



4046-04 / JH

9th April 2025

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BRIGHAM STREET, OPENSHAW – NAPHTHALENE HOTSPOT DELINEATION

Introduction

This Validation Report has been prepared at the request of John Southworth Ltd. Instructions to proceed with this report were received in February 2025. The c. 0.52 Ha site is located to the west of Brigham Street, Openshaw, Manchester at the approximate postcode M11 2JR. The National Ordnance Survey grid reference for the centre of the site is 388229E, 397811N.

This report follows, and should be read in conjunction with, the following reports:

- Curtins '*Brigham Street - Phase 2 Ground Investigation*' (ref: 081427-CUR-00-XX-RP-GE-00002, dated: 24th July 2023)
- IGE Consulting Ltd., '*Remediation Strategy – Land off Brigham Street, Openshaw*' (ref: 4046-02, dated: 17th November 2023).

This validation report concerns Item 1 of the above referenced Remediation Strategy - 'Naphthalene Delineation (TT01)'.

Remedial Requirements

The above referenced Curtins Phase 2 Ground Investigation recorded a marginal naphthalene exceedance in TT01. It would be prudent to delineate Naphthalene (SVOC) exceedance in TT01 for further assessment. Subject to findings it could then be retained on site within a suitable area such as beneath hardstanding or soft landscaping in accordance with an MMP or disposed of off-site.

Material deemed to be impacted through either visual or olfactory observations or as a result of notable PID readings (> 50 ppm) will be excavated and stockpiled on an impermeable membrane. The membrane will be placed upon a clay containment bund and covered to negate the risk of soils leaching and dispersal of any odours and/or vapours.

An IGE engineer will regularly monitor the stockpiled material with a PID to determine the need for boundary monitoring (albeit not anticipated). This material will then be subject to detailed laboratory analysis to determine the suitability for reuse or the requirements for off-site disposal.



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The chemical testing suite will consist of naphthalene, TPH-CWG and SOM as contaminants of concern.

Upon completion of the delineation and excavation, the sides and base of the resulting void(s) where impacted material is present will be chemically validated to confirm that no impacted materials remain in situ.

Validation samples will be collected at c 5 - 10 linear metre centres from the side and base of the excavation. The results of this validation testing will be directly compared to the GACs noted above to demonstrate that no unacceptable level of risk to human health, controlled waters or the wider environment remains.

Validation Requirements

Documentation of the delineation exercise will consist of:

- Plans and logs of excavated materials
- Depths and IDs of sample locations
- Provision of PID results of in-situ and stockpiled materials
- Chemical testing of the excavated materials and 'in-situ' validated hotspot 'walls'
- Volumetrics of impacted material
- Strategy for re-use / disposal at the site

Remedial Works

The site was visited on 26th February 2025 to supervise and validate the naphthalene hotspot removal and delineation works on site. Excavation works commenced around TT01 with predominantly dark, ashy material removed down to c. 1.00m bgl. The excavation was limited in the northern and western directions due to the site boundary, as illustrated in Figure 1 which shows part of the excavation. No visual or olfactory evidence of contamination was encountered during the excavation works and no PID readings greater than 10ppm were recorded during regular testing during works. A sample of the excavated material (Sample B) was obtained, alongside a sample of natural material at the base of the excavation (Sample A) and on the south eastern side of the excavation (Sample C).

In total, c. 100m³ of material was excavated and stockpiled awaiting chemical testing results. The samples were analysed by i2 Analytical and subsequently assessed by IGE Consulting. The material was analysed for speciated PAHs, TPH-CWG and SOM as per the remediation strategy for comparison to GACs for a '*residential with plant uptake*' end use. No exceedances above human health criteria were detected. The chemical test results and screening table are enclosed.

Once received, the results indicated that the material was suitable for re use on site and it was therefore placed beneath the highway and the excavation was backfilled with site won natural subsoil.



Figure 1 – The area of the excavation around TT01.

Conclusion

On the basis of the information provided, the remedial objectives of Item 1 of the Remediation Strategy have been met. Remedial works to meet Item 2 of the Remediation Strategy (Cover System Validation) was completed in March 2025 - LINK . Consequently, all Remedial Works are completed on the scheme.

If any additional information is needed, do not hesitate to ask.

Yours sincerely,

James Harley MSci SGPV FGS
Geo-Environmental Engineer

Enclosed – Validation chemical Testing Results and Screening Table

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Analytical Report Number : 25-009958

Project / Site name:	Brighom	Samples received on:	27/02/2025
Your job number:	4046	Samples instructed on/ Analysis started on:	28/02/2025
Your order number:		Analysis completed by:	08/03/2025
Report Issue Number:	1	Report issued on:	10/03/2025
Samples Analysed:	3 soil samples		

Signed:



Rachel Chappell
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
air	- once the analysis is complete

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Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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: 25-009958

Project / Site name: Brighom

Lab Sample Number				467595	467596	467597
Sample Reference				Sample A	Sample B	Sample C
Sample Number				None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				26/02/2025	26/02/2025	26/02/2025
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status			

Stone Content	%	0.1	NONE	< 0.1	19.1	< 0.1
Moisture Content	%	0.01	NONE	15	13	13
Total mass of sample received	kg	0.1	NONE	0.6	0.5	0.6

General Inorganics

Organic Matter (automated)	%	0.1	MCERTS	1.4	1.4	1.3
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.07	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.13	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.27	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	1.4	0.43
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.39	0.13
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.8	0.72
Pyrene	mg/kg	0.05	MCERTS	< 0.05	1.7	0.72
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.99	0.45
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.97	0.5
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	1	0.49
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.4	0.23
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.79	0.44
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.43	0.21
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.64	0.33

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	10.9	4.66
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Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	< 10	< 10	< 10

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	< 0.020	< 0.020	< 0.020
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	< 10
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	< 10
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	< 10	< 10	< 10

Analytical Report Number: 25-009958

Project / Site name: Brighom

Lab Sample Number				467595	467596	467597
Sample Reference				Sample A	Sample B	Sample C
Sample Number				None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				26/02/2025	26/02/2025	26/02/2025
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status			

VOCs

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

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

Analytical Report Number : 25-009958

Project / Site name: Brigham

* 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 *
467595	Sample A	None Supplied	None Supplied	Brown clay and sand with gravel
467596	Sample B	None Supplied	None Supplied	Brown sand with gravel and stones
467597	Sample C	None Supplied	None Supplied	Brown sand with gravel

Analytical Report Number : 25-009958

Project / Site name: Brighom

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI 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 (Walkley Black Method)	In-house method	L009B	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
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

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 30°C.

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.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution



Job No: 4046

Lab Sample Number			467595	467596	467597	GAC - S4UL unless stated								
Sample Reference			Sample A	Sample B	Sample C	Statistical Analysis					Statistical Results			
Depth (m)			None Supplied	None Supplied	None Supplied	Count	Standard Deviation	Minimum	Maximum	Mean	Maximum	1% Residential with Home Grown Produce	Pass/ Fail	Exceedances
Date Sampled			26/02/2025	26/02/2025	26/02/2025									
Analytical Parameter (Soil Analysis)														
	Units	LoD												
Stone Content	%	0.1	0.1	19.1	0.1	3	10.97	0.1	19.1	6.4	19.1			
Moisture Content	%	0.01	15	13	13	3	1.15	13.00	15.00	13.67	15.00			
Total mass of sample received	kg	0.1	0.6	0.5	0.6	3	0.06	0.500	0.600	0.567	0.600			
General Inorganics														
Organic Matter (automated)	%	0.10	1.40	1.40	1.30	3	0.06	1.30	1.40	1.37				
Speciated PAHs														
Naphthalene	mg/kg	0.05	0.05	0.05	0.05	3	0.00	0.05	0.05	0.05	0.05	2.30	Pass	0
Acenaphthylene	mg/kg	0.05	0.05	0.07	0.05	3	0.01	0.05	0.07	0.06	0.07	170	Pass	0
Acenaphthene	mg/kg	0.05	0.05	0.13	0.05	3	0.05	0.05	0.13	0.08	0.13	210	Pass	0
Fluorene	mg/kg	0.05	0.05	0.27	0.05	3	0.13	0.05	0.27	0.12	0.27	170	Pass	0
Phenanthrene	mg/kg	0.05	0.05	1.4	0.43	3	0.70	0.05	1.40	0.63	1.40	95	Pass	0
Anthracene	mg/kg	0.05	0.05	0.39	0.13	3	0.18	0.05	0.39	0.19	0.39	2400	Pass	0
Fluoranthene	mg/kg	0.05	0.05	1.8	0.72	3	0.88	0.05	1.80	0.86	1.80	280	Pass	0
Pyrene	mg/kg	0.05	0.05	1.7	0.72	3	0.83	0.05	1.70	0.82	1.70	620	Pass	0
Benzo(a)anthracene	mg/kg	0.05	0.05	0.99	0.45	3	0.47	0.05	0.99	0.50	0.99	7.20	Pass	0
Chrysene	mg/kg	0.05	0.05	0.97	0.5	3	0.46	0.05	0.97	0.51	0.97	15	Pass	0
Benzo(b)fluoranthene	mg/kg	0.05	0.05	1	0.49	3	0.48	0.05	1.00	0.51	1.00	2.60	Pass	0
Benzo(k)fluoranthene	mg/kg	0.05	0.05	0.4	0.23	3	0.18	0.05	0.40	0.23	0.40	77	Pass	0
Benzo(a)pyrene	mg/kg	0.05	0.05	0.79	0.44	3	0.37	0.05	0.79	0.43	0.79	2.20	Pass	0
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	0.05	0.43	0.21	3	0.19	0.05	0.43	0.23	0.43	27	Pass	0
Dibenz(a,h)anthracene	mg/kg	0.05	0.05	0.05	0.05	3	0.00	0.05	0.05	0.05	0.05	0.24	Pass	0
Benzo(ghi)perylene	mg/kg	0.05	0.05	0.64	0.33	3	0.30	0.05	0.64	0.34	0.64	320	Pass	0
Total PAH														
Speciated Total EPA-16 PAHs	mg/kg	0.8	0.8	10.9	4.66	3	5.10	0.80	10.90	5.45				
Monoaromatics & Oxygenates														
Benzene	µg/kg	5	5	5	5	3	0.00	5	5	5.00	5	87	Pass	0
Toluene	µg/kg	5	5	5	5	3	0.00	5	5	5.00	5	130000	Pass	0
Ethylbenzene	µg/kg	5	5	5	5	3	0.00	5	5	5.00	5	47000	Pass	0
p & m-xylene	µg/kg	5	5	5	5	3	0.00	5	5	5.00	5	56000	Pass	0
o-xylene	µg/kg	8	8	8	8	3	0.00	8	8	8.00	8	60000	Pass	0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	5	5	5	3	0.00	5	5	5.00		-		
Petroleum Hydrocarbons														
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.01	0.01	0.01	0.01	3	0.000	0.010	0.010	0.010	0.010	42	Pass	0
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.01	0.01	0.01	0.01	3	0.000	0.010	0.010	0.010	0.010	100	Pass	0
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.01	0.01	0.01	0.01	3	0.000	0.010	0.010	0.010	0.010	27	Pass	0
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	1	1	1	3	0.00	1.00	1.00	1.00	1.00	130	Pass	0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	2	2	2	3	0.00	2.00	2.00	2.00	2.00	1100	Pass	0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	8	8	8	3	0.00	8.00	8.00	8.00	8.00	-		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	8	8	8	3	0.00	8.00	8.00	8.00	8.00	65000	Pass	0
TPH-CWG - Aliphatic >EC5 - EC35	mg/kg	10	10	10	10	3	0.00	10.00	10.00	10.00	10.00	65000	Pass	0
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.01	0.01	0.01	0.01	3	0.000	0.010	0.010	0.010	0.010	70	Pass	0
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.01	0.01	0.01	0.01	3	0.000	0.010	0.010	0.010	0.010	130	Pass	0
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.02	0.02	0.02	0.02	3	0.000	0.020	0.020	0.020	0.020	34	Pass	0
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	1	1	1	3	0.00	1.00	1.00	1.00	1.00	74	Pass	0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	2	2	2	3	0.00	2.00	2.00	2.00	2.00	140	Pass	0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	10	10	10	3	0.00	10.00	10.00	10.00	10.00	260	Pass	0
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	10	10	10	3	0.00	10.00	10.00	10.00	10.00	1100	Pass	0
TPH-CWG - Aromatic >EC5 - EC35	mg/kg	10	10	10	10	3	0.00	10.00	10.00	10.00	10.00	1100	Pass	0

Category 4 Screening Levels (March 2014) used for Arsenic

	Exceeded GAC & C4SL
	Exceeded GAC but not C4SL
	Recorded below laboratory detection limit

This spreadsheet has been developed by IGE Consulting Ltd