05	MCERTS	8.2	6.9	9.7	4.5	7.3
Pyrene	mg/kg	0.05	MCERTS	7.2	6.3	8.1	3.8	6.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.2	3.7	3.9	2	3.2
Chrysene	mg/kg	0.05	MCERTS	2.8	3.2	3.6	1.7	3.1
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	4.8	5	5.5	2.8	4.4
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1.2	2.1	1.6	0.74	1.7
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.6	4.5	4.2	2.2	3.7
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.6	2.1	1.9	1.1	1.8
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.39	0.61	0.45	0.27	0.45
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.8	2.4	2.1	1.2	2

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	41.9	41.9	48.4	26	41
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Analytical Report Number: 24-049440-2B
Project / Site name: Land South Side of Stonehouse Farm Barn, Horsham
Your Order No: J15857_1A

Lab Sample Number				356671	356672	356673	356674	356675
Sample Reference				TP3	TP8	TP8	TP9	TP10
Sample Number				ES	ES	ES	ES	ES
Depth (m)				0.70	0.30	0.70	0.30	1.00
Date Sampled				21/10/2024	21/10/2024	21/10/2024	21/10/2024	21/10/2024
Time Taken				1100	1100	1100	1130	1200
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	12	11	12	10
Boron (water soluble)	mg/kg	0.2	MCERTS	2.5	1.4	4.1	1.6	1.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	0.4	0.4	0.5	0.3
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	26	25	30	32
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	23	24	24	23
Lead (aqua regia extractable)	mg/kg	1	MCERTS	57	70	120	62	55
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	16	14	15	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	42	40	38	55	37
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	86	89	130	110	82

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	< 0.010	-	-
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	< 0.010	-	-
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	< 0.010	-	-
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	-	-	< 1.0	-	-
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	-	-	3.5	-	-
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	-	15	-	-
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	-	89	-	-
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	-	-	110	-	-

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	-	< 0.010	-	-
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	-	< 0.010	-	-
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	-	-	< 0.020	-	-
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	-	-	2.3	-	-
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	-	-	8.5	-	-
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	-	40	-	-
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	-	94	-	-
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	-	-	140	-	-

TPH Total >EC6 - EC40 _{EH_CU+HS_1D_TOTAL}	mg/kg	10	NONE	120	98	330	120	61
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Petroleum Range Organics (EC6 - EC10) _{HS_1D_TOTAL}	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (EC10 - EC40) _{EH_CU_1D_TOTAL}	mg/kg	10	MCERTS	120	98	330	120	61

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	-	-	< 5.0	-	-
Benzene	µg/kg	5	MCERTS	-	-	< 5.0	-	-
Toluene	µg/kg	5	MCERTS	-	-	< 5.0	-	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	< 5.0	-	-
p & m-Xylene	µg/kg	8	MCERTS	-	-	< 8.0	-	-
o-Xylene	µg/kg	5	MCERTS	-	-	< 5.0	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



Analytical Report Number: 24-049440-2B
Project / Site name: Land South Side of Stonehouse Farm Barn, Horsham
Your Order No: J15857_1A

Lab Sample Number				356676	356677
Sample Reference				TP11	TP12
Sample Number				ES	ES
Depth (m)				1.00	0.40
Date Sampled				21/10/2024	21/10/2024
Time Taken				1200	1300
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	17
Total mass of sample received	kg	0.1	NONE	0.1	0.1

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.3	9.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	990	3600
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.496	1.8
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	496	1800
Sulphide	mg/kg	1	MCERTS	120	25
Organic Matter (automated)	%	0.1	MCERTS	2.5	3.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.24	0.08
Acenaphthylene	mg/kg	0.05	MCERTS	0.42	0.19
Acenaphthene	mg/kg	0.05	MCERTS	0.44	0.15
Fluorene	mg/kg	0.05	MCERTS	0.7	0.17
Phenanthrene	mg/kg	0.05	MCERTS	4.8	2.9
Anthracene	mg/kg	0.05	MCERTS	1.4	0.76
Fluoranthene	mg/kg	0.05	MCERTS	7.8	6
Pyrene	mg/kg	0.05	MCERTS	6.6	5.1
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.6	2.9
Chrysene	mg/kg	0.05	MCERTS	3.1	2.7
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	4.6	3.9
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	2.1	1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	4.1	2.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2	1.3
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.5	0.4
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.2	1.4

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	44.6	31.8
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Analytical Report Number: 24-049440-2B
Project / Site name: Land South Side of Stonehouse Farm Barn, Horsham
Your Order No: J15857_1A

Lab Sample Number				356676	356677
Sample Reference				TP11	TP12
Sample Number				ES	ES
Depth (m)				1.00	0.40
Date Sampled				21/10/2024	21/10/2024
Time Taken				1200	1300
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	15
Boron (water soluble)	mg/kg	0.2	MCERTS	2.6	3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.5	0.5
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30	29
Copper (aqua regia extractable)	mg/kg	1	MCERTS	49	39
Lead (aqua regia extractable)	mg/kg	1	MCERTS	120	130
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	19
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	42	45
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	160	220

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	-	-
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	-	-
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	-
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	-
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	-	-

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	-
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	-
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	-	-
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	-	-
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	-	-
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	-
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	-
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	-	-

TPH Total >EC6 - EC40 _{EH_CU+HS_1D_TOTAL}	mg/kg	10	NONE	95	240
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Petroleum Range Organics (EC6 - EC10) _{HS_1D_TOTAL}	mg/kg	1	ISO 17025	< 1.0	< 1.0
TPH (EC10 - EC40) _{EH_CU_1D_TOTAL}	mg/kg	10	MCERTS	95	240

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	-	-
Benzene	µg/kg	5	MCERTS	-	-
Toluene	µg/kg	5	MCERTS	-	-
Ethylbenzene	µg/kg	5	MCERTS	-	-
p & m-Xylene	µg/kg	8	MCERTS	-	-
o-Xylene	µg/kg	5	MCERTS	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



Analytical Report Number : 24-049440-2B
Project / Site name: Land South Side of Stonehouse Farm Barn, Horsham

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
356671	TP3	ES	0.7	Brown loam and clay with gravel and vegetation
356672	TP8	ES	0.3	Brown clay and loam with gravel and vegetation
356673	TP8	ES	0.7	Brown loam and clay with gravel and vegetation
356674	TP9	ES	0.3	Brown clay and loam with gravel and vegetation
356675	TP10	ES	1	Brown clay and loam with gravel
356676	TP11	ES	1	Brown clay and loam with gravel and brick
356677	TP12	ES	0.4	Brown loam and clay with gravel and vegetation

Analytical Report Number : 24-049440-2B
Project / Site name: Land South Side of Stonehouse Farm Barn, Horsham

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	In-house method	L010-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088-PL	D/W	MCERTS
Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS	In-house method	L076B/L088-PL	D/W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS



Analytical Report Number : 24-049440-2B
Project / Site name: Land South Side of Stonehouse Farm Barn, Horsham

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined aravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution