



Windowless Sample Log

Borehole No.

WS1

Sheet 1 of 1

Project Name: Thongsbridge Mills

Project No.
MSD/01

Co-ords: -

Date
10/08/2018

Location: Thongsbridge

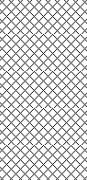
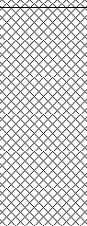
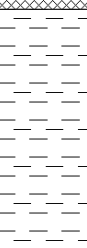
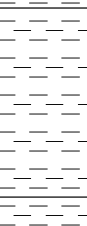
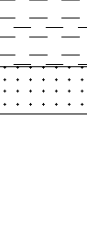
Level:

Scale
1:40

Client: Mr S Marsden

Rig Crew:

Logged:
AMJ

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.50 - 0.70	ES					MADE GROUND: Orange brown slightly clayey sandy, gravel and cobbles of sandstone.	
		1.20 - 1.40	ES		1.00			MADE GROUND: Soft, brown and orange, sandy to very sandy clay with occasional cobble sized fragments of sandstone and brick	1
		2.50 - 2.70	D	HVP=12	2.20			Very soft (very low strength) dark grey very silty CLAY. (Alluvium)	2
		3.00	SPT	N=4 (0,0/1,0,0,3)					3
		3.50		HVP=10	3.50			Soft orange brown sandy gravelly CLAY. Gravel is medium to coarse subrounded to subangular of sandstone and mudstone. (Alluvium)	4
					4.50			Light grey sandy gravelly CLAY. Gravel is medium to coarse subrounded to subangular of sandstone. (Alluvium)	
					5.00			Weak yellow grey fine grained SANDSTONE	5
					5.25			End of Borehole at 5.250m	
									6
									7
									8

Groundwater: No groundwater encountered

Backfill: Backfilled with arisings upon completion

Remarks: None

 ARP Geotechnical Limited				Windowless Sample Log				Borehole No. WS3 Sheet 1 of 1	
Project Name: Thongsbridge Mills				Project No. MSD/01		Co-ords: -		Date 10/08/2018	
Location: Thongsbridge						Level:		Scale 1:40	
Client: Mr S Marsden						Rig Crew:		Logged: AMJ	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20 - 0.30	ES				MADE GROUND: Medium dense gravel and cobbles of sandstone in an orange brown, slightly clayey sand matrix		
		0.50 - 0.70	ES						
		1.00	SPT	N=30 (4,4/4,4,10,12)					1
		2.00	SPT	N=15 (6,11/6,3,3,3)					2
					2.50				
					3.45			Soft dark grey very silty CLAY. (Alluvium)	3
								End of Borehole at 3.450m	4
									5
									6
									7
									8

Groundwater: No groundwater encountered
 Backfill: Backfilled with arisings upon completion
 Remarks: None

RrWS_v1.054



Windowless Sample Log

Borehole No.

WS4

Sheet 1 of 1

Project Name: Thongsbridge Mills

Project No.
MSD/01

Co-ords: -

Date
10/08/2018

Location: Thongsbridge

Level:

Scale
1:40

Client: Mr S Marsden

Rig Crew:

Logged:
AMJ

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30 - 0.50	ES					MADE GROUND: Medium dense orange brown, slightly clayey sandy gravel and cobbles of sandstone.	
		1.00	SPT	N=37 (4,5/13,8,8,8)					1
		2.00	SPT	N=18 (12,8/7,4,4,3)					2
		3.00	SPT	N=21 (4,3/6,5,5,5)					3
		3.60 - 3.80	D		3.50			MADE GROUND: Dense dark grey sandy gravelly clay including fragments of brick and sandstone cobbles.	4
		4.00	SPT	N=48 (9,11/17,11,10,10)	4.60				
		5.00	SPT	50 (14,13/24,26,,)	5.30			Very weak dark grey MUDSTONE	5
								End of Borehole at 5.300m	6
									7
									8

Groundwater: No groundwater encountered

Backfill: Gas well installed. Plain pipe and bentonite from ground level to 1.0m and slotted pipe and gravel from 1.0m to 3.0m depth

Remarks: None

ARP ARP Geotechnical Limited					Windowless Sample Log				Borehole No. WS5 Sheet 1 of 1	
Project Name: Thongsbridge Mills					Project No. MSD/01		Co-ords: -		Date 10/08/2018	
Location: Thongsbridge							Level:		Scale 1:40	
Client: Mr S Marsden							Rig Crew:		Logged: AMJ	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.10 - 0.30			0.40			MADE GROUND: yellow brown clayey sand with cobbles of sandstone.	1 2 3 4 5 6 7 8	
					0.80			MADE GROUND: yellow brown sandy clay with fragments of brick and cobbles of sandstone		
					0.90			Weak light brown yellow SANDSTONE.		
								End of Borehole at 0.900m		
Groundwater: No groundwater encountered Backfill: Backfilled with arisings upon completion Remarks: None										
RrWS_v1.054										



ARP Geotechnical
Limited

Windowless Sample Log

Borehole No.

WS6

Sheet 1 of 1

Project Name: Thongsbridge Mills

Project No.
MSD/01

Co-ords: -

Date
10/08/2018

Location: Thongsbridge

Level:

Scale
1:40

Client: Mr S Marsden

Rig Crew:

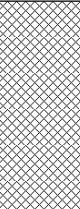
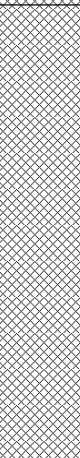
Logged:
AMJ

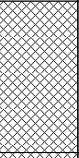
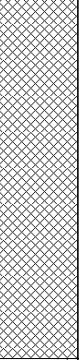
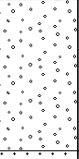
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30 - 0.50	ES					MADE GROUND: Gravel and cobbles of sandstone in an orange brown, slightly clayey sand matrix	
		1.00	SPT	50 (21,15/26,24,,)	1.00			Weak yellow buff SANDSTONE	1
					1.30			End of Borehole at 1.300m	
									2
									3
									4
									5
									6
									7
									8

Groundwater: No groundwater encountered

Backfill: Gas well installed. Plain pipe and bentonite from ground level to 0.5m and slotted pipe and gravel from 0.5m to 1.0m depth

Remarks: None

ARP ARP Geotechnical Limited				Trial Pit Log				TrialPit No A3 Sheet 1 of 1		
Project Name: Thongsbridge Mills				Project No. MSD/01		Co-ords: - Level:		Date 28/07/2005		
Location: Thongsbridge				Pit Dimensions (m) Length: m Width: m Depth: 2.20 m		Machine Type: JCB 3CX		Scale 1:25 Logged: JDQ		
Client: Mr S Marsden										
Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description				
Depth	Type	Results								
			0.70			MADE GROUND: Gravel, cobbles and boulders of sandstone in an orange brown, slightly clayey sand matrix				
			2.20			MADE GROUND: Brick, concrete, sandstone gravel and occasional glass in a grey, clayey sand matrix				
						End of Pit at 2.200m				
									1	
									2	
									3	
									4	
									5	
Groundwater: No groundwater was encountered										
Backfill: The pit was backfilled with arisings										
Stability: The excavation sides remained stable										
Remarks: None										
RrTP_v1.053										

 ARP Geotechnical Limited				Trial Pit Log				TrialPit No A4 Sheet 1 of 1	
Project Name: Thongsbridge Mills				Project No. MSD/01		Co-ords: - Level:		Date 28/07/2005	
Location: Thongsbridge				Pit Dimensions (m) Length: m Width: m Depth: 2.25 m		Machine Type: JCB 3CX		Scale 1:25 Logged: JDQ	
Client: Mr S Marsden									
Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
Depth	Type	Results							
			0.50			MADE GROUND: Gravel, cobbles and boulders of sandstone in an orange brown, slightly clayey sand matrix			
			1.70			MADE GROUND: Wood, brick and sandstone gravel in a dark grey, sandy matrix			
			2.20			Slightly clayey, sandy, cobbly, medium to coarse, angular, tabular, sandstone GRAVEL (weathered sandstone)			
			2.25			Strong, light brown, fine grained SANDSTONE End of Pit at 2.250m			
Groundwater: No groundwater encountered 1 Backfill: The pit was backfilled with arisings 2 Stability: The excavation sides remained stable 3 Remarks: None 4 RrTP_v1.053 5									

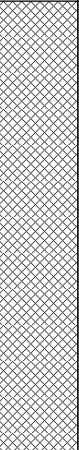
Date
28/07/2005

Logged:
JDQ

Depth: 0.50 m

[illegible]

RrTP_v1.053

 ARP Geotechnical Limited				Trial Pit Log				TrialPit No B4 Sheet 1 of 1				
Project Name: Thongsbridge Mills				Project No. MSD/01		Co-ords: - Level:		Date 28/07/2005				
Location: Thongsbridge						Pit Dimensions (m) Length: m Width: m Depth: 3.30 m		Machine Type: JCB 3CX				
Client: Mr S Marsden								Scale 1:25 Logged: JDQ				
Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description						
Depth	Type	Results										
			1.50			MADE GROUND: Soft, brown and orange, sandy to very sandy silt with occasional layers of soft, orange brown, sandy clay (reworked natural strata)				1		
						2.00		Soft, olive grey and orange brown, sandy, slightly gravelly CLAY. Gravel is medium to coarse and angular. (Alluvium)				
								Soft, grey, sandy, organic clay. (Alluvium)				
			3.30			<i>...from 2.7m; very sandy and gravelly. Gravel is medium to coarse, occasionally cobble size, and rounded to subangular</i>				3		
						End of Pit at 3.300m						
										4		
										5		

Groundwater: No groundwater was encountered
 Backfill: The pit was backfilled with arisings
 Stability: The excavation sides remained stable
 Remarks: None

RrTP_v1.053

Date
28/07/2005

Logged:
.IDQ

Depth: 1.75 m

Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth	Type	Results				
			0.50			Soft, brown and orange brown, sandy to very sandy SILT. (Alluvium)
						Firm, olive grey and orange brown, slightly sandy to sandy CLAY. (Alluvium)
			0.90			Soft, grey, sandy, very gravelly, moist organic CLAY. Gravel is medium to coarse, occasionally cobble size, and rounded to subangular. (Alluvium)
			1.75			End of Pit at 1.750m

Remarks: None

Date
28/07/2005

Logged:
.JDO

Depth: 1.95 m

[illegible]

Remarks: None

APPENDIX K

LABORATORY TEST CERTIFICATES AND SCREENING VALUES

Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 759719-1

Date of Report: 31-Aug-2018

Customer: ARP Associates and ARP Geotechnical
Ltd
5 & 6 Northwest Business Park
Servia Hill
Leeds
LS6 2QH

Customer Contact: Mr Andy Jones

Customer Job Reference: MSD/01

Customer Purchase Order: MSD/01

Customer Site Reference: Thongsbridge Mills

Date Job Received at Concept: 14-Aug-2018

Date Analysis Started: 15-Aug-2018

Date Analysis Completed: 31-Aug-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual



Report checked
and authorised by :
Zoe Gunter
Customer Service Advisor

Issued by :
Chloe Kitto
Customer Service Advisor

Concept Reference: 759719 Project Site: Thongsbridge Mills Customer Reference: MSD/01 Soil Analysed as Soil ARP Geotechnical Standard Suite									
Concept Reference				759719 001	759719 002	759719 003	759719 004	759719 005	
Customer Sample Reference				WS1	WS1	WS2	WS2	WS3	
Top Depth				0.50	1.20	0.50	1.00	0.20	
Bottom Depth				0.70	1.40	0.70	1.20	0.30	
Date Sampled				10-AUG-2018	10-AUG-2018	10-AUG-2018	10-AUG-2018	10-AUG-2018	
Matrix Class				Topsoil	Sandy Soil	Topsoil	Sandy Soil	Topsoil	
Determinand	Method	Test Sample	LOD	Units					
Arsenic	T6	M40	2	mg/kg	4	7	5	7	6
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	24	38	14	33	19
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	14	35	37	32	23
Lead	T6	M40	1	mg/kg	29	72	39	58	35
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	23	22	11	27	17
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	66	120	39	88	110
SO4(Total)	T6	A40	0.01	%	0.03	0.08	0.02	0.12	0.20
(Water Soluble) SO4 expressed as SO4	T242	A40	0.05	g/l	<0.05	0.07	<0.05	0.29	0.43
pH	T7	A40			4.5	7.6	7.5	6.9	7.6
Phenols(Mono)	T546	AR	1	mg/kg	<1	<1	<1	<1	<1
TPH (C8-C35)(Total)	T206	M105	1	mg/kg	(13) 5	(13) 44	(13) 300	(13) 63	(13) 27
Asbestos ID	T27	A40			N.D.	N.D.	N.D.	Chrysotile Loose Fibres Detected	N.D.
Soil Organic Matter	T287	A40	0.1	%	0.9	3.1	1.6	4.6	2.2

Concept Reference: 759719 Project Site: Thongsbridge Mills Customer Reference: MSD/01 Soil Analysed as Soil ARP Geotechnical Standard Suite									
Concept Reference				759719 006	759719 007	759719 008	759719 009	759719 010	
Customer Sample Reference				WS3	WS4	WS4	WS5	WS6	
Top Depth				0.50	0.30	3.60	0.10	0.30	
Bottom Depth				0.70	0.50	3.80	0.30	0.50	
Date Sampled				10-AUG-2018	10-AUG-2018	10-AUG-2018	10-AUG-2018	10-AUG-2018	
Matrix Class				Topsoil	Topsoil	Sandy Soil	Topsoil	Topsoil	
Determinand	Method	Test Sample	LOD	Units					
Arsenic	T6	M40	2	mg/kg	12	8	3	<2	9
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	23	25	34	6	25
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	37	28	28	3	33
Lead	T6	M40	1	mg/kg	76	78	21	8	81
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	19	22	32	6	21
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	130	110	85	21	110
SO4(Total)	T6	A40	0.01	%	1.3	0.15	0.03	<0.01	0.37
(Water Soluble) SO4 expressed as SO4	T242	A40	0.05	g/l	2.2	0.13	0.18	<0.05	0.80
pH	T7	A40			8.0	8.9	6.6	8.9	9.7
Phenols(Mono)	T546	AR	1	mg/kg	<1	<1	<1	<1	<1
TPH (C8-C35)(Total)	T206	M105	1	mg/kg	(13) 200	(13) 160	(13) 40	(13) 8	(13) 360
Asbestos ID	T27	A40			N.D.	N.D.	N.D.	N.D.	Trace of Amosite
Soil Organic Matter	T287	A40	0.1	%	4.9	3.6	1.5	0.1	4.0

Concept Reference:	759719
Project Site:	Thongsbridge Mills
Customer Reference:	MSD/01
Soil	Analysed as Soil
ARP Geotechnical Standard Suite	

Concept Reference: 759719 Project Site: Thongsbridge Mills Customer Reference: MSD/01	
Soil MCERTS Preparation	Analysed as Soil

Concept Reference: 759719 Project Site: Thongsbridge Mills Customer Reference: MSD/01	
Soil MCERTS Preparation	Analysed as Soil

Concept Reference: 759719 Project Site: Thongsbridge Mills Customer Reference: MSD/01	
Soil MCERTS Preparation	Analysed as Soil

Soil	Analysed as Soil
MCERTS Preparation	

Concept Reference					759719 011	759719 012	759719 013	759719 014
Customer Sample Reference					Stockpile 1-1	Stockpile 1-2	Stockpile 2-1	Stockpile 2-2
Top Depth								
Bottom Depth								
Date Sampled					10-AUG-2018	10-AUG-2018	10-AUG-2018	10-AUG-2018
Matrix Class					Topsoil	Topsoil	Topsoil	Topsoil
Determinand	Method	Test Sample	LOD	Units				
Moisture @ 105C	T162	AR	0.1	%	2.6	3.2	4.1	3.3
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1

Concept Reference: 759719 Project Site: Thongsbridge Mills Customer Reference: MSD/01	
Soil PAH US EPA 16 (B and K split)	Analysed as Soil

Soil	Analysed as Soil
PAH US EPA 16 (B and K split)	

Concept Reference					759719 001	759719 002	759719 003	759719 004	759719 005
Customer Sample Reference					WS1	WS1	WS2	WS2	WS3
Top Depth					0.50	1.20	0.50	1.00	0.20
Bottom Depth					0.70	1.40	0.70	1.20	0.30
Date Sampled					10-AUG-2018	10-AUG-2018	10-AUG-2018	10-AUG-2018	10-AUG-2018
Matrix Class					Topsoil	Sandy Soil	Topsoil	Sandy Soil	Topsoil
Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.6	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	0.1	0.1	0.2	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.2	0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	1.3	2.9	1.3	0.3
Anthracene	T207	M105	0.1	mg/kg	<0.1	0.3	1.0	0.3	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	0.2	1.8	6.1	1.7	0.9
Pyrene	T207	M105	0.1	mg/kg	0.2	1.6	5.7	1.6	0.9
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	0.7	3.0	0.8	0.5
Chrysene	T207	M105	0.1	mg/kg	<0.1	0.9	3.0	0.9	0.6
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	0.4	2.7	0.5	0.3
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	0.8	3.1	0.9	0.6
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	0.1	0.6	2.1	0.7	0.5
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	0.3	1.9	0.4	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.8	0.2	0.2
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	0.4	2.0	0.4	0.3
PAH(total)	T207	M105	0.1	mg/kg	0.5	9.1	35	10	5.3

Concept Reference: 759719 Project Site: Thongsbridge Mills Customer Reference: MSD/01 Soil Analysed as Soil PAH US EPA 16 (B and K split)									
Concept Reference					759719 006	759719 007	759719 008	759719 009	759719 010
Customer Sample Reference					WS3	WS4	WS4	WS5	WS6
Top Depth					0.50	0.30	3.60	0.10	0.30
Bottom Depth					0.70	0.50	3.80	0.30	0.50
Date Sampled					10-AUG-2018	10-AUG-2018	10-AUG-2018	10-AUG-2018	10-AUG-2018
Matrix Class					Topsoil	Topsoil	Sandy Soil	Topsoil	Topsoil
Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	0.6	0.3	<0.1	<0.1	2.2
Acenaphthylene	T207	M105	0.1	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	0.9	0.4	<0.1	<0.1	1.7
Fluorene	T207	M105	0.1	mg/kg	0.6	0.3	<0.1	<0.1	1.1
Phenanthrene	T207	M105	0.1	mg/kg	6.8	3.2	0.2	<0.1	10
Anthracene	T207	M105	0.1	mg/kg	1.6	0.7	<0.1	<0.1	2.2
Fluoranthene	T207	M105	0.1	mg/kg	8.3	4.6	0.3	<0.1	11
Pyrene	T207	M105	0.1	mg/kg	7.7	4.2	0.3	<0.1	9.9
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	3.8	2.2	0.1	<0.1	5.1
Chrysene	T207	M105	0.1	mg/kg	4.1	2.4	0.1	<0.1	5.6
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	3.0	1.5	<0.1	<0.1	3.8
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	3.1	2.3	0.1	<0.1	4.3
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	3.5	2.0	<0.1	<0.1	4.5
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	1.6	1.0	<0.1	<0.1	29
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	0.4	0.5	<0.1	<0.1	17
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	1.8	1.1	<0.1	<0.1	31
PAH(total)	T207	M105	0.1	mg/kg	48	27	1.2	<0.1	140

Concept Reference: 759719 Project Site: Thongsbridge Mills Customer Reference: MSD/01 Soil Analysed as Soil PAH US EPA 16 (B and K split)									
Concept Reference					759719 011	759719 012	759719 013	759719 014	
Customer Sample Reference					Stockpile 1-1	Stockpile 1-2	Stockpile 2-1	Stockpile 2-2	
Top Depth									
Bottom Depth									
Date Sampled					10-AUG-2018	10-AUG-2018	10-AUG-2018	10-AUG-2018	
Matrix Class					Topsoil	Topsoil	Topsoil	Topsoil	
Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
PAH(total)	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	

Index to symbols used in 759719-1

Value	Description
AR	As Received
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
A40	Assisted dried < 40C
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

These samples have been analysed exceeding recommended holding times. It is possible therefore that the results provided may be compromised for pH.
Asbestos testing was subcontracted to REC Asbestos.

Method Index

Value	Description
T287	Calc TOC/0.58
T2	Grav
T207	GC/MS (MCERTS)
T242	2:1 Extraction/ICP/OES (TRL 447 T1)
T546	Colorimetry (CF)
T162	Grav (1 Dec) (105 C)
T6	ICP/OES
T27	PLM
T7	Probe
T206	GC/FID (MCERTS)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Arsenic	T6	M40	2	mg/kg	M	001-014
Cadmium	T6	M40	1	mg/kg	M	001-014
Chromium	T6	M40	1	mg/kg	M	001-014
Chromium VI	T6	A40	1	mg/kg	N	001-014
Copper	T6	M40	1	mg/kg	M	001-014
Lead	T6	M40	1	mg/kg	M	001-014
Mercury	T6	M40	1	mg/kg	M	001-014
Nickel	T6	M40	1	mg/kg	M	001-014
Selenium	T6	M40	3	mg/kg	M	001-014
Zinc	T6	M40	1	mg/kg	M	001-014
SO4(Total)	T6	A40	0.01	%	N	001-014
(Water Soluble) SO4 expressed as SO4	T242	A40	0.05	g/l	M	001-014
pH	T7	A40			M	001-014
Phenols(Mono)	T546	AR	1	mg/kg	M	001-014
TPH (C8-C35)(Total)	T206	M105	1	mg/kg	M	001-014
Asbestos ID	T27	A40			SU	001-014
Soil Organic Matter	T287	A40	0.1	%	N	001-014
Naphthalene	T207	M105	0.1	mg/kg	M	001-014
Acenaphthylene	T207	M105	0.1	mg/kg	U	001-014
Acenaphthene	T207	M105	0.1	mg/kg	M	001-014
Fluorene	T207	M105	0.1	mg/kg	M	001-014
Phenanthrene	T207	M105	0.1	mg/kg	M	001-014
Anthracene	T207	M105	0.1	mg/kg	U	001-014
Fluoranthene	T207	M105	0.1	mg/kg	M	001-014
Pyrene	T207	M105	0.1	mg/kg	M	001-014
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001-014
Chrysene	T207	M105	0.1	mg/kg	M	001-014
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	001-014
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	001-014
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001-014
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001-014

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001-014
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001-014
PAH(total)	T207	M105	0.1	mg/kg	U	001-014
Moisture @105C	T162	AR	0.1	%	N	001-014
Retained on 10mm sieve	T2	M40	0.1	%	N	001-014



Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 760341-1

Date of Report: 12-Sep-2018

Customer: ARP Associates and ARP Geotechnical
Ltd
5 & 6 Northwest Business Park
Servia Hill
Leeds
LS6 2QH

Customer Contact: Ms Maria Beasley

Customer Job Reference: M50101

Date Job Received at Concept: 14-Aug-2018

Date Analysis Started: 17-Aug-2018

Date Analysis Completed: 12-Sep-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual



Report checked
and authorised by :
Aneta Dybek-Echtermeyer
Customer Service Advisor

Issued by :
Aneta Dybek-Echtermeyer
Customer Service Advisor

Concept Reference: 760341 Customer Reference: M50101 Soil Analysed as Soil MCERTS Preparation					
Concept Reference				760341 001	
Customer Sample Reference				HAND SAMPLE 1	
Top Depth				0.50	
Depth				0.50	
Date Sampled				10-AUG-2018	
Matrix Class				Topsoil	
Determinand	Method	Test Sample	LOD	Units	
Moisture @105C	T162	AR	0.1	%	9.5
Retained on 10mm sieve	T2	M40	0.1	%	<0.1

Concept Reference: 760341 Customer Reference: M50101 Soil Analysed as Soil ARP Geotechnical Standard Suite					
Concept Reference				760341 001	
Customer Sample Reference				HAND SAMPLE 1	
Top Depth				0.50	
Depth				0.50	
Date Sampled				10-AUG-2018	
Matrix Class				Topsoil	
Determinand	Method	Test Sample	LOD	Units	
Arsenic	T6	M40	2	mg/kg	3
Cadmium	T6	M40	1	mg/kg	<1
Chromium	T6	M40	1	mg/kg	38
Chromium VI	T6	A40	1	mg/kg	<1
Copper	T6	M40	1	mg/kg	31
Lead	T6	M40	1	mg/kg	19
Mercury	T6	M40	1	mg/kg	<1
Nickel	T6	M40	1	mg/kg	42
Selenium	T6	M40	3	mg/kg	<3
Zinc	T6	M40	1	mg/kg	67
SO4(Total)	T6	A40	0.01	%	<0.01
(Water Soluble) SO4 expressed as SO4	T242	A40	0.05	g/l	<0.05
pH	T7	A40			6.2
Phenols(Mono)	T546	AR	1	mg/kg	<1
TPH (C8-C35)(Total)	T206	M105	1	mg/kg	(13) 15
Asbestos ID	T27	A40			N.D.
Soil Organic Matter	T287	A40	0.1	%	1.1

Concept Reference: 760341 Customer Reference: M50101 Soil Analysed as Soil PAH US EPA 16 (B and K split)					
Concept Reference				760341 001	
Customer Sample Reference				HAND SAMPLE 1	
Top Depth				0.50	
Depth				0.50	
Date Sampled				10-AUG-2018	
Matrix Class				Topsoil	
Determinand	Method	Test Sample	LOD	Units	
Naphthalene	T207	M105	0.1	mg/kg	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1

Index to symbols used in 760341-1

Value	Description
A40	Assisted dried < 40C
AR	As Received
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

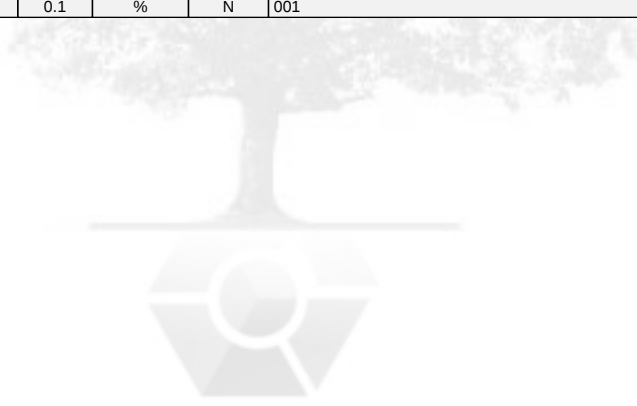
Asbestos was subcontracted to REC Asbestos.

Method Index

Value	Description
T2	Grav
T6	ICP/OES
T7	Probe
T242	2:1 Extraction/ICP/OES (TRL 447 T1)
T287	Calc TOC/0.58
T207	GC/MS (MCERTS)
T206	GC/FID (MCERTS)
T546	Colorimetry (CF)
T27	PLM
T162	Grav (1 Dec) (105 C)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Arsenic	T6	M40	2	mg/kg	M	001
Cadmium	T6	M40	1	mg/kg	M	001
Chromium	T6	M40	1	mg/kg	M	001
Chromium VI	T6	A40	1	mg/kg	N	001
Copper	T6	M40	1	mg/kg	M	001
Lead	T6	M40	1	mg/kg	M	001
Mercury	T6	M40	1	mg/kg	M	001
Nickel	T6	M40	1	mg/kg	M	001
Selenium	T6	M40	3	mg/kg	M	001
Zinc	T6	M40	1	mg/kg	M	001
SO4(Total)	T6	A40	0.01	%	N	001
(Water Soluble) SO4 expressed as SO4	T242	A40	0.05	g/l	M	001
pH	T7	A40			M	001
Phenols(Mono)	T546	AR	1	mg/kg	M	001
TPH (C8-C35)(Total)	T206	M105	1	mg/kg	M	001
Asbestos ID	T27	A40			SU	001
Soil Organic Matter	T287	A40	0.1	%	N	001
Naphthalene	T207	M105	0.1	mg/kg	M	001
Acenaphthylene	T207	M105	0.1	mg/kg	U	001
Acenaphthene	T207	M105	0.1	mg/kg	M	001
Fluorene	T207	M105	0.1	mg/kg	M	001
Phenanthrene	T207	M105	0.1	mg/kg	M	001
Anthracene	T207	M105	0.1	mg/kg	U	001
Fluoranthene	T207	M105	0.1	mg/kg	M	001
Pyrene	T207	M105	0.1	mg/kg	M	001
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001
Chrysene	T207	M105	0.1	mg/kg	M	001
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	001
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	001
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001
PAH(total)	T207	M105	0.1	mg/kg	U	001
Moisture @105C	T162	AR	0.1	%	N	001
Retained on 10mm sieve	T2	M40	0.1	%	N	001



Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 764165-1

Date of Report: 10-Sep-2018

Customer: ARP Associates and ARP Geotechnical
Ltd
5 & 6 Northwest Business Park
Servia Hill
Leeds
LS6 2QH

Customer Contact: Mr Andy Jones

Customer Job Reference: MSD/01

Customer Purchase Order: MSD/01

Customer Site Reference: Thongsbridge Mills

Date Job Received at Concept: 14-Aug-2018

Date Analysis Started: 04-Sep-2018

Date Analysis Completed: 10-Sep-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual



1549

Report checked
and authorised by :
Chloe Kitto
Customer Service Advisor

Issued by :
Chloe Kitto
Customer Service Advisor



Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Asbestos Quantification Stage 3	T413	AR	0.001	%	SU	001-002
Naphthalene	T149	10:1	0.01	µg/l	U	002
Acenaphthylene	T149	10:1	0.01	µg/l	U	002
Acenaphthene	T149	10:1	0.01	µg/l	U	002
Fluorene	T149	10:1	0.01	µg/l	U	002
Phenanthrene	T149	10:1	0.01	µg/l	U	002
Anthracene	T149	10:1	0.01	µg/l	U	002
Fluoranthene	T149	10:1	0.01	µg/l	U	002
Pyrene	T149	10:1	0.01	µg/l	U	002
Benzo(a)Anthracene	T149	10:1	0.01	µg/l	U	002
Chrysene	T149	10:1	0.01	µg/l	U	002
Benzo(b)fluoranthene	T149	10:1	0.01	µg/l	U	002
Benzo(k)fluoranthene	T149	10:1	0.01	µg/l	U	002
Benzo(a)Pyrene	T149	10:1	0.01	µg/l	U	002
Indeno(123-cd)Pyrene	T149	10:1	0.01	µg/l	U	002
Dibenzo(ah)Anthracene	T149	10:1	0.01	µg/l	U	002
Benzo(ghi)Perylene	T149	10:1	0.01	µg/l	U	002
PAH(total)	T149	10:1	0.01	µg/l	U	002



ECõS Environmental

Low Moor Business Park,
Common Road, Bradford BD12 8ND
Tel: 01274 691122 Fax: 01274 608100

Client: ARP Geotechnical Limited
Northwest House
5/6 Northwest Business Park
Servia Hill
Leeds
West Yorkshire
LS6 2QH

FAO: Mr J Quinn

RECEIVED
10 AUG 2005

REF NO	83679
DATE	APR
TIME	
LOCATION	
REMARKS	
INITIALS	

100

Analytical Report Number: R05/8430

Client Project Name: Thongsbridge Mill
Client Project Number: MSD/01
Your Order Number: MSD/01
Order Receipt Date: 01/08/05
Reporting Date: Tuesday 9 August 2005

If you have any queries regarding this report please contact our Customer Services Manager



ECoS Environmental
Low Moor Business Park,
Common Road, Bradford BD12 8ND
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Thongsbridge Mill

Project Number: MSD/01

Client: ARP Geotechnical Limited

Reporting Date: Tuesday 9 August 2005

Comments

All analyses are carried out using the laboratory's standard methods unless otherwise agreed.

The test results in this report refer only to the actual samples on which testing has been performed.

Any opinions and/or interpretations expressed herein are outside the scope of the testing laboratory's UKAS accreditation.

The test report shall not be reproduced, except in full, without the testing laboratory's written approval.

This testing laboratory cannot be held responsible for the condition or suitability of samples submitted for testing by a third party or for the competency of personnel other than its own staff.

Soil Samples

Results are expressed based on air dried mass @ 40°C unless otherwise stated.

See key in Notes section for explanation of numerical categories for asbestos results, if applicable.

Stones (for example inert flints and inorganic minerals) >10mm are removed prior to analysis. Unless otherwise stated, results have not been corrected for this loss.

Samples submitted for leachate determination were prepared using agreed procedures and analysed using UKAS accredited methodology where appropriate.

Results are expressed without correction for recovery factors.

Key:

Accreditation:

MCERTS = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000 and the Environment Agency MCERTS for soil standard.

17025 = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000.

None = This test is currently not on our scope of accreditation.

Sample Pretreatment (Appended to Method of Detection)

D = Air Dried @ 40°C

R = As Received

Sample Type

B = Bulk disturbed sample

C = Core Sample

D = Small disturbed sample

P = Piston sample

U = Undisturbed sample - open drive

W = Water Sample

Sample Results

Analysis not requested

*** Test not completed. Please see notes on last page

Signed: 

For and on behalf of ECoS Environmental

Approved signatories:

Name

J R Brown

R Beeker

P Richardson

J Stoddart

Position

Customer Services Manager

Integration Manager

Quality Manager

Technical Manager



ECOS Environmental
Low Moor Business Park,
Common Road, Bradford BD12 8ND
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Thongsbridge Mill

Project Number: MSD/01

Client: ARP Geotechnical Limited

Reporting Date: Tuesday 9 August 2005

Soil Samples

Method Statement

Determinand	Method of Detection	Sample Pretreatment	Limit of Detection	Accreditation	Sub-Contracted	Result Date
Arsenic	ICP-OES	D	1.0 mg/kg	17025	No	04/08/05
Cadmium	ICP-OES	D	0.2 mg/kg	17025	No	04/08/05
Chromium (total)	ICP-OES	D	0.2 mg/kg	17025	No	04/08/05
Lead	ICP-OES	D	0.5 mg/kg	17025	No	04/08/05
Mercury	ICP-OES	D	1.0 mg/kg	17025	No	04/08/05
Selenium	ICP-OES	D	1.0 mg/kg	17025	No	04/08/05
Boron (water soluble)	ICP-OES	D	0.5 mg/kg	17025	No	04/08/05
Copper	ICP-OES	D	0.2 mg/kg	17025	No	04/08/05
Nickel	ICP-OES	D	0.2 mg/kg	17025	No	04/08/05
Zinc	ICP-OES	D	0.2 mg/kg	17025	No	04/08/05
Phenols (monohydric)	Colorimetry	R	1.0 mg/kg	17025	No	02/08/05
TPH	GC-FID	D	0.1 mg/kg	17025	No	08/08/05
Sulphate (total)	ICP-OES	D	30 mg/kg SO ₄	17025	No	04/08/05
pH	pH-meter	D	N/A	17025	No	09/08/05
Stones Content	Gravimetry	D	0.1 %	None	No	04/08/05
PAH (total)	GC-FID	D	0.1 mg/kg	17025	No	08/08/05
TOC	Colorimetry	D	0.1 %	None	No	03/08/05
Benzene	GC-FID	R	0.1 mg/kg	17025	No	08/08/05
Toluene	GC-FID	R	0.1 mg/kg	17025	No	08/08/05
Ethyl Benzene	GC-FID	R	0.1 mg/kg	17025	No	08/08/05
Xylene	GC-FID	R	0.1 mg/kg	17025	No	08/08/05



EC&S Environmental
Low Moor Business Park,
Common Road, Bradford BD12 8ND
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Thongsbridge Mill

Client: ARP Geotechnical Limited

Project Number: MSD/01

Reporting Date: Tuesday 9 August 2005

Water Samples

Method Statement

Determinand	Method of Detection	Sample Pretreatment	Limit of Detection	Accreditation	Sub-Contracted	Result Date
Arsenic	AAS-HYDRIDE	R	1.0 ug/l	17025	No	04/08/05
Cadmium	GF-AAS	R	0.1 ug/l	17025	No	04/08/05
Chromium	ICP-OES	R	0.01 mg/l	17025	No	08/08/05
Lead	ICP-OES	R	0.03 mg/l	17025	No	08/08/05
Mercury	AAS-HYDRIDE	R	0.1 ug/l	17025	No	04/08/05
Selenium	AAS-HYDRIDE	R	1.0 ug/l	17025	No	05/08/05
Boron	ICP-OES	R	0.01 mg/l	17025	No	08/08/05
Copper	ICP-OES	R	0.01 mg/l	17025	No	08/08/05
Nickel	ICP-OES	R	0.01 mg/l	17025	No	08/08/05
Zinc	ICP-OES	R	0.01 mg/l	17025	No	08/08/05
Phenols (monohydric)	Colorimetry	R	0.01 mg/l	17025	No	01/08/05
TPH	GC-FID	R	0.01 mg/l	17025	No	08/08/05
Sulphate	HPLC-IC	R	1 mg/l SO ₄	17025	No	03/08/05
pH	pH-meter	R	N/A	17025	No	03/08/05
PAH (total)	GC-MS	R	0.01 mg/l	17025	No	04/08/05
Benzene	GC-FID	R	0.01 mg/l	17025	No	08/08/05
Toluene	GC-FID	R	0.01 mg/l	17025	No	08/08/05
Ethyl Benzene	GC-FID	R	0.01 mg/l	17025	No	08/08/05
Xylene	GC-FID	R	0.01 mg/l	17025	No	08/08/05

ECõS Environmental

Low Moor Business Park,
Common Road, Bradford BD12 8ND
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Thongsbridge Mill

Project Number: MSD/01

Client: ARP Geotechnical Limited

Reporting Date: Tuesday 9 August 2005

		BH/TP				
Top Depth / m		0.20	1.30	0.80	0.70	0.50
Bottom Depth / m		0.40	1.60	1.00	1.10	0.70
Customer ID		A1	A2	A3	A4	B3
Sample Type						
Date Sampled				28/07/05	28/07/05	
Receipt Date		NR	NR	01/08/05	01/08/05	NR
ECoS Sample ID				S0584024	S0584025	
Matrix Type				Soil	Soil	
Determinand	Units					
Arsenic	mg/kg	4.7	23.4	6.1	25.0	1.8
Cadmium	mg/kg	0.3	0.6	<0.2	0.6	<0.2
Chromium (total)	mg/kg	54.0	46.9	26.8	36.5	30.0
Lead	mg/kg	32.7	323.0	44.3	198.4	20.7
Mercury	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Selenium	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	<0.5	0.6	<0.5	<0.5	<0.5
Copper	mg/kg	19.4	54.3	17.8	64.9	5.0
Nickel	mg/kg	24.6	36.7	17.8	30.5	17.5
Zinc	mg/kg	52.8	100.2	93.3	119.2	55.9
Phenols (monohydric)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
TPH	mg/kg	29.1	1073.0	386.0	466.1	18.9
Sulphate (total)	mg/kg SO4	325	2345	3476	568	283
pH	N/A	6.2	6.8	9.0	7.3	6.3
Stones Content	%	8.3	14.5	54.4	30.4	43.6
PAH (total)	mg/kg	1.6	170.5	1.6	43.1	<0.1
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethyl Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1



ECoS Environmental

Low Moor Business Park,
Common Road, Bradford BD12 8ND
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Thongsbridge Mill

Project Number: MSD/01

Client: ARP Geotechnical Limited

Reporting Date: Tuesday 9 August 2005

BH/TP						
Top Depth / m		0.40	0.00	0.90	0.00	0.00
Bottom Depth / m		0.80	0.30	1.20	0.20	0.30
Customer ID		B4	B5	B6	C3	C4i
Sample Type						
Date Sampled		28/07/05	28/07/05	28/07/05		
Receipt Date		01/08/05	01/08/05	01/08/05		
ECoS Sample ID		S0584027	S0584028	S0584029		
matrix type		Soil	Soil	Soil		
Determinand	Units					
Arsenic	mg/kg	11.7	6.6	5.1	23.4	26.2
Cadmium	mg/kg	0.2	0.3	0.3	0.9	0.8
Chromium (total)	mg/kg	78.8	32.8	47.0	52.7	317.5
Lead	mg/kg	63.9	29.7	39.5	151.8	190.1
Mercury	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Selenium	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Copper	mg/kg	37.6	17.7	24.1	44.4	89.4
Nickel	mg/kg	28.3	21.0	31.9	32.7	28.6
Zinc	mg/kg	72.7	85.5	79.8	119.5	123.9
Phenols (monohydric)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
TPH	mg/kg	467.2	92.5	357.1	117.1	3914.0
Sulphate (total)	mg/kg SO4	1550	593	937	748	1475
pH	N/A	3.7	4.8	5.4	4.8	5.6
Stones Content	%	<0.1	<0.1	<0.1	<0.1	9.0
PAH (total)	mg/kg	1.0	<0.1	<0.1	2.8	66.2
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethyl Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
TOC	%	#	#	6.8	#	#



ECoS Environmental

Low Moor Business Park,
Common Road, Bradford BD12 8ND
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Thongsbridge Mill

Project Number: MSD/01

Client: ARP Geotechnical Limited

Reporting Date: Tuesday 9 August 2005

		BH/TP		
Top Depth / m		1.65	1.80	
Bottom Depth / m				
Customer ID		C5	C4	
Sample Type				
Date Sampled				
Receipt Date		NR	NR	
ECoS Sample ID				
Matrix Type				
Determinand	Units			
Arsenic	ug/l	<1.0	<1.0	
Cadmium	ug/l	0.9	0.8	
Chromium	mg/l	<0.01	<0.01	
Lead	mg/l	<0.03	<0.03	
Mercury	ug/l	<0.1	0.3	
Selenium	ug/l	<1.0	<1.0	
Boron	mg/l	0.07	0.02	
Copper	mg/l	0.08	<0.01	
Nickel	mg/l	<0.01	<0.01	
Zinc	mg/l	<0.01	<0.01	
Phenols (monohydric)	mg/l	<0.01	<0.01	
TPH	mg/l	<0.01	<0.01	
Sulphate	mg/l SO4	111	117	
pH	N/A	6.0	6.0	
PAH (total)	mg/l	<0.01	<0.01	
Benzene	mg/l	<0.01	<0.01	
Toluene	mg/l	<0.01	<0.01	
Ethyl Benzene	mg/l	<0.01	<0.01	
Xylene	mg/l	<0.01	<0.01	



ECoS Environmental

Low Moor Business Park,
Common Road, Bradford BD12 8ND
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Thongsbridge Mill

Project Number: MSD/01

Client: ARP Geotechnical Limited

Reporting Date: Tuesday 9 August 2005

Notes and Preservation Details

None



ARP GEOTECHNICAL LIMITED
SOIL CONTAMINANT SCREENING VALUES
SITES FOR COMMERCIAL USE

Determinand	S4UL (mg/kg)			C4SL (mg/kg)		
Arsenic	640			640		
Cadmium	190			410		
Chromium (trivalent)	8600					
Chromium (hexavalent)	33			49		
Lead				2300		
Inorganic Mercury	1100					
Selenium	12000					
Copper	68000					
Nickel	980					
Zinc	730000					
Acidity (pH)	*Should be Greater Than 5					
	1% SOM	2.5% SOM	6% SOM	1% SOM	2.5% SOM	6% SOM
Acenaphthene	84000	97000	100000			
Acenaphthylene	83000	97000	100000			
Anthracene	520000	540000	540000			
Benzo(a)anthracene	170	170	180			
Benzo(a)pyrene	35	35	36			77
Benzo(b)fluoranthene	44	44	45			
Benzo(g,h,i)perylene	3900	4000	4000			
Benzo(k)fluoranthene	1200	1200	1200			
Chrysene	350	350	350			
Dibenzo(a,h)anthracene	3.5	3.6	3.6			
Fluoranthene	2300	2300	2300			
Fluorene	63000	68000	71000			
Indeno(1,2,3-cd)pyrene	500	510	510			
Naphthalene	190	460	1100			
Phenanthrene	22000	22000	23000			
Pyrene	54000	54000	54000			
Phenols	440	690	1300			
Total TPH	*Above 2000, speciate and compare with values below:					
C5 to C6 Aliphatic	3200	5900	12000			
C6 to C8 Aliphatic	7800	17000	40000			
C8 to C10 Aliphatic	2000	4800	11000			
C10 to C12 Aliphatic	9700	23000	47000			
C12 to C16 Aliphatic	59000	82000	90000			
C16 to C35 Aliphatic	1600000	1700000	1800000			
C35 TO C44 Aliphatic	1600000	1700000	1800000			
C5 to C7 Aromatic (Benzene)	26000	46000	86000			
C7 to C8 Aromatic (Toluene)	56000	110000	180000			
C8 to C10 Aromatic	3500	8100	17000			
C10 to C12 Aromatic	16000	28000	34000			
C12 to C16 Aromatic	36000	37000	38000			
C16 to C21 Aromatic	28000	28000	28000			
C21 TO C35 Aromatic	28000	28000	28000			
C35 TO C44 Aromatic	28000	28000	28000			
Asbestos	*Should be None Detected			*Should be None Detected		

* In House Value/Approach S4UL = Suitable 4 Use Level, CIEH/LQM 2014 C4SL = Cat 4 Screening Level, DEFRA, 2014

Blank cell indicates no published value or in-house value. Some values presented are above saturation limits.

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LABORATORY REPORT



4043

Contract Number: PSL18/4241

Report Date: 30 August 2018

Client's Reference:

Client Name: ARP Associates
Northwest House
5/6 Northwest Business Park
Servia Hill
Leeds
LS6 2QH

For the attention of: Andy Jones

Contract Title: Thongsbridge Mills, Thongsbridge

Date Received: 21/8/2018

Date Commenced: 21/8/2018

Date Completed: 30/8/2018

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson
(Director)

A Watkins
(Director)

R Berriman
(Quality Manager)

L Knight
(Senior Technician)

L Pavey
(Senior/Quality Technician)

S Wilson
(Senior Technician)

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Doncaster DN4 0AR
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Page 1 of

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

4043

PSL
Professional Soils Laboratory

THONGSBRIDGE MILLS, THONGSBRIDGE

Contract No:

PSL18/4241

Client Ref:

MSD/01

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

*** : Liquid Limit and Plastic Limit Wet Sieved.**



4043

PSL

Professional Soils Laboratory

THONGSBRIDGE MILLS, THONGSBRIDGE

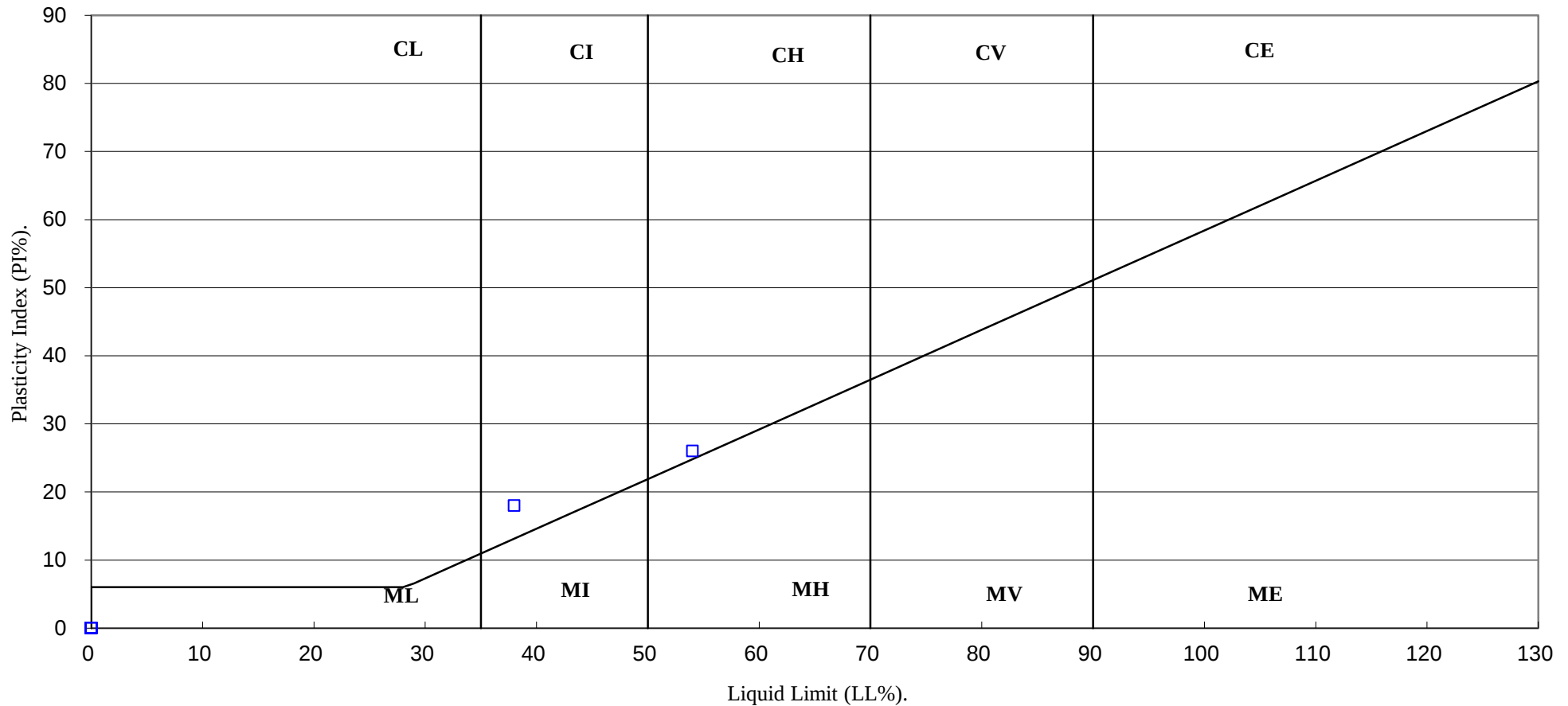
Contract No:

PSL18/4241

Client Ref:

MSD/01

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



4043

PSL
Professional Soils Laboratory

THONGSBRIDGE MILLS, THONGSBRIDGE

Contract No:

PSL18/4241

Client Ref:

MSD/01



Certificate of Analysis

Certificate Number 18-20419

31-Aug-18

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 18-20419

Client Reference PSL18/4241

Order No (not supplied)

Contract Title Thongsbridge Mills, Thongsbridge

Description 2 Soil samples.

Date Received 28-Aug-18

Date Started 28-Aug-18

Date Completed 31-Aug-18

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

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

Approved By

Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 18-20419

Client Ref PSL18/4241

Contract Title Thongsbridge Mills, Thongsbridge

Lab No	1384332	1384333
Sample ID	WS1	WS2
Depth	2.50-2.70	3.60-3.80
Other ID		
Sample Type	D	D
Sampling Date	n/s	n/s
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Inorganics					
pH	DETSC 2008#			6.3	6.9
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	160	54

Information in Support of the Analytical Results

Our Ref 18-20419
 Client Ref PSL18/4241
 Contract Thongsbridge Mills, Thongsbridge

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1384332	WS1 2.50-2.70 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), pH + Conductivity (7 days)	
1384333	WS2 3.60-3.80 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (365 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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

APPENDIX L

GAS MONITORING RESULTS

ARP GEOTECHNICAL BOREHOLE MONITORING RESULTS

JOB NO. MSD/01 **CLIENT:** MR S MARSDEN

SITE: THONGSBRIDGE MILLS, THONGSBRIDGE, HOLMFIRTH

BH: WS2

Date	Borehole Steady Flow Rate (l/hr)*	Peak CH ₄ (%)	Q _{hg} CH ₄ (l/hr)	Peak CO ₂ (%)	Q _{hg} CO ₂ (l/hr)	Min. O ₂ (%)	Depth to Groundw ater (m)	Comment
29/08/2018	0.1	0.0	0.000	0.3	0.000	14.5		Borehole dry
19/09/2018	0.1	0.0	0.000	0.6	0.001	14.6		Borehole dry
24/10/2018	0.1	0.0	0.000	4.8	0.005	12.8	2.94	
01/11/2018	0.1	0.0	0.000	4.7	0.005	13.2	2.95	
			0.000		0.000			
			0.000		0.000			

* Where no flow is detected, detection limit of 0.1l/hr should be inserted

Q_{hg} = Hazardous gas flow rate, in accordance with BS8485:2007

Denotes a negative steady gas flow rate

ARP GEOTECHNICAL BOREHOLE MONITORING RESULTS

JOB NO. MSD/01 **CLIENT:** MR S MARSDEN

SITE: THONGSBRIDGE MILLS, THONGSBRIDGE, HOLMFIRTH

BH: WS4

Date	Borehole Steady Flow Rate (l/hr)*	Peak CH ₄ (%)	Q _{hg} CH ₄ (l/hr)	Peak CO ₂ (%)	Q _{hg} CO ₂ (l/hr)	Min. O ₂ (%)	Depth to Groundw ater (m)	Comment
29/08/2018	0.1	6.2	0.006	9.8	0.010	0.3		Borehole dry
19/09/2018	0.1	7.0	0.007	9.4	0.009	4.5		Borehole dry
24/10/2018	0.1	10.3	0.010	7.5	0.008	0.5	2.98	
01/11/2018	0.1	8.0	0.008	8.0	0.008	0.7	2.98	
			0.000		0.000			
			0.000		0.000			

* Where no flow is detected, detection limit of 0.1l/hr should be inserted

Q_{hg} = Hazardous gas flow rate, in accordance with BS8485:2007

Denotes a negative steady gas flow rate

ARP GEOTECHNICAL BOREHOLE MONITORING RESULTS

JOB NO. MSD/01 **CLIENT:** MR S MARSDEN

SITE: THONGSBRIDGE MILLS, THONGSBRIDGE, HOLMFIRTH

BH: WS6

Date	Borehole Steady Flow Rate (l/hr)*	Peak CH ₄ (%)	Q _{hg} CH ₄ (l/hr)	Peak CO ₂ (%)	Q _{hg} CO ₂ (l/hr)	Min. O ₂ (%)	Depth to Groundw ater (m)	Comment
29/08/2018	0.1	0.0	0.000	0.8	0.000800	14.3		Borehole dry
19/09/2018	0.1	0.0	0.000	0.6	0.000600	14.6		Borehole dry
24/10/2018	0.1	0.0	0.000	4.5	0.004500	12.2		Borehole dry
01/11/2018	0.1	0.0	0.000	4.6	0.004600	12.8		Borehole dry
			0.000		0.000000			
			0.000		0.000000			

* Where no flow is detected, detection limit of 0.1l/hr should be inserted

Q_{hg} = Hazardous gas flow rate, in accordance with BS8485:2007

Denotes a negative steady gas flow rate

ARP GEOTECHNICAL BOREHOLE MONITORING RESULTS

JOB NO. MSD/01 **CLIENT:** MR S MARSDEN

SITE: THONGSBRIDGE MILLS, THONGSBRIDGE, HOLMFIRTH

BAROMETRIC PRESSURES

Monitor Date	Weather on Day	Pressure on Day (mb)*	Pressure on day before (mb)*	Pressure 2 days before (mb)*	Trend*
29/08/2018	Overcast, dry	1015	1016	1007	Varied
19/09/2018	Cloudy, windy	1000	1000	1011	Low, falling
24/10/2018	Overcast, dry	1026	1027	1037	High, falling
01/11/2018	Overcast, dry	1004	1005	996	Low, varied

*Pressures at midday (EGNM) corrected to sea level.

<https://www.timeanddate.com/weather/uk/leeds/historic>

APPENDIX M

CONTAMINATION REMEDIATION STATEMENT



CONTAMINATION REMEDIATION STATEMENT

**FOR
THONGSBIDGE MILLS
THONGSBIDGE**

ON BEHALF OF

MR S MARSDEN

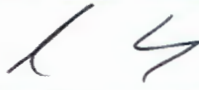
ARP GEOTECHNICAL LTD

CHARTERED CONSULTING ENGINEERS

Northwest House 5/6 Northwest Business Park Servia Hill Leeds LS6 2QH

☎ 0113 245 8498 ✉ leeds@arpgeotechnical.co.uk 🌐 www.arpconsultingengineers.co.uk

CLIENT: MR S MARSDEN
JOB NUMBER: MSD/01
PROJECT: THONGSBRIDGE MILLS, THONGSBRIDGE
REPORT TYPE: CONTAMINATION REMEDIATION STATEMENT
REPORT REFERENCE: MSD/01rem

	Name	Signature
Prepared By:	A Jones BSc FGS	
Authorised By:	J Race BSc CGeol FGS EurGeol	

ISSUE	DATE	STATUS
1	23 RD NOVEMBER 2018	V1 FINAL

1.0 Introduction

- 1.1 This document has been prepared to provide information for the Client and other interested parties, such as the Regulatory Authorities, outlining how contamination encountered on the site will be managed to ensure that the site is environmentally suitable for the intended residential use. The document should be agreed, prior to implementation, with the relevant Regulatory Authorities, usually the local Planning Authority and NHBC or other building control provider.

2.0 The Site

- 2.1 The ARP Geotechnical Ltd Combined Stage 1/Stage 2 Geo-environmental Report, dated November 2018 under reference MSD/01, makes an assessment of contamination, along with other aspects.
- 2.2 The conceptual site model is for commercial units, including access roads and car parking.
- 2.3 The vast majority of the site is relatively flat and level and covered in rough grass or young shrub/weed vegetation. However, the western margin of the site slopes steeply upwards to meet Huddersfield Road. A number of cuts have been made into the slope and retaining walls constructed. In the far south of the site, in the western margins of the site, a large retaining structure exists in a low area/hollow, possibly used for storage of crushed rock. Also, within the western margin of the site is a retaining wall structure with a beam and block style suspended floor. Again, this appears to be a storage area. Two IBC containers were located on the suspended floor. The structure may be the beginnings of a house or other building, which has been halted. In the far south of the site, a relatively new access road, complete with drainage, has been built.
- 2.4 The site is bounded to the north by an industrial estate. A retaining wall approximately 3m high forms the boundary. The site is on the high side, with the industrial site on the low side. The site is bounded to the east by a row of mature trees, a small stone retaining wall (low side to the east), a storage area for plant/machinery, and then rough ground sloping downwards until the River Holme. The site is bounded to the south by mature trees and then a large industrial/farm building. The site is bounded to the west by Huddersfield Road, houses and fields beyond.
- 2.5 The geological map shows the site to be covered by superficial deposits comprising river terrace deposits (sand and gravel) across the southeastern half of the site, underlain by Huddersfield White Rock (sandstone) across the northern two thirds of the site and Marsden Formation (mudstone and siltstone) across the southern third.
- 2.6 The site is considered stable with regard to coal mining. There are no workable coal seams within 30m of the surface of the site. Therefore, there will be no arisings of coal during proposed development works. It will not be possible to win any coal from the site by excavations before development.

- 2.7 The strata beneath the site are classed as a Secondary A Aquifer. There are no groundwater abstractions within 1km of the site.
- 2.8 The general area slopes down to the east. The nearest downslope surface water is the River Holme, 15m beyond the eastern corner of the site. However, there are no sensitive surface water abstractions within 1km of the site. The vast majority of the site is not in an area at risk from river flooding, with the exception being a small area in the southern corner of the site, which is within Flood Zones 2 and 3. The risks of flooding from other causes such as adverse topography or insufficient surface water drainage, are not considered here, and a separate specialist Flood Risk and Drainage Report should be commissioned if such risk needs to be quantified.
- 2.9 No radon protective measures are stated to be necessary on the site. However, the site is in an intermediate probability radon area, as between 1% and 3% of homes are estimated to be above the radon action level. In these circumstances of apparent conflict, it may be prudent to assume basic radon protection is required, to prevent conveyancing difficulties. The site requires gas mitigation measures in accordance with Characteristic Situation 2 which includes (amongst other things) a gas membrane with low permeability to carbon dioxide and methane. This membrane will be adequate for basic radon protection.
- 2.10 There is one recorded landfill within 250m of the site, located 176m to the southeast. Gas monitoring has been completed for the site.
- 2.11 Ordnance Survey archive maps show that the site was occupied by a large mill pond from at least 1854 until sometime between 1987 and 1995, when it was presumably infilled. The remainder of the site has remained undeveloped. The surrounding land has been occupied by woollen mills and residential properties.
- 2.12 Made ground was encountered across the majority of the site, up to a maximum depth of 4.6m and typically around 1.5m to 2.0m depth. It was locally absent in positions A5, B5 and B6. The made ground encountered was typically comprised of gravel, cobbles and boulders of sandstone in a clayey, sandy matrix. Occasionally the made ground contained fragments of brick, concrete and glass. Locally the made ground consisted of reworked natural clay.
- 2.13 Below the made ground, alluvium as very soft to firm grey sandy slightly gravelly clay was encountered. This was locally absent where bedrock was found at very shallow depth and in position WS4 where the deepest made ground was encountered. Bedrock was encountered at depths of between 0.0m (at surface) and 5.0m as weak sandstone and locally as a very weak mudstone. Over the majority of the site the bedrock was encountered beneath the alluvial deposits described above. Shallow bedrock was encountered in positions A5, WS5 and WS6 which are all close to the western boundary where the site raises up and meets Huddersfield Road.
- 2.14 The excavations within the trial pits generally remained stable for the short period of exposure and the pits were backfilled with the arisings on completion. All of the trial pits

and all of the boreholes identified groundwater to be absent below the site. Subsequent monitoring of the boreholes identified a very small amount of water to be present at the base of the monitoring installations but this is not considered to be representative of a continuous groundwater table.

- 2.15 The made ground was found to contain localised elevated concentrations of PAH, including dibenzo(ah)anthracene at 17 mg/kg (the assessment criteria is 3.6 mg/kg), and trace amounts of asbestos (less than 0.0016).
- 2.16 Elevated carbon dioxide and methane were identified during the gas monitoring undertaken.

3.0 Remediation Strategy

- 3.1 Gas protection is required. CS2 classification requires a gas protection score of 3.5. There are a number of ways to do this, including underfloor ventilation, gas barriers and various floor constructions.
- 3.2 The specific design of the protection measures, and the verification required, is dependent on the detailed foundation design, the selection of products/suppliers, the gas regime, and who installs the protection. Once more of these factors are known, as a minimum following foundation design and design of the protection measures, a Statement on Gas Protection should be prepared. The document should provide information for the Client and other interested parties, such as the regulatory authorities, outlining how gas protection measures for properties on the site will be implemented and the installation verified as satisfactory. The document should be agreed, prior to implementation, with the relevant Regulatory Authorities.
- 3.3 Where any localised landscaping is present, a minimum 0.45m combined thickness of uncontaminated soils (topsoil and subsoil) should be provided. In areas of hardstanding or building footprints, the cover blanket is not required. The cover blanket must be clean and uncontaminated.
- 3.4 When cohesive cover blankets are being used, external levels and surface water drainage will need to be carefully designed to avoid localised surface water ponding.

4.0 Validation

- 4.1 To satisfy the Regulatory Authorities, verification that the above measures have been successfully implemented needs to be independently confirmed, in accordance with the guidance supplied in the document produced by the Yorkshire and Lincolnshire Pollution Advisory Group (YALPAG): "Guidance on the Verification Requirements for Cover Systems". The measures described below will be required to ensure compliance with the document.

- 4.2 Following placement of the cover soils in any landscaping it will be necessary to confirm the required 0.45m cover of uncontaminated soil has been placed, by excavating trial pits to 0.45m depth. The trial pits will be photographed, to include a reference scale, and the photographs included within any report to enable the location on site to be identified.
- 4.3 If any contaminated material is disposed off-site, the disposal/transfer documents should be retained for inclusion in the Validation Report.

5.0 Laboratory Testing

- 5.1 For any imported subsoil and topsoil used within localised areas of landscaping, the source will need to be confirmed, and the material tested for the attached suite of contaminants, to comply with the maximum screening values listed. The frequency of testing is given on the table below. Any samples already tested in the site investigation carried out to date can be considered part of the overall total required.

Material Type	Number of Samples
Topsoil or subsoil from greenfield site	Minimum 3No. or 1 per 250m ³ (whichever is greater)
Topsoil or subsoil from brownfield site	Minimum 6No. or 1 per 100m ³ (whichever is greater)

- 5.2 The material should be placed in quarantined stockpiles prior to sampling and once a stockpile has been approved by the Engineer, no further material should be added to the stockpile, and any further import should be stockpiled separately. Any cross contamination of materials should be avoided, and further testing carried out where any cross contamination is suspected to have occurred.
- 5.3 If space is insufficient on the site to store quarantined stockpiles, topsoil/subsoil can be placed directly into the appropriate landscape areas, but samples of each material would need to be tested by taking samples from the validation trial pits.
- 5.4 The results of all the laboratory analysis, excavation logs, plans, photographs, and import documents will form part of the Remediation Validation Report.

6.0 Unexpected Contamination

- 6.1 Any unexpected contamination uncovered during the works shall be inspected, sampled and analysed in laboratory for the suite of determinands appended to this Remediation Statement, and compared to the maximum concentration levels listed on the enclosure. Works on the affected materials shall cease until the appraisal is complete and, if necessary, a revised Remediation Statement is to be prepared and approved by the Planning Authority before work is recommenced.



ARP GEOTECHNICAL LIMITED
SOIL CONTAMINANT SCREENING VALUES
SITES FOR COMMERCIAL USE

Determinand	S4UL (mg/kg)			C4SL (mg/kg)		
Arsenic	640			640		
Cadmium	190			410		
Chromium (trivalent)	8600					
Chromium (hexavalent)	33			49		
Lead				2300		
Inorganic Mercury	1100					
Selenium	12000					
Copper	68000					
Nickel	980					
Zinc	730000					
Acidity (pH)	*Should be Greater Than 5					
	1% SOM	2.5% SOM	6% SOM	1% SOM	2.5% SOM	6% SOM
Acenaphthene	84000	97000	100000			
Acenaphthylene	83000	97000	100000			
Anthracene	520000	540000	540000			
Benzo(a)anthracene	170	170	180			
Benzo(a)pyrene	35	35	36			77
Benzo(b)fluoranthene	44	44	45			
Benzo(g,h,i)perylene	3900	4000	4000			
Benzo(k)fluoranthene	1200	1200	1200			
Chrysene	350	350	350			
Dibenzo(a,h)anthracene	3.5	3.6	3.6			
Fluoranthene	2300	2300	2300			
Fluorene	63000	68000	71000			
Indeno(1,2,3-cd)pyrene	500	510	510			
Naphthalene	190	460	1100			
Phenanthrene	22000	22000	23000			
Pyrene	54000	54000	54000			
Phenols	440	690	1300			
Total TPH	*Above 2000, speciate and compare with values below:					
C5 to C6 Aliphatic	3200	5900	12000			
C6 to C8 Aliphatic	7800	17000	40000			
C8 to C10 Aliphatic	2000	4800	11000			
C10 to C12 Aliphatic	9700	23000	47000			
C12 to C16 Aliphatic	59000	82000	90000			
C16 to C35 Aliphatic	1600000	1700000	1800000			
C35 TO C44 Aliphatic	1600000	1700000	1800000			
C5 to C7 Aromatic (Benzene)	26000	46000	86000			
C7 to C8 Aromatic (Toluene)	56000	110000	180000			
C8 to C10 Aromatic	3500	8100	17000			
C10 to C12 Aromatic	16000	28000	34000			
C12 to C16 Aromatic	36000	37000	38000			
C16 to C21 Aromatic	28000	28000	28000			
C21 TO C35 Aromatic	28000	28000	28000			
C35 TO C44 Aromatic	28000	28000	28000			
Asbestos	*Should be None Detected			*Should be None Detected		

* In House Value/Approach S4UL = Suitable 4 Use Level, CIEH/LQM 2014 C4SL = Cat 4 Screening Level, DEFRA, 2014

Blank cell indicates no published value or in-house value. Some values presented are above saturation limits.

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