



Certificate of Analysis

Certificate Number 24-06432

Issued: 11-Apr-24

Client Coopers (Chester) Ltd
Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU

Our Reference 24-06432

Client Reference ~ 8353

Order No ~ P/O10002

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL ESTATE, RADCLIFFE

Description 12 Soil samples.

Date Received 27-Mar-24

Date Started 27-Mar-24

Date Completed 11-Apr-24

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



Normec DETS Limited

Unit 2, Park Road Industrial Estate South, Consett, Co Durham, DH8 5PY

Symbol key at end of report Tel: 01207 582333 • email: info@dets.co.uk • www.dets.co.uk

Page 1 of 14

Summary of Chemical Analysis

Matrix Descriptions

Our Ref 24-06432

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL ESTATE, RADCLIFFE

Sample ID	Depth	Lab No	Completed	Matrix Description
WS01	0.00-0.40	2317961	11/04/2024	Dark brown gravelly, sandy CLAY including odd rootlets
WS02	0.30-0.80	2317962	11/04/2024	Brown sandy CLAY
WS03	0.6	2317964	11/04/2024	Dark brown gravelly, sandy CLAY including odd rootlets (Possible made ground - slag)
WS04	0.2	2317965	11/04/2024	Dark brown gravelly, sandy CLAY including numerous rootlets
WS05	0.00-0.30	2317966	11/04/2024	Dark brown gravelly, sandy CLAY including odd rootlets
WS06	0.30-0.60	2317967	11/04/2024	Brown sandy CLAY including odd rootlets
WS06	0.8	2317968	11/04/2024	Dark brown very gravelly SAND (Possible made ground - slag)
WS06	1.60-2.00	2317969	11/04/2024	Dark brown slightly gravelly, sandy CLAY including odd rootlets
WS07	0.2	2317970	11/04/2024	Dark brown gravelly, sandy CLAY including odd rootlets (Possible made ground - plastic)
WS08	0.30-1.00	2317971	11/04/2024	Brown sandy CLAY including odd rootlets
WS09	0.2	2317972	11/04/2024	Dark brown gravelly, sandy CLAY including odd rootlets (Possible made ground - glass)

Summary of Chemical Analysis

Soil Samples

Our Ref 24-06432

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL ESTATE, RADCLIFFE

Lab No	2317961	2317962	2317964	2317965	2317966	2317967	2317968
Sample ID ~	WS01	WS02	WS03	WS04	WS05	WS06	WS06
Depth ~	0.00-0.40	0.30-0.80	0.60	0.20	0.00-0.30	0.30-0.60	0.80
Other ID ~							
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	21/03/2024	21/03/2024	21/03/2024	21/03/2024	22/03/2024	22/03/2024	22/03/2024
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	49	140	130	120	45	35	60
Beryllium	DETSC 2301#	0.2	mg/kg	0.4	0.6	2.8	0.6	0.9	0.8	1.8
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.4	0.4	0.5	0.3	0.3	0.7	2.5
Cadmium	DETSC 2301#	0.1	mg/kg	0.1	0.2	0.7	0.2	0.4	0.4	1.2
Chromium	DETSC 2301#	0.15	mg/kg	63	63	23	130	33	29	14
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	84	76	440	73	73	120	200
Lead	DETSC 2301#	0.3	mg/kg	160	160	230	210	160	300	220
Mercury	DETSC 2325#	0.05	mg/kg	0.22	0.15	0.86	0.50	0.31	0.24	0.18
Nickel	DETSC 2301#	1	mg/kg	13	16	66	21	19	22	41
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	0.8	< 0.5	1.1	< 0.5	3.4
Vanadium	DETSC 2301#	0.8	mg/kg	20	23	73	25	32	26	53
Zinc	DETSC 2301#	1	mg/kg	100	87	180	79	130	110	110
Inorganics										
pH	DETSC 2008#		pH	5.3	6.9	6.3	5.2	4.9	6.6	6.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.8	0.5	0.2	1.6	0.7	11	1.5
FOC	DETSC 2084#	0.001			0.018					
FOC	DETSC 2002	0.001		0.015		0.053	0.017	0.028	0.011	0.061
Total Organic Carbon	DETSC 2084#	0.5	%		1.8					
Total Organic Carbon	DETSC 2002	0.1	%	1.5		5.3	1.7	2.8	1.1	6.1
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	31	14	85	11	17	25	160
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.11	0.05	0.16	0.08	0.09	0.05	0.12
Petroleum Hydrocarbons										
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg				< 0.01			< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg				< 0.01			< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg				< 0.01			< 0.01
Aliphatic >EC10-EC12 Cleanup	DETSC 3521*	1.5	mg/kg				< 1.50			< 1.50
Aliphatic >EC12-EC16 Cleanup	DETSC 3521*	1.2	mg/kg				< 1.20			< 1.20
Aliphatic >EC16-EC21 Cleanup	DETSC 3521*	1.5	mg/kg				< 1.50			< 1.50
Aliphatic >EC21-EC24 Cleanup	DETSC 3521*	3.4	mg/kg				< 3.40			< 3.40
Aliphatic >EC21-EC35 Cleanup	DETSC 3521*	3.4	mg/kg				< 3.40			< 3.40
Aliphatic >EC24-EC35 Cleanup	DETSC 3521*	3.4	mg/kg				< 3.40			< 3.40
Aliphatic >EC10-EC35 Cleanup	DETSC 3521*	10	mg/kg				< 10.00			< 10.00
Aliphatic >EC10-EC40 Cleanup	DETSC 3521*	10	mg/kg				< 10.00			< 10.00
Aliphatic C5-C35 Cleanup	DETSC 3521*	10	mg/kg				< 10.00			< 10.00
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg				< 0.01			< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg				< 0.01			< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg				< 0.01			< 0.01
Aromatic >EC10-EC12 Cleanup	DETSC 3521*	0.9	mg/kg				< 0.90			< 0.90
Aromatic >EC12-EC16 Cleanup	DETSC 3521*	0.5	mg/kg				< 0.50			< 0.50
Aromatic >EC16-EC21 Cleanup	DETSC 3521*	0.6	mg/kg				0.74			< 0.60

Summary of Chemical Analysis

Soil Samples

Our Ref 24-06432

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL ESTATE, RADCLIFFE

Lab No	2317961	2317962	2317964	2317965	2317966	2317967	2317968
Sample ID ~	WS01	WS02	WS03	WS04	WS05	WS06	WS06
Depth ~	0.00-0.40	0.30-0.80	0.60	0.20	0.00-0.30	0.30-0.60	0.80
Other ID ~							
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	21/03/2024	21/03/2024	21/03/2024	21/03/2024	22/03/2024	22/03/2024	22/03/2024
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units								
Aromatic >EC21-EC24 Cleanup	DETSC 3521*	1.4	mg/kg				< 1.40				< 1.40
Aromatic >EC21-EC35 Cleanup	DETSC 3521*	1.4	mg/kg				< 1.40				< 1.40
Aromatic >EC24-EC35 Cleanup	DETSC 3521*	1.4	mg/kg				< 1.40				< 1.40
Aromatic C5-C35 Cleanup	DETSC 3521*	10	mg/kg				< 10.00				< 10.00
Aromatic >EC10-EC35 Cleanup	DETSC 3521*	10	mg/kg				< 10.00				< 10.00
Aromatic >EC10-EC40 Cleanup	DETSC 3521*	10	mg/kg				< 10.00				< 10.00
TPH Ali/Aro Total C5-C35 Cleanup	DETSC 3521*	10	mg/kg				< 10.00				< 10.00
Benzene	DETSC 3321#	0.01	mg/kg				< 0.01				< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg				< 0.01				< 0.01
Toluene	DETSC 3321#	0.01	mg/kg				< 0.01				< 0.01
Xylene	DETSC 3321#	0.01	mg/kg				< 0.01				< 0.01
PAHs											
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.09	< 0.03	0.11	0.10	0.09	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.13	< 0.03	0.15	0.16	0.16	< 0.03	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	0.13	< 0.03	0.16	0.15	0.15	< 0.03	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	0.06	0.05	0.05	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	0.05	< 0.03	0.07	0.06	0.06	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	0.06	0.06	0.05	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.04	0.03	0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	0.48	< 0.10	0.65	0.57	0.56	< 0.10	< 0.10	< 0.10
Phenols											
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	0.3	0.6	< 0.3	< 0.3	1.2

Summary of Chemical Analysis

Soil Samples

Our Ref 24-06432

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL EST

Lab No	2317969	2317970	2317971	2317972
Sample ID ~	WS06	WS07	WS08	WS09
Depth ~	1.60-2.00	0.20	0.30-1.00	0.20
Other ID ~				
Sample Type ~	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	22/03/2024	22/03/2024	22/03/2024	22/03/2024
Sampling Time ~	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	8.2	24	10	23
Beryllium	DETSC 2301#	0.2	mg/kg	0.7	1.7	0.3	0.7
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.5	0.3	0.6	0.4
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.5	0.1	0.5
Chromium	DETSC 2301#	0.15	mg/kg	9.5	26	16	25
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	15	73	18	65
Lead	DETSC 2301#	0.3	mg/kg	17	110	25	160
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.16	< 0.05	1.1
Nickel	DETSC 2301#	1	mg/kg	9.5	25	11	17
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	13	35	19	26
Zinc	DETSC 2301#	1	mg/kg	48	180	63	310
Inorganics							
pH	DETSC 2008#		pH	6.3	7.3	6.1	7.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.7	0.9	0.4	0.6
FOC	DETSC 2084#	0.001		0.11		0.014	
FOC	DETSC 2002	0.001			0.044		0.045
Total Organic Carbon	DETSC 2084#	0.5	%	11		1.4	
Total Organic Carbon	DETSC 2002	0.1	%		4.4		4.5
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	380	73	< 10	24
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.20	0.09	0.05	0.07
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg		< 0.01		
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg		< 0.01		
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01		
Aliphatic >EC10-EC12 Cleanup	DETSC 3521*	1.5	mg/kg		< 1.50		
Aliphatic >EC12-EC16 Cleanup	DETSC 3521*	1.2	mg/kg		< 1.20		
Aliphatic >EC16-EC21 Cleanup	DETSC 3521*	1.5	mg/kg		< 1.50		
Aliphatic >EC21-EC24 Cleanup	DETSC 3521*	3.4	mg/kg		< 3.40		
Aliphatic >EC21-EC35 Cleanup	DETSC 3521*	3.4	mg/kg		< 3.40		
Aliphatic >EC24-EC35 Cleanup	DETSC 3521*	3.4	mg/kg		< 3.40		
Aliphatic >EC10-EC35 Cleanup	DETSC 3521*	10	mg/kg		< 10.00		
Aliphatic >EC10-EC40 Cleanup	DETSC 3521*	10	mg/kg		< 10.00		
Aliphatic C5-C35 Cleanup	DETSC 3521*	10	mg/kg		< 10.00		
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg		< 0.01		
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg		< 0.01		
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01		
Aromatic >EC10-EC12 Cleanup	DETSC 3521*	0.9	mg/kg		< 0.90		
Aromatic >EC12-EC16 Cleanup	DETSC 3521*	0.5	mg/kg		< 0.50		
Aromatic >EC16-EC21 Cleanup	DETSC 3521*	0.6	mg/kg		2.68		

Summary of Chemical Analysis

Soil Samples

Our Ref 24-06432

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL EST

Lab No	2317969	2317970	2317971	2317972
Sample ID ~	WS06	WS07	WS08	WS09
Depth ~	1.60-2.00	0.20	0.30-1.00	0.20
Other ID ~				
Sample Type ~	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	22/03/2024	22/03/2024	22/03/2024	22/03/2024
Sampling Time ~	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Aromatic >EC21-EC24 Cleanup	DETSC 3521*	1.4	mg/kg		1.92		
Aromatic >EC21-EC35 Cleanup	DETSC 3521*	1.4	mg/kg		6.46		
Aromatic >EC24-EC35 Cleanup	DETSC 3521*	1.4	mg/kg		4.54		
Aromatic C5-C35 Cleanup	DETSC 3521*	10	mg/kg		< 10.00		
Aromatic >EC10-EC35 Cleanup	DETSC 3521*	10	mg/kg		< 10.00		
Aromatic >EC10-EC40 Cleanup	DETSC 3521*	10	mg/kg		< 10.00		
TPH Ali/Aro Total C5-C35 Cleanup	DETSC 3521*	10	mg/kg		< 10.00		
Benzene	DETSC 3321#	0.01	mg/kg		< 0.01		
Ethylbenzene	DETSC 3321#	0.01	mg/kg		< 0.01		
Toluene	DETSC 3321#	0.01	mg/kg		< 0.01		
Xylene	DETSC 3321#	0.01	mg/kg		< 0.01		
PAHs							
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.03	< 0.03	0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.04
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.26	< 0.03	0.15
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	0.05	< 0.03	0.06
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.67	< 0.03	0.24
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.65	< 0.03	0.23
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.27	< 0.03	0.13
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	0.34	< 0.03	0.14
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.40	< 0.03	0.16
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.14	< 0.03	0.09
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.30	< 0.03	0.14
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.14	< 0.03	0.11
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04	< 0.03	0.06
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	0.18	0.03	0.13
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	3.4	< 0.10	1.7
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.9	25	0.7	0.8

Summary of Chemical Analysis

Soil VOC/SVOC Samples

Our Ref 24-06432

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL ESTATE, RADCLIFFE

Lab No	2317963	2317964
Sample ID ~	WS03	WS03
Depth ~	0.20	0.60
Other ID ~		
Sample Type ~	SOIL	SOIL
Sampling Date ~	21/03/2024	21/03/2024
Sampling Time ~	n/s	n/s

Test	Method	LOD	Units		
VOCs					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

Summary of Chemical Analysis

Soil VOC/SVOC Samples

Our Ref 24-06432

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL ESTATE, RADCLIFFE

Lab No	2317963	2317964
Sample ID ~	WS03	WS03
Depth ~	0.20	0.60
Other ID ~		
Sample Type ~	SOIL	SOIL
Sampling Date ~	21/03/2024	21/03/2024
Sampling Time ~	n/s	n/s

Test	Method	LOD	Units		
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Naphthalene	DETSC 3431	0.01	mg/kg	< 0.01	
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
SVOCs					
Phenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Acenaphthylene	DETSC 3433	0.1	mg/kg	< 0.1	
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Acenaphthene	DETSC 3433	0.1	mg/kg	< 0.1	
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Fluorene	DETSC 3433	0.1	mg/kg	< 0.1	

Summary of Chemical Analysis

Soil VOC/SVOC Samples

Our Ref 24-06432

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL ESTATE, RADCLIFFE

Lab No	2317963	2317964
Sample ID ~	WS03	WS03
Depth ~	0.20	0.60
Other ID ~		
Sample Type ~	SOIL	SOIL
Sampling Date ~	21/03/2024	21/03/2024
Sampling Time ~	n/s	n/s

Test	Method	LOD	Units		
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Phenanthrene	DETSC 3433	0.1	mg/kg	0.4	
Anthracene	DETSC 3433	0.1	mg/kg	< 0.1	
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	0.3	< 0.1
Fluoranthene	DETSC 3433	0.1	mg/kg	0.7	
Pyrene	DETSC 3433	0.1	mg/kg	0.6	
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3433	0.1	mg/kg	0.3	
Chrysene	DETSC 3433	0.1	mg/kg	0.3	
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	0.3	< 0.1
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3433	0.1	mg/kg	0.5	
Benzo(k)fluoranthene	DETSC 3433	0.1	mg/kg	0.1	
Benzo(a)pyrene	DETSC 3433	0.1	mg/kg	0.4	
Indeno(123cd)pyrene	DETSC 3433	0.1	mg/kg	0.3	
Dibenzo(ah)anthracene	DETSC 3433	0.1	mg/kg	< 0.1	
Benzo(ghi)perylene	DETSC 3433	0.1	mg/kg	0.2	
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1

Summary of Asbestos Analysis

Soil Samples

Our Ref ~ 24-06432

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL ESTATE, RADCLIFFE

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2317961	WS01 0.00-0.40	SOIL	NAD	none	Pierce Booth
2317964	WS03 0.60	SOIL	NAD	none	Pierce Booth
2317965	WS04 0.20	SOIL	NAD	none	Pierce Booth
2317966	WS05 0.00-0.30	SOIL	NAD	none	Pierce Booth
2317967	WS06 0.30-0.60	SOIL	NAD	none	Pierce Booth
2317968	WS06 0.80	SOIL	NAD	none	Pierce Booth
2317970	WS07 0.20	SOIL	NAD	none	Pierce Booth
2317972	WS09 0.20	SOIL	NAD	none	Pierce Booth

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 24-06432

Client Ref ~ 8353

Contract ~ LAND ADJACENT TO BEALEY INDUSTRIAL ESTATE, RADCLIFFE

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2317961	WS01 0.00-0.40 SOIL	21/03/24	PG		
2317962	WS02 0.30-0.80 SOIL	21/03/24	PG		
2317963	WS03 0.20 SOIL	21/03/24	GJ 250ml x2, GJ 60ml		
2317964	WS03 0.60 SOIL	21/03/24	GJ 250ml x2, GJ 60ml		
2317965	WS04 0.20 SOIL	21/03/24	GJ 250ml x2, GJ 60ml		
2317966	WS05 0.00-0.30 SOIL	22/03/24	PG		
2317967	WS06 0.30-0.60 SOIL	22/03/24	PG		
2317968	WS06 0.80 SOIL	22/03/24	GJ 250ml x2, GJ 60ml		
2317969	WS06 1.60-2.00 SOIL	22/03/24	PG		
2317970	WS07 0.20 SOIL	22/03/24	GJ 250ml x2, GJ 60ml		
2317971	WS08 0.30-1.00 SOIL	22/03/24	PG		
2317972	WS09 0.20 SOIL	22/03/24	GJ 250ml x2, GJ 60ml		

Key: P-Plastic G-Bag G-Glass J-Jar

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO ₄	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC 2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC 2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC 2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC 2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC 2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2311	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO ₄	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	As Received	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3321	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3521	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3521	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3521	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
--------	-----------	-------	-----------------------	-----------------------	----------------	------	--------

Key:

~ Sample details are provided by the client and can affect the validity of the results

* -not accredited.

-MCERTS (accreditation only applies if report carries the MCERTS logo).

\$ -subcontracted.

n/s -not supplied.

I/S -insufficient sample.

U/S -unsuitable sample.

t/f -to follow.

nd -not detected.

End of Report



Certificate of Analysis

Certificate Number 24-07560

Issued: 17-Apr-24

Client Coopers (Chester) Ltd
Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU

Our Reference 24-07560

Client Reference ~ 8353

Order No ~ P/O10002

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL ESTATE, RADCLIFFE

Description 6 Leachate prepared by DETS samples.

Date Received 27-Mar-24

Date Started 12-Apr-24

Date Completed 17-Apr-24

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



Normec DETS Limited

Unit 2, Park Road Industrial Estate South, Consett, Co Durham, DH8 5PY

Symbol key at end of report Tel: 01207 582333 • email: info@dets.co.uk • www.dets.co.uk

Page 1 of 3

Summary of Chemical Analysis

Leachate Samples

Our Ref 24-07560

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL ESTATE, RADCLIFFE

Lab No	2324235	2324236	2324237	2324238	2324239	2324240
Sample ID ~	WS02	WS03	WS04	WS06	WS06	WS09
Depth ~	0.30-0.80	0.60	0.20	0.30-0.60	0.80	0.20
Other ID ~						
Sample Type ~	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date ~	21/03/2024	21/03/2024	21/03/2024	22/03/2024	22/03/2024	22/03/2024
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Preparation									
BS EN 12457 10:1	DETSC 1009*			Y	Y	Y	Y	Y	Y
Metals									
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	7.1	2.0	2.4		1.2	
Copper, Dissolved	DETSC 2306	0.4	ug/l		2.8				
Lead, Dissolved	DETSC 2306	0.09	ug/l				3.4		
Zinc, Dissolved	DETSC 2306	1.3	ug/l						12
Inorganics									
Cyanide, Total	DETSC 2130	40	ug/l				< 40		

Information in Support of the Analytical Results

Our Ref 24-07560

Client Ref ~ 8353

Contract ~ LAND ADJACENT TO BEALEY INDUSTRIAL ESTATE, RADCLIFFE

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Holding time exceeded for tests	Inappropriat e container for tests
2324235	WS02 0.30-0.80 LEACHATE	21/03/24	PG		
2324236	WS03 0.60 LEACHATE	21/03/24	GJ 250ml x2, GJ 60ml		
2324237	WS04 0.20 LEACHATE	21/03/24	GJ 250ml x2, GJ 60ml		
2324238	WS06 0.30-0.60 LEACHATE	22/03/24	PG		
2324239	WS06 0.80 LEACHATE	22/03/24	GJ 250ml x2, GJ 60ml		
2324240	WS09 0.20 LEACHATE	22/03/24	GJ 250ml x2, GJ 60ml		

Key: P-Plastic G-Bag G-Glass J-Jar

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Key:

~ Sample details are provided by the client and can affect the validity of the results

* -not accredited.

-MCERTS (accreditation only applies if report carries the MCERTS logo).

\$ -subcontracted.

n/s -not supplied.

I/S -insufficient sample.

U/S -unsuitable sample.

t/f -to follow.

nd -not detected.

End of Report



Certificate of Analysis

Certificate Number 24-20913

Issued: 08-Oct-24

Client Coopers (Chester) Ltd
Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU

Our Reference 24-20913

Client Reference ~ 8353

Order No ~ 10200-LP

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Description 15 Soil samples, 1 Misc sample.

Date Received 01-Oct-24

Date Started 01-Oct-24

Date Completed 08-Oct-24

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



A handwritten signature in black ink, appearing to read "K. Bridgwood".

Kirk Bridgwood
General Manager



Normec DETS Limited

Unit 2, Park Road Industrial Estate South, Consett, Co Durham, DH8 5PY

Symbol key at end of report Tel: 01207 582333 • email: info@dets.co.uk • www.dets.co.uk

Page 1 of 17

Summary of Chemical Analysis

Matrix Descriptions

Our Ref 24-20913

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Sample ID	Depth	Lab No	Completed	Matrix Description
TP01	0.1	2402143	08/10/2024	Dark brown very gravelly, sandy CLAY including odd rootlets (Possible made ground - brick)
TP02	0.7	2402146	08/10/2024	Dark brown very gravelly, sandy CLAY including odd rootlets (Possible made ground - brick)
TP03	0.2	2402148	08/10/2024	Dark brown very gravelly, sandy CLAY including odd rootlets (Possible made ground - brick)
TP03	1.2	2402150	08/10/2024	Dark brown slightly gravelly, sandy CLAY including odd rootlets
TP04	0.1	2402151	08/10/2024	Dark brown gravelly, sandy CLAY including odd rootlets
TP05	0.4	2402152	08/10/2024	Dark brown very gravelly, sandy CLAY including odd rootlets (Possible made ground - brick)
TP06	1	2402154	08/10/2024	Brown slightly gravelly, sandy CLAY
TP08	0.2	2402157	08/10/2024	Dark brown very gravelly, sandy CLAY including odd rootlets (Possible made ground - glass) (Possible made ground - brick)
TP09	1	2402158	08/10/2024	Dark brown gravelly, sandy CLAY including odd rootlets

Summary of Chemical Analysis

Soil/Misc Samples

Our Ref 24-20913

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2402143	2402145	2402146	2402147	2402148	2402149
Sample ID ~	TP01	TP02	TP02	TP02	TP03	TP03
Depth ~	0.10	0.10	0.70	2.70	0.20	0.50
Other ID ~						
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	26/09/2024	26/09/2024	26/09/2024	26/09/2024	26/09/2024	26/09/2024
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	14		28		16
Beryllium	DETSC 2301#	0.2	mg/kg	1.1		0.9		0.8
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.5		0.9		1.1
Cadmium	DETSC 2301#	0.1	mg/kg	0.5		0.6		0.9
Chromium	DETSC 2301#	0.15	mg/kg	21		64		32
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0		< 1.0		< 1.0
Copper	DETSC 2301#	0.2	mg/kg	41		110		100
Lead	DETSC 2301#	0.3	mg/kg	83		260		170
Mercury	DETSC 2325#	0.05	mg/kg	0.09		0.49		0.17
Nickel	DETSC 2301#	1	mg/kg	13		32		23
Selenium	DETSC 2301#	0.5	mg/kg	4.7		< 0.5		< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	24		33		26
Zinc	DETSC 2301#	1	mg/kg	120		220		230
Inorganics								
pH	DETSC 2008#		pH	10.0		9.5		9.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.4		0.5		0.6
FOC	DETSC 2002	0.001		0.027		0.035		0.022
Total Organic Carbon	DETSC 2002	0.1	%	2.7		3.5		2.2
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	49		230		100
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.27		0.13		0.09
Petroleum Hydrocarbons								
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg			< 0.01		< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg			< 0.01		< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg			< 0.01		< 0.01
Aliphatic >EC10-EC12 Cleanup	DETSC 3521*	1.5	mg/kg			1.89		2.56
Aliphatic >EC12-EC16 Cleanup	DETSC 3521*	1.2	mg/kg			< 1.20		1.64
Aliphatic >EC16-EC21 Cleanup	DETSC 3521*	1.5	mg/kg			< 1.50		< 1.50
Aliphatic >EC21-EC24 Cleanup	DETSC 3521*	3.4	mg/kg			< 3.40		< 3.40
Aliphatic >EC21-EC35 Cleanup	DETSC 3521*	3.4	mg/kg			< 3.40		4.42
Aliphatic >EC24-EC35 Cleanup	DETSC 3521*	3.4	mg/kg			< 3.40		4.42
Aliphatic >EC10-EC35 Cleanup	DETSC 3521*	10	mg/kg			< 10.00		< 10.00
Aliphatic >EC10-EC40 Cleanup	DETSC 3521*	10	mg/kg			< 10.00		< 10.00
Aliphatic C5-C35 Cleanup	DETSC 3521*	10	mg/kg			< 10.00		< 10.00
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg			< 0.01		< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg			< 0.01		< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg			< 0.01		< 0.01
Aromatic >EC10-EC12 Cleanup	DETSC 3521*	0.9	mg/kg			< 0.90		< 0.90
Aromatic >EC12-EC16 Cleanup	DETSC 3521*	0.5	mg/kg			< 0.50		< 0.50
Aromatic >EC16-EC21 Cleanup	DETSC 3521*	0.6	mg/kg			< 0.60		< 0.60
Aromatic >EC21-EC24 Cleanup	DETSC 3521*	1.4	mg/kg			2.58		2.40



Summary of Chemical Analysis Soil/Misc Samples

Our Ref 24-20913

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2402143	2402145	2402146	2402147	2402148	2402149
Sample ID ~	TP01	TP02	TP02	TP02	TP03	TP03
Depth ~	0.10	0.10	0.70	2.70	0.20	0.50
Other ID ~						
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	26/09/2024	26/09/2024	26/09/2024	26/09/2024	26/09/2024	26/09/2024
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Aromatic >EC21-EC35 Cleanup	DETSC 3521*	1.4	mg/kg				8.98		2.40
Aromatic >EC24-EC35 Cleanup	DETSC 3521*	1.4	mg/kg				6.41		< 1.40
Aromatic C5-C35 Cleanup	DETSC 3521*	10	mg/kg				< 10.00		< 10.00
Aromatic >EC10-EC35 Cleanup	DETSC 3521*	10	mg/kg				< 10.00		< 10.00
Aromatic >EC10-EC40 Cleanup	DETSC 3521*	10	mg/kg				< 10.00		< 10.00
TPH Ali/Aro Total C5-C35 Cleanup	DETSC 3521*	10	mg/kg				10.88		11.03

PAHs

Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03		0.08		0.04	
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03		0.04		< 0.03	
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.09		0.31		0.17	
Fluorene	DETSC 3303	0.03	mg/kg	0.05		0.23		0.13	
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.58		1.9		1.1	
Anthracene	DETSC 3303	0.03	mg/kg	0.13		0.48		0.29	
Fluoranthene	DETSC 3303#	0.03	mg/kg	1.2		2.7		2.4	
Pyrene	DETSC 3303#	0.03	mg/kg	1.1		2.6		2.3	
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.45		1.0		0.89	
Chrysene	DETSC 3303	0.03	mg/kg	0.50		0.95		0.81	
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.56		1.2		1.1	
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.21		0.43		0.33	
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.42		0.96		0.79	
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.19		0.40		0.36	
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.05		0.12		0.10	
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.24		0.54		0.45	
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	5.7		14		11	

PCBs

PCB 118	DETSC 3401#	0.01	mg/kg		< 0.01				
PCB 77	DETSC 3401*	0.01	mg/kg		< 0.01				
PCB 81	DETSC 3401*	0.01	mg/kg		< 0.01				
PCB 105	DETSC 3401*	0.01	mg/kg		< 0.01				
PCB 114	DETSC 3401*	0.01	mg/kg		< 0.01				
PCB 118	DETSC 3401#	0.01	mg/kg		< 0.01				
PCB 123	DETSC 3401*	0.01	mg/kg		< 0.01				
PCB 126	DETSC 3401*	0.01	mg/kg		< 0.01				
PCB 156	DETSC 3401*	0.01	mg/kg		< 0.01				
PCB 157	DETSC 3401*	0.01	mg/kg		< 0.01				
PCB 167	DETSC 3401*	0.01	mg/kg		< 0.01				
PCB 169	DETSC 3401*	0.01	mg/kg		< 0.01				
PCB 189	DETSC 3401*	0.01	mg/kg		< 0.01				

Phenols

Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.6		< 0.3		0.4	
---------------------	-------------	-----	-------	-----	--	-------	--	-----	--

Summary of Chemical Analysis

Soil/Misc Samples

Our Ref 24-20913

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2402150	2402151	2402152	2402153	2402154	2402155
Sample ID ~	TP03	TP04	TP05	TP05	TP06	TP07
Depth ~	1.20	0.10	0.40	2.20	1.00	0.90
Other ID ~						
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	26/09/2024	26/09/2024	26/09/2024	26/09/2024	26/09/2024	26/09/2024
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	29	43	150		24	
Beryllium	DETSC 2301#	0.2	mg/kg	0.7	1.1	2.8		0.8	
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.5	0.5	0.6		0.3	
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.8	0.3		0.4	
Chromium	DETSC 2301#	0.15	mg/kg	24	32	20		19	
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0		< 1.0	
Copper	DETSC 2301#	0.2	mg/kg	31	140	170		53	
Lead	DETSC 2301#	0.3	mg/kg	52	310	250		78	
Mercury	DETSC 2325#	0.05	mg/kg	0.08	0.98	0.37		0.26	
Nickel	DETSC 2301#	1	mg/kg	28	25	80		22	
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	0.8	3.2		1.4	
Vanadium	DETSC 2301#	0.8	mg/kg	23	34	69		22	
Zinc	DETSC 2301#	1	mg/kg	75	200	170		120	
Inorganics									
pH	DETSC 2008#		pH	7.7	8.1	6.1		7.9	
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	0.4	0.3		0.1	
FOC	DETSC 2002	0.001		0.016	0.039	0.076		0.017	
Total Organic Carbon	DETSC 2002	0.1	%	1.6	3.9	7.6		1.7	
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	60	20	140		32	
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.05	0.08	0.26		0.04	
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg				< 0.01		< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg				< 0.01		< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg				< 0.01		< 0.01
Aliphatic >EC10-EC12 Cleanup	DETSC 3521*	1.5	mg/kg				3.18		3.81
Aliphatic >EC12-EC16 Cleanup	DETSC 3521*	1.2	mg/kg				2.13		2.34
Aliphatic >EC16-EC21 Cleanup	DETSC 3521*	1.5	mg/kg				< 1.50		< 1.50
Aliphatic >EC21-EC24 Cleanup	DETSC 3521*	3.4	mg/kg				< 3.40		< 3.40
Aliphatic >EC21-EC35 Cleanup	DETSC 3521*	3.4	mg/kg				< 3.40		< 3.40
Aliphatic >EC24-EC35 Cleanup	DETSC 3521*	3.4	mg/kg				< 3.40		< 3.40
Aliphatic >EC10-EC35 Cleanup	DETSC 3521*	10	mg/kg				< 10.00		< 10.00
Aliphatic >EC10-EC40 Cleanup	DETSC 3521*	10	mg/kg				< 10.00		< 10.00
Aliphatic C5-C35 Cleanup	DETSC 3521*	10	mg/kg				< 10.00		< 10.00
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg				< 0.01		< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg				< 0.01		< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg				< 0.01		< 0.01
Aromatic >EC10-EC12 Cleanup	DETSC 3521*	0.9	mg/kg				< 0.90		< 0.90
Aromatic >EC12-EC16 Cleanup	DETSC 3521*	0.5	mg/kg				< 0.50		< 0.50
Aromatic >EC16-EC21 Cleanup	DETSC 3521*	0.6	mg/kg				< 0.60		< 0.60
Aromatic >EC21-EC24 Cleanup	DETSC 3521*	1.4	mg/kg				2.74		3.13



Summary of Chemical Analysis Soil/Misc Samples

Our Ref 24-20913

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2402150	2402151	2402152	2402153	2402154	2402155
Sample ID ~	TP03	TP04	TP05	TP05	TP06	TP07
Depth ~	1.20	0.10	0.40	2.20	1.00	0.90
Other ID ~						
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	26/09/2024	26/09/2024	26/09/2024	26/09/2024	26/09/2024	26/09/2024
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Aromatic >EC21-EC35 Cleanup	DETSC 3521*	1.4	mg/kg				2.74		3.13
Aromatic >EC24-EC35 Cleanup	DETSC 3521*	1.4	mg/kg			< 1.40			< 1.40
Aromatic C5-C35 Cleanup	DETSC 3521*	10	mg/kg			< 10.00			< 10.00
Aromatic >EC10-EC35 Cleanup	DETSC 3521*	10	mg/kg			< 10.00			< 10.00
Aromatic >EC10-EC40 Cleanup	DETSC 3521*	10	mg/kg			< 10.00			< 10.00
TPH Ali/Aro Total C5-C35 Cleanup	DETSC 3521*	10	mg/kg			< 10.00			< 10.00
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	0.08	< 0.03		< 0.03	
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04	< 0.03		< 0.03	
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.31	< 0.03		< 0.03	
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	0.24	< 0.03		< 0.03	
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	2.4	0.04		< 0.03	
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	0.65	< 0.03		< 0.03	
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	3.7	0.07		< 0.03	
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	3.3	0.07		< 0.03	
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	1.3	0.04		< 0.03	
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	1.1	0.05		< 0.03	
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	1.6	0.04		< 0.03	
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.52	< 0.03		< 0.03	
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	1.2	< 0.03		< 0.03	
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.51	< 0.03		< 0.03	
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.13	< 0.03		< 0.03	
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	0.65	< 0.03		< 0.03	
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	18	0.31		< 0.10	
PCBs									
PCB 118	DETSC 3401#	0.01	mg/kg						
PCB 77	DETSC 3401*	0.01	mg/kg						
PCB 81	DETSC 3401*	0.01	mg/kg						
PCB 105	DETSC 3401*	0.01	mg/kg						
PCB 114	DETSC 3401*	0.01	mg/kg						
PCB 118	DETSC 3401#	0.01	mg/kg						
PCB 123	DETSC 3401*	0.01	mg/kg						
PCB 126	DETSC 3401*	0.01	mg/kg						
PCB 156	DETSC 3401*	0.01	mg/kg						
PCB 157	DETSC 3401*	0.01	mg/kg						
PCB 167	DETSC 3401*	0.01	mg/kg						
PCB 169	DETSC 3401*	0.01	mg/kg						
PCB 189	DETSC 3401*	0.01	mg/kg						
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.6	< 0.3		< 0.3	

Summary of Chemical Analysis

Soil/Misc Samples

Our Ref 24-20913

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2402156	2402157	2402158
Sample ID ~	TP08	TP08	TP09
Depth ~	0.05	0.20	1.00
Other ID ~			
Sample Type ~	SOIL	SOIL	SOIL
Sampling Date ~	26/09/2024	26/09/2024	26/09/2024
Sampling Time ~	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg		17	25
Beryllium	DETSC 2301#	0.2	mg/kg		0.7	1.1
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg		0.4	0.2
Cadmium	DETSC 2301#	0.1	mg/kg		0.7	0.8
Chromium	DETSC 2301#	0.15	mg/kg		29	41
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg		100	87
Lead	DETSC 2301#	0.3	mg/kg		150	190
Mercury	DETSC 2325#	0.05	mg/kg		0.19	0.28
Nickel	DETSC 2301#	1	mg/kg		22	31
Selenium	DETSC 2301#	0.5	mg/kg		< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg		24	32
Zinc	DETSC 2301#	1	mg/kg		240	180
Inorganics						
pH	DETSC 2008#		pH		10.9	8.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg		0.3	0.3
FOC	DETSC 2002	0.001			0.015	0.048
Total Organic Carbon	DETSC 2002	0.1	%		1.5	4.8
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l		130	50
Sulphate as SO4, Total	DETSC 2321#	0.01	%		0.12	0.07
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg			< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg			< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg			< 0.01
Aliphatic >EC10-EC12 Cleanup	DETSC 3521*	1.5	mg/kg			2.94
Aliphatic >EC12-EC16 Cleanup	DETSC 3521*	1.2	mg/kg			1.83
Aliphatic >EC16-EC21 Cleanup	DETSC 3521*	1.5	mg/kg			< 1.50
Aliphatic >EC21-EC24 Cleanup	DETSC 3521*	3.4	mg/kg			< 3.40
Aliphatic >EC21-EC35 Cleanup	DETSC 3521*	3.4	mg/kg			< 3.40
Aliphatic >EC24-EC35 Cleanup	DETSC 3521*	3.4	mg/kg			< 3.40
Aliphatic >EC10-EC35 Cleanup	DETSC 3521*	10	mg/kg			< 10.00
Aliphatic >EC10-EC40 Cleanup	DETSC 3521*	10	mg/kg			< 10.00
Aliphatic C5-C35 Cleanup	DETSC 3521*	10	mg/kg			< 10.00
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg			< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg			< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg			< 0.01
Aromatic >EC10-EC12 Cleanup	DETSC 3521*	0.9	mg/kg			< 0.90
Aromatic >EC12-EC16 Cleanup	DETSC 3521*	0.5	mg/kg			< 0.50
Aromatic >EC16-EC21 Cleanup	DETSC 3521*	0.6	mg/kg			2.23
Aromatic >EC21-EC24 Cleanup	DETSC 3521*	1.4	mg/kg			5.65

Summary of Chemical Analysis

Soil/Misc Samples

Our Ref 24-20913

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2402156	2402157	2402158
Sample ID ~	TP08	TP08	TP09
Depth ~	0.05	0.20	1.00
Other ID ~			
Sample Type ~	SOIL	SOIL	SOIL
Sampling Date ~	26/09/2024	26/09/2024	26/09/2024
Sampling Time ~	n/s	n/s	n/s

Test	Method	LOD	Units			
Aromatic >EC21-EC35 Cleanup	DETSC 3521*	1.4	mg/kg			69.55
Aromatic >EC24-EC35 Cleanup	DETSC 3521*	1.4	mg/kg			63.90
Aromatic C5-C35 Cleanup	DETSC 3521*	10	mg/kg			71.78
Aromatic >EC10-EC35 Cleanup	DETSC 3521*	10	mg/kg			71.78
Aromatic >EC10-EC40 Cleanup	DETSC 3521*	10	mg/kg			90.17
TPH Ali/Aro Total C5-C35 Cleanup	DETSC 3521*	10	mg/kg			76.55
PAHs						
Naphthalene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg		< 0.03	0.05
Fluorene	DETSC 3303	0.03	mg/kg		< 0.03	0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg		0.06	0.31
Anthracene	DETSC 3303	0.03	mg/kg		< 0.03	0.07
Fluoranthene	DETSC 3303#	0.03	mg/kg		0.15	0.54
Pyrene	DETSC 3303#	0.03	mg/kg		0.17	0.51
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		0.07	0.19
Chrysene	DETSC 3303	0.03	mg/kg		0.07	0.18
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		0.07	0.24
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		< 0.03	0.08
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		0.05	0.18
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		< 0.03	0.09
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		0.04	0.12
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		0.68	2.6
PCBs						
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01
PCB 77	DETSC 3401*	0.01	mg/kg	< 0.01		< 0.01
PCB 81	DETSC 3401*	0.01	mg/kg	< 0.01		< 0.01
PCB 105	DETSC 3401*	0.01	mg/kg	< 0.01		< 0.01
PCB 114	DETSC 3401*	0.01	mg/kg	< 0.01		< 0.01
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01		< 0.01
PCB 123	DETSC 3401*	0.01	mg/kg	< 0.01		< 0.01
PCB 126	DETSC 3401*	0.01	mg/kg	< 0.01		< 0.01
PCB 156	DETSC 3401*	0.01	mg/kg	< 0.01		< 0.01
PCB 157	DETSC 3401*	0.01	mg/kg	< 0.01		< 0.01
PCB 167	DETSC 3401*	0.01	mg/kg	< 0.01		< 0.01
PCB 169	DETSC 3401*	0.01	mg/kg	< 0.01		< 0.01
PCB 189	DETSC 3401*	0.01	mg/kg	< 0.01		< 0.01
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg		0.4	0.5

Summary of Chemical Analysis

Soil VOC/SVOC Samples

Our Ref 24-20913

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2402147	2402149	2402153	2402155
Sample ID ~	TP02	TP03	TP05	TP07
Depth ~	2.70	0.50	2.20	0.90
Other ID ~				
Sample Type ~	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	26/09/2024	26/09/2024	26/09/2024	26/09/2024
Sampling Time ~	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
VOCs							
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil VOC/SVOC Samples

Our Ref 24-20913

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2402147	2402149	2402153	2402155
Sample ID ~	TP02	TP03	TP05	TP07
Depth ~	2.70	0.50	2.20	0.90
Other ID ~				
Sample Type ~	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	26/09/2024	26/09/2024	26/09/2024	26/09/2024
Sampling Time ~	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
SVOCs							
Phenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	0.6	< 0.1	< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3433	0.1	mg/kg	< 0.1	0.9	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 0.1	0.6	< 0.1	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 24-20913

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2402147	2402149	2402153	2402155
Sample ID ~	TP02	TP03	TP05	TP07
Depth ~	2.70	0.50	2.20	0.90
Other ID ~				
Sample Type ~	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	26/09/2024	26/09/2024	26/09/2024	26/09/2024
Sampling Time ~	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3433	0.1	mg/kg	< 0.1	0.7	< 0.1	< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3433	0.1	mg/kg	< 0.1	3.8	< 0.1	0.1
Anthracene	DETSC 3433	0.1	mg/kg	0.1	1.2	< 0.1	0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3433	0.1	mg/kg	0.3	2.7	< 0.1	0.2
Pyrene	DETSC 3433	0.1	mg/kg	0.3	2.3	< 0.1	0.2
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	0.1	0.1
Benzo(a)anthracene	DETSC 3433	0.1	mg/kg	< 0.1	1.0	< 0.1	0.2
Chrysene	DETSC 3433	0.1	mg/kg	< 0.1	1.0	< 0.1	0.2
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1	0.6	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1	0.4	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3433	0.1	mg/kg	< 0.1	0.6	< 0.1	< 0.1
Indeno(123cd)pyrene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(ah)anthracene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	< 0.1	0.4	< 0.1	< 0.1

Summary of Asbestos Analysis Soil Samples

Our Ref 24-20913

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Material

Lab No	Sample ID	Sample Location	Type*	Result	Comment*
2402143	TP01 0.10		SOIL	NAD	none
2402144	TP01 0.40		Cement	Chrysotile	none
2402146	TP02 0.70		SOIL	Amosite	Amosite present as fibre bundles
2402148	TP03 0.20		SOIL	Amosite	Amosite present as fibre bundles
2402150	TP03 1.20		SOIL	NAD	none
2402151	TP04 0.10		SOIL	NAD	none
2402152	TP05 0.40		SOIL	NAD	none
2402154	TP06 1.00		SOIL	NAD	none
2402157	TP08 0.20		SOIL	NAD	none
2402158	TP09 1.00		SOIL	Amosite Chrysotile	Amosite and Chrysotile present as fibre bundles

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of A are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -no laboratory scope of accreditation.

Analyst

Vicky Convery
Vicky Convery
Vicky Convery
Vicky Convery
Vicky Convery
Vicky Convery
Vicky Convery
Vicky Convery
Vicky Convery
Vicky Convery

asbestos. Samples
s Detected. Where a
t included in

Information in Support of the Analytical Results

Our Ref 24-20913
 Client Ref ~ 8353
 Contract ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Hold time exceeded for tests	Inappropriate container for tests
2402143	TP01 0.10 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2402144	TP01 0.40 MISC	26/09/24	PG		
2402145	TP02 0.10 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2402146	TP02 0.70 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2402147	TP02 2.70 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2402148	TP03 0.20 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2402149	TP03 0.50 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2402150	TP03 1.20 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2402151	TP04 0.10 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2402152	TP05 0.40 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2402153	TP05 2.20 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2402154	TP06 1.00 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2402155	TP07 0.90 SOIL	26/09/24	PG		BTEX / C5-C10, EPH/Aliphatic/Aromatic + Cleanup SVOC
2402156	TP08 0.05 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2402157	TP08 0.20 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2402158	TP09 1.00 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		

Key: G-Glass J-Jar P-Plastic G-Bag

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO ₄	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC 2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC 2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC 2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC 2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC 2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2311	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO ₄	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	As Received	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3321	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3521	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3521	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3521	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
--------	-----------	-------	-----------------------	-----------------------	----------------	------	--------

Key:

~ Sample details are provided by the client and can affect the validity of the results

* -not accredited.

-MCERTS (accreditation only applies if report carries the MCERTS logo).

\$ -subcontracted.

n/s -not supplied.

I/S -insufficient sample.

U/S -unsuitable sample.

t/f -to follow.

nd -not detected.

End of Report



Certificate of Analysis

Certificate Number 24-21167

Issued: 14-Oct-24

Client Coopers (Chester) Ltd
Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU

Our Reference 24-21167

Client Reference ~ 8353

Order No ~ 10203-LP

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Description 5 Soil samples.

Date Received 03-Oct-24

Date Started 03-Oct-24

Date Completed 14-Oct-24

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



2139

Normec DETS Limited

Unit 2, Park Road Industrial Estate South, Consett, Co Durham, DH8 5PY

Symbol key at end of report Tel: 01207 582333 • email: info@dets.co.uk • www.dets.co.uk

Page 1 of 9

Summary of Chemical Analysis

Matrix Descriptions

Our Ref 24-21167

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Sample ID	Depth	Lab No	Completed	Matrix Description
WS101	0.4	2403425	14/10/2024	Dark brown very gravelly, sandy CLAY (Possible made ground - brick)
WS101	3.00-4.00	2403426	14/10/2024	Dark brown very gravelly, sandy CLAY (Possible made ground - brick)
WS102	0.7	2403427	14/10/2024	Dark brown very gravelly, sandy CLAY (Possible made ground - brick)
WS103	0.2	2403428	14/10/2024	Brown gravelly, sandy CLAY
WS104	0.7	2403429	14/10/2024	Black slightly clayey, very gravelly SAND (Possible made ground - brick)

Summary of Chemical Analysis Soil Samples

Our Ref 24-21167

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2403425	2403426	2403427	2403428	2403429
Sample ID ~	WS101	WS101	WS102	WS103	WS104
Depth ~	0.40	3.00-4.00	0.70	0.20	0.70
Other ID ~					
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	30/09/2024	30/09/2024	30/09/2024	30/09/2024	30/09/2024
Sampling Time ~	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	41	7.1	11	15	34
Beryllium	DETSC 2301#	0.2	mg/kg	1.1	2.4	0.6	0.6	2.5
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.8	0.5	0.4	< 0.2	0.7
Cadmium	DETSC 2301#	0.1	mg/kg	0.8	0.8	0.8	0.3	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	62	21	28	16	19
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	140	33	210	100	130
Lead	DETSC 2301#	0.3	mg/kg	350	110	230	67	53
Mercury	DETSC 2325#	0.05	mg/kg	0.73	0.06	0.72	0.07	< 0.05
Nickel	DETSC 2301#	1	mg/kg	33	17	24	15	59
Selenium	DETSC 2301#	0.5	mg/kg	0.7	< 0.5	< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	59	42	29	24	66
Zinc	DETSC 2301#	1	mg/kg	290	89	290	58	49
Inorganics								
pH	DETSC 2008#		pH	8.3	11.7	10.5	6.7	7.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg	1.1	0.2	0.6	0.2	< 0.1
FOC	DETSC 2002	0.001		0.026	0.022	0.027	0.017	0.099
Total Organic Carbon	DETSC 2002	0.1	%	2.6	2.2	2.7	1.7	9.9
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	64	56	120	46	130
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.08	0.16	0.09	0.04	0.11
Petroleum Hydrocarbons								
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg		< 0.01			
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg		< 0.01			
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01			
Aliphatic >EC10-EC12 Cleanup	DETSC 3521*	1.5	mg/kg		< 15.00			
Aliphatic >EC12-EC16 Cleanup	DETSC 3521*	1.2	mg/kg		15.12			
Aliphatic >EC16-EC21 Cleanup	DETSC 3521*	1.5	mg/kg		< 15.00			
Aliphatic >EC21-EC24 Cleanup	DETSC 3521*	3.4	mg/kg		< 34.00			
Aliphatic >EC21-EC35 Cleanup	DETSC 3521*	3.4	mg/kg		< 3.40			
Aliphatic >EC24-EC35 Cleanup	DETSC 3521*	3.4	mg/kg		< 34.00			
Aliphatic >EC10-EC35 Cleanup	DETSC 3521*	10	mg/kg		< 76.00			
Aliphatic >EC10-EC40 Cleanup	DETSC 3521*	10	mg/kg		< 110.00			
Aliphatic C5-C35 Cleanup	DETSC 3521*	10	mg/kg		49.19			
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg		< 0.01			
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg		< 0.01			
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01			
Aromatic >EC10-EC12 Cleanup	DETSC 3521*	0.9	mg/kg		< 9.00			
Aromatic >EC12-EC16 Cleanup	DETSC 3521*	0.5	mg/kg		468.4			
Aromatic >EC16-EC21 Cleanup	DETSC 3521*	0.6	mg/kg		1760			
Aromatic >EC21-EC24 Cleanup	DETSC 3521*	1.4	mg/kg		449.1			

Summary of Chemical Analysis

Soil Samples

Our Ref 24-21167

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2403425	2403426	2403427	2403428	2403429
Sample ID ~	WS101	WS101	WS102	WS103	WS104
Depth ~	0.40	3.00-4.00	0.70	0.20	0.70
Other ID ~					
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	30/09/2024	30/09/2024	30/09/2024	30/09/2024	30/09/2024
Sampling Time ~	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Aromatic >EC21-EC35 Cleanup	DETSC 3521*	1.4	mg/kg		1362			
Aromatic >EC24-EC35 Cleanup	DETSC 3521*	1.4	mg/kg		912.8			
Aromatic C5-C35 Cleanup	DETSC 3521*	10	mg/kg		3600			
Aromatic >EC10-EC35 Cleanup	DETSC 3521*	10	mg/kg		3590			
Aromatic >EC10-EC40 Cleanup	DETSC 3521*	10	mg/kg		3664			
TPH Ali/Aro Total C5-C35 Cleanup	DETSC 3521*	10	mg/kg		3649			
Benzene	DETSC 3321#	0.01	mg/kg		< 0.01			
Ethylbenzene	DETSC 3321#	0.01	mg/kg		< 0.01			
Toluene	DETSC 3321#	0.01	mg/kg		< 0.01			
Xylene	DETSC 3321#	0.01	mg/kg		< 0.01			
PAHs								
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	0.56	< 1.00	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.30	< 1.00	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.04	11	< 1.00	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	11	< 1.00	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.30	57	3.0	< 0.03	0.12
Anthracene	DETSC 3303	0.03	mg/kg	0.06	13	< 1.00	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.59	38	4.9	0.05	0.34
Pyrene	DETSC 3303#	0.03	mg/kg	0.54	29	4.1	0.04	0.41
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.28	6.4	2.3	0.04	0.28
Chrysene	DETSC 3303	0.03	mg/kg	0.29	5.1	2.5	< 0.03	0.32
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.41	3.9	3.4	0.03	0.44
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.15	1.8	1.5	< 0.03	0.17
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.29	3.1	3.2	< 0.03	0.34
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.13	1.1	1.3	< 0.03	0.15
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.04	0.44	< 1.00	< 0.03	0.06
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.17	1.3	1.8	< 0.03	0.21
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	3.3	180	28	0.13	2.8
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.5	0.9	0.5	0.3	0.9

Summary of Asbestos Analysis Soil Samples

Our Ref 24-21167

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2403425	WS101 0.40	SOIL	NAD	none	Pierce Booth
2403426	WS101 3.00-4.00	SOIL	NAD	none	Pierce Booth
2403427	WS102 0.70	SOIL	Chrysotile	Chrysotile present in microscopic cement fragment	Pierce Booth
2403428	WS103 0.20	SOIL	NAD	none	Pierce Booth
2403429	WS104 0.70	SOIL	NAD	none	Pierce Booth

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 24-21167
 Client Ref ~ 8353
 Contract ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Hold time exceeded for tests	Inappropriate container for tests
2403425	WS101 0.40 SOIL	30/09/24	GJ 250ml x2, GJ 60ml		
2403426	WS101 3.00-4.00 SOIL	30/09/24	GJ 250ml x2, GJ 60ml		
2403427	WS102 0.70 SOIL	30/09/24	GJ 250ml x2, GJ 60ml		
2403428	WS103 0.20 SOIL	30/09/24	GJ 250ml x2, GJ 60ml		
2403429	WS104 0.70 SOIL	30/09/24	GJ 250ml x2, GJ 60ml		

Key: G-Glass J-Jar

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
 Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
 The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO ₄	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC 2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC 2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC 2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC 2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC 2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2311	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO ₄	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	As Received	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3321	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3521	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3521	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3521	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
--------	-----------	-------	-----------------------	-----------------------	----------------	------	--------

Key:

~ Sample details are provided by the client and can affect the validity of the results

* -not accredited.

-MCERTS (accreditation only applies if report carries the MCERTS logo).

\$ -subcontracted.

n/s -not supplied.

I/S -insufficient sample.

U/S -unsuitable sample.

t/f -to follow.

nd -not detected.

End of Report



Certificate of Analysis

Certificate Number 24-22201

Issued: 22-Oct-24

Client Coopers (Chester) Ltd
Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU

Our Reference 24-22201

Client Reference ~ 8353

Order No ~ 10200-LP

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Description 3 Soil samples, 3 Leachate prepared by DETS samples.

Date Received 01-Oct-24

Date Started 16-Oct-24

Date Completed 22-Oct-24

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



2139

Normec DETS Limited

Unit 2, Park Road Industrial Estate South, Consett, Co Durham, DH8 5PY

Symbol key at end of report Tel: 01207 582333 • email: info@dets.co.uk • www.dets.co.uk

Page 1 of 5

Summary of Chemical Analysis

Leachate Samples

Our Ref 24-22201

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2409990	2409991	2409994
Sample ID ~	TP04	TP05	TP02
Depth ~	0.10	0.40	0.70
Other ID ~			
Sample Type ~	LEACHATE	LEACHATE	LEACHATE
Sampling Date ~	26/09/2024	26/09/2024	26/09/2024
Sampling Time ~	n/s	n/s	n/s

Test	Method	LOD	Units			
Preparation						
BS EN 12457 10:1	DETSC 1009*			Y	Y	Y
Metals						
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	3.7	2.3	
Copper, Dissolved	DETSC 2306	0.4	ug/l		1.5	
Lead, Dissolved	DETSC 2306	0.09	ug/l	1.9	1.3	2.9

Summary of Asbestos Analysis Samples

Our Ref 24-22201

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	Sample ID	Sample Location	Material Type	Result	Comment*	Analyst
Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.						

Summary of Asbestos Quantification Analysis

Soil Samples

Our Ref 24-22201

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2409988	2409989	2409992
Sample ID ~	TP02	TP03	TP09
Depth ~	0.70	0.20	1.00
Other ID ~			
Sample Type ~			
Sampling Date ~	26/09/2024	26/09/2024	26/09/2024
Sampling Time ~			

Test	Method	Units				
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %		0.003	0.002	0.004
Gravimetric Quantification (a)	DETSC 1102	Mass %		na	na	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %		0.003	0.002	0.004
Quantification by PCOM (c)	DETSC 1102	Mass %		na	na	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g		na	na	na
Breakdown of Gravimetric Analysis (a)						
Mass of Sample		g		23.01	27.80	23.05
ACMs present*		type				
Mass of ACM in sample		g				
% ACM by mass		%				
% asbestos in ACM		%				
% asbestos in sample		%				
Breakdown of Detailed Gravimetric Analysis (b)						
% Amphibole bundles in sample		Mass %		0.003	0.002	0.003
% Chrysotile bundles in sample		Mass %		na	na	0.002
Breakdown of PCOM Analysis (c)						
% Amphibole fibres in sample		Mass %		na	na	na
% Chrysotile fibres in sample		Mass %		na	na	na
Breakdown of Potentially Respirable Fibre Analysis (d)						
Amphibole fibres		Fibres/g		na	na	na
Chrysotile fibres		Fibres/g		na	na	na

* Denotes test or material description outside of UKAS accreditation.
 % asbestos in Asbestos Containing Materials (ACMs) is determined by
 by reference to HSG 264.
 Recommended sample size for quantification is approximately 1kg
 # denotes deviating sample

Information in Support of the Analytical Results

Our Ref 24-22201

Client Ref ~ 8353

Contract ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2409988	TP02 0.70 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2409989	TP03 0.20 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2409990	TP04 0.10 LEACHATE	26/09/24	GJ 250ml x2, GJ 60ml		
2409991	TP05 0.40 LEACHATE	26/09/24	GJ 250ml x2, GJ 60ml		
2409992	TP09 1.00 SOIL	26/09/24	GJ 250ml x2, GJ 60ml		
2409994	TP02 0.70 LEACHATE	26/09/24	GJ 250ml x2, GJ 60ml		

Key: G-Glass J-Jar

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Key:

~ Sample details are provided by the client and can affect the validity of the results

* -not accredited.

-MCERTS (accreditation only applies if report carries the MCERTS logo).

\$ -subcontracted.

n/s -not supplied.

I/S -insufficient sample.

U/S -unsuitable sample.

t/f -to follow.

nd -not detected.

End of Report



Certificate of Analysis

Certificate Number 24-22203

Issued: 22-Oct-24

Client Coopers (Chester) Ltd
Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU

Our Reference 24-22203

Client Reference ~ 8353

Order No ~ 10203-LP

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Description 1 Soil sample, 3 Leachate prepared by DETS samples.

Date Received 03-Oct-24

Date Started 16-Oct-24

Date Completed 22-Oct-24

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



2139

Normec DETS Limited

Unit 2, Park Road Industrial Estate South, Consett, Co Durham, DH8 5PY

Symbol key at end of report Tel: 01207 582333 • email: info@dets.co.uk • www.dets.co.uk

Page 1 of 5

Summary of Chemical Analysis

Leachate Samples

Our Ref 24-22203

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2409995	2409996	2409998
Sample ID ~	WS101	WS101	WS102
Depth ~	0.40	3.00-4.00	0.70
Other ID ~			
Sample Type ~	LEACHATE	LEACHATE	LEACHATE
Sampling Date ~	30/09/2024	30/09/2024	30/09/2024
Sampling Time ~	n/s	n/s	n/s

Test	Method	LOD	Units			
Preparation						
BS EN 12457 10:1	DETSC 1009*			Y	Y	Y
Metals						
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	< 0.16		
Copper, Dissolved	DETSC 2306	0.4	ug/l			2.0
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.22		1.3
PAHs						
Naphthalene	DETSC 3304	0.05	ug/l		0.08	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l		0.66	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l		16	0.02
Fluorene	DETSC 3304	0.01	ug/l		3.6	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l		0.39	0.02
Anthracene	DETSC 3304	0.01	ug/l		0.51	0.01
Fluoranthene	DETSC 3304	0.01	ug/l		3.5	0.04
Pyrene	DETSC 3304	0.01	ug/l		2.5	0.05
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l		0.32	0.03
Chrysene	DETSC 3304	0.01	ug/l		0.23	0.03
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l		0.26	0.06
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l		0.12	0.02
Benzo(a)pyrene	DETSC 3304	0.01	ug/l		0.25	0.05
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l		0.11	0.04
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l		< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l		0.12	0.05
PAH Total	DETSC 3304	0.2	ug/l		29	0.41

Summary of Asbestos Analysis Samples

Our Ref 24-22203

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	Sample ID	Sample Location	Material Type	Result	Comment*	Analyst
Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.						

Summary of Asbestos Quantification Analysis

Soil Samples

Our Ref 24-22203

Client Ref ~ 8353

Contract Title ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Lab No	2409997
Sample ID ~	WS102
Depth ~	0.70
Other ID ~	
Sample Type ~	
Sampling Date ~	30/09/2024
Sampling Time ~	

Test	Method	Units		
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %		0.035
Gravimetric Quantification (a)	DETSC 1102	Mass %		0.035
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %		na
Quantification by PCOM (c)	DETSC 1102	Mass %		na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g		na

Breakdown of Gravimetric Analysis (a)

Mass of Sample		g		13.26
ACMs present*		type		Cement
Mass of ACM in sample		g		0.0309
% ACM by mass		%		0.233
% asbestos in ACM		%		15
% asbestos in sample		%		0.035

Breakdown of Detailed Gravimetric Analysis (b)

% Amphibole bundles in sample		Mass %		na
% Chrysotile bundles in sample		Mass %		na

Breakdown of PCOM Analysis (c)

% Amphibole fibres in sample		Mass %		na
% Chrysotile fibres in sample		Mass %		na

Breakdown of Potentially Respirable Fibre Analysis (d)

Amphibole fibres		Fibres/g		na
Chrysotile fibres		Fibres/g		na

* Denotes test or material description outside of UKAS accreditation.
 % asbestos in Asbestos Containing Materials (ACMs) is determined by
 by reference to HSG 264.
 Recommended sample size for quantification is approximately 1kg
 # denotes deviating sample

Information in Support of the Analytical Results

Our Ref 24-22203

Client Ref ~ 8353

Contract ~ LAND ADJACENT TO BEALEY INDUSTRIAL

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2409995	WS101 0.40 LEACHATE	30/09/24	GJ 250ml x2, GJ 60ml		
2409996	WS101 3.00-4.00 LEACHATE	30/09/24	GJ 250ml x2, GJ 60ml		
2409997	WS102 0.70 SOIL	30/09/24	GJ 250ml x2, GJ 60ml		
2409998	WS102 0.70 LEACHATE	30/09/24	GJ 250ml x2, GJ 60ml		

Key: G-Glass J-Jar

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Key:

~ Sample details are provided by the client and can affect the validity of the results

* -not accredited.

-MCERTS (accreditation only applies if report carries the MCERTS logo).

\$ -subcontracted.

n/s -not supplied.

I/S -insufficient sample.

U/S -unsuitable sample.

t/f -to follow.

nd -not detected.

End of Report

Site Investigation Report for
Land Adjacent to Bealey Industrial Estate, Radcliffe

Appendix 9

Geotechnical Test Results



Settlement Calculations

TEST REPORT

Client Coopers (Chester) Ltd

Address Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU

Contract 8353 -
Land Adjacent to Bealey Industrial Estate, Radcliffe

Order Number 8353 (10007-LP)

Job Number MRN 24064/8

Date of Issue 03 May 2024

Page 1 of 6

Approved Signatories

Notes

- 1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.
- 2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.
- 3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.
- 4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.
- 5 The results included within the report are representative of the samples submitted for analysis.
- 6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.



Andrew House, Hadfield Street, Dukinfield, Cheshire SK16 4QX Tel: 0161 475 0870
Email: enquiries@murrayrix.com Website: www.murrayrix.com

Also at: London: 020 8523 1999

Murray Rix is the trading name of Murray Rix (Northern) Limited. Registered in England 2878361

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870



TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

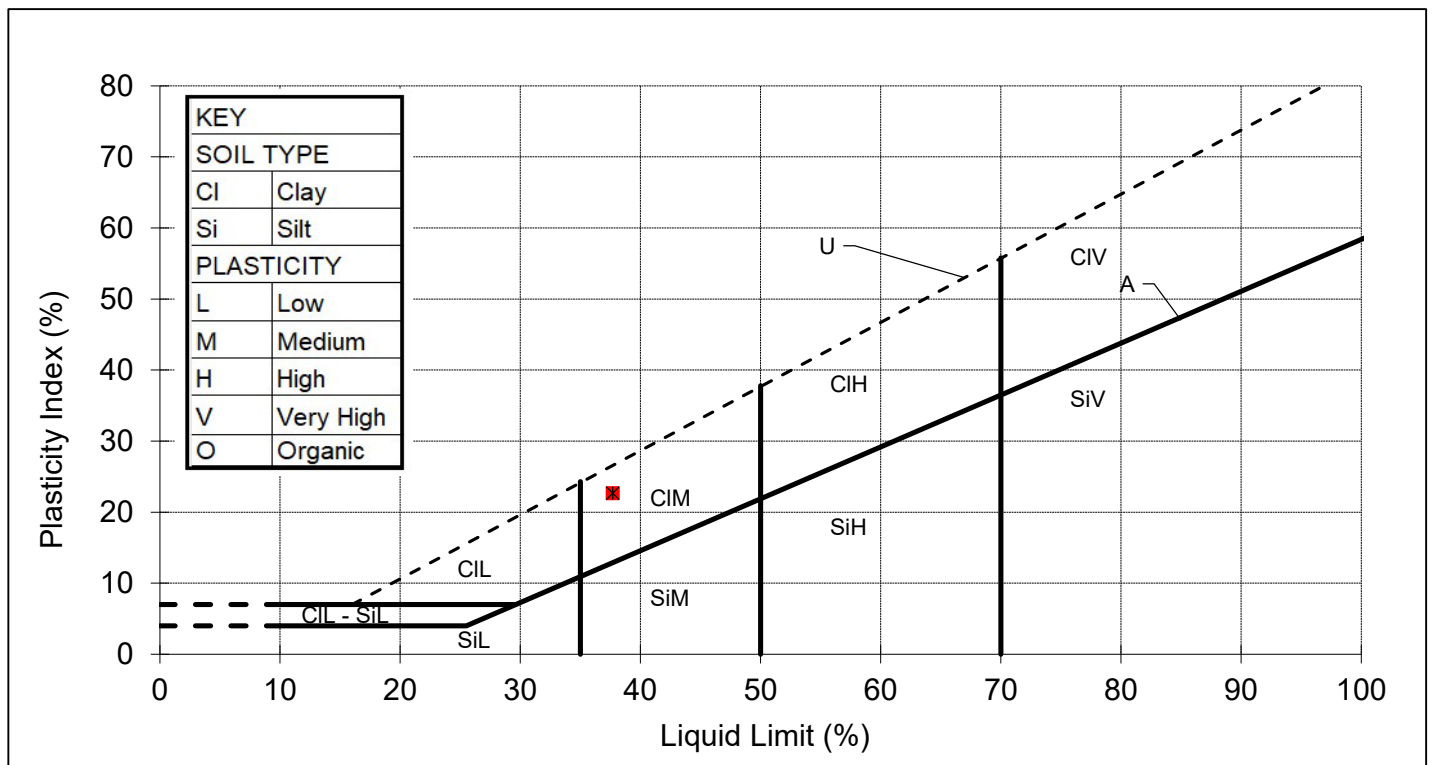
CLIENT	Coopers (Chester) Ltd		
SITE	8353 - Land Adjacent to Bealey Industrial Estate, Radcliffe		
JOB NUMBER	MRN 24064/8		

SAMPLE LABEL	WS01 1.6-2.2m (B)	DATE SAMPLED	21-Mar-24
SAMPLE No.	450601	DATE RECEIVED	08-Apr-24
DATE TESTED	16-Apr-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy CLAY.		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Moisture Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	18.3	36.8	1.027	
Determination 2 (avg)	18.7	36.6		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
26.0	38	15	23	98



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Laboratory Manager)

DATE

03-May-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870



TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

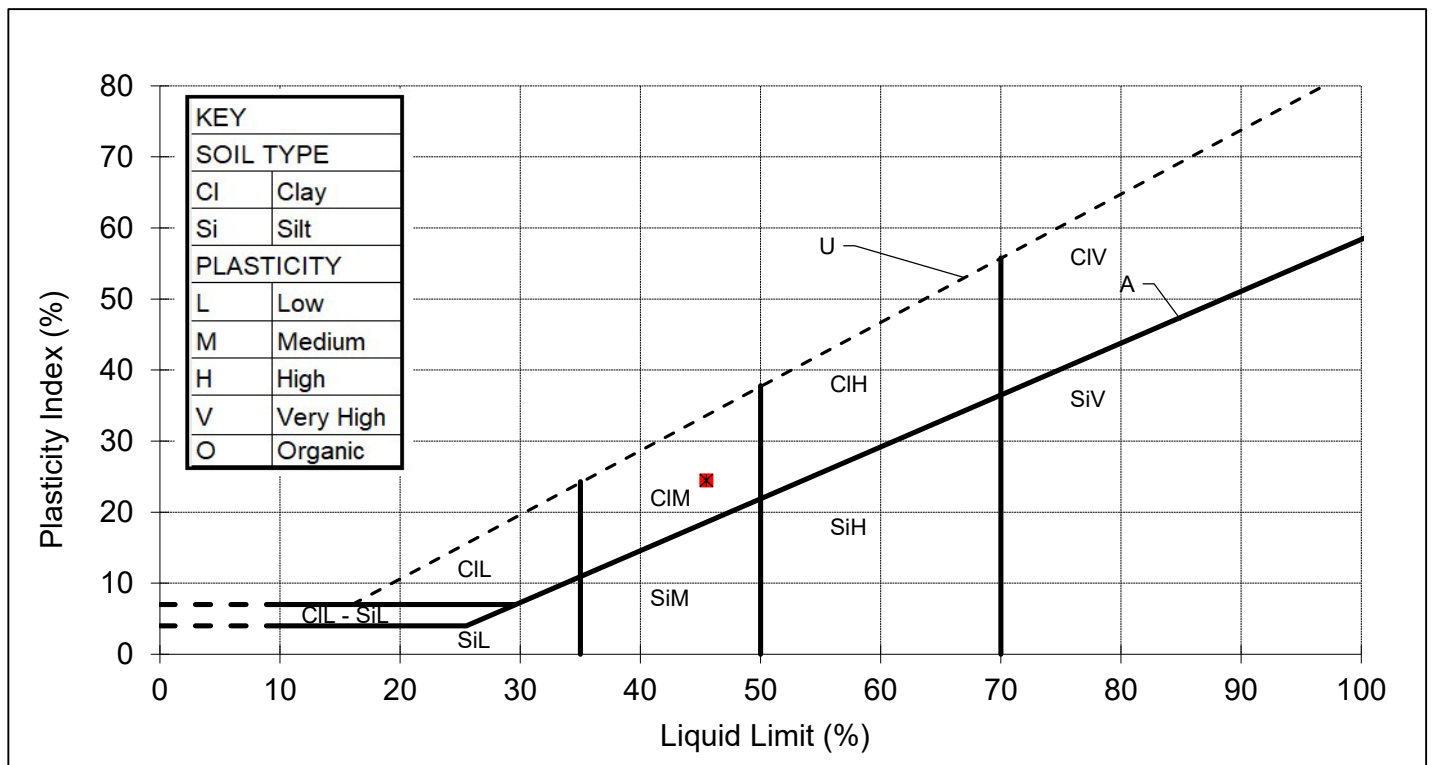
CLIENT	Coopers (Chester) Ltd
SITE	8353 - Land Adjacent to Bealey Industrial Estate, Radcliffe
JOB NUMBER	MRN 24064/8

SAMPLE LABEL	WS02 0.8-1.70m (B)	DATE SAMPLED	21-Mar-24
SAMPLE No.	450602	DATE RECEIVED	08-Apr-24
DATE TESTED	16-Apr-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY.		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Moisture Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	18.5	44.6	1.025	
Determination 2 (avg)	18.7	44.2		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
34.6	45	21	24	89



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Laboratory Manager)

DATE

03-May-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870



TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

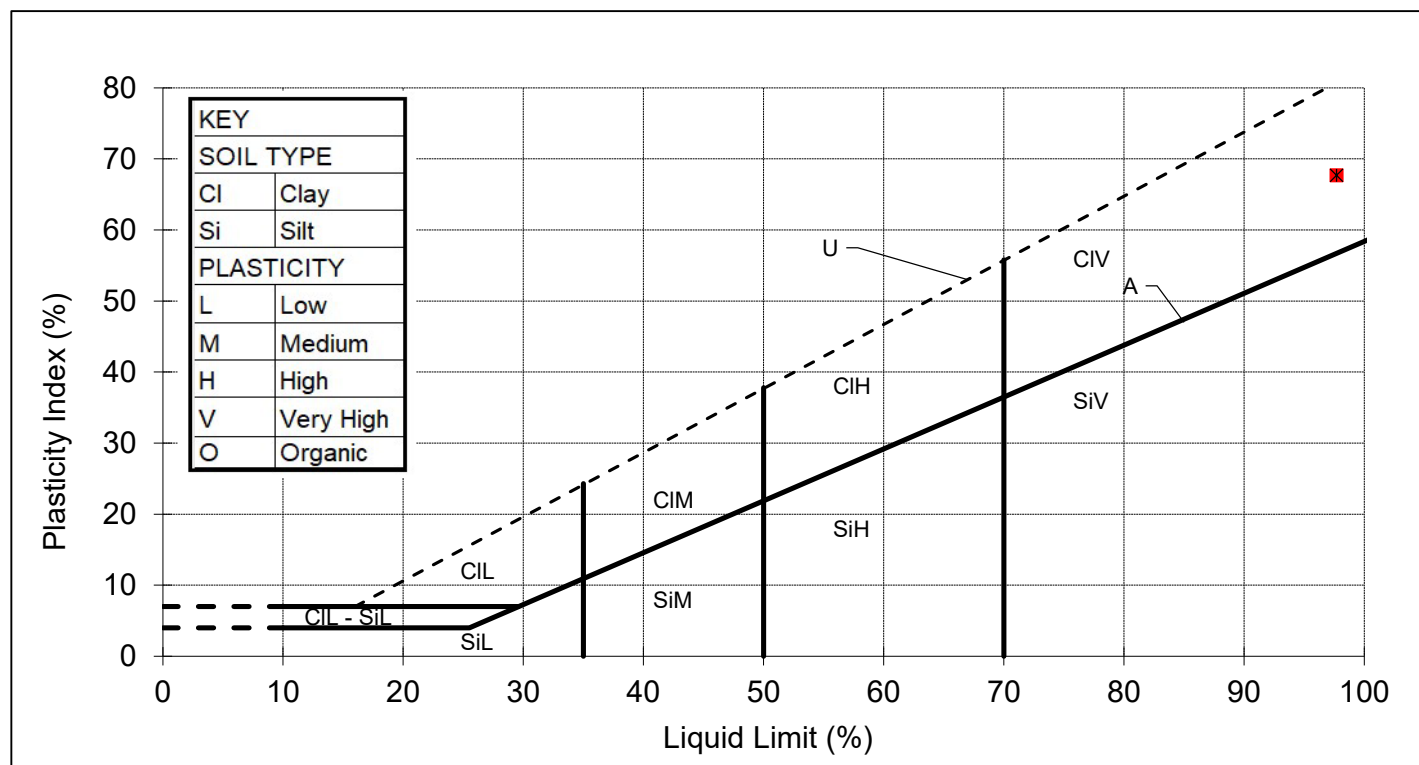
CLIENT	Coopers (Chester) Ltd
SITE	8353 - Land Adjacent to Bealey Industrial Estate, Radcliffe
JOB NUMBER	MRN 24064/8

SAMPLE LABEL	WS06 1.1-1.60m (B)	DATE SAMPLED	22-Mar-24
SAMPLE No.	450603	DATE RECEIVED	08-Apr-24
DATE TESTED	16-Apr-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly organic CLAY.		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Moisture Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	24.2	105.6	0.926	
Determination 2 (avg)	24.1	105.4		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
63.2	98	30	68	99



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Laboratory Manager)

DATE

03-May-24

MURRAY RIX
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

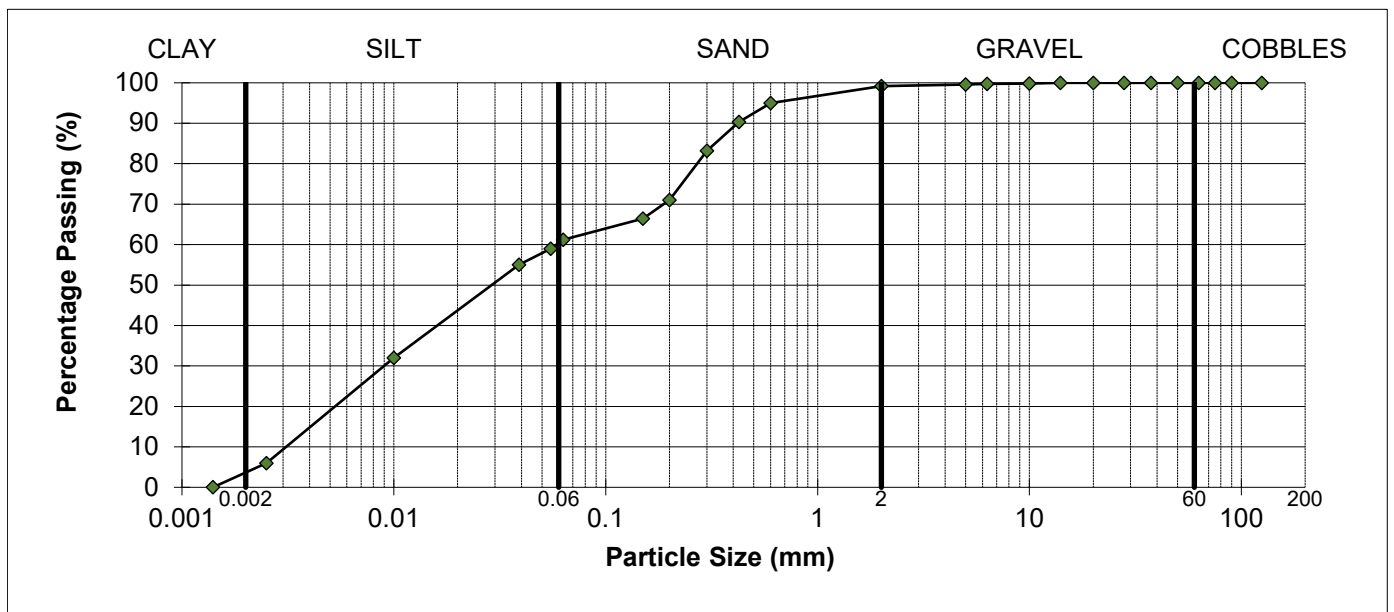
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	Coopers (Chester) Ltd
SITE	8353 - Land Adjacent to Bealey Industrial Estate, Radcliffe
JOB NUMBER	MRN 24064/8

SAMPLE LABEL	WS06 2.00-2.30m (B)	DATE SAMPLED	22-Mar-24
LAB SAMPLE No	450604	DATE RECEIVED	08-Apr-24
DATE TESTED	18-Apr-24	SAMPLED BY	Client

MATERIAL	Brown clayey sandy slightly gravelly SILT.
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2	99	
90	100		0.6	95	
75	100		0.425	90	
63	100		0.3	83	
50	100		0.2	71	
37.5	100		0.15	66	
28	100		0.063	61	
20	100		0.055	59	
14	100		0.039	55	
10	100		0.01	32	
6.3	100		0.0025	6	
5	100		0.0014	0	



REMARKS

As received water content = 73.4%

SIGNED

NAME

O.P. Davies BA (Hons)
(Laboratory Manager)

DATE

03-May-24

MURRAY RIX
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

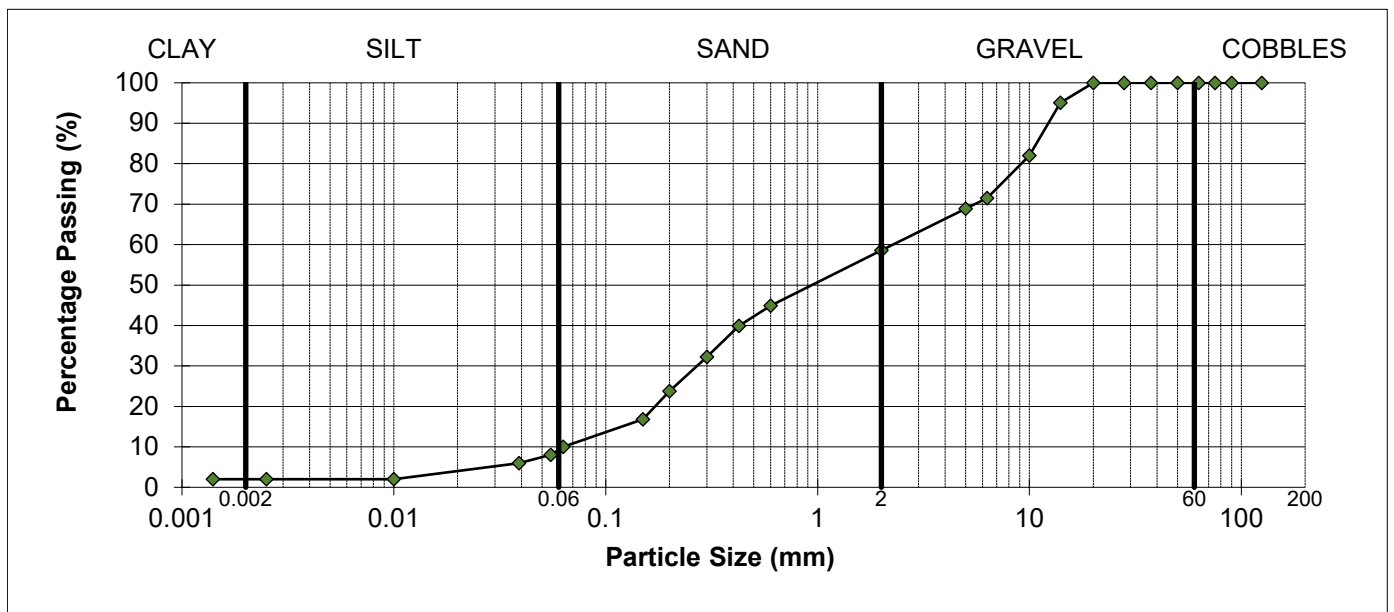
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	Coopers (Chester) Ltd
SITE	8353 - Land Adjacent to Bealey Industrial Estate, Radcliffe
JOB NUMBER	MRN 24064/8

SAMPLE LABEL	WS09 0.6-1.9m (B)	DATE SAMPLED	22-Mar-24
LAB SAMPLE No	450605	DATE RECEIVED	08-Apr-24
DATE TESTED	18-Apr-24	SAMPLED BY	Client

MATERIAL	Brown silty gravelly SAND.
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2	59	
90	100		0.6	45	
75	100		0.425	40	
63	100		0.3	32	
50	100		0.2	24	
37.5	100		0.15	17	
28	100		0.063	10	
20	100		0.055	8	
14	95		0.039	6	
10	82		0.01	2	
6.3	72		0.0025	2	
5	69		0.0014	2	



REMARKS

As received water content = 24.8%

SIGNED

NAME

O.P. Davies BA (Hons)
(Laboratory Manager)

DATE

03-May-24

Land Adjacent to Bealey's Industrial Estate, Radcliffe

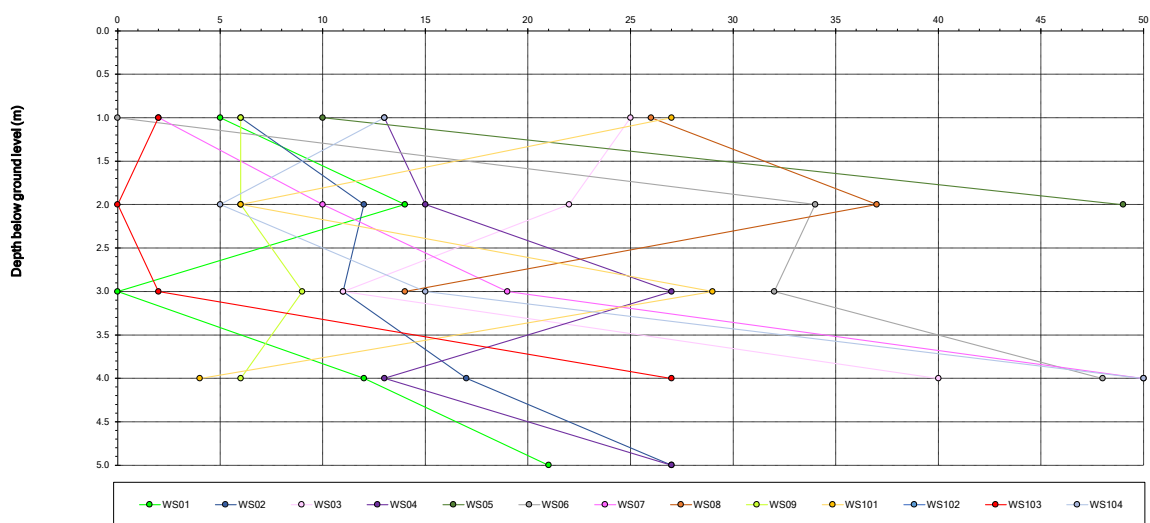
SPT N Value Summary Table

Madeground	Gravel	Soft/Firm Clay	Water Strike
Silt	Sand & Gravel	Stiff Clay	
Peat	Sand	Borehole Terminated	

Depth below ground level (m)	Exploratory Hole References												
	WS01	WS02	WS03	WS04	WS05	WS06	WS07	WS08	WS09	WS101	WS102	WS103	WS104
0.0													
0.1													
0.2													
0.3													
0.4													
0.5													
0.6													
0.7													
0.8													
0.9													
1.0	5	6	25	13	10	0	2	26	6	27		2	13
1.1													
1.2													
1.3													
1.4													
1.5													
1.6													
1.7													
1.8													
1.9													
2.0	14	12	22	15	49	34	10	37	6	6		0	5
2.1													
2.2													
2.3													
2.4													
2.5													
2.6													
2.7													
2.8													
2.9													
3.0	0	11	11	27		32	19	14	9	29		2	15
3.1													
3.2													
3.3													
3.4													
3.5													
3.6													
3.7													
3.8													
3.9													
4.0	12	17	40	13		48	50		6	4		27	50
4.1													
4.2													
4.3													
4.4													
4.5													
4.6													
4.7													
4.8													
4.9													
5.0	21	27		27									
5.1													
5.2													
5.3													
5.4													

Borehole SPT N Value with depth

SPT N Value



Project Name: Land Adj. Bealeys Trading Estate, Radcliffe

Project Reference: 8353

CALCULATION OF ULTIMATE BEARING CAPACITY - HANSEN'S METHOD

Footing width, B (m)	0.6
Footing length, L (m)	10
Founding depth, D (m)	1
Slope of ground (deg)	0
Soil bulk density, gb (kN/m ³)	18
Depth to water table (m)	3
Effective density for calculations, gamma (kN/m ³)	18.0
Effective overburden press. at founding level, q (kPa)	18

B should be <= L

Cohesion, c _u (kPa)	
Angle of shearing res., phi, used (deg)	
SPT N value	9
Calculated phi based on SPT(deg)	29.6
Angle of shearing res., phi, used (deg)	29.6

If blank, value will be based on SPT. Based on Tzeraghi and Peck

correlation by Peck, Hanson, Thornburn - see p 2.

0.5171 = radians

HANSEN'S BEARING CAPACITY FACTORS

N(q)	17.6
N(c)	29.3
N(g)	18.9

$$= e^{(\pi \cdot \tan(\phi))} \cdot \tan^2(45 + (\phi/2))$$

$$= (2 + \pi) \text{ if } \phi=0; = (N_q - 1) \cdot \cot(\phi) \text{ if } \phi > 0$$

$$= 2 \cdot (N_q - 1) \cdot \tan(\phi)$$

HANSEN'S MODIFYING FACTORS

	(c)	(q)	(g)
Shape factors, s(c), s(q), s(g)	1.04	1.03	0.976
Depth factors, d(c), d(q), d(g)	1.41	1.30	1.00
Ground slope, g(c), g(q), g(g)	1.00	1.00	1.00

shape factors calculated using
formulae given by Hansen
- see page 2 for details.

ULTIMATE BEARING CAPACITY

Cohesion contribution N(c)	0	= c*N(c)*s(c)*d(c)*g(c)
Overburden contribution N(q)	425	= q*N(q)*s(q)*d(q)*g(q)
Friction contribution N(g)	100	= 0.5*gamma*g(c)*g(q)*g(g)
Ultimate bearing capacity (kPa)	525	

Allowable bearing capacity*	175 kPa
------------------------------------	----------------

* Notes:

(1) for a factor of safety of 3 against ultimate bearing capacity failure.

(2) for granular soils, the allowable bearing capacity is likely to be limited by settlement considerations rather than ultimate bearing capacity. This should be checked.

CALCULATION FOR EFFECTIVE DENSITY

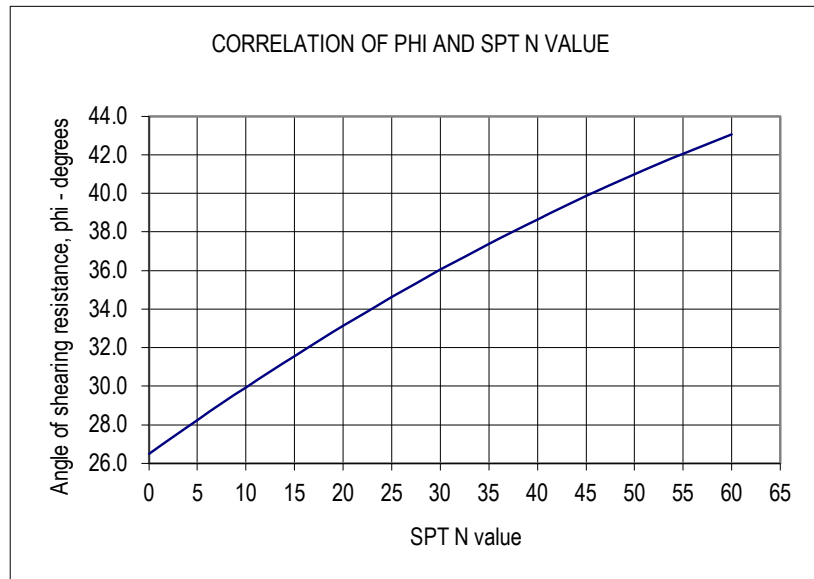
H= .5*B*tan(45+phi/2)	0.516	=0.5*B*tan(45+phi/2)
Water below footing, dw	2.000	if water depth > footing depth, = water depth - footing depth, otherwise 0
1st half of expression, A	18.000	if dw < H, = actual density, gb; otherwise gb * dw*(2H - dw)/H ²
2nd half of expression, B	0.000	if dw < H, 0; otherwise (gb - dens.water)*(H - dw) ² /H ²
Eff. dens, gamma = A+B	18.000	

PECK, HANSON AND THORNBURN'S CORRELATION BETWEEN SPT N VALUE AND PHI

Page 2

SPT N VALUE	PHI (DEG)
0	26.5
5	28.3
10	30.0
15	31.6
20	33.1
25	34.6
30	36.0
35	37.4
40	38.7
45	39.9
50	41.0
55	42.1
60	43.1

Phi calculated as $\phi = 25.5 + 0.36N + 0.0014N^2$, obtained by curve fitting the published graph (see Tominson, etc.)


EXPRESSIONS FOR HANSEN'S SHAPE FACTORS

$$s(c) = 1 + (B/L) \cdot (N_q/N_c)$$

$$s(q) = 1 + (B/L) \cdot \sin(\phi)$$

$$s(g) = 1 - 0.4 \cdot (B/L)$$

$$d(c) = 1 + 0.4 \cdot \tan(D/B) \cdot \tan(\phi)$$

$$d(q) = 1 + 2 \cdot \tan(\phi) \cdot (1 - \sin(\phi)) \cdot \tan(D/B) \cdot \tan(\phi)$$

$$d(g) = 1.0$$

** note that in these expressions, $\tan(D/B)$ should be replaced with (D/B) if $D \leq B$, but the error is small, and conservative.

$$g(c) = 1 - (\text{ground slope})^0 / 147^0$$

$$g(q) = (1 - \tan(\text{ground slope}))^5$$

Burland and Burbidge Settlement Assessment for Sand & Gravel

$$q'_n \times B^{0.7} \times I_c$$

		Recommended	Maximum
Allowable Bearing Pressure	q'_n	100 kPa	175
Footing Breadth Index	$B^{0.7}$	0.69936819	0.69936819
Compressibility Index	I_c	0.078896293	0.07889629
SPT value	n'	9	9
Shape Factor	F_s	1.516658982	1.51665898
Creep Factor over 10 yrs	F_t	1.404575749	1.40457575
Settlement		11.75427 mm	20.55702 mm

Site Investigation Report for
Land Adjacent to Bealey Industrial Estate, Radcliffe

Appendix 10

Tier 1 Risk Assessment Screening Values



Controlled Water Receptor Threshold Values



**Legislation Framework which Drives the Contamination Assessment of Land in
England and Wales**



JIWG Asbestos Decision Support Tool Calculation Sheet



Source Signature Double Ratio Plots and Explanation Sheets

Soil Tier 1 Threshold Values (mg/kg) Residential and POS

		Elements and compounds	S4UL	Small Terrace	Med/Large Terrace	Semi-detached	Detached	Residential (without Veg)	POS (Resi)	POS (Park)
				White, yellow & green values are NOAEL with orange values C4SL						
Silty clay	Metals/Semi-metals	Arsenic	37	37 (32.4 CLEA)				40 (40)	79 (79)	168 (170)
		Beryllium	1.7 (inh.)	51 (to be used with caution and superseded)				(1.7)	(2.2)	(63)
		Boron	290	291				(11,000)	(21,000)	(46,000)
		Cadmium	11	22 (11 CLEA)				150 (85)	220 (120)	880 (532)
		Chromium (III)	910	3000				(910)	(1,500)	(33,000)
		Chromium (VI)	6	21 (4.3)				21 (6)	51 (7.7)	250 (220)
		Copper	2,400	2,330 (Phytotoxic pH <6 = 100, pH6-7 = 135, pH >7 = 200)				(7,100)	(12,000)	(44,000)
		Lead	-	200				310	630	1,300
		Mercury (methyl)	11	7.4 (SGV withdrawn)				(15)	(40)	(68)
		Mercury (inorganic)	40	169 (SGV withdrawn)				(56)	(120)	(240)
		Mercury (Hg)	1.2	1.2 (SGV withdrawn)				(1.2)	(16)	(30vap (25.8))
		Nickel	130	(130 S4UL) (Phytotoxic pH <6 = 60, pH6-7 = 75, pH >7 = 110)				(180)	(230)	(800)
		Selenium	250	351				(430)	(1,100)	(1,800)
		Vanadium	410	79				(1,200)	(2,000)	(5,000)
		Zinc	3,700	3,750 (Phytotoxic pH <6 = 200, pH6-7 = 200, pH >7 = 300)				(40,000)	(81,000)	(170,000)
	PAH	Acenaphthene	210	205				(3,000 – 57 s)	(15,000)	(29,000)
		Acenaphthylene	170	168				(2,900 – 86.1 s)	(15,000)	(29,000)
		Anthracene	2,400	2,260				(31,000 – 1.17 v)	(74,000)	(150,000)
		Benzo(a)anthracene	7.2	3.1				(11)	(29)	(49)
		Benzo(a)pyrene	2.2	5 (6% SOM) (0.83 CLEA)				5.3 (3.2)	10 (5.7)	21 (11)
		Benzo(b)fluoranthene	2.6	5.56				(3.9)	(7.1)	(13)
		Benzo(ghi)perylene	320	10.7				(360)	(640)	(1,400)
		Benzo(k)fluoranthene	7.7	8.5				(110)	(190)	(370)
		Chrysene	15	6.0				(30)	(57)	(93)
		Dibenz(ah)anthracene	0.24	0.76				(0.31)	(0.57)	(1.1)
		Fluoranthene	280	257				(1,500)	(3,100)	(6,300)
		Fluorene	170	163				(2,800 – 30.9 s)	(9,900)	(20,000)
		Indeno(123-cd)pyrene	27	3.18				(45)	(82)	(150)
Sandy loam	BTX	Phenanthrene	95	91.8				(1,300 – 36 s)	(3,100)	(6,200)
		Pyrene	620	563				(3,700)	(7,400)	(15,000)
		Naphthalene	2.3	1.54	1.71	1.7	1.97	(2.3)	(4,900)	(1,200 – 76.4 s)
		Benzene	0.087	0.2 (1%) (0.079 CLEA)	0.082	0.082	0.085	0.89 (0.38)	140 (72)	190 (90)
		Toluene	130	119	122	122	125	(869)	(56,000)	(87,000 v)
	Aliphatic	Ethylbenzene	47	62.5	68	67.9	71.6	(83)	(24,000)	(17,000 v)
		Xylene (based on p)	56	41.7	45.5	45.3	50.9	(70)	(41,000)	(17,000 v)
		Phenol	280	184	207	206	224	(750)	(760)	(760)
		5-6	42	30				(42)	(570,000 – 304 s)	(95,000 – 304 s)
		6-8	100	73				(100)	(600,000)	(150,000 – 144 s)
		8-10	27	19				(27)	(13,000)	(14,000 – 78 s)
		10-12	130 (48)	93 (48) ^{vap}				(130 – 48 v)	(13,000)	(21,000 – 48 s)
		12-16	1,100 (24)	740 (24) ^{sol}				(1,100 - 24 v)	(13,000)	(25,000 – 24 s)
		16-35	65,000 (8.48)	45,000 (8.48) ^{sol}				(65,000)	(250,000)	(450,000)
		35-44	65,000 (8.48)	45,000 (8.48) ^{sol}				(65,000)	(250,000)	(450,000)
Aromatic	8-10	34	27				(47)	(5,000)	(7,200 – 613 v)	
	10-12	74	69				(250)	(5,000)	(9,200 – 364 s)	
	12-16	140	140				(1,800)	(5,100)	(10,000)	
	16-21	260 (	250				(1,900)	(3,800)	(7,600)	
	21-35	1,100	890				(1,900)	(3,800)	(7,600)	

Notes:

The soil organic matter has been assumed to be 1% as this is the most conservative value for organic compounds. Inorganic compounds unaffected by this parameter.

Silty clay strata appears to prove more conservative threshold values for metals, semi-metals and several PAH compounds. Sandy loam strata appears to prove more conservative threshold values for TPH compounds, phenol and naphthalene.

The assessment of hydrocarbon fractions should be completed additively to determine the total risk of the whole range of compounds present as well as by single TPH fractional units, however this should be undertaken on a sample by sample basis where significant hydrocarbon concentrations have been encountered to derive a compound TPH concentration.

Although benzene has a C4SL value, this has been calculated for small terraced housing and not other housing stock, therefore other housing stock should either adopt the more conservative CLEA thresholds or that of a small terraced property. All thresholds not coloured orange (C4SL) for different housing stock have utilised LQM/CIEH Generic Assessment Criteria for Human Health Risk assessment, 2nd edition, 2009. CLEA values in brackets where C4SL values are available.

Vap denotes where the threshold is exceeded beyond the vapour saturation limit. Sol denotes where the threshold is exceeded beyond the solubility saturation limit.

It should be noted that these threshold values only relate to human health risk assessment and an assessment for potential groundwater risk should be undertaken as a separate risk assessment.

CONTROLLED WATER RECEPTOR THRESHOLD VALUES (µg/l)

Compound/element		Groundwater Quality Threshold Values ¹ Maximum value	Environmental Quality Standards (EQS)			
			Long term (mean) for fresh waters ¹³	Short term (95 th percentile) for fresh waters ¹³	Annual average (AA-EQS) for inland surface waters ¹⁴	Maximum allowable concentration (MAC-EQS) ¹⁴ for inland surface waters ¹⁵
Inorganic elements and compounds	Ammonium	500	-	-	-	-
	Arsenic	10	50	-	-	-
	Boron	1000	-	-	-	-
	Cadmium ⁹	5.0	-	-	≤0.08 (Class 1)	≤0.45 (Class 1)
		-	-	-	0.08 (Class 2)	0.45 (Class 2)
		-	-	-	0.09 (Class 3)	0.6 (Class 3)
		-	-	-	0.15 (Class 4)	0.9 (Class 4)
		-	-	-	0.25 (Class 5)	1.5 (Class 5)
	Chromium (III)	50	4.7	32	-	-
	Chromium (VI)	-	3.4	-	-	-
	Chloride	250,000	-	-	-	-
	Chlorine	-	2	5	-	-
	Copper	2000	1 ⁵	-	-	-
	Cyanide	50	1	5	-	-
	Iron	-	1,000	-	-	-
	Lead	10	-	-	1.2 ⁵	14
	Manganese	-	123 ⁵	-	-	-
	Mercury	1.0	-	-	-	0.07
	Nickel	20	-	-	4 ⁵	34
	Nitrate ²	50,000	-	-	-	-
	Nitrite ²	500	-	-	-	-

Compound/element		Groundwater Quality Threshold Values ¹ Maximum value	Environmental Quality Standards (EQS)			
			Long term (mean) for fresh waters ¹³	Short term (95 th percentile) for fresh waters ¹³	Annual average (AA-EQS) for inland surface waters ¹⁴	Maximum allowable concentration (MAC-EQS) ¹⁴ for inland surface waters ¹⁵
	Selenium	10	-	-	-	-
	Sulphate	250,000	-	-	-	-
	Zinc	-	10.9	-	-	-
PAH compounds	Anthracene	-	-	-	0.1	0.1
	Benzo(a)pyrene	0.01	-	-	1.7x10 ⁻⁴	0.27
	Fluoranthene	-	-	-	0.0063	0.12
	Naphthalene	-	-	-	2	130
	PAH compounds (benzo(b)fluoranthene + benzo(k)fluoranthene + benzo(ghi)perylene + indeno(1,2,3-cd)pyrene)	0.1	-	-	1.7x10 ⁻⁴⁽¹²⁾	0.27 ⁽¹²⁾
	Benzo(b)fluoranthene	-	-	-	-	0.017
	Benzo(k)fluoranthene	-	-	-	-	0.017
	Benzo(ghi)perylene	-	-	-	-	8.2x10 ⁻³
	Indeno(1,2,3-cd)pyrene	-	-	-	-	n/a
BTEX compounds	Benzene	1.0	-	-	10	50
	Ethene	-	-	-	-	-
	Toluene	-	74	380	-	-
	Xylene	-	-	-	-	-
VOCs	Carbon tetrachloride	-	-	-	12	n/a
	C10-C13 Chloroalkanes (e.g. chloroethane, bromomethane, chloromethane)	-	-	-	0.4	1.4
	1,2-dichloroethane	3.0	-	-	10	n/a
	Trihalomethanes total (trichloromethane (chloroform) + bromoform +	100	-	-	-	-

Compound/element		Groundwater Quality Threshold Values ¹ Maximum value	Environmental Quality Standards (EQS)			
			Long term (mean) for fresh waters ¹³	Short term (95 th percentile) for fresh waters ¹³	Annual average (AA-EQS) for inland surface waters ¹⁴	Maximum allowable concentration (MAC-EQS) ¹⁴ for inland surface waters ¹⁵
	dibromochloromethane + bromodichloromethane)					
	Vinyl chloride	0.5	-	-	-	-
	1,2 dichloroethane	3.0	-	-	-	-
	Trichlorobenzenes	-	-	-	0.4	n/a
	Tetrachloroethane + trichloroethylene	10	-	-	-	-
	Trichloroethylene	-	-	-	10	n/a
	Tetrachloroethane	-	140	1848		
	Tetrachloroethylene	-	-	-	10	n/a
	Trichloromethane (alternative name chloroform)	-	-	-	2.5	n/a
	Tetrachloromethane	3	-	-	-	-
SVOCs	Benzyl butyl phthalate	-	7.5	51	-	-
	Bis(2-ethylhexyl)phthalate (alternative name: di(2-ethylhexyl)-phthalate	-	-	-	1.3	n/a
	Brominated diphenylethers ⁸	-	-	-	na	0.14
	2,4-dichlorophenol	-	4.2	140	-	-
	Hexa-chlorobenzene	-	-	-	-	0.05
	Hexa-chlorobutadiene	-	-	-	-	0.6
	Pentachlorophenol	-	-	-	0.4	1
Other organic compounds	Phenol	-	7.7	46	-	-
Pesticides in	Pesticides & related products ³	-	-	-	-	-

Compound/element		Groundwater Quality Threshold Values ¹ Maximum value	Environmental Quality Standards (EQS)			
			Long term (mean) for fresh waters ¹³	Short term (95 th percentile) for fresh waters ¹³	Annual average (AA-EQS) for inland surface waters ¹⁴	Maximum allowable concentration (MAC-EQS) ¹⁴ for inland surface waters ¹⁵
	Aldrin	0.03	-	-	-	-
	Dieldrin	0.03	-	-	-	-
	Heptachlor	0.03	-	-	-	-
	Heptachlo epoxide	0.03	-	-	-	-
	Other pesticides	0.1	-	-	-	-
	Pesticides total ⁴	0.5	-	-	-	-
Pesti-cides in surface waters	Atrazine	-	-	-	0.6	2.0
	Chlorfenvinphos	-	-	-	0.1	0.3
	Chlorpyrifos (Chlorpyrifosethyl)	-	-	-	0.03	0.1
	Cyclodiene pesticides: aldrin, dieldrin, endrin ¹⁰	-	-	-	0.01	n/a
	Cypermethrin	-	0.0001	0.0004	8x10 ⁻⁵	6x10 ⁻⁴
	Diazinon	-	0.01	0.02	-	-
	DDT total ¹¹	-	-	-	0.025	n/a
	2,4 dichlorophenoxyacetic acid (2,4 D)	-	0.3	1.3	-	-
	Dichlorvos	-	-	-	6x10 ⁻⁴	7x10 ⁻⁴
	Dimethoate	-	0.48	4.0	-	-
	Endosulfan	-	-	-	0.005	0.01
	Heptachlor and hetachlorepoide	-	-	-	2x10 ⁻⁷	3x10 ⁻⁴
	Mecoprop	-	18	187	-	-
	Permethrin	-	0.001	0.01	-	-
	Simazine	-	-	-	1	4
	Terbutryn	-	-	-	0.065	0.34

NOTES

1. Threshold values based on The Water Supply (Water Quality) Regulations 2018
2. The water must satisfy the formula " $[\text{nitrate}]/50 + [\text{nitrite}]/3 \leq 1$ ", where the square brackets signify the concentrations in mg/l for nitrate (NO_3) and nitrite (NO_2).
3. "pesticides and related products" means any of the following, and includes their relevant metabolites, degradation and reaction products— (a) organic insecticide; (b) organic herbicide; (c) organic fungicide; (d) organic nematocide; (e) organic acaricide; (f) organic algicide; (g) organic rodenticide; (h) organic slimicide; (i) any product related to any of (a) to (h) (including any growth regulator).
4. The sum of the concentrations of the individual compounds detected and quantified in the monitoring process.
5. "Bioavailable" meaning the fraction of the dissolved concentration of the metal likely to result in toxic effects as determined using the UKTAG Metal Bioavailability Assessment Tool (also referred to as a PNEC Estimator) for the relevant metal.
6. The Environment Agency (EA) must define the type of river systems according to their alkalinity and altitude and the acid neutralising capacity for the river due to the dissolved carbon content. The definition due to alkalinity and altitude is in Table 1, as follows:

Site altitude	Table 1 - Alkalinity (as mg/l CaCO_3)				
	<10	≥ 10 to <50	≥ 50 to <100	≥ 100 to <200	>200
Under 80m	Type 1	Type 2	Type 3	Type 5	Type 7
Over 80m			Type 4	Type 6	

The quality of the rivers or river sections will then be categorised by the EA, according to the dissolved oxygen content, biological oxygen demand and ammonia levels relative to the type denoted in Table 1. The ammonia standards would be classified as follows in Table 2.

Table 2 -Ammonia standards for rivers (rivers categorised by type in accordance with river type in Table 1 above.				
Total ammonia as nitrogen (mg/l) (90 percentile)				
Type	High	Good	Moderate	Poor
1, 2, 4 and 6	0.2	0.3	0.75	1.1
3, 5 and 7	0.3	0.6	1.1	2.5

7. Ambient background concentrations have been presented in the Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 with regards to the ambient background dissolved zinc concentrations.
8. The EQS refers to the sum of the concentrations of congener numbers 28, 47, 99, 100, 153 and 154.
9. The EQS for cadmium and its compounds is dependent on the water hardness as specified: Class 1: <40mg CaCO_3/l , Class 2: 40 to <50mg CaCO_3/l , Class 3: 50 to <100mg CaCO_3/l , Class 4: 100 to <200mg CaCO_3/l and Class 5: $\geq 200\text{mg CaCO}_3/\text{l}$.
10. EQS relates to the sum of aldrin, dieldrin and endrin.

11. DDT total comprises the sum of the isomers 1,1,1-trichloro-2,2 bis (p-chlorophenyl) ethane, 1,1,1-trichloro-2 (o-chlorophenyl)-2-(p-chlorophenyl) ethane, 1,1 -dichloro-2,2 bis (p-chlorophenyl) ethylene and 1,1-dichloro-2,2 bis (p-chlorophenyl) ethane.
12. For the group of PAH compounds benzo(b)fluoranthene + benzo(k)fluoranthene + benzo(ghi)perylene + indeno(1,2,3-cd)pyrene, the EQS for benzo(a)pyrene must be applied, this being considered to be a marker for these PAH compounds.
13. Fresh water includes rivers and lakes.
14. Where the MAC-EQS is noted as n/a, the AA-EQS values are considered protective against short-term pollution peaks in continuous discharges as they are significantly lower than the values derived on the basis of acute toxicity.
15. Inland surface waters includes rivers and lakes and related artificial or heavily modified water bodies.

Legislation Framework Which Drives the Contamination Assessment of Land in England and Wales

Foreward

In the UK, historical contaminated land is regulated by the planning and development control system and the contaminated land regime set out in Part IIA of the Environmental Protection Act 1990. The Water Act 2003 amended the Part IIA legislation in respect of controlled waters.

When considering an application for development, the potential for the land to be contaminated is a material consideration, and the planning authority should satisfy itself that any contamination is properly assessed and adequately remediated, based on a suitable for use approach. This is to ensure that the land is made suitable for its proposed new use.

For development sites which introduce new potential sources of pollution on site and these are either suspected of, or known to be causing environmental damage, a remediation notice may be placed on the operator under the Environmental Damages (Prevention and Remediation) Regulations, as applicable to England or Wales. The legislation aims to deter pollution events from occurring. When pollution events do occur, apportionment of the 'blame' for the pollution event follows a specific protocol to assess which party, assuming multiple parties have utilised the site, is responsible. The operator deemed responsible for the pollution will then be expected to clean up the pollution ideally voluntarily, or a remediation notice is served enforcing the polluter to undertake the works, assuming an appeal made is unsuccessful.

As such, developers should give due consideration to the Environmental Damages (Prevention and Remediation) Regulations during management of their site activities, for which they are responsible. Fuel tanks are often on site for the refuelling of plant, providing a potential point source of pollution at one or a number of locations about the site, as they are relocated. In addition, soils (generic term for all non-construction materials) used to raise site levels, form engineering platforms (i.e. piling and roads) and for use in garden areas are imported to site.

The legislation is complex and often is interchangeable and may depend upon the time the contamination was released into the environment and the receptors which have been/may be detrimentally affected by the contamination. A summary of the most relevant legislation and guidance is noted below.

Developers should not take on liability for all previous pollution the vendor and previous owners have left on the site. If some liability has to be taken to progress the sale of the site, a full appreciation of the liabilities of the contamination must be understood. It is common during the course of the ground investigation that all sources of historical contamination are not revealed and hence it is prudent to keep liability for these unknown events with the previous operators.

Interaction of the Planning Regime with the Environmental Protection Act 1990 – Part IIA

Current guidance/legislation applicable to England has been published by the Ministry of Housing, Communities and Local Government, the ‘*National Planning Policy Framework*’, February 2019, and by the Department of Environment, Food and Rural Affairs (DEFRA), the ‘*Environmental Protection Act 1990: Part 2A. Contaminated Land Statutory Guidance*’, April 2012. The Welsh Government has published ‘*Planning Policy Wales, Edition 11*’, February 2021 and ‘*Contaminated Land Statutory Guidance for Wales 2012*’, 2013. Both planning policies continue to promote the ‘suitable for use approach’, with the emphasis related to ensuring that the future use or development being undertaken would not be designated as contaminated land under Part IIA of the Environmental Protection Act 1990. Where remediation is required this should be undertaken in such a manner that it would not have an adverse impact on the environment.

In order for a planning decision to be made, a site investigation carried out by a specialist must be provided, which assesses the potential hazards to future site users and the local environment arising from past activities or natural factors. Where remediation is required to mitigate these impacts, the remediation scheme must show that the land would not be designated as contaminated land under Part IIA of the Environmental Protection Act 1990. If contamination cannot be overcome satisfactorily, the authority may refuse planning permission.

The responsibility for ensuring the development is undertaken in such a manner lies with the developer/land owner.

The definition of contaminated land is presented in the Environmental Protection Act 1990 as follows: ‘*any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that—*

(a) significant harm is being caused or there is a significant possibility of such harm being caused; or
(b) significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused;’

Before the local authority can conclude that land appears to be contaminated land, the authority must assess the risk that a significant pollutant linkage exists.

This means that each of the following has to be present:

- (a) a **contaminant**;
- (b) a **receptor**; and
- (c) a **pathway**.

Guidance defines the risk as the combination of:

‘(a) the likelihood that harm, or pollution of water, will occur as a result of contaminants in, on or under the land; and

(b) the scale and seriousness of such harm or pollution if it did occur’.

Legislation Framework Which Drives the Contamination Assessment of Land in England and Wales

The Statutory Guidance under Part IIA of the Environmental Protection Act 1990 both in England and Wales promotes the application of a four category test to assess whether land is contaminated or not. Category 1 sites are sites which have a high likelihood of contamination and would be considered as a significant problem. Category 4 sites are sites which are obviously not contaminated on the basis of either desktop information or a basic intrusive investigation. Categories 2 and 3 lie between the obviously uncontaminated and contaminated sites, with the division between these categories being considered as contaminated land under Part IIA. Risk assessment will be required to assess whether a site lies within Category 2 or 3. The risk assessment will initially be determined by health risks, then by socio-economic factors should health risks be uncertain, with a default decision of contaminated should the tests not be adequately met (refer to Figure 1).

For the purpose of determining whether a site may be classified as contaminated land, soil guideline values (SGV)/generic assessment criteria (GAC) should not be utilised as determining factors. These may be applied to confirm Category 4 sites, these showing categorically that it is considered there is no risk of harm to human health on such sites. However, SGV and GAC threshold values are conservative, indicating that there is no risk at all to human health or very minimal risk. As such, these should not be considered to act as threshold values between Category 3 and Category 4 sites. The Statutory Guidance has made provision for generic screening values to be derived, termed as Category 4 Screening Levels (C4SL), which still provide a cautious assessment but relate the risk associated with normal ambient levels of contaminants, termed the low observed adverse effect level (LOAEL), making for a more pragmatic approach to risk assessment. C4SLs may be applied to site investigations undertaken in support of a planning application. To date C4SLs have been derived arsenic, cadmium, chromium (VI), lead, benzo(a)pyrene and benzene and represent. It has been proposed to derive twenty additional C4SLs including the inorganic and organic contaminants. As C4SLs will result in levels of contaminant concentrations in soils that will still be considered to be acceptable in terms of level of risk in relation to the Part IIA of the Environmental Protection Act 1990.

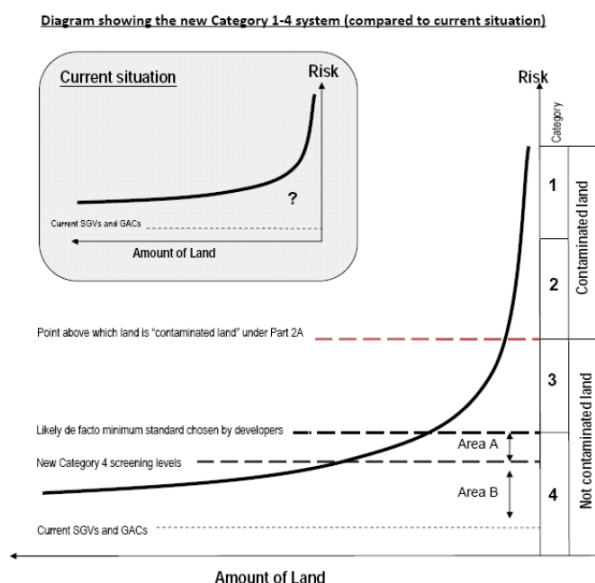


Figure 1: The New Four Category System

Environmental Protection Act 1990 – Part III

It should be noted that under the Environmental Protection Act 1990, the statutory nuisance regime applies to ‘*premises which may be prejudicial to health or a nuisance*’. In this case the term ‘*health*’ does not apply to contaminated land issues. However, nuisance may apply where the effects of deposits of substances on land cause offence to human senses (such as stench).

Environmental Damage (Prevention and Remediation) Regulations

The following legislation made in England and Wales respectively, is designed to control new contamination events.

- *The Environmental Damage (Prevention and Remediation) (England) Regulations 2015* (revoking the 2009 Regulations).
- *The Environmental Damage (Prevention and Remediation) (Wales) Regulations 2009*, as amended by *The Environmental Damage (Prevention and Remediation) (Amendment) (Wales) Regulations 2015*.

The meaning of ‘environmental damage’ has been detailed by DEFRA’s guidance document applicable to these Regulations as shown below:

‘An important point to note is that the Regulations are a ‘backstop’, only applying when something has gone wrong and there is an imminent threat or actual ‘environmental damage’ within the scope of the Regulations. The emphasis should be on proactively putting in place appropriate pollution prevention measures to reduce risks to the environment. Those running businesses and other operations can reduce the likelihood of ever being caught by the Regulations’ requirements by minimising risks to the natural resources covered by the Regulations. This means that businesses should be aware, in particular, where they:

- *Operate within or near areas of high biodiversity value, especially Sites of Special Scientific Interest (SSSIs);*
- *Operate near water bodies; and/or*
- *Carry out activities with potential risks to human health*
- *This is so they can take the necessary steps to manage the relevant risks effectively, including implementing and monitoring appropriate pollution prevention measures.*

The Regulations do not cover all types of damage to the environment. They only cover ‘environmental damage’ which is one or more of damage to:

- *protected species and natural habitats or to a site of special scientific interest (these are referred to collectively in the guidance as **damage to species and habitats**);*
- *surface water or groundwater (these are referred to collectively in the guidance as **damage to water**); and,*
- *land. (Damage to land is contamination of land by substances, preparations, organisms or micro-organisms that results in a significant risk of adverse effects on human health.*

Legislation Framework Which Drives the Contamination Assessment of Land in England and Wales

Both the England and Wales Regulations state they do not apply in relation to:

- damage that occurred before the Regulations originally came into force in 2009, but for marine waters July 2015
- damage that occurs or occurred after these dates, or is or was threatened after these dates, but is caused by an incident, event or emission that took place before these dates; or
- damage caused by an incident, event or emission that takes or took place after these dates, if derived from an activity that took place and finished before these dates.
- environmental damage caused by pollution of a diffuse character if the causal link between the damage and specific activities cannot be defined.

The Regulations state where an operator of an activity has caused environmental damage, or where there is sufficient evidence to indicate that environmental damage will eventually occur, the operator must immediately

- take all practicable steps to prevent further damage; and
- notify all relevant details to the relevant enforcing authority.



Joint Industry Working Group
Asbestos in Soil and Construction & Demolition Materials

Decision Support Tool for the
Qualitative Risk Ranking of Work
Activities and Receptors Involved in
or Exposed to Asbestos in Soil and
Construction & Demolition Materials

VERSION 2

February 2017

CL:AIRE

This spreadsheet tool provides the user with a decision support platform designed by the Joint Industry Working Group for Asbestos in Soil and Construction & Demolition Materials (JIWG) to assist in the risk-rank activities and receptors as part of a preliminary risk assessment under CLR11.

The aim of developing this tool is to provide industry with a consistent decision making format that is aligned with UK health & safety and environmental regulatory policies, and is consistent with the wider objectives of the JIwG.

This is Version 2 of this tool, and has been amended following industry feedback on the BETA version released in 2016. The JIwG would welcome feedback from users of this version on its applicability and validity to the wide range of scenarios that may be encountered when assessing the potential risk from asbestos and asbestos-containing materials in the ground.

ISBN 978-1-905046-29-4

© CL'AIRE 2017

Published by CL'AIRE, 32 Bloomsbury Street, London WC1B 3QJ.

All rights reserved. No part of this publication or tool may be reproduced, stored in a retrieval system, or transmitted in any form or by any other means, electronic, mechanical, photocopying, recording or otherwise, without the written permission of the copyright holder.

Acknowledgements

CL'AIRE and the JIwG would like to gratefully acknowledge Simon Cole - AECOM, Stephen Forster - Remedia Group and Garry Burdett - Health and Safety Laboratory for the design and development of this decision support tool.

Disclaimer

CL'AIRE and the JIwG will not be responsible for any loss, however arising, the use of, or reliance on, the information contained in this decision support tool and associated user guide, nor do they assume responsibility or liability for errors or omissions contained within. Users are advised to use the information contained herein purely as a guide and to take appropriate professional advice where necessary.

Decision Support Tool for Receptor Risk Ranking

Stage 1 Hazard Identification		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Loose fibrous asbestos debris	3
Extent of degradation of ACMs	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Asbestos fibre type	Mainly chrysotile and trace amphibole (no crocidolite)	1
Sub-total		12
Hazard ranking		Medium



Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Stage 2

Emission Factors

Score

Amount of asbestos fibre in selected ACM/fibre type as % of host material

Very Low quantities - 0.001 to 0.01 %wt/wt

1

Respirable fibre index for ACM - RIVM report 711701034 (2003)

High

4

Activity type and effect on deterioration of ACMs

Low disturbance, minimal deterioration expected

2

Best description of primary host material matrix

Made Ground - Recycled Aggregate, Track Ballast

4

Sub-total

11

Exposure ranking

Medium

Stage 3		Score	
Pathway and Receptor Sensitivity			
Receptor category	Construction	No score required	
Age of Receptor	Young adult (>16 and <24)	2	
Duration of exposure/site occupancy	> 1hr <10 hr daily exposure (e.g. part-time to full time occupational exposure or extended daily recreational exposure)	3	
Receptor ranking		5	Medium
Combined hazard, exposure and receptor ranking		High	
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4	
Pathway: Depth to impacted material	Material visible at the surface, very likely to be disturbed by wind erosion and/or human/animal disturbance of soil	E	
Pathway ranking		4E	High
Overall ranking		High	

Project Reference	8353
Site Name	Land Adjacent to Bealeys Industrial Estate, Radcliffe
Client	Westchurch Homes
Run by	BH
Date	08-Nov-24
Reviewed by	BH
Characterisation of scenario being evaluated	Disturbance of fibres/fibre bundles during construction phase without mitigation
Interpretation of scenario ranking by DST	High risk where mitigation measures are likely to be required.

Decision Support Tool for Receptor Risk Ranking

Stage 1		Score
Hazard Identification		
Select ACM type (run model for each type to generate 'Worst Case' output)	Loose fibrous asbestos debris	3
Extent of degradation of ACMs	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Asbestos fibre type	Mainly chrysotile and trace amphibole (no crocidolite)	1
Sub-total		12
Hazard ranking		Medium



Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Stage 2

Emission Factors

Score

Amount of asbestos fibre in selected ACM/fibre type as % of host material

Very Low quantities - 0.001 to 0.01 %wt/wt

1

Respirable fibre index for ACM - RIVM report 711701034 (2003)

High

4

Activity type and effect on deterioration of ACMs

Moderate disturbance, slight deterioration expected

3

Best description of primary host material matrix

Made Ground - Recycled Aggregate, Track Ballast

4

Sub-total

12

Exposure ranking

Medium



Stage 3		Score
Pathway and Receptor Sensitivity		
Receptor category	Residential (Pre-Remediation)	No score required
Age of Receptor	Infant (under 5)	4
Duration of exposure/site occupancy	>> 10 hours per day (e.g. 24 hour residential exposure)	4
Receptor ranking		8 High
Combined hazard, exposure and receptor ranking		High
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4
Pathway: Depth to impacted material	Material present near the surface, potential to be disturbed during non-construction/routine use of land	D
Pathway ranking	4D	Medium
Overall ranking		Medium

Project Reference	8353
Site Name	Land Adjacent to Bealeys Industrial Estate, Radcliffe
Client	Westchurch Homes
Run by	BH
Date	08-Nov-24
Reviewed by	BH
Characterisation of scenario being evaluated	Disturbance of fibres/fibre bundles in residential gardens if no remediation completed.
Interpretation of scenario ranking by DST	Medium Risk identified where remediation measures are required to mitigate the risk.

Decision Support Tool for Receptor Risk Ranking

Stage 1 Hazard Identification		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Loose fibrous asbestos debris	3
Extent of degradation of ACMs	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Asbestos fibre type	Mainly chrysotile and trace amphibole (no crocidolite)	1
Sub-total		12
Hazard ranking		Medium

Stage 2

Emission Factors

Score

Amount of asbestos fibre in selected ACM/fibre type as % of host material

Very Low quantities - 0.001 to 0.01 %wt/wt

1

Respirable fibre index for ACM - RIVM report 711701034 (2003)

High

4

Activity type and effect on deterioration of ACMs

No disturbance activity

0

Best description of primary host material matrix

Made Ground - Recycled Aggregate, Track Ballast

4

Sub-total

9

Exposure ranking

Low



Stage 3		Score
Pathway and Receptor Sensitivity		
Receptor category	Residential (Post Remediation)	No score required
Age of Receptor	Infant (under 5)	4
Duration of exposure/site occupancy	>> 10 hours per day (e.g. 24 hour residential exposure)	4
Receptor ranking		8 High
Combined hazard, exposure and receptor ranking		High
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4
Pathway: Depth to impacted material	Material buried at significant depth, very unlikely to be disturbed.	A
Pathway ranking		4A Negligible
Overall ranking		Negligible

Project Reference	8353
Site Name	Land Adjacent to Bealeys Industrial Estate, Radcliffe
Client	Westchurch Homes
Run by	BH
Date	08-Nov-24
Reviewed by	BH
Characterisation of scenario being evaluated	Disturbance of fibres/fibre bundles - After Placement of inert cover systems within residential gardens.
Interpretation of scenario ranking by DST	Negligible risk - the remediation works are appropriate

Decision Support Tool for Receptor Risk Ranking

Stage 1		Score
Hazard Identification		
Select ACM type (run model for each type to generate 'Worst Case' output)	Loose fibrous asbestos debris	3
Extent of degradation of ACMs	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Asbestos fibre type	Mainly chrysotile and trace amphibole (no crocidolite)	1
Sub-total		12
Hazard ranking		Medium



Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Stage 2

Emission Factors

Score

Amount of asbestos fibre in selected ACM/fibre type as % of host material

Very Low quantities - 0.001 to 0.01 %wt/wt

1

Respirable fibre index for ACM - RIVM report 711701034 (2003)

High

4

Activity type and effect on deterioration of ACMs

High disturbance, significant deterioration expected

4

Best description of primary host material matrix

Made Ground - Recycled Aggregate, Track Ballast

4

Sub-total

13

Exposure ranking

Medium

Stage 3			
Pathway and Receptor Sensitivity		Score	
Receptor category	Residential (Adjacent Residents)	No score required	
Age of Receptor	Infant (under 5)	4	
Duration of exposure/site occupancy	>> 10 hours per day (e.g. 24 hour residential exposure)	4	
Receptor ranking		8	High
Combined hazard, exposure and receptor ranking			High
Pathway: Distance of Receptor from Source	>10m of edge of area of disturbance	3	
Pathway: Depth to impacted material	Material visible at the surface, very likely to be disturbed by wind erosion and/or human/animal disturbance of soil	E	
Pathway ranking		3E	Medium
Overall ranking			Medium

Project Reference	8353
Site Name	Land Adjacent to Bealeys Industrial Estate, Radcliffe
Client	Westchurch Homes
Run by	BH
Date	08-Nov-24
Reviewed by	BH
Characterisation of scenario being evaluated	Disturbance of fibres/fibre bundles - Adjacent residents during construction if no mitigation measures implemented.
Interpretation of scenario ranking by DST	Medium risk - mitigation measures required.

Decision Support Tool for Receptor Risk Ranking

Stage 1 Hazard Identification		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Bonded ACMs: cement, vinyl, composites, textured decorative coatings, bitumen products	0
Extent of degradation of ACMs	Weathered (Slight degradation in ACM; material still retains its basic integrity)	2
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Non-friable ACM or ACM with fibres firmly linked in a matrix	0
Distribution of Visible Asbestos Across Affected Area	Moderate/frequent occurrences of visible contamination by ACMs	3
Asbestos fibre type	Chrysotile alone	0
Sub-total		5
Hazard ranking		Very Low

Stage 2

Emission Factors

Score

Amount of asbestos fibre in selected ACM/fibre type as % of host material

Large quantities - ≥ 0.1 %wt/wt

4

Respirable fibre index for ACM - RIVM report 711701034 (2003)

Very low

1

Activity type and effect on deterioration of ACMs

High disturbance, significant deterioration expected

4

Best description of primary host material matrix

Made Ground - Recycled Aggregate, Track Ballast

4

Sub-total

13

Exposure ranking

Medium



Stage 3		Score
Pathway and Receptor Sensitivity		
Receptor category	Construction	No score required
Age of Receptor	Young adult (>16 and <24)	2
Duration of exposure/site occupancy	> 1hr <10 hr daily exposure (e.g. part-time to full time occupational exposure or extended daily recreational exposure)	3
Receptor ranking		5 Medium
Combined hazard, exposure and receptor ranking		Medium
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4
Pathway: Depth to impacted material	Material visible at the surface, very likely to be disturbed by wind erosion and/or human/animal disturbance of soil	E
Pathway ranking		4E High
Overall ranking		High

Project Reference	8353
Site Name	Land Adjacent to Bealeys Industrial Estate, Radcliffe
Client	Westchurch Homes
Run by	BH
Date	08-Nov-24
Reviewed by	BH
Characterisation of scenario being evaluated	ACM materials within soil and impact to construction works, soils disturbed by construction works without controls to mitigate risk
Interpretation of scenario ranking by DST	High Risk - controls to mitigate risks are required.

Decision Support Tool for Receptor Risk Ranking

Stage 1 Hazard Identification		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Bonded ACMs: cement, vinyl, composites, textured decorative coatings, bitumen products	0
Extent of degradation of ACMs	Weathered (Slight degradation in ACM; material still retains its basic integrity)	2
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Non-friable ACM or ACM with fibres firmly linked in a matrix	0
Distribution of Visible Asbestos Across Affected Area	Moderate/frequent occurrences of visible contamination by ACMs	3
Asbestos fibre type	Chrysotile alone	0
Sub-total		5
Hazard ranking		Very Low



Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Stage 2

Emission Factors

Score

Amount of asbestos fibre in selected ACM/fibre type as % of host material

Large quantities - ≥ 0.1 %wt/wt

4

Respirable fibre index for ACM - RIVM report 711701034 (2003)

Very low

1

Activity type and effect on deterioration of ACMs

Moderate disturbance, slight deterioration expected

3

Best description of primary host material matrix

Made Ground - Recycled Aggregate, Track Ballast

4

Sub-total

12

Exposure ranking

Medium



Stage 3		Score
Pathway and Receptor Sensitivity		
Receptor category	Residential (Pre-Remediation)	No score required
Age of Receptor	Infant (under 5)	4
Duration of exposure/site occupancy	>> 10 hours per day (e.g. 24 hour residential exposure)	4
Receptor ranking		8 High
Combined hazard, exposure and receptor ranking		High
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4
Pathway: Depth to impacted material	Material present near the surface, potential to be disturbed during non-construction/routine use of land	D
Pathway ranking	4D	Medium
Overall ranking		Medium

Project Reference	8353
Site Name	Land Adjacent to Bealeys Industrial Estate, Radcliffe
Client	Westchurch Homes
Run by	BH
Date	08-Nov-24
Reviewed by	BH
Characterisation of scenario being evaluated	ACM materials within soil, present within residential gardens if no remediation works completed
Interpretation of scenario ranking by DST	Medium Risk - remediation works required.

Decision Support Tool for Receptor Risk Ranking

Stage 1		Score
Hazard Identification		
Select ACM type (run model for each type to generate 'Worst Case' output)	Bonded ACMs: cement, vinyl, composites, textured decorative coatings, bitumen products	0
Extent of degradation of ACMs	Weathered (Slight degradation in ACM; material still retains its basic integrity)	2
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Non-friable ACM or ACM with fibres firmly linked in a matrix	0
Distribution of Visible Asbestos Across Affected Area	Moderate/frequent occurrences of visible contamination by ACMs	3
Asbestos fibre type	Chrysotile alone	0
Sub-total		5
Hazard ranking		Very Low

Stage 2

Emission Factors

Score

Amount of asbestos fibre in selected ACM/fibre type as % of host material

Large quantities - ≥ 0.1 %wt/wt

4

Respirable fibre index for ACM - RIVM report 711701034 (2003)

Very low

1

Activity type and effect on deterioration of ACMs

No disturbance activity

0

Best description of primary host material matrix

Made Ground - Recycled Aggregate, Track Ballast

4

Sub-total

9

Exposure ranking

Low



Stage 3		Score
Pathway and Receptor Sensitivity		
Receptor category	Residential (Post Remediation)	No score required
Age of Receptor	Infant (under 5)	4
Duration of exposure/site occupancy	>> 10 hours per day (e.g. 24 hour residential exposure)	4
Receptor ranking		8 High
Combined hazard, exposure and receptor ranking		High
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4
Pathway: Depth to impacted material	Material buried at significant depth, very unlikely to be disturbed.	A
Pathway ranking		4A Negligible
Overall ranking		Negligible

Project Reference	8353
Site Name	Land Adjacent to Bealeys Industrial Estate, Radcliffe
Client	Westchurch Homes
Run by	BH
Date	08-Nov-24
Reviewed by	BH
Characterisation of scenario being evaluated	ACM materials within soil, present within residential gardens at depth below a cover system
Interpretation of scenario ranking by DST	Negligible Risk - remediation works suitable.

Decision Support Tool for Receptor Risk Ranking

Stage 1 Hazard Identification		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Bonded ACMs: cement, vinyl, composites, textured decorative coatings, bitumen products	0
Extent of degradation of ACMs	Weathered (Slight degradation in ACM; material still retains its basic integrity)	2
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Non-friable ACM or ACM with fibres firmly linked in a matrix	0
Distribution of Visible Asbestos Across Affected Area	Moderate/frequent occurrences of visible contamination by ACMs	3
Asbestos fibre type	Chrysotile alone	0
Sub-total		5
Hazard ranking		Very Low

Stage 2

Emission Factors

Score

Amount of asbestos fibre in selected ACM/fibre type as % of host material

Large quantities - ≥ 0.1 %wt/wt

4

Respirable fibre index for ACM - RIVM report 711701034 (2003)

Very low

1

Activity type and effect on deterioration of ACMs

High disturbance, significant deterioration expected

4

Best description of primary host material matrix

Made Ground - Recycled Aggregate, Track Ballast

4

Sub-total

13

Exposure ranking

Medium

Stage 3

Pathway and Receptor Sensitivity

Score

Receptor category	Residential (Adjacent Residents)	No score required
Age of Receptor	Infant (under 5)	4
Duration of exposure/site occupancy	>> 10 hours per day (e.g. 24 hour residential exposure)	4

Receptor ranking

8

High

Combined hazard, exposure and receptor ranking

High

Pathway: Distance of Receptor from Source	>10m of edge of area of disturbance	3
Pathway: Depth to impacted material	Material visible at the surface, very likely to be disturbed by wind erosion and/or human/animal disturbance of soil	E

Pathway ranking

3E

Medium

Overall ranking

Medium

Project Reference	8353
Site Name	Land Adjacent to Bealeys Industrial Estate, Radcliffe
Client	Westchurch Homes
Run by	BH
Date	08-Nov-24
Reviewed by	BH
Characterisation of scenario being evaluated	ACM materials within soil, disturbed by construction works impacted adjacent residents without controls to mitigate
Interpretation of scenario ranking by DST	Medium Risk - controls to mitigate risks are required.

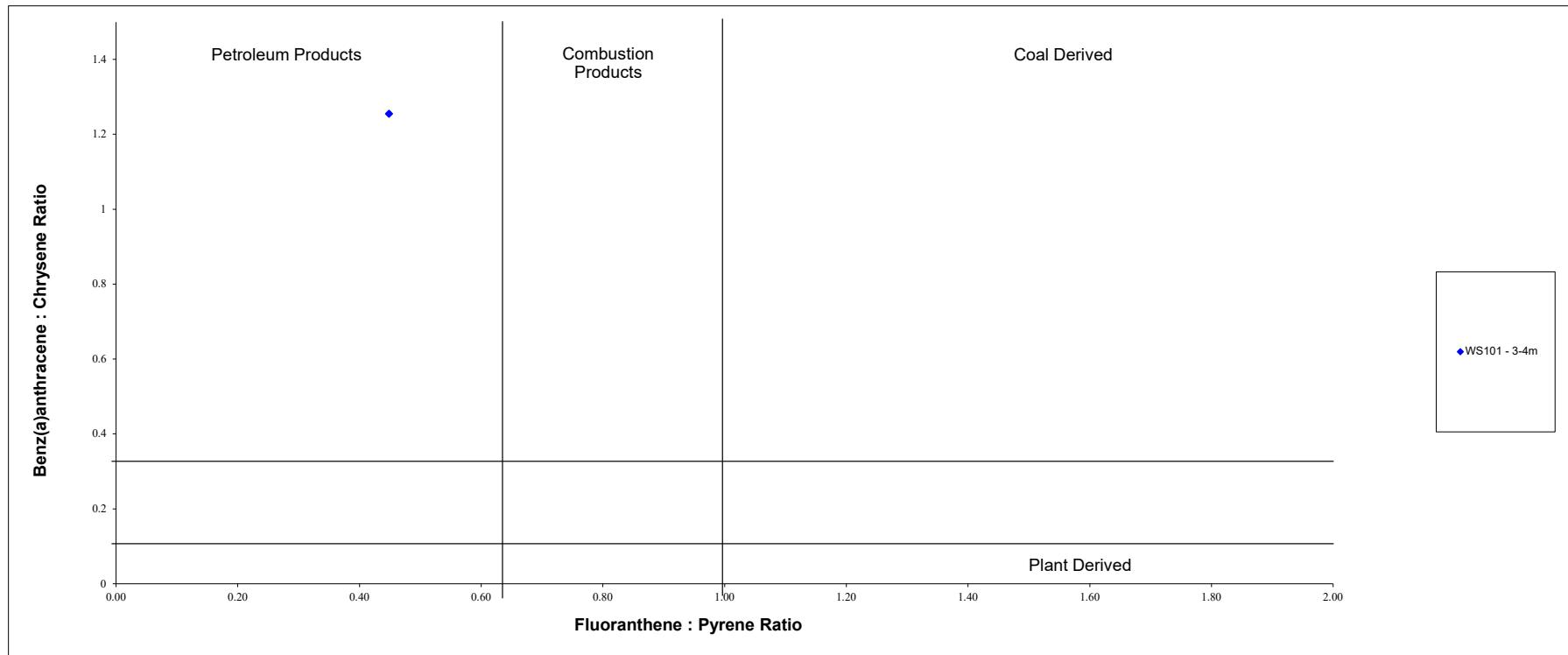
Source Signature Double Ratio Plot

Cooper Associates Project Number:	8353
Laboratory Reference Number:	N/A

Sample Type:	Madeground
Laboratory:	DETS

Sample No.	WS101 - 3-4m						
Benzo(a)anthracene	6.4						
Chrysene	5.1						
Fluoranthene	13						
Pyrene	29						

All concentrations are in mg/kg



Source Signature Double Ratio Plot Explanation Sheet

When coal forms, organic matter is converted to coal via low grade metamorphism. The geological process which converts the fresh organic matter to a carbon based strata is noted to comprise carbonisation as well as dehydrogenation. The carbonisation process forms methane gases as well as partially converts the material into hydrocarbon based products. As carbonisation progresses, the volume of volatile gases diminish as these are driven from the strata and complex organic compounds are formed. The slow cracking of the organic material over many millions of years, where a constant heat flow is present will eventually strip the material of hydrogen, nitrogen and oxygen, producing purer carbon products. The presence of the PAH concentrations encountered to date within the samples analysed are not beyond what may be expected for a coal. Other methods of PAH formation comprise the partial combustion of fuel such as coal and petroleum.

To determine whether the source of the PAH compounds are petroleum or pyrogenically (from coal fragments) formed, a source signature double ratio plot assessment was undertaken. This method of appraisal compares a ratio of comparative compound pairs for 4 No. PAH compounds. This means that the properties of the comparative PAH compounds are similar (such as aqueous solubility, molecular weight, Kow) and have diagnostic source ratios which should retain their relative concentrations and hence their ratio remain constant. Cooper Associates have adopted a classification of double ratio PAH compounds fluoranthene/pyrene and benzo(a)anthracene/chrysene in accordance with Costa and Sauer 2005. These have been considered the most appropriate pairing to determine a differentiation between petroleum fuels, coal, coal derived products, combustion products and natural plant matter (such as peat and lignin).

The method for differentiating petroleum based hydrocarbon concentrations from natural organic units is by determining the rates of combustion and the relative losses of PAH compounds within samples analysed. Forensic environmental scientists, situated predominately within the United States, have investigated the relationships between many combinations of PAH compounds and it is generally considered the 4 No. compounds mentioned above have a suitable and representative correlation for this assessment.

The method of assessment requires the 2 ratios of the 2 pairs of diagnostic source ratio compounds to be calculated, and the results plotting on a graph. The graph has areas compartmentalised into petroleum, combustion and coal derived sources, with plant derived sources situated in the bottom right hand corner. These designations have been derived from ALcontrol Geochem's extensive knowledge with regards to PAH signatures as well as the extensive work completed by Environmental Forensic scientists such as H J Costa and T C Sauer. ALcontrol Geochem have been using this method for tracing hydrocarbon sources for many years and have pooled their extensive database of material type traces for their graphic representation (refer to Figure 1 below).

PAH compounds can be both created and lost through combustion. With regards to petroleum derived products, the fresh compounds tend to be situated on the mid left hand side of the graph, with combusted and heavier fuels moving north east across the graph. Coal is generally positioned in the top right area of the graph, with combustion products such as ash and clinker, soot and burnt coal being situated between coal and petroleum sections. It should be noted that smokeless fuels appear within the mid petroleum derived column as the processes involved in the formation of this fuel includes the removal of certain PAH compounds.

Peat forms PAH compounds due to the degradation of organic matter and is represented in the bottom right hand corner of the graph. Asphalt and coal tar derived tarmac can also be determined from this form of analysis.

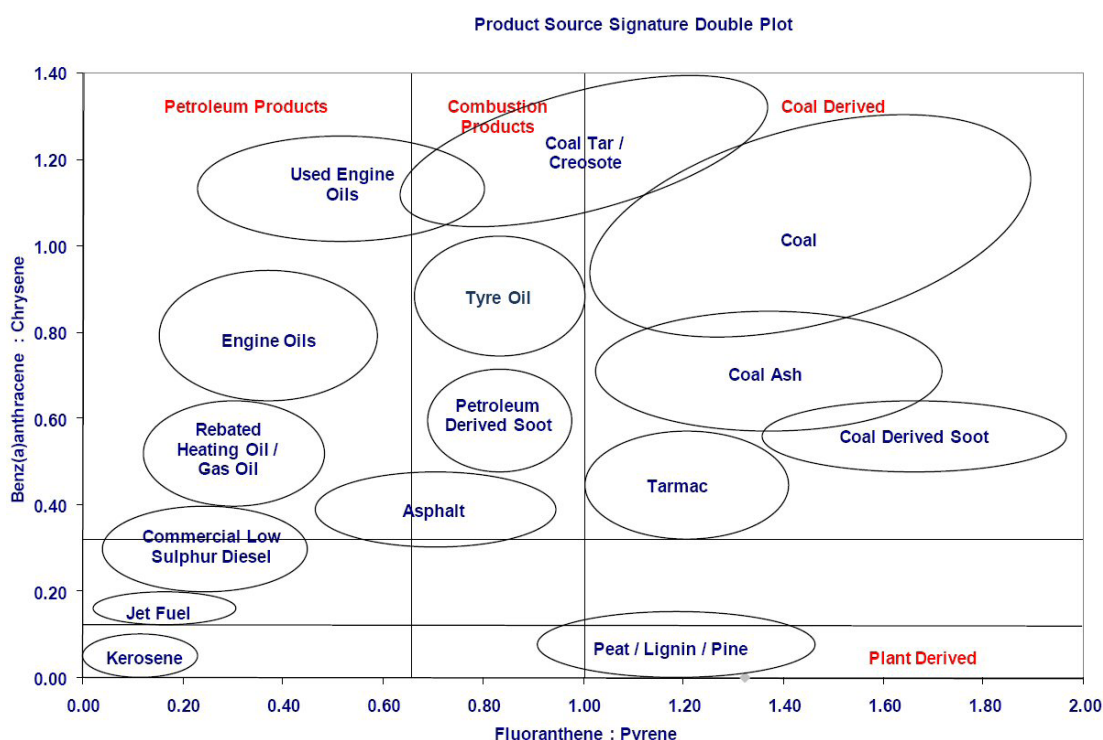


Figure 1: Key to source signature double ratio plots based on conjectured source.

Double ratio plots – references

Double ratio plots have been developed as a result of expanding our Environment Forensic capabilities and is based on the following references amongst others.

Yunker, M. B., Macdonald, R. W., Vingarzin, R., Mitchell, R. H., Goyette, D., and Sylvestre, S. 2002. PAH in the Fraser River basin: A critical appraisal of PAH ratios as indicators of PAH source and composition. *Organic Geochemistry* 33:489-515.

Costa, H. J., and Sauer, T. C., Jr. 2005. Technical Note - Forensic Approaches and Considerations in Identifying PAH Background. *Environmental Forensics*, 6:9-16.

As for how robust the technique is, for low concentrations, or where the PAHs being used to determine the ratios are very similar it will not be completely reliable, but we have found that in most cases it offers a very good correlation with visual and/or site histories. Ratios other than those on the flier can also be used.

Environmental forensics is basically a matter of using the most appropriate ratios to identify sources and correlate spills. There are hundreds of possible combinations, and it is very much a case of experience and knowledge as to which will give the most meaningful answers, as no two sites are the same.

The Fluoranthene:Pyrene vs Benz(a)anthracene:chrysene ratios have been found to be the best in identifying the sources of PAH compounds with regard to petroleum, petrogenic (coal), combustion (ash and clinker) or recently formed (peat).

Site Investigation Report for
Land Adjacent to Bealey Industrial Estate, Radcliffe

Appendix 11

United Utilities Potable Water Supply Risk Assessment

Supplementary guidance for the selection of water pipes in land potentially affected by contamination

Introduction

In January 2011, UK Water Industry Research (UKWIR) published “Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites” (Ref 10/WM/03/21; the ‘UKWIR Guidance’). Its aim is to ensure that the correct materials are selected for water pipes and components to be used below ground in brownfield sites to protect the quality of drinking water whilst taking into account the service life of the water distribution system. It supersedes the Water Regulations Advisory Scheme (WRAS) Information and Guidance Note 9-04-03 “Laying Pipes in Contaminated Land” which has been withdrawn.

The UKWIR Guidance is for use by developers, self-lay organisations, water companies and consultants when planning, designing and constructing water mains and/or services in brownfield sites. It defines brownfield sites as “land or premises that have previously been used or developed. They may also be vacant or derelict. However, they are not necessarily contaminated.” The UKWIR Guidance states that it does not apply to greenfield sites; however, we consider this supplementary guidance and the relevant sections of the UKWIR guidance as being equally suitable for application to those greenfield sites considered to be potentially affected by contamination. Where greenfield sites are not affected by contamination a preliminary risk assessment (see below) will suffice.

The UKWIR Guidance also states that there should be no departure from its provisions “*except where formally approved by the Water Company, such departure being technically justifiable or representing advances in knowledge or product development*”.

We have adopted the UKWIR Guidance in principle and produced this company specific supplementary guidance (the ‘UUW Guidance’) which includes the Risk Assessment for Water Pipes (the ‘RA’).

This guidance does not cover operative safety, health exposure modelling or accidental pipe damage.

which the pipes are to be laid may be affected by contamination. The application of the source, pathway, receptor concept will be an integral part of any pipeline risk assessment. For each potential source (the contamination) and each potential receptor (the water pipe), consideration shall be given to whether a potential pathway between source and receptor exists, or may exist in the future, linking the two. There are normally only three pathways by which contamination may come into contact with water pipes. These are direct contact with the soil or backfill, an excessive vapour phase or a contaminated groundwater regime. If none of these conditions exist on site (adopting the source, pathway, receptor concept) then it is likely that extended and/or targeted soil testing will not be required and a simple risk assessment will suffice. For those sites where land may be affected by contamination appropriate testing shall be undertaken on the materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials. The testing requirements are as described in the following section.

The signatories of the Water Supply Application Form and the RA must ensure that all assessments of land condition have been carried out in accordance with applicable current standards and guidelines by or under the direction of a suitably qualified competent person.

We require the competent person to be a) a chartered member of an appropriate professional body (such as the Institution of Civil Engineers, the Geological Society of London or the Royal Institution of Chartered Surveyors) with relevant experience of investigating contaminated sites or b) a Specialist in Land Condition (SiLC) with appropriate geo-environmental experience.

Risk Assessment for Water Pipes in Land Potentially Affected by Contamination

Any application for new water supplies to a development (construction of new properties, or renovation or conversion of existing buildings) in land potentially affected by contamination shall include a completed RA.

As a minimum a desk study (preliminary risk assessment) shall be provided with the RA in accordance with the framework in Environment Agency publication “Model Procedures for the Management of Land Contamination” (ref: CLR11) that sets out whether the land through

How to contact us about the information in this leaflet



DeveloperServicesWater@uuplc.co.uk



0345 072 6067

Opening hours:
8am-5pm Mon to Thurs
8am-4.30pm Fri

Testing Requirements

The soil, rock and if appropriate groundwater tests that are required on all sites where the potential for organic contamination has been identified in the desk study and where water pipes are proposed to be laid must be accredited by United Kingdom Accreditation Service (UKAS) as a minimum and where commercially available the Environment Agency's Monitoring Certification Service (MCERTS). These accredited tests should be undertaken for:

Banded hydrocarbons EC5-EC10, EC10-EC16, EC16-EC40 (Total aliphatic and aromatic hydrocarbons for each banding may be summed). Aliphatic/aromatic fractionation and subsequent banding may be required should a more detailed site specific risk assessment be undertaken. The bandings have been amended to take into account readily available laboratory tests. The equivalent carbon number (EC) is used to assess petroleum hydrocarbon mixtures rather than the actual number of carbon atoms in the molecule in line with guidance issued by the Environment Agency (2005).

Volatile organic compounds (VOCs) (method by head space or purge & trap GCMS) with tentative identification of compounds greater than 20µg/kg. The method used should be capable of detecting a wide range of compounds listed in US EPA Method 8260C or similar. The method should include analysis of naphthalene.

BTEX (Benzene, toluene, ethyl benzene and xylenes) plus MTBE (Methyl-tertiary butyl ether) (by head space GCMS)

Semi-Volatile Organic Compounds (SVOCs) (method by GCMS) with tentative identification of compounds greater than 20µg/kg The method used should be capable of detecting the compounds listed in US EPA Method 8270D or similar. The total concentration of SVOCs excludes polycyclic aromatic hydrocarbons, ethers, nitrobenzene, ketones, aldehydes, phenols, cresols and chlorinated phenols. Phenols, cresols and chlorinated phenols which are detected by the SVOC analysis are given their own assessment criteria.

We do not consider Table G1 and Table 3.1 of the UKWIR Guidance to be a definitive guide for assessing total concentrations. Table 1 in the RA below replaces Table 3.1 of the UKWIR Guidance.

Where previous site uses include the use, storage, treatment, disposal or manufacture of any of the following, appropriate testing for these substances will be required:

- Ethers, nitrobenzene, ketones, aldehydes and amines. Note that the presence of amines on any site at the proposed pipe depth +/- 1.0m precludes the use of polyethylene. The methods of analysis and method of calculation of total concentrations of these compounds will need to be agreed with UUW.

To comply with the testing requirements, the suites of tests that are required on all brownfield sites where wrapped steel, wrapped ductile iron or copper pipes are to be laid as minimum must include:

- pH, Conductivity and redox potential

Sufficiency of Testing

Water pipes are normally laid at between 0.75 and 1.35m from finished ground level to crown of pipe. Samples taken and tested must represent both a) the soil in which the water pipes are to be laid and b) the soil down to at least 500mm below the underside of the proposed pipe. Where the proposed depth of the pipes is unknown at the time of application, soil samples representative of the ground condition between surface level and 1.5m below finished ground level shall be taken as a minimum. Where appropriate (see UKWIR Guidance) groundwater sampling and groundwater monitoring will also be necessary. Photo-ionisation detection (PID) monitoring along the proposed route of the pipeline may be employed, though this does not provide a definitive guide to the suitability of water pipe materials.

Where required a sufficient number of test results should be obtained from the material in which the pipes are to be laid. CLAIRE/CIEH 2008 "Guidance on comparing soil contamination data with a critical concentration" may be used, where appropriate, to justify the number of soil samples tested; however, this statistical model should not be used on heterogeneous materials or used to average test results from different types of materials.

Further guidance on representative sampling is contained within BS10175:2011 Code of Practice for the Investigation of Potentially Contaminated Sites, the Department of the Environment's Contaminated Land Research Report "Sampling strategies for contaminated land" prepared by The Centre for Research into the Built Environment, Nottingham Trent University (Ref: CLR 4; 1994) and the Environment Agency's "Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination" (ref: R&D Technical Report P5-066/TR; 2000).

Where remediation has been carried out on the site, the test results obtained from validation samples will be used in the assessment. Where a horizontal capping system has been or will be employed using materials spread across a site, sufficient samples will need to be taken to characterise the capping material used and the results presented to UUW. However, the sufficiency of sampling on the horizontal capping system, in which the pipeline will be placed, may be assessed on the basis of the source, quantity and type of materials used.

Detection Limits

Only positive concentrations, ie those above the limit of detection should be used in summation of VOC and SVOC (or other test groups of compounds ie phenols, cresols and chlorinated phenols). Laboratory methods shall provide a minimum limit of detection of 10µg/kg for each individual VOC or SVOC (or other test groups of compounds) quantitatively detected in accordance with the methods described above. For tentatively identified compounds (TICs), only those compounds with a concentration of 20µg/kg or greater shall be used in the summation of VOC and SVOC (or other test groups of compounds).

Protective Measures

Where polyethylene, ductile iron, steel or copper pipes are to be laid on a brownfield site or other land potentially affected by contamination (whether or not it has been remediated) and where the concentrations exceed the generic guideline values set out in Table 1 of the RA, the developer shall provide either:

- a) a robust risk assessment to show how any contaminants will not significantly impact on proposed water supplies or buried assets over the lifetime of the assets; or
- b) more suitable pipe materials; or
- c) an engineering solution to protect the pipe work backed up by an adequate assessment of the risk.

Liquid free phase product (e.g. oil or free solvent layers) shall not remain in the ground or groundwater in the vicinity of water pipes, whether barrier pipe or any other pipe materials are used.

When designing pipe routes on land potentially affected by contamination, new preferential contamination pathways along the route of new water pipes shall not be created. Particular measures may be required to prevent the possible migration of contamination through pipe bedding and into controlled waters.

References

BS10175: 2011

"Investigation of Potentially Contaminated Sites Code of Practice"

CLAIRE/CIEH

"Guidance on comparing soil contamination data with a critical concentration" 2008

Department of the Environment Contaminated Land Research Report

"Sampling strategies for contaminated land"
prepared by The Centre for Research into the Built Environment, Nottingham Trent University (Ref: CLR 4) 1994

Environment Agency

"Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination"
(ref: R&D Technical Report P5-066/TR) 2000

Environment Agency

"Model Procedures for the Management of Land Contamination" (ref: CLR11), 2004

Environment Agency P5-080/TR3

"The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils", 2005

UK Water Industry Research (UKWIR)

"Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites" (Ref 10/WM/03/21)
January 2011

Water Regulations Advisory Scheme (WRAS)

Information and Guidance Note 9-04-03

"Laying Pipes in Contaminated Land" 2002

Frequently asked questions

Why has UUW published supplementary guidance to the 'UKWIR Guidance for the Selection of Water Pipes to be used in Brownfield Sites'?

UUW agrees with the UKWIR Guidance in principle; we have published supplementary guidance to clarify some of the areas in which it will operate.

Does the UKWIR Guidance only apply to 'brownfield sites'?

Yes, the UKWIR Guidance does apply to brownfield sites; in addition United Utilities Water will apply this guidance and the UUW supplementary guidance to any greenfield sites which are potentially affected by contamination.

Who is responsible for completing/ signing the Risk Assessment for Water Pipes (RA)?

This may be the Developer, the Developers representative, or the competent person directing the land assessment. The signatory of the Risk Assessment for Water Pipes (RA) must ensure that all land assessments have been carried out in accordance with current standards and guidelines by or under the direction of a suitably qualified competent person. For water supply applications on land potentially affected by contamination, UUW requires the competent person to be either a chartered member of an appropriate professional body (such as the Institution of Civil Engineers, the Geological Society of London or the Royal Institution of Chartered Surveyors) with relevant experience of investigating contaminated sites or a Specialist in Land Condition (SiLC). This level of competency is intended to promote good practice and high professional standards and is no greater than that required for planning purposes by Local Authorities.

Do we need to agree the number and location of soil samples with the Water Company as indicated by the UKWIR guidance following the Preliminary Risk Assessment (PRA)?

Where a preliminary risk assessment (PRA) highlights the need for a site investigation UUW considers it is a responsibility of the qualified competent person directing the land assessment to determine the location and frequency of sampling. UUW's role would be to confirm that the appropriate

choice of pipe material has been made on the basis of the information provided.

What do we do if the pipe route is not known when the Site Investigation report is commissioned?

Where the route of the pipe is not known at the site investigation stage, then any resultant pipe selection needs to take account of any contamination found on the site. Consideration should be given to identifying the route and depth of the pipeline at the site investigation stage to avoid unnecessary testing.

Is it acceptable not to undertake a site investigation and specify the use of barrier pipe which seems to be suitable for all conditions?

Not all brownfield land is contaminated, and because of that a default to barrier pipe is not an acceptable approach to UUW, due to the possibility of higher installation and future maintenance costs. The approach as to whether a site investigation is needed should be risk based. For those sites where land may be affected by contamination appropriate testing shall be undertaken on the ground materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials.

Examples where defaulting to barrier pipe would not be acceptable:

- Where a capping layer (non-contaminated) is introduced within which the pipes will be installed.
- Sites with a potential low risk for contamination.
- Where liquid free phase product (e.g. oil or free solvent layers) is in the ground or groundwater in the vicinity of water pipes.
- Where the route of the pipe could be diverted to another suitable location free from contamination.

Are UUW employees who will assess the Design Proposals for contaminated sites suitably qualified?

It is the role of the Developer's suitably qualified competent person to deal with or direct the assessment of land. UUW's role is to assess the Risk Assessment for Water

Pipes and supporting Site Assessment Report (SAR) which is provided with any new water supply application (ie. it has been provided in the correct format, proposals for pipe selection are included, the methodology is in line with the UKWIR Guidance and UUW Supplementary Guidance, it has been directed by a suitably qualified competent person etc.). If UUW do need to provide assistance or information in deciding pipe materials then the assessment would be carried out under the direction of a suitably qualified competent person.

What happens to existing PE that is in the ground under the "old" guidelines?

The latest UKWIR guidance and UUW's supplementary guidance are intended to be used to decide what pipe materials will be used for new water mains and services. It will have no effect for developers with regard to any parts of UUW's existing network.

Will the Developer be required to submit a fully completed Risk Assessment for Water Pipes (RA) and supporting Site Assessment Report (SAR), including pipe material recommendation, for both the option of a mains requisition application and the option of a self-lay application?

Yes, UUW expect the 'Developer', as defined in UUW Supplementary Guidance, to submit a Risk Assessment for Water Pipes (RA) and supporting Site Assessment Report (SAR), including pipe material recommendation, in respect of any water pipes being installed on the development irrespective of who is to install them.

Does Table 1 in UUW's Risk Assessment for Water Pipes (RA) replace any of the tables to be completed in the Site Assessment Report (SAR) as required in the UKWIR Guidance?

UUW does not consider Table G1 and Table 3.1 of the UKWIR Guidance to be a definitive guide for assessing total concentrations. Table 1 in UUW's RA replaces Table 3.1 of the UKWIR Guidance.

Have any other Water Companies adopted the UKWIR Guidance yet?

You will need to contact the water company concerned if you are intending to install water pipes outside UUW's licensed area.

About us

United Utilities is the North West's water company. We keep the taps flowing and toilets flushing for seven million customers every day. From Crewe to Carlisle, we work hard behind the scenes to help your life flow smoothly.

Risk assessment for water pipes (RA)

The risk assessment for water pipes will help you choose appropriate materials for your development. We are happy to deal with a risk assessment for water pipes in advance of any formal application for a new water supply.

If you need any help completing the form please call us on **0345 072 6067**.

Section 1: Development details	
Development name (if it has one)	N/A
Development address	Land adjacent to Bealey Industrial Estate, Radcliffe
OS Grid reference (mid point)	SD 797 082
Developer's name	Westchurch Homes
UUW reference number (for UU use only)	
Please provide details below of the current and historical use of the site and adjacent sites. <i>If your supporting information has details of the current and historical site use, please reference below the relevant sections of your report.</i> Onsite: Current: - open ground, dense vegetation, outside units and storage of trading estate. Historical: - part of former Broad Dumers Paper Works, including reservoirs, holding/storage tanks, and filter beds and Bealey's Goit. reservoir/tanks recorded as inert landfill following filling in the 1980's. Offsite: Current: Trading estate to the south west and west, open land to the north, residential to the east and south. Historical: Eaton Hill Cotton Mill (later a dyeing works, then dyeing and finishing), a gasometer, Dumers Paper Works, Radcliffe Bleach and Chemical Works (later bleaching works), a chemical works, engineering works, infilled reservoirs, areas of waste disposal activity and a sewage works.	
Section 2: Preliminary risk assessment	
Has your desk study and site walkover identified any land potentially affected by contamination?	☒ Yes ☐ No
If the site is potentially affected by contamination but you have not completed any intrusive site investigation please provide details below of the rationale behind the intended pipe selection. <i>If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report.</i> N/A - investigations undertaken	

Section 3: Intrusive site investigation																																	
Have you completed any intrusive site investigation?						☒ Yes ☐ No																											
Have you completed any none intrusive site investigation?						☐ Yes ☒ No																											
Date(s) when the site investigation(s) undertaken						<table border="1"> <tr> <td>2</td><td>1</td><td>0</td><td>3</td><td>2</td><td>0</td><td>2</td><td>4</td> </tr> <tr> <td>2</td><td>6</td><td>0</td><td>9</td><td>2</td><td>0</td><td>2</td><td>4</td> </tr> <tr> <td>D</td><td>D</td><td>M</td><td>M</td><td>Y</td><td>Y</td><td>Y</td><td>Y</td> </tr> </table>				2	1	0	3	2	0	2	4	2	6	0	9	2	0	2	4	D	D	M	M	Y	Y	Y	Y
2	1	0	3	2	0	2	4																										
2	6	0	9	2	0	2	4																										
D	D	M	M	Y	Y	Y	Y																										
At what level has groundwater been encountered?						0.6-3.0 metres below ground level or ☐ Not encountered																											
Table 1 (Pipeline Selection Risk Assessment Summary (PSRAS)) below classifies testing required where the preliminary risk assessment has identified land potentially affected by contamination. Please provide details below of any test groups which have not been tested and the rationale for not testing. <i>If your supporting information has details of the rationale behind not testing any particular test groups, please reference below the relevant sections of your report.</i>																																	
Refer to Coopers Letter Report 8353si for rationale of selected suites of testing, based upon conceptual site model. Additional investigation required in areas of the site which were inaccessible.																																	
If the intrusive site investigation has identified concentrations above the PE threshold (see PSRAS) and your intended pipe selection is PE. Please provide details below of the rationale behind the intended pipe selection. <i>If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report.</i>																																	
Area of petroleum range hydrocarbon contamination proposed for removal.																																	
Section 4: Site remediation																																	
Please provide details below of any site remediation (which may include a change in site levels) already completed. <i>If your supporting information has details of the site remediation already completed, please reference below the relevant sections of your report.</i>																																	
No remediation undertaken at time of assessment (see below for proposals).																																	
Has the PSRAS (Table 1) been completed using appropriate data after remediation?								☐ Yes ☒ No ☐ N/A																									
Please provide details below of any proposed site remediation and an analysis of whether this will affect your intended pipe selection. <i>If your supporting information has details of any proposed site remediation and whether this will affect your intended pipe selection, please reference below the relevant sections of your report.</i>																																	
Subject to additional investigation upon vacant possession of the site, concurrent with demolition works. Areas of petroleum range hydrocarbons from former reservoir to be removed. Cover systems intended for proposed gardens.																																	

Section 5: Final use of site

Please provide details below of any chemicals (including fuel) to be stored on site and any other future contamination risks which may affect your intended pipe selection.

If your supporting information has details of potential contamination risks which may affect your intended pipe selection, please reference below the relevant sections of your report.

None - Proposed residential end use.

What water pipe materials are intended to be used on site?

☒ PE ☐ PE Barrier Pipe Type A ☐ PE Barrier Pipe Type B
Other (please specify):

Section 6: Additional information

Please use the section below to provide any additional details to support your intended pipe selection.

Refer to Coopers Report 8353si.

The investigation has identified an areas of elevated petroleum range hydrocarbons intended for removal.

The proposed pipeline materials are for initial proposals only based upon the information of the areas accessible for investigation and this assessment should be revised upon completion of the additional investigation.

Section 7: Risk assessor

Name and relevant qualifications of person directing the risk assessment for water pipes

B W Hill BSc(Hons), CSci, MEnvSc, FGS (Chartered Scientist)

Name and address of risk assessor's company

Coopers (Chester) Ltd,
Park House, Sandpiper Court, Chester Business Park
Chester
CH4 9QU

Date risk assessment performed

0 8 1 1 2 0 2 4

Section 8: Declaration

I confirm I have completed this form and provided supporting information in accordance with 'UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites' and UUW's Supplementary Guidance. I also confirm that if any further site investigation is needed and carried out, I will be required to submit an additional Risk Assessment for Water Pipes with the relevant supporting information. I understand that failure to supply any of the required information may delay my application being processed.

Name	Ben Hill	Company	Coopers (Chester) Ltd
Telephone	01244 684920	Date	0 8 1 1 2 0 2 4

Please email the completed form and supporting information to DeveloperServicesWater@uuplc.co.uk or post to us at United Utilities Water, Developer Services, Second floor Grasmere House, Lingley Mere, Warrington WA5 3LP.



About us

United Utilities is the North West's water company. We keep the taps flowing and toilets flushing for seven million customers every day. From Crewe to Carlisle, we work hard behind the scenes to help your life flow smoothly.

United Utilities Water Limited, Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Warrington WA5 3LP.
Registered in England and Wales. Registered Number 2366678.

Table 1 - Pipe selection risk assessment summary (PSRAS)

1. Testing must be undertaken on the materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials. Please use the appropriate testing data to complete Table 1 below.

2. If more than one pipe selection is being made, for example, for pipes in different areas of a large site, a completed PSRAS is required for each selection.

What materials have been tested to populate Table 1 below? ☒ Existing ground materials ☐ Remediated materials ☐ Imported capping materials

Coopers Note - further investigation needed, including targeting of former tanks and areas of high risk of elevated TPH.

All concentrations in mg/kg								
Test Group	Testing Required?	PE threshold	Metal Pipes/ Barrier Pipe	Laboratory Detection Limit	Testing UKAS accredited Y/N	Maximum concentration at proposed pipeline depth See Note [2]	Maximum site concentration See Note [3]	Locations and depths where concentrations exceed proposed pipeline threshold
Total VOCs	Where Preliminary Risk Assessment (PRA) has identified land potentially affected by contamination	0.5	Pass	0.01	Y	<LOD	<LOD	None
Total BTEX & MTBE		0.1	Pass	0.1	Y	<LOD	<LOD	None
Total SVOCs (excluding PAHs and those substances marked with an *)		2	Pass	0.1	Y	0.1	0.1	None
EC5-EC10 aliphatic and aromatic hydrocarbons		2	Pass	0.01	Y	<LOD	<LOD	None
EC10-EC16 aliphatic and aromatic hydrocarbons		10	Pass	1.5	Y	483.52	483.52	WS101 (3-4m bgl)
EC16-EC40 aliphatic and aromatic hydrocarbons		500	Pass	3.4	Y	3121.9	3121.9	WS101 (3-4m bgl)
Phenols* (from SVOC analysis)		2	Pass	0.1	Y	<LOD	<LOD	None
Cresols and chlorinated phenols* (from SVOC analysis)		2	Pass	0.1	Y	<LOD	<LOD	None
Ethers*	Only where identified	0.5	Pass	N/A	N/A	N/A	N/A	N/A
Nitrobenzene*		0.5	Pass	N/A	N/A	N/A	N/A	N/A
Ketones*		0.5	Pass	N/A	N/A	N/A	N/A	N/A
Aldehydes*		0.5	Pass	N/A	N/A	N/A	N/A	N/A
Amines		Fail	Pass	N/A	N/A	N/A	N/A	N/A
Corrosive	Conductivity, Redox and pH	Pass	See Note [1]	N/A	N/A	N/A	N/A	N/A

Note [1] Threshold: For wrapped steel, corrosive if pH<7 and conductivity > 400µS/cm. For wrapped ductile iron corrosive if pH<5, Eh not neutral and conductivity > 400µS/cm. For copper, corrosive if pH<5 or >8 and Eh positive.

Note [2] Water pipes are normally laid at 0.75-1.35m below finished ground level.

Note [3] Also state if liquid free product is present in soil or groundwater.

NA = not tested based upon conceptual site model - refer to Coopers Report No. 8353si for justification of testing.

Site Investigation Report for
Land Adjacent to Bealey Industrial Estate, Radcliffe

Appendix 12

CDM Information

Client : Westchurch Homes
 Project : Land Adjacent to Bealey Industrial Estate, Radcliffe
 Project No : 8353

DESIGN RISK ASSESSMENTS FOR FOUNDATION OPTIONS

ACTIVITY/ELEMENT OF DESIGN	HAZARD (ie slips, trips, falls, manual handling, use of mobile plant, chemicals etc.)	RISK ASSESSMENT								HAZARD AVOIDANCE MEASURES (specify measures required to avoid or minimize risk using hierarchy of controls)
		Construction Phase				Operational/Maintenance Phase				
		High	Med	Low	N/A	High	Med	Low	N/A	
Foundations <1200mm deep and House Drainage (ie Traditional & Nominally Reinforced Strip Footings)	Falls/slips/trips		✓						✓	Provide information and training on working in excavations. Use daily inspections by competent person prior to entry into trench and recording on Excavation Register
	Trench Collapse			✓					✓	Ensure excavationsides battered back to a safe angle of repose. Provide information and training on working in excavations. Use daily inspections by competent person.
Breaking out existing foundations	Noise /vibration		✓						✓	Identify existing foundations and dig out using mechanical excavator. If not possible break out using hand held breakers. Minimise vibration in breakers by maintenance. Ensure use of thick gloves/appropriate PPE
	Contamination			✓					✓	Removal of contaminated material to a licensed landfill site or use of inert cover over contaminated strata . Use of PPE by groundworkers. Enforcement of good hygiene rules and provision of welfare facilities.
Handling of blocks/bricks and steel mesh	Musculo-Skeletal Injury		✓						✓	Use of mechanical handling plus manual handling risk assessment. Certificate required for mechanical handling. Designer to specify use of blocks/bricks and mesh of suitable unit weight for manual handling. Contractor to ensure mesh lengths take into account manual handling. Mechanical handling where possible.
Concrete pouring/mortars	Skin Irritation/Eczema		✓						✓	Contractor to ensure proper use of barrier cream/PPE. Designer to ensure suitable mortar additives. Contractor to carry out COSHH assessments.
	Existing services		✓						✓	Contact utilities managementcompanies to confirm existence or absence of live services. Provide utilities plans to Contractor. Use of Cat and Genny during excavation and proceed with care. Hand dug excavations where necessary.
Foundations >1200mm deep and Drains/Services (ie Deep Strip footings or Mass Concrete Trench Fill	Trench collapse	✓							✓	Ensure excavationsides supported by propping/trench sheeting, or battered back to a safe angle of repose. Provide information and training on working in excavations. Use daily inspections by competent person. Added risk in areas of groundwater. Ensure that excavationpumped dry at all times.
	Slips/trips/falls	✓							✓	Provide information and training on working in excavations. Use daily inspections by competent person prior to entry into trench and recording on Excavation Register
	Contamination			✓					✓	Removal of contaminated material to a licensed landfill site or use of inert cover over contaminated strata. Use of PPE by groundworkers. Enforcement of good hygiene rules and provision of welfare facilities.
	Existing Services			✓					✓	Contact utilities managementcompanies to confirm existence or absence of live services. Provide utilities plans to Contractor. Use of Cat and Genny during excavation and proceed with care. Hand dug excavations where necessary.

Client : Westchurch Homes
Project : Land Adjacent to Bealey Industrial Estate, Radcliffe
Project No : 8353

DESIGN RISK ASSESSMENTS FOR FOUNDATION OPTIONS

ACTIVITY/ELEMENT OF DESIGN	HAZARD (ie slips, trips, falls, manual handling, use of mobile plant, chemicals etc.)	RISK ASSESSMENT								HAZARD AVOIDANCE MEASURES (specify measures required to avoid or minimize risk using hierarchy of controls)
		Construction Phase				Operational/Maintenance Phase				
		High	Med	Low	N/A	High	Med	Low	N/A	
<u>Foundations</u> <u>>1200mm deep and</u> <u>Drains/Services</u>	Continued									
Installation of polystyrene sheets for heave protection requiring manned entry to unsupported excavations	Trench collapse Slips/trips/falls	✓							✓	Install inaccordance with approved method statement and to include edge protection and adequate cross over points. Alternatively consider integral raft foundation with stone blanket.
Concrete pouring/mortars	Skin Irritation/Eczema	✓							✓	Contractor to ensure proper use of barrier cream/PPE. Designer to ensure suitable mortar additives. Contractor to carry out COSHH assessments.
Handling of blocks/bricks and steel mesh	Musculo-Skeletal injury		✓						✓	Use of mechanical handling plus manual handling risk assessment. Certificate required for mechanical handling. Designer to specify use of blocks/bricks and mesh of suitable unit weight for manual handling. Contractor to ensure mesh lengths take into account manual handling. Mechanical handling where possible.
	Asphyxia and confirmed space working	✓							✓	Confined space procedures for working in deep excavations/manholes.Ensure fumes from mechanical plant, such as pumps, are well controlled.
Breaking out existing foundations	Noise/Vibration			✓					✓	Identify existing foundations and dig out using mechanical excavator. If not possible break out using hand held breakers. Minimise vibration in breakers by maintenance. Ensure use of thick gloves/appropriate PPE
<u>Raft Foundations</u> <u>with Integral floor slab</u>	Slips/trips/falls		✓						✓	Provide information and training on working in excavations.Use daily inspections by competent person prior to entry into trench and recording on Excavation Register
Strip existing fill material and remove to approved bearing strata. Backfill with approved consolidated granular fill.	Trench collapse	✓							✓	Ensure excavationsides supported by propping/trench sheeting, or battered back to a safe angle of repose. Provide information and training on working in excavations.Use daily inspections by competent person. Added risk in areas of groundwater. Ensure that excavation pumped dry at all times.
	Contamination			✓					✓	Removal of contaminated material to a licensed landfill site or use of inert cover over contaminated strata. Use of PPE by groundworkers. Enforcement of good hygiene rules and provision of welfare facilities.

Client : Westchurch Homes
Project : Land Adjacent to Bealey Industrial Estate, Radcliffe
Project No : 8353

DESIGN RISK ASSESSMENTS FOR FOUNDATION OPTIONS

ACTIVITY/ELEMENT OF DESIGN	HAZARD (ie slips, trips, falls, manual handling, use of mobile plant, chemicals etc.)	RISK ASSESSMENT								HAZARD AVOIDANCE MEASURES (specify measures required to avoid or minimize risk using hierarchy of controls)
		Construction Phase				Operational/Maintenance Phase				
		High	Med	Low	N/A	High	Med	Low	N/A	
<u>Raft Foundations with Integral floor slab</u>	Continued									
Construction of granular blanket beneath raft for heavy precautions, depth <1200mm.	Trench collapse Slips/trips/falls			✓					✓	Ensure excavationsides battered back to a safe angle of repose. Provide information and training on working in excavations. Use daily inspections by competent person. Use daily inspections by competent person prior to entry into trench and recording on Excavation Register.
Breaking out existing foundations	Noise/Vibration			✓					✓	Identify existing foundations and dig out using mechanical excavator. If not possible break out using hand held breakers. Minimise vibration in breakers by maintenance. Ensure use of thick gloves/appropriate PPE
	Existing Services			✓					✓	Contact utilities managementcompanies to confirm existence or absence of live services. Provide utilities plans to Contractor. Use of Cat and Genny during excavation and proceed with care. Hand dug excavations where necessary.
	Backfilling			✓					✓	Use mechanical excavators to place approved granular fill in layers and lightly compact. Geotextile wrap fills in 1m max. lift heights and use graded granular material with good self compacting properties. Compaction with plant only when excavation depth <1200mm deep.
Steel Fixing	Musculo-Skeletal injury		✓						✓	Designer to schedule bars to take into account manual handling. Avoid long large diameter bars. Use of mechanical handling where possible plus manual handling risk assessment. Certificate required for machanical handling
Concrete pouring/mortars	Skin Irritation/Eczema	✓							✓	Contractor to ensure proper use of barrier cream/PPE. Designer to ensure suitable mortar additives. Contractor to carry out COSHH assessments.
<u>Foundations-piled</u>										
Mobilisation of plant	Sequencing of piling work with other construction to avoid unsafe conditions		✓						✓	Tender documents to include site investigation report and current services information. Contractor to plan site access. Provision of stone support blanket where required to protect buried services. Design of piling platform to BR470. Agree working clearances with highway authority
	Damage to buried services		✓						✓	
	Rig overturning		✓						✓	

Client : Westchurch Homes
Project : Land Adjacent to Bealey Industrial Estate, Radcliffe
Project No : 8353

DESIGN RISK ASSESSMENTS FOR FOUNDATION OPTIONS

ACTIVITY/ELEMENT OF DESIGN	HAZARD (ie slips, trips, falls, manual handling, use of mobile plant, chemicals etc.)	RISK ASSESSMENT								HAZARD AVOIDANCE MEASURES (specify measures required to avoid or minimize risk using hierarchy of controls)
		Construction Phase				Operational/Maintenance Phase				
		High	Med	Low	N/A	High	Med	Low	N/A	
Foundations-piled	Continued									
Pile driving - CFA	Hearing loss		✓						✓	Contractor to establish closed working zone inside which PPE to be mandatory (ear defenders, etc)
	Contamination		✓						✓	Any arisings from pile excavation to be segregated and disposed of as controlled waste. Operatives to be provided with adequate welfare provisions for washing and eating.
-CFA auger changes	Musculo-skeletal injury		✓						✓	Limit number of pile sizes to struicture.
- Steel fixing	Musculo-skeletal injury		✓						✓	Schedule bars to take into account manual handling. Avoid long large diameter bars who weight would exceed 20kgs. Consider automated cage reinforcement equipment.
-Reinforcement lifting	Injury from falling steel bars		✓						✓	Design of reinforcement cages to be robust enough for lifting.
- Concrete pouring	Skin irritation/ eczema		✓						✓	Contractor to ensure proper use of barrier cream/ PPE
Pile driving - precast concrete segmental	Hearing loss	✓							✓	Contractor to establish closed working zone inside which PPE to be mandatory (ear defenders, etc)
	Musculo-skeletal injury Trapping/ crushing	✓							✓	Contractor to prepare Method Statement. Provide information and training in handling a jointing piles. COSHH assessment of adhesives used in pile jointing.. Use of PPE.
Pile trimming to cut-off level and expose reinforcement. - Scabbling pile surface	Noise/Vibration Musculo-skeletal injury Trapping/ crushing Cuts & abrasions		✓						✓	Correct use of mechanical pile croppers or other means of trimming that do not involve excessive use of hand held tools. Minimise vibration in hand held breakers by maintenance. Ensure use of thick gloves/appropriate PPE. Use protection caps on exposed bars after trimming.
Ground Beams										
Retained ground "fill": excavation < 1.2m	Trench collapse		✓						✓	Ensure excavation sides battered back to angle of safe repose. Provide information and traini on working in excavations. Use "permit to work" system and daily inspections by competent person.
Retained ground "fill": excavation > 1.2m	Trench collapse/ trips/ falls	✓							✓	Ensure excavation sides supported by propping/ trench sheeting, or battered back to angle safe repose. Provide information and training on working in excavations. Use "permit to work" system and daily inspections by competent person.
Steel fixing	Musculo-skeletal injury		✓						✓	Schedule bars to take into account manual handling. Avoid long large diameter bars whose weight would exceed 20kgs.
Concrete pouring	Skin irritation/ eczema		✓						✓	Contractor to ensure proper use of barrier cream/ PPE

Site Investigation Report for
Land Adjacent to Bealey Industrial Estate, Radcliffe

Appendix 13

Reference Drawings

<u>Drawing No.</u>	<u>Revision</u>	<u>Title</u>
8353/L1	-	Site Location Plan
8353/AP	-	Aerial Photograph
8353/01	A	Site Plan
8353/200	-	Hazardous Ground Gas Conceptual Model
8215/RP	-	Remediation Plan
8215/LRH/CS2/PC/PE/G/01	-	Typical Gas Precaution Detail to a Precast Concrete Slab and a Vented Void for CS2

SCALE	1:25000@A4
DATE	17.10.24
DRAWN	AH
CHEK'D	BH

Land Adjacent to Bealey Industrial Estate, Radcliffe.

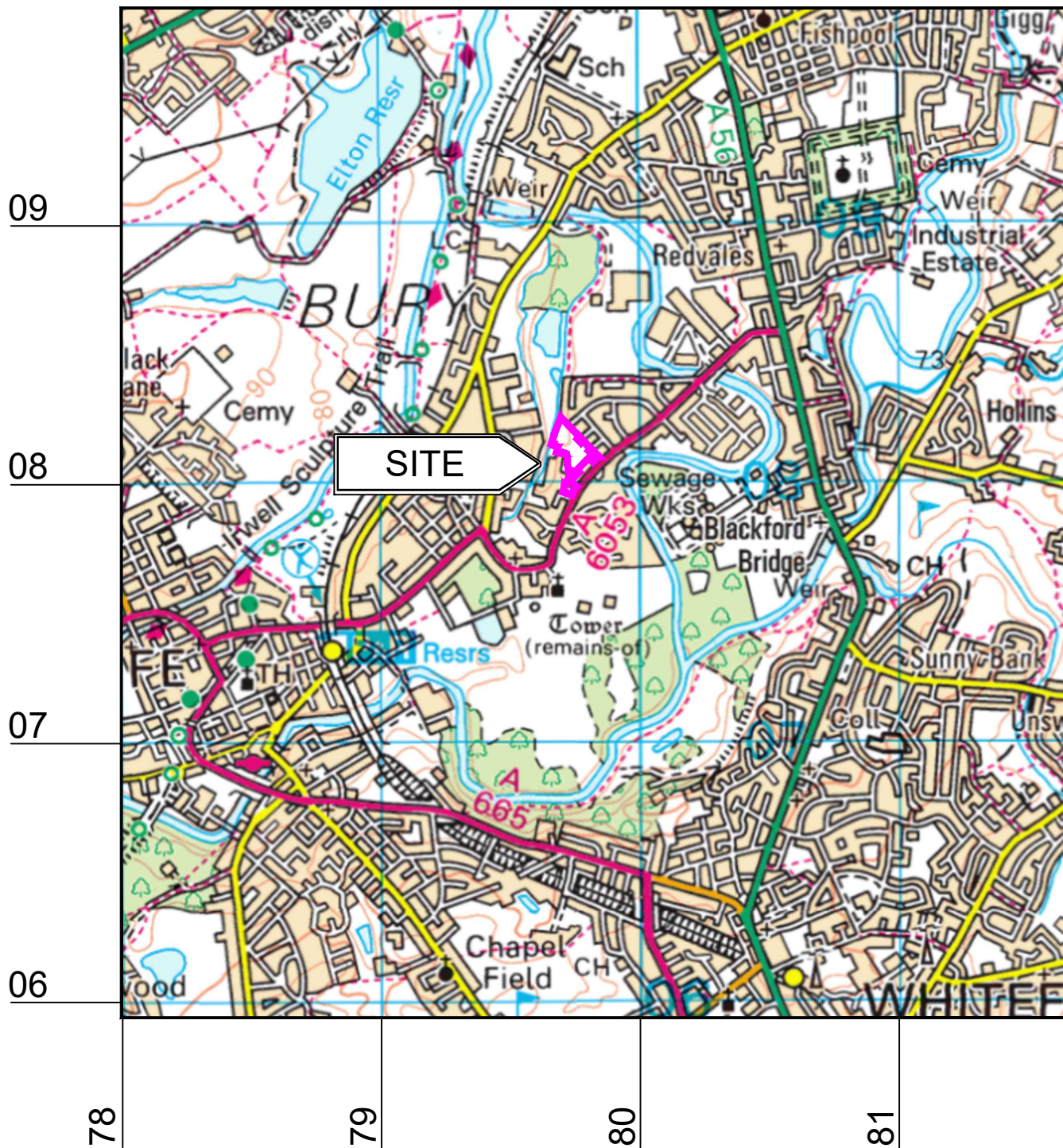
SITE LOCATION PLAN

Drg No: 8353 / L1



National Grid reference
of the proposed site.

SJ 797 081



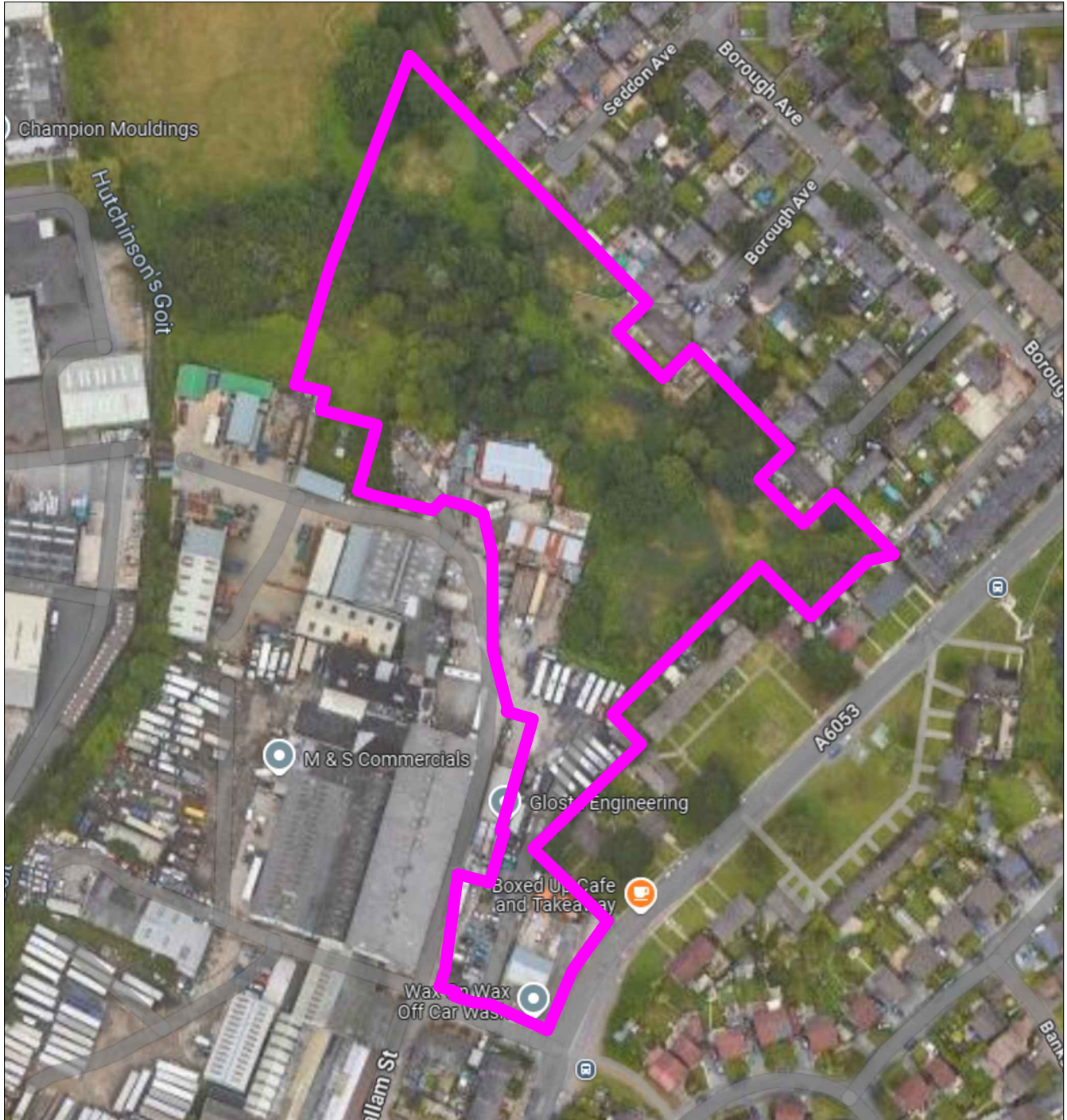
0 200 400 600 800 1000 1500 2000

SCALE BAR (m)



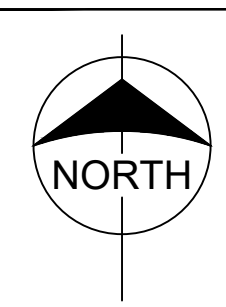
KEY

—— Site boundary



0 10 20 40 60 80 100 120 140 160 180 200

SCALE BAR (m)



THIS DRAWING SHOULD ONLY
BE PRINTED IN COLOUR

- KEY TO EXPLORATORY HOLES**
(All positions are approximate unless otherwise stated)
- Blue flag icon: Trial pits TP01 - TP09 excavated by Coopers on 26 September 2024
 - Red circle with dot icon: Window sample boreholes WS01 - WS09 drilled for Coopers between 21 & 22 March 2024
 - Red circle with dot icon: Window sample boreholes WS101 - WS104 drilled for Coopers on 30 September 2024
 - Blue flag icon: Hand dug trial pits excavated by Coopers on 30 September 2024
- KEY TO EXISTING FEATURES**
(All positions are approximate unless otherwise stated)
- Blue wavy line icon: Hutchinson's Goit (taken from OS tile)
 - Green circle icon: Surveyed trees (taken from ref. a)
 - Green wavy line icon: Surveyed foliage (taken from ref. a)
 - Grey rectangle icon: Surveyed building (taken from ref. a)
 - White rectangle icon: Surveyed steel containers (taken from ref. a)
 - Orange rectangle icon: Surveyed temporary structures (taken from ref. a)
 - Orange dashed circle icon: Presence of Japanese Knotweed observed by Coopers between 21 & 22 March 2024
 - Blue and yellow checkered circle icon: Flytipping observed by Coopers between 21 & 22 March 2024
 - Red and yellow checkered circle icon: Flytipping of possible asbestos containing materials observed by coopers between 21 & 22 March 2024
 - Orange square icon: Surveyed telecommunications mask (taken from ref. a)
 - Red line icon: Surveyed overhead cable (taken from ref. a)
 - Orange line icon: Surveyed fence (taken from ref. a)
 - Pink dashed line icon: Surveyed bottom of bank (taken from ref. a)
 - Grey line icon: Topographical contours (taken from ref. a)
 - Pink line icon: Approximate site boundary

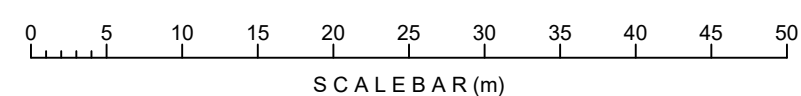
- KEY TO FORMER FEATURES**
(All positions are approximate unless otherwise stated)
- Red rectangle icon: Former electricity substation (taken from ref. c)
 - Blue wavy line icon: Former reservoir (taken from ref. c)
 - Blue wavy line icon: Former extent of Bealey's Goit (taken from ref. c)
 - Blue wavy line with arrow icon: Former water feature with flow direction (taken from ref. c)
 - Blue circle with 'W' icon: Former well (taken from ref. c)
 - Pink diamond icon: Former tank (taken from ref. c)
 - Yellow rectangle with 'S-TK.' icon: Former settling tanks (taken from ref. c)
 - Orange rectangle with 'TK.' icon: Former filter beds (taken from ref. c)
 - Black and white dashed line icon: Former tramway (taken from ref. c)
 - Red rectangle with 'TK.' icon: Former landfill (taken from ref. d)

- KEY TO ACCESS**
(All positions are approximate unless otherwise stated)
- Green dashed line icon: Area accessible for SI

- KEY TO SURVEYED SERVICES**
(All positions are approximate unless otherwise stated)
(Taken from ref. e)
- Red line with arrow icon: Foul Drainage
 - Blue line with arrow icon: Surface Drainage
 - Red dashed line icon: Electricity
 - Green dashed line icon: Gas
 - Blue dashed line icon: Ground Probing Radar
 - Blue dashed line icon: Water
 - Pink dashed line icon: Cable Television
 - Purple dashed line icon: British Telecom
 - Green dashed line icon: Pipe
 - Unknown icon: Unknown
 - Red dashed line icon: Electricity (TFR) Taken From Records
 - Green dashed line icon: Gas (TFR) Taken From Records
 - Blue dashed line icon: Water (TFR) Taken From Records

This drawing is to be read in conjunction with the following:-

- RJP Surveying Consultants Ltd, Proposed Development at Dummers Lane, Radcliffe, Topographical Survey, ref. WH062 / T00, dated January 2024.
- Westchurch Homes, Bealey Industrial Estate, Radcliffe, Site Location Plan, ref. BIE-LOC-001, dated February 2024.
- Groundsure Insights, Land Adjacent to Bealey Industrial Estate, Radcliffe, ref. GD-HMJ-3VX-27B-111_1250 & ref. GS-HMJ-3VX-27B-111_LS, dated 15 February 2024.
- Groundsure Enviro+Geo Insight, Land Adjacent to Bealey Industrial Estate, Radcliffe, ref. GS-B5J-QUX-W33-1YT, dated 15 February 2024.
- Avoin Maa Surveys Ltd, Bealey Industrial Estate, Radcliffe, ref. 0924/WEST/11199, dated 19 September 2024.



REVISION BOX				
Rev.	Date	Revision	By	Appd.
A	03.10.24	Surveyed services added to plan. Site boundary updated, site re-centred and sheet size updated to A1. Latest Coopers exploratory holes added to plan.	AH/OS	BH

coopers
chartered consulting engineers

Tel: 01244 684910
Email: admin@coopers.co.uk
Web: http://coopers.co.uk

Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU

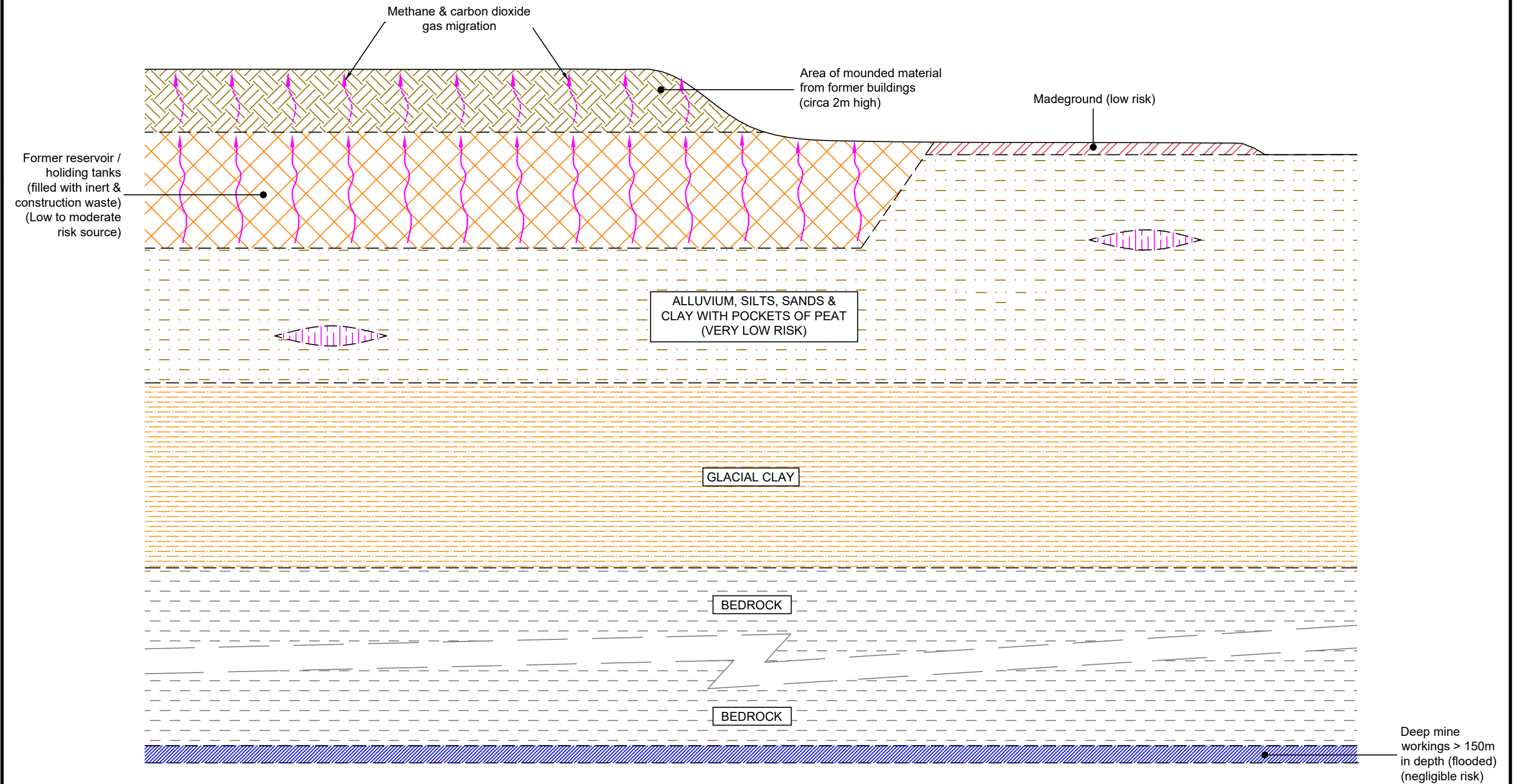
Client
WESTCHURCH HOMES LTD

Project
Land Adjacent to Bealey Industrial Estate, Radcliffe.

Title
SITE PLAN

DRAWING NUMBER
8353 / 01

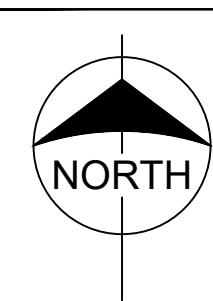
SCALE at A1	1:500	REVISION
DATE	11.04.24	
DRAWN	OS	
CHECKED	BH	A



THIS DRAWING SHOULD ONLY
BE PRINTED IN COLOUR

© Copyright The original of this drawing contained coloured symbols and/or features.
Any black and white reproduction should not be relied upon.

SCALE	NTS @ A3						Land Adjacent to Bealey Industrial Estate, Radcliffe.	HAZARDOUS GROUND GAS CONCEPTUAL MODEL	coopers chartered consulting engineers Tel: 01244 684910 Email: admin@coopers.co.uk Web: http://coopers.co.uk Park House Sandpiper Court Chester Business Park Chester CH4 9QU
DATE	09.10.24								
DRAWN	AH								
CHEK'D	BH								



THIS DRAWING SHOULD ONLY
BE PRINTED IN COLOUR

KEY TO REMEDIATION

(All positions are approximate unless otherwise stated)

Characteristic Situation 2 Gas Mitigation Measures

Further investigation required concurrent with demolition and site clearance

Former reservoir - removal of ACMs and TPH impacted soils

All gardens and landscaping to contain cover systems:

- Rear Gardens = 600mm inert cover system (incl. of min 150mm of topsoil) on to geotextile*.
- Frontages = 450mm inert cover system (incl. of min 150mm of topsoil) on to geotextile*.

* no geotextile is required if natural strata identified at <600mm.

KEY TO EXPLORATORY HOLES

(All positions are approximate unless otherwise stated)

Trial pits TP01 - TP09 excavated by Coopers on 26 September 2024

Window sample boreholes WS01 - WS09 drilled for Coopers between 21 & 22 March 2024

Window sample boreholes WS101 - WS104 drilled for Coopers on 30 September 2024

Hand dug trial pits excavated by Coopers on 30 September 2024 30 September 2024.

KEY TO EXISTING FEATURES

(All positions are approximate unless otherwise stated)

Bealey's Goit (taken from OS tile)

Surveyed building (taken from ref. a)

Site boundary (taken from ref. e)

KEY TO FORMER FEATURES

(All positions are approximate unless otherwise stated)

Former electricity substation (taken from ref. c)

Former reservoir (taken from ref. c)

Former extent of Bealey's Goit (taken from ref. c)

Former water feature with flow direction (taken from ref. c)

Former well (taken from ref. c)

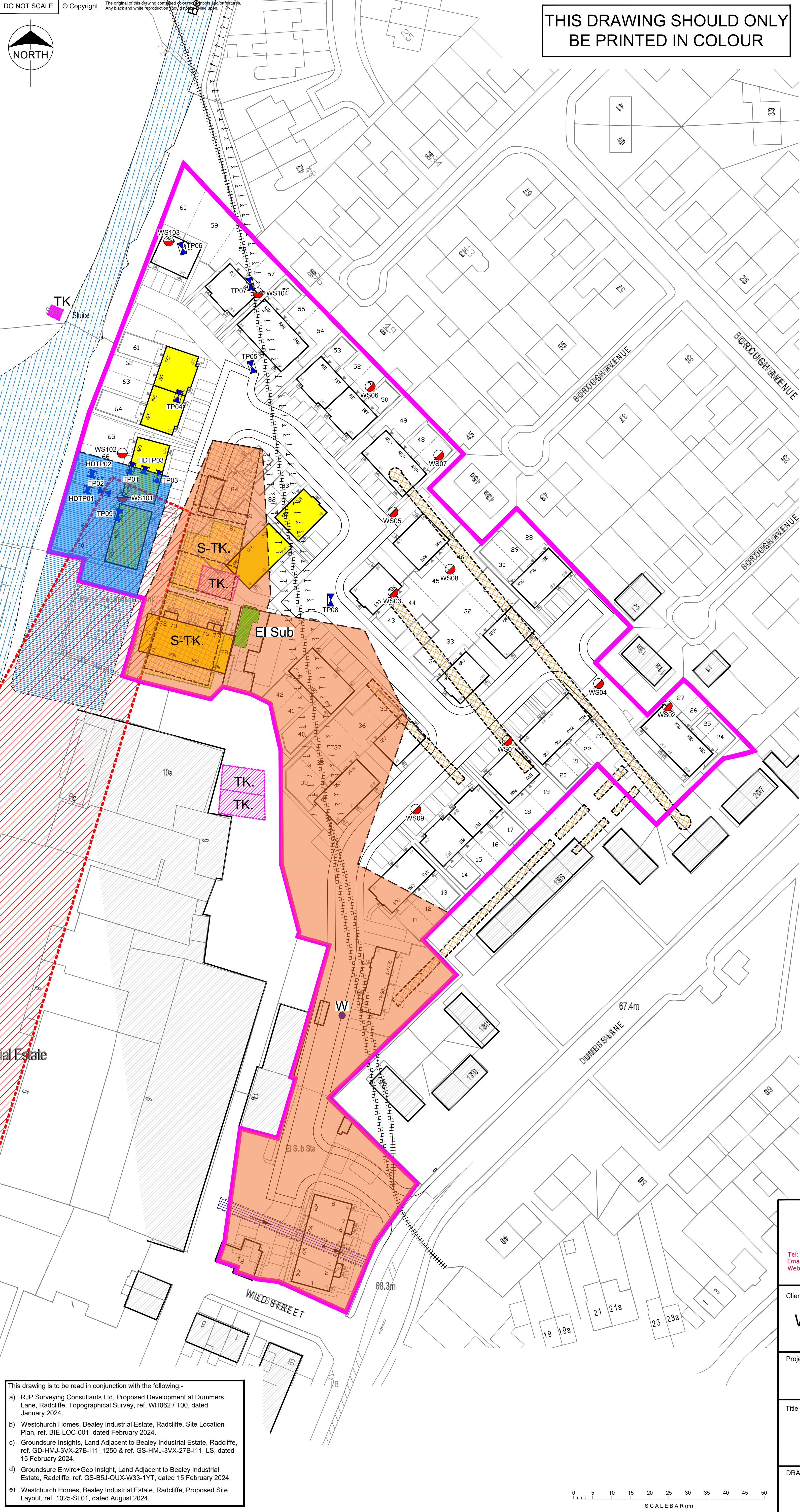
Former tank (taken from ref. c)

Former settling tanks (taken from ref. c)

Former filter beds (taken from ref. c)

Former tramway (taken from ref. c)

Former landfill (taken from ref. d)



This drawing is to be read in conjunction with the following:-

- RJP Surveying Consultants Ltd, Proposed Development at Dummers Lane, Radcliffe, Topographical Survey, ref. WH062 / T00, dated January 2024.
- Westchurch Homes, Bealey Industrial Estate, Radcliffe, Site Location Plan, ref. BIE-LOC-001, dated February 2024.
- Groundsure Insights, Land Adjacent to Bealey Industrial Estate, Radcliffe, ref. GD-HMJ-3VX-27B-111_1250 & ref. GS-HMJ-3VX-27B-111_LS, dated 15 February 2024.
- Groundsure Enviro+Geo Insight, Land Adjacent to Bealey Industrial Estate, Radcliffe, ref. GS-B5J-QUX-W33-1YT, dated 15 February 2024.
- Westchurch Homes, Bealey Industrial Estate, Radcliffe, Proposed Site Layout, ref. 1025-SL01, dated August 2024.

coopers
chartered consulting engineers

Tel: 01244 684910
Email: admin@coopers.co.uk
Web: <http://coopers.co.uk>

Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU

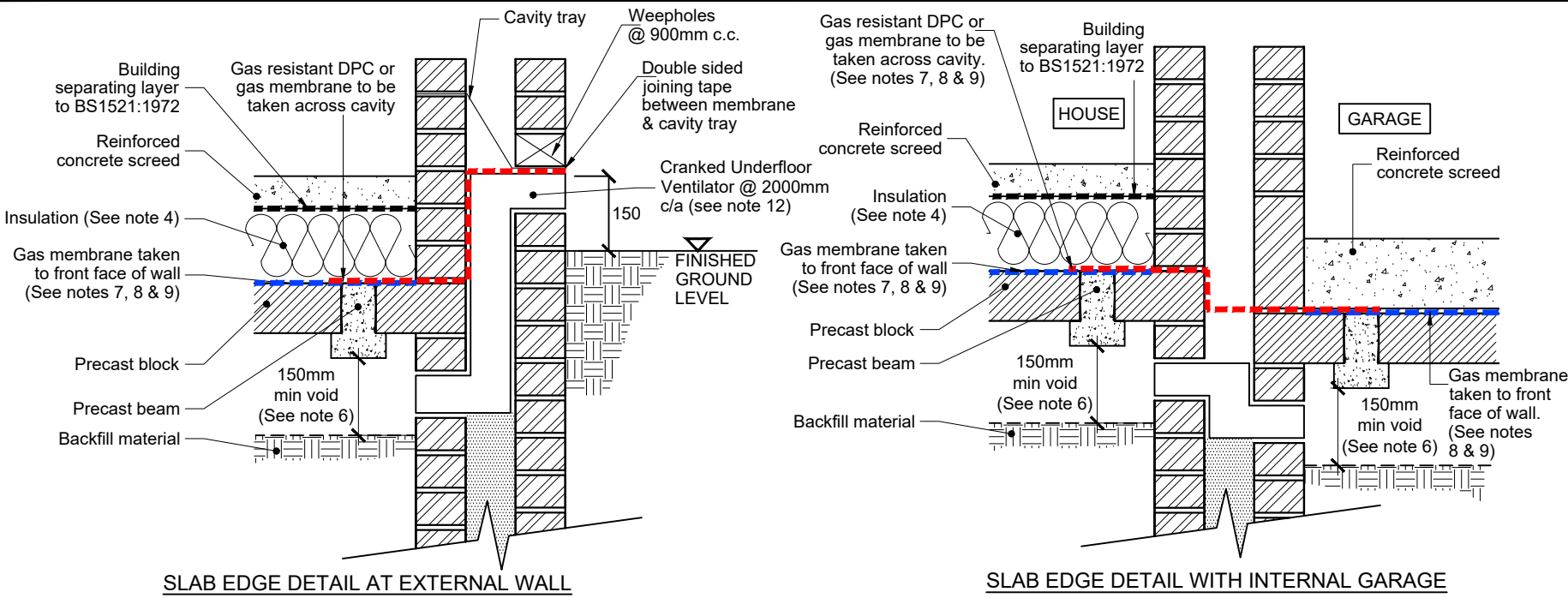
Client
WESTCHURCH HOMES LTD

Project
Land Adjacent to Bealey Industrial Estate, Radcliffe.

Title
REMEDIATION PLAN

DRAWING NUMBER
8353 / RP

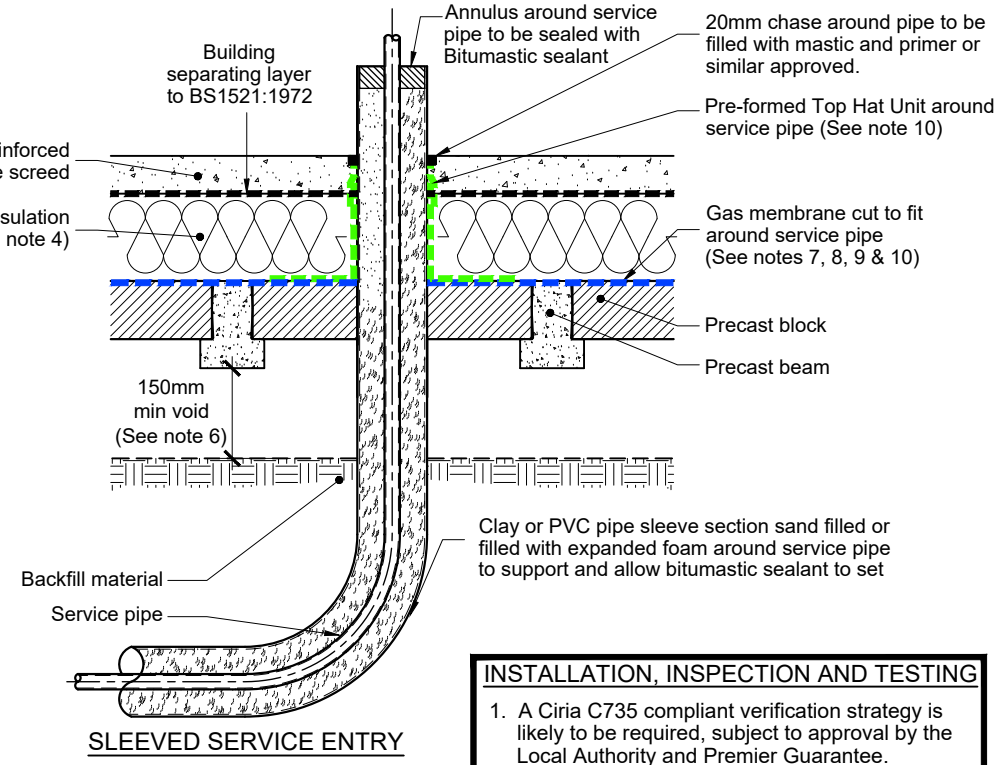
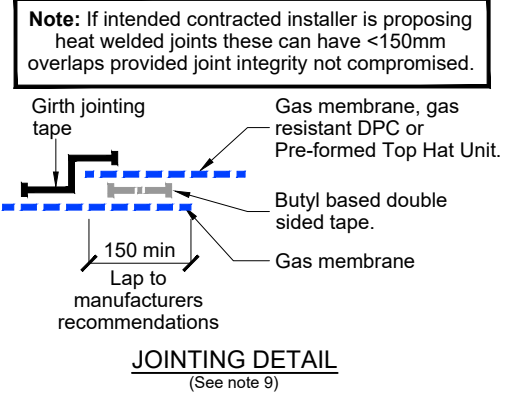
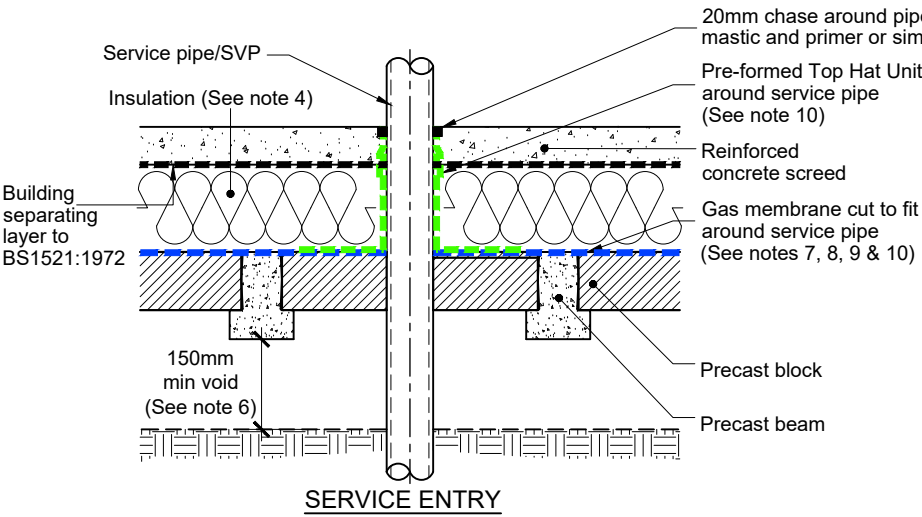
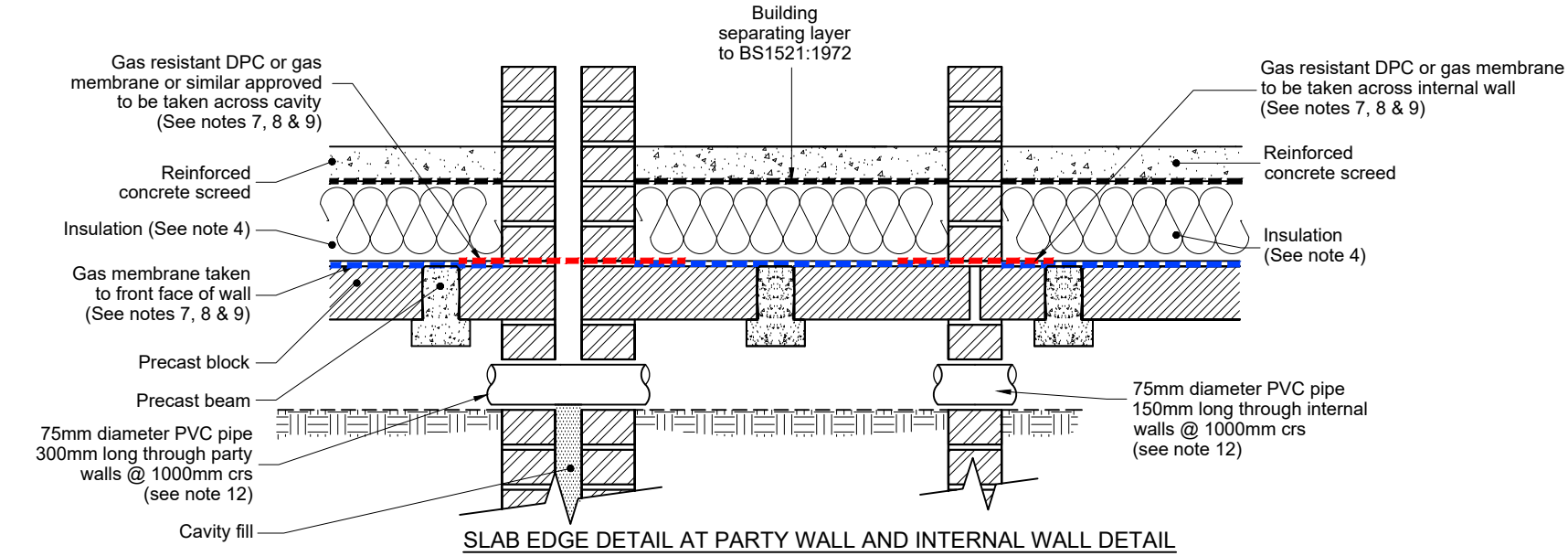
SCALE at A1	1:500	REVISION
DATE	06.11.24	
DRAWN	AH	
CHECKED	BH	-



NOTES

- Coopers take no responsibility for the inappropriate use of this detail on a development. It is the responsibility of the Developer to commission a suitably qualified geo-environmental consultant to assess the relevant ground gas conditions at a development based upon the findings of in situ monitoring and/or qualitative risk assessment.
- Coopers drawing is in accordance with current best practice with respect to design of measures and specification of membranes for the adequate protection of dwellings from the ingress of harmful ground gases. The details contained on this drawing are generic and for guidance purposes only. Any proposed amendments to the detail due to variations on specific house types should be referred back to Coopers for review and approval prior to implementation on site.
- This drawing was prepared for the purpose stated. New products, improved practices and legislation may necessitate an alteration to this drawing in whole or in part after its submission. It is recommended that this drawing is referred to Coopers for reappraisal no later than one year from the date on this drawing. Continued use of this drawing beyond this date is at the Developers own risk.
- Reference needs to be made to specific design drawings for the relevant housetype for robust details, specifics for the floor slab type, insulation details, acoustic protection etc. as applicable.
- For details of proposed foundations refer to site specific foundation plan and site investigation report.
- The minimum clear void below the suspended precast concrete ground floor is to be 150mm (plus heave thickness, where applicable) and should be adequately ventilated in accordance with the Building Regulations. The base of the void is to be within 450mm of the outer ground level unless masonry is designed by a structural engineer. The backfill material should be effectively drained.
- The gas resistant membrane should be a minimum 500µm (2000 gauge) first generation, high quality polyethylene membrane which has low permeability to carbon dioxide and also acts as a damp proof membrane as well as a barrier to radon. **The specification of the gas resistant membrane should be submitted to Coopers for approval prior to use.**
- All gas membranes should be installed to the manufacturers guidelines and recommendations. Special care must be taken to ensure that the gas membrane is not snagged, torn, punctured, stretched or in any way damaged during construction. All damaged areas of the gas membrane must be replaced or repaired to manufacturers recommendations.
- Joints between sheets of gas membrane should be well lapped (150mm min) and taped between sheets with a double sided butyl based tape in accordance with manufacturers recommendations. Depending on the manufacturer, an optional girth jointing strap can be provided, as shown below, for additional security.
- All service entry points should be fitted with pre-formed gas resistant top hats. Tophats should be sealed to the pipe and gas membrane using butyl based double sided tape and fixed to the pipe with a jubilee clip.
- Gas Situation is defined in accordance with BS8485:2015+A1:2019.
- Coopers designs for sub-floor passive ventilation propose external vents on at least 3 sides of the building and venting through all internal walls. These designs account for a range of potential traditional residential houses and contractors should contact the developer's engineers if the house type specific variations of venting differ from these designs. In the event of any discrepancies between the developers house type drawings and this drawing then Coopers drawing takes precedence unless the developer has calculations to prove that this design meets the minimum requirements in accordance with BS8485:2015+A1:2019

FOR GUIDANCE PURPOSES ONLY



This typical detail is provided as a guide for construction of gas membrane installation only. House type specific variations are required to account for slopes on garage floor slabs, stepped slab levels, full building level access, party wall temporary shuttering, corner unit construction, cloaking units around doors, piers, and other similar specific considerations. We would advocate the contractors hold pre-construction discussions with Coopers (and the verification consultants if another consultant) on the approaches and considerations for specific house type construction prior to commencing installation. Should variations be constructed without prior consent these will be deemed by Coopers as a defect and not suitable for construction or approval by us or third parties.

INSTALLATION, INSPECTION AND TESTING

- A Ciria C735 compliant verification strategy is likely to be required, subject to approval by the Local Authority and Premier Guarantee.

CDM HIGH RISK ASSESSMENT

FOR ALL RISKS REFER TO DESIGN RISK ASSESSMENT

coopers
chartered consulting engineers

Tel: 01244 684910
Fax: 01244 684911
Email: admin@coopersassociates.co.uk
Web: http://coopers.co.uk

Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU

CLIENT
WESTCHURCH HOMES LTD

PROJECT
Land Adjacent to Bealey Industrial Estate, Radcliffe.

TITLE
Typical Gas Precaution Detail to a Precast Concrete Slab and a Vented Void for CS2

DRAWN BY	OS
DATE	08.11.2024
SCALE(S)	NTS
DRAWING NUMBER	REVISION