

Hill Holdings Ltd
The Power House
Gunpowder Mill
Powdermill Lane
Waltham Abbey, Essex
EN9 1BN

Jag Bains
Technical Manager - JagBains@hill.co.uk

23 November 2023

Subject: The Roundway – Verification of clean cover requirements
Our ref: L-21914m-2.4.2-23-866-BA

Dear Mr Bains,

IDOM Merebrook (IDOM) has been commissioned by Hill Holdings Limited to undertake the validation of clean cover at The Roundway, Tottenham N17 7HE. IDOM previously undertook preliminary site investigation works to advise on the geo-environmental implications of the redevelopment of the site for the proposed end use. The proposed development consists of 5 residential apartments for the homeless, with communal landscaped areas. IDOM produced the following report for submission:

- 1) IDOM Merebrook; Ermine Road, Geoenvironmental Assessment Report; ref. GEA-21914m-22-463 (RevA); dated December 2022.

Contamination of soils by metals and PAH compounds was reported. As a result, mitigation measures in the form of clean soils in areas of soft landscaping were recommended. This should include 300 mm of clean validated soil, to incorporate a minimum of 150 mm validated topsoil in communal landscaped areas. A greater thickness, 600 mm of clean soil will be required for any private gardens. This was recommended in letter L-21914m-2.4.2-23-251-RJG dated 8 March 2023.

Clean cover validation

IDOM attended site on 16th October 2023 to undertake validation of the communal landscaped areas around the 5 plots. This comprised the excavation of hand-dug pits at two locations, MHP101 and MHP102. In addition, samples of topsoil were recovered.

The trial pits were extended to a depth of 400 mm below ground level and encountered topsoil. The topsoil was described as a brown sandy gravelly clay, with at least 300 mm present in each pit. A photographic record of the inspection pits is appended to this letter.

Samples recovered from the two hand pits were submitted to a UKAS/MCERTS accredited laboratory for analysis of a broad spectrum of contaminants. After testing, the sample MHP101-ES exceeded the screening value for Dibenzo(a,h)anthracene of 0.31 mg/kg, with a concentration of 0.33 mg/kg.

As a result, additional soil samples were collected to understand the variability of the soil chemistry. A second round of sampling was carried out on 6th November 2023. Six additional samples were taken of the topsoil in the landscaped areas (MHP1- MHP6). Soils were described as brown sandy gravelly clay and were consistent with those previously samples.

Subject: The Roundway – Ground gas mitigation and clean cover requirements
Our ref: L-21914m-2.4.2-23-251-RJG
Page: 2/2

IDOM

Chemical data was also consistent with the previous samples. The maximum recorded concentration of Dibenzo(a,h)anthracene was 0.31 mg/kg from MHP3. Given the consistent nature of the soils, applying an average across the dataset is appropriate (the data set is not large enough for more detailed statistical analysis). From the two data sets, the average concentration for Dibenzo(a,h)anthracene was 0.25 mg/kg, which is below the screening value of 0.31 mg/kg.

In addition, to this all other tested contaminants were below the screening values protective of human health. The laboratory analytical certificates (References: 23-68041 and 23-67577) are appended to this letter report.

In conclusion, the cover soils placed in landscaped areas of The Roundway were found to be of a suitable chemical quality and had generally been placed to an appropriate thickness.

I trust the above and attached are suitable for your current requirements. If you have any queries, please do not hesitate to contact me.

Yours sincerely



Ben Alexander
For IDOM Merebrook Ltd

Enclosed:

- i. Laboratory certificates
- ii. Photographs

Rob Glavin
Merebrook
First Floor
1 Leonard Place
Westerham Road
Keston
BR2 6HQ

t: 01689 889980
f: 01689 889981
e: rqlavin@idom.com

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 : 23-62847

Project / Site name:	Roundways, Tottenham	Samples received on:	16/10/2023
Your job number:	21914M	Samples instructed on/ Analysis started on:	16/10/2023
Your order number:	23-2-FDO-LABS	Analysis completed by:	23/10/2023
Report Issue Number:	1	Report issued on:	23/10/2023
Samples Analysed:	2 soil samples		



Signed: _____

Anna Goc
PL Head of Reporting Team
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: 23-62847
 Project / Site name: Roundways, Tottenham
 Your Order No: 23-2-FDO-LABS

Lab Sample Number				2846874	2846875
Sample Reference				MHP101-ES	MHP102-ES
Sample Number				None Supplied	None Supplied
Depth (m)				0.20	0.20
Date Sampled				16/10/2023	16/10/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	9.3
Total mass of sample received	kg	0.001	NONE	0.6	0.6

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8	8.5
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.615	0.0503
Organic Matter (automated)	%	0.1	MCERTS	3.5	2.5
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2	1.5

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.12	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.11	0.11
Acenaphthene	mg/kg	0.05	MCERTS	0.15	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.15	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.4	0.41
Anthracene	mg/kg	0.05	MCERTS	0.52	0.15
Fluoranthene	mg/kg	0.05	MCERTS	3.8	1.4
Pyrene	mg/kg	0.05	MCERTS	3.7	1.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.1	0.87
Chrysene	mg/kg	0.05	MCERTS	2.1	0.85
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	2.6	1.5
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1.3	0.5
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.5	1.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.3	0.66
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.33	0.19
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.4	0.73

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	23.5	9.8
-----------------------------	-------	-----	-----------	------	-----

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	9
Barium (aqua regia extractable)	mg/kg	1	MCERTS	86	67
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	21	17
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	36	37
Lead (aqua regia extractable)	mg/kg	1	MCERTS	130	52
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	14
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	31	28
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	92

Analytical Report Number: 23-62847
 Project / Site name: Roundways, Tottenham
 Your Order No: 23-2-FDO-LABS

Lab Sample Number				2846874	2846875
Sample Reference				MHP101-ES	MHP102-ES
Sample Number				None Supplied	None Supplied
Depth (m)				0.20	0.20
Date Sampled				16/10/2023	16/10/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	11	< 8.0
TPH-CWG - Aliphatic >EC35 - EC40 _{EH_CU_1D_AL}	mg/kg	10	NONE	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	11	< 10

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	36	10
TPH-CWG - Aromatic >EC35 - EC40 _{EH_CU_1D_AR}	mg/kg	10	NONE	13	12
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	45	13
TPH Total C5 - C40 _{EH_CU+HS_1D_TOTAL}	mg/kg	10	NONE	72	28

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

Analytical Report Number : 23-62847

Project / Site name: Roundways, Tottenham

* 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 *
2846874	MHP101-ES	None Supplied	0.2	Brown clay and loam with gravel and vegetation.
2846875	MHP102-ES	None Supplied	0.2	Brown clay and loam with gravel and vegetation.

Analytical Report Number : 23-62847

Project / Site name: Roundways, Tottenham

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
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.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
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	A001-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
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 (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	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
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.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. Refer to CoA for band specific accreditation.	In-house method with silica gel split/clean up.	L088/76-PL	D	MCERTS

Analytical Report Number : 23-62847

Project / Site name: Roundways, Tottenham

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
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	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

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 gravimetrically 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 - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Rob Glavin

Merebrook
First Floor
1 Leonard Place
Westerham Road
Keston
BR2 6HQ

t: 01689 889980
f: 01689 889981
e: rqlavin@idom.com

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 : 23-67577

Project / Site name:	Roundways Tottenham	Samples received on:	08/11/2023
Your job number:	21914M	Samples instructed on/ Analysis started on:	08/11/2023
Your order number:	23-2-FDO-LABS	Analysis completed by:	16/11/2023
Report Issue Number:	1	Report issued on:	16/11/2023
Samples Analysed:	6 soil samples		

**Signed:**

Joanna Szwagrzak
Reporting Specialist
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: 23-67577
Project / Site name: Roundways Tottenham
Your Order No: 23-2-FDO-LABS

Lab Sample Number				2871680	2871681	2871682	2871683	2871684
Sample Reference				MHP1	MHP2	MHP3	MHP4	MHP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				06/11/2023	06/11/2023	06/11/2023	06/11/2023	06/11/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	18	15	18	19	13
Total mass of sample received	kg	0.001	NONE	0.5	0.5	0.5	0.6	0.5

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.6	8.2	8.1	7.8	8.3
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0539	0.214	0.0452	0.0258	0.0367
Organic Matter (automated)	%	0.1	MCERTS	5	4	3.6	2	3.2
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.9	2.3	2.1	1.1	1.9

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.15	0.05	0.09	< 0.05	0.12
Acenaphthylene	mg/kg	0.05	MCERTS	0.11	0.06	0.1	< 0.05	0.1
Acenaphthene	mg/kg	0.05	MCERTS	0.09	0.14	0.13	< 0.05	0.15
Fluorene	mg/kg	0.05	MCERTS	0.09	0.16	0.14	< 0.05	0.15
Phenanthrene	mg/kg	0.05	MCERTS	1.3	1.9	2.4	0.2	1.5
Anthracene	mg/kg	0.05	MCERTS	0.26	0.52	0.5	0.05	0.41
Fluoranthene	mg/kg	0.05	MCERTS	3.2	3.7	5.2	0.42	3.2
Pyrene	mg/kg	0.05	MCERTS	2.9	3.3	4.6	0.4	2.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.7	1.9	2.7	0.24	1.7
Chrysene	mg/kg	0.05	MCERTS	1.7	1.8	2.7	0.26	1.7
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	2.4	2.3	3.1	0.31	2.2
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1	1.1	1.5	0.14	0.95
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2	2	2.7	0.26	2.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.1	1.1	1.5	0.15	0.91
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.24	0.21	0.31	< 0.05	0.28
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.4	1.2	1.6	0.19	1.2

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	19.6	21.5	29.2	2.62	19.4
-----------------------------	-------	-----	-----------	------	------	------	------	------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	14	20	19	10
Barium (aqua regia extractable)	mg/kg	1	MCERTS	150	75	190	160	79
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	23	15	35	40	20
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	16	35	40	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	110	29	89	56	32
Lead (aqua regia extractable)	mg/kg	1	MCERTS	180	56	200	94	53
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	23	15	29	40	15
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	44	29	58	73	31
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	270	95	300	120	84

Analytical Report Number: 23-67577
Project / Site name: Roundways Tottenham
Your Order No: 23-2-FDO-LABS

Lab Sample Number	2871680	2871681	2871682	2871683	2871684
Sample Reference	MHP1	MHP2	MHP3	MHP4	MHP5
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	06/11/2023	06/11/2023	06/11/2023	06/11/2023	06/11/2023
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC35 - EC40 EH_CU_1D_AL	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0	3.7	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	10	14	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	32	36	< 10	< 10	19
TPH-CWG - Aromatic >EC35 - EC40 EH_CU_1D_AR	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	NONE	44	54	15	< 10	22
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	53	64	15	< 10	30

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

Analytical Report Number: 23-67577
Project / Site name: Roundways Tottenham
Your Order No: 23-2-FDO-LABS

Lab Sample Number				2871685
Sample Reference				MHP6
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				06/11/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	14
Total mass of sample received	kg	0.001	NONE	0.5

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.4
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0809
Organic Matter (automated)	%	0.1	MCERTS	3.7
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.2

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.07
Acenaphthene	mg/kg	0.05	MCERTS	0.08
Fluorene	mg/kg	0.05	MCERTS	0.06
Phenanthrene	mg/kg	0.05	MCERTS	0.95
Anthracene	mg/kg	0.05	MCERTS	0.26
Fluoranthene	mg/kg	0.05	MCERTS	2
Pyrene	mg/kg	0.05	MCERTS	1.8
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.2
Chrysene	mg/kg	0.05	MCERTS	1.2
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1.7
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.67
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.74
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.2
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.98

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	13.4
-----------------------------	-------	-----	-----------	------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	85
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (III)	mg/kg	1	NONE	21
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	39
Lead (aqua regia extractable)	mg/kg	1	MCERTS	60
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	33
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	93

Analytical Report Number: 23-67577
 Project / Site name: Roundways Tottenham
 Your Order No: 23-2-FDO-LABS

Lab Sample Number				2871685
Sample Reference				MHP6
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				06/11/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Monoaromatics & Oxygenates				
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	5	MCERTS	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.02	NONE	< 0.020
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.02	NONE	< 0.020
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.05	NONE	< 0.050
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC35 - EC40 EH_CU_1D_AL	mg/kg	10	NONE	< 10
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	NONE	< 10

TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	NONE	< 0.010
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	NONE	< 0.010
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.05	NONE	< 0.050
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	4.2
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	21
TPH-CWG - Aromatic >EC35 - EC40 EH_CU_1D_AR	mg/kg	10	NONE	< 10
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	NONE	34
TPH Total C5 - C40 EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	47

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

Analytical Report Number : 23-67577

Project / Site name: Roundways Tottenham

* 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 *
2871680	MHP1	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
2871681	MHP2	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
2871682	MHP3	None Supplied	None Supplied	Brown clay and loam with gravel and vegetation.
2871683	MHP4	None Supplied	None Supplied	Brown clay with gravel and vegetation.
2871684	MHP5	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
2871685	MHP6	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.

Analytical Report Number : 23-67577
Project / Site name: Roundways Tottenham

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
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.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
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 (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	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
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.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L0738-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. Refer to CoA for band specific accreditation.	In-house method with silica gel split/clean up.	L088/76-PL	D	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	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

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 gravimetrically 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.

Analytical Report Number : 23-67577
Project / Site name: Roundways Tottenham

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
----------------------	-------------------------------	-----------------------------	---------------	--------------------	----------------------

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 - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total



Plate 1: MHP101 – 350mm of topsoil



Plate 2: MHP102 – 450mm of topsoil.