Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
% Stones >10mm$_A$	6.4	<0.1	<0.1	<0.1	<0.1	<0.1	5.6	% w/w	0.1	A-T-044
pH$_D$ M#	9.49	8.19	7.86	8.09	6.07	8.02	8.10	pH	0.01	A-T-031s
Sulphate (water sol 2:1)$_D$ M#	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	g/l	0.01	A-T-028s
Sulphate (acid soluble)$_D$ M#	<1000	490	850	370	620	310	650	mg/kg	200	A-T-028s
Total Organic Carbon$_D$ M#	-	1.77	-	1.69	-	-	2.92	% w/w	0.03	A-T-032s
Arsenic$_D$ M#	<1	9	7	2	5	10	6	mg/kg	1	A-T-024s
Cadmium$_D$ M#	0.7	1.7	1.0	0.9	1.1	0.7	13.4	mg/kg	0.5	A-T-024s
Copper$_D$ M#	7	40	20	16	17	17	51	mg/kg	1	A-T-024s
Chromium$_D$ M#	10	26	32	34	35	19	41	mg/kg	1	A-T-024s
Chromium (hexavalent)$_D$	<1	-	-	-	-	<1	-	mg/kg	1	A-T-048s
Lead$_D$ M#	3	34	60	48	39	47	48	mg/kg	1	A-T-024s
Mercury$_D$	1.75	<0.17	<0.17	<0.17	<0.17	<0.17	0.67	mg/kg	0.17	A-T-024s
Nickel$_D$ M#	4	28	21	17	25	11	33	mg/kg	1	A-T-024s
Selenium$_D$ M#	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-024s
Zinc$_D$ M#	36	76	88	97	93	71	146	mg/kg	5	A-T-024s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
Asbestos in Soil (inc. matrix) ^										
Asbestos in soil$_D^{\#}$	NAD	NAD	NAD	NAD	NAD	NAD	NAD			A-T-045
Asbestos Matrix (visual)$_D$	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope)$_D$	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
PAH-16MS										
Acenaphthene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	0.01	<0.01	<0.01	<0.01	0.04	<0.01	mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.04	mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	<0.04	0.14	0.12	0.11	0.05	0.39	0.25	mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	<0.04	0.18	0.14	0.12	0.06	0.39	0.24	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	<0.05	0.23	0.19	0.17	0.09	0.51	0.36	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	0.06	0.16	0.10	0.09	<0.05	0.24	0.14	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	<0.07	<0.07	<0.07	<0.07	0.19	0.12	mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	<0.06	0.17	0.16	0.15	0.08	0.46	0.36	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	<0.08	0.26	0.30	0.26	0.14	0.89	0.78	mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	<0.03	0.16	0.10	0.10	0.04	0.26	0.14	mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	<0.03	0.07	0.11	0.09	0.05	0.32	0.39	mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	<0.07	0.25	0.26	0.22	0.13	0.76	0.66	mg/kg	0.07	A-T-019s
Total PAH-16MS$_A^{M\#}$	<0.08	1.63	1.48	1.31	0.64	4.58	3.51	mg/kg	0.01	A-T-019s

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
VOC										
Dichlorodifluoromethane$_A$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Chloromethane$_A$	<10	-	-	-	-	-	-	µg/kg	10	A-T-006s
Vinyl Chloride (Chloroethene)$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromomethane$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Chloroethane$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Trichlorofluoromethane$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1-Dichloroethene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Carbon Disulphide$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Dichloromethane$_A$	<5	-	-	-	-	-	-	µg/kg	5	A-T-006s
trans 1,2-Dichloroethene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1-Dichloroethane$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
cis 1,2-Dichloroethene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
2,2-Dichloropropane$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromochloromethane$_A^\#$	<5	-	-	-	-	-	-	µg/kg	5	A-T-006s
Chloroform$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1,1-Trichloroethane$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1-Dichloropropene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Carbon Tetrachloride$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2-Dichloroethane$_A^\#$	<2	-	-	-	-	-	-	µg/kg	2	A-T-006s
Benzene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Trichloroethene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2-Dichloropropane$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Dibromomethane$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromodichloromethane$_A^\#$	<10	-	-	-	-	-	-	µg/kg	10	A-T-006s
cis 1,3-Dichloropropene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Toluene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
trans 1,3-Dichloropropene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1,2-Trichloroethane$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,3-Dichloropropane$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Tetrachloroethene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Dibromochloromethane$_A^\#$	<3	-	-	-	-	-	-	µg/kg	3	A-T-006s
1,2-Dibromoethane$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
Chlorobenzene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1,1,2-Tetrachloroethane$_A$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Ethylbenzene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
m & p Xylene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
o-Xylene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Styrene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromoform$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Isopropylbenzene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1,2,2-Tetrachloroethane$_A$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2,3-Trichloropropane$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromobenzene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
n-Propylbenzene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
2-Chlorotoluene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,3,5-Trimethylbenzene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
4-Chlorotoluene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
tert-Butylbenzene$_A^\#$	<2	-	-	-	-	-	-	µg/kg	2	A-T-006s
1,2,4-Trimethylbenzene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
sec-Butylbenzene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
4-Isopropyltoluene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,3-Dichlorobenzene$_A$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,4-Dichlorobenzene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
n-Butylbenzene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2-Dichlorobenzene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2-Dibromo-3-chloropropane (DCBP)$_A$	<2	-	-	-	-	-	-	µg/kg	2	A-T-006s
1,2,4-Trichlorobenzene$_A$	<3	-	-	-	-	-	-	µg/kg	3	A-T-006s
Hexachlorobutadiene$_A^\#$	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2,3-Trichlorobenzene$_A$	<3	-	-	-	-	-	-	µg/kg	3	A-T-006s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
TPH CWG with Clean Up										
Ali >C5-C6$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C10-C12$_A^{M\#}$	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C12-C16$_A^{M\#}$	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C16-C21$_A^{M\#}$	<10	<1	<1	<1	<1	<1	1	mg/kg	1	A-T-055s
Ali >C21-C35$_A^{M\#}$	84	14	10	9	6	7	59	mg/kg	1	A-T-055s
Total Aliphatics$_A$	84	14	10	9	6	7	60	mg/kg	1	Calc-As Recd
Aro >C5-C7$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C10-C12$_A$	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C12-C16$_A$	<10	<1	1	<1	<1	2	4	mg/kg	1	A-T-055s
Aro >C16-C21$_A^{M\#}$	<10	2	4	4	1	18	20	mg/kg	1	A-T-055s
Aro >C21-C35$_A^{M\#}$	53	11	17	16	8	61	57	mg/kg	1	A-T-055s
Total Aromatics$_A$	53	13	22	20	9	81	81	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35)$_A$	137	27	32	28	16	88	141	mg/kg	1	Calc-As Recd
BTEX - Benzene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s

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Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
% Moisture at <40C$_A$	13.1	7.4	11.0	-	-	-	-	% w/w	0.1	A-T-044
% Stones >10mm$_A$	3.1	<0.1	15.5	<0.1	2.3	<0.1	<0.1	% w/w	0.1	A-T-044
pH$_D$ M#	8.64	8.91	8.59	7.98	6.90	7.24	8.14	pH	0.01	A-T-031s
Sulphate (water sol 2:1)$_D$ M#	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	g/l	0.01	A-T-026s
Sulphate (acid soluble)$_D$ M#	580	360	1300	510	520	580	570	mg/kg	200	A-T-028s
Total Organic Carbon$_D$ M#	11.4	-	3.68	1.80	-	2.90	-	% w/w	0.03	A-T-032s
Arsenic$_D$ M#	10	<1	3	8	8	6	7	mg/kg	1	A-T-024s
Cadmium$_D$ M#	2.4	0.6	1.5	0.7	1.2	1.0	2.7	mg/kg	0.5	A-T-024s
Copper$_D$ M#	84	63	36	16	15	17	115	mg/kg	1	A-T-024s
Chromium$_D$ M#	28	20	41	23	36	23	36	mg/kg	1	A-T-024s
Chromium (hexavalent)$_D$	<1	<1	<1	-	-	-	-	mg/kg	1	A-T-040s
Lead$_D$ M#	114	15	90	43	35	26	229	mg/kg	1	A-T-024s
Mercury$_D$	2.17	1.45	1.85	<0.17	<0.17	<0.17	1.99	mg/kg	0.17	A-T-024s
Nickel$_D$ M#	35	36	29	15	26	18	29	mg/kg	1	A-T-024s
Selenium$_D$ M#	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-024s
Zinc$_D$ M#	157	35	94	77	100	69	464	mg/kg	5	A-T-024s

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Client Project Name: Gravesham Leisure Centre

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Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
Asbestos in Soil (inc. matrix) ^										
Asbestos in soil$_D^{\#}$	NAD	NAD	NAD	NAD	NAD	NAD	NAD			A-T-045
Asbestos Matrix (visual)$_D$	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope)$_D$	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045

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Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
PAH-16MS										
Acenaphthene$_A^{M\#}$	0.32	0.42	1.08	<0.01	<0.01	<0.01	0.07	mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	0.14	0.70	0.27	<0.01	<0.01	<0.01	0.04	mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	1.36	2.39	3.71	0.02	<0.02	<0.02	0.30	mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	2.94	6.29	11.1	0.18	0.05	0.06	1.31	mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	2.67	4.19	7.89	0.17	0.05	0.06	1.04	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	3.37	5.43	9.12	0.23	0.07	0.09	1.32	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	1.54	2.55	3.85	0.11	<0.05	<0.05	0.57	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	1.09	1.86	3.37	0.08	<0.07	<0.07	0.42	mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	2.95	5.87	10	0.21	<0.06	0.08	1.28	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	0.31	0.59	0.88	<0.04	<0.04	<0.04	0.12	mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	8.15	14.6	27	0.41	0.12	0.13	3.07	mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	0.47	0.51	0.89	<0.01	<0.01	<0.01	0.08	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	1.73	2.89	4.64	0.11	<0.03	0.05	0.67	mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	0.03	0.04	0.09	<0.03	<0.03	<0.03	0.14	mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	5.93	8.28	16.1	0.13	0.04	0.05	1.46	mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	6.77	13.5	23.3	0.36	0.11	0.11	2.56	mg/kg	0.07	A-T-019s
Total PAH-16MS$_A^{M\#}$	39.8	70.1	123	2.01	0.44	0.63	14.4	mg/kg	0.01	A-T-019s

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Client Project Ref: 52511

Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
TPH Total with ID + GC Trace										
TPH total (>C6-C40)$_{A}^{M\#}$	384	1560	1990	-	-	-	-	mg/kg	10	A-T-007s
TPH FID Chromatogram$_{A}$	Appended	Appended	Appended	-	-	-	-			A-T-007s
TPH ID Interpretation$_{A}$	C12-C44 with some PAHs and other unknown hydrocarbons	C10-C44 with some PAHs and other unknown hydrocarbons	C10-C44 with some PAHs and other unknown hydrocarbons	-	-	-	-			A-T-007s

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Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
TPH CWG with Clean Up										
Ali >C5-C6$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C10-C12$_A^{M\#}$	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C12-C16$_A^{M\#}$	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C16-C21$_A^{M\#}$	<10	<10	11	1	<1	<1	2	mg/kg	1	A-T-055s
Ali >C21-C35$_A^{M\#}$	103	253	78	12	6	9	200	mg/kg	1	A-T-055s
Total Aliphatics$_A$	103	253	89	13	6	9	203	mg/kg	1	Calc-As Recd
Aro >C5-C7$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C10-C12$_A$	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C12-C16$_A$	20	13	108	2	<1	<1	8	mg/kg	1	A-T-055s
Aro >C16-C21$_A^{M\#}$	77	58	801	6	2	3	110	mg/kg	1	A-T-055s
Aro >C21-C35$_A^{M\#}$	282	242	1510	16	11	6	308	mg/kg	1	A-T-055s
Total Aromatics$_A$	379	313	2420	24	13	9	426	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35)$_A$	482	566	2510	37	19	18	629	mg/kg	1	Calc-As Recd
BTEX - Benzene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s

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Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP2	HP3	HP4	HP5						
Depth to Top	0.00	0.20	0.00	0.00						
Depth To Bottom	0.30	0.40	0.30	0.30						
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	4AE	4AE	4ABE	4ABE						
% Stones >10mm$_A$	<0.1	15.1	9.6	10.9				% w/w	0.1	A-T-044
pH$_D$$^{M\#}$	7.70	9.69	8.54	8.39				pH	0.01	A-T-031s
Sulphate (water sol 2:1)$_D$$^{M\#}$	<0.01	<0.01	0.04	0.04				g/l	0.01	A-T-026s
Sulphate (acid soluble)$_D$$^{M\#}$	730	1100	700	540				mg/kg	200	A-T-028s
Arsenic$_D$$^{M\#}$	4	7	5	6				mg/kg	1	A-T-024s
Cadmium$_D$$^{M\#}$	2.6	2.0	1.4	1.9				mg/kg	0.5	A-T-024s
Copper$_D$$^{M\#}$	42	16	76	38				mg/kg	1	A-T-024s
Chromium$_D$$^{M\#}$	29	21	21	117				mg/kg	1	A-T-024s
Lead$_D$$^{M\#}$	67	161	33	108				mg/kg	1	A-T-024s
Mercury$_D$	0.36	1.39	1.15	1.24				mg/kg	0.17	A-T-024s
Nickel$_D$$^{M\#}$	23	16	19	19				mg/kg	1	A-T-024s
Selenium$_D$$^{M\#}$	<1	<1	<1	<1				mg/kg	1	A-T-024s
Zinc$_D$$^{M\#}$	327	182	116	323				mg/kg	5	A-T-024s

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Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP2	HP3	HP4	HP5						
Depth to Top	0.00	0.20	0.00	0.00						
Depth To Bottom	0.30	0.40	0.30	0.30						
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	4AE	4AE	4ABE	4ABE						
Asbestos in Soil (inc. matrix) ^										
Asbestos in soil$_D$#	NAD	NAD	NAD	NAD						A-T-045
Asbestos Matrix (visual)$_D$	-	-	-	-						A-T-045
Asbestos Matrix (microscope)$_D$	-	-	-	-						A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A	N/A	N/A	N/A						A-T-045

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Client Project Name: Gravesham Leisure Centre

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Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP2	HP3	HP4	HP5						
Depth to Top	0.00	0.20	0.00	0.00						
Depth To Bottom	0.30	0.40	0.30	0.30						
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	4AE	4AE	4ABE	4ABE						
PAH-16MS										
Acenaphthene$_A^{M\#}$	<0.01	<0.01	0.03	0.04				mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	<0.01	<0.01	0.03				mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	<0.02	0.03	0.05	0.11				mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	0.07	0.09	0.18	0.87				mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	0.07	0.11	0.16	1.02				mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	0.11	0.14	0.22	1.42				mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	<0.05	0.10	0.11	0.89				mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	<0.07	0.08	0.54				mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	0.11	0.10	0.21	1.19				mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	<0.04	<0.04	0.13				mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	0.21	0.17	0.44	2.48				mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	<0.01	<0.01	0.02	0.02				mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	0.05	0.10	0.12	0.86				mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	<0.03	<0.03	<0.03	<0.03				mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	0.10	0.08	0.27	0.72				mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	0.19	0.15	0.39	2.23				mg/kg	0.07	A-T-019s
Total PAH-16MS$_A^{M\#}$	0.91	1.07	2.28	12.6				mg/kg	0.01	A-T-019s

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Client Project Ref: 52511

Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP2	HP3	HP4	HP5						
Depth to Top	0.00	0.20	0.00	0.00						
Depth To Bottom	0.30	0.40	0.30	0.30						
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	4AE	4AE	4ABE	4ABE						
Speciated PCB-EC7 & WHO12										
PCB BZ 28$_{A}^{M\#}$	<0.003	-	-	-				mg/kg	0.003	A-T-004s
PCB BZ 52$_{A}^{M\#}$	<0.002	-	-	-				mg/kg	0.002	A-T-004s
PCB BZ 81$_{A}^{M\#}$	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 101$_{A}^{M\#}$	<0.004	-	-	-				mg/kg	0.004	A-T-004s
PCB BZ 105$_{A}^{M\#}$	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 114$_{A}^{M\#}$	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 118$_{A}^{M\#}$	<0.007	-	-	-				mg/kg	0.007	A-T-004s
PCB BZ 123$_{A}^{M\#}$	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 126$_{A}^{M\#}$	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 138$_{A}^{M\#}$	<0.006	-	-	-				mg/kg	0.006	A-T-004s
PCB BZ 153$_{A}^{M\#}$	<0.004	-	-	-				mg/kg	0.004	A-T-004s
PCB BZ 156$_{A}^{M\#}$	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 157$_{A}^{M\#}$	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 167$_{A}^{M\#}$	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 169$_{A}^{M\#}$	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 180$_{A}^{M\#}$	<0.004	-	-	-				mg/kg	0.004	A-T-004s
PCB BZ 189$_{A}^{M\#}$	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 77$_{A}^{M\#}$	<0.005	-	-	-				mg/kg	0.005	A-T-004s
Total Speciated PCB-EC7 & WHO12$_{A}^{M\#}$	<0.007	-	-	-				mg/kg	0.003	A-T-004s

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Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP2	HP3	HP4	HP5						
Depth to Top	0.00	0.20	0.00	0.00						
Depth To Bottom	0.30	0.40	0.30	0.30						
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	4AE	4AE	4ABE	4ABE						
TPH CWG with Clean Up										
Ali >C5-C6$_A^{\#}$	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Ali >C6-C8$_A^{\#}$	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	<1	<1	<1	<1				mg/kg	1	A-T-055s
Ali >C10-C12$_A^{MF}$	<1	<1	<1	<1				mg/kg	1	A-T-055s
Ali >C12-C16$_A^{MF}$	<1	<1	<1	1				mg/kg	1	A-T-055s
Ali >C16-C21$_A^{MF}$	2	<1	<1	4				mg/kg	1	A-T-055s
Ali >C21-C35$_A^{MF}$	54	10	11	164				mg/kg	1	A-T-055s
Total Aliphatics$_A$	56	10	11	169				mg/kg	1	Calc-As Recd
Aro >C5-C7$_A^{\#}$	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	<1	<1	<1	2				mg/kg	1	A-T-055s
Aro >C10-C12$_A$	<1	<1	<1	4				mg/kg	1	A-T-055s
Aro >C12-C16$_A$	2	2	3	7				mg/kg	1	A-T-055s
Aro >C16-C21$_A^{MF}$	5	5	18	56				mg/kg	1	A-T-055s
Aro >C21-C35$_A^{MF}$	17	17	41	286				mg/kg	1	A-T-055s
Total Aromatics$_A$	25	24	62	355				mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35)$_A$	81	34	73	524				mg/kg	1	Calc-As Recd
BTEX - Benzene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.
The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:
Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.
Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,
E = contains roots/twigs.

Key:
IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve
Subscript "^" indicates analysis has dependant options against results. Testing dependant on results appear in the comments area of your sample receipt.
EPH CWG results have humics mathematically subtracted through instrument calculation
TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

v2

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: RSK Environment Ltd Tonbridge, Anerley Court, Half Moon Lane, Hildenborough, Tonbridge, Kent, TN11 9HU

Project: Gravesham Leisure Centre

Clients Project No: 52511

Project No: 23/02978

Date Received: 29/03/2023 (am)

Cool Box Temperatures (°C): 10.4 & 10.7

Lab Sample ID	23/02978/3	23/02978/16
Client Sample No		
Client Sample ID/Depth	WS2 0.00-0.30m	HP3 0.20-0.40m
Date Sampled	16/02/23	23/02/23
Deviation Code		
F	✓	✓

Key
F *Maximum holding time exceeded between sampling date and analysis for analytes listed below*

HOLDING TIME EXCEEDANCES

Lab Sample ID	23/02978/3	23/02978/16
Client Sample No		
Client Sample ID/Depth	WS2 0.00-0.30m	HP3 0.20-0.40m
Date Sampled	16/02/23	23/02/23
PAH-16MS	✓	✓
Sulphate (acid soluble)	✓	✓
Sulphate (water sol 2:1)	✓	✓
EPHCWG	✓	✓
VPHCWG	✓	✓

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12
Client Sample No												
Client Sample ID/Depth	BH1 0.05m	WS1 0.00-0.30m	WS2 0.00-0.30m	WS3 0.00-0.30m	WS4 0.00-0.30m	WS5 0.10-0.40m	WS6 0.00-0.30m	SA1 0.00-0.20m	SA2 0.00-0.20m	SA2 0.20-0.40m	SA3 0.00-0.30m	TP1 0.00-0.30m
Date Sampled	17/03/23	16/03/23	16/02/23	16/03/24	16/02/24	16/03/25	16/02/25	20/03/23	20/03/23	20/03/23	21/03/23	21/03/23
A-T-004s								03/04/2023		03/04/2023		
A-T-006s	03/04/2023											
A-T-007s								31/03/2023	31/03/2023	31/03/2023		
A-T-019s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-022s	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023
A-T-024s	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
A-T-025w								11/04/2023		11/04/2023		
A-T-026s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-026w								11/04/2023		11/04/2023		
A-T-026w (F)								11/04/2023		11/04/2023		
A-T-028s	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023
A-T-030s								07/04/2023		06/04/2023		
A-T-031s	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-031w								11/04/2023		11/04/2023		
A-T-032s		06/04/2023		06/04/2023			06/04/2023	11/04/2023		06/04/2023	06/04/2023	
A-T-032w								11/04/2023		11/04/2023		
A-T-037w								11/04/2023		11/04/2023		
A-T-040s	06/04/2023					06/04/2023		06/04/2023	06/04/2023	06/04/2023		
A-T-044	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-045	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023
A-T-050w								11/04/2023		11/04/2023		
A-T-055s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-ANCs								11/04/2023		11/04/2023		
Calc-As Recd	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
Calc-no stones								11/04/2023		11/04/2023		
Probe (w)								11/04/2023		11/04/2023		

Lab Sample ID	23/02978/13	23/02978/14	23/02978/15	23/02978/16	23/02978/17	23/02978/18
Client Sample No						
Client Sample ID/Depth	TP2 0.00-0.10m	HP1 0.00-0.30m	HP2 0.00-0.30m	HP3 0.20-0.40m	HP4 0.00-0.30m	HP5 0.00-0.30m
Date Sampled	21/03/23	24/03/23	24/03/23	23/02/23	23/03/23	23/03/23
A-T-004s			03/04/2023			
A-T-006s						
A-T-007s						
A-T-019s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-022s	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023
A-T-024s	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
A-T-025w						
A-T-026s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-026w						
A-T-026w (F)						
A-T-028s	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023
A-T-030s						
A-T-031s	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-031w						
A-T-032s	06/04/2023					
A-T-032w						
A-T-037w						
A-T-040s						
A-T-044	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-045	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023
A-T-050w						
A-T-055s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-ANCs						
Calc-As Recd	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
Calc-no stones						
Probe (w)						

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

Appendix I
LABORATORY CERTIFICATES FOR GEOTECHNICAL ANALYSIS

STRUCTURAL SOILS LTD

TEST REPORT

Report No. 584979-01 (00) 1774

Date 25-April-2023 Contract Gravesham Leisure Centre

Client RSK
Address Anerley Court
Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU
For the Attention of Josh Curnow

Samples submitted by client	05-April-2023	Client Reference	52511
Method of sampling	Unknown	Client Order No.	n/a
Testing Started	11-April-2023	Instruction Type	Written
Testing Completed	21-April-2023		

Tests marked 'Not UKAS Accredited' in this report are not included in the UKAS Accreditation Schedule for our Laboratory.

UKAS Accredited Tests

P105	Water Content BS EN ISO 17892-1:2014
P106	Linear Density BS EN ISO 17892-2:2014
P114	Liquid and plastic limits BS EN ISO 17892-12:2018

Undertaken by a sub-contractor

2.04	Sulphate content (water extract) in accordance with BRE Special Digest 1:2005
2.07	pH value in accordance with BRE Special Digest 1:2005

* This clause of BS1377 is no longer the most up to date method due to the publication of ISO17892

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of .
Test were undertaken on samples 'as received' unless otherwise stated.
Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.
Results relate only to items tested
This report shall not be reproduced except in full without written permission of SSL Laboratories

Structural Soils Ltd 18 Frogmore Rd Hemel Hempstead HP3 9RT Tel.01442 416661 e-mail dimitris.xirouchakis@soils.co.uk

TESTING VERIFICATION CERTIFICATE

UKAS TESTING
1774

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **25/04/2023 13:47:20**.

Testing reported after this date is not covered by this Verification Certificate.



Approved Signatory
Sharon Cairns (Laboratory Manager)

(Head Office)
Bristol Laboratory
Unit 1A, Princess Street
Bedminster
Bristol
BS3 4AG

Castleford Laboratory
The Potteries, Pottery Street
Castleford
West Yorkshire
WF10 1NJ

Hemel Laboratory
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tonbridge Laboratory
Anerley Court, Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU

	Contract:	Job No:
STRUCTURAL SOILS LTD	**Gravesham Leisure Centre**	**584979**

AGS

GINT_LIBRARY_V10_01.GLB LibVersion: v8_07_001 PrjVersion: v8_07 | GrfcText L - LAB VERIFICATION REPORT - V02 - A4P | 584979-GRAVESHAM-LEISURE-CENTRE-RSK-52511.GPJ - v10_01.
Structural Soils Ltd, Branch Office - Hemel Hempstead: 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT. Tel: 01442 262323, Fax: 01442 262683, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 25/04/23 - 13:59 | SC1 |

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with Part 1,Part 12 of BS EN ISO 17892

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Water Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
BH1		D	0.50	16.6	55	24	31	95	Orangish brown slightly gravelly slightly sandy CLAY
BH1		D	1.20	11.4	29	15	14	93	Brown mottled orange slightly gravelly slightly sandy CLAY with pockets of chalk
BH2		D	0.50	20.8	36	19	17	94	Orangish brown slightly gravelly sandy CLAY
BH2		D	1.75	23.7	NP	NP	NP	89	White slightly gravelly silty CHALK with bands of brown clay
BH3		D	0.50	17.4	36	20	16	88	Brown mottled orange slightly gravelly slightly sandy CLAY
BH3		D	1.20	28.0	50	20	30	90	Orangish brown slightly gravelly slightly sandy CLAY
WS1		D	0.80	14.8	44	20	24	87	Orangish brown slightly gravelly slightly sandy CLAY
WS3		D	0.70	19.6	33	17	16	81	Brown mottled orange slightly gravelly slightly sandy CLAY with chalk and flint

SYMBOLS: * denotes BS 1377

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with Part 1,Part 12 of BS EN ISO 17892

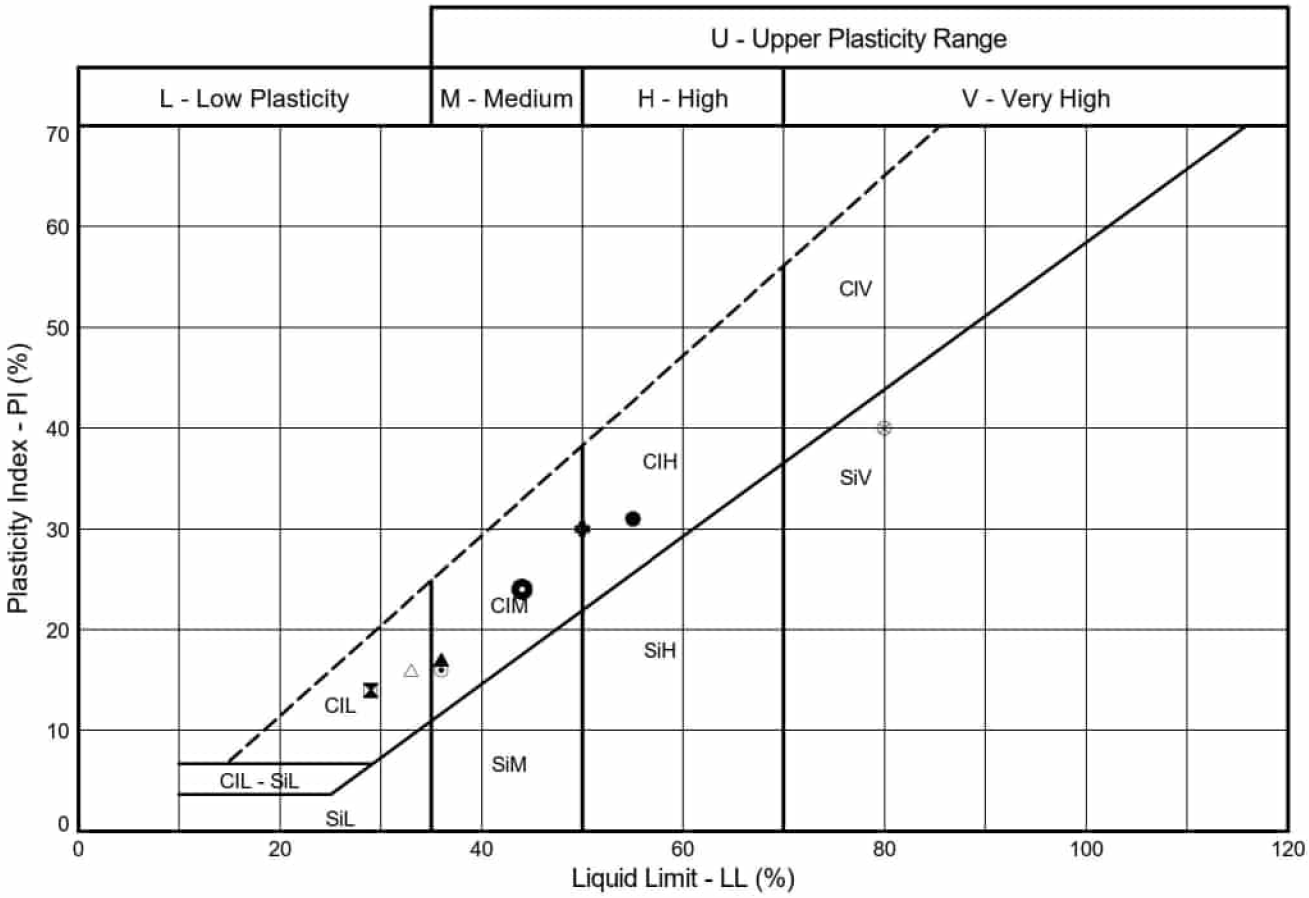
Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Water Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
WS5		D	1.00	17.3	80	40	40	73	Brown mottled orange slightly gravelly CLAY

SYMBOLS: * denotes BS 1377

STRUCTURAL SOILS LTD	Contract: Gravesham Leisure Centre	Contract Ref: 584979

PI vs LL CHART

According to BS EN 14688-2:2018
Testing in accordance with BS EN ISO 17892-12:2018+A1:2021



Sample Identification				Test Method #	Preparation Method +	WC	LL	PL	PI	<425µm	Lab location	Notes
	Exploratory Position ID	Sample	Depth (m)			%	%	%	%	%		
●	BH1	D	0.50	5.3.14/5.5/6.5	5.2.7	16.6	55	24	31	95	T	
⧓	BH1	D	1.20	5.3.14/5.5/6.5	5.2.7	11.4	29	15	14	93	T	
▲	BH2	D	0.50	5.3.14/5.5/6.5	5.2.7	20.8	36	19	17	94	T	
	BH2	D	1.75	5.3.14/5.5/6.5	5.2.7	23.7	NP	NP	NP	89	T	
⊙	BH3	D	0.50	5.3.14/5.5/6.5	5.2.7	17.4	36	20	16	88	T	
✿	BH3	D	1.20	5.3.14/5.5/6.5	5.2.7	28.0	50	20	30	90	T	
◉	WS1	D	0.80	5.3.14/5.5/6.5	5.2.7	14.8	44	20	24	87	T	
△	WS3	D	0.70	5.3.14/5.5/6.5	5.2.7	19.6	33	17	16	81	T	
⊗	WS5	D	1.00	5.3.14/5.5/6.5	5.2.7	17.3	80	40	40	73	T	

Tested in accordance with the following clauses of BS EN ISO 17892-12:2018+A1:2021
5.3 - Cone Penetrometer Method; 5.3.14 - One-Point Cone Penetrometer Method; 5.4 - Casagrande Method; 5.5 - Plastic Limit Method; 6.5 - Plasticity Index

Water Content (WC) tested in accordance with BS EN ISO 17892-1:2014

+ Tested in accordance with the following clauses of BS EN ISO 17892-12:2018+A1:2021
5.2.1 - Natural State and 5.2.7 - Wet Sieved

Key: * = Non-standard test, NP = Non plastic, I = Increasing WC, D = Decreasing WC.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

STRUCTURAL SOILS
Anerley Court
Half Moon Lane
Hildenborough
Tonbridge TN11 9HU

Compiled By		Date
[redacted]	SHARON CAIRNS	25/04/23

Contract	Contract Ref:
Gravesham Leisure Centre	584979

GINT_LIBRARY_V10_01.GLB LibVersion: v8_07_001 PrjVersion: v8_07 | Graph L - ALINE STANDARD - 17892 - A4P | 584979-GRAVESHAM-LEISURE-CENTRE-RSK-52511.GPJ - v10_01.
Structural Soils Ltd, Branch Office - Hemel Hempstead: 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT. Tel: 01442 262323, Fax: 01442 262683, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 25/04/23 - 13:49 | SC1 |

SUMMARY OF SATURATED MOISTURE CONTENT OF CHALK TESTS

In accordance with clause 3.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Number of Lumps	Moisture Content %	Bulk Density Mg/m^3	Dry Density Mg/m^3	Saturated Moisture Content %	Description of Sample	Lab location
SA1		D	1.40	3	25*	1.82*	1.46*	32*	White CHALK	T
SA1		D	2.40	3	25*	1.80*	1.44*	32*	White CHALK	T
SA2		D	1.60	3	30*	1.86*	1.43*	33*	White CHALK	T
SA2		D	2.60	3	29*	1.86*	1.44*	32*	White CHALK	T
SA3		D	1.80	3	20*	1.75*	1.46*	31*	White CHALK	T
TP1		D	2.60	3	29*	1.86*	1.43*	33*	White CHALK	T
TP2		D	2.60	3	29*	1.90*	1.47*	31*	White CHALK with yellow mottling	T

* denotes the average values from multiple lumps

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

STRUCTURAL SOILS
Anerley Court
Half Moon Lane
Hildenborough
Tonbridge TN11 9HU

Compiled By: [redacted] SHARON CAIRNS

Date: 25.04.23

Contract Ref: 584979

Contract: Gravesham Leisure Centre

AGS

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 23/03427
Issue Number: 1 **Date:** 18 April, 2023

Client: Structural Soils Limited (Tonbridge Lab)
Anerley Court
Half Moon Lane
Hildenborough
Kent
UK
TN11 9HU

Project Manager: Hemel Lab/Richard Ashby
Project Name: Gravesham Leisure Centre
Project Ref: 52511
Order No: N/A
Date Samples Received: 12/04/23
Date Instructions Received: 12/04/23
Date Analysis Completed: 18/04/23

Approved by:

[redacted]

Gemma Berrisford
Client Manager

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 1247

Envirolab Job Number: 23/03427

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/03427/1	23/03427/2	23/03427/3	23/03427/4	23/03427/5	23/03427/6	23/03427/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	BH1	BH1	BH1	BH2	BH2	BH2			
Depth to Top	3.00	8.00	13.50	18.00	5.00	10.50	15.00			
Depth To Bottom	3.45	8.45			5.45					
Date Sampled										
Sample Type	Solid	Solid	Solid	Solid	Solid	Solid	Solid			
Sample Matrix Code	7	7	7	7	7	7	7			
% Stones >10mm$_A$	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	% w/w	0.1	A-T-044
pH BRE$_D$$^{M\#}$	8.74	8.94	8.90	8.96	9.03	9.00	8.94	pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1)$_D$$^{M\#}$	15	<10	<10	<10	<10	<10	25	mg/l	10	A-T-026s

Envirolab Job Number: 23/03427

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/03427/8	23/03427/9	23/03427/10	23/03427/11				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH3	BH3	BH3	TP2						
Depth to Top	10.50	15.50	20.00	0.60						
Depth To Bottom		15.95	20.45	1.00						
Date Sampled										
Sample Type	Solid	Solid	Solid	Soil - D						
Sample Matrix Code	7	7	7	5A						
% Stones >10mm$_A$	<0.1	<0.1	<0.1	5.7				% w/w	0.1	A-T-044
pH BRE$_D$$^{M\#}$	8.90	8.88	9.09	8.17				pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1)$_D$$^{M\#}$	19	24	<10	<10				mg/l	10	A-T-026s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.
The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:
Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.
Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,
E = contains roots/twigs.

Key:
IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve
Subscript "^" indicates analysis has dependant options against results. Testing dependant on results appear in the comments area of your sample receipt.
EPH CWG results have humics mathematically subtracted through instrument calculation
TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

v2

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Tonbridge Lab), Anerley Court, Half Moon Lane, Hildenborough, Kent, UK, TN11 9HU

Project: Gravesham Leisure Centre

Clients Project No: 52511

Project No: 23/03427

Date Received: 12/04/2023 (am)

Cool Box Temperatures (°C): 6.1

Lab Sample ID	23/03427/1	23/03427/2	23/03427/3	23/03427/4	23/03427/5	23/03427/6	23/03427/7	23/03427/8	23/03427/9	23/03427/10	23/03427/11
Client Sample No											
Client Sample ID/Depth	BH1 3.00-3.45m	BH1 8.00-8.45m	BH1 13.50m	BH1 18.00m	BH2 5.00-5.45m	BH2 10.50m	BH2 15.00m	BH3 10.50m	BH3 15.50-15.95m	BH3 20.00-20.45m	TP2 0.60-1.00m
Date Sampled											
Deviation Code											
E (no date)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Key
E (no date) *No sampling date provided (all results affected if not provided)*

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	23/03427/1	23/03427/2	23/03427/3	23/03427/4	23/03427/5	23/03427/6	23/03427/7	23/03427/8	23/03427/9	23/03427/10	23/03427/11
Client Sample No											
Client Sample ID/Depth	BH1 3.00-3.45m	BH1 8.00-8.45m	BH1 13.50m	BH1 18.00m	BH2 5.00-5.45m	BH2 10.50m	BH2 15.00m	BH3 10.50m	BH3 15.50-15.95m	BH3 20.00-20.45m	TP2 0.60-1.00m
Date Sampled											
A-T-026s	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023
A-T-031s	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023
A-T-044	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

STRUCTURAL SOILS LTD

TEST REPORT

Report No. 584979-01 (00) 1774

Date	25-April-2023	Contract	Gravesham Leisure Centre

Client RSK
Address Anerley Court
Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU
For the Attention of Josh Curnow

Samples submitted by client	05-April-2023	Client Reference	52511
Method of sampling	Unknown	Client Order No.	n/a
Testing Started	11-April-2023	Instruction Type	Written
Testing Completed	21-April-2023		

Tests marked 'Not UKAS Accredited' in this report are not included in the UKAS Accreditation Schedule for our Laboratory.

UKAS Accredited Tests

P105	Water Content BS EN ISO 17892-1:2014
P106	Linear Density BS EN ISO 17892-2:2014
P114	Liquid and plastic limits BS EN ISO 17892-12:2018

Undertaken by a sub-contractor

2.04	Sulphate content (water extract) in accordance with BRE Special Digest 1:2005
2.07	pH value in accordance with BRE Special Digest 1:2005

* This clause of BS1377 is no longer the most up to date method due to the publication of ISO17892

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of .
Test were undertaken on samples 'as received' unless otherwise stated.
Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.
Results relate only to items tested
This report shall not be reproduced except in full without written permission of SSL Laboratories

Structural Soils Ltd 18 Frogmore Rd Hemel Hempstead HP3 9RT Tel.01442 416661 e-mail dimitris.xirouchakis@soils.co.uk

TESTING VERIFICATION CERTIFICATE

1774

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **25/04/2023 13:47:20**.

Testing reported after this date is not covered by this Verification Certificate.

[redacted]

Approved Signatory
Sharon Cairns (Laboratory Manager)

(Head Office)
Bristol Laboratory
Unit 1A, Princess Street
Bedminster
Bristol
BS3 4AG

Castleford Laboratory
The Potteries, Pottery Street
Castleford
West Yorkshire
WF10 1NJ

Hemel Laboratory
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tonbridge Laboratory
Anerley Court, Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU

	Contract:	Job No:
STRUCTURAL SOILS LTD	**Gravesham Leisure Centre**	**584979**

AGS

GINT_LIBRARY_V10_01.GLB LibVersion: v8_07_001 PrjVersion: v8_07 | GrfcText L - LAB VERIFICATION REPORT - V02 - A4P | 584979-GRAVESHAM-LEISURE-CENTRE-RSK-52511.GPJ - v10_01.
Structural Soils Ltd, Branch Office - Hemel Hempstead: 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT. Tel: 01442 262683, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 25/04/23 - 13:59 | SC1 |

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with Part 1,Part 12 of BS EN ISO 17892

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Water Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
BH1		D	0.50	16.6	55	24	31	95	Orangish brown slightly gravelly slightly sandy CLAY
BH1		D	1.20	11.4	29	15	14	93	Brown mottled orange slightly gravelly slightly sandy CLAY with pockets of chalk
BH2		D	0.50	20.8	36	19	17	94	Orangish brown slightly gravelly sandy CLAY
BH2		D	1.75	23.7	NP	NP	NP	89	White slightly gravelly silty CHALK with bands of brown clay
BH3		D	0.50	17.4	36	20	16	88	Brown mottled orange slightly gravelly slightly sandy CLAY
BH3		D	1.20	28.0	50	20	30	90	Orangish brown slightly gravelly slightly sandy CLAY
WS1		D	0.80	14.8	44	20	24	87	Orangish brown slightly gravelly slightly sandy CLAY
WS3		D	0.70	19.6	33	17	16	81	Brown mottled orange slightly gravelly slightly sandy CLAY with chalk and flint

SYMBOLS: * denotes BS 1377

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with Part 1,Part 12 of BS EN ISO 17892

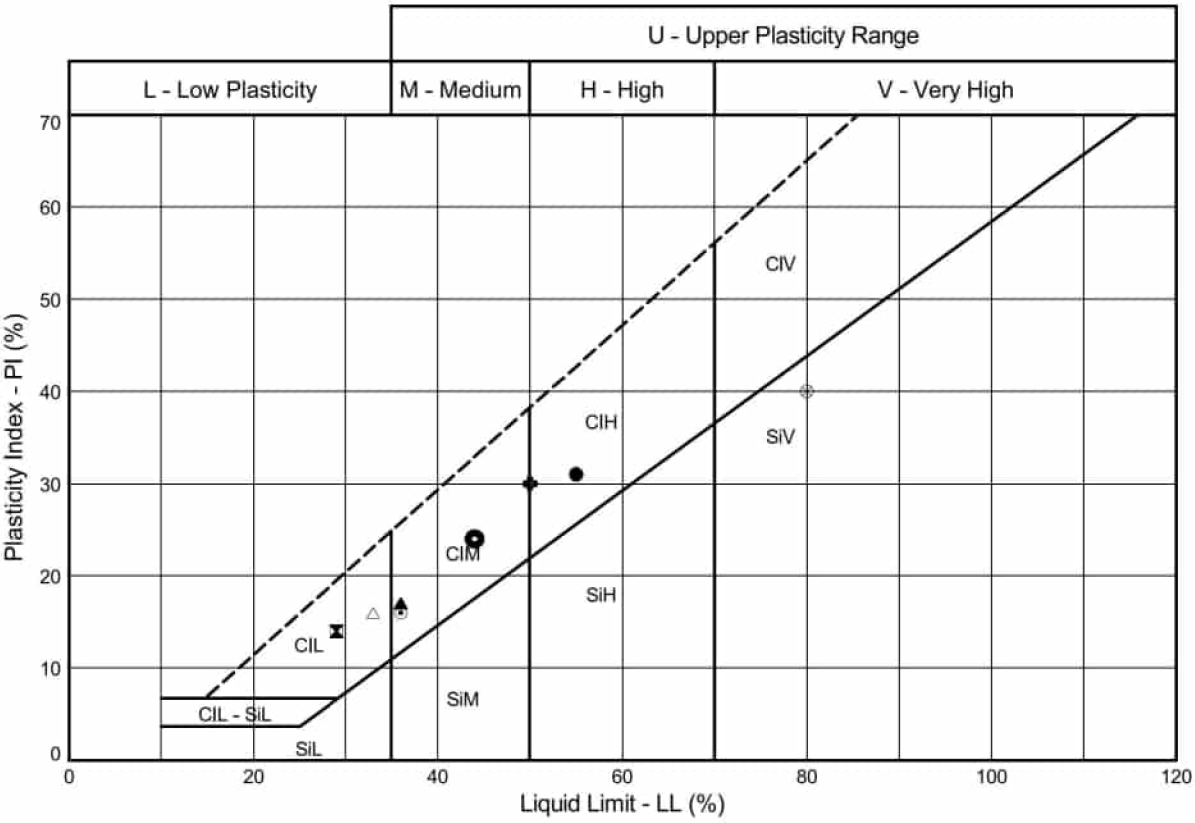
Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Water Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
WS5		D	1.00	17.3	80	40	40	73	Brown mottled orange slightly gravelly CLAY

SYMBOLS: * denotes BS 1377

	Contract:	Contract Ref:
STRUCTURAL SOILS LTD	Gravesham Leisure Centre	584979

PI vs LL CHART

According to BS EN 14688-2:2018
Testing in accordance with BS EN ISO 17892-12:2018+A1:2021



Sample Identification				Test Method #	Preparation Method +	WC	LL	PL	PI	<425µm	Lab location	Notes
	Exploratory Position ID	Sample	Depth (m)			%	%	%	%	%		
●	BH1	D	0.50	5.3.14/5.5/6.5	5.2.7	16.6	55	24	31	95	T	
⧗	BH1	D	1.20	5.3.14/5.5/6.5	5.2.7	11.4	29	15	14	93	T	
▲	BH2	D	0.50	5.3.14/5.5/6.5	5.2.7	20.8	36	19	17	94	T	
	BH2	D	1.75	5.3.14/5.5/6.5	5.2.7	23.7	NP	NP	NP	89	T	
⊙	BH3	D	0.50	5.3.14/5.5/6.5	5.2.7	17.4	36	20	16	88	T	
✿	BH3	D	1.20	5.3.14/5.5/6.5	5.2.7	28.0	50	20	30	90	T	
◉	WS1	D	0.80	5.3.14/5.5/6.5	5.2.7	14.8	44	20	24	87	T	
△	WS3	D	0.70	5.3.14/5.5/6.5	5.2.7	19.6	33	17	16	81	T	
⊗	WS5	D	1.00	5.3.14/5.5/6.5	5.2.7	17.3	80	40	40	73	T	

Tested in accordance with the following clauses of BS EN ISO 17892-12:2018+A1:2021
5.3 - Cone Penetrometer Method; 5.3.14 - One-Point Cone Penetrometer Method; 5.4 - Casagrande Method; 5.5 - Plastic Limit Method; 6.5 - Plasticity Index

Water Content (WC) tested in accordance with BS EN ISO 17892-1:2014

+ Tested in accordance with the following clauses of BS EN ISO 17892-12:2018+A1:2021
5.2.1 - Natural State and 5.2.7 - Wet Sieved

Key: * = Non-standard test, NP = Non plastic, I = Increasing WC, D = Decreasing WC.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

STRUCTURAL SOILS
Anerley Court
Half Moon Lane
Hildenborough
Tonbridge TN11 9HU

Compiled By		Date
[redacted]	SHARON CAIRNS	25/04/23

Contract	Contract Ref:
Gravesham Leisure Centre	584979

AGS

GINT_LIBRARY_V10_01.GLB LibVersion: v8_07_001 PrjVersion: v8_07 | Graph L - ALINE STANDARD - 17892 - A4P | 584979-GRAVESHAM-LEISURE-CENTRE-RSK-52511.GPJ - v10_01.
Structural Soils Ltd, Branch Office - Hemel Hempstead: 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT. Tel: 01442 262683, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 25/04/23 - 13:49 | SC1 |

SUMMARY OF SATURATED MOISTURE CONTENT OF CHALK TESTS

In accordance with clause 3.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Number of Lumps	Moisture Content %	Bulk Density Mg/m^3	Dry Density Mg/m^3	Saturated Moisture Content %	Description of Sample	Lab location
SA1		D	1.40	3	25*	1.82*	1.46*	32*	White CHALK	T
SA1		D	2.40	3	25*	1.80*	1.44*	32*	White CHALK	T
SA2		D	1.60	3	30*	1.86*	1.43*	33*	White CHALK	T
SA2		D	2.60	3	29*	1.86*	1.44*	32*	White CHALK	T
SA3		D	1.80	3	20*	1.75*	1.46*	31*	White CHALK	T
TP1		D	2.60	3	29*	1.86*	1.43*	33*	White CHALK	T
TP2		D	2.60	3	29*	1.90*	1.47*	31*	White CHALK with yellow mottling	T

* denotes the average values from multiple lumps

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

STRUCTURAL SOILS
Anerley Court
Half Moon Lane
Hildenborough
Tonbridge TN11 9HU

Compiled By: [redacted] SHARON CAIRNS

Date: 25.04.23

Contract Ref: 584979

Contract: Gravesham Leisure Centre

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 23/03427
Issue Number: 1 **Date:** 18 April, 2023

Client: Structural Soils Limited (Tonbridge Lab)
Anerley Court
Half Moon Lane
Hildenborough
Kent
UK
TN11 9HU

Project Manager: Hemel Lab/Richard Ashby
Project Name: Gravesham Leisure Centre
Project Ref: 52511
Order No: N/A
Date Samples Received: 12/04/23
Date Instructions Received: 12/04/23
Date Analysis Completed: 18/04/23

Approved by:

[redacted]
Client Manager

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING
1247

Envirolab Job Number: 23/03427

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/03427/1	23/03427/2	23/03427/3	23/03427/4	23/03427/5	23/03427/6	23/03427/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	BH1	BH1	BH1	BH2	BH2	BH2			
Depth to Top	3.00	8.00	13.50	18.00	5.00	10.50	15.00			
Depth To Bottom	3.45	8.45			5.45					
Date Sampled										
Sample Type	Solid	Solid	Solid	Solid	Solid	Solid	Solid			
Sample Matrix Code	7	7	7	7	7	7	7			
% Stones >10mm$_A$	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	% w/w	0.1	A-T-044
pH BRE$_D$$^{M\#}$	8.74	8.94	8.90	8.96	9.03	9.00	8.94	pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1)$_D$$^{M\#}$	15	<10	<10	<10	<10	<10	25	mg/l	10	A-T-028s

envirolab

Envirolab Job Number: 23/03427

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/03427/8	23/03427/9	23/03427/10	23/03427/11				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH3	BH3	BH3	TP2						
Depth to Top	10.50	15.50	20.00	0.60						
Depth To Bottom		15.95	20.45	1.00						
Date Sampled										
Sample Type	Solid	Solid	Solid	Soil - D						
Sample Matrix Code	7	7	7	5A						
% Stones >10mm$_A$	<0.1	<0.1	<0.1	5.7				% w/w	0.1	A-T-044
pH BRE$_D$$^{M\#}$	8.90	8.88	9.09	8.17				pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1)$_D$$^{M\#}$	19	24	<10	<10				mg/l	10	A-T-026s

REPORT NOTES

General

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Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
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The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:
Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.
Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,
E = contains roots/twigs.

Key:
IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve
Subscript "^" indicates analysis has dependant options against results. Testing dependant on results appear in the comments area of your sample receipt.
EPH CWG results have humics mathematically subtracted through instrument calculation
TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

v2

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Tonbridge Lab), Anerley Court, Half Moon Lane, Hildenborough, Kent, UK, TN11 9HU

Project: Gravesham Leisure Centre

Clients Project No: 52511

Project No: 23/03427

Date Received: 12/04/2023 (am)

Cool Box Temperatures (°C): 6.1

Lab Sample ID	23/03427/1	23/03427/2	23/03427/3	23/03427/4	23/03427/5	23/03427/6	23/03427/7	23/03427/8	23/03427/9	23/03427/10	23/03427/11
Client Sample No											
Client Sample ID/Depth	BH1 3.00-3.45m	BH1 8.00-8.45m	BH1 13.50m	BH1 18.00m	BH2 5.00-5.45m	BH2 10.50m	BH2 15.00m	BH3 10.50m	BH3 15.50-15.95m	BH3 20.00-20.45m	TP2 0.60-1.00m
Date Sampled											
Deviation Code											
E (no date)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Key
E (no date) *No sampling date provided (all results affected if not provided)*

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	23/03427/1	23/03427/2	23/03427/3	23/03427/4	23/03427/5	23/03427/6	23/03427/7	23/03427/8	23/03427/9	23/03427/10	23/03427/11
Client Sample No											
Client Sample ID/Depth	BH1 3.00-3.45m	BH1 8.00-8.45m	BH1 13.50m	BH1 18.00m	BH2 5.00-5.45m	BH2 10.50m	BH2 15.00m	BH3 10.50m	BH3 15.50-15.95m	BH3 20.00-20.45m	TP2 0.60-1.00m
Date Sampled											
A-T-026s	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023
A-T-031s	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023
A-T-044	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

Appendix J
GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH

Generic assessment criteria for human health: commercial scenario

Background

RSK's generic assessment criteria (GAC) were initially prepared following the publication by the Environment Agency (EA) of soil guideline value (SGV) and toxicological (TOX) reports, and associated publications in 2009[1]. RSK GAC were updated following the publication of GAC by LQM/CIEH in 2009[2]. RSK GAC are periodically revised when updated information on toxicological, land use or receptor parameters is published.

Updates to the RSK GAC

In 2014, the publication of Category 4 Screening Levels (C4SL)[3,4], as part of the Defra-funded research project SP1010, included modifications to certain exposure assumptions documented within EA Science Report SC050221/SR3 (herein after referred to as SR3)[5] used in the generation of SGVs.

C4SL were initially published for six substances (cadmium, arsenic, benzene, benzo(a)pyrene, chromium VI and lead) for a sandy loam soil type with 6% soil organic matter, based on a low level of toxicological concern (LLTC; see Section 2.3 of research project report SP1010[3]). Further C4SL were published in 2021 for vinyl chloride, tetrachloroethene (PCE) and trichloroethene (TCE). Where a C4SL has been published, the RSK GAC duplicates the C4SL using all input parameters within the SP1010 final project report[3] and associated chemical specific reports[6], and adopts them as GAC for these substances. Due to the use of decimal places rather than significant figures applied to the Contaminated Land Exposure Assessment (CLEA) tool outputs, the GAC presented may be marginally differently to the C4SL values, however any differences between the values are minimal and would not equate to an unacceptable risk.

For all other substances the only C4SL exposure modification relevant to a commercial end use are daily inhalation rates.

The RSK GAC have also been revised with updated toxicology published by LQM/CIEH in 2015[7] or by the USEPA[14], where a C4SL has not been published.

RSK GAC derivation for metals and organic compounds

Model selection

Soil assessment criteria (SAC) were calculated using the CLEA tool v1.071, supporting EA guidance[5,8,9] and revised exposure scenarios published for the C4SL[3]. The SAC are also termed GAC.

Pathway selection

In accordance with SR3[5] the commercial scenario considers risks to a female worker who works from the age of 16 to 65 years. It should be noted that this end use is not suitable for a workplace nursery but may be appropriate for a sports centre or shopping centre where children are present. In accordance with Box 3.5, SR3[5] the pathways considered for production of the SAC in the commercial scenario are

- direct soil and dust ingestion

- dermal contact with soil both indoors and outdoors
- indoor air inhalation from soil and vapour and outdoor inhalation of soil and vapour.

With respect to volatilisation, the CLEA model assumes a simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase[9]. The upper boundaries of this partitioning are represented by the maximum aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA model estimates saturated soil concentrations where these limits are reached[9]. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous- or vapour-based soil saturation limits. Model output cells are flagged red where the saturated soil concentration has been exceeded and the contribution of the indoor and outdoor vapour pathway to total exposure is greater than 10%. In this case, further consideration of the following is required[9]:

- Free phase contamination may be present.
- Exposure from the vapour pathways will be over-predicted by the model, as in reality the vapour phase concentration will not increase at concentrations above saturation limits
- Where the vapour pathway contribution is greater than 90%, it is unlikely the relevant health criteria value (HCV) will be exceeded at soil concentrations at least a factor of ten higher than the relevant HCV.

Where the vapour pathway is the predominant pathway (contributes greater than 90% of exposure) or the only exposure route considered and the cell is highlighted red (SAC exceeds saturation limit), the risk based on the assumed conceptual model is likely to be negligible as the vapour risk is assumed to be tolerable at maximum possible soil concentrations. In such circumstances, the vapour pathway exposure should be considered based on the presence of free phase or non-aqueous phase liquid sources and the measured concentrations of volatile organic compounds (VOC) in the vapour phase. Screening could be considered based on setting the SAC as the modelled soil saturation limits. However, as stated within the CLEA handbook[9], this is likely to not be practical in many cases because of the very low saturation limits and, in any case, is highly conservative.

It should also be noted that for mixtures of compounds, free phase may be present where soil (or groundwater) concentrations are well below saturation limits for individual compounds.

Where the vapour pathway is only one of the exposure pathways considered, an additional approach can then be utilised as detailed within Section 4.12 of the CLEA model handbook[9], which explains how to calculate an effective assessment criterion manually.

SR3[5] states that, as a general rule of thumb, it is recognised that estimating vapour phase concentrations from dissolved and sorbed phase contamination by petroleum hydrocarbons are at least a factor of ten higher than those likely to be measured on-site. RSK has therefore applied an empirical subsurface to indoor air correction factor of 10 into the CLEA model chemical database for all petroleum hydrocarbon fractions (including BTEX, trimethylbenzenes and the polycyclic aromatic hydrocarbons (PAH) naphthalene, acenaphthene and acenaphthylene) to reduce this conservatism.

Input selection

The most up-to-date published chemical and toxicological data was obtained from EA Report SC050021/SR7[10], the EA TOX[1] reports, the C4SL SP1010 project report and associated chemical specific reports[3,6], the 2015 LQM/CIEH report[7] or the USEPA IRIS database[14]. Where a LLTC[3,6] has been published for a substance, RSK has used these input parameters to derive the RSK GAC. Toxicological and specific chemical parameters for 1,2,4-trimethylbenzene, barium, methyl tertiary-butyl ether (MTBE), 1,1,2-trichlorethane, 1,1-dichloroethene, 1,2-dichloropropane, 2-chloronaphthalene, chloroethane, chloromethane, cis 1,2-dichloroethene, dichloromethane, hexachloroethane and trans 1,2-dichloroethene were obtained from the CL:AIRE Soil Generic Assessment Criteria report[11].

For TPH, aromatic hydrocarbons C_5–C_8 were not modelled, as this range comprises benzene (>EC5-EC7) and toluene (>EC7-EC8), which are modelled separately.

Physical parameters

For the commercial end use, the CLEA default pre-1970s three-storey office building was used. SR3[5] notes this commercial building type to be the most conservative in terms of protection from vapour intrusion. The default input building parameters presented in Table 3.10 of SR3[5] have been used.

The parameters for a sandy loam soil type were used in line with Table 4.4 of SR3[5]. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for this SOM, RSK has produced an additional set of GAC for SOM of 1% and 2.5% for all substances using the CLEA tool.

Summary of modifications to the default CLEA SR3[5] input parameters for a commercial land use

In summary, the RSK commercial GAC were produced using the default input parameters for soil properties, the air dispersion model, building properties and the vapour model detailed in SR3[5]. Modifications to the default SR3[5] exposure scenarios based on the C4SL exposure scenarios[3] are presented in Table 2 below. The sole modification to the default commercial input parameters is the updated inhalation rate.

The final selected GAC are presented by pathway in Table 3 with the combined GAC in Table 4.

Figure 1: Conceptual model for CLEA commercial scenario

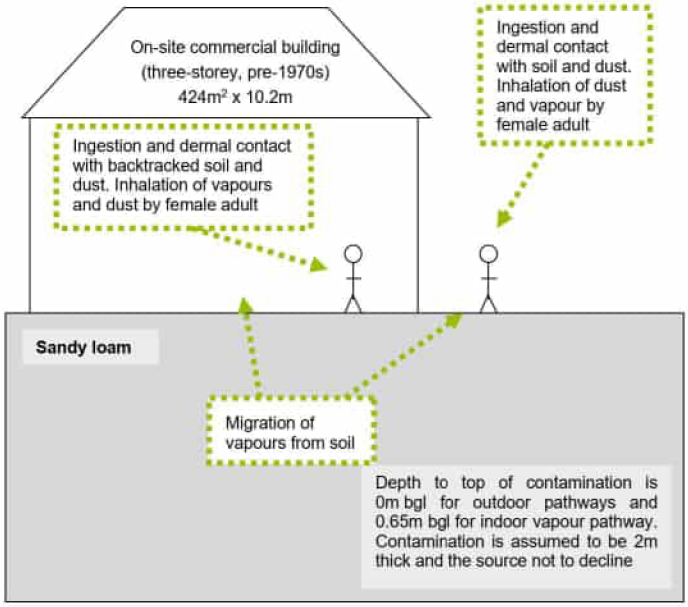


Table 1: Exposure assessment parameters for commercial scenario – inputs for CLEA model

Parameter	Value	Justification
Land use	Commercial	Chosen land use
Receptor	Female worker	Taken as female adult exposed over 49 years from age 16 to 65 years, Box 3.5, SR3[5]
Building	Office (pre-1970)	Key generic assumption given in Box 3.5, SR3[5]. Pre-1970s three-storey office building chosen as it is the most conservative in terms of protection from vapour intrusion (Section 3.4.6, SR3[5])
Soil type	Sandy loam	Most common UK soil type (Section 4.3.1, Table 4.4, SR3[5])
Start age class (AC)	17	AC corresponding to key generic assumption that the critical receptor is a working female adult exposed over a 49-year period from age 16 to 65 years. Assumption given in Box 3.5, SR3[5]
End AC	17	
SOM (%)	6	Representative of sandy loam according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents'[13]
	1	To provide SAC for sites where SOM < 6% as often observed by RSK
	2.5	
pH	7	Model default

Table 2: Commercial – modified receptor inputs

Parameter	Unit	Value	Justification
Inhalation rate (AC17)	m^3 day^{-1}	15.7	Mean value USEPA, 2011[12]; Table 3.2, SP1010[3]

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12. USEPA (2011), *Exposure factors handbook*, EPA/600/R-090/052F (Washington, DC: Office of Research and Development).

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GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - COMMERCIAL

Table 3

Human health generic assessment criteria by pathway for commercial scenario

Compound	Notes	SAC appropriate to pathway SOM 1% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 2.5% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 6% (mg/kg)			Soil saturation limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Metals													
Arsenic	(a,b)	6.35E+02	1.25E+03	NR	NR	6.35E+02	1.25E+03	NR	NR	6.35E+02	1.25E+03	NR	NR
Barium	(b)	2.21E+04	NR	NR	NR	2.21E+04	NR	NR	NR	2.21E+04	NR	NR	NR
Beryllium		3.97E+03	1.17E+01	NR	NR	3.97E+03	1.17E+01	NR	NR	3.97E+03	1.17E+01	NR	NR
Boron		2.38E+05	2.82E+07	NR	NR	2.38E+05	2.82E+07	NR	NR	2.38E+05	2.82E+07	NR	NR
Cadmium	(a)	7.73E+02	8.57E+02	4.10E+02	NR	7.73E+02	8.57E+02	4.10E+02	NR	7.73E+02	8.57E+02	4.10E+02	NR
Chromium (III) - trivalent	(c)	3.31E+05	8.57E+03	NR	NR	3.31E+05	8.57E+03	NR	NR	3.31E+05	8.57E+03	NR	NR
Chromium (VI) - hexavalent	(a,d)	9.62E+02	4.91E+01	NR	NR	9.62E+02	4.91E+01	NR	NR	9.62E+02	4.91E+01	NR	NR
Copper		1.89E+05	8.96E+04	6.83E+04	NR	1.89E+05	8.96E+04	6.83E+04	NR	1.89E+05	8.96E+04	6.83E+04	NR
Lead	(a)	2.53E+03	NR	NR	NR	2.53E+03	NR	NR	NR	2.53E+03	NR	NR	NR
Elemental Mercury (Hg^0)	(d)	NR	1.54E+01	NR	4.31E+00	NR	3.36E+01	NR	1.07E+01	NR	5.80E+01	NR	2.58E+01
Inorganic Mercury (Hg^{2+})		1.18E+03	1.97E+04	1.12E+03	NR	1.18E+03	1.97E+04	1.12E+03	NR	1.18E+03	1.97E+04	1.12E+03	NR
Methyl Mercury (Hg^{2+})		3.38E+02	2.15E+03	2.92E+02	7.33E+01	3.38E+02	3.67E+03	3.11E+02	1.42E+02	3.38E+02	7.33E+03	3.23E+02	3.04E+02
Nickel	(d)	3.06E+03	9.83E+02	NR	NR	3.06E+03	9.83E+02	NR	NR	3.06E+03	9.83E+02	NR	NR
Selenium	(b)	1.23E+04	NR	NR	NR	1.23E+04	NR	NR	NR	1.23E+04	NR	NR	NR
Vanadium		2.15E+04	9.03E+03	NR	NR	2.15E+04	9.03E+03	NR	NR	2.15E+04	9.03E+03	NR	NR
Zinc	(b)	7.39E+05	1.97E+06	NR	NR	7.39E+05	1.97E+06	NR	NR	7.39E+05	1.97E+06	NR	NR
Cadmium (free)		6.56E+02	7.54E+04	6.53E+02	NR	6.56E+02	7.54E+04	6.53E+02	NR	6.56E+02	7.54E+04	6.53E+02	NR
Volatile Organic Compounds													
Benzene	(a)	1.08E+03	2.72E+01	2.72E+01	1.23E+03	1.09E+03	5.19E+01	4.36E+01	2.26E+03	1.09E+03	1.09E+02	9.80E+01	4.71E+03
Toluene		4.24E+05	6.49E+04	5.63E+04	8.69E+02	4.24E+05	1.43E+05	1.07E+05	1.92E+03	4.24E+05	3.24E+05	1.84E+05	4.36E+03
Ethylbenzene		1.91E+05	5.89E+03	5.71E+03	5.19E+02	1.91E+05	1.39E+04	1.29E+04	1.22E+03	1.91E+05	3.21E+04	2.75E+04	2.84E+03
Xylene - m		3.43E+05	6.26E+03	6.16E+03	6.26E+02	3.43E+05	1.47E+04	1.41E+04	1.47E+03	3.43E+05	3.44E+04	3.12E+04	3.46E+03
Xylene - o		3.43E+05	6.73E+03	6.60E+03	4.78E+02	3.43E+05	1.57E+04	1.50E+04	1.12E+03	3.43E+05	3.66E+04	3.30E+04	2.62E+03
Xylene - p		3.43E+05	6.03E+03	5.92E+03	5.76E+02	3.43E+05	1.41E+04	1.36E+04	1.35E+03	3.43E+05	3.28E+04	3.00E+04	3.17E+03
Total xylene		3.43E+05	6.03E+03	5.92E+03	6.25E+02	3.43E+05	1.41E+04	1.36E+04	1.47E+03	3.43E+05	3.28E+04	3.00E+04	3.46E+03
Methyl tertiary-Butyl ether (MTBE)		5.73E+05	7.58E+03	7.48E+03	2.04E-04	5.73E+05	1.23E+04	1.21E+04	3.31E+04	5.73E+05	2.34E+04	2.23E+04	5.27E+04
1,1,1,2-Tetrachloroethane		1.10E+04	1.09E+02	1.08E+02	2.60E+03	1.10E+04	2.53E+02	2.47E+02	6.02E+03	1.10E+04	3.88E+03	3.59E+02	1.40E+04
1,1,2,2-Tetrachloroethane		1.10E+04	2.61E+02	2.74E+02	2.67E+03	1.10E+04	5.75E+02	5.49E+02	5.46E+03	1.10E+04	1.26E+03	1.12E+03	1.20E+04
1,1,1-Trichloroethane		1.14E+06	9.60E+02	8.60E+02	1.43E+03	1.14E+06	1.35E+03	1.35E+03	2.92E+03	1.14E+06	2.96E+03	2.95E+03	6.39E+03
1,1,2 Trichloroethane		7.62E+03	3.92E+01	8.91E+01	4.03E+03	7.62E+03	1.84E+02	1.80E+02	8.21E+03	7.62E+03	4.02E+02	3.82E+02	1.80E+04
1,1-Dichloroethene		8.76E+04	2.43E+01	2.43E+01	2.23E+03	8.76E+04	4.36E+01	4.36E+01	3.96E+03	8.76E+04	8.68E+01	8.67E+01	7.94E+03
1,2-Dichloroethane		2.29E+02	6.73E-01	6.71E-01	3.41E+03	2.29E+02	9.71E-01	9.67E-01	4.91E+03	2.29E+02	1.67E+00	1.66E+00	8.43E+03
1,2,4-Trimethylbenzene		NR	3.29E+02	NR	4.74E+02	NR	8.41E+02	NR	1.16E+03	NR	1.64E+03	NR	2.76E+03
1,3,5-Trimethylbenzene	(e)	NR	NR	NR	2.30E+02	NR	NR	NR	5.52E+02	NR	NR	NR	1.30E+03
1,2-Dichloropropane		2.57E+04	3.14E+00	3.13E+00	1.19E+03	2.57E+04	8.54E+00	8.54E+00	2.11E+03	2.57E+04	1.11E+01	1.11E+01	4.24E+03
Carbon Tetrachloride (tetrachloromethane)		7.62E+03	2.87E+00	2.87E+00	1.52E+03	7.62E+03	8.29E+00	8.29E+00	3.32E+03	7.62E+03	1.43E+01	1.42E+01	7.54E+03
Chloromethane		NR	9.03E+02	NR	2.61E+03	NR	1.22E+03	NR	3.54E+03	NR	1.97E+03	NR	5.71E+03
Chloromethane		NR	9.84E-01	NR	1.91E+03	NR	1.11E+00	NR	2.24E+03	NR	1.48E+00	NR	2.99E+03
Cis 1,2 Dichloroethene		1.36E+01	NR	NR	3.94E+03	2.29E+01	NR	NR	6.61E+03	4.44E+01	NR	NR	1.29E+04
Dichloromethane		9.04E+03	2.63E+02	2.57E+02	7.27E+03	9.04E+03	3.00E+02	2.99E+02	9.68E+03	9.04E+03	5.39E+02	5.39E+02	1.53E+04
Tetrachloroethene (PCE)		2.67E+04	2.45E+01	2.44E+01	4.24E+02	2.67E+04	5.49E+01	5.48E+01	9.51E+02	2.67E+04	1.26E+02	1.26E+02	2.19E+03
Trans 1,2 Dichloroethene		3.23E+04	2.07E+01	NR	3.42E+03	3.23E+04	3.74E+01	NR	5.17E+03	3.23E+04	7.63E+01	NR	1.25E+04
Trichloroethene (TCE)		7.39E-01	2.59E+00	NR	1.54E+03	1.53E+00	5.43E+00	NR	3.22E+03	3.98E+00	1.25E+01	NR	7.14E+03
Vinyl Chloride (chloroethene)		1.19E+02	1.13E+00	1.12E+00	1.36E+03	1.19E+02	1.46E+00	1.45E+00	1.76E+03	1.19E+02	2.24E+00	2.20E+00	2.69E+03
Semi-Volatile Organic Compounds													
2-Chloronaphthalene		1.53E+05	3.71E+02	3.70E+02	1.14E+02	1.53E+05	9.07E+02	9.03E+02	2.80E+02	1.53E+05	2.10E+03	2.10E+03	6.69E+02
Acenaphthene		1.10E+05	2.75E+05	1.08E+05	5.76E+01	1.10E+05	5.36E+05	1.08E+05	1.41E+02	1.10E+05	6.85E+05	1.08E+05	3.38E+02

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - COMMERCIAL

Table 3

Human health generic assessment criteria by pathway for commercial scenario

Compound	Notes	SAC appropriate to pathway SOM 1% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 2.5% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 6% (mg/kg)			Soil saturation limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Acenaphthylene		1.10E+05	2.68E+06	1.05E+05	8.61E+01	1.10E+05	5.23E+06	1.07E+05	2.12E+02	1.10E+05	8.65E+06	1.08E+05	5.06E+02
Anthracene		5.49E+05	1.13E+07	5.23E+05	1.17E+00	5.49E+05	2.36E+07	5.36E+05	2.91E+00	5.49E+05	4.13E+07	5.42E+05	6.96E+00
Benzo(a)anthracene		2.84E+02	4.58E+02	1.67E+02	1.71E+00	2.84E+02	4.47E+02	1.74E+02	4.28E+00	2.84E+02	4.67E+02	1.76E+02	1.03E+01
Benzo(a)pyrene	(a)	7.68E+01	2.04E+02	5.59E+01	9.11E-01	7.68E+01	2.09E+02	5.61E+01	2.28E+00	7.68E+01	2.11E+02	5.63E+01	5.46E+00
Benzo(b)fluoranthene		7.13E+01	1.17E+02	4.43E+01	1.22E+00	7.13E+01	1.20E+02	4.47E+01	3.04E+00	7.13E+01	1.21E+02	4.49E+01	7.29E+00
Benzo(g,h,i)perylene		6.29E+03	1.05E+04	3.93E+03	1.54E-02	6.29E+03	1.06E+04	3.95E+03	3.85E-02	6.29E+03	1.07E+04	3.96E+03	9.23E-02
Benzo(k)fluoranthene		1.88E+03	3.11E+03	1.17E+03	6.87E-01	1.88E+03	3.17E+03	1.18E+03	1.72E+00	1.88E+03	3.21E+03	1.19E+03	4.12E+00
Chrysene		5.67E+02	8.89E+02	3.46E+02	4.40E-01	5.67E+02	9.25E+02	3.52E+02	1.10E+00	5.67E+02	9.47E+02	3.55E+02	2.64E+00
Dibenzo(a,h)anthracene		5.67E+00	9.32E+00	3.33E+00	3.93E-03	5.67E+00	9.52E+00	3.50E+00	9.82E-03	5.67E+00	9.84E+00	3.57E+00	2.36E-02
Fluoranthene		2.29E+04	1.89E+06	2.26E+04	1.89E+01	2.29E+04	2.72E+06	2.27E+04	4.73E+01	2.29E+04	3.32E+06	2.27E+04	1.13E+02
Fluorene		7.31E+04	4.55E+05	6.36E+04	3.09E+01	7.31E+04	1.06E+06	6.84E+04	7.65E+01	7.31E+04	2.24E+06	7.08E+04	1.83E+02
Hexachloroethane		2.09E+01	NR	NR	8.17E+00	4.98E+01	NR	NR	2.01E+01	1.19E+02	NR	NR	4.81E+01
Indeno(1,2,3-cd)pyrene		8.10E+02	1.31E+03	5.01E+02	6.13E-02	8.10E+02	1.35E+03	5.06E+02	1.53E-01	8.10E+02	1.37E+03	5.09E+02	3.68E-01
Naphthalene		3.64E+04	1.87E+03	1.78E+03	7.64E+01	3.64E+04	4.39E+03	3.92E+03	1.83E+02	3.64E+04	9.94E+03	7.81E+03	4.32E+02
Phenanthrene		2.29E+04	5.35E+05	2.19E+04	3.60E+01	2.29E+04	1.00E+06	2.24E+04	8.96E+01	2.29E+04	1.86E+06	2.25E+04	2.14E+02
Pyrene		5.49E+04	4.47E+06	5.42E+04	2.20E+00	5.49E+04	6.46E+06	5.44E+04	5.49E+00	5.49E+04	7.91E+06	5.49E+04	1.32E+01
Phenol		1.10E+06	2.65E+04	2.58E+04	2.42E+04	1.10E+06	3.04E+04	2.96E+04	3.81E+04	1.10E+06	3.46E+04	3.35E+04	7.03E+04
Total petroleum hydrocarbons													
Aliphatic hydrocarbons EC5-EC6		4.77E+06	3.19E+03	3.19E+03	3.04E+02	4.77E+06	5.86E+03	5.86E+03	5.98E+02	4.77E+06	1.21E+04	1.21E+04	1.15E+03
Aliphatic hydrocarbons >EC6-EC8		4.77E+06	7.79E+03	7.76E+03	1.44E+02	4.77E+06	1.74E+04	1.74E+04	3.22E+02	4.77E+06	3.97E+04	3.96E+04	7.06E+02
Aliphatic hydrocarbons >EC8-EC10		9.53E+04	2.02E+03	2.00E+03	7.77E+01	9.53E+04	4.91E+03	4.85E+03	1.90E+02	9.53E+04	1.17E+04	1.13E+04	4.51E+02
Aliphatic hydrocarbons >EC10-EC12		9.53E+04	9.97E+03	9.69E+03	4.75E+01	9.53E+04	2.47E+04	2.29E+04	1.18E+02	9.53E+04	5.89E+04	4.73E+04	2.83E+02
Aliphatic hydrocarbons >EC12-EC16		9.53E+04	8.26E+04	5.88E+04	2.37E+01	9.53E+04	2.04E+05	8.17E+04	5.91E+01	9.53E+04	4.81E+05	9.02E+04	1.42E+02
Aliphatic hydrocarbons >EC16-EC35	(b)	1.58E+06	NR	NR	8.48E+00	1.75E+06	NR	NR	2.12E+01	1.83E+06	NR	NR	5.09E+01
Aliphatic hydrocarbons >EC35-EC44	(b)	1.58E+06	NR	NR	8.48E+00	1.75E+06	NR	NR	2.12E+01	1.83E+06	NR	NR	5.09E+01
Aromatic hydrocarbons >EC8-EC10		3.81E+04	3.55E+03	3.46E+03	6.13E+02	3.81E+04	8.66E+03	8.11E+03	1.50E+03	3.81E+04	2.05E+04	1.70E+04	3.58E+03
Aromatic hydrocarbons >EC10-EC12		3.81E+04	1.92E+04	1.62E+04	3.64E+02	3.81E+04	4.69E+04	2.73E+04	8.99E+02	3.81E+04	1.10E+05	3.42E+04	2.15E+03
Aromatic hydrocarbons >EC12-EC16		3.81E+04	2.02E+05	3.62E+04	1.69E+02	3.81E+04	4.76E+05	3.73E+04	4.19E+02	3.81E+04	1.03E+06	3.78E+04	1.00E+03
Aromatic hydrocarbons >EC16-EC21	(b)	2.82E+04	NR	NR	5.37E+01	2.83E+04	NR	NR	1.34E+02	2.84E+04	NR	NR	3.21E+02
Aromatic hydrocarbons >EC21-EC35	(b)	2.84E+04	NR	NR	4.83E+00	2.84E+04	NR	NR	1.21E+01	2.84E+04	NR	NR	2.90E+01
Aromatic hydrocarbons >EC35-EC44	(b)	2.84E+04	NR	NR	4.83E+00	2.84E+04	NR	NR	1.21E+01	2.84E+04	NR	NR	2.90E+01

Notes:

EC - equivalent carbon; GrAC - groundwater screening value; SAC - soil screening value.

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded.

Calculated SAC exceeds soil saturation limit and may significantly affect the interpretation of any exceedances as the contribution of the indoor and outdoor vapour pathway to total exposure is >10%.

Calculated SAC exceeds soil saturation limit but the exceedance will not affect the SAC significantly as the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.

Calculated SAC does not exceed the soil saturation limit.

The SAC for organic compounds are dependant upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, PAHs naphtalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway (Section 10.1.1, SR3)

(a) SAC for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead are derived using the C4SL toxicology data

(b) SAC for barium and selenium should not include the inhalation pathway as no expert group HCV has been derived; aliphatic and aromatic hydrocarbons >EC16 should not include inhalation pathway due to their non-volatile nature and inhalation exposure being minimal (oral, dermal and inhalation exposure is compared to the oral HCV); arsenic should only be based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report. The Oral SAC should be adopted for zinc and benzo(a)pyrene.

(c) SAC for CIII should be based on the lower of the oral and inhalation SAC (see LQM/CIEH 2015 Section 6.8)

(d) SAC for elemental mercury, chromium VI and nickel should be based on the inhalation pathway only.

(e) SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4 trimethylbenzene may be used.

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - COMMERCIAL

Table 4
Human Health Generic Assessment Criteria for Commercial Scenario

Compound	SAC for Soil SOM 1% (mg/kg)	SAC for Soil SOM 2.5% (mg/kg)	SAC for Soil SOM 6% (mg/kg)
Metals			
Arsenic	640	640	640
Barium	22,000	22,000	22,000
Beryllium	12	12	12
Boron	240,000	240,000	240,000
Cadmium	410	410	410
Chromium (III) - trivalent	8,600	8,600	8,600
Chromium (VI) - hexavalent	49	49	49
Copper	68,000	68,000	68,000
Lead	2,300	2,300	2,300
Elemental Mercury (Hg^0)	15 (4)	33 (11)	58 (26)
Inorganic Mercury (Hg^{2+})	1,120	1,120	1,120
Methyl Mercury (Hg^{4+})	290 (73)	310 (142)	320
Nickel	980	980	980
Selenium	12,000	12,000	12,000
Vanadium	9,000	9,000	9,000
Zinc	740,000	740,000	740,000
Cyanide (free)	650	650	650
Volatile Organic Compounds			
Benzene	27	50	98
Toluene	56,000 (869)	107,000 (1,916)	184,000 (4,357)
Ethylbenzene	6,000 (518)	13,000 (1,216)	27,000 (2,844)
Xylene - m	6,200 (625)	14,100 (1,474)	31,200 (3,457)
Xylene - o	6,600 (478)	15,000 (1,120)	33,000 (2,618)
Xylene - p	5,900 (576)	13,600 (1,353)	30,000 (3,167)
Total xylene	5,900 (625)	13,600 (1,474)	30,000 (3,457)
Methyl tertiary-Butyl ether (MTBE)	7,500	12,100	22,400
1,1,1,2 Tetrachloroethane	110	250	560
1,1,2,2-Tetrachloroethane	270	550	1,130
1,1,1-Trichloroethane	700	1,300	3,000
1,1,2 Trichloroethane	89	180	382
1,1-Dichloroethene	24	43	87
1,2-Dichloroethane	0.67	0.97	1.65
1,2,4-Trimethylbenzene	330	640	1,040
1,3,5-Trimethylbenzene	NR	NR	NR
1,2-Dichloropropane	3	6	11
Carbon Tetrachloride (tetrachloromethane)	2.9	6.3	14.2
Chloroethane	901	1,223	1,972
Chloromethane	1.0	1.1	1.5
Cis 1,2 Dichloroethene	14	23	44
Dichloromethane	257	339	526
Tetrachloroethene (PCE)	24	55	125
Trichloroethene (TCE)	0.7	1.5	3.4
Trans 1,2 Dichloroethene	21	37	76
Vinyl Chloride (chloroethene)	1.1	1.4	2.2
Semi-Volatile Organic Compounds			
2-Chloronaphthalene	370 (114)	902 (280)	2,098 (669)
Acenaphthene	110,000	110,000	110,000
Acenaphthylene	110,000	110,000	110,000
Anthracene	520,000	540,000	540,000
Benzo(a)anthracene	170	170	180
Benzo(a)pyrene	77	77	77
Benzo(b)fluoranthene	44	45	45
Benzo(g,h,i)perylene	3,900	3,900	4,000
Benzo(k)fluoranthene	1,200	1,200	1,200
Chrysene	350	350	350
Dibenzo(a,h)anthracene	3.5	3.6	3.6
Fluoranthene	23,000	23,000	23,000
Fluorene	63,000 (31)	68,000	71,000
Hexachloroethane	21 (8)	50 (20)	111 (48)
Indeno(1,2,3-cd)pyrene	500	510	510
Naphthalene	1,800 (76)	3,900 (183)	7,800 (432)
Phenanthrene	22,000	22,000	23,000
Pyrene	54,000	54,000	54,000
Phenol	440*	690*	1,300*
Total Petroleum Hydrocarbons			
Aliphatic hydrocarbons EC_5-EC_6	3,200 (304)	5,900 (558)	12,100 (1,150)
Aliphatic hydrocarbons >EC_6-EC_8	7,800 (144)	17,400 (322)	39,600 (736)
Aliphatic hydrocarbons >EC_8-EC_{10}	2,000 (78)	4,800 (190)	11,300 (451)
Aliphatic hydrocarbons >EC_{10}-EC_{12}	9,700 (48)	22,900 (118)	47,300 (283)
Aliphatic hydrocarbons >EC_{12}-EC_{16}	59,000 (24)	82,000 (59)	90,000 (142)
Aliphatic hydrocarbons >EC_{16}-EC_{35}	1,000,000**	1,000,000**	1,000,000**
Aliphatic hydrocarbons >EC_{35}-EC_{44}	1,000,000**	1,000,000**	1,000,000**
Aromatic hydrocarbons >EC_8-EC_{10}	3,500 (613)	8,100 (1,503)	17,000 (3,580)
Aromatic hydrocarbons >EC_{10}-EC_{12}	16,000 (364)	28,000 (899)	34,000 (2,150)
Aromatic hydrocarbons >EC_{12}-EC_{16}	36,000 (169)	37,000	38,000
Aromatic hydrocarbons >EC_{16}-EC_{21}	28,000	28,000	28,000
Aromatic hydrocarbons >EC_{21}-EC_{35}	28,000	28,000	28,000
Aromatic hydrocarbons >EC_{35}-EC_{44}	28,000	28,000	28,000
Minerals			
Asbestos	Stage 1 test – No asbestos detected with ID; Stage 2 test - <0.001% dry weight (exceedance of either equates to an exceedance of the GAC)[1]		

Notes:

[1,2] Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.

NR - SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4 trimethylbenzene may be used

EC - equivalent carbon. GrAC - groundwater assessment criteria. SAC - soil assessment criteria.

* The GAC for Phenol is based on a threshold which is protective of direct contact (SC050021/Phenol SGV report)

** Denoted SAC calculated exceeds 100% contaminant, hence 100% (1,000,000mg/kg) has been taken as SAC

The SAC for organic compounds are dependent on Soil Organic Matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58.
1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, PAHs napthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3.

(VALUE IN BRACKETS)

RSK has adopted an approach for petroleum hydrocarbons in accordance with LQM/CIEH whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the SAC with the corresponding solubility or vapour saturation limits given in brackets.

Appendix K
GENERIC ASSESSMENT CRITERIA FOR PHYTOTOXIC EFFECTS

APPENDIX K
GENERIC ASSESSMENT CRITERIA FOR PHYTOTOXIC EFFECTS

Several compounds can inhibit plant growth; hence it is important to have generic assessment criteria (GAC) to promote healthy plant growth. In the absence of other published GAC, the GAC have been obtained from legislation (UK and European) and guidance related to the use of sewage sludge on agricultural fields.

The Council of European Communities Sewage Sludge Directive (86/278/EEC) dated 1986, has been transposed into UK law by Statutory Instrument No. 1263, The Sludge (use in Agriculture) Regulations 1989 (Public Health England, Wales and Scotland), as ammended in 1990 and The Sludge (use in Agriculture) Regulations (Northern Ireland) SR No, 245, 1990. In addition the Department of Environment (DoE) produced a Code of Practice (CoP) (Updated 2nd Edition) in 2006 which provided guidance on the application of sewage sludge on agricultural land (however the status of this document is unclear as it is on the archive section of the Defra website).

The directive seeks to encourage the use of sewage sludge in agriculture and to regulate its use in such a way as to "***prevent harmful effects on soil, vegetation, animals and man".*** To this end, it prohibits the use of untreated sludge on agricultural land unless it is injected or incorporated into the soil. Treated sludge is defined as having undergone "biological, chemical or heat treatment, long-term storage or any other appropriate process so as significantly to reduce its fermentability and the health hazards resulting from its use". To provide protection against potential health risks from residual pathogens, sludge must not be applied to soil in which fruit and vegetable crops are growing, or less than ten months before fruit and vegetable crops are to be harvested. Grazing animals must not be allowed access to grassland or forage land less than three weeks after the application of sludge.

The specified limits of concentrations of selected elements in soil are presented in Table 4 of the updated 2nd Edition of the DoE Code of Practice and are designed to protect plant growth. It is noted that these values are more stringent than the values set in current UK regulations. However since they were ammended following recommendations from the Independent Scientific Committee in 1993. (MAFF/DOE 1993). The GAC are presented in Table 1.

Table 1: Generic assessment criteria

Determinant	Generic assessment criteria (mg/kg)			
	pH 5.0 < 5.5	pH 5.5 < 6.0	pH 6.0 < 7.0	pH >7.0
Zinc	200	200	200	300
Copper	80	100	135	200
Nickel	50	60	75	110
Lead	300	300	300	300
Cadmium	3	3	3	3
Mercury	1	1	1	1
Note: Only compounds with assessment criteria documented within the Directive 86/278/EEC have been included, although criteria for 5 additional compounds have been presented within the 2006 CoP.				

Appendix L
GENERIC ASSESSMENT CRITERIA POTABLE WATER SUPPLY PIPES

A range of pipe materials is available and careful selection, design and installation is required to ensure that water supply pipes are satisfactorily installed and meet the requirements of the Water Supply (Water Fittings) Regulations 1999 in England and Wales, the Byelaws 2000 in Scotland and the Northern Ireland Water Regulations. The regulations include a requirement to use only suitable materials when laying water pipes and laying water pipes without protection is not permitted at contaminated sites. The water supply company has a statutory duty to enforce the regulations.

Contaminants in the ground can pose a risk to human health by permeating potable water supply pipes. To fulfil their statutory obligation, UK water supply companies require robust evidence from developers to demonstrate either that the ground in which new plastic supply pipes will be laid is free from specific contaminants, or that the proposed remedial strategy will mitigate any existing risk. If these requirements cannot be demonstrated to the satisfaction of the relevant water company, it becomes necessary to specify an alternative pipe material on the whole development or in specific zones.

In 2010, UK Water Industry Research (UKWIR) published *Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites* (Report Ref. No. 10/WM/03/21). This report reviewed previously published industry guidelines and threshold concentrations adopted by individual water supply companies.

The focus of the UKWIR research project was to develop clear and concise procedures, which provide consistency in the pipe selection decision process. It was intended to provide guidance that can be used to ensure compliance with current regulations and to prevent water supply pipe failing prematurely due to the presence of contamination.

The report concluded that in most circumstances only organic contaminants pose a potential risk to plastic pipe materials and Table 3.1 of the report provides threshold concentrations for polyethylene (PE) and polyvinyl chloride (PVC) pipes for the organic contaminants of concern. The report also makes recommendations for the procedures to be adopted in the design of site investigations and sampling strategies, and the assessment of data, to ensure that the ground through which water supply pipes will be laid is adequately characterised.

Risks to water supply pipes have therefore been assessed against the threshold concentrations for PE and PVC pipe specified in Table 3.1 of Report 10/WM/03/21, which have been adopted as the GAC for this linkage and are reproduced in Table A3 below.

Since water supply pipes are typically laid at a minimum depth of 0.75m below finished ground levels, sample results from depths between 0.5m and 1.5m below finished level are generally considered suitable for assessing risks to water supply. Samples outside these depths can be used, providing the stratum is the same as that in which water supply pipes are likely to be located. The report specifies that sampling should characterise the ground conditions to a minimum of 0.5m below the proposed depth of the pipe.

It should be noted that the assessment provided in this report is a guide and the method of assessment and recommendations should be checked with the relevant water supply company.

Table Q1: Generic assessment criteria for water supply pipes

		Pipe material	
		GAC (mg/kg)	
	Parameter group	PE	PVC
1	Extended VOC suite by purge and trap or head space and GC-MS with TIC (Not including compounds within group 1a)	0.5	0.125
1a	• BTEX + MTBE	0.1	0.03
2	SVOCs TIC by purge and trap or head space and GC-MS with TIC (aliphatic and aromatic C_5–C_{10}) (Not including compounds within group 2e and 2f)	2	1.4
2e	• Phenols	2	0.4
2f	• Cresols and chlorinated phenols	2	0.04
3	Mineral oil C_{11}–C_{20}	10	Suitable
4	Mineral oil C_{21}–C_{40}	500	Suitable
5	Corrosive (conductivity, redox and pH)	Suitable	Suitable
Specific suite identified as relevant following site investigation			
2a	Ethers	0.5	1
2b	Nitrobenzene	0.5	0.4
2c	Ketones	0.5	0.02
2d	Aldehydes	0.5	0.02
6	Amines	Not suitable	Suitable
Notes: where indicated as 'suitable', the material is considered resistant to permeation or degradation and no threshold concentration has been specified by UKWIR.			

Appendix M
GENERIC ASSESSMENT TABLES

Job Number:
Client:
Site:

Revised Wilson and Card Classification Ground Gas Risk Assessment

Job No.:	52511
Client:	Furness Partnership Limited
Site:	Gravesham Leisure Centre

For low-rise residential developments without a clear ventilated sub-floor void, flats and commercial / industrial sites

Characteristic Situation	Risk	GSV
1	Very Low	0.07
2	Low	0.7
3	Moderate	3.5
4	Moderate to High	15
5	High	70
6	Very High	>70

From CIRIA Report 659 (2006) "Assessing Risks Posed By Hazardous Ground Gases To Buildings", Wilson et al.

KEY:
GSV Gas Screening Value

GSV cannot be calculated on a site-specific basis

GSV indicates very low risk
GSV indicates low to moderate risk
GSV indicates moderate or greater risk; Concentrations of CH4 ≥20%V/V; CO2 ≥30%V/V
Oxygen concentration ≤10%v/v
Total ground gas concentrations >100%v/v

BH NO.	DATE	CH4 I %v/v	CH4 SS %v/v	CO2 I %v/v	CO2 SS %v/v	O2 I %v/v	O2 SS %v/v	Flow l/hr	Baro mbar	BH Press mbar	I SUM %v/v	SS SUM %v/v	GSV CH4	GSV CO2	CS No.
BH1 (S)	31.03.2023	0.1	0.1	0.1	1.7	21.5	20.9	0	978	0.05	21.7	22.7	0.00	0.00	CS1
	06.04.2023	0.1	0.1	0.2	1.2	21.4	20.0	0.1	1005	0.07	21.7	21.3	0.00	0.00	CS1
	14.04.2023	0.1	<0.1	0.2	1.0	21.3	21.3	0.1	997	-0.02	21.6	22.3	0.00	0.00	CS1
BH1 (D)	31.03.2023	0.2	0.1	0.1	2.1	21.3	18.8	0	979	0	21.6	21.0	0.00	0.00	CS1
	06.04.2023	0.1	0.1	0.2	1.0	21.2	20.3	0.2	1006	0.07	21.5	21.4	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.1	1.1	21.3	20.1	0.1	998	0.05	21.4	21.2	0.00	0.00	CS1
WS4	31.03.2023	<0.1	<0.1	0.4	1.2	21.1	19.1	0	979	0.11	21.5	20.3	0.00	0.00	CS1
	06.04.2023	0.1	<0.1	0.3	1.4	21.1	19.9	0	1009	0.02	21.5	21.3	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.2	1.1	21.2	19.6	0.1	998	0.02	21.4	20.7	0.00	0.00	CS1
BH3	31.03.2023	<0.1	<0.1	0.1	2.5	21.2	19.8	0	979	0.04	21.3	21.3	0.00	0.00	CS1
	06.04.2023	<0.1	<0.1	0.3	1.9	20.8	19.4	0.1	1008	0.02	21.2	21.3	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.2	0.9	21.2	20.4	0.1	998	0.07	21.4	21.3	0.00	0.00	CS1
WS3	31.03.2023	<0.1	<0.1	0.4	1.8	21.3	19.8	0.1	979	-0.02	21.7	21.6	0.00	0.00	CS1
	06.04.2023	<0.1	<0.1	0.1	1.7	21.1	20.0	0.1	1006	0.09	21.2	21.7	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.2	1.4	21.2	19.6	0	998	0.09	21.4	21.0	0.00	0.00	CS1
BH2	31.03.2023	<0.1	<0.1	0.2	0.6	21.3	19.9	0.1	979	-0.05	21.5	20.5	0.00	0.00	CS1
	06.04.2023	0.1	<0.1	0.1	0.7	21.6	20.0	0.1	1008	0.02	21.8	20.7	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.1	0.6	21.8	20.6	0	997	0.11	21.9	21.2	0.00	0.00	CS1
WS2	31.03.2023	<0.1	<0.1	0.2	0.2	21.6	21.7	0	979	0.07	21.8	21.9	0.00	0.00	CS1
	06.04.2023	<0.1	<0.1	0.2	0.9	21.3	21.1	0	1008	-0.04	21.5	22.0	0.00	0.00	CS1
	14.04.2023										0.0	0.0	0.00	0.00	CS1
WS1	31.03.2023	<0.1	<0.1	0.1	1.2	21.8	21.1	0.1	979	-0.04	21.9	22.3	0.00	0.00	CS1
	06.04.2023	<0.1	<0.1	0.1	1.4	21.3	18.9	0.1	1006	-0.05	21.4	20.3	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.2	0.7	21.5	21.3	0.2	998	0	21.7	22.0	0.00	0.00	CS1
WS6	31.03.2023	<0.1	<0.1	0.2	2.1	21.7	20.1	0.1	979	0.11	21.9	22.2	0.00	0.00	CS1
	06.04.2023	<0.1	<0.1	0.2	2.3	21.2	20.6	0.1	1006	0.02	21.4	22.9	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.1	1.5	21.5	19.5	0.1	998	0.02	21.6	21.0	0.00	0.00	CS1
WS5	31.03.2023	<0.1	<0.1	0.3	1.7	21.8	19.9	0.1	979	0.09	21.9	21.6	0.00	0.00	CS1
	06.04.2023	<0.1	<0.1	0.2	1.6	21.4	19.6	0.1	1000	0.09	21.6	21.2	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.2	1.6	21.5	19.3	0.1	998	-0.02	21.7	20.9	0.00	0.00	CS1

WORST-CASE VALUES PER BOREHOLE

		Maximum CH4		Maximum CO2		Minimum O2		Max Flow	Not Applicable		Maximum Total		Maximum GSVs		CS No
BH1 (S)		0.1	0.1	0.2	1.7	21.3	20.0	0.1			21.6	21.8	0.00	0.00	CS1
BH1 (D)		0.2	0.1	0.2	2.1	21.2	18.8	0.2			21.6	21.0	0.00	0.00	CS1
WS4		0.1	<0.1	0.4	1.4	21.1	19.1	0.1			21.6	20.5	0.00	0.00	CS1
BH3		<0.1	<0.1	0.3	2.5	20.9	18.8	0.1			21.2	21.3	0.00	0.00	CS1
WS3		<0.1	<0.1	0.4	1.8	21.1	19.6	0.1			21.5	21.4	0.00	0.00	CS1
BH2		0.1	<0.1	0.2	0.7	21.3	19.9	0.1			21.6	20.6	0.00	0.00	CS1
WS2		<0.1	<0.1	0.2	1.4	21.3	18.9	0.2			21.5	20.3	0.00	0.00	CS1
WS1		<0.1	<0.1	0.2	1.4	21.3	18.9	0.2			21.5	20.3	0.00	0.00	CS1
WS6		<0.1	<0.1	0.2	2.3	21.2	19.5	0.1			21.4	21.8	0.00	0.00	CS1
WS5		<0.1	<0.1	0.3	1.7	21.4	19.3	0.1			21.7	21.0	0.00	0.00	CS1

Project name	Gravesham Leisure Centre
Project code	52511
Client name	Furness Partnership
Address	Cascades Leisure Centre, Thong Lane, Gravesend, Kent
NGR	
Land use	Phytotoxic (pH >7.0)
SOM	1%
GAC version	2012_01

Notes:

RSK

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects	Lab sample ID	23/02978/1	23/02978/14	23/02978/15	23/02978/16	23/02978/17	23/02978/18	23/02978/8	23/02978/9	23/02978/10	23/02978/11
									Client sample ID	BH1	HP1	HP2	HP3	HP4	HP5	SA1	SA2	SA2	SA3
									Depth to top	0.05	0	0	0.2	0	0	0	0	0.2	0
									Depth to bottom		0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.4	0.3
									Date sampled	17/03/23	24/03/23	24/03/23	23/02/23	23/03/23	23/03/23	20/03/23	20/03/23	20/03/23	21/03/23
Metals and Inorganics																			
Arsenic	mg/kg			10	<1	18	16	2	<1		7	4	7	5	6	10	<1	3	8
Cadmium	mg/kg	1		1.9	0.6	18	18	0	0.7	2.7	2.6	2	1.4	1.9	2.4	0.6	1.5	0.7	
Chromium	mg/kg			117	10	18	18	0	10	36	29	21	21	117	28	20	41	23	
Chromium (hexavalent)	mg/kg				<1	5	0	5	<1							<1	<1	<1	
Copper	mg/kg	200		115	7	18	18	0	7	115	42	16	76	38	84	63	36	16	
Lead	mg/kg	300		229	3	18	18	0	3	229	67	161	33	108	114	15	90	43	
Mercury	mg/kg	1		2.1	<0.17	18	10	8	1.75	1.96	0.36	1.33	1.15	1.24	2.12	1.45	1.81	<0.17	
Nickel	mg/kg	110		36	4	18	18	0	4	29	23	16	19	19	35	36	29	15	
Selenium	mg/kg				<1	18	0	18	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Zinc	mg/kg	400		402	35	18	18	0	36	402	312	182	116	124	157	35	94	77	
Asbestos																			
Asbestos in soil						18	0	18	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	
Petroleum Hydrocarbons																			
Ali >C5-C6	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Ali >C6-C8	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Ali >C8-C10	mg/kg				<1	18	0	18	<10	<1	<1	<1	<1	<1	<10	<10	<10	<1	
Ali >C10-C12	mg/kg				<1	18	0	18	<10	<1	<1	<1	<1	<1	<10	<10	<10	<1	
Ali >C12-C16	mg/kg			1	<1	18	1	17	<10	<1	<1	<1	<1	1	<10	<10	<10	<1	
Ali >C16-C21	mg/kg			11	<1	18	6	12	<10	2	2	<1	<1	4	<10	<10	11	1	
Ali >C21-C35	mg/kg			253	6	18	18	0	84	200	54	10	11	164	103	253	78	12	
Ali >C16-C35 calculated	mg/kg			253	6	18	18	0	84	202	56	10	11	168	103	253	89	13	
Total Aliphatics	mg/kg			253	6	18	18	0	84	203	56	10	11	169	103	253	89	13	
Aro >C5-C7	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Aro >C7-C8	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Aro >C8-C10	mg/kg			2	<1	18	1	17	<10	<1	<1	<1	<1	2	<10	<10	<10	<1	
Aro >C10-C12	mg/kg			4	<1	18	1	17	<10	<1	<1	<1	<1	4	<10	<10	<10	<1	
Aro >C12-C16	mg/kg			108	<1	18	12	6	<10	8	2	2	3	7	20	13	108	2	
Aro >C16-C21	mg/kg			801	1	18	17	1	<10	110	5	5	18	56	77	58	801	6	
Aro >C21-C35	mg/kg			1510	6	18	18	0	53	308	17	17	41	286	282	242	1510	16	
Total Aromatics	mg/kg			2420	9	18	18	0	53	426	25	24	62	355	379	313	2420	24	
TPH (Ali & Aro)	mg/kg			2510	16	18	18	0	137	629	81	34	73	524	482	566	2510	37	
BTEX - Benzene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
BTEX - Toluene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
BTEX - Ethyl Benzene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
BTEX - o Xylene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
BTEX - m & p Xylene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
TPH total (>C6-C40)	mg/kg			1990	384	3	3	0							384	1560	1990		
TPH ID (for FID characterisations)						3									C12-C44 with	C10-C44 with	C10-C44 with some PAHs ar		
TPH FID Chromatogram						3									Appended	Appended	Appended		
Fuel oxygenates																			
MTBE	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	

Project name	Gravesham Leisure Centre
Project code	52511
Client name	Furness Partnership
Address	Cascades Leisure Centre, Thong Lane, Gravesend, Kent
NGR	
Land use	Phytotoxic (pH >7.0)
SOM	1%
GAC version	2012_01

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete	Lab sample ID	23/02978/12	23/02978/13	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7
									Client sample ID	TP1	TP2	WS1	WS2	WS3	WS4	WS5	WS6
									Depth to top	0	0	0	0	0	0	0.1	0
									Depth to bottom	0.3	0.1	0.3	0.3	0.3	0.3	0.4	0.3
									Date sampled	21/03/23	21/03/23	16/03/23	16/02/23	16/03/24	16/02/24	16/03/25	16/02/25
Metals and Inorganics																	
Arsenic	mg/kg			10	<1	18	16	2		8	6	9	7	2	5	10	6
Cadmium	mg/kg			14.1	0.6	18	18	0		1.2	1	1.7	1	0.9	1.1	0.7	14.1
Chromium	mg/kg			117	10	18	18	0		36	23	26	32	34	35	19	41
Chromium (hexavalent)	mg/kg				<1	5	0	5								<1	
Copper	mg/kg	200		115	7	18	18	0		15	17	40	20	16	17	17	51
Lead	mg/kg	300		229	3	18	18	0		35	26	34	60	48	39	47	48
Mercury	mg/kg			2.1	<0.17	18	10	8		<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	0.67
Nickel	mg/kg	110		36	4	18	18	0		26	18	28	21	17	25	11	33
Selenium	mg/kg				<1	18	0	18		<1	<1	<1	<1	<1	<1	<1	<1
Zinc	mg/kg	300		402	35	18	18	0		100	69	76	88	97	93	71	146
Asbestos																	
Asbestos in soil						18	0	18		NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD
Petroleum Hydrocarbons																	
Ali >C5-C6	mg/kg				<0.01	18	0	18		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ali >C6-C8	mg/kg				<0.01	18	0	18		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ali >C8-C10	mg/kg				<1	18	0	18		<1	<1	<1	<1	<1	<1	<1	<1
Ali >C10-C12	mg/kg				<1	18	0	18		<1	<1	<1	<1	<1	<1	<1	<1
Ali >C12-C16	mg/kg			1	<1	18	1	17		<1	<1	<1	<1	<1	<1	<1	<1
Ali >C16-C21	mg/kg			11	<1	18	6	12		<1	<1	<1	<1	<1	<1	<1	1
Ali >C21-C35	mg/kg			253	6	18	18	0		6	9	14	10	9	6	7	59
Ali >C16-C35 calculated	mg/kg			253	6	18	18	0		6	9	14	10	9	6	7	60
Total Aliphatics	mg/kg			253	6	18	18	0		6	9	14	10	9	6	7	60
Aro >C5-C7	mg/kg				<0.01	18	0	18		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aro >C7-C8	mg/kg				<0.01	18	0	18		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aro >C8-C10	mg/kg			2	<1	18	1	17		<1	<1	<1	<1	<1	<1	<1	<1
Aro >C10-C12	mg/kg			4	<1	18	1	17		<1	<1	<1	<1	<1	<1	<1	<1
Aro >C12-C16	mg/kg			108	<1	18	12	6		<1	<1	<1	1	<1	<1	2	4
Aro >C16-C21	mg/kg			801	1	18	17	1		2	3	2	4	4	1	18	20
Aro >C21-C35	mg/kg			1510	6	18	18	0		11	6	11	17	16	8	61	57
Total Aromatics	mg/kg			2420	9	18	18	0		13	9	13	22	20	9	81	81
TPH (Ali & Aro)	mg/kg			2510	16	18	18	0		19	18	27	32	28	16	88	141
BTEX - Benzene	mg/kg				<0.01	18	0	18		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - Toluene	mg/kg				<0.01	18	0	18		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - Ethyl Benzene	mg/kg				<0.01	18	0	18		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - o Xylene	mg/kg				<0.01	18	0	18		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - m & p Xylene	mg/kg				<0.01	18	0	18		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TPH total (>C6-C40)	mg/kg			1990	384	3	3	0									
TPH ID (for FID characterisations)						3						id other unknown hydrocarbons						
TPH FID Chromatogram						3											
Fuel oxygenates																	
MTBE	mg/kg				<0.01	18	0	18		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

								Lab sample ID	23/02978/1	23/02978/14	23/02978/15	23/02978/16	23/02978/17	23/02978/18	23/02978/8	23/02978/9	23/02978/10	23/02978/11
								Client sample ID	BH1	HP1	HP2	HP3	HP4	HP5	SA1	SA2	SA2	SA3
								Depth to top	0.05	0	0	0.2	0	0	0	0	0.2	0
								Depth to bottom		0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.4	0.3
								Date sampled	17/03/23	24/03/23	24/03/23	23/02/23	23/03/23	23/03/23	20/03/23	20/03/23	20/03/23	21/03/23
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects											
Polycyclic aromatic hydrocarbons																			
Acenaphthene	mg/kg			1.08	<0.01	18	8	10	<0.01	0.07	<0.01	<0.01	0.03	0.04	0.32	0.42	1.08	<0.01	
Acenaphthylene	mg/kg			0.7	<0.01	18	7	11	<0.01	0.04	<0.01	<0.01	<0.01	0.03	0.14	0.7	0.27	<0.01	
Anthracene	mg/kg			3.71	<0.02	18	10	8	<0.02	0.3	<0.02	0.03	0.05	0.11	1.36	2.39	3.71	0.02	
Benzo(a)anthracene	mg/kg			11.1	<0.04	18	17	1	<0.04	1.31	0.07	0.09	0.18	0.87	2.94	6.29	11.1	0.18	
Benzo(a)pyrene	mg/kg			7.89	<0.04	18	17	1	<0.04	1.04	0.07	0.11	0.16	1.02	2.67	4.19	7.89	0.17	
Benzo(b)fluoranthene	mg/kg			9.12	<0.05	18	17	1	<0.05	1.32	0.11	0.14	0.22	1.42	3.37	5.43	9.12	0.23	
Benzo(ghi)perylene	mg/kg			3.85	<0.05	18	14	4	0.06	0.57	<0.05	0.1	0.11	0.89	1.54	2.55	3.85	0.11	
Benzo(k)fluoranthene	mg/kg			3.37	<0.07	18	9	9	<0.07	0.42	<0.07	<0.07	0.08	0.54	1.09	1.86	3.37	0.08	
Chrysene	mg/kg			10	<0.06	18	16	2	<0.06	1.28	0.11	0.1	0.21	1.19	2.95	5.87	10	0.21	
Dibenzo(ah)anthracene	mg/kg			0.88	<0.04	18	6	12	<0.04	0.12	<0.04	<0.04	<0.04	0.13	0.31	0.59	0.88	<0.04	
Fluoranthene	mg/kg			27	<0.08	18	17	1	<0.08	3.07	0.21	0.17	0.44	2.48	8.15	14.6	27	0.41	
Fluorene	mg/kg			0.89	<0.01	18	8	10	<0.01	0.08	<0.01	<0.01	0.02	0.02	0.47	0.51	0.89	<0.01	
Indeno(123-cd)pyrene	mg/kg			4.64	<0.03	18	16	2	<0.03	0.67	0.05	0.1	0.12	0.86	1.73	2.89	4.64	0.11	
Naphthalene	mg/kg			0.14	<0.03	18	4	14	<0.03	0.14	<0.03	<0.03	<0.03	<0.03	0.03	0.04	0.09	<0.03	
Phenanthrene	mg/kg			16.1	<0.03	18	17	1	<0.03	1.46	0.1	0.08	0.27	0.72	5.93	8.28	16.1	0.13	
Pyrene	mg/kg			23.3	<0.07	18	17	1	<0.07	2.56	0.19	0.15	0.39	2.23	6.77	13.5	23.3	0.36	
Total PAH-16MS	mg/kg			123	<0.08	18	17	1	<0.08	14.4	0.91	1.07	2.28	12.6	39.8	70.1	123	2.01	
Volatile Organic Compounds (VOC)																			
1,1,1,2-Tetrachloroethane	mg/kg				<0.001	1	0	1	<0.001										
1,1,1-Trichloroethane	mg/kg				<0.001	1	0	1	<0.001										
1,1,2,2-Tetrachloroethane	mg/kg				<0.001	1	0	1	<0.001										
1,1,2-Trichloroethane	mg/kg				<0.001	1	0	1	<0.001										
1,1-Dichloroethane	mg/kg				<0.001	1	0	1	<0.001										
1,1-Dichloroethene	mg/kg				<0.001	1	0	1	<0.001										
1,1-Dichloropropene	mg/kg				<0.001	1	0	1	<0.001										
1,2,3-Trichlorobenzene	mg/kg				<0.003	1	0	1	<0.003										
1,2,3-Trichloropropane	mg/kg				<0.001	1	0	1	<0.001										
1,2,4-Trichlorobenzene	mg/kg				<0.003	1	0	1	<0.003										
1,2,4-Trimethylbenzene	mg/kg				<0.001	1	0	1	<0.001										
1,2-Dibromo-3-chloropropane	mg/kg				<0.002	1	0	1	<0.002										
1,2-Dibromoethane	mg/kg				<0.001	1	0	1	<0.001										
1,2-Dichlorobenzene	mg/kg				<0.001	1	0	1	<0.001										
1,2-Dichloroethane	mg/kg				<0.002	1	0	1	<0.002										
1,2-Dichloropropane	mg/kg				<0.001	1	0	1	<0.001										
1,3,5-Trimethylbenzene	mg/kg				<0.001	1	0	1	<0.001										
1,3-Dichlorobenzene	mg/kg				<0.001	1	0	1	<0.001										
1,3-Dichloropropane	mg/kg				<0.001	1	0	1	<0.001										
1,4-Dichlorobenzene	mg/kg				<0.001	1	0	1	<0.001										
2,2-Dichloropropane	mg/kg				<0.001	1	0	1	<0.001										
2-Chlorotoluene	mg/kg				<0.001	1	0	1	<0.001										
4-Chlorotoluene	mg/kg				<0.001	1	0	1	<0.001										
4-Isopropyltoluene	mg/kg				<0.001	1	0	1	<0.001										
Benzene	mg/kg				<0.001	1	0	1	<0.001										
Bromobenzene	mg/kg				<0.001	1	0	1	<0.001										
Bromochloromethane	mg/kg				<0.005	1	0	1	<0.005										
Bromodichloromethane	mg/kg				<0.01	1	0	1	<0.01										
Bromoform	mg/kg				<0.001	1	0	1	<0.001										
Bromomethane	mg/kg				<0.001	1	0	1	<0.001										
Carbon Disulphide	mg/kg				<0.001	1	0	1	<0.001										
Carbon Tetrachloride	mg/kg				<0.001	1	0	1	<0.001										
Chlorobenzene	mg/kg				<0.001	1	0	1	<0.001										
Chloroethane	mg/kg				<0.001	1	0	1	<0.001										
Chloroform	mg/kg				<0.001	1	0	1	<0.001										

								Lab sample ID	23/02978/12	23/02978/13	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7
								Client sample ID	TP1	TP2	WS1	WS2	WS3	WS4	WS5	WS6
								Depth to top	0	0	0	0	0	0	0.1	0
								Depth to bottom	0.3	0.1	0.3	0.3	0.3	0.3	0.4	0.3
								Date sampled	21/03/23	21/03/23	16/03/23	16/02/23	16/03/24	16/02/24	16/03/25	16/02/25
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete								
Polycyclic aromatic hydrocarbons																
Acenaphthene	mg/kg			1.08	<0.01	18	8	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02
Acenaphthylene	mg/kg			0.7	<0.01	18	7	11	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.04	<0.01
Anthracene	mg/kg			3.71	<0.02	18	10	8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.04
Benzo(a)anthracene	mg/kg			11.1	<0.04	18	17	1	0.05	0.06	0.14	0.12	0.11	0.05	0.39	0.25
Benzo(a)pyrene	mg/kg			7.99	<0.04	18	17	1	0.05	0.06	0.18	0.14	0.12	0.06	0.39	0.24
Benzo(b)fluoranthene	mg/kg			9.12	<0.05	18	17	1	0.07	0.09	0.23	0.19	0.17	0.09	0.51	0.36
Benzo(ghi)perylene	mg/kg			3.85	<0.05	18	14	4	<0.05	<0.05	0.16	0.1	0.09	<0.05	0.24	0.14
Benzo(k)fluoranthene	mg/kg			3.37	<0.07	18	9	9	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.19	0.12
Chrysene	mg/kg			10	<0.06	18	16	2	<0.06	0.08	0.17	0.16	0.15	0.08	0.46	0.36
Dibenzo(ah)anthracene	mg/kg			0.88	<0.04	18	6	12	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.05	<0.04
Fluoranthene	mg/kg			27	<0.08	18	17	1	0.12	0.13	0.26	0.3	0.26	0.14	0.89	0.78
Fluorene	mg/kg			0.89	<0.01	18	8	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01
Indeno(123-cd)pyrene	mg/kg			4.64	<0.03	18	16	2	<0.03	0.05	0.16	0.1	0.1	0.04	0.26	0.14
Naphthalene	mg/kg			0.14	<0.03	18	4	14	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Phenanthrene	mg/kg			16.1	<0.03	18	17	1	0.04	0.05	0.07	0.11	0.09	0.05	0.32	0.39
Pyrene	mg/kg			23.3	<0.07	18	17	1	0.11	0.11	0.25	0.26	0.22	0.13	0.76	0.66
Total PAH-16MS	mg/kg			123	<0.08	18	17	1	0.44	0.63	1.63	1.48	1.31	0.64	4.58	3.51
Volatile Organic Compounds (VOC)																
1,1,1,2-Tetrachloroethane	mg/kg				<0.001	1	0	1								
1,1,1-Trichloroethane	mg/kg				<0.001	1	0	1								
1,1,2,2-Tetrachloroethane	mg/kg				<0.001	1	0	1								
1,1,2-Trichloroethane	mg/kg				<0.001	1	0	1								
1,1-Dichloroethane	mg/kg				<0.001	1	0	1								
1,1-Dichloroethene	mg/kg				<0.001	1	0	1								
1,1-Dichloropropene	mg/kg				<0.001	1	0	1								
1,2,3-Trichlorobenzene	mg/kg				<0.005	1	0	1								
1,2,3-Trichloropropane	mg/kg				<0.001	1	0	1								
1,2,4-Trichlorobenzene	mg/kg				<0.005	1	0	1								
1,2,4-Trimethylbenzene	mg/kg				<0.001	1	0	1								
1,2-Dibromo-3-chloropropane	mg/kg				<0.002	1	0	1								
1,2-Dibromoethane	mg/kg				<0.001	1	0	1								
1,2-Dichlorobenzene	mg/kg				<0.001	1	0	1								
1,2-Dichloroethane	mg/kg				<0.002	1	0	1								
1,2-Dichloropropane	mg/kg				<0.001	1	0	1								
1,3,5-Trimethylbenzene	mg/kg				<0.001	1	0	1								
1,3-Dichlorobenzene	mg/kg				<0.001	1	0	1								
1,3-Dichloropropane	mg/kg				<0.001	1	0	1								
1,4-Dichlorobenzene	mg/kg				<0.001	1	0	1								
2,2-Dichloropropane	mg/kg				<0.001	1	0	1								
2-Chlorotoluene	mg/kg				<0.001	1	0	1								
4-Chlorotoluene	mg/kg				<0.001	1	0	1								
4-Isopropyltoluene	mg/kg				<0.001	1	0	1								
Benzene	mg/kg				<0.001	1	0	1								
Bromobenzene	mg/kg				<0.001	1	0	1								
Bromochloromethane	mg/kg				<0.005	1	0	1								
Bromodichloromethane	mg/kg				<0.01	1	0	1								
Bromoform	mg/kg				<0.001	1	0	1								
Bromomethane	mg/kg				<0.001	1	0	1								
Carbon Disulphide	mg/kg				<0.001	1	0	1								
Carbon Tetrachloride	mg/kg				<0.001	1	0	1								
Chlorobenzene	mg/kg				<0.001	1	0	1								
Chloroethane	mg/kg				<0.001	1	0	1								
Chloroform	mg/kg				<0.001	1	0	1								

								Lab sample ID	23/02978/1	23/02978/14	23/02978/15	23/02978/16	23/02978/17	23/02978/18	23/02978/8	23/02978/9	23/02978/10	23/02978/11
								Client sample ID	BH1	HP1	HP2	HP3	HP4	HP5	SA1	SA2	SA2	SA3
								Depth to top	0.05	0	0	0.2	0	0	0	0	0.2	0
								Depth to bottom		0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.4	0.3
								Date sampled	17/03/23	24/03/23	24/03/23	23/02/23	23/03/23	23/03/23	20/03/23	20/03/23	20/03/23	21/03/23
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects										
Chloromethane	mg/kg				<0.01	1	0	1	<0.01									
cis 1,2-Dichloroethene	mg/kg				<0.001	1	0	1	<0.001									
cis 1,3-Dichloropropene	mg/kg				<0.001	1	0	1	<0.001									
Dibromochloromethane	mg/kg				<0.003	1	0	1	<0.003									
Dibromomethane	mg/kg				<0.001	1	0	1	<0.001									
Dichlorodifluoromethane	mg/kg				<0.001	1	0	1	<0.001									
Dichloromethane	mg/kg				<0.005	1	0	1	<0.005									
Ethylbenzene	mg/kg				<0.001	1	0	1	<0.001									
Hexachlorobutadiene	mg/kg				<0.001	1	0	1	<0.001									
Isopropylbenzene	mg/kg				<0.001	1	0	1	<0.001									
m & p Xylene	mg/kg				<0.001	1	0	1	<0.001									
n-Butylbenzene	mg/kg				<0.001	1	0	1	<0.001									
n-Propylbenzene	mg/kg				<0.001	1	0	1	<0.001									
o-Xylene	mg/kg				<0.001	1	0	1	<0.001									
sec-Butylbenzene	mg/kg				<0.001	1	0	1	<0.001									
Styrene	mg/kg				<0.001	1	0	1	<0.001									
tert-Butylbenzene	mg/kg				<0.002	1	0	1	<0.002									
Tetrachloroethene	mg/kg				<0.001	1	0	1	<0.001									
Toluene	mg/kg				<0.001	1	0	1	<0.001									
trans 1,2-Dichloroethene	mg/kg				<0.001	1	0	1	<0.001									
trans 1,3-Dichloropropene	mg/kg				<0.001	1	0	1	<0.001									
Trichloroethene	mg/kg				<0.001	1	0	1	<0.001									
Trichlorofluoromethane	mg/kg				<0.001	1	0	1	<0.001									
Vinyl Chloride	mg/kg				<0.001	1	0	1	<0.001									
PCBs																		
PCB BZ 101	mg/kg				<0.004	1	0	1			<0.004							
PCB BZ 105	mg/kg				<0.005	1	0	1			<0.005							
PCB BZ 114	mg/kg				<0.005	1	0	1			<0.005							
PCB BZ 118	mg/kg				<0.007	1	0	1			<0.007							
PCB BZ 123	mg/kg				<0.005	1	0	1			<0.005							
PCB BZ 126	mg/kg				<0.005	1	0	1			<0.005							
PCB BZ 138	mg/kg				<0.006	1	0	1			<0.006							
PCB BZ 153	mg/kg				<0.004	1	0	1			<0.004							
PCB BZ 156	mg/kg				<0.005	1	0	1			<0.005							
PCB BZ 157	mg/kg				<0.005	1	0	1			<0.005							
PCB BZ 167	mg/kg				<0.005	1	0	1			<0.005							
PCB BZ 169	mg/kg				<0.005	1	0	1			<0.005							
PCB BZ 180	mg/kg				<0.004	1	0	1			<0.004							
PCB BZ 189	mg/kg				<0.005	1	0	1			<0.005							
PCB BZ 28	mg/kg				<0.003	1	0	1			<0.003							
PCB BZ 52	mg/kg				<0.002	1	0	1			<0.002							
PCB BZ 77	mg/kg				<0.005	1	0	1			<0.005							
PCB BZ 81	mg/kg				<0.005	1	0	1			<0.005							
Other analytes																		
% Moisture	% w/w			13.1	7.4	3	3	0							13.1	7.4	11	
% Stones >10mm	% w/w			15.5	<0.1	18	8	10	6.4	<0.1	<0.1	15.1	9.6	10.9	3.1	<0.1	15.5	<0.1
pH	pH			9.69	6.07	18	18	0	9.49	8.14	7.7	9.69	8.54	8.39	8.64	8.91	8.59	7.98
Sulphate (acid soluble)	mg/kg			1300	310	18	17	1	<1000	570	730	1100	700	540	580	360	1300	510
Sulphate (water sol 2:1)	g/l			0.06	<0.01	18	4	14	0.06	0.02	<0.01	<0.01	0.04	0.04	<0.01	<0.01	<0.01	<0.01
Total Organic Carbon	% w/w			11.4	1.69	7	7	0							11.4		3.68	1.8
Converted to SOM (x / 0.58)	% w/w			19.65517	2.913793	7	7	0							19.6551724		6.34482759	3.10344828
Total Speciated PCB-EC7 & WHO12	mg/kg				<0.007	1	0	1			<0.007							

								Lab sample ID	23/02978/12	23/02978/13	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7
								Client sample ID	TP1	TP2	WS1	WS2	WS3	WS4	WS5	WS6
								Depth to top	0	0	0	0	0	0	0.1	0
								Depth to bottom	0.3	0.1	0.3	0.3	0.3	0.3	0.4	0.3
								Date sampled	21/03/23	21/03/23	16/03/23	16/02/23	16/03/24	16/02/24	16/03/25	16/02/25
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete								
Chloromethane	mg/kg				<0.01	1	0	1								
cis 1,2-Dichloroethene	mg/kg				<0.001	1	0	1								
cis 1,3-Dichloropropene	mg/kg				<0.001	1	0	1								
Dibromochloromethane	mg/kg				<0.003	1	0	1								
Dibromomethane	mg/kg				<0.001	1	0	1								
Dichlorodifluoromethane	mg/kg				<0.001	1	0	1								
Dichloromethane	mg/kg				<0.005	1	0	1								
Ethylbenzene	mg/kg				<0.001	1	0	1								
Hexachlorobutadiene	mg/kg				<0.001	1	0	1								
Isopropylbenzene	mg/kg				<0.001	1	0	1								
m & p Xylene	mg/kg				<0.001	1	0	1								
n-Butylbenzene	mg/kg				<0.001	1	0	1								
n-Propylbenzene	mg/kg				<0.001	1	0	1								
o-Xylene	mg/kg				<0.001	1	0	1								
sec-Butylbenzene	mg/kg				<0.001	1	0	1								
Styrene	mg/kg				<0.001	1	0	1								
tert-Butylbenzene	mg/kg				<0.002	1	0	1								
Tetrachloroethene	mg/kg				<0.001	1	0	1								
Toluene	mg/kg				<0.001	1	0	1								
trans 1,2-Dichloroethene	mg/kg				<0.001	1	0	1								
trans 1,3-Dichloropropene	mg/kg				<0.001	1	0	1								
Trichloroethene	mg/kg				<0.001	1	0	1								
Trichlorofluoromethane	mg/kg				<0.001	1	0	1								
Vinyl Chloride	mg/kg				<0.001	1	0	1								
PCBs																
PCB BZ 101	mg/kg				<0.004	1	0	1								
PCB BZ 105	mg/kg				<0.005	1	0	1								
PCB BZ 114	mg/kg				<0.005	1	0	1								
PCB BZ 118	mg/kg				<0.007	1	0	1								
PCB BZ 123	mg/kg				<0.005	1	0	1								
PCB BZ 126	mg/kg				<0.005	1	0	1								
PCB BZ 138	mg/kg				<0.008	1	0	1								
PCB BZ 153	mg/kg				<0.004	1	0	1								
PCB BZ 156	mg/kg				<0.005	1	0	1								
PCB BZ 157	mg/kg				<0.005	1	0	1								
PCB BZ 167	mg/kg				<0.005	1	0	1								
PCB BZ 169	mg/kg				<0.005	1	0	1								
PCB BZ 180	mg/kg				<0.004	1	0	1								
PCB BZ 189	mg/kg				<0.005	1	0	1								
PCB BZ 28	mg/kg				<0.003	1	0	1								
PCB BZ 52	mg/kg				<0.002	1	0	1								
PCB BZ 77	mg/kg				<0.005	1	0	1								
PCB BZ 81	mg/kg				<0.005	1	0	1								
Other analytes																
% Moisture	% w/w			13.1	7.4	3	3	0								
% Stones >10mm	% w/w			15.5	<0.1	18	8	10	2.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.6
pH	pH			9.69	6.07	18	18	0	6.9	7.24	8.19	7.86	8.09	6.07	8.02	8.1
Sulphate (acid soluble)	mg/kg			1300	310	18	17	1	520	580	490	850	370	620	310	650
Sulphate (water sol 2:1)	g/l			0.06	<0.01	18	4	14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Organic Carbon	% w/w			11.4	1.69	7	7	0		2.9	1.77		1.69			2.92
Converted to SOM (x / 0.58)	% w/w			19.65517	2.913793	7	7	0		5	3.05172414		2.9137931			5.03448276
Total Speciated PCB-EC7 & WHO12	mg/kg				<0.007	1	0	1								

Appendix N
WM3 ASSESSMENT

envirolab

Haswaste, developed by Dr. Iain Haslock.

Please enter available data in the rows associated with the test (grey) cells. Calculation cells initially display either "0.0000" or "#DIV/0!".
If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property.

52511 Gravesham Leisure Centre		BH1	WS1	WS2	WS3	WS4	WS5	WS6	SA1	SA2
Ref. 1		0.05	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00
Ref. 2			0.30	0.30	0.30	0.30	0.40	0.30	0.20	0.20
Date		17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25	20-Mar-23	20-Mar-23
% Moisture	%								13.1	7.4
pH (soil)		9.49	8.19	7.86	8.09	6.07	8.02	8.1	8.64	8.91
pH (leachate)										
Arsenic	mg/kg	<1	9	7	2	5	10	6	10	<1
Cadmium	mg/kg	0.7	1.7	1	0.9	1.1	0.7	13.4	2.4	0.6
Copper	mg/kg	7	40	20	16	17	17	51	84	63
CrVI or Chromium	mg/kg	10	26	32	34	35	19	41	28	20
Lead	mg/kg	3	34	60	48	39	47	48	114	15
Mercury	mg/kg	1.75	<0.17	<0.17	<0.17	<0.17	<0.17	0.67	2.17	1.45
Nickel	mg/kg	4	28	21	17	25	11	33	35	36
Selenium	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	mg/kg	36	76	88	97	93	71	146	157	35
Barium	mg/kg									
Beryllium	mg/kg									
Vanadium	mg/kg									
Cobalt	mg/kg									
Manganese	mg/kg									
Molybdenum	mg/kg									
Antimony	mg/kg									
Aluminium	mg/kg									
Bismuth	mg/kg									
CrIII	mg/kg									
Iron	mg/kg									
Strontium	mg/kg									
Tellurium	mg/kg									
Thallium	mg/kg									
Titanium	mg/kg									
Tungsten	mg/kg									
Ammoniacal N	mg/kg									
ws Boron	mg/kg									
PAH (Input Total PAH **OR** individual PAH results)										
Acenaphthene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	0.32	0.42
Acenaphthylene	mg/kg	<0.01	0.01	<0.01	<0.01	<0.01	0.04	<0.01	0.14	0.7
Anthracene	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.04	1.36	2.39
Benzo(a)anthracene	mg/kg	<0.04	0.14	0.12	0.11	0.05	0.39	0.25	2.94	6.29
Benzo(a)pyrene	mg/kg	<0.04	0.18	0.14	0.12	0.06	0.39	0.24	2.67	4.19
Benzo(b)fluoranthene	mg/kg	<0.05	0.23	0.19	0.17	0.09	0.51	0.36	3.37	5.43
Benzo(ghi)perylene	mg/kg	0.06	0.16	0.1	0.09	<0.05	0.24	0.14	1.54	2.55
Benzo(k)fluoranthene	mg/kg	<0.07	<0.07	<0.07	<0.07	<0.07	0.19	0.12	1.09	1.86
Chrysene	mg/kg	<0.06	0.17	0.16	0.15	0.08	0.46	0.36	2.95	5.87
Dibenzo(ah)anthracene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	0.31	0.59
Fluoranthene	mg/kg	<0.08	0.26	0.3	0.26	0.14	0.89	0.78	8.15	14.6
Fluorene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.47	0.51
Indeno(123cd)pyrene	mg/kg	<0.03	0.16	0.1	0.1	0.04	0.26	0.14	1.73	2.89
Naphthalene	mg/kg	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	0.04
Phenanthrene	mg/kg	<0.03	0.07	0.11	0.09	0.05	0.32	0.39	5.93	8.28
Pyrene	mg/kg	<0.07	0.25	0.26	0.22	0.13	0.76	0.66	6.77	13.5
Coronene	mg/kg									
Total PAHs (16 or 17)	mg/kg									
TPH										
Petrol	mg/kg									
Diesel	mg/kg									
Lube Oil	mg/kg									
Crude Oil	mg/kg									
White Spirit / Kerosene	mg/kg									
Creosote	mg/kg									
Unknown TPH with ID	mg/kg									
Unknown TPHCWG	mg/kg								384	1560
Total Sulphide	mg/kg									
Complex Cyanide	mg/kg									
Free (or Total) Cyanide	mg/kg									
Thiocyanate	mg/kg									
Elemental/Free Sulphur	mg/kg									
Phenols Input Total Phenols HPLC **OR** individual Phenol results.										
Phenol	mg/kg									
Cresols	mg/kg									
Xylenols	mg/kg									
Resourcinol	mg/kg									
Phenols Total by HPLC	mg/kg									
BTEX Input Total BTEX **OR** individual BTEX results.										
Benzene	mg/kg									
Toluene	mg/kg									
Ethylbenzene	mg/kg									
Xylenes	mg/kg									
Total BTEX	mg/kg									
PCBs (POPs)										
PCBs Total (eg EC7/WHO12)	mg/kg									
PBBs (POPs)										
Hexabromobiphenyl (Total or PBB153; 2,2',4,4',5,5'- if only available)	mg/kg									

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Please enter available data in the rows associated with the test (grey) cells. Calculation cells initially display either "0.0000" or "#DIV/0!".
If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property.

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		BH1	WS1	WS2	WS3	WS4	WS5	WS6	SA1	SA2
Ref. 1		0.05	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00
Ref. 2			0.30	0.30	0.30	0.30	0.40	0.30	0.20	0.20
Date		17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25	20-Mar-23	20-Mar-23
POPs Dioxins and Furans Input Total Dioxins and Furans **OR** individual Dioxin and Furan results.										
2,3,7,8-TeCDD	mg/kg									
1,2,3,7,8-PeCDD	mg/kg									
1,2,3,4,7,8-HxCDD	mg/kg									
1,2,3,6,7,8-HxCDD	mg/kg									
1,2,3,7,8,9-HxCDD	mg/kg									
1,2,3,4,6,7,8-HpCDD	mg/kg									
OCDD	mg/kg									
2,3,7,8-TeCDF	mg/kg									
1,2,3,7,8-PeCDF	mg/kg									
2,3,4,7,8-PeCDF	mg/kg									
1,2,3,4,7,8-HxCDF	mg/kg									
1,2,3,6,7,8-HxCDF	mg/kg									
2,3,4,6,7,8-HxCDF	mg/kg									
1,2,3,7,8,9-HxCDF	mg/kg									
1,2,3,4,6,7,8-HpCDF	mg/kg									
1,2,3,4,7,8,9-HpCDF	mg/kg									
OCDF	mg/kg									
Total Dioxins and Furans	mg/kg									
Some Pesticides (POPs unless otherwise stated)										
Aldrin	mg/kg									
α Hexachlorocyclohexane (alpha-HCH) *(leave empty if total HCH results used)*	mg/kg									
δ Hexachlorocyclohexane (beta-HCH) *(leave empty if total HCH results used)*	mg/kg									
α Cis-Chlordane (alpha) ***OR*** *Total Chlordane*	mg/kg									
δ Hexachlorocyclohexane (delta-HCH) *(leave empty if total HCH results used)*	mg/kg									
Dieldrin	mg/kg									
Endrin	mg/kg									
γ Hexachlorocyclohexane (gamma-HCH) (lindane) ***OR*** *Total HCH*	mg/kg									
Heptachlor	mg/kg									
Hexachlorobenzene	mg/kg									
o,p'-DDT *(leave empty if total DDT results used)*	mg/kg									
p,p'-DDT ***OR*** *Total DDT*	mg/kg									
χ Trans-Chlordane (gamma) *(leave empty if total Chlordane results used)*	mg/kg									
Chlordecone (kepone)	mg/kg									
Pentachlorobenzene	mg/kg									
Mirex	mg/kg									
Toxaphene (camphechlor)	mg/kg									
Tin										
Tin *(leave empty if Organotin and Tin excl Organotin results used)*	mg/kg									
Organotin										
Dibutyltin; DiBT	mg/kg									
Tributyltin; TriBT	mg/kg									
Triphenyltin; TriPT	mg/kg									
Tetrabutyltin; TeBT	mg/kg									
Tin excluding Organotin										
Tin excl Organotin	mg/kg									

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Please enter available data in the rows associated with the test (grey) cells. Calculation cells initially display either "0.0000" or "#DIV/0!".
If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property.

52511 Gravesham Leisure Centre	BH1	WS1	WS2	WS3	WS4	WS5	WS6	SA1	SA2
Ref. 1	0.05	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00
Ref. 2		0.30	0.30	0.30	0.30	0.40	0.30	0.20	0.20
Date	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25	20-Mar-23	20-Mar-23

Asbestos in Soil	Thresholds									
Asbestos detected in Soil (enter Y or N)	Y	N	N	N	N	N	N	N	N	N
		If Asbestos in Soil above is "Y", the soil is Hazardous Waste HP5 and HP7								
Asbestos % Composition in Soil (Matrix Loose Fibres or Microscopic Identifiable Pieces only)	see "Carc HP7 % Asbestos in Soil (Fibres)" below	%								
Carcinogenic HP7 % Asbestos in Soil (fibres or micro pieces) *Please be advised, if the calculation cell is "0.00000" DOES NOT MEAN asbestos testing has been undertaken and the result is zero.*	≥0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		If Asbestos in Soil above is "Y", but Asbestos % above is "<0.1%", the soil is Non Hazardous Waste. You can only use Asbestos % results where loose fibres or micro pieces are only present. You cannot use Asbestos % results when visual identifiable pieces are present.								
Asbestos Identifiable Pieces visible with the naked eye detected in the Soil (enter Y or N)	Y									
		If visual identifiable pieces of asbestos are present, you cannot use Asbestos % results and the whole soil sample is Hazardous Waste HP5 and HP7 Construction material containing Asbestos 17 06 05. Therefore, if Asbestos in Soil above is "Y", the Asbestos % above is "<0.1%", but the Asbestos Identifiable Pieces visible with the naked eye is "Y", the soil is Hazardous Waste.								
		Identifiable Pieces are Cement, Fragments, Board, Rope etc. ie anything ACM that is not Loose Fibres.								
		All visual asbestos pieces need to be removed leaving only fibres (or micro pieces) with an Asbestos % Composition in Soil result of <0.1% for the soil to become non-hazardous waste.								

Hazardous Property	Thresholds	Cut Off Value	**If cells below turn yellow and the text turns red, the samples should be classified as Hazardous Waste.**								
Corrosive HP8	≥5%	<1%	#VALUE!	0.00618	0.00707	0.00679	0.00738	0.00497	0.00896	0.00582	#VALUE!
Irritant HP4	≥10%	<1%	#VALUE!	0.00571	0.00318	0.00207	0.00258	0.00324	0.00656	0.00940	#VALUE!
Irritant HP4	≥20%	<1%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.00428	#VALUE!	0.01565	0.01567
Specifc Target Organ Toxicity HP5	≥1%		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Specifc Target Organ Toxicity HP5	≥20%		0.00000	0.00001	0.00001	0.00001	0.00001	0.00003	0.00004	0.00052	0.00077
Specifc Target Organ Toxicity HP5	≥1%		0.00192	0.00566	0.00614	0.00653	0.00672	0.00365	0.00787	0.00614	0.00673
Specifc Target Organ Toxicity HP5	≥10%		#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Aspiration Toxicity HP5	≥10%		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.03337	0.14446
Acute Toxicity HP6	≥0.1%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.25%	<0.1%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.00086	0.00134	#VALUE!
Acute Toxicity HP6	≥5%	<0.1%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Acute Toxicity HP6	≥25%	<1%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.02575	0.01696
Acute Toxicity HP6	≥0.25%	<0.1%	0.00018	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.00007	0.00019	0.00013
Acute Toxicity HP6	≥2.5%	<0.1%	0.00192	0.00499	0.00614	0.00653	0.00672	0.00365	0.00787	0.00467	0.00356
Acute Toxicity HP6	≥15%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥55%	<1%	0.00007	0.00017	0.00010	0.00009	0.00011	0.00007	0.00134	0.00021	0.00006
Acute Toxicity HP6	≥0.1%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.5%	<0.1%	0.00217	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.00928	0.00507	0.00375
Acute Toxicity HP6	≥3.5%	<0.1%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Acute Toxicity HP6	≥22.5%	<1%	0.00190	0.01358	0.01250	0.01004	0.01087	0.00884	0.01723	0.02430	0.01472
Carcinogenic HP7	≥0.1%		#VALUE!	0.00566	0.00614	0.00653	0.00672	0.00470	0.00787	0.03337	#VALUE!
Carcinogenic HP7	≥0.1%		0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
Carcinogenic HP7	≥1%		0.00000	0.00002	0.00001	0.00001	0.00000	0.00003	0.00001	0.00015	0.00027
Carcinogenic HP7 Unknown TPH with ID	≥1,000mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carcinogenic HP7 b(a)p marker test (Unknown TPH with ID only) Cell only applicable if TPH >1,000mg/kg	≥0.01%		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
pH Corrosive HP8 pH (soil or leachate)	H8 ≥11.0		9.49	8.19	7.86	8.09	8.07	8.02	8.10	8.64	8.91
pH Corrosive HP8 pH (soil or leachate)	H8 ≤2		9.49	8.19	7.86	8.09	8.07	8.02	8.10	8.64	8.91
Toxic for Reproduction HP10	≥0.3%		0.00081	0.00566	0.00600	0.00480	0.00505	0.00470	0.00667	0.00691	0.00673
Toxic for Reproduction HP10	≥5%		0.00192	0.00499	0.00614	0.00653	0.00672	0.00365	0.00787	0.03337	0.14446
Mutagenic HP11	≥0.1%		0.00192	0.00499	0.00614	0.00653	0.00672	0.00365	0.00787	0.03337	0.14446
Mutagenic HP11 Unknown TPH with ID	≥1,000mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mutagenic HP11 b(a)p marker test (Unknown TPH with ID only) Cell only applicable if TPH >1,000mg/kg	≥0.01%		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Mutagenic HP11	≥1%		0.00081	0.00566	0.00424	0.00343	0.00505	0.00222	0.00667	0.00614	0.00673
Produces Toxic Gases HP12 Sulphide	≥1,400mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Produces Toxic Gases HP12 Cyanide	≥1,200mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Produces Toxic Gases HP12 Thiocyanate	≥2,600mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HP13 Sensitising	≥10%		0.00192	0.00566	0.00614	0.00653	0.00672	0.00365	0.00787	0.00614	0.00673

Table 3 of the CLP, CL Inventory, ATPs, IARC, Concawe, MSDSs, REACH + Pesticide Properties databases. Worst case REACH + MSDS's used for *** STOT + Acute Toxicity.

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If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property.

52511 Gravesham Leisure Centre

	BH1	WS1	WS2	WS3	WS4	WS5	WS6	SA1	SA2
Ref. 1	0.05	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00
Ref. 2		0.30	0.30	0.30	0.30	0.40	0.30	0.20	0.20
Date	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25	20-Mar-23	20-Mar-23
Ecotoxic HP14 amended v6	≥25%	<0.1%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Ecotoxic HP14 amended v6	≥25%	<0.1% (except Be, V, Te, Tl, Petrol, Diesel, Crude Oil, Kerosene, White Spirit, Creosote, TPH, TPHCWG, Phenol, Cresols, Xylenols, T-Phenols, CompCN, Thiocyanate, Toluene, Ethylbenzene, Xylene + BTEX 1%).	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Ecotoxic HP14 amended v6	≥25%	<0.1% (except Be, V, Te, Tl, Petrol, Diesel, Crude Oil, Kerosene, White Spirit, Creosote, TPH, TPHCWG, Phenol, Cresols, Xylenols, T-Phenols, CompCN, Thiocyanate, Toluene, Ethylbenzene, Xylene + BTEX 1%).	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Persistent Organic Pollutant (PCB, PBB or POP Pesticides)	>0.005%		0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
Persistent Organic Pollutant (Total Dioxins+Furans)	>0.0000015%		0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000
Persistent Organic Pollutant (Individual Dioxins+Furans)	>0.0000015%		0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000

- dermal contact with soil both indoors and outdoors
- indoor air inhalation from soil and vapour and outdoor inhalation of soil and vapour.

With respect to volatilisation, the CLEA model assumes a simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase[9]. The upper boundaries of this partitioning are represented by the maximum aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA model estimates saturated soil concentrations where these limits are reached[9]. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous- or vapour-based soil saturation limits. Model output cells are flagged red where the saturated soil concentration has been exceeded and the contribution of the indoor and outdoor vapour pathway to total exposure is greater than 10%. In this case, further consideration of the following is required[9]:

- Free phase contamination may be present.
- Exposure from the vapour pathways will be over-predicted by the model, as in reality the vapour phase concentration will not increase at concentrations above saturation limits
- Where the vapour pathway contribution is greater than 90%, it is unlikely the relevant health criteria value (HCV) will be exceeded at soil concentrations at least a factor of ten higher than the relevant HCV.

Where the vapour pathway is the predominant pathway (contributes greater than 90% of exposure) or the only exposure route considered and the cell is highlighted red (SAC exceeds saturation limit), the risk based on the assumed conceptual model is likely to be negligible as the vapour risk is assumed to be tolerable at maximum possible soil concentrations. In such circumstances, the vapour pathway exposure should be considered based on the presence of free phase or non-aqueous phase liquid sources and the measured concentrations of volatile organic compounds (VOC) in the vapour phase. Screening could be considered based on setting the SAC as the modelled soil saturation limits. However, as stated within the CLEA handbook[9], this is likely to not be practical in many cases because of the very low saturation limits and, in any case, is highly conservative.

It should also be noted that for mixtures of compounds, free phase may be present where soil (or groundwater) concentrations are well below saturation limits for individual compounds.

Where the vapour pathway is only one of the exposure pathways considered, an additional approach can then be utilised as detailed within Section 4.12 of the CLEA model handbook[9], which explains how to calculate an effective assessment criterion manually.

SR3[5] states that, as a general rule of thumb, it is recognised that estimating vapour phase concentrations from dissolved and sorbed phase contamination by petroleum hydrocarbons are at least a factor of ten higher than those likely to be measured on-site. RSK has therefore applied an empirical subsurface to indoor air correction factor of 10 into the CLEA model chemical database for all petroleum hydrocarbon fractions (including BTEX, trimethylbenzenes and the polycyclic aromatic hydrocarbons (PAH) naphthalene, acenaphthene and acenaphthylene) to reduce this conservatism.

Input selection

The most up-to-date published chemical and toxicological data was obtained from EA Report SC050021/SR7[10], the EA TOX[1] reports, the C4SL SP1010 project report and associated chemical specific reports[3,6], the 2015 LQM/CIEH report[7] or the USEPA IRIS database[14]. Where a LLTC[3,6] has been published for a substance, RSK has used these input parameters to derive the RSK GAC. Toxicological and specific chemical parameters for 1,2,4-trimethylbenzene, barium, methyl tertiary-butyl ether (MTBE), 1,1,2-trichlorethane, 1,1-dichloroethene, 1,2-dichloropropane, 2-chloronaphthalene, chloroethane, chloromethane, cis 1,2-dichloroethene, dichloromethane, hexachloroethane and trans 1,2-dichloroethene were obtained from the CL:AIRE Soil Generic Assessment Criteria report[11].

For TPH, aromatic hydrocarbons C_5–C_8 were not modelled, as this range comprises benzene (>EC5-EC7) and toluene (>EC7-EC8), which are modelled separately.

Physical parameters

For the commercial end use, the CLEA default pre-1970s three-storey office building was used. SR3[5] notes this commercial building type to be the most conservative in terms of protection from vapour intrusion. The default input building parameters presented in Table 3.10 of SR3[5] have been used.

The parameters for a sandy loam soil type were used in line with Table 4.4 of SR3[5]. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for this SOM, RSK has produced an additional set of GAC for SOM of 1% and 2.5% for all substances using the CLEA tool.

Summary of modifications to the default CLEA SR3[5] input parameters for a commercial land use

In summary, the RSK commercial GAC were produced using the default input parameters for soil properties, the air dispersion model, building properties and the vapour model detailed in SR3[5]. Modifications to the default SR3[5] exposure scenarios based on the C4SL exposure scenarios[3] are presented in Table 2 below. The sole modification to the default commercial input parameters is the updated inhalation rate.

The final selected GAC are presented by pathway in Table 3 with the combined GAC in Table 4.

Figure 1: Conceptual model for CLEA commercial scenario

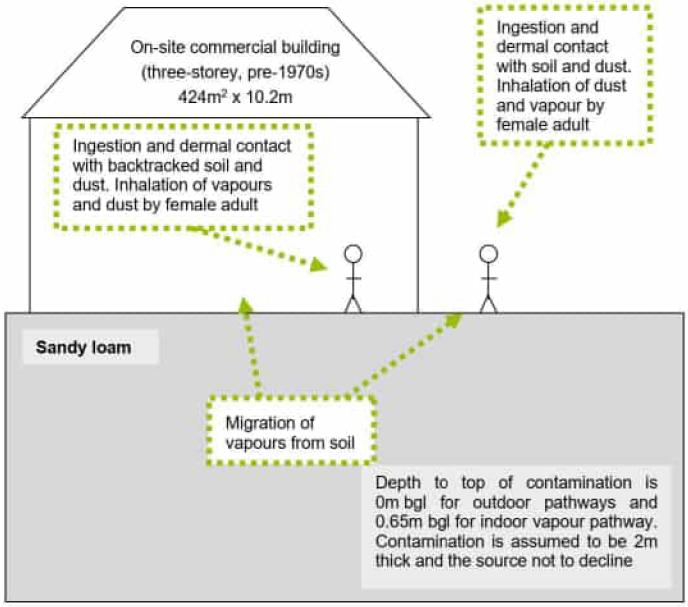


Table 1: Exposure assessment parameters for commercial scenario – inputs for CLEA model

Parameter	Value	Justification
Land use	Commercial	Chosen land use
Receptor	Female worker	Taken as female adult exposed over 49 years from age 16 to 65 years, Box 3.5, SR3[5]
Building	Office (pre-1970)	Key generic assumption given in Box 3.5, SR3[5]. Pre-1970s three-storey office building chosen as it is the most conservative in terms of protection from vapour intrusion (Section 3.4.6, SR3[5])
Soil type	Sandy loam	Most common UK soil type (Section 4.3.1, Table 4.4, SR3[5])
Start age class (AC)	17	AC corresponding to key generic assumption that the critical receptor is a working female adult exposed over a 49-year period from age 16 to 65 years. Assumption given in Box 3.5, SR3[5]
End AC	17	
SOM (%)	6	Representative of sandy loam according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents'[13]
	1	To provide SAC for sites where SOM < 6% as often observed by RSK
	2.5	
pH	7	Model default

Table 2: Commercial – modified receptor inputs

Parameter	Unit	Value	Justification
Inhalation rate (AC17)	m^3 day^{-1}	15.7	Mean value USEPA, 2011[12]; Table 3.2, SP1010[3]

References

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GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - COMMERCIAL

Table 3

Human health generic assessment criteria by pathway for commercial scenario

Compound	Notes	SAC appropriate to pathway SOM 1% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 2.5% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 6% (mg/kg)			Soil saturation limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Metals													
Arsenic	(a,b)	6.35E+02	1.25E+03	NR	NR	6.35E+02	1.25E+03	NR	NR	6.35E+02	1.25E+03	NR	NR
Barium	(b)	2.21E+04	NR	NR	NR	2.21E+04	NR	NR	NR	2.21E+04	NR	NR	NR
Beryllium		3.97E+03	1.17E+01	NR	NR	3.97E+03	1.17E+01	NR	NR	3.97E+03	1.17E+01	NR	NR
Boron		2.38E+05	2.82E+07	NR	NR	2.38E+05	2.82E+07	NR	NR	2.38E+05	2.82E+07	NR	NR
Cadmium	(a)	7.73E+02	8.57E+02	4.10E+02	NR	7.73E+02	8.57E+02	4.10E+02	NR	7.73E+02	8.57E+02	4.10E+02	NR
Chromium (III) - trivalent	(c)	3.31E+05	8.57E+03	NR	NR	3.31E+05	8.57E+03	NR	NR	3.31E+05	8.57E+03	NR	NR
Chromium (VI) - hexavalent	(a,d)	9.62E+02	4.91E+01	NR	NR	9.62E+02	4.91E+01	NR	NR	9.62E+02	4.91E+01	NR	NR
Copper		1.89E+05	8.96E+04	6.83E+04	NR	1.89E+05	8.96E+04	6.83E+04	NR	1.89E+05	8.96E+04	6.83E+04	NR
Lead	(a)	2.53E+03	NR	NR	NR	2.53E+03	NR	NR	NR	2.53E+03	NR	NR	NR
Elemental Mercury (Hg^0)	(d)	NR	1.54E+01	NR	4.31E+00	NR	3.36E+01	NR	1.07E+01	NR	5.80E+01	NR	2.58E+01
Inorganic Mercury (Hg^{2+})		1.18E+03	1.97E+04	1.12E+03	NR	1.18E+03	1.97E+04	1.12E+03	NR	1.18E+03	1.97E+04	1.12E+03	NR
Methyl Mercury (Hg^{2+})		3.38E+02	2.15E+03	2.92E+02	7.33E+01	3.38E+02	3.67E+03	3.11E+02	1.42E+02	3.38E+02	7.33E+03	3.23E+02	3.04E+02
Nickel	(d)	3.06E+03	9.83E+02	NR	NR	3.06E+03	9.83E+02	NR	NR	3.06E+03	9.83E+02	NR	NR
Selenium	(b)	1.23E+04	NR	NR	NR	1.23E+04	NR	NR	NR	1.23E+04	NR	NR	NR
Vanadium		2.15E+04	9.03E+03	NR	NR	2.15E+04	9.03E+03	NR	NR	2.15E+04	9.03E+03	NR	NR
Zinc	(b)	7.39E+05	1.97E+06	NR	NR	7.39E+05	1.97E+06	NR	NR	7.39E+05	1.97E+06	NR	NR
Cadmium (free)		6.56E+02	7.54E+04	6.53E+02	NR	6.56E+02	7.54E+04	6.53E+02	NR	6.56E+02	7.54E+04	6.53E+02	NR
Volatile Organic Compounds													
Benzene	(a)	1.08E+03	2.72E+01	2.72E+01	1.23E+03	1.09E+03	5.19E+01	4.36E+01	2.26E+03	1.09E+03	1.09E+02	9.80E+01	4.71E+03
Toluene		4.24E+05	6.49E+04	5.63E+04	8.69E+02	4.24E+05	1.43E+05	1.07E+05	1.92E+03	4.24E+05	3.24E+05	1.84E+05	4.36E+03
Ethylbenzene		1.91E+05	5.89E+03	5.71E+03	5.19E+02	1.91E+05	1.39E+04	1.29E+04	1.22E+03	1.91E+05	3.21E+04	2.75E+04	2.84E+03
Xylene - m		3.43E+05	6.26E+03	6.16E+03	6.26E+02	3.43E+05	1.47E+04	1.41E+04	1.47E+03	3.43E+05	3.44E+04	3.12E+04	3.46E+03
Xylene - o		3.43E+05	6.73E+03	6.60E+03	4.78E+02	3.43E+05	1.57E+04	1.50E+04	1.12E+03	3.43E+05	3.66E+04	3.30E+04	2.62E+03
Xylene - p		3.43E+05	6.03E+03	5.92E+03	5.76E+02	3.43E+05	1.41E+04	1.36E+04	1.35E+03	3.43E+05	3.28E+04	3.00E+04	3.17E+03
Total xylene		3.43E+05	6.03E+03	5.92E+03	6.25E+02	3.43E+05	1.41E+04	1.36E+04	1.47E+03	3.43E+05	3.28E+04	3.00E+04	3.46E+03
Methyl tertiary-Butyl ether (MTBE)		5.73E+05	7.58E+03	7.48E+03	2.04E-04	5.73E+05	1.23E+04	1.21E+04	3.31E+04	5.73E+05	2.34E+04	2.23E+04	5.27E+04
1,1,1,2-Tetrachloroethane		1.10E+04	1.09E+02	1.08E+02	2.60E+03	1.10E+04	2.53E+02	2.47E+02	6.02E+03	1.10E+04	3.88E+03	3.59E+02	1.40E+04
1,1,2,2-Tetrachloroethane		1.10E+04	2.61E+02	2.74E+02	2.67E+03	1.10E+04	5.75E+02	5.49E+02	5.46E+03	1.10E+04	1.26E+03	1.12E+03	1.20E+04
1,1,1-Trichloroethane		1.14E+06	9.60E+02	8.60E+02	1.43E+03	1.14E+06	1.35E+03	1.35E+03	2.92E+03	1.14E+06	2.96E+03	2.95E+03	6.39E+03
1,1,2 Trichloroethane		7.62E+03	3.92E+01	8.91E+01	4.03E+03	7.62E+03	1.84E+02	1.80E+02	8.21E+03	7.62E+03	4.02E+02	3.82E+02	1.80E+04
1,1-Dichloroethene		8.76E+04	2.43E+01	2.43E+01	2.23E+03	8.76E+04	4.36E+01	4.36E+01	3.96E+03	8.76E+04	8.68E+01	8.67E+01	7.94E+03
1,2-Dichloroethane		2.29E+02	6.73E-01	6.71E-01	3.41E+03	2.29E+02	9.71E-01	9.67E-01	4.91E+03	2.29E+02	1.67E+00	1.66E+00	8.43E+03
1,2,4-Trimethylbenzene		NR	3.29E+02	NR	4.74E+02	NR	8.41E+02	NR	1.16E+03	NR	1.64E+03	NR	2.76E+03
1,3,5-Trimethylbenzene	(e)	NR	NR	NR	2.30E+02	NR	NR	NR	5.52E+02	NR	NR	NR	1.30E+03
1,2-Dichloropropane		2.57E+04	3.14E+00	3.13E+00	1.19E+03	2.57E+04	8.54E+00	8.54E+00	2.11E+03	2.57E+04	1.11E+01	1.11E+01	4.24E+03
Carbon Tetrachloride (tetrachloromethane)		7.62E+03	2.87E+00	2.87E+00	1.52E+03	7.62E+03	8.29E+00	8.29E+00	3.32E+03	7.62E+03	1.43E+01	1.42E+01	7.54E+03
Chloromethane		NR	9.03E+02	NR	2.61E+03	NR	1.22E+03	NR	3.54E+03	NR	1.97E+03	NR	5.71E+03
Chloromethane		NR	9.84E-01	NR	1.91E+03	NR	1.11E+00	NR	2.24E+03	NR	1.48E+00	NR	2.99E+03
Cis 1,2 Dichloroethene		1.36E+01	NR	NR	3.94E+03	2.29E+01	NR	NR	6.61E+03	4.44E+01	NR	NR	1.29E+04
Dichloromethane		9.04E+03	2.63E+02	2.57E+02	7.27E+03	9.04E+03	3.00E+02	2.99E+02	9.68E+03	9.04E+03	5.39E+02	5.39E+02	1.53E+04
Tetrachloroethene (PCE)		2.67E+04	2.45E+01	2.44E+01	4.24E+02	2.67E+04	5.49E+01	5.48E+01	9.51E+02	2.67E+04	1.26E+02	1.26E+02	2.19E+03
Trans 1,2 Dichloroethene		3.23E+04	2.07E+01	NR	3.42E+03	3.23E+04	3.74E+01	NR	5.17E+03	3.23E+04	7.63E+01	NR	1.25E+04
Trichloroethene (TCE)		7.39E-01	2.59E+00	NR	1.54E+03	1.53E+00	5.43E+00	NR	3.22E+03	3.98E+00	1.25E+01	NR	7.14E+03
Vinyl Chloride (chloroethene)		1.19E+02	1.13E+00	1.12E+00	1.36E+03	1.19E+02	1.46E+00	1.45E+00	1.76E+03	1.19E+02	2.24E+00	2.20E+00	2.69E+03
Semi-Volatile Organic Compounds													
2-Chloronaphthalene		1.53E+05	3.71E+02	3.70E+02	1.14E+02	1.53E+05	9.07E+02	9.03E+02	2.80E+02	1.53E+05	2.10E+03	2.10E+03	6.69E+02
Acenaphthene		1.10E+05	2.75E+05	1.08E+05	5.76E+01	1.10E+05	5.36E+05	1.08E+05	1.41E+02	1.10E+05	6.85E+05	1.08E+05	3.38E+02

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - COMMERCIAL

Table 3

Human health generic assessment criteria by pathway for commercial scenario

Compound	Notes	SAC appropriate to pathway SOM 1% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 2.5% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 6% (mg/kg)			Soil saturation limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Acenaphthylene		1.10E+05	2.68E+06	1.05E+05	8.61E+01	1.10E+05	5.23E+06	1.07E+05	2.12E+02	1.10E+05	8.65E+06	1.08E+05	5.06E+02
Anthracene		5.49E+05	1.13E+07	5.23E+05	1.17E+00	5.49E+05	2.36E+07	5.36E+05	2.91E+00	5.49E+05	4.13E+07	5.42E+05	6.96E+00
Benzo(a)anthracene		2.84E+02	4.58E+02	1.67E+02	1.71E+00	2.84E+02	4.47E+02	1.74E+02	4.28E+00	2.84E+02	4.67E+02	1.76E+02	1.03E+01
Benzo(a)pyrene	(a)	7.68E+01	2.04E+02	5.59E+01	9.11E-01	7.68E+01	2.09E+02	5.61E+01	2.28E+00	7.68E+01	2.11E+02	5.63E+01	5.46E+00
Benzo(b)fluoranthene		7.13E+01	1.17E+02	4.43E+01	1.22E+00	7.13E+01	1.20E+02	4.47E+01	3.04E+00	7.13E+01	1.21E+02	4.49E+01	7.29E+00
Benzo(g,h,i)perylene		6.29E+03	1.05E+04	3.93E+03	1.54E-02	6.29E+03	1.06E+04	3.95E+03	3.85E-02	6.29E+03	1.07E+04	3.96E+03	9.23E-02
Benzo(k)fluoranthene		1.88E+03	3.11E+03	1.17E+03	6.87E-01	1.88E+03	3.17E+03	1.18E+03	1.72E+00	1.88E+03	3.21E+03	1.19E+03	4.12E+00
Chrysene		5.67E+02	8.89E+02	3.46E+02	4.40E-01	5.67E+02	9.25E+02	3.52E+02	1.10E+00	5.67E+02	9.47E+02	3.55E+02	2.64E+00
Dibenzo(a,h)anthracene		5.67E+00	9.32E+00	3.33E+00	3.93E-03	5.67E+00	9.52E+00	3.50E+00	9.82E-03	5.67E+00	9.84E+00	3.57E+00	2.36E-02
Fluoranthene		2.29E+04	1.89E+06	2.26E+04	1.89E+01	2.29E+04	2.72E+06	2.27E+04	4.73E+01	2.29E+04	3.32E+06	2.27E+04	1.13E+02
Fluorene		7.31E+04	4.55E+05	6.36E+04	3.09E+01	7.31E+04	1.06E+06	6.84E+04	7.65E+01	7.31E+04	2.24E+06	7.08E+04	1.83E+02
Hexachloroethane		2.09E+01	NR	NR	8.17E+00	4.98E+01	NR	NR	2.01E+01	1.19E+02	NR	NR	4.81E+01
Indeno(1,2,3-cd)pyrene		8.10E+02	1.31E+03	5.01E+02	6.13E-02	8.10E+02	1.35E+03	5.06E+02	1.53E-01	8.10E+02	1.37E+03	5.09E+02	3.68E-01
Naphthalene		3.64E+04	1.87E+03	1.78E+03	7.64E+01	3.64E+04	4.39E+03	3.92E+03	1.83E+02	3.64E+04	9.94E+03	7.81E+03	4.32E+02
Phenanthrene		2.29E+04	5.35E+05	2.19E+04	3.60E+01	2.29E+04	1.00E+06	2.24E+04	8.96E+01	2.29E+04	1.86E+06	2.25E+04	2.14E+02
Pyrene		5.49E+04	4.47E+06	5.42E+04	2.20E+00	5.49E+04	6.46E+06	5.44E+04	5.49E+00	5.49E+04	7.91E+06	5.49E+04	1.32E+01
Phenol		1.10E+06	2.65E+04	2.58E+04	2.42E+04	1.10E+06	3.04E+04	2.96E+04	3.81E+04	1.10E+06	3.46E+04	3.35E+04	7.03E+04
Total petroleum hydrocarbons													
Aliphatic hydrocarbons EC5-EC6		4.77E+06	3.19E+03	3.19E+03	3.04E+02	4.77E+06	5.86E+03	5.86E+03	5.98E+02	4.77E+06	1.21E+04	1.21E+04	1.15E+03
Aliphatic hydrocarbons >EC6-EC8		4.77E+06	7.79E+03	7.76E+03	1.44E+02	4.77E+06	1.74E+04	1.74E+04	3.22E+02	4.77E+06	3.97E+04	3.96E+04	7.06E+02
Aliphatic hydrocarbons >EC8-EC10		9.53E+04	2.02E+03	2.00E+03	7.77E+01	9.53E+04	4.91E+03	4.85E+03	1.90E+02	9.53E+04	1.17E+04	1.13E+04	4.51E+02
Aliphatic hydrocarbons >EC10-EC12		9.53E+04	9.97E+03	9.69E+03	4.75E+01	9.53E+04	2.47E+04	2.29E+04	1.18E+02	9.53E+04	5.89E+04	4.73E+04	2.83E+02
Aliphatic hydrocarbons >EC12-EC16		9.53E+04	8.26E+04	5.88E+04	2.37E+01	9.53E+04	2.04E+05	8.17E+04	5.91E+01	9.53E+04	4.81E+05	9.02E+04	1.42E+02
Aliphatic hydrocarbons >EC16-EC35	(b)	1.58E+06	NR	NR	8.48E+00	1.75E+06	NR	NR	2.12E+01	1.83E+06	NR	NR	5.09E+01
Aliphatic hydrocarbons >EC35-EC44	(b)	1.58E+06	NR	NR	8.48E+00	1.75E+06	NR	NR	2.12E+01	1.83E+06	NR	NR	5.09E+01
Aromatic hydrocarbons >EC8-EC10		3.81E+04	3.55E+03	3.46E+03	6.13E+02	3.81E+04	8.66E+03	8.11E+03	1.50E+03	3.81E+04	2.05E+04	1.70E+04	3.58E+03
Aromatic hydrocarbons >EC10-EC12		3.81E+04	1.92E+04	1.62E+04	3.64E+02	3.81E+04	4.69E+04	2.73E+04	8.99E+02	3.81E+04	1.10E+05	3.42E+04	2.15E+03
Aromatic hydrocarbons >EC12-EC16		3.81E+04	2.02E+05	3.62E+04	1.69E+02	3.81E+04	4.76E+05	3.73E+04	4.19E+02	3.81E+04	1.03E+06	3.78E+04	1.00E+03
Aromatic hydrocarbons >EC16-EC21	(b)	2.82E+04	NR	NR	5.37E+01	2.83E+04	NR	NR	1.34E+02	2.84E+04	NR	NR	3.21E+02
Aromatic hydrocarbons >EC21-EC35	(b)	2.84E+04	NR	NR	4.83E+00	2.84E+04	NR	NR	1.21E+01	2.84E+04	NR	NR	2.90E+01
Aromatic hydrocarbons >EC35-EC44	(b)	2.84E+04	NR	NR	4.83E+00	2.84E+04	NR	NR	1.21E+01	2.84E+04	NR	NR	2.90E+01

Notes:

EC - equivalent carbon; GrAC - groundwater screening value; SAC - soil screening value.

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded.

Calculated SAC exceeds soil saturation limit and may significantly affect the interpretation of any exceedances as the contribution of the indoor and outdoor vapour pathway to total exposure is >10%.

Calculated SAC exceeds soil saturation limit but the exceedance will not affect the SAC significantly as the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.

Calculated SAC does not exceed the soil saturation limit.

The SAC for organic compounds are dependant upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, PAHs naphtalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway (Section 10.1.1, SR3)

(a) SAC for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead are derived using the C4SL toxicology data

(b) SAC for barium and selenium should not include the inhalation pathway as no expert group HCV has been derived; aliphatic and aromatic hydrocarbons >EC16 should not include inhalation pathway due to their non-volatile nature and inhalation exposure being minimal (oral, dermal and inhalation exposure is compared to the oral HCV); arsenic should only be based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report. The Oral SAC should be adopted for zinc and benzo(a)pyrene.

(c) SAC for CIII should be based on the lower of the oral and inhalation SAC (see LQM/CIEH 2015 Section 6.8)

(d) SAC for elemental mercury, chromium VI and nickel should be based on the inhalation pathway only.

(e) SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4 trimethylbenzene may be used.