

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JP

SPT Hammer Ref: AR1979
Test Date: 07/11/2017
Report Date: 07/11/2017
File Name: AR1979.spt
Test Operator: SH

Instrumented Rod Data

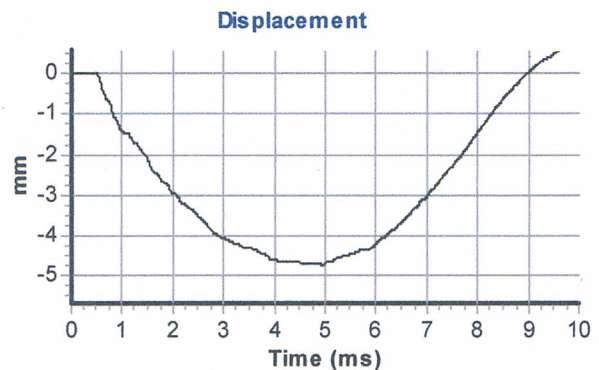
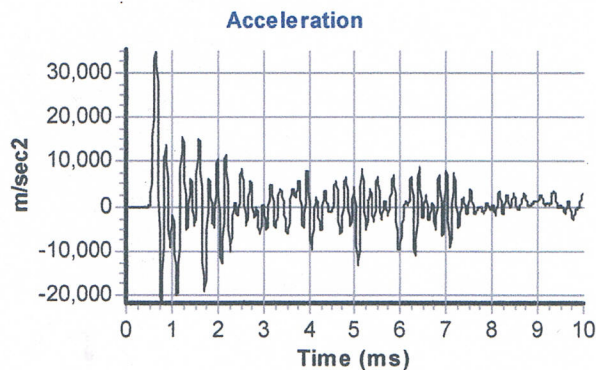
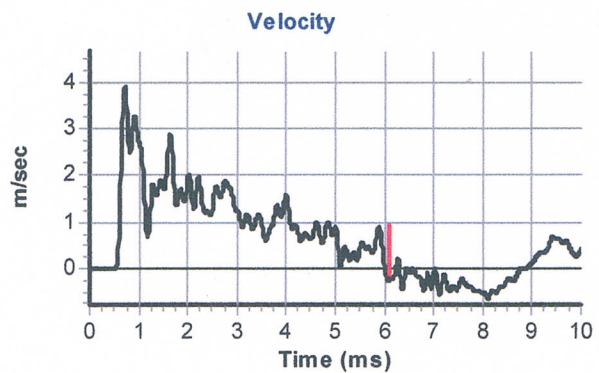
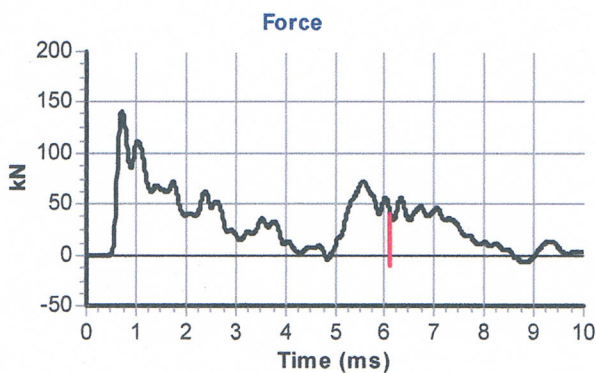
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.0
Assumed Modulus E_a (GPa): 200
Accelerometer No.1: 7080
Accelerometer No.2: 11609

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 10.0

Comments / Location

CALIBRATION



Calculations

Area of Rod A (mm^2): 905
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 332

Energy Ratio E_r (%): **70**

Signed: M.GARDNER

Title: FITTER

The recommended calibration interval is 12 months

APPENDIX 5

GAS AND GROUNDWATER MONITORING RESULTS

BWB GAS AND GROUNDWATER MONITORING

Site:		Plot J, Kingsway Business Park	
Client:		Wilson Bowden Developments Ltd	
Job No.:		MCS2374	
Date:		18 January 2018	
Start / End Time:		11:15 - 12:45	
Engineer:		TY	
Monitoring Equipment:	Gas Meter ID	-	
	PID ID	-	
	Dip Tape	-	
	Other		

NR = Not Recorded
Dry = No Groundwater



Weather Conditions	Start	End
(Dry / Raining)	DRIZZLE	DRIZZLE
Cloud Cover (Oktas)	8/8	8/8
Wind Strength (m/s)	2.3	1.1
Wind Direction (from)	SW	SW
Temperature (°C)	6.0	5.0
Barometric Pressure (mb)	976	976
(Rising/ Falling)		STEADY
PID - Air	-	-
PID - Calibration Gas	-	-

Location Reference	Relative Pressure (mbar)	Flow (l/hr)		Methane (%v/v)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Hydrogen Sulphide (ppm)	Carbon Monoxide (ppm)	PID (ppm)	Depth to water (m)	Base of Response Zone (m)	Free-Phase Product Level Top (m)	Groundwater Elevation (m AOD)	Notes
		Peak	Steady	Peak	Steady	Peak	Steady	Min	Steady								
Ambient Air Start (Calibration)																	
Ambient Air Finish (Calibration)																	
BH01	976		0.0		<0.1		0.3		19.9	<1	<1	-	2.89	7.47		149.89	
BH02	976		0.0		<0.1		0.9	19.1	19.2	<1	<1	-	4.45	9.98		151.31	
BH03	976		0.0		<0.1		4.0		9.4	<1	<1	-	3.06	6.09		149.65	Values steadily decreased/ increased for over 6 minutes
BH04	976	-0.9	0.0		<0.1		3.9		9.3	<1	<1	-	3.11	6.72		151.20	
BH05	976		0.0		<0.1		1.8		16.4	<1	<1	-	0.99	7.44		154.85	
BH06	975	-3.4	0.0		<0.1		13.1		2.6	<1	10.0	-	4.12	8.36		150.88	Values steadily decreased/ increased for over 6 minutes

BWB GAS AND GROUNDWATER MONITORING

Site:		Plot J, Kingsway Business Park	
Client:		Wilson Bowden Developments Ltd	
Job No.:		MCS2374	
Date:		25 January 2018	
Start / End Time:		08:00 - 12:00	
Engineer:		ZT	
Monitoring Equipment:	Gas Meter ID	-	
	PID ID	-	
	Dip Tape	-	
	Other		

NR = Not Recorded
Dry = No Groundwater



Weather Conditions	Start	End
(Dry / Raining)	DRY	DRY
Cloud Cover (Oktas)	6	7
Wind Strength (m/s)	0.2	0.5
Wind Direction (from)	SW	SW
Temperature (°C)	11.0	12.0
Barometric Pressure (mb)	984	985
(Rising/ Falling)		RISING
PID - Air	-	-
PID - Calibration Gas	-	-

Location Reference	Relative Pressure (mbar)	Flow (l/hr)		Methane (%v/v)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Hydrogen Sulphide (ppm)	Carbon Monoxide (ppm)	PID (ppm)	Depth to water (m)	Base of Response Zone (m)	Free-Phase Product Level Top (m)	Groundwater Elevation (m AOD)	Notes
		Peak	Steady	Peak	Steady	Peak	Steady	Min	Steady								
Ambient Air Start (Calibration)																	
Ambient Air Finish (Calibration)																	
BH01		-0.4	<0.1		<0.1		4.6		11.5	<1	<1	<0.1	2.95	7.42		149.83	
BH02		-0.1	<0.1		<0.1		1.8		17.4	<1	<1	<0.1	4.32	8.72		151.44	
BH03		10.7	2.6		<0.1		3.7		6.2	<1	<1	<0.1	2.85	6.16		149.86	
BH04		-11.5	-11.3		<0.1		2.3		13.1	<1	<1	<0.1	2.94	6.76		151.37	
BH05		1.9	<0.1		<0.1		2.3		15.4	<1	<1	<0.1	1.21	7.38		154.63	
BH06		-9.1	<0.1		<0.1	10.6	10.4		7.9	<1	<1	<0.1	4.12	8.40		150.88	

BWB GAS AND GROUNDWATER MONITORING

Site:		Plot J, Kingsway Business Park	
Client:		Wilson Bowden Developments Ltd	
Job No.:		MCS2374	
Date:		29 January 2018	
Start / End Time:		14:00 - 15:00	
Engineer:		ZT	
Monitoring Equipment:	Gas Meter ID	-	
	PID ID	-	
	Dip Tape	-	
	Other		

NR = Not Recorded
Dry = No Groundwater



Weather Conditions	Start	End
(Dry / Raining)	DRY	DRY
Cloud Cover (Oktas)	6	5
Wind Strength (m/s)	0.3	0.6
Wind Direction (from)	W	W
Temperature (°C)	9.0	8.0
Barometric Pressure (mb)	1006	1005
(Rising/ Falling)		FALLING
PID - Air	-	-
PID - Calibration Gas	-	-

Location Reference	Relative Pressure (mbar)	Flow (l/hr)		Methane (%v/v)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Hydrogen Sulphide (ppm)	Carbon Monoxide (ppm)	PID (ppm)	Depth to water (m)	Base of Response Zone (m)	Free-Phase Product Level Top (m)	Groundwater Elevation (m AOD)	Notes
		Peak	Steady	Peak	Steady	Peak	Steady	Min	Steady								
Ambient Air Start (Calibration)																	
Ambient Air Finish (Calibration)																	
BH01		-1.5	5.1		<0.1		1.7		18.4	<1	<1	<0.1	3.01	5.81		149.77	
BH02		0.1	<0.1		<0.1	2.0	1.6		17.0	<1	<1	<0.1	4.27	6.47		151.49	
BH03		9.4	0.1		<0.1		3.6		8.0	<1	<1	<0.1	3.05	6.14		149.66	
BH04		-26.3	0.1		<0.1		2.4		13.1	<1	<1	<0.1	3.09	6.68		151.22	
BH05		7.6	<0.1		<0.1		1.8		15.3	<1	<1	<0.1	0.82	7.21		155.02	
BH06		-18.6	-0.3		<0.1		<0.1		20.5	<1	<1	<0.1	2.00	7.81		153.00	Silt on dip

BWB GAS AND GROUNDWATER MONITORING

Site:		Plot J, Kingsway Business Park
Client:		Wilson Bowden Developments Ltd
Job No.:		MCS2374
Date:		08 February 2018
Start / End Time:		08:15 - 09:30
Engineer:		ZT
Monitoring Equipment:	Gas Meter ID	-
	PID ID	-
	Dip Tape	-
	Other	

NR = Not Recorded
Dry = No Groundwater



Weather Conditions	Start	End
(Dry / Raining)	DRY	DRY
Cloud Cover (Oktas)	8	8
Wind Strength (m/s)	0.6	0.5
Wind Direction (from)	SW	SW
Temperature (°C)	3.0	4.0
Barometric Pressure (mb)	995	995
(Rising/ Falling)		STEADY
PID - Air	-	-
PID - Calibration Gas	-	-

Location Reference	Relative Pressure (mbar)	Flow (l/hr)		Methane (%v/v)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Hydrogen Sulphide (ppm)	Carbon Monoxide (ppm)	PID (ppm)	Depth to water (m)	Base of Response Zone (m)	Free-Phase Product Level Top (m)	Groundwater Elevation (m AOD)	Notes
		Peak	Steady	Peak	Steady	Peak	Steady	Min	Steady								
Ambient Air Start (Calibration)																	
Ambient Air Finish (Calibration)																	
BH01		0.1	<0.1		<0.1		4.7		13.0	<1	<1	<0.1	3.04	5.67		149.74	
BH02			<0.1		<0.1		1.6		17.7	<1	<1	<0.1	4.20	6.43		151.56	
BH03		0.1	<0.1		<0.1		2.9		11.6	<1	<1	<0.1	3.08	6.10		149.63	
BH04		25.4	<0.1		<0.1		2.4		13.3	<1	<1	<0.1	3.13	5.18		151.18	
BH05			<0.1		<0.1		3.3		15.1	<1	<1	<0.1	2.21	3.95		153.63	
BH06			<0.1		<0.1		1.8		18.8	<1	<1	<0.1	3.70	7.82		151.30	

APPENDIX 6

SOIL AND SOIL LEACHATE CHEMICAL ANALYSIS RESULTS



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Analytical Report Number : 18-72894

Project / Site name:	Plot J.Rochdale	Samples received on:	12/01/2018
Your job number:	MCS2374	Samples instructed on:	15/01/2018
Your order number:	POR015715	Analysis completed by:	22/01/2018
Report Issue Number:	1	Report issued on:	22/01/2018
Samples Analysed:	6 leachate samples - 22 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 18-72894

Project / Site name: Plot J.Rochdale

Your Order No: POR015715

Lab Sample Number				888910	888911	888912	888913	888914
Sample Reference				TP01	TP02	TP02	TP03	TP04
Sample Number				2	1	2	3	4
Depth (m)				0.75-0.85	0.55-0.65	0.55-0.65	0.10-0.20	0.50-0.60
Date Sampled				09/01/2018	10/01/2018	10/01/2018	09/01/2018	09/01/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	-	-	-
Moisture Content	%	N/A	NONE	27	27	-	-	-
Total mass of sample received	kg	0.001	NONE	0.51	1.5	-	-	-

Asbestos in Soil	Type	N/A	ISO 17025	-	-	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.4	6.3	-	-	-
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	-	-	-
Complex Cyanide	mg/kg	1	MCERTS	< 1	< 1	-	-	-
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0084	0.010	-	-	-
Total Sulphur	mg/kg	50	MCERTS	350	340	-	-	-
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.028	0.022	-	-	-

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.40	-	-	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.51	-	-	-
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.44	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.24	-	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.29	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.35	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.16	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.32	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	2.71	-	-	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	7.8	-	-	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	130	80	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.42	0.68	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	2.4	0.7	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	20	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	5.9	27	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	7.6	33	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	8.5	19	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	13	23	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	17	45	-	-	-

Analytical Report Number: 18-72894

Project / Site name: Plot J.Rochdale

Your Order No: POR015715

Lab Sample Number				888910	888911	888912	888913	888914
Sample Reference				TP01	TP02	TP02	TP03	TP04
Sample Number				2	1	2	3	4
Depth (m)				0.75-0.85	0.55-0.65	0.55-0.65	0.10-0.20	0.50-0.60
Date Sampled				09/01/2018	10/01/2018	10/01/2018	09/01/2018	09/01/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Benzene	ug/kg	1	MCERTS	-	< 1.0	-	-	-
Toluene	ug/kg	1	MCERTS	-	< 1.0	-	-	-
Ethylbenzene	ug/kg	1	MCERTS	-	< 1.0	-	-	-
p & m-xylene	ug/kg	1	MCERTS	-	< 1.0	-	-	-
o-xylene	ug/kg	1	MCERTS	-	< 1.0	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	-	< 1.0	-	-	-

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	44	< 10	-	-	-
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8.0	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	< 8.0	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	-	-

Analytical Report Number: 18-72894

Project / Site name: Plot J.Rochdale

Your Order No: POR015715

Lab Sample Number	888915	888916	888917	888918	888919
Sample Reference	TP05	TP06	TP09	TP11	TP13
Sample Number	1	4	4	1	1
Depth (m)	0.20-0.30	1.50-1.60	2.40-2.50	1.00-1.10	0.10-0.20
Date Sampled	09/01/2018	09/01/2018	10/01/2018	10/01/2018	10/01/2018
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	-
Moisture Content	%	N/A	NONE	22	9.8
Total mass of sample received	kg	0.001	NONE	1.2	0.61

Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	5.6	6.2	6.1	6.4	-
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	-
Complex Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	-
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0099	0.0072	0.0080	0.0069	-
Total Sulphur	mg/kg	50	MCERTS	430	90	120	62	-
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.032	0.0048	0.0033	0.0046	-

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	0.18	< 0.05	< 0.05	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	0.20	< 0.05	< 0.05	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	0.91	< 0.05	< 0.05	< 0.05	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	0.81	< 0.05	< 0.05	< 0.05	-
Pyrene	mg/kg	0.05	MCERTS	0.69	< 0.05	< 0.05	< 0.05	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.50	< 0.05	< 0.05	< 0.05	-
Chrysene	mg/kg	0.05	MCERTS	0.39	< 0.05	< 0.05	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.45	< 0.05	< 0.05	< 0.05	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.23	< 0.05	< 0.05	< 0.05	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.42	< 0.05	< 0.05	< 0.05	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	4.78	< 0.80	< 0.80	< 0.80	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	3.4	3.6	5.9	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	75	37	20	25	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.53	0.47	0.30	0.54	-
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1	0.4	0.5	0.4	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	18	8.5	15	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	13	11	17	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	54	7.2	6.1	7.5	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	16	11	16	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	26	22	10	18	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	63	32	23	28	-

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Project / Site name: Plot J.Rochdale

Your Order No: POR015715

Lab Sample Number				888915	888916	888917	888918	888919
Sample Reference				TP05	TP06	TP09	TP11	TP13
Sample Number				1	4	4	1	1
Depth (m)				0.20-0.30	1.50-1.60	2.40-2.50	1.00-1.10	0.10-0.20
Date Sampled				09/01/2018	09/01/2018	10/01/2018	10/01/2018	10/01/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Benzene	ug/kg	1	MCERTS	-	< 1.0	-	-	-
Toluene	ug/kg	1	MCERTS	-	< 1.0	-	-	-
Ethylbenzene	ug/kg	1	MCERTS	-	< 1.0	-	-	-
p & m-xylene	ug/kg	1	MCERTS	-	< 1.0	-	-	-
o-xylene	ug/kg	1	MCERTS	-	< 1.0	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	-	< 1.0	-	-	-

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	23	< 10	< 10	< 10	-
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	-
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8.0	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	< 8.0	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	-	-

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Project / Site name: Plot J.Rochdale

Your Order No: POR015715

Lab Sample Number	888920	888921	888922	888923	888924
Sample Reference	TP13	TP16	TP19	TP21	TP21
Sample Number	2	11	2	4	3
Depth (m)	0.10-0.20	0.20-0.30	0.40-0.50	0.10-0.20	0.10-0.20
Date Sampled	10/01/2018	12/01/2018	09/01/2018	11/01/2018	11/01/2018
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	32	23
Total mass of sample received	kg	0.001	NONE	1.5	1.4

Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	Not-detected	-
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	5.7	4.8	5.8	-	5.5
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	-	< 1
Complex Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	-	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	-	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.013	0.014	0.016	-	0.013
Total Sulphur	mg/kg	50	MCERTS	480	460	380	-	370
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.037	0.035	0.033	-	0.030

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	0.19
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.41	0.23	0.39	-	1.1
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	0.18
Fluoranthene	mg/kg	0.05	MCERTS	0.87	0.38	0.63	-	1.2
Pyrene	mg/kg	0.05	MCERTS	0.89	0.33	0.56	-	1.0
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.73	0.23	0.43	-	0.70
Chrysene	mg/kg	0.05	MCERTS	0.56	0.22	0.35	-	0.55
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.68	0.23	0.41	-	0.64
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.30	0.16	0.20	-	0.28
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.65	0.28	0.34	-	0.59
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.23	< 0.05	< 0.05	-	0.24
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.22	< 0.05	< 0.05	-	0.27

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	5.54	2.06	3.31	-	6.96
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	16	15	-	14
Barium (aqua regia extractable)	mg/kg	1	MCERTS	100	99	77	-	55
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.73	0.85	0.78	-	0.66
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	1.0	0.9	-	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	-	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	19	19	-	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	34	39	34	-	32
Lead (aqua regia extractable)	mg/kg	1	MCERTS	110	68	68	-	54
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	16	17	-	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	35	32	25	-	28
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	74	81	57	-	47

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Project / Site name: Plot J.Rochdale

Your Order No: POR015715

Lab Sample Number				888920	888921	888922	888923	888924
Sample Reference				TP13	TP16	TP19	TP21	TP21
Sample Number				2	11	2	4	3
Depth (m)				0.10-0.20	0.20-0.30	0.40-0.50	0.10-0.20	0.10-0.20
Date Sampled				10/01/2018	12/01/2018	09/01/2018	11/01/2018	11/01/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Benzene	ug/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Toluene	ug/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
p & m-xylene	ug/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
o-xylene	ug/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	-	-	-	< 1.0

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	21	< 10	< 10	-	< 10
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-	-	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	-	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	-	-	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	-	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	-	-	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	14	-	-	-	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	21	-	-	-	< 10

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Project / Site name: Plot J.Rochdale

Your Order No: POR015715

Lab Sample Number	888925	888926	888927	888928	888929
Sample Reference	TP23	TP25	TP27	TP27	TP29
Sample Number	4	5	2	6	5
Depth (m)	0.75-0.85	2.40-2.50	0.45-0.55	1.75-1.85	0.50-0.60
Date Sampled	11/01/2018	11/01/2018	08/01/2018	08/01/2018	08/01/2018
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	21
Moisture Content	%	N/A	NONE	11	11
Total mass of sample received	kg	0.001	NONE	0.55	0.51

Asbestos in Soil	Type	N/A	ISO 17025	-	-	Not-detected	-	-
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	4.6	6.1	-	6.3	6.5
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	-	< 1	< 1
Complex Cyanide	mg/kg	1	MCERTS	< 1	< 1	-	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	-	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.019	0.018	-	0.013	0.0087
Total Sulphur	mg/kg	50	MCERTS	84	85	-	73	100
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0026	0.0032	-	0.0036	0.0051

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	-	< 0.80	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.0	5.7	-	5.7	3.4
Barium (aqua regia extractable)	mg/kg	1	MCERTS	31	69	-	36	25
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.41	0.63	-	0.58	0.30
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	0.5	-	0.4	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	-	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	20	-	22	14
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18	18	-	16	8.2
Lead (aqua regia extractable)	mg/kg	1	MCERTS	7.7	8.5	-	10	6.9
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	20	-	19	11
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	20	21	-	22	20
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	27	38	-	32	19

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Project / Site name: Plot J.Rochdale

Your Order No: POR015715

Lab Sample Number				888925	888926	888927	888928	888929
Sample Reference				TP23	TP25	TP27	TP27	TP29
Sample Number				4	5	2	6	5
Depth (m)				0.75-0.85	2.40-2.50	0.45-0.55	1.75-1.85	0.50-0.60
Date Sampled				11/01/2018	11/01/2018	08/01/2018	08/01/2018	08/01/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	ug/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	ug/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	ug/kg	1	MCERTS	-	-	-	-	-
o-xylene	ug/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	< 10	< 10	-	< 10	< 10
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	-

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Project / Site name: Plot J.Rochdale

Your Order No: POR015715

Lab Sample Number	888930	888931			
Sample Reference	TP30	TP30			
Sample Number	2	1			
Depth (m)	0.35-0.45	0.35-0.45			
Date Sampled	08/01/2018	08/01/2018			
Time Taken	None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	-	< 0.1
Moisture Content	%	N/A	NONE	-	17
Total mass of sample received	kg	0.001	NONE	-	1.2

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-		
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	6.7		
Total Cyanide	mg/kg	1	MCERTS	-	< 1		
Complex Cyanide	mg/kg	1	MCERTS	-	< 1		
Free Cyanide	mg/kg	1	MCERTS	-	< 1		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.014		
Total Sulphur	mg/kg	50	MCERTS	-	300		
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	-	0.025		

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	-	1.5		
Anthracene	mg/kg	0.05	MCERTS	-	0.22		
Fluoranthene	mg/kg	0.05	MCERTS	-	2.2		
Pyrene	mg/kg	0.05	MCERTS	-	1.9		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	1.3		
Chrysene	mg/kg	0.05	MCERTS	-	1.3		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	1.7		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	0.48		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	1.4		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	0.50		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	0.61		

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	13.1		
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	10		
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	80		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.63		
Boron (water soluble)	mg/kg	0.2	MCERTS	-	0.6		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	-	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	19		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	25		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	41		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	15		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	19		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	49		

Analytical Report Number: 18-72894

Project / Site name: Plot J.Rochdale

Your Order No: POR015715

Lab Sample Number				888930	888931			
Sample Reference				TP30	TP30			
Sample Number				2	1			
Depth (m)				0.35-0.45	0.35-0.45			
Date Sampled				08/01/2018	08/01/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

Benzene	ug/kg	1	MCERTS	-	< 1.0			
Toluene	ug/kg	1	MCERTS	-	< 1.0			
Ethylbenzene	ug/kg	1	MCERTS	-	< 1.0			
p & m-xylene	ug/kg	1	MCERTS	-	< 1.0			
o-xylene	ug/kg	1	MCERTS	-	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	-	< 1.0			

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	-	36			
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	-	< 0.1			
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	2.1			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	25			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	36			



Analytical Report Number: 18-72894

Project / Site name: Plot J.Rochdale

Your Order No: POR015715

Lab Sample Number				888932	888933	888934	888935	888936
Sample Reference				TP02	TP06	TP13	TP21	TP29
Sample Number				1	4	2	3	5
Depth (m)				0.55-0.65	1.50-1.60	0.10-0.20	0.10-0.20	0.50-0.60
Date Sampled				10/01/2018	09/01/2018	10/01/2018	11/01/2018	08/01/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)				Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	7.1	6.8	6.5	6.5	6.7
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO ₄	mg/l	0.1	ISO 17025	2.7	1.7	2.1	1.9	2.7

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1	< 1.1	1.8	< 1.1	< 1.1
Barium (dissolved)	µg/l	0.05	ISO 17025	15	1.5	6.0	7.1	3.4
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.3	< 0.2	< 0.2	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	< 10	< 10	17	14	< 10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.7	< 0.4	0.9	0.8	1.6
Copper (dissolved)	µg/l	0.7	ISO 17025	13	5.9	37	31	21
Lead (dissolved)	µg/l	1	ISO 17025	2.7	1.2	6.7	3.5	2.7
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.9	< 0.3	2.5	1.8	0.8
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7	< 1.7	3.6	< 1.7
Zinc (dissolved)	µg/l	0.4	ISO 17025	7.1	3.6	7.7	9.7	7.6



Analytical Report Number: 18-72894

Project / Site name: Plot J.Rochdale

Your Order No: POR015715

Lab Sample Number				888937				
Sample Reference				TP30				
Sample Number				1				
Depth (m)				0.35-0.45				
Date Sampled				08/01/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)				Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	7.7				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO ₄	mg/l	0.1	ISO 17025	2.5				

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1				
Barium (dissolved)	µg/l	0.05	ISO 17025	19				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	0.3				
Boron (dissolved)	µg/l	10	ISO 17025	< 10				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.0				
Copper (dissolved)	µg/l	0.7	ISO 17025	18				
Lead (dissolved)	µg/l	1	ISO 17025	3.0				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.8				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7				
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.9				

Analytical Report Number : 18-72894

Project / Site name: Plot J.Rochdale

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
888910	TP01	2	0.75-0.85	Brown clay and sand.
888911	TP02	1	0.55-0.65	Brown clay and sand with vegetation.
888912	TP02	2	0.55-0.65	-
888913	TP03	3	0.10-0.20	-
888914	TP04	4	0.50-0.60	-
888915	TP05	1	0.20-0.30	Brown loam and clay with gravel and vegetation.
888916	TP06	4	1.50-1.60	Light brown sand with gravel.
888917	TP09	4	2.40-2.50	Light brown sandy clay with gravel.
888918	TP11	1	1.00-1.10	Light brown sandy clay.
888919	TP13	1	0.10-0.20	-
888920	TP13	2	0.10-0.20	Brown loam and clay with vegetation.
888921	TP16	11	0.20-0.30	Brown loam and clay with gravel and vegetation.
888922	TP19	2	0.40-0.50	Brown loam and clay with gravel and vegetation.
888923	TP21	4	0.10-0.20	-
888924	TP21	3	0.10-0.20	Brown loam and clay with gravel and vegetation.
888925	TP23	4	0.75-0.85	Light brown clay and sand.
888926	TP25	5	2.40-2.50	Light brown sandy clay.
888927	TP27	2	0.45-0.55	-
888928	TP27	6	1.75-1.85	Light brown clay and sand with gravel.
888929	TP29	5	0.50-0.60	Brown sandy clay with gravel and stones.
888930	TP30	2	0.35-0.45	-
888931	TP30	1	0.35-0.45	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 18-72894

Project / Site name: Plot J.Rochdale

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Complex Cyanide in soil	Determination of complex cyanide by calculation.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L009-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS

Iss No 18-72894-1 Plot J.Rochdale MCS2374

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 18-72894

Project / Site name: Plot J.Rochdale

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding.	L076-PL	W	MCERTS
TPH2 (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Sample Deviation Report



Sample ID	Other ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
TP27	6	S	18-72894	888928	c	Total cyanide in soil	L080-PL	c
TP29	5	S	18-72894	888929	c	Total cyanide in soil	L080-PL	c
TP30	1	S	18-72894	888931	c	Total cyanide in soil	L080-PL	c

APPENDIX 7

GROUNDWATER CHEMICAL ANALYSIS RESULTS

**Thomas Yarnall**

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Analytical Report Number : 18-74222

Project / Site name:	Plot J, Rochdale	Samples received on:	29/01/2018
Your job number:	MC52210	Samples instructed on:	29/01/2018
Your order number:		Analysis completed by:	05/02/2018
Report Issue Number:	1	Report issued on:	05/02/2018
Samples Analysed:	6 water samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 18-74222

Project / Site name: Plot J, Rochdale

Lab Sample Number				897166	897167	897168	897169	897170
Sample Reference				BH01	BH02	BH03	BH04	BH05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				25/01/2018	25/01/2018	25/01/2018	25/01/2018	25/01/2018
Time Taken				1030	1045	0820	0930	0915
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	pH Units	N/A	ISO 17025	6.1	6.5	6.1	6.0	6.2
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	300	200	130	190	170
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO ₄	µg/l	45	ISO 17025	36700	12400	16900	11500	13700
Sulphate as SO ₄	mg/l	0.045	ISO 17025	36.7	12.4	16.9	11.5	13.7
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	42	50	23	28	41
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	3.45	3.31	3.76	3.46	10.4

Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
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Analytical Report Number: 18-74222

Project / Site name: Plot J, Rochdale

Lab Sample Number				897166	897167	897168	897169	897170
Sample Reference				BH01	BH02	BH03	BH04	BH05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				25/01/2018	25/01/2018	25/01/2018	25/01/2018	25/01/2018
Time Taken				1030	1045	0820	0930	0915
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	1.3
Barium (dissolved)	µg/l	0.05	ISO 17025	260	91	67	110	110
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	24	27	16	15	13
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Calcium (dissolved)	mg/l	0.012	ISO 17025	34	29	16	24	18
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.7	< 0.4	< 0.4	0.4	1.1
Copper (dissolved)	µg/l	0.7	ISO 17025	2.5	3.0	6.3	3.3	10
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	12	7.2	3.7	1.4	7.2
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	3.8	< 1.7	< 1.7	4.6	< 1.7
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.5	7.1	4.8	3.6	9.5

Monoaromatics

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH2 (C6 - C10)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 18-74222

Project / Site name: Plot J, Rochdale

Lab Sample Number				897171				
Sample Reference				BH06				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				25/01/2018				
Time Taken				0845				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	pH Units	N/A	ISO 17025	5.9				
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	470				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO ₄	µg/l	45	ISO 17025	105000				
Sulphate as SO ₄	mg/l	0.045	ISO 17025	105				
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	22				
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	4.98				

Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01				

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16				
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Analytical Report Number: 18-74222

Project / Site name: Plot J, Rochdale

Lab Sample Number				897171				
Sample Reference				BH06				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				25/01/2018				
Time Taken				0845				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	1.3				
Barium (dissolved)	µg/l	0.05	ISO 17025	250				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Boron (dissolved)	µg/l	10	ISO 17025	30				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Calcium (dissolved)	mg/l	0.012	ISO 17025	74				
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0				
Chromium (dissolved)	µg/l	0.4	ISO 17025	< 0.4				
Copper (dissolved)	µg/l	0.7	ISO 17025	4.5				
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	7.3				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7				
Zinc (dissolved)	µg/l	0.4	ISO 17025	3.7				

Monoaromatics

Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0				

Petroleum Hydrocarbons

TPH1 (C10 - C40)	µg/l	10	NONE	< 10				
TPH2 (C6 - C10)	µg/l	10	ISO 17025	< 10				
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 18-74222

Project / Site name: Plot J, Rochdale

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE
TPH2 (Waters)	Determination of hydrocarbons C6-C10 by headspace GC-MS. Accredited Matrices SW, PW. GW.	In-house method based on USEPA8260	L088-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Iss No 18-74222-1 Plot J, Rochdale MC52210

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The results included within the report are representative of the samples submitted for analysis.

Page 6 of 7

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
BH01		W	18-74222	897166	c	Ammoniacal Nitrogen as N in water	L082-PL	c
BH01		W	18-74222	897166	c	Electrical conductivity at 20oC of water	L031-PL	c
BH01		W	18-74222	897166	c	pH at 20oC in water (automated)	L099-PL	c
BH02		W	18-74222	897167	c	Ammoniacal Nitrogen as N in water	L082-PL	c
BH02		W	18-74222	897167	c	Electrical conductivity at 20oC of water	L031-PL	c
BH02		W	18-74222	897167	c	pH at 20oC in water (automated)	L099-PL	c
BH03		W	18-74222	897168	c	Ammoniacal Nitrogen as N in water	L082-PL	c
BH03		W	18-74222	897168	c	Electrical conductivity at 20oC of water	L031-PL	c
BH03		W	18-74222	897168	c	pH at 20oC in water (automated)	L099-PL	c
BH04		W	18-74222	897169	c	Ammoniacal Nitrogen as N in water	L082-PL	c
BH04		W	18-74222	897169	c	Electrical conductivity at 20oC of water	L031-PL	c
BH04		W	18-74222	897169	c	pH at 20oC in water (automated)	L099-PL	c
BH05		W	18-74222	897170	c	Ammoniacal Nitrogen as N in water	L082-PL	c
BH05		W	18-74222	897170	c	Electrical conductivity at 20oC of water	L031-PL	c
BH05		W	18-74222	897170	c	pH at 20oC in water (automated)	L099-PL	c
BH06		W	18-74222	897171	c	Ammoniacal Nitrogen as N in water	L082-PL	c
BH06		W	18-74222	897171	c	Electrical conductivity at 20oC of water	L031-PL	c
BH06		W	18-74222	897171	c	pH at 20oC in water (automated)	L099-PL	c

APPENDIX 8

GEOTECHNICAL LABORATORY TESTING RESULTS



TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



4041

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

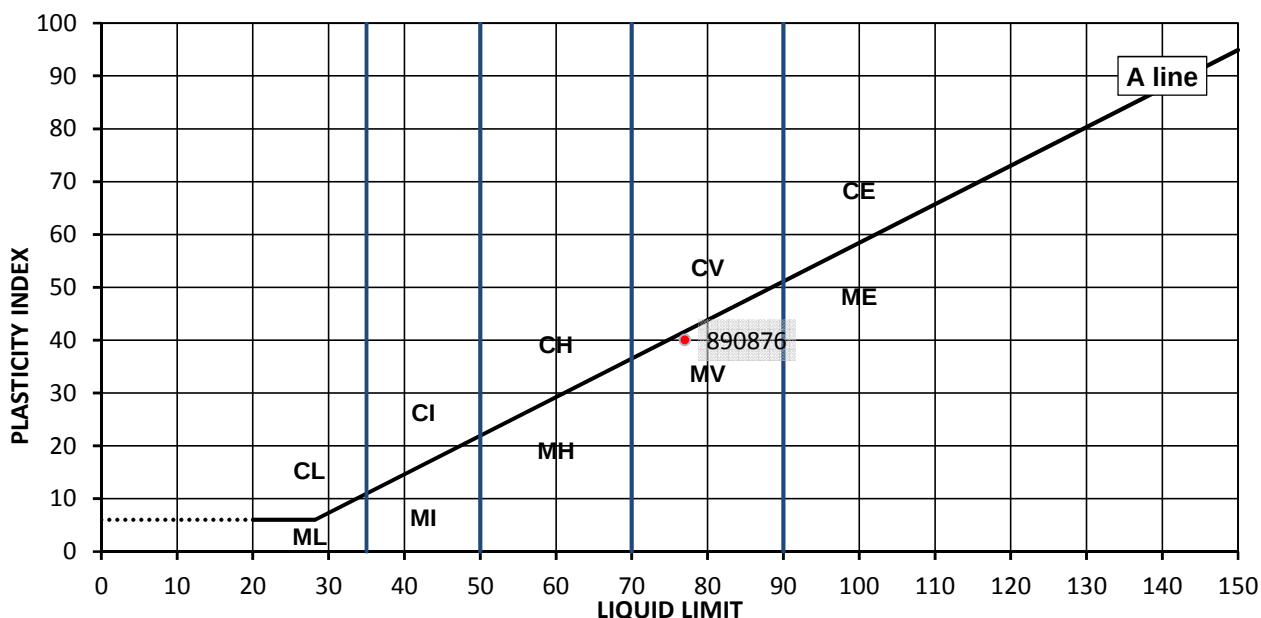
TEST RESULTS

Laboratory Reference: 890876
Sample Reference: Not Given

Description: Dark brown slightly organic CLAY
Location: TP01
Sample Preparation: Tested in natural condition

Sample Type: D
Depth Top [m]: 0.75
Depth Base [m]: 0.85

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
83	77	37	40	100



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L	Low
	I	Medium
	H	High
	V	Very high
	E	Extremely high
Organic	O	append to classification for organic material (eg CHO)

Remarks

Approved:

Signed:

Dariusz Piotrowski
PL Laboratory
Manager Geotechnical
Section
Date Reported: 02/02/2018

Piotrowski

Darren Berrill
Geotechnical General
Manager

D. Berrill

for and on behalf of i2 Analytical Ltd

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The results included within the report are representative of the samples submitted for analysis.
The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."



TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

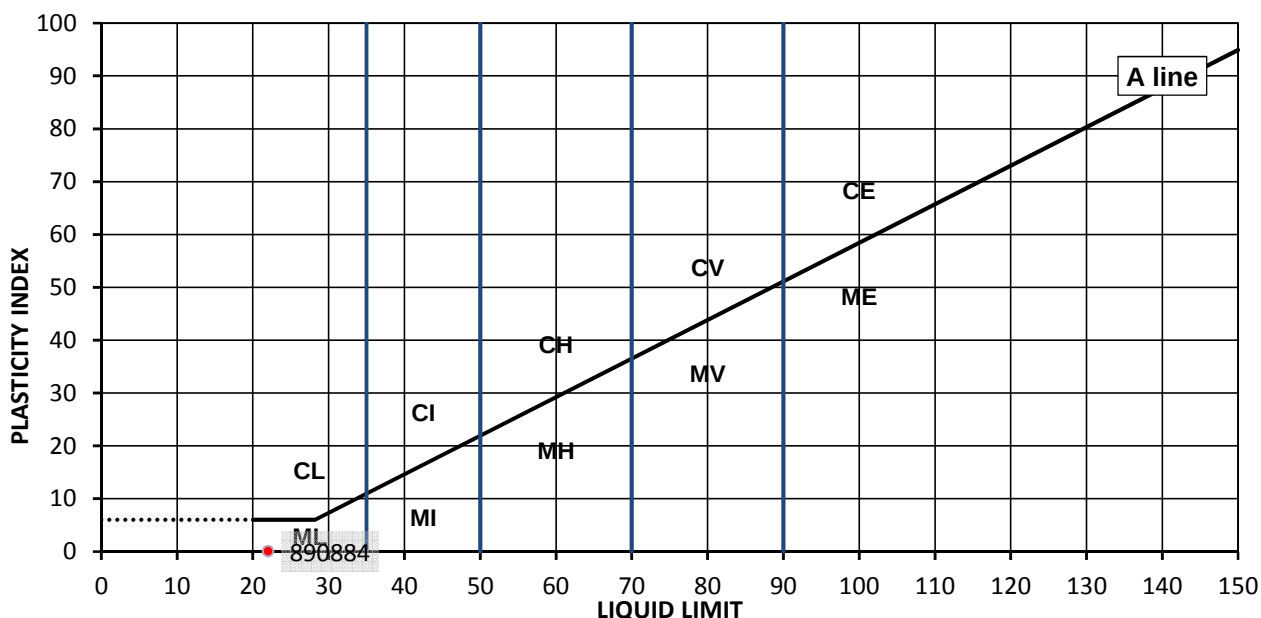
TEST RESULTS

Laboratory Reference: 890884
Sample Reference: Not Given

Description: Yellowish brown slightly gravelly slightly clayey SAND
Location: TP08
Sample Preparation: Tested after >425um removed by hand

Sample Type: D
Depth Top [m]: 3.40
Depth Base [m]: 3.50

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
19	22	NP	NP	97



Remarks NP – non plastic

Approved:

Dariusz Piotrowski
PL Laboratory
Manager Geotechnical
Section
Date Reported: 02/02/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

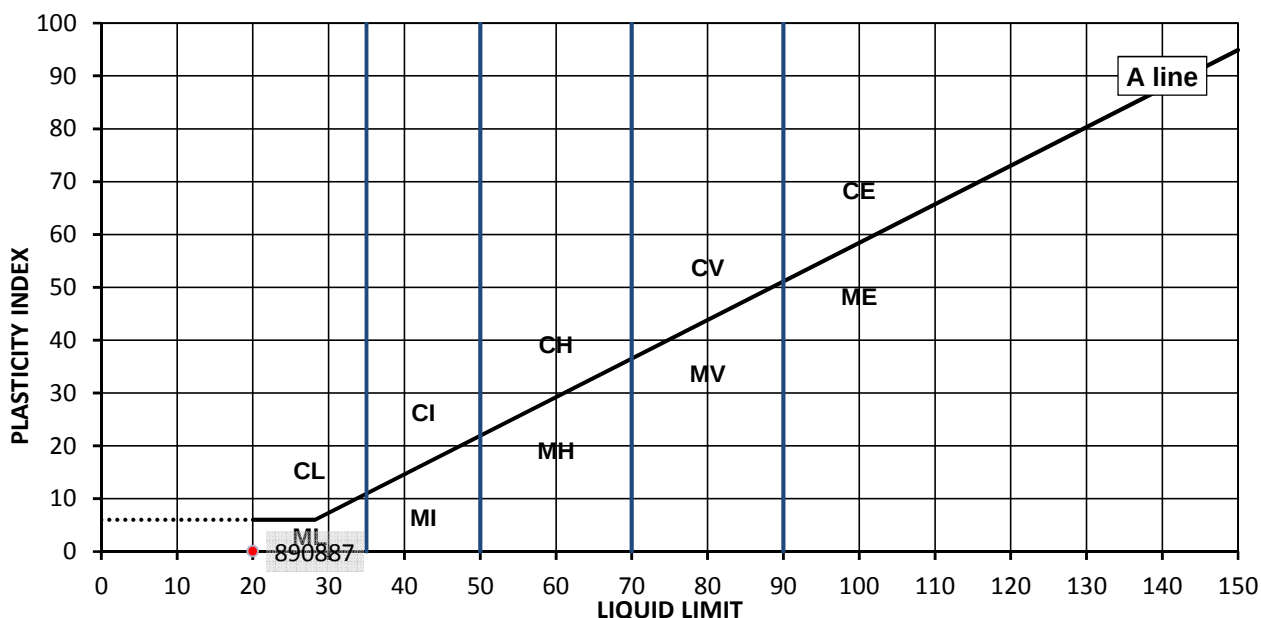
TEST RESULTS

Laboratory Reference: 890887
Sample Reference: Not Given

Description: Yellowish brown slightly gravelly SAND
Location: TP11
Sample Preparation: Tested after >425um removed by hand

Sample Type: D
Depth Top [m]: 1.00
Depth Base [m]: 1.10

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
24	20	NP	NP	98



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L Low	50 to 70
	I Medium	70 to 90
	H High	exceeding 90
	V Very high	
	E Extremely high	
Organic	O	append to classification for organic material (eg CHO)

Remarks NP – non plastic

Approved:

Dariusz Piotrowski
PL Laboratory
Manager Geotechnical
Section
Date Reported: 02/02/2018

Piotrowski

Signed:

Darren Berrill
Geotechnical General
Manager

D. Berrill

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

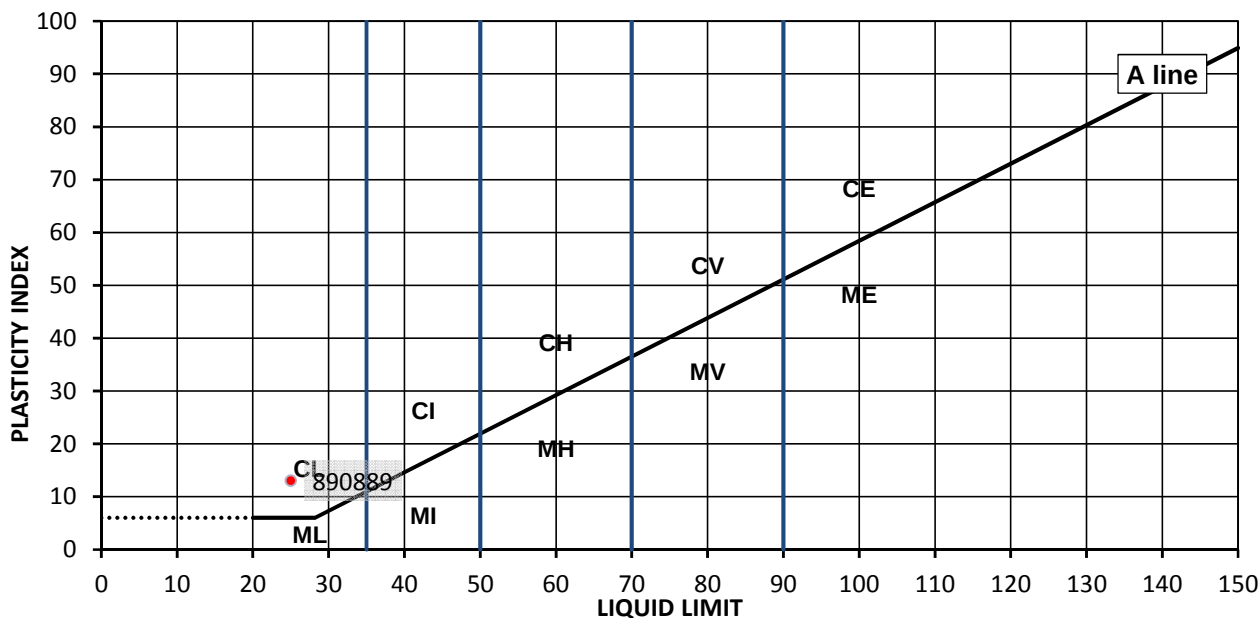
TEST RESULTS

Laboratory Reference: 890889
Sample Reference: Not Given

Description: Dark brown slightly gravelly very sandy CLAY
Location: TP12
Sample Preparation: Tested after >425um removed by hand

Sample Type: D
Depth Top [m]: 3.10
Depth Base [m]: 3.20

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
12	25	12	13	97



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L	Low
	I	Medium
	H	High
	V	Very high
	E	Extremely high
Organic	O	append to classification for organic material (eg CHO)

Remarks

Approved:

Signed:

Dariusz Piotrowski
PL Laboratory
Manager Geotechnical
Section
Date Reported: 02/02/2018

Piotrowski

Darren Berrill
Geotechnical General
Manager

[Signature]

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

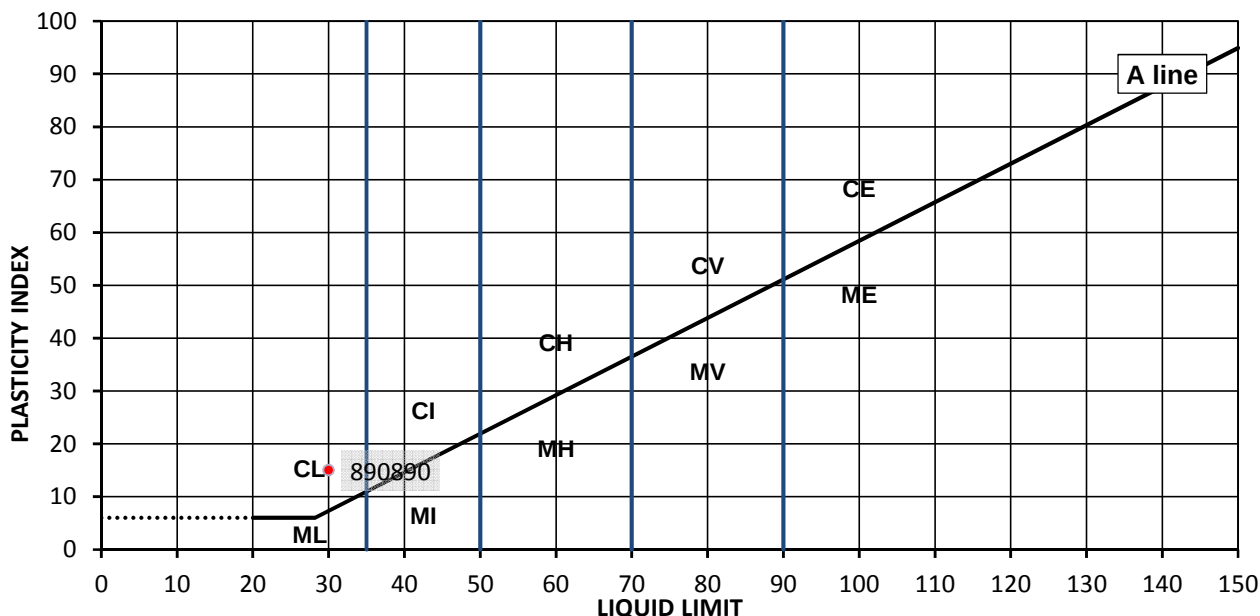
TEST RESULTS

Laboratory Reference: 890890
Sample Reference: Not Given

Description: Dark brown slightly gravelly very sandy CLAY
Location: TP13
Sample Preparation: Tested after >425um removed by hand

Sample Type: D
Depth Top [m]: 1.50
Depth Base [m]: 1.60

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
16	30	15	15	98



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L	Low
	I	Medium
	H	High
	V	Very high
	E	Extremely high
Organic	O	append to classification for organic material (eg CHO)

Remarks

Approved:

Signed:

Dariusz Piotrowski
PL Laboratory
Manager Geotechnical
Section
Date Reported: 02/02/2018

Piotrowski

Darren Berrill
Geotechnical General
Manager

D. Berrill

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

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Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

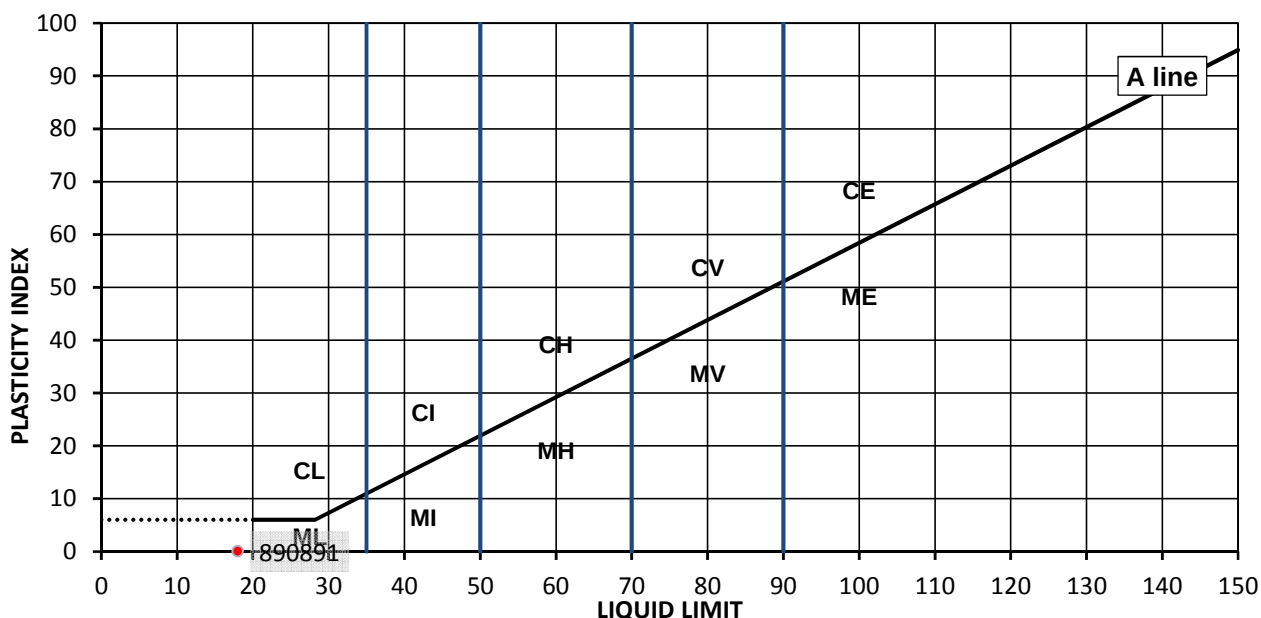
TEST RESULTS

Laboratory Reference: 890891
Sample Reference: Not Given

Description: Yellowish brown slightly gravelly SAND
Location: TP14
Sample Preparation: Tested after >425um removed by hand

Sample Type: D
Depth Top [m]: 1.00
Depth Base [m]: 1.10

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
14	18	NP	NP	99



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L	Low
	I	Medium
	H	High
	V	Very high
	E	Extremely high
Organic	O	append to classification for organic material (eg CHO)

Remarks NP – non plastic

Approved:

Dariusz Piotrowski
PL Laboratory
Manager Geotechnical
Section
Date Reported: 02/02/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

Client: BWB Consulting Limited
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35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

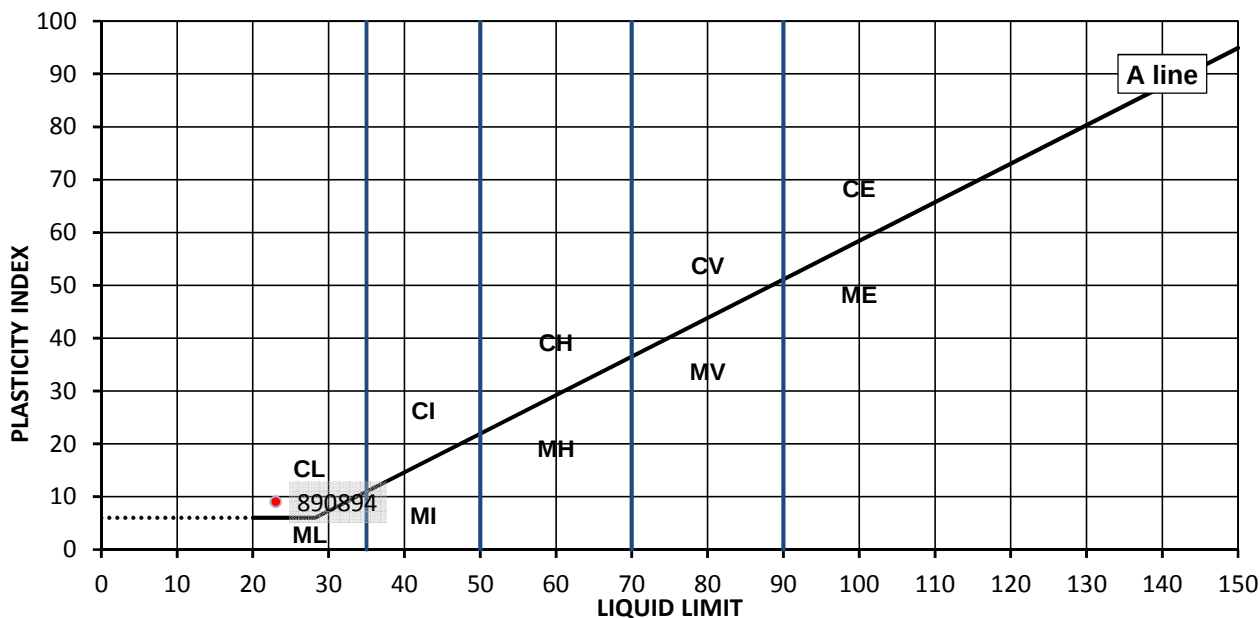
TEST RESULTS

Laboratory Reference: 890894
Sample Reference: Not Given

Description: Dark brown slightly gravelly clayey SAND
Location: TP17
Sample Preparation: Tested after >425um removed by hand

Sample Type: D
Depth Top [m]: 3.70
Depth Base [m]: 3.80

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
17	23	14	9	98



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L	Low
	I	Medium
	H	High
	V	Very high
	E	Extremely high
Organic	O	append to classification for organic material (eg CHO)

Remarks

Approved:

Signed:

Dariusz Piotrowski
PL Laboratory
Manager Geotechnical
Section
Date Reported: 02/02/2018

Piotrowski

Darren Berrill
Geotechnical General
Manager

[Signature]

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
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Watford Herts WD18 8YS



4041

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Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

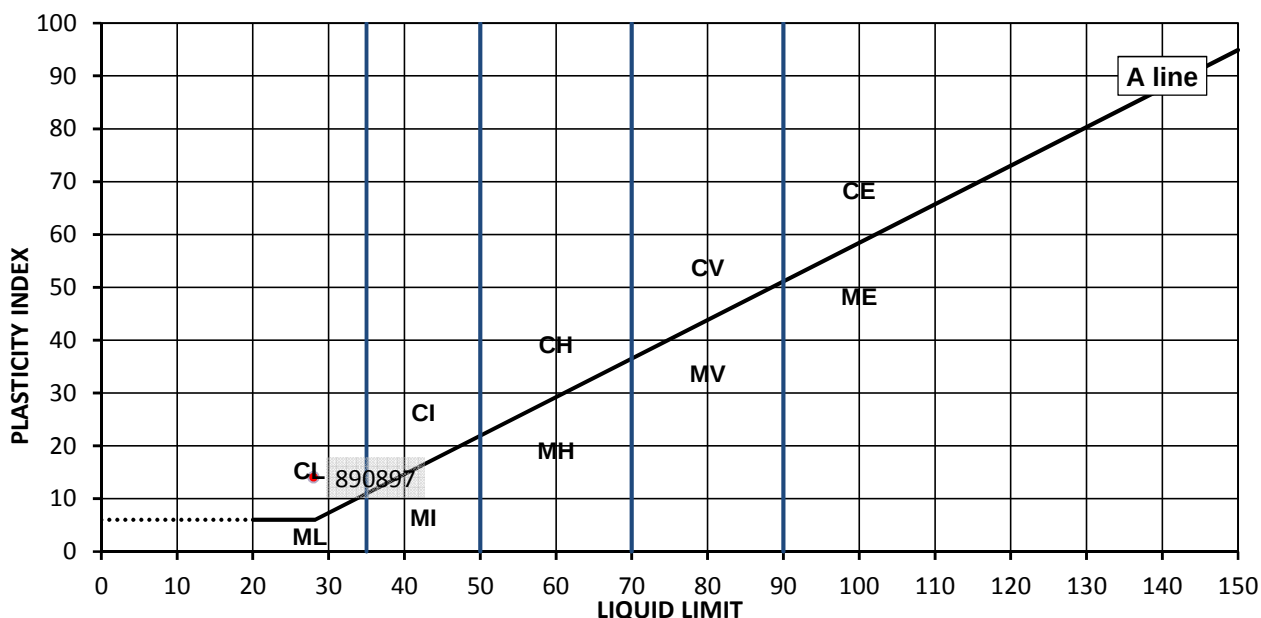
TEST RESULTS

Laboratory Reference: 890897
Sample Reference: Not Given

Description: Dark brown slightly gravelly very sandy CLAY
Location: TP21
Sample Preparation: Tested after >425um removed by hand

Sample Type: D
Depth Top [m]: 2.10
Depth Base [m]: 2.20

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
17	28	14	14	97



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L	Low
	I	Medium
	H	High
	V	Very high
	E	Extremely high
Organic	O	append to classification for organic material (eg CHO)

Remarks

Approved:

Signed:

Dariusz Piotrowski
PL Laboratory
Manager Geotechnical
Section
Date Reported: 02/02/2018

Piotrowski

Darren Berrill
Geotechnical General
Manager

[Signature]

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Summary of Classification Test Results

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Soil Description	Density		M/C	Atterberg				PD
		Reference	Top depth [m]	Base depth [m]	Type		bulk	dry		% Passing 425um	LL	PL	PI	
							Mg/m3	Mg/m3		%	%	%	%	
890870	BH01	Not Given	9.50	9.95	U	Dark brown slightly gravelly CLAY			16					
890871	BH02	Not Given	13.00	Not Given	U	Dark brown slightly gravelly CLAY			13					
890872	BH03	Not Given	8.00	Not Given	U	Dark brown slightly gravelly CLAY			15					
890873	BH04	Not Given	11.00	Not Given	U	Dark brown slightly gravelly CLAY			12					
890874	BH05	Not Given	6.50	Not Given	U	Brown sandy CLAY			14					
890875	BH05	Not Given	9.50	9.95	U	Dark brown slightly gravelly CLAY			15					
890876	TP01	Not Given	0.75	0.85	D	Dark brown slightly organic CLAY			83	100	77	37	40	
890878	TP03	Not Given	1.00	1.10	B	Yellowish brown gravelly SAND								2.64
890880	TP04	Not Given	1.40	1.50	D	Yellowish brown slightly gravelly SAND								2.72
890881	TP07	Not Given	1.00	1.10	B	Brown clayey SAND								2.69

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 02/02/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Summary of Classification Test Results

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7 Woodshots Meadow
Croxley Green Business Park
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Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Soil Description	Density		M/C	Atterberg				PD
		Reference	Top depth [m]	Base depth [m]	Type		bulk	dry		% Passing 425um	LL	PL	PI	
							Mg/m3	Mg/m3		%	%	%	%	%
890883	TP08	Not Given	0.40	0.50	B	Brown clayey SAND								2.7
890884	TP08	Not Given	3.40	3.50	D	Yellowish brown slightly gravelly slightly clayey SAND			19	97	22	NP	NP*	
890885	TP10	Not Given	0.90	1.00	B	Yellowish brown slightly clayey SAND								2.68
890887	TP11	Not Given	1.00	1.10	D	Yellowish brown slightly gravelly SAND			24	98	20	NP	NP*	
890888	TP12	Not Given	0.80	0.90	B	Brown sandy clayey GRAVEL								2.69
890889	TP12	Not Given	3.10	3.20	D	Dark brown slightly gravelly very sandy CLAY			12	97	25	12	13	
890890	TP13	Not Given	1.50	1.60	D	Dark brown slightly gravelly very sandy CLAY			16	98	30	15	15	
890891	TP14	Not Given	1.00	1.10	D	Yellowish brown slightly gravelly SAND			14	99	18	NP	NP*	
890892	TP15	Not Given	1.10	1.20	B	Brown gravelly sandy CLAY								2.68
890894	TP17	Not Given	3.70	3.80	D	Dark brown slightly gravelly clayey SAND			17	98	23	14	9	

Comments: * NP – non plastic

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 02/02/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Summary of Classification Test Results

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7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Soil Description	Density		M/C	Atterberg				PD
		Reference	Top depth [m]	Base depth [m]	Type		bulk	dry		% Passing 425um	LL	PL	PI	
							Mg/m3	Mg/m3		%	%	%	%	Mg/m3
890895	TP19	Not Given	0.90	1.00	B	Brown slightly gravelly slightly sandy CLAY								2.69
890897	TP21	Not Given	2.10	2.20	D	Dark brown slightly gravelly very sandy CLAY			17	97	28	14	14	
890899	TP24	Not Given	0.60	0.70	B	Dark brown sandy gravelly CLAY								2.66
890902	TP27	Not Given	1.20	1.30	B	Dark brown slightly gravelly sandy CLAY								2.66

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 02/02/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE**Determination of Particle Size Distribution**

Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890877

Sample Reference: Not Given

Sample description: Orangish brown gravelly clayey SAND

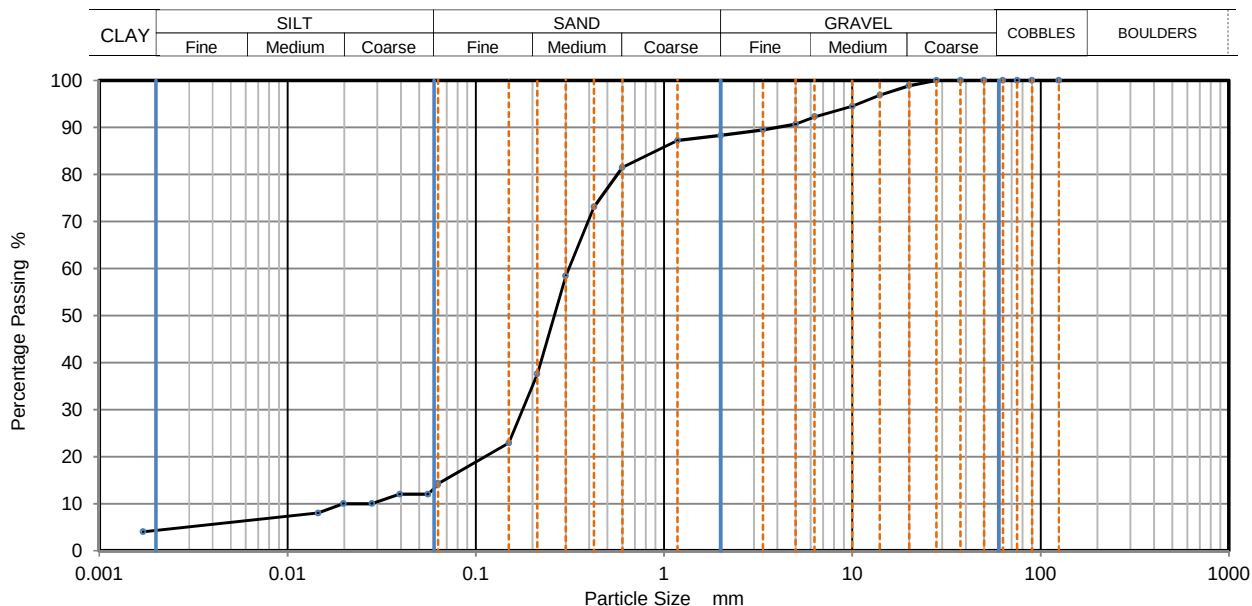
Sample Type: D

Location: TP01

Depth Top [m]: 1.75

Supplier: Not Given

Depth Base [m]: 1.85



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	14
90	100	0.0557	12
75	100	0.0394	12
63	100	0.0280	10
50	100	0.0198	10
37.5	100	0.0146	8
28	100	0.0017	4
20	99		
14	97		
10	95		
6.3	92		
5	91		
3.35	90		
2	88		
1.18	87		
0.6	82	Particle density (assumed) 2.65 Mg/m3	
0.425	73		
0.3	58		
0.212	38		
0.15	23		
0.063	14		

Dry Mass of sample [g]: 929

Sample Proportions		% dry mass
Very coarse		0.00
Gravel		11.70
Sand		74.00
Silt		9.90
Clay		4.40

Grading Analysis		
D100	mm	28
D60	mm	0.312
D30	mm	0.177
D10	mm	0.0192
Uniformity Coefficient		16
Curvature Coefficient		5.3

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Darren Berrill
Geotechnical General
Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE**Determination of Particle Size Distribution**

Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

Client: BWB Consulting Limited
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35 Livery Street Birmingham
B3 2PB

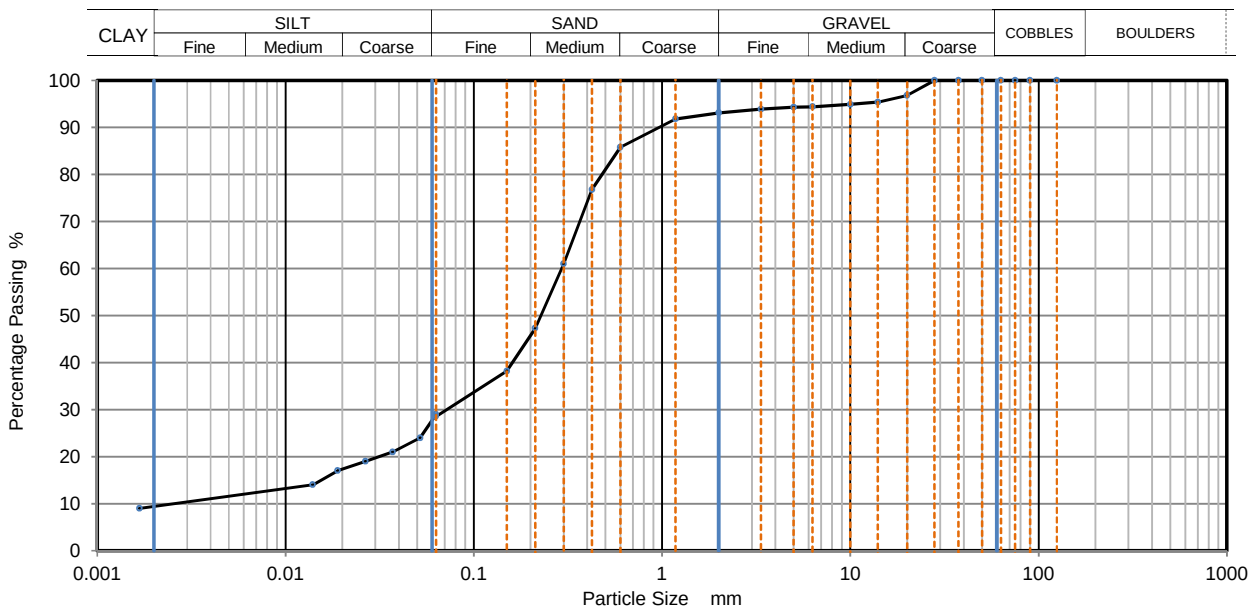
Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890879
Sample description: Yellowish brown gravelly clayey SAND
Location: TP03
Supplier: Not Given

Sample Reference: Not Given
Sample Type: B
Depth Top [m]: 3.00
Depth Base [m]: 3.10



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	29
90	100	0.0519	24
75	100	0.0371	21
63	100	0.0266	19
50	100	0.0189	17
37.5	100	0.0140	14
28	100	0.0017	9
20	97		
14	95		
10	95		
6.3	94		
5	94		
3.35	94		
2	93		
1.18	92		
0.6	86	Particle density (assumed) 2.65 Mg/m3	
0.425	77		
0.3	61		
0.212	47		
0.15	38		
0.063	29		

Dry Mass of sample [g]: 612

Sample Proportions		% dry mass
Very coarse		0.00
Gravel		6.90
Sand		64.50
Silt		19.50
Clay		9.10

Grading Analysis		
D100	mm	28
D60	mm	0.293
D30	mm	0.0717
D10	mm	0.00283
Uniformity Coefficient		100
Curvature Coefficient		6.2

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Darren Berrill
Geotechnical General
Manager

Date Reported: 02/02/2018

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TEST CERTIFICATE**Determination of Particle Size Distribution**

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890882

Sample Reference: Not Given

Sample description: Yellowish brown clayey very gravelly SAND

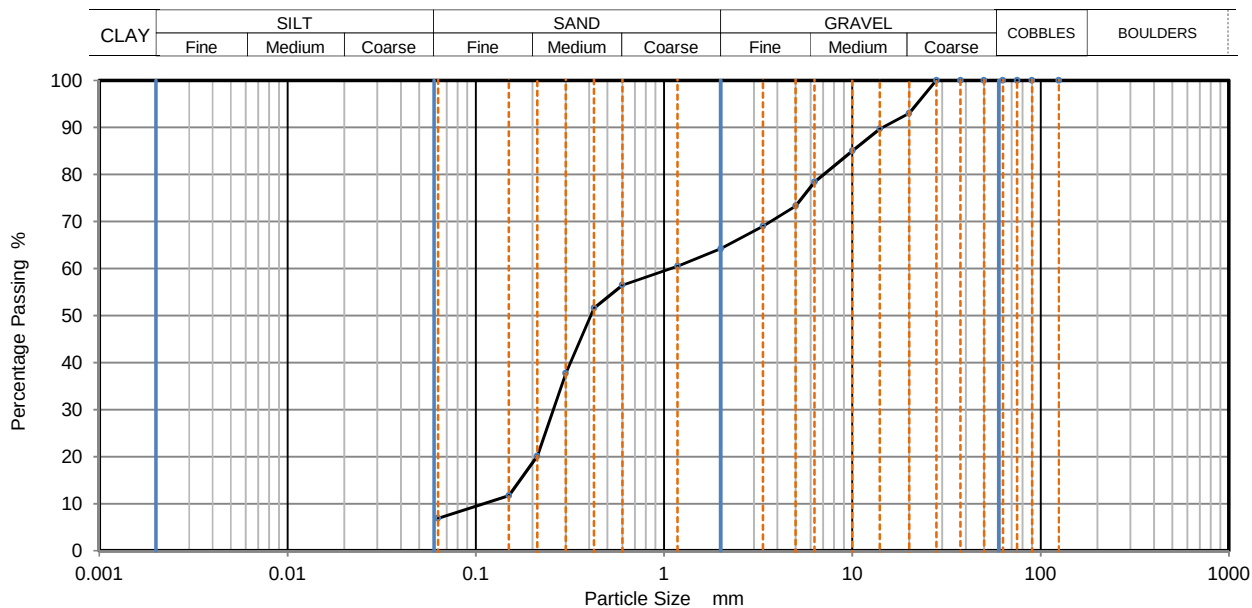
Sample Type: B

Location: TP07

Depth Top [m]: 1.90

Supplier: Not Given

Depth Base [m]: 2.00



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	93		
14	90		
10	85		
6.3	78		
5	73		
3.35	69		
2	64		
1.18	61		
0.6	57		
0.425	52		
0.3	38		
0.212	20		
0.15	12		
0.063	7		

Dry Mass of sample [g]: 2642

Sample Proportions		% dry mass
Very coarse		0.00
Gravel		35.80
Sand		57.20
Fines <0.063mm		6.90

Grading Analysis		
D100	mm	28
D60	mm	1.08
D30	mm	0.258
D10	mm	0.111
Uniformity Coefficient		9.8
Curvature Coefficient		0.56

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Darren Berrill
Geotechnical General
Manager

Date Reported: 02/02/2018

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TEST CERTIFICATE**Determination of Particle Size Distribution**

Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890886

Sample Reference: Not Given

Sample description: Yellowish brown slightly gravelly clayey SAND

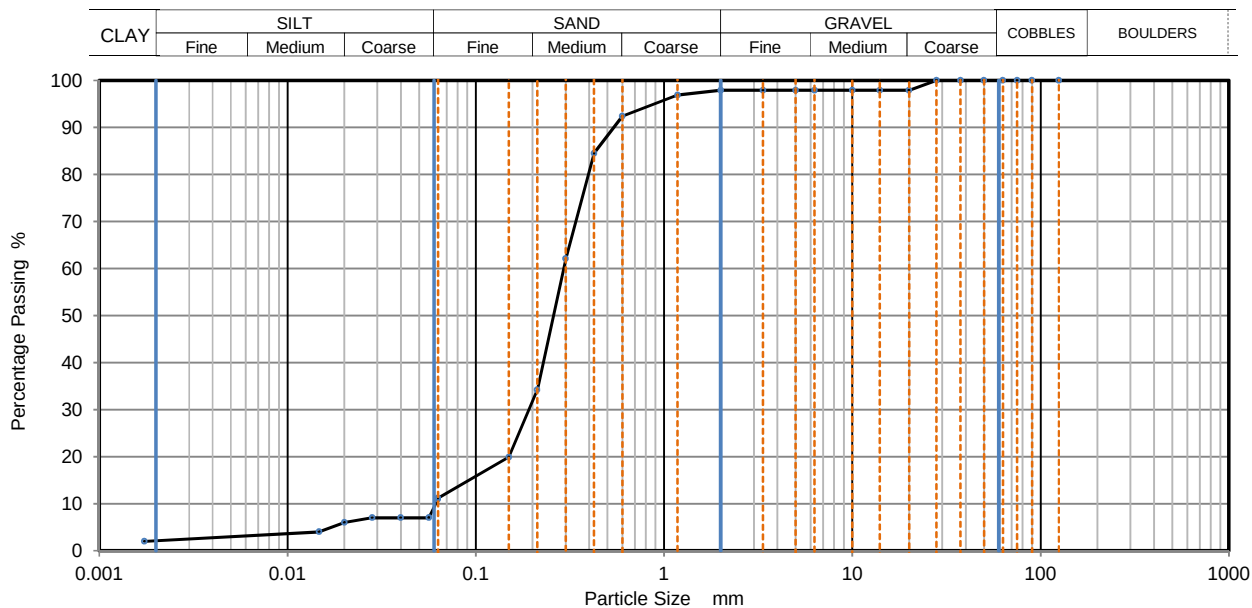
Sample Type: D

Location: TP10

Depth Top [m]: 2.15

Supplier: Not Given

Depth Base [m]: 2.25



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	11
90	100	0.0564	7
75	100	0.0399	7
63	100	0.0282	7
50	100	0.0200	6
37.5	100	0.0147	4
28	100	0.0017	2
20	98		
14	98		
10	98		
6.3	98		
5	98		
3.35	98		
2	98		
1.18	97		
0.6	92	Particle density (assumed) 2.65 Mg/m ³	
0.425	85		
0.3	62		
0.212	34		
0.15	20		
0.063	11		

Dry Mass of sample [g]:

461

Sample Proportions		% dry mass
Very coarse		0.00
Gravel		2.10
Sand		86.60
Silt		9.30
Clay		2.00

Grading Analysis		
D100	mm	28
D60	mm	0.292
D30	mm	0.191
D10	mm	0.0608
Uniformity Coefficient		4.8
Curvature Coefficient		2.1

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Darren Berrill
Geotechnical General
Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."



4041

TEST CERTIFICATE**Determination of Particle Size Distribution**

Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890893

Sample Reference: Not Given

Sample description: Yellowish brown clayey very gravelly SAND

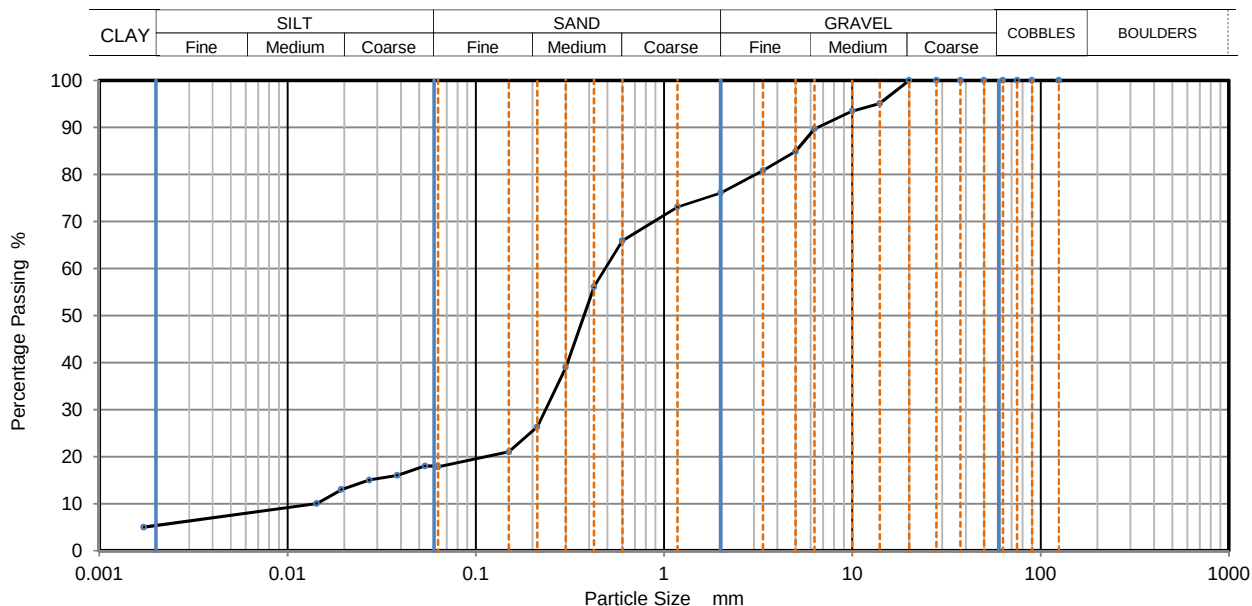
Sample Type: D

Location: TP16

Depth Top [m]: 2.30

Supplier: Not Given

Depth Base [m]: 2.40



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	18
90	100	0.0537	18
75	100	0.0382	16
63	100	0.0272	15
50	100	0.0193	13
37.5	100	0.0143	10
28	100	0.0017	5
20	100		
14	95		
10	94		
6.3	90		
5	85		
3.35	81		
2	76		
1.18	73		
0.6	66	Particle density (assumed) 2.65 Mg/m3	
0.425	56		
0.3	39		
0.212	26		
0.15	21		
0.063	18		

Dry Mass of sample [g]: 912

Sample Proportions		% dry mass
Very coarse		0.00
Gravel		23.90
Sand		58.30
Silt		12.60
Clay		5.20

Grading Analysis		
D100	mm	20
D60	mm	0.488
D30	mm	0.235
D10	mm	0.0147
Uniformity Coefficient		33
Curvature Coefficient		7.7

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Darren Berrill
Geotechnical General
Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE**Determination of Particle Size Distribution**

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



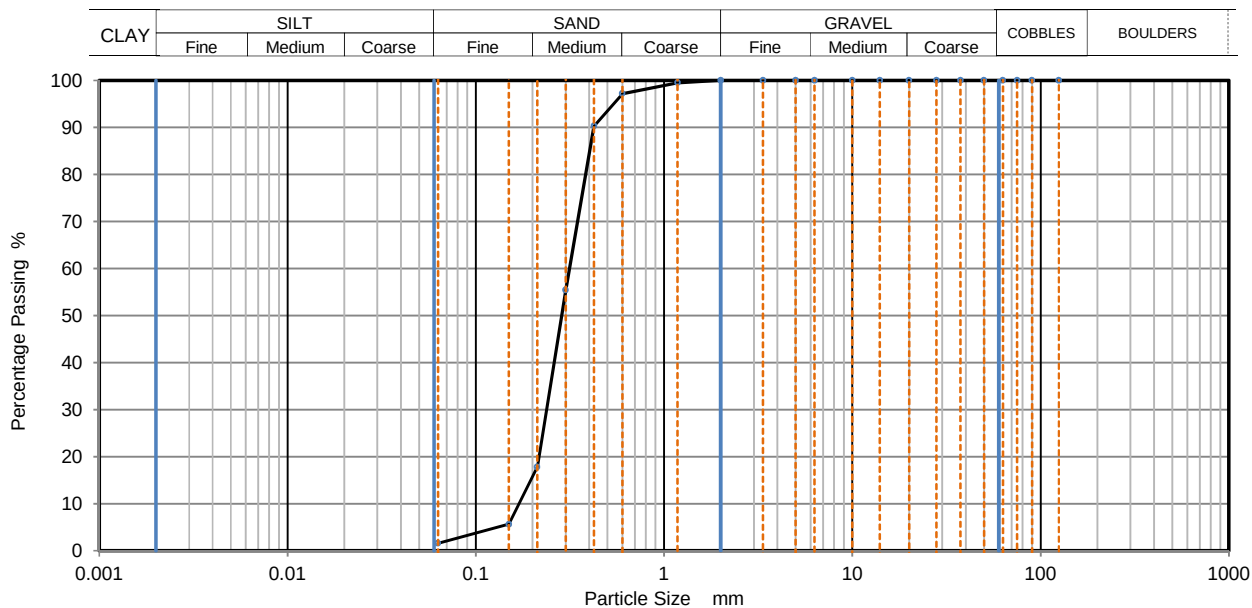
Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS Laboratory Reference: 890896
Sample description: Orangish brown SAND
Location: TP21
Supplier: Not Given

Sample Reference: Not Given
Sample Type: D
Depth Top [m]: 1.20
Depth Base [m]: 1.30





4041

TEST CERTIFICATE**Determination of Particle Size Distribution**

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

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Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

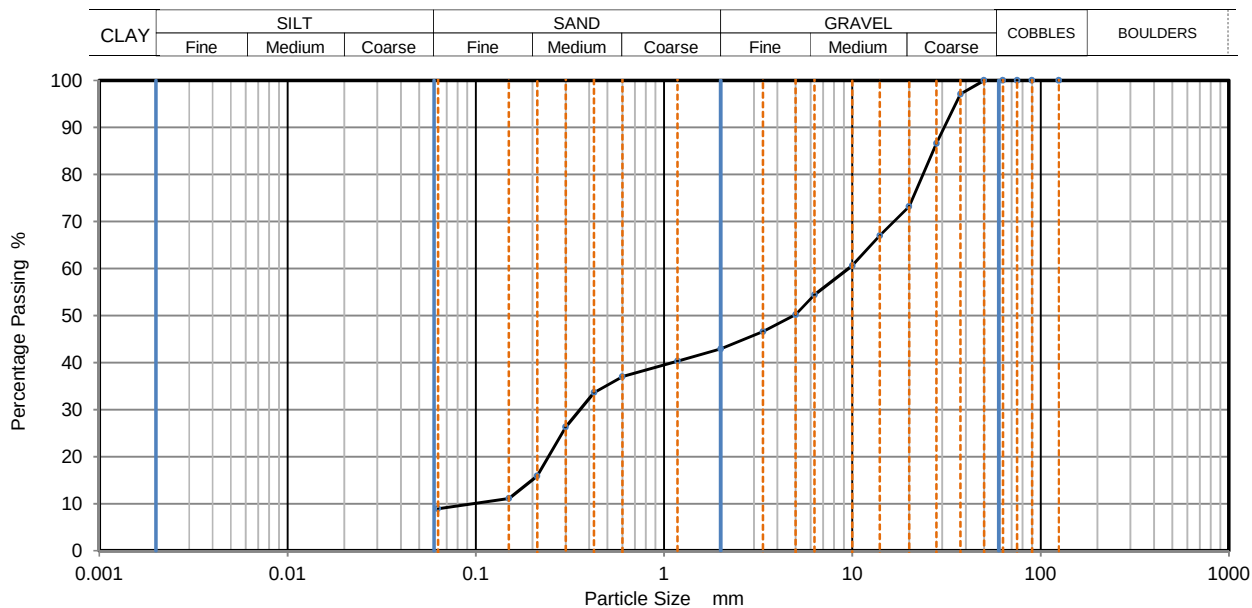
Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 24/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890898
Sample description: Brown clayey very sandy GRAVEL
Location: TP23
Supplier: Not Given

Sample Reference: Not Given
Sample Type: B
Depth Top [m]: 2.40
Depth Base [m]: 2.50





4041

TEST CERTIFICATE**Determination of Particle Size Distribution**

Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890900

Sample Reference: Not Given

Sample description: Brown silty clayey SAND

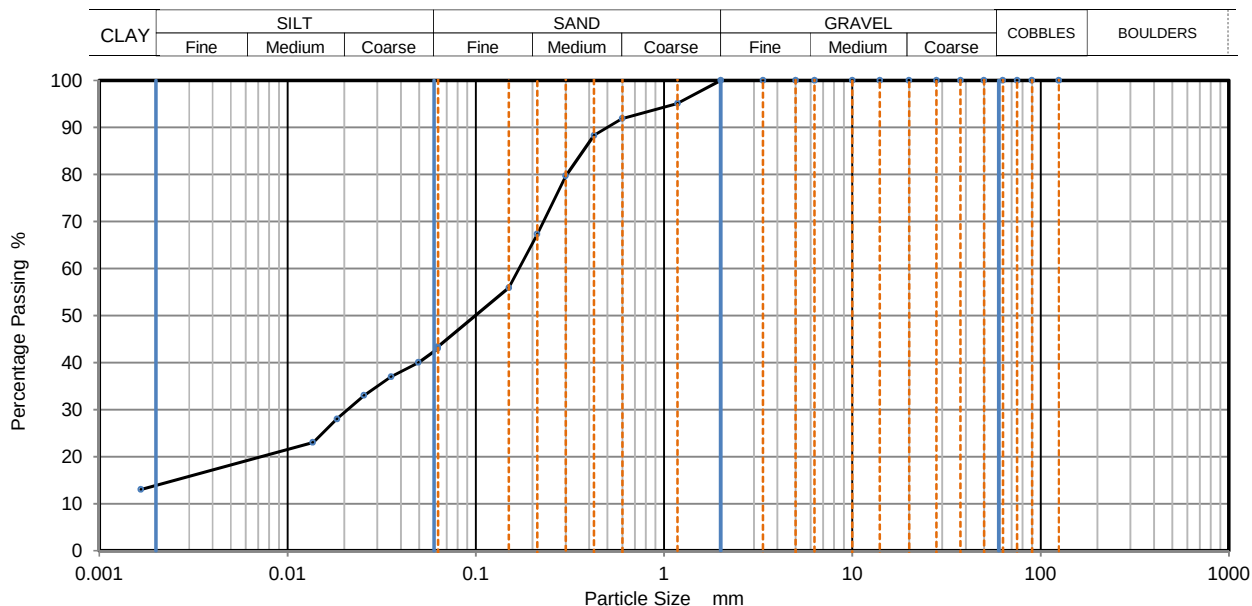
Sample Type: D

Location: TP25

Depth Top [m]: 1.40

Supplier: Not Given

Depth Base [m]: 1.50



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	43
90	100	0.0496	40
75	100	0.0355	37
63	100	0.0254	33
50	100	0.0183	28
37.5	100	0.0136	23
28	100	0.0017	13
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	95		
0.6	92	Particle density (assumed) 2.65 Mg/m ³	
0.425	88		
0.3	80		
0.212	67		
0.15	56		
0.063	43		

Dry Mass of sample [g]: 524

Sample Proportions		% dry mass
Very coarse		0.00
Gravel		0.00
Sand		56.60
Silt		29.20
Clay		14.20

Grading Analysis		
D100	mm	2
D60	mm	0.17
D30	mm	0.0204
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Darren Berrill
Geotechnical General
Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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Determination of Particle Size Distribution



Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890901

Sample Reference: Not Given

Sample description: Yellowish brown slightly gravelly silty clayey SAND

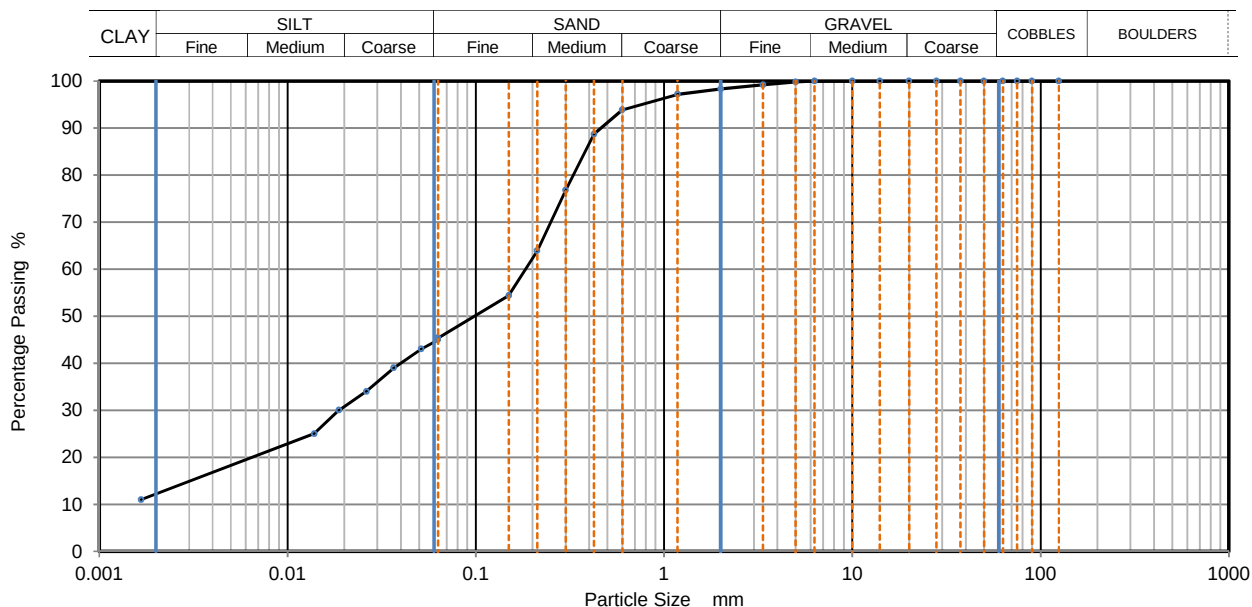
Sample Type: D

Location: TP26

Depth Top [m]: 1.85

Supplier: Not Given

Depth Base [m]: 1.95



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	45
90	100	0.0512	43
75	100	0.0367	39
63	100	0.0262	34
50	100	0.0188	30
37.5	100	0.0139	25
28	100	0.0017	11
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	99		
2	98		
1.18	97		
0.6	94		
0.425	89	Particle density	(assumed)
0.3	77	2.65	Mg/m3
0.212	64		
0.15	54		
0.063	45		

Dry Mass of sample [g]: 534

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	1.70
Sand	52.90
Silt	32.90
Clay	12.50

Grading Analysis		
D100	mm	6.3
D60	mm	0.184
D30	mm	0.0195
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Signed:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Darren Berrill
Geotechnical General
Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE**Determination of Particle Size Distribution**

Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890903

Sample Reference: Not Given

Sample description: Brown slightly gravelly very sandy silty CLAY

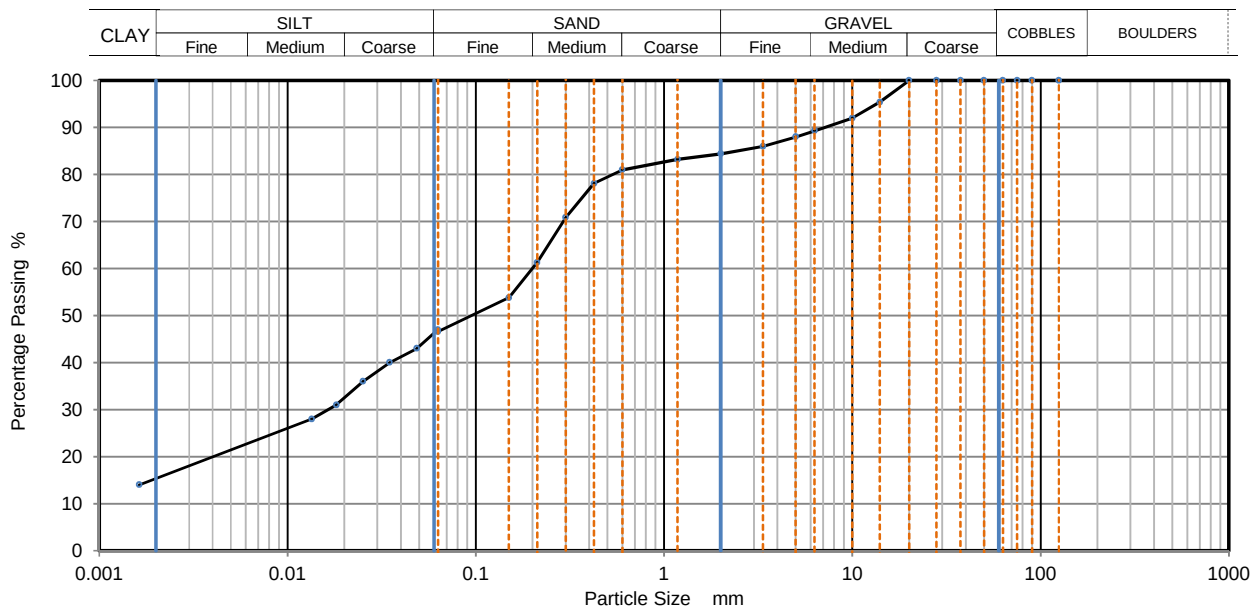
Sample Type: D

Location: TP29

Depth Top [m]: 1.80

Supplier: Not Given

Depth Base [m]: 1.90



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	47
90	100	0.0486	43
75	100	0.0349	40
63	100	0.0252	36
50	100	0.0182	31
37.5	100	0.0134	28
28	100	0.0016	14
20	100		
14	95		
10	92		
6.3	89		
5	88		
3.35	86		
2	84		
1.18	83		
0.6	81	Particle density (assumed) 2.65 Mg/m3	
0.425	78		
0.3	71		
0.212	61		
0.15	54		
0.063	47		

Dry Mass of sample [g]: 566

Sample Proportions		% dry mass
Very coarse		0.00
Gravel		15.60
Sand		37.80
Silt		31.30
Clay		15.30

Grading Analysis		
D100	mm	20
D60	mm	0.199
D30	mm	0.0164
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Darren Berrill
Geotechnical General
Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE

Dry Density / Moisture Content Relationship

Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

Tested in accordance with BS 1377-4:1990: Clause 3.4 using 2.5kg[light] Rammer

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

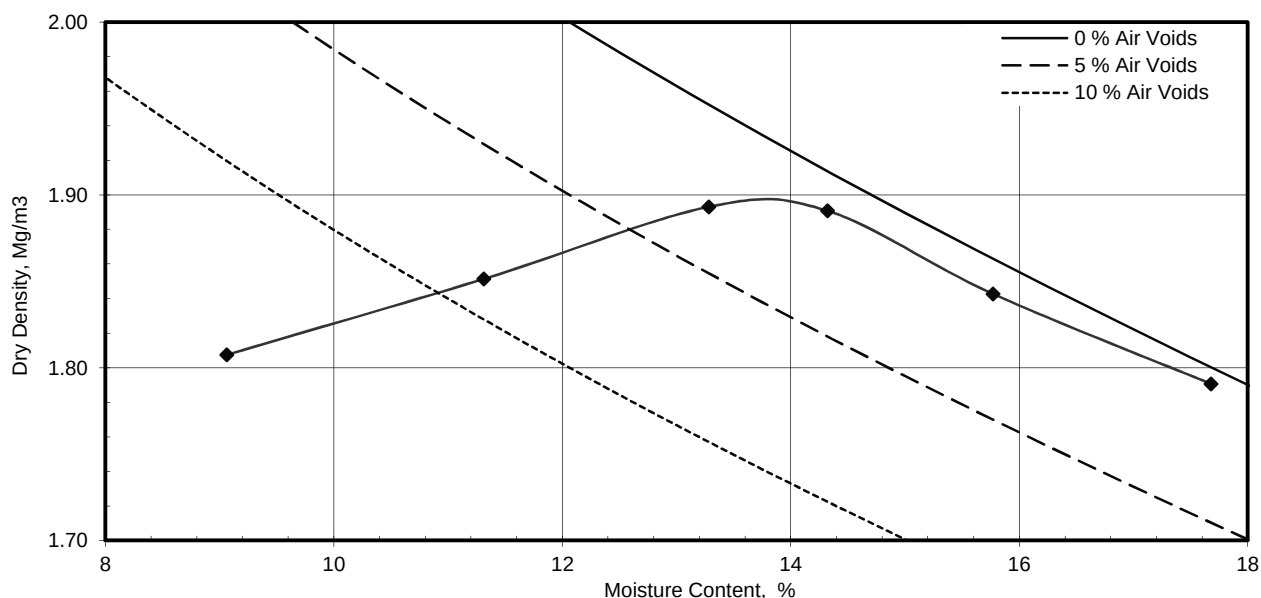
Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890878
Hole No.: TP03
Sample Reference: Not Given
Sample Description: Yellowish brown gravelly SAND

Depth Top [m]: 1.00
Depth Base [m]: 1.10
Sample Type: B



Preparation		Material used was natural
Mould Type		CBR
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	6
Material Retained on 20.0 mm Sieve	%	8
Particle Density - Measured using gas jar	Mg/m³	2.64
As received Moisture Content	%	9.1
Maximum Dry Density	Mg/m³	1.90
Optimum Moisture Content	%	14

Remarks:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Mark Beastall
Geotechnical
Commercial Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship

Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

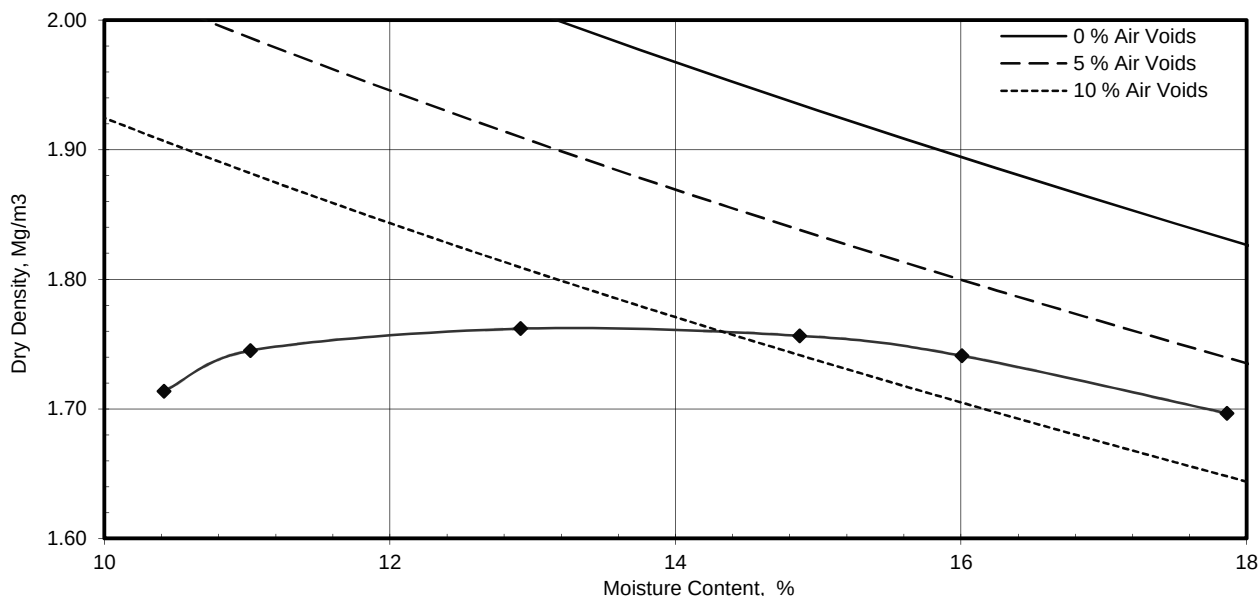
Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890880
Hole No.: TP04
Sample Reference: Not Given
Sample Description: Yellowish brown slightly gravelly SAND

Depth Top [m]: 1.40
Depth Base [m]: 1.50
Sample Type: D



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	1
Particle Density - Measured using gas jar	Mg/m³	2.72
As received Moisture Content	%	10
Maximum Dry Density	Mg/m³	1.76
Optimum Moisture Content	%	13

Remarks:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Mark Beastall
Geotechnical
Commercial Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE**Dry Density / Moisture Content Relationship****Light Compaction**

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

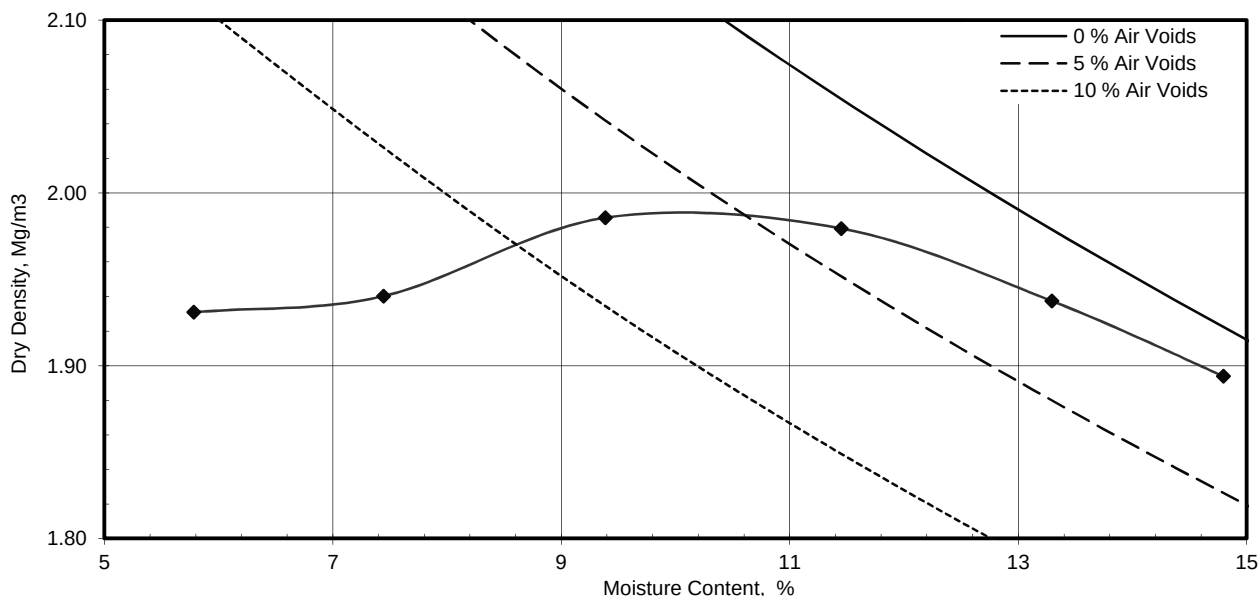
Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890881
Hole No.: TP07
Sample Reference: Not Given
Sample Description: Brown clayey SAND

Depth Top [m]: 1.00
Depth Base [m]: 1.10
Sample Type: B



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.69
As received Moisture Content	%	15
Maximum Dry Density	Mg/m³	1.99
Optimum Moisture Content	%	10

Remarks:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Mark Beastall
Geotechnical
Commercial Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship

Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

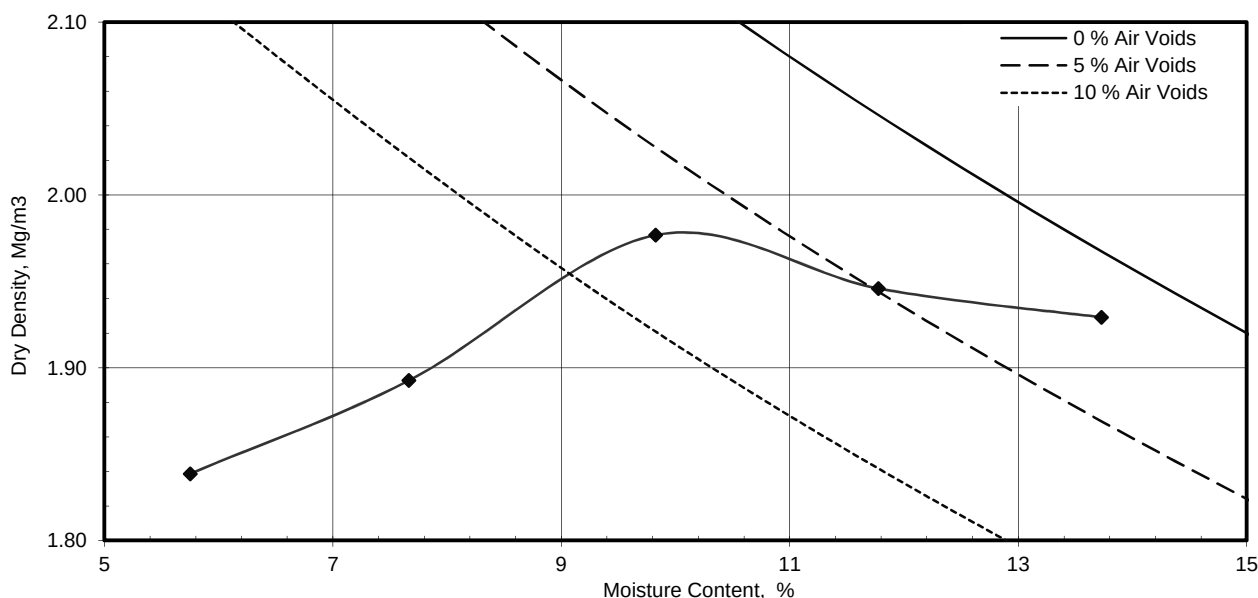
Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890883
Hole No.: TP08
Sample Reference: Not Given
Sample Description: Brown clayey SAND

Depth Top [m]: 0.40
Depth Base [m]: 0.50
Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.70
As received Moisture Content	%	14
Maximum Dry Density	Mg/m³	1.98
Optimum Moisture Content	%	9.8

Remarks:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Mark Beastall
Geotechnical
Commercial Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship

Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

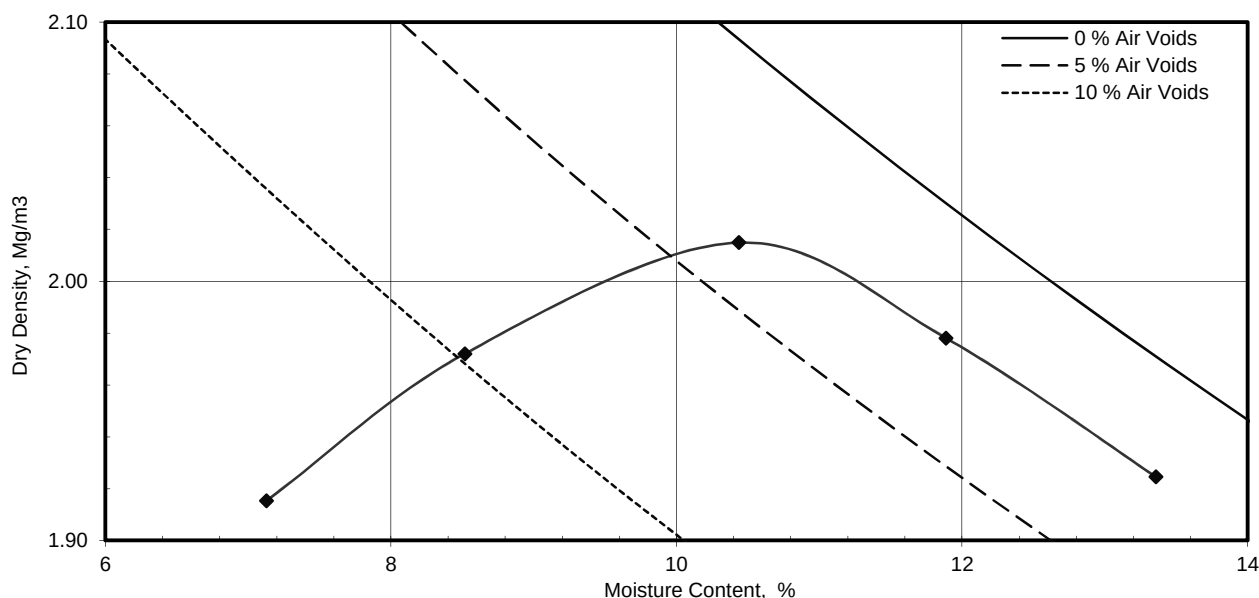
Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890885
Hole No.: TP10
Sample Reference: Not Given
Sample Description: Yellowish brown slightly clayey SAND

Depth Top [m]: 0.90
Depth Base [m]: 1.00
Sample Type: B



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.68
As received Moisture Content	%	13
Maximum Dry Density	Mg/m³	2.01
Optimum Moisture Content	%	10

Remarks:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Mark Beastall
Geotechnical
Commercial Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship

Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

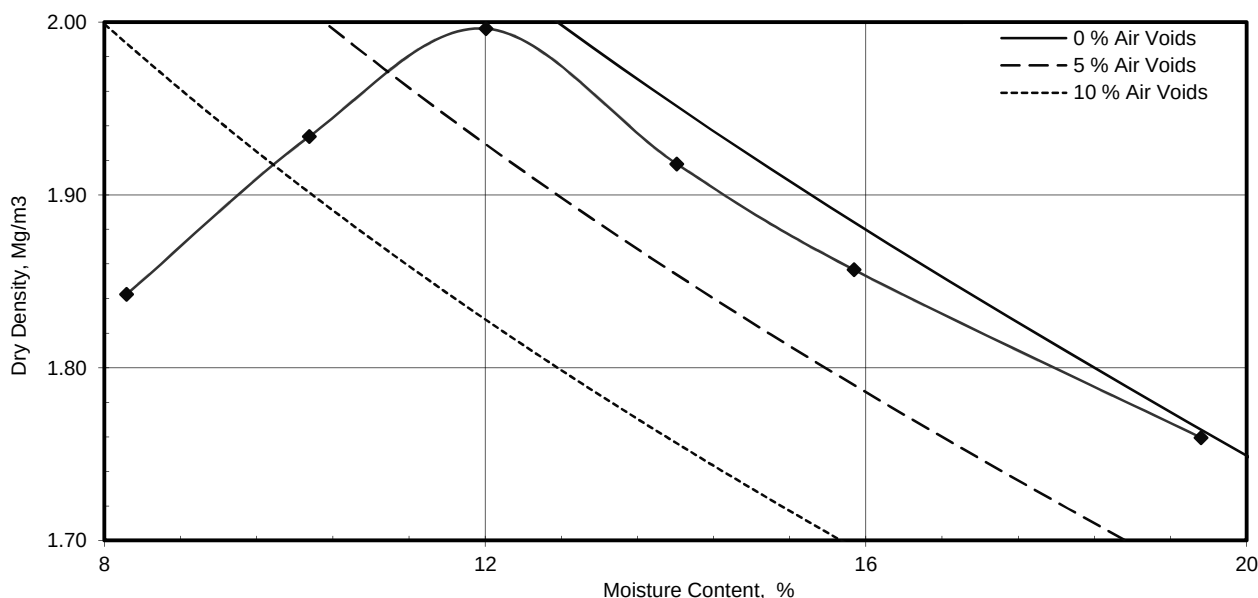
Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 26/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890888
Hole No.: TP12
Sample Reference: Not Given
Sample Description: Brown sandy clayey GRAVEL

Depth Top [m]: 0.80
Depth Base [m]: 0.90
Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	35
Material Retained on 20.0 mm Sieve	%	33
Particle Density - Measured using gas jar	Mg/m³	2.69
As received Moisture Content	%	20
Maximum Dry Density	Mg/m³	2.00
Optimum Moisture Content	%	12

Remarks: Insufficient material - compacted in proctor mould; Zone X - test carried out as per client request

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Mark Beastall
Geotechnical
Commercial Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE

Dry Density / Moisture Content Relationship

Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in accordance with BS 1377-4:1990: Clause 3.4 using 2.5kg[light] Rammer

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

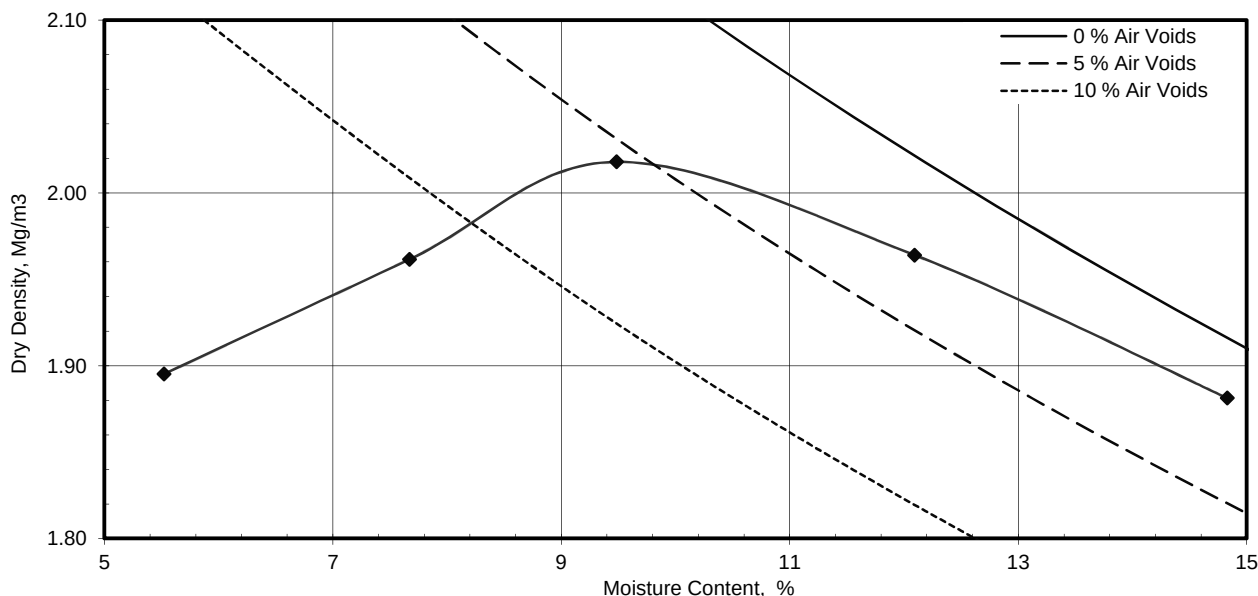
Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890892
Hole No.: TP15
Sample Reference: Not Given
Sample Description: Brown gravelly sandy CLAY

Depth Top [m]: 1.10
Depth Base [m]: 1.20
Sample Type: B



Preparation	Material used was natural	
Mould Type	CBR	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	%	11
Material Retained on 20.0 mm Sieve	%	8
Particle Density - Measured using gas jar	Mg/m³	2.68
As received Moisture Content	%	15
Maximum Dry Density	Mg/m³	2.02
Optimum Moisture Content	%	9.5

Remarks: Zone X - test carried out as per client request

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Mark Beastall
Geotechnical
Commercial Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship

Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Environmental Science

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

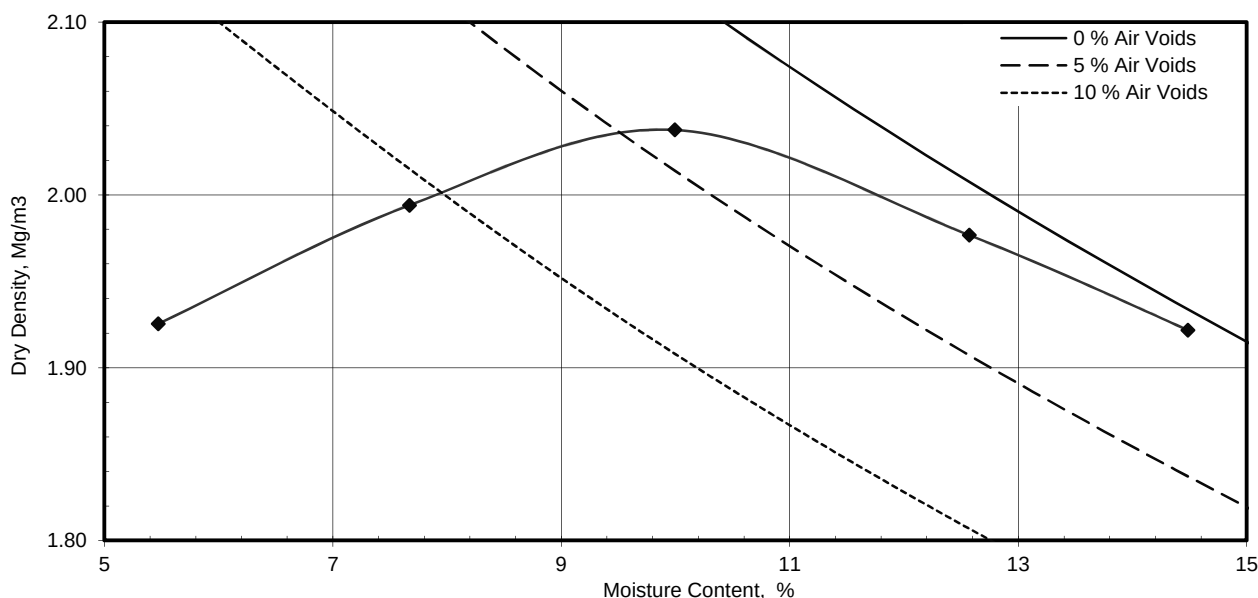
Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890895
Hole No.: TP19
Sample Reference: Not Given
Sample Description: Brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 0.90
Depth Base [m]: 1.00
Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	2
Material Retained on 20.0 mm Sieve	%	6
Particle Density - Measured using gas jar	Mg/m³	2.69
As received Moisture Content	%	14
Maximum Dry Density	Mg/m³	2.04
Optimum Moisture Content	%	10

Remarks: Insufficient material - compacted in proctor mould

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Mark Beastall
Geotechnical
Commercial Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship

Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

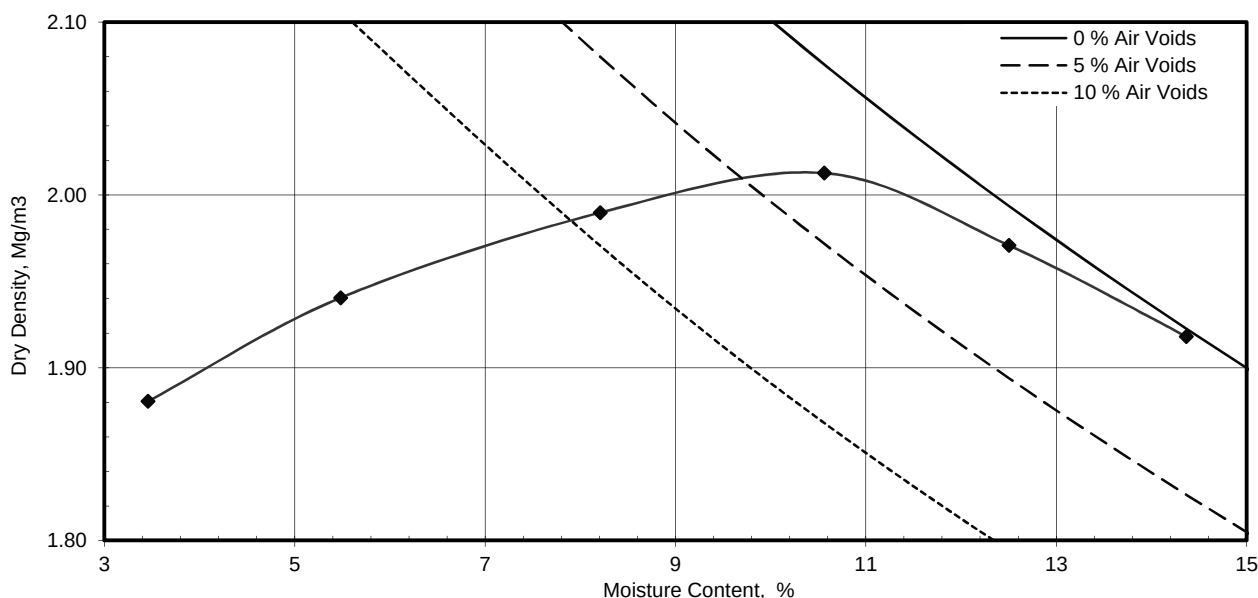
Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 26/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890899
Hole No.: TP24
Sample Reference: Not Given
Sample Description: Dark brown sandy gravelly CLAY

Depth Top [m]: 0.60
Depth Base [m]: 0.70
Sample Type: B



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	%	11
Material Retained on 20.0 mm Sieve	%	5
Particle Density - Measured using gas jar	Mg/m³	2.66
As received Moisture Content	%	14
Maximum Dry Density	Mg/m³	2.01
Optimum Moisture Content	%	11

Remarks: Insufficient material - compacted in proctor mould; Zone X - test carried out as per client request

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Mark Beastall
Geotechnical
Commercial Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship

Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB

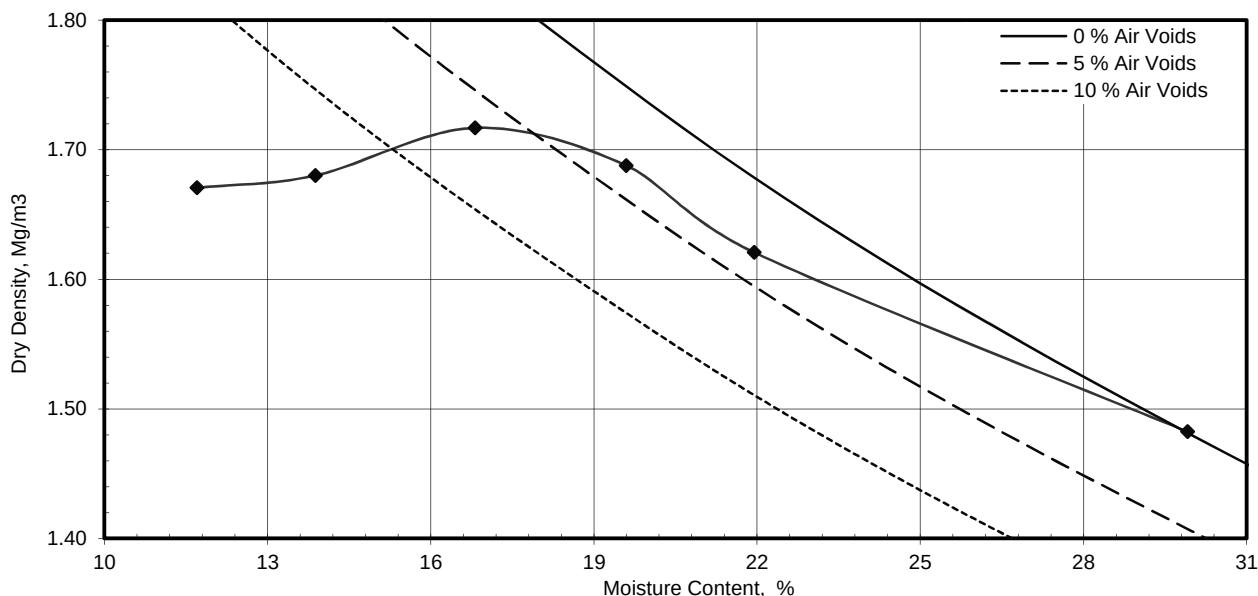
Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 25/01/2018
Sampled By: Not Given

Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

TEST RESULTS

Laboratory Reference: 890902
Hole No.: TP27
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly sandy CLAY

Depth Top [m]: 1.20
Depth Base [m]: 1.30
Sample Type: B



Preparation	Material used was natural	
Mould Type	1 Litre	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.66
As received Moisture Content	%	30
Maximum Dry Density	Mg/m³	1.72
Optimum Moisture Content	%	17

Remarks:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Mark Beastall
Geotechnical
Commercial Manager

Date Reported: 02/02/2018

for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE

Determination of Unconsolidated Undrained Triaxial Compression

Tested in Accordance with BS1377: Part 7: 1990, clause 8, single specimen

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 26/01/2018
Sampled By: Not Given

Test Result

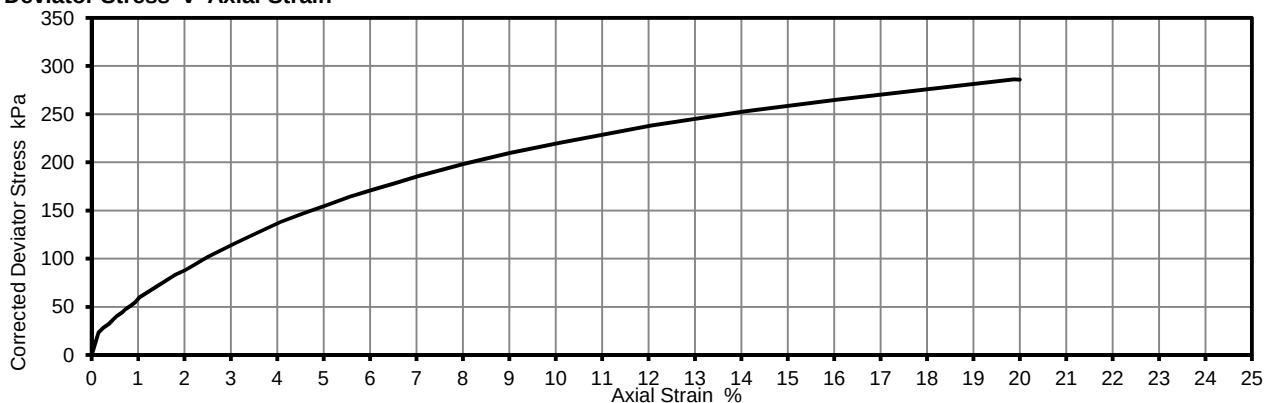
Laboratory Reference: 890870
Hole No.: BH01
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly CLAY

Depth Top [m]: 9.50
Depth Base [m]: 9.95
Sample Type: U

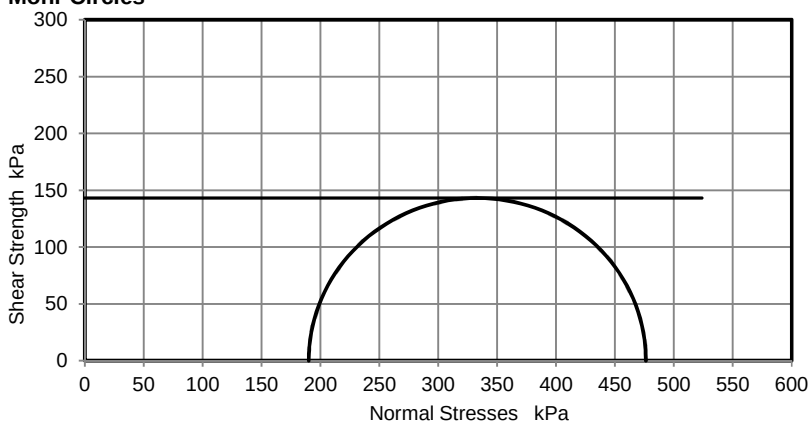
Test Number	1
Length	200.00 mm
Diameter	101.50 mm
Bulk Density	2.19 Mg/m ³
Moisture Content	16 %
Dry Density	1.90 Mg/m ³

Rate of Strain	2.00 %/min
Cell Pressure	190 kPa
Axial Strain at failure	19.9 %
Deviator Stress, $(\sigma_1 - \sigma_3)_f$	286 kPa
Undrained Shear Strength, c_u	143 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Compound

Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Notes:

Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 02/02/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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Determination of Unconsolidated Undrained Triaxial Compression

Tested in Accordance with BS1377: Part 7: 1990, clause 8, single specimen

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 26/01/2018
Sampled By: Not Given

Test Result

Laboratory Reference: 890871
Hole No.: BH02
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly CLAY

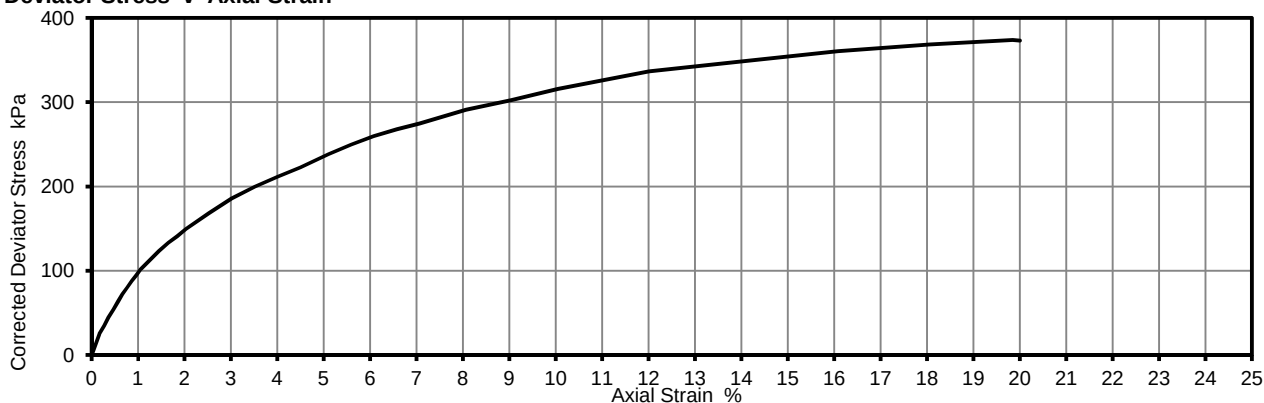
Depth Top [m]: 13.00
Depth Base [m]: Not Given
Sample Type: U

Test Number	1
Length	199.70 mm
Diameter	100.59 mm
Bulk Density	2.21 Mg/m ³
Moisture Content	13 %
Dry Density	1.95 Mg/m ³

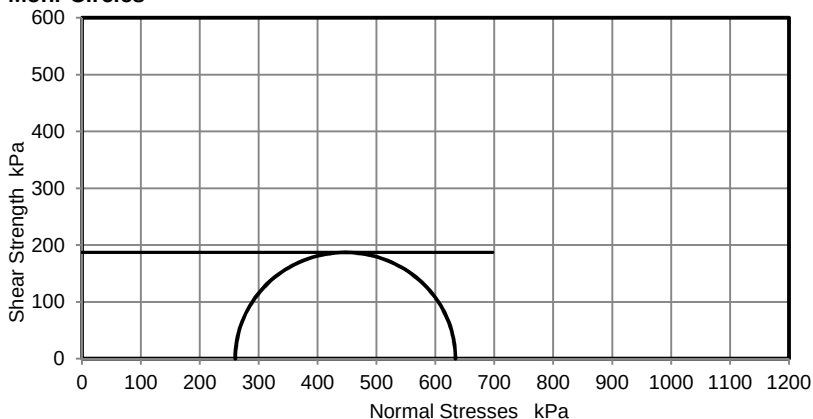
Rate of Strain
Cell Pressure
Axial Strain at failure
Deviator Stress, $(\sigma_1 - \sigma_3)_f$
Undrained Shear Strength, c_u
Mode of Failure

2.00	%/min
260	kPa
19.8	%
374	kPa
187	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Brittle	

Deviator Stress v Axial Strain



Mohr Circles



Position
within
sample



Notes:

Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 02/02/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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Tested in Accordance with BS1377: Part 7: 1990, clause 8, single specimen

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 26/01/2018
Sampled By: Not Given

Test Result

Laboratory Reference: 890872
Hole No.: BH03
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly CLAY

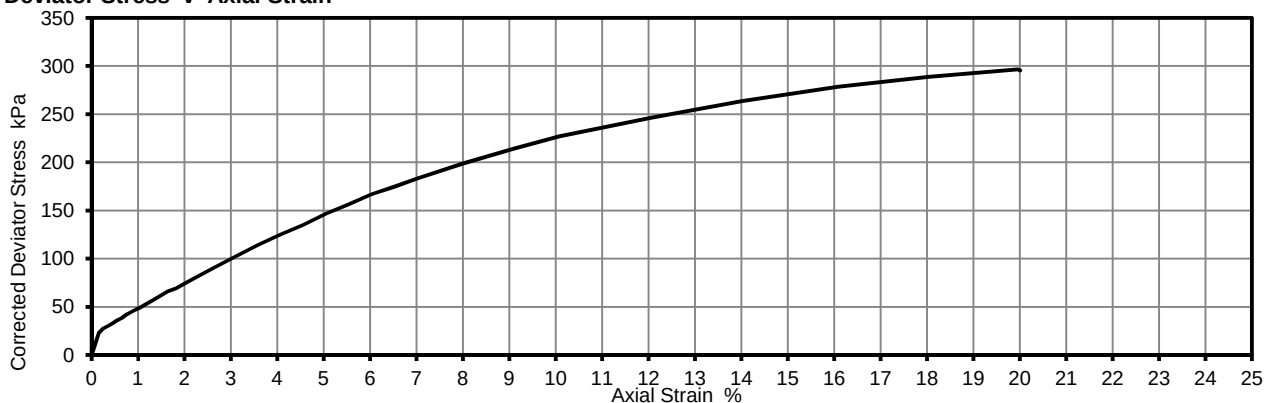
Depth Top [m]: 8.00
Depth Base [m]: Not Given
Sample Type: U

Test Number	1
Length	189.30 mm
Diameter	102.55 mm
Bulk Density	2.20 Mg/m ³
Moisture Content	15 %
Dry Density	1.91 Mg/m ³

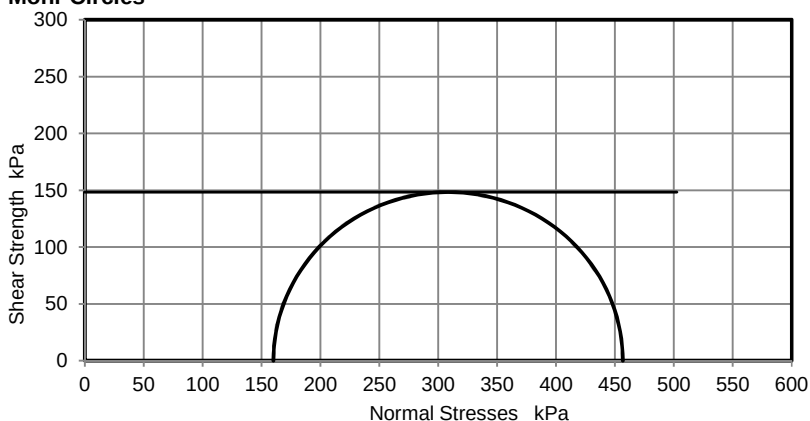
Rate of Strain
Cell Pressure
Axial Strain at failure
Deviator Stress, $(\sigma_1 - \sigma_3)_f$
Undrained Shear Strength, c_u
Mode of Failure

2.00	%/min
160	kPa
19.9	%
297	kPa
148	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Brittle	

Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Notes:

Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 02/02/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 26/01/2018
Sampled By: Not Given

Test Result

Laboratory Reference: 890873
Hole No.: BH04
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly CLAY

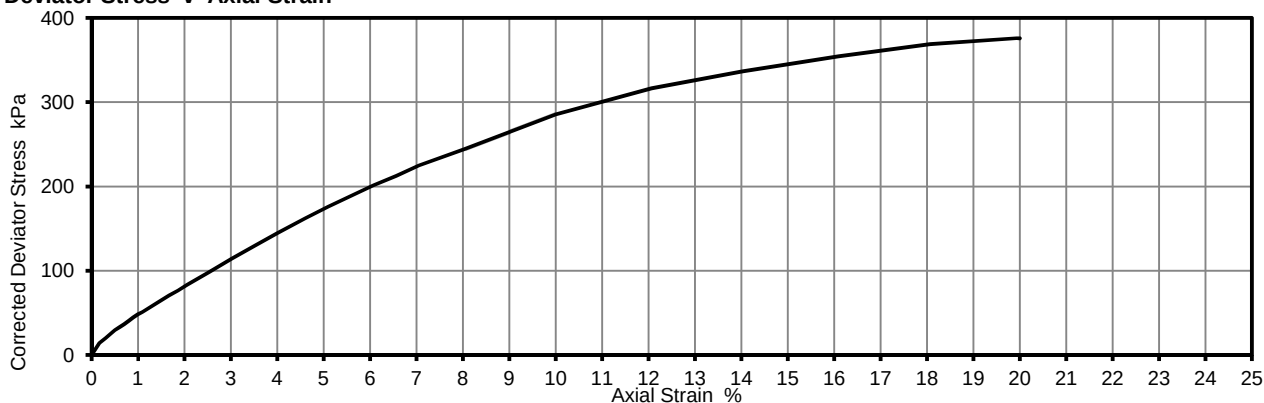
Depth Top [m]: 11.00
Depth Base [m]: Not Given
Sample Type: U

Test Number	1
Length	201.61 mm
Diameter	102.61 mm
Bulk Density	2.20 Mg/m ³
Moisture Content	12 %
Dry Density	1.95 Mg/m ³

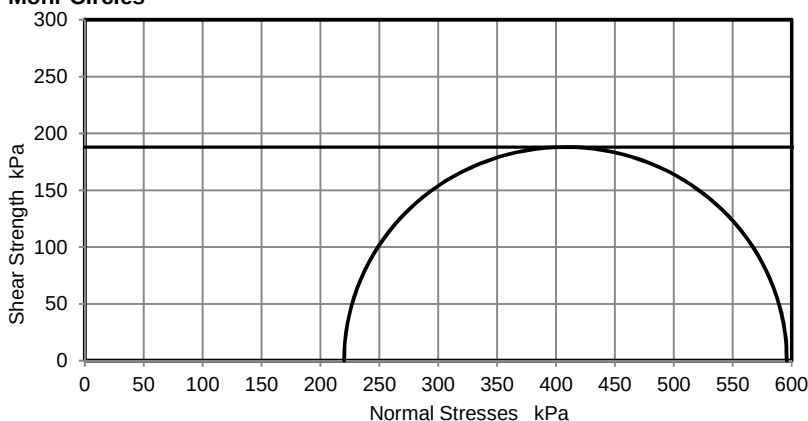
Rate of Strain
Cell Pressure
Axial Strain at failure
Deviator Stress, $(\sigma_1 - \sigma_3)_f$
Undrained Shear Strength, c_u
Mode of Failure

1.98	%/min
220	kPa
19.9	%
376	kPa
188	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Brittle	

Deviator Stress v Axial Strain



Mohr Circles



Position
within
sample



Notes:

Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 02/02/2018

Signed:

Darren Berrill
Geotechnical General
Manager

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TEST CERTIFICATE

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Tested in Accordance with BS1377: Part 7: 1990, clause 8, single specimen

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 26/01/2018
Sampled By: Not Given

Test Result

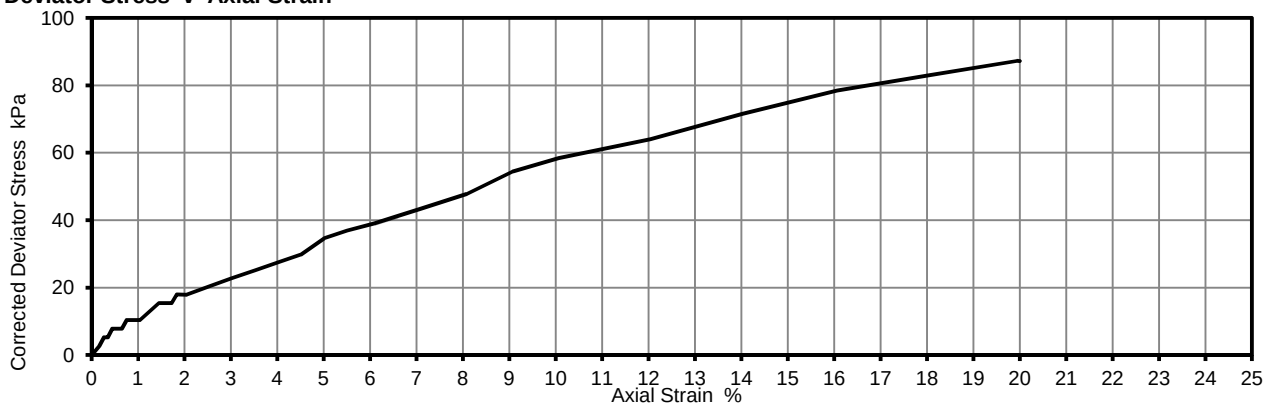
Laboratory Reference: 890874
Hole No.: BH05
Sample Reference: Not Given
Sample Description: Brown sandy CLAY

Depth Top [m]: 6.50
Depth Base [m]: Not Given
Sample Type: U

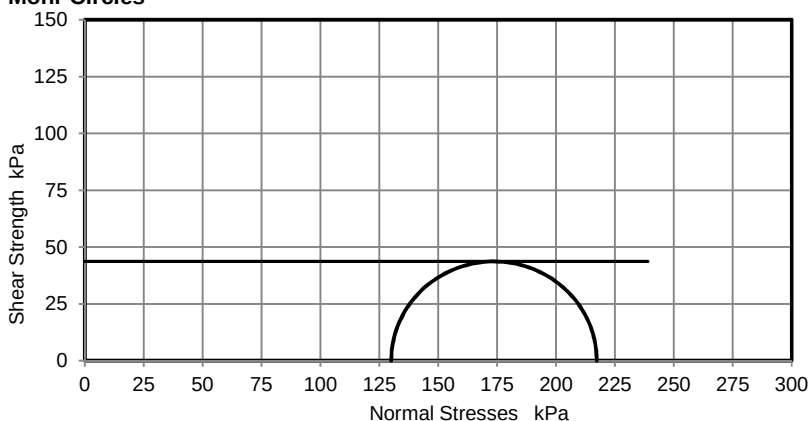
Test Number	1
Length	137.70 mm
Diameter	69.50 mm
Bulk Density	2.17 Mg/m ³
Moisture Content	14 %
Dry Density	1.91 Mg/m ³

Rate of Strain	2.00 %/min
Cell Pressure	130 kPa
Axial Strain at failure	19.9 %
Deviator Stress, $(\sigma_1 - \sigma_3)_f$	87 kPa
Undrained Shear Strength, c_u	44 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Compound

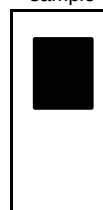
Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Notes:

Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 02/02/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Unconsolidated Undrained Triaxial Compression

Tested in Accordance with BS1377: Part 7: 1990, clause 8, single specimen

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: BWB Consulting Limited
Client Address: Livery Place
35 Livery Street Birmingham
B3 2PB
Contact: Laura Westoby
Site Name: Plot J, Rochdale
Site Address: Not Given

Client Reference: MCS2374
Job Number: 18-73207
Date Sampled: Not Given
Date Received: 12/01/2018
Date Tested: 26/01/2018
Sampled By: Not Given

Test Result

Laboratory Reference: 890875
Hole No.: BH05
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly CLAY

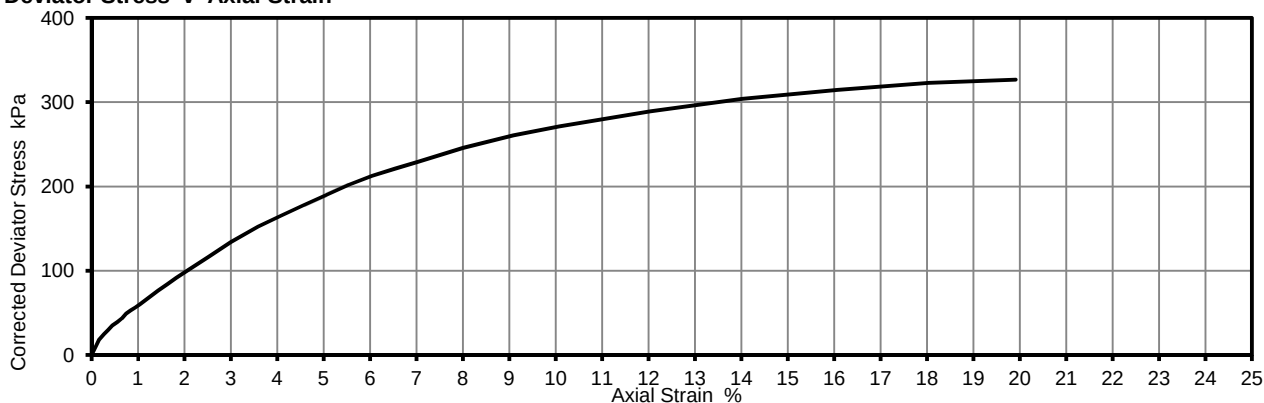
Depth Top [m]: 9.50
Depth Base [m]: 9.95
Sample Type: U

Test Number	1
Length	201.60 mm
Diameter	101.60 mm
Bulk Density	2.22 Mg/m ³
Moisture Content	15 %
Dry Density	1.92 Mg/m ³

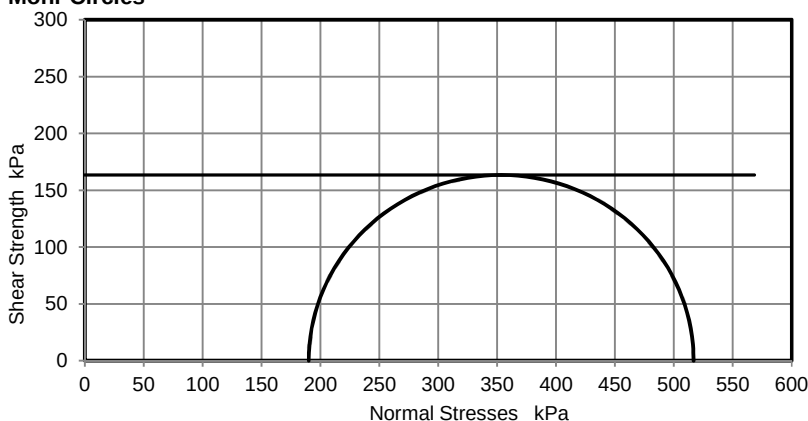
Rate of Strain
Cell Pressure
Axial Strain at failure
Deviator Stress, $(\sigma_1 - \sigma_3)_f$
Undrained Shear Strength, c_u
Mode of Failure

1.98	%/min
190	kPa
19.9	%
327	kPa
163	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Brittle	

Deviator Stress v Axial Strain



Mohr Circles



Position
within
sample



Notes:

Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 02/02/2018

Signed:

Darren Berrill
Geotechnical General
Manager

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Laura Westaby
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Analytical Report Number : 18-73225

Project / Site name:	Plot J Rochdale	Samples received on:	12/01/2018
Your job number:	MCS2374	Samples instructed on:	17/01/2018
Your order number:		Analysis completed by:	30/01/2018
Report Issue Number:	1	Report issued on:	30/01/2018
Samples Analysed:	11 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.



Analytical Report Number: 18-73225

Project / Site name: Plot J Rochdale

Lab Sample Number				891024	891025	891026	891027	891028
Sample Reference				BH01	BH04	BH05	TP01	TP03
Sample Number				1	None Supplied	9	1	1
Depth (m)				9.50-9.95	11.00	6.50-6.95	0.75-0.85	1.00-1.10
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	11	9.8	43	6.8
Total mass of sample received	kg	0.001	NONE	0.36	0.27	0.29	0.18	0.56

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.6	8.5	8.4	6.6	8.2
Total Sulphate as SO ₄	%	0.005	MCERTS	0.034	0.032	0.032	0.067	0.028
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.052	0.053	0.050	0.021	0.0084
Total Sulphur	%	0.005	MCERTS	0.063	0.062	0.062	0.075	0.010

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Lab Sample Number				891029	891030	891031	891032	891033
Sample Reference				TP04	TP10	TP14	TP19	TP23
Sample Number				2	4	2	3	5
Depth (m)				1.40-1.50	0.90-1.00	1.00-1.10	0.90-1.00	2.40-2.50
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	9.2	13	12	12	12
Total mass of sample received	kg	0.001	NONE	0.58	0.61	0.25	0.44	0.56

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2	7.9	7.9	6.6	6.6
Total Sulphate as SO ₄	%	0.005	MCERTS	0.019	0.024	0.020	0.027	0.024
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0085	0.013	0.017	0.018	0.014
Total Sulphur	%	0.005	MCERTS	0.007	0.009	0.009	0.012	0.008



Analytical Report Number: 18-73225

Project / Site name: Plot J Rochdale

Lab Sample Number				891034				
Sample Reference				TP25				
Sample Number				3				
Depth (m)				1.40-1.50				
Date Sampled				Deviating				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	12				
Total mass of sample received	kg	0.001	NONE	0.41				

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.1				
Total Sulphate as SO ₄	%	0.005	MCERTS	0.029				
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.041				
Total Sulphur	%	0.005	MCERTS	0.011				



Analytical Report Number : 18-73225

Project / Site name: Plot J Rochdale

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
891024	BH01	1	9.50-9.95	Brown clay and sand with vegetation.
891025	BH04	None Supplied	11.00	Brown clay.
891026	BH05	9	6.50-6.95	Brown clay and sand with gravel.
891027	TP01	1	0.75-0.85	Brown clay.
891028	TP03	1	1.00-1.10	Brown sand with gravel.
891029	TP04	2	1.40-1.50	Brown sandy clay.
891030	TP10	4	0.90-1.00	Brown clay and sand.
891031	TP14	2	1.00-1.10	Brown clay and sand.
891032	TP19	3	0.90-1.00	Brown clay and sand with gravel.
891033	TP23	5	2.40-2.50	Brown sand with gravel.
891034	TP25	3	1.40-1.50	Brown clay and sand.

Analytical Report Number : 18-73225

Project / Site name: Plot J Rochdale

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests"	L038	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

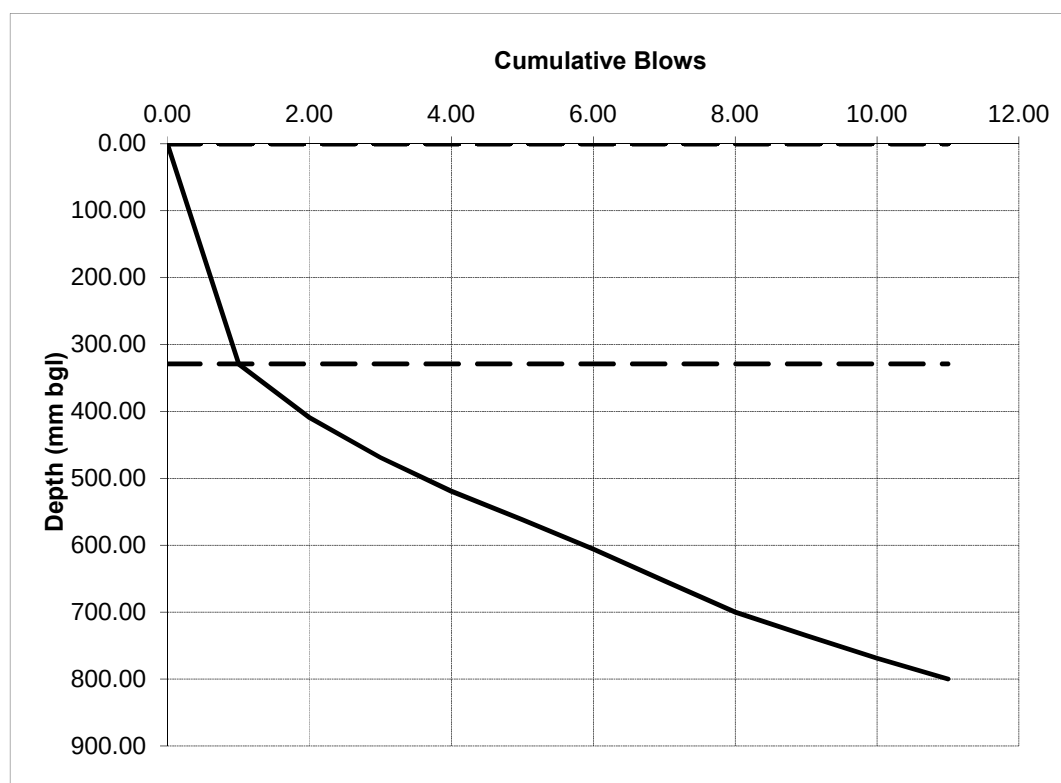
Sample Deviation Report



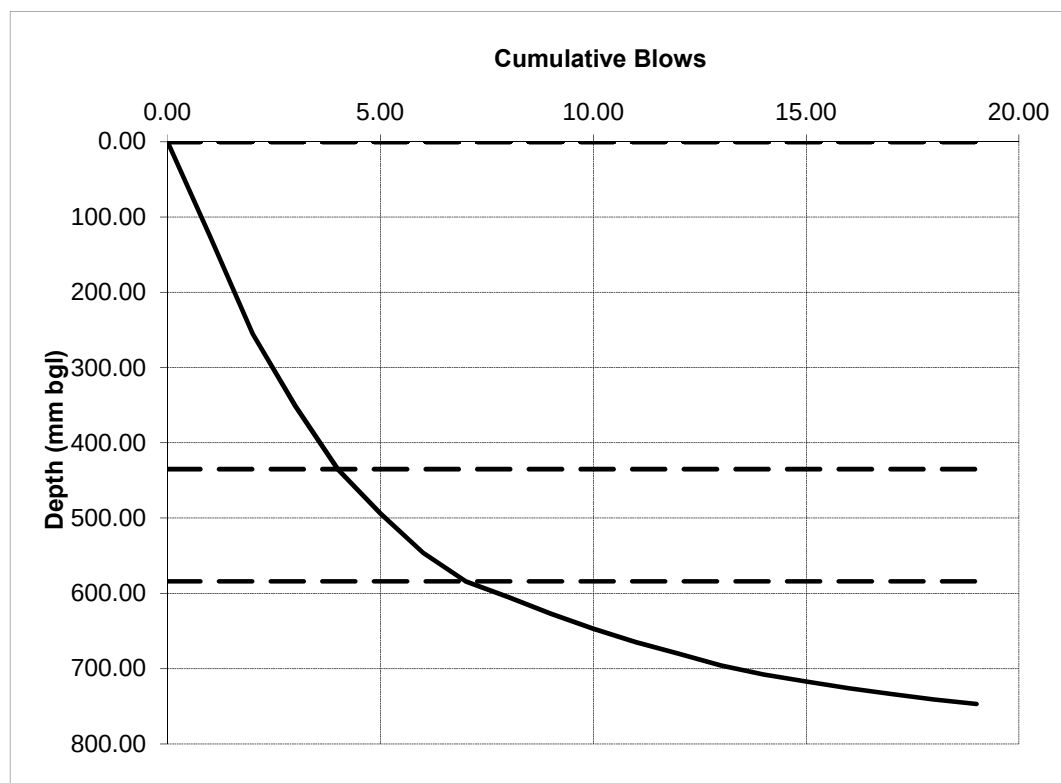
Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
BH01	1	S	18-73225	891024	a			
BH04		S	18-73225	891025	a			
BH05	9	S	18-73225	891026	a			
TP01	1	S	18-73225	891027	a			
TP03	1	S	18-73225	891028	a			
TP04	2	S	18-73225	891029	a			
TP10	4	S	18-73225	891030	a			
TP14	2	S	18-73225	891031	a			
TP19	3	S	18-73225	891032	a			
TP23	5	S	18-73225	891033	a			
TP25	3	S	18-73225	891034	a			

APPENDIX 9

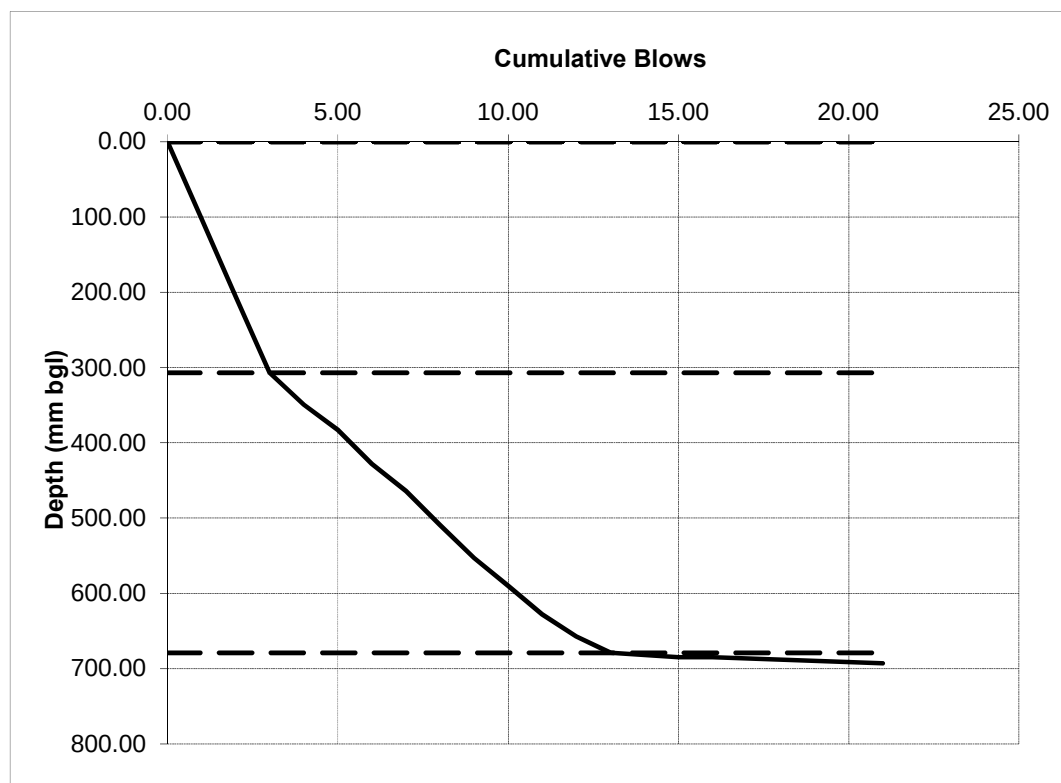
DYNAMIC CONE PENETROMETER TEST RESULTS

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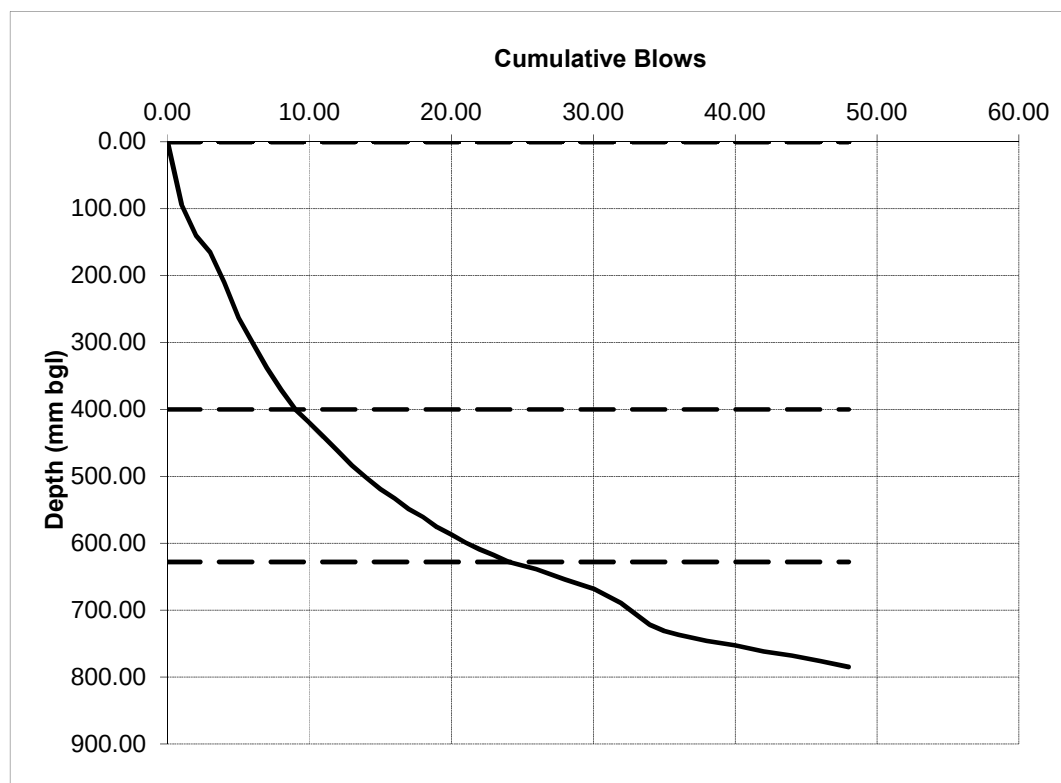
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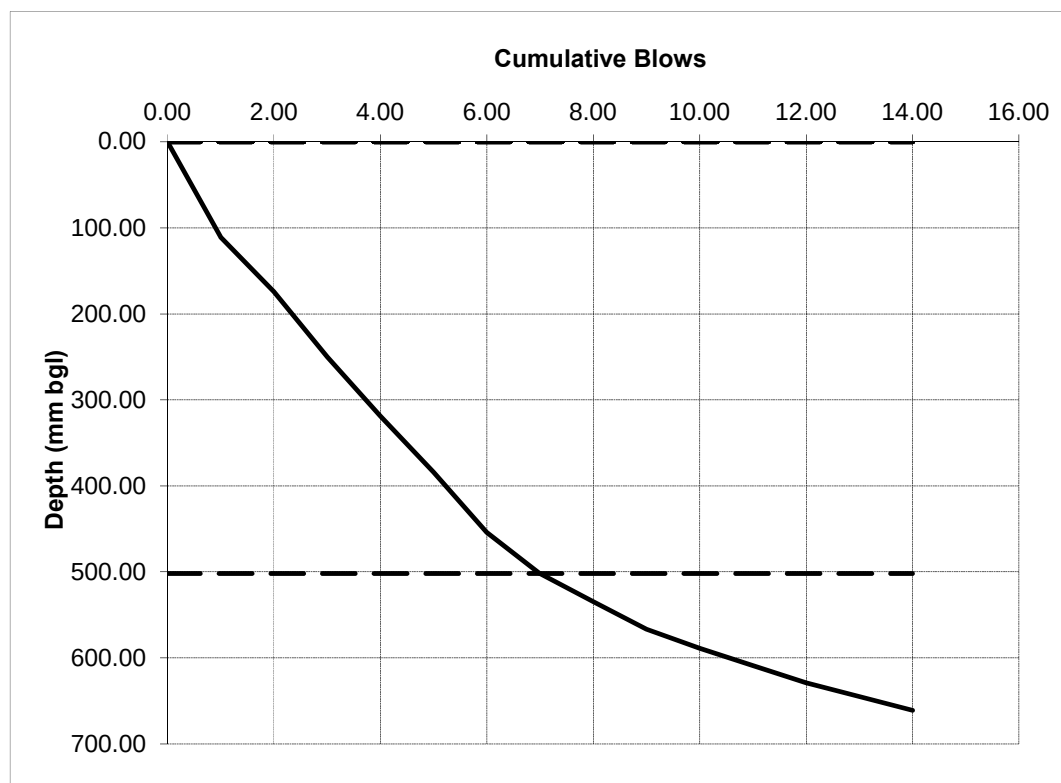
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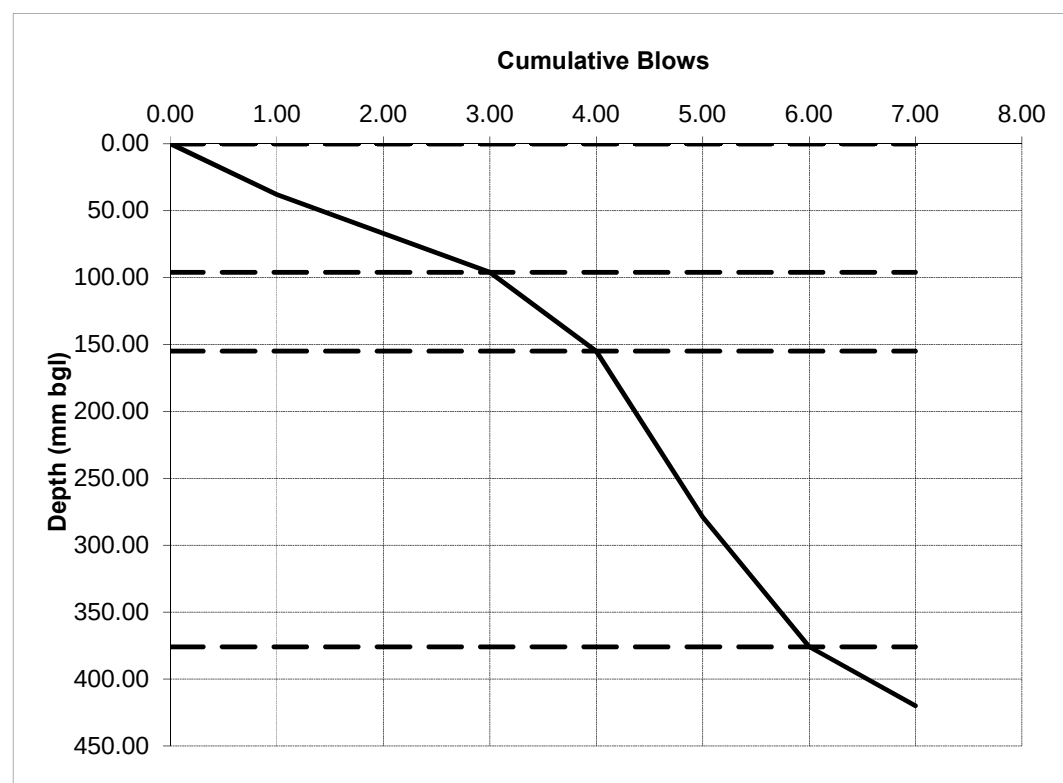
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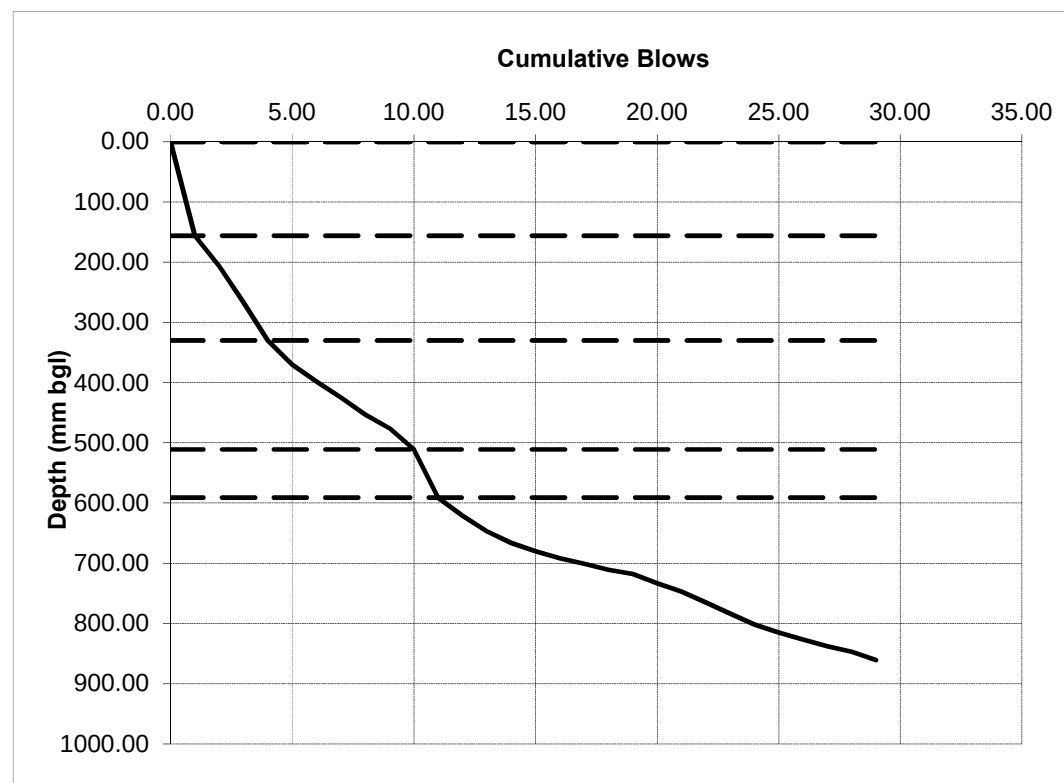
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CBR Interpretation based on the TRL Equation: $\text{Log}_{10}(\text{CBR}) = 2.480 - [1.057 \times \text{Log}_{10}(\text{DCP Strength})]$

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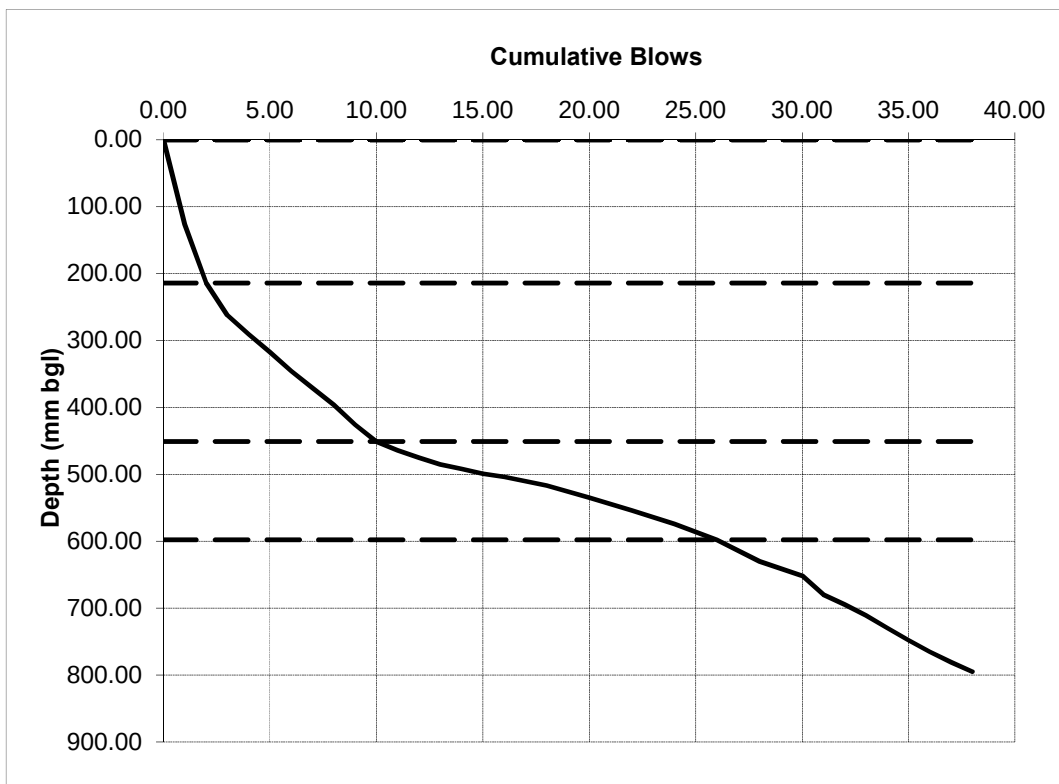
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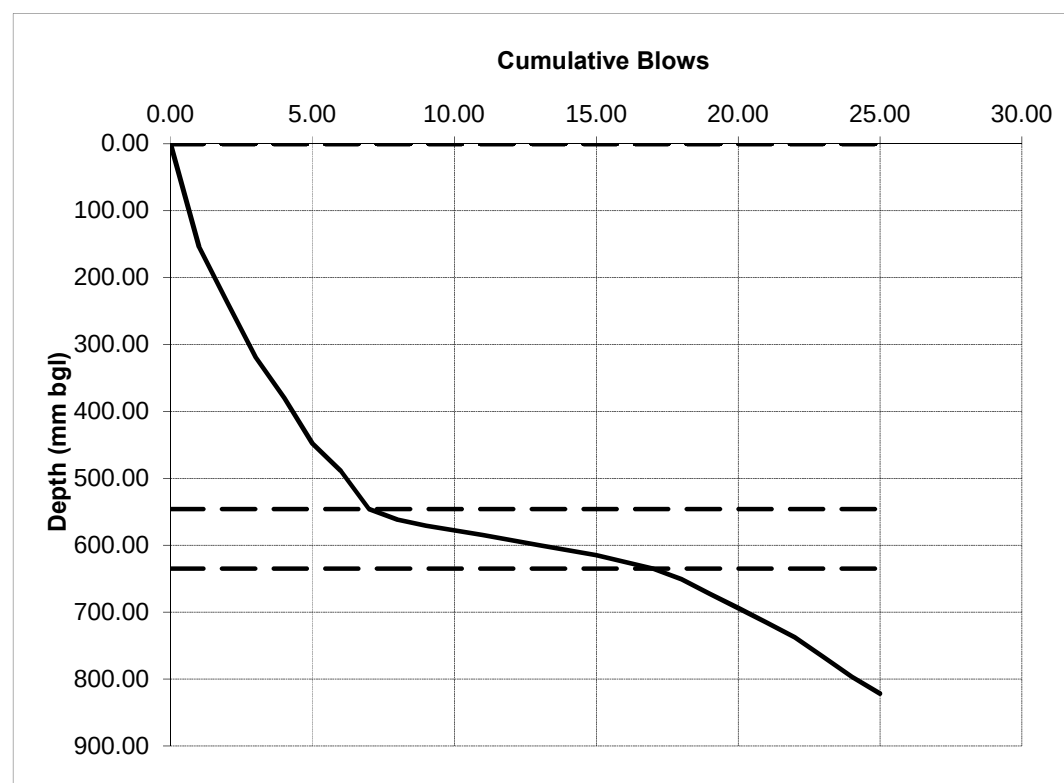
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Dynamic Cone Penetrometer

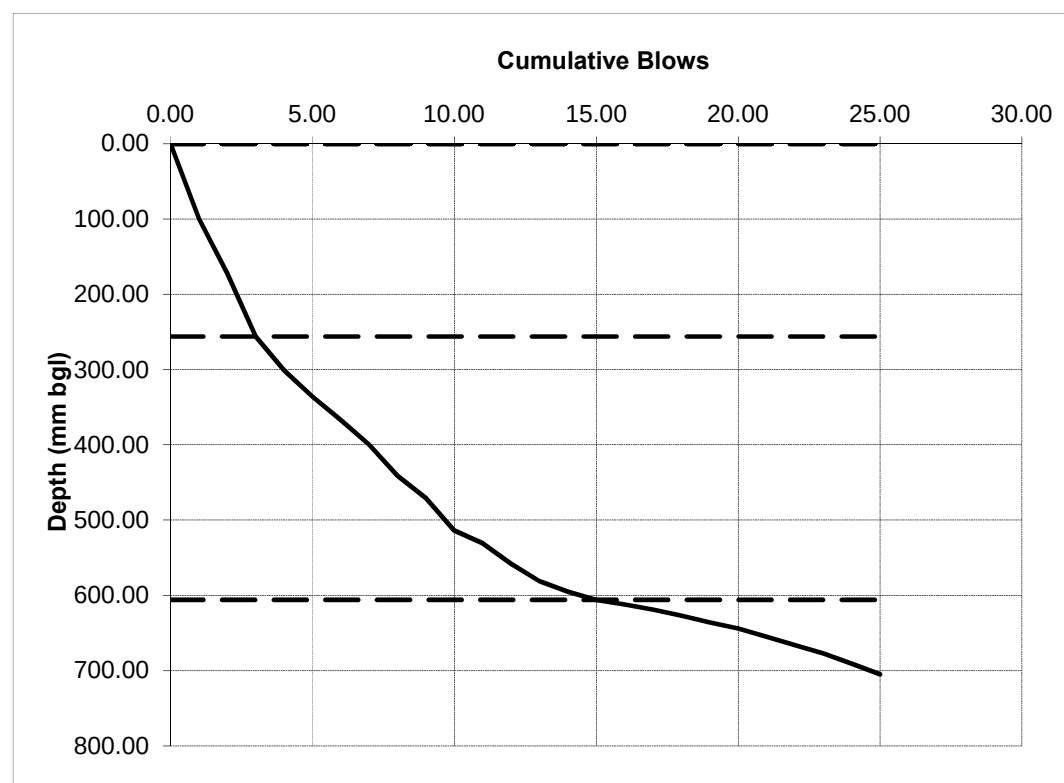
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PROJECT TITLE	Plot J, Kingsway BP
TEST REFERENCE	TP13
DATE	10-Jan-18
MATERIAL/ STRATA TYPE	Topsoil / HGD
START DEPTH (mm bgl)	0
WEATHER/ GROUND CONDITION	Damp

BWB[illegible]

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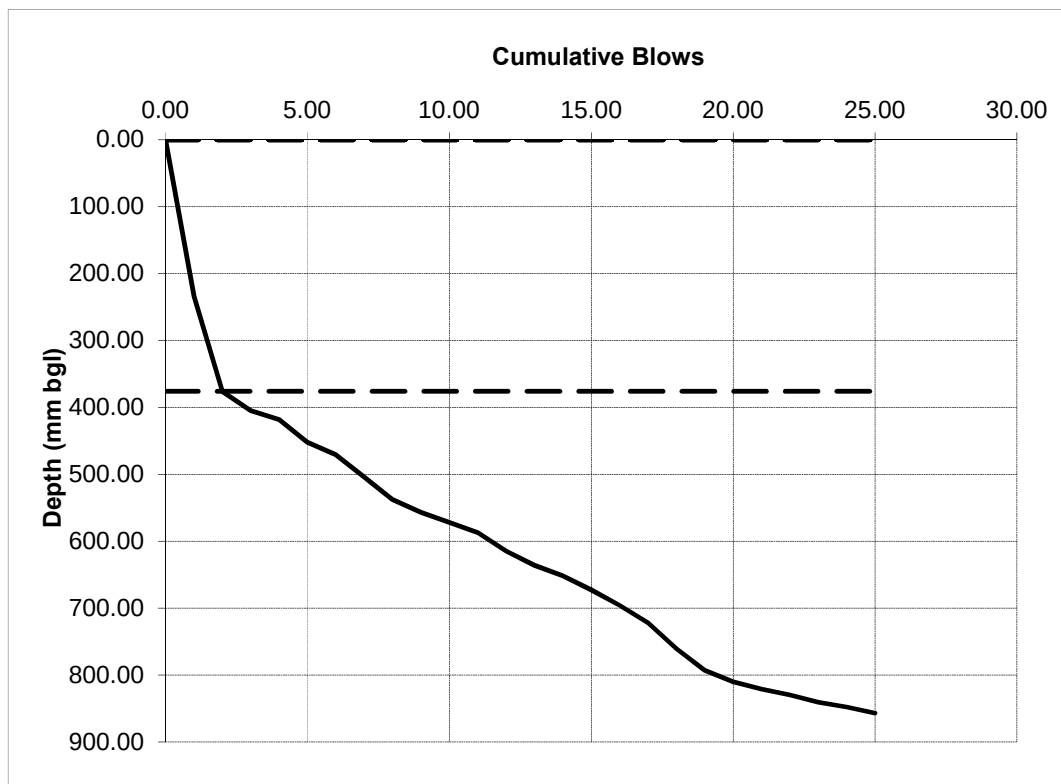
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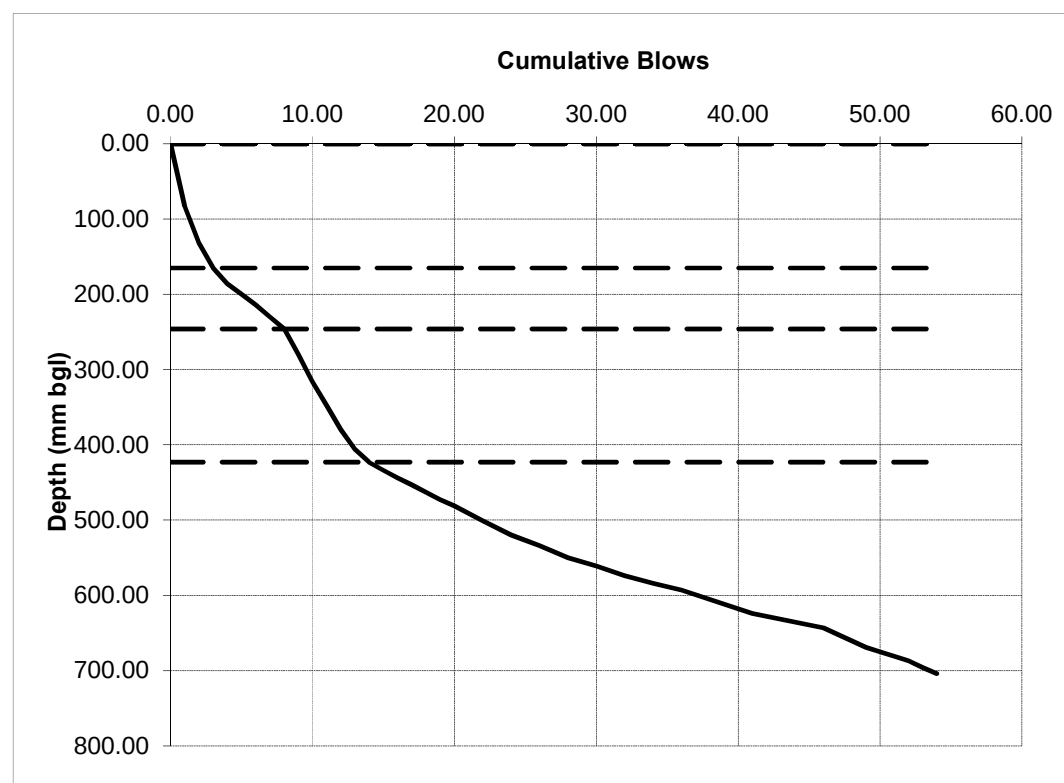
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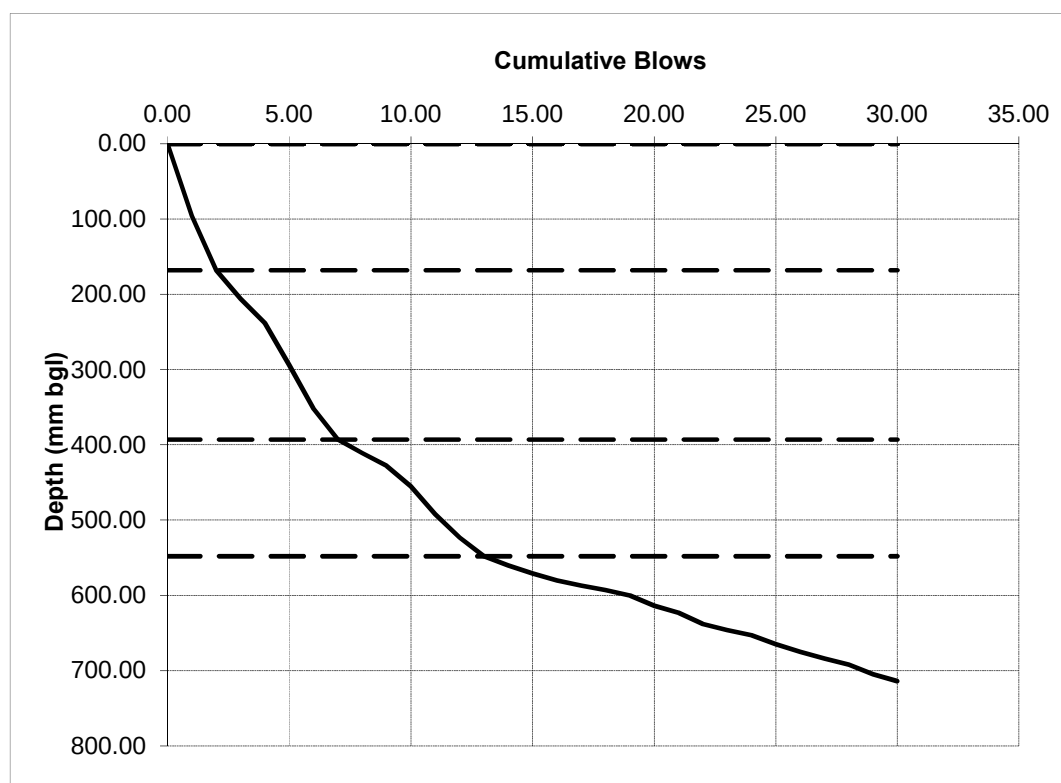
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TEST REFERENCE	TP11
DATE	10-Jan-18
MATERIAL/ STRATA TYPE	Topsoil / HGD
START DEPTH (mm bgl)	0
WEATHER/ GROUND CONDITION	Damp

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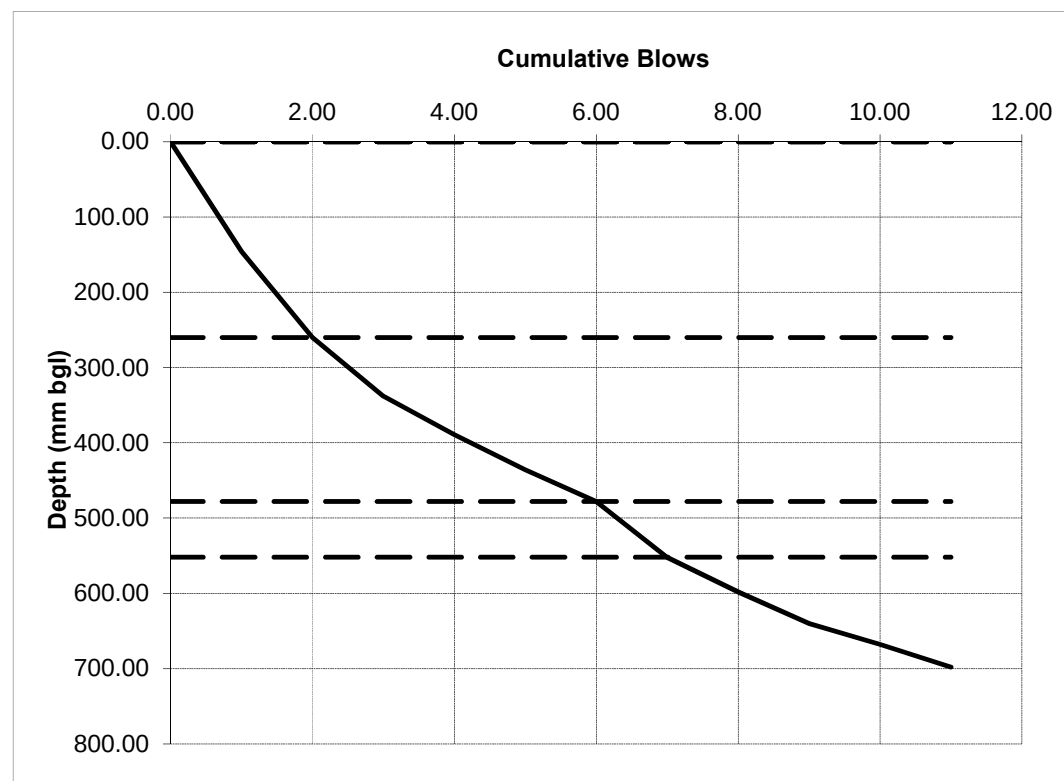
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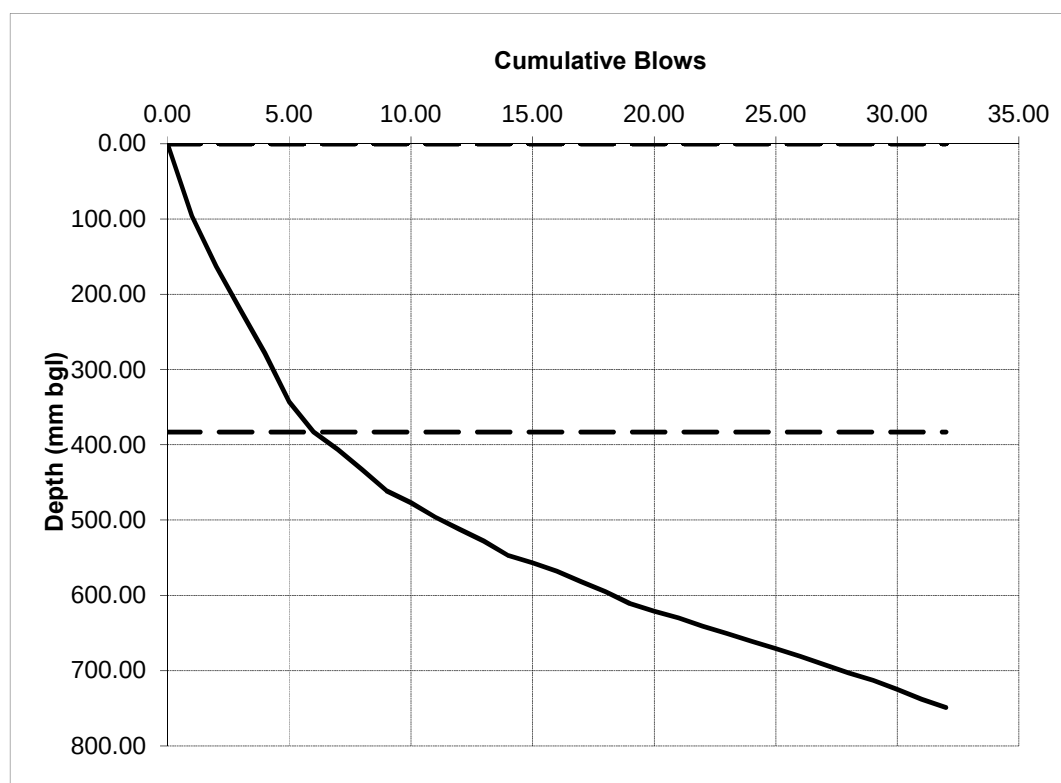
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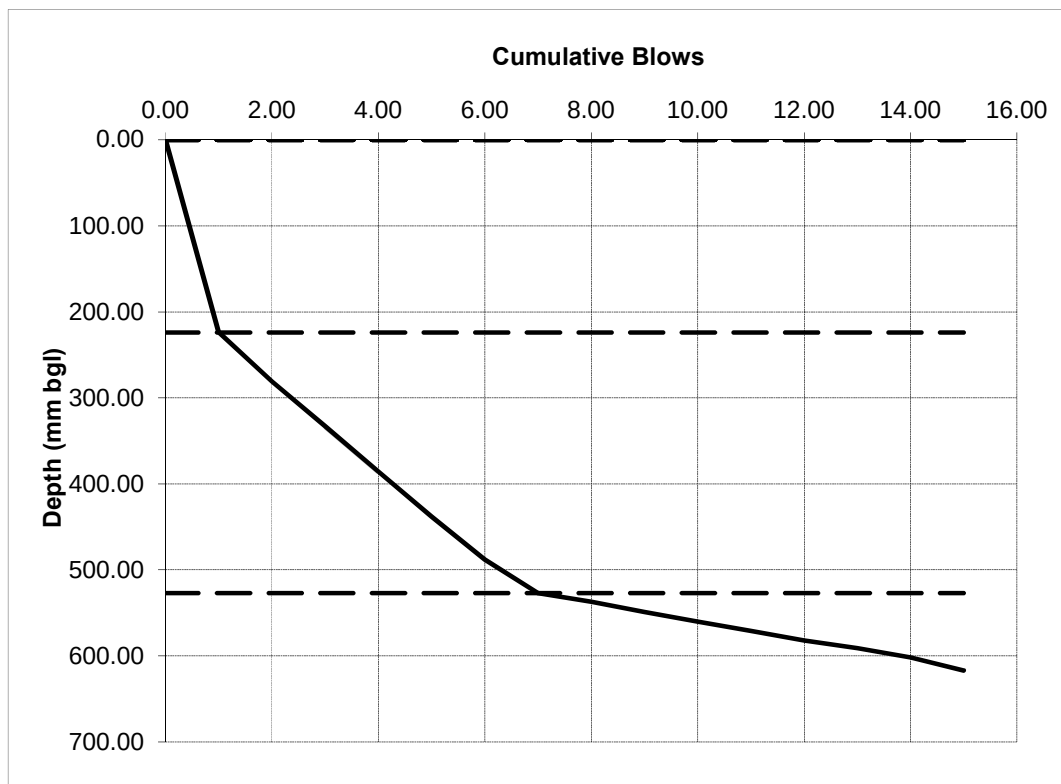
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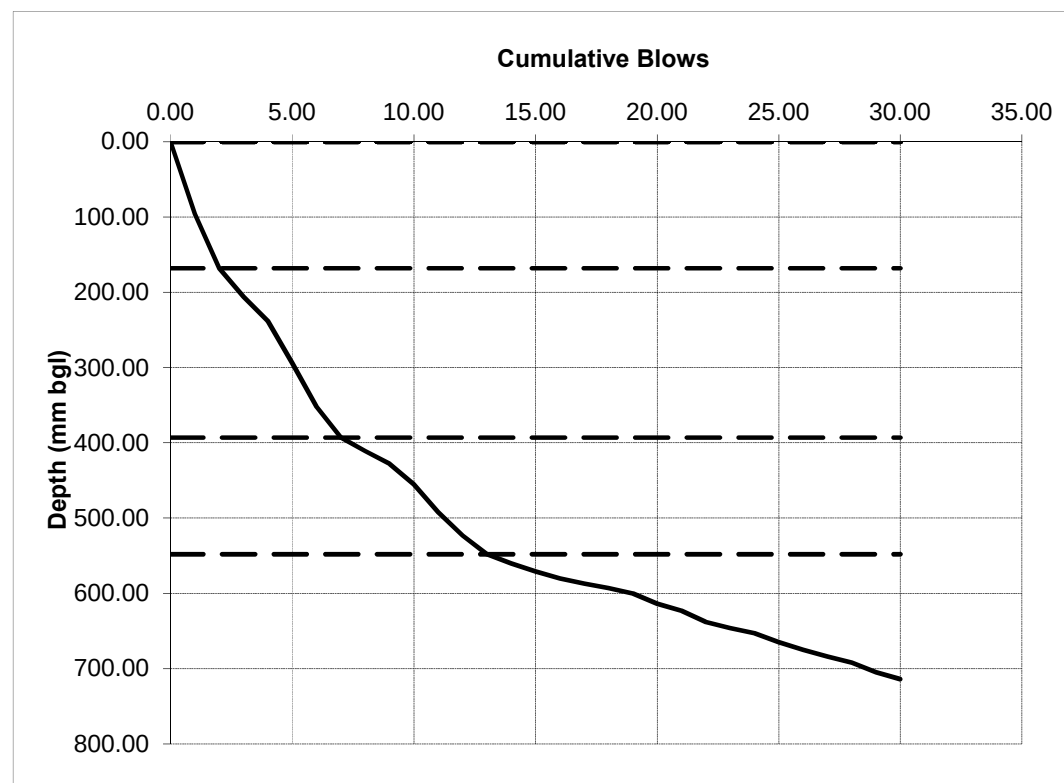
Dynamic Cone Penetrometer

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PROJECT TITLE	Plot J, Kingsway BP
TEST REFERENCE	TP19
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WEATHER/ GROUND CONDITION	Damp

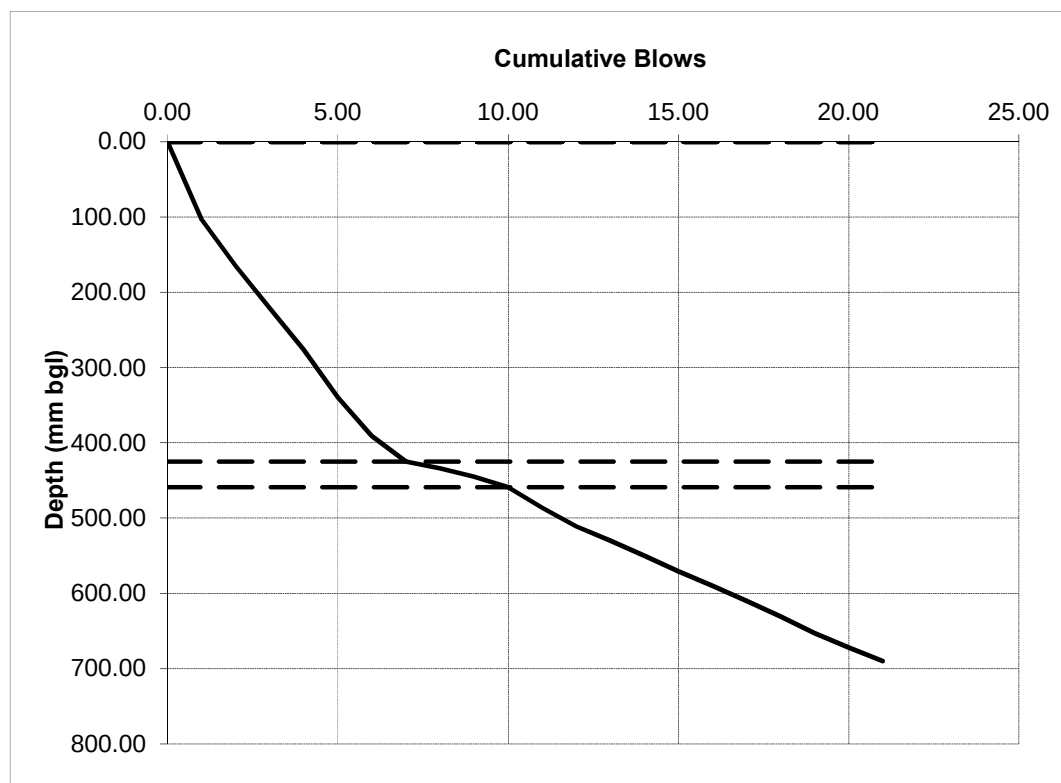
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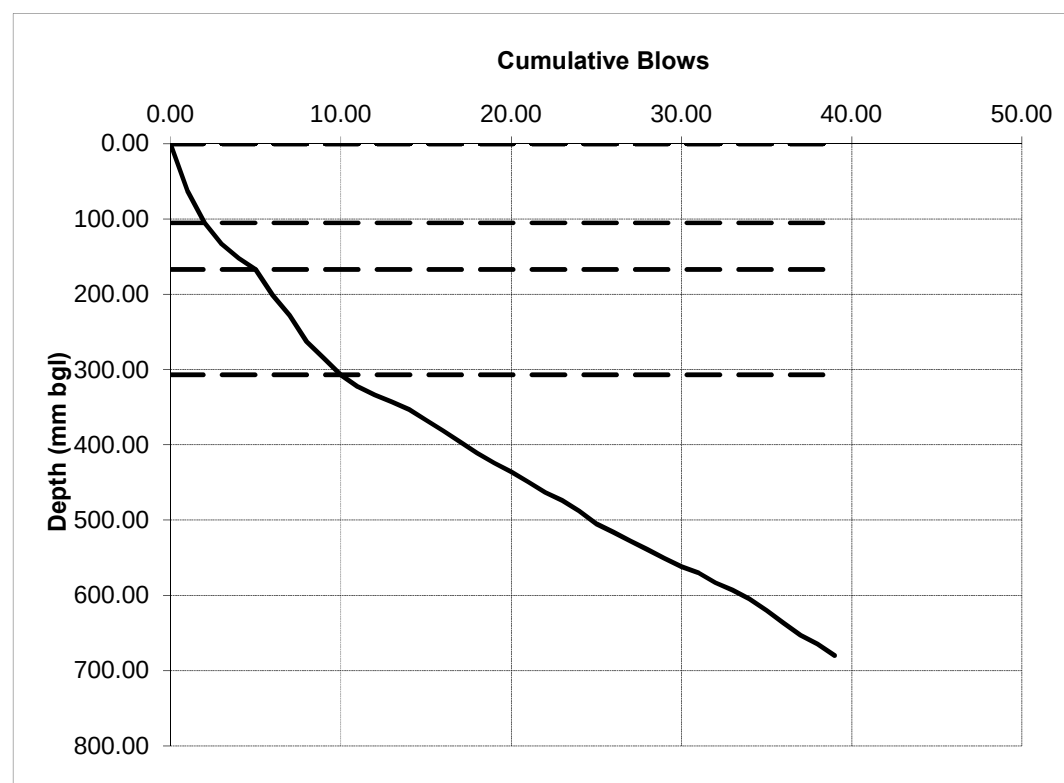
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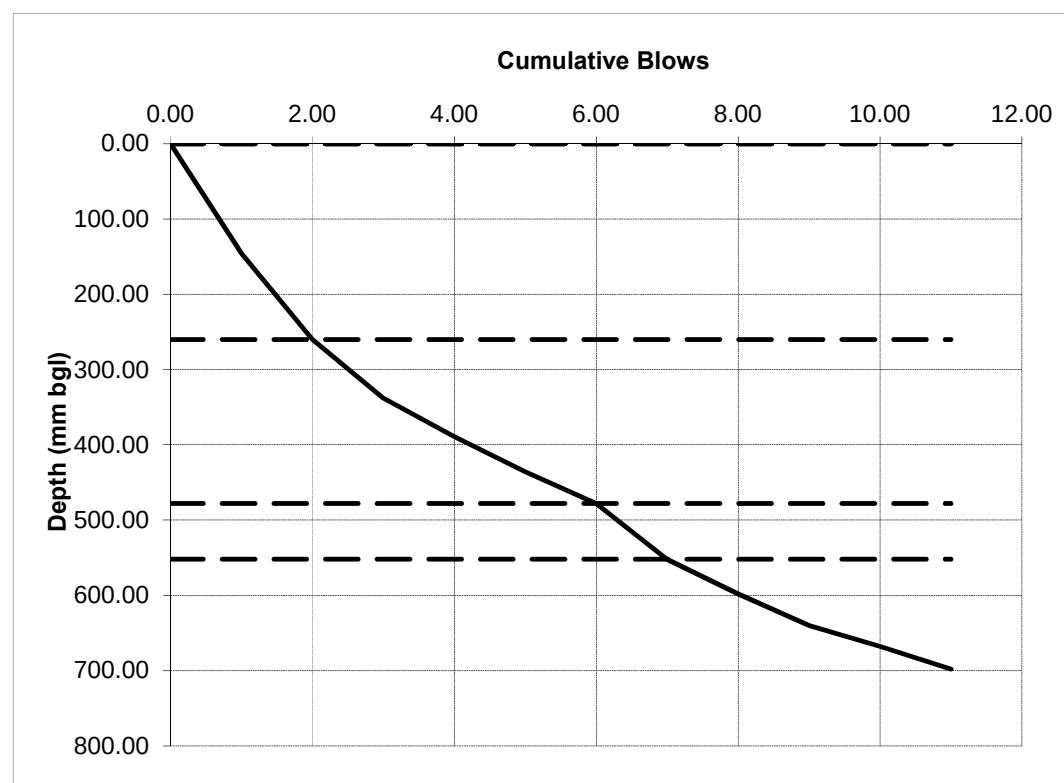
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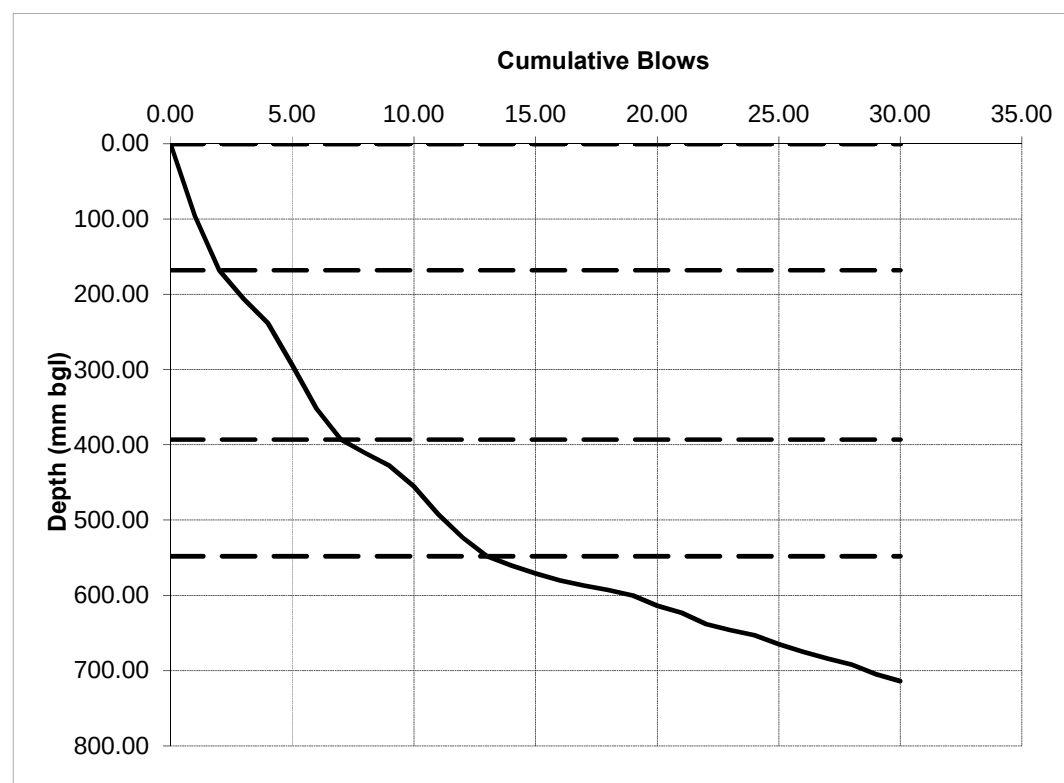
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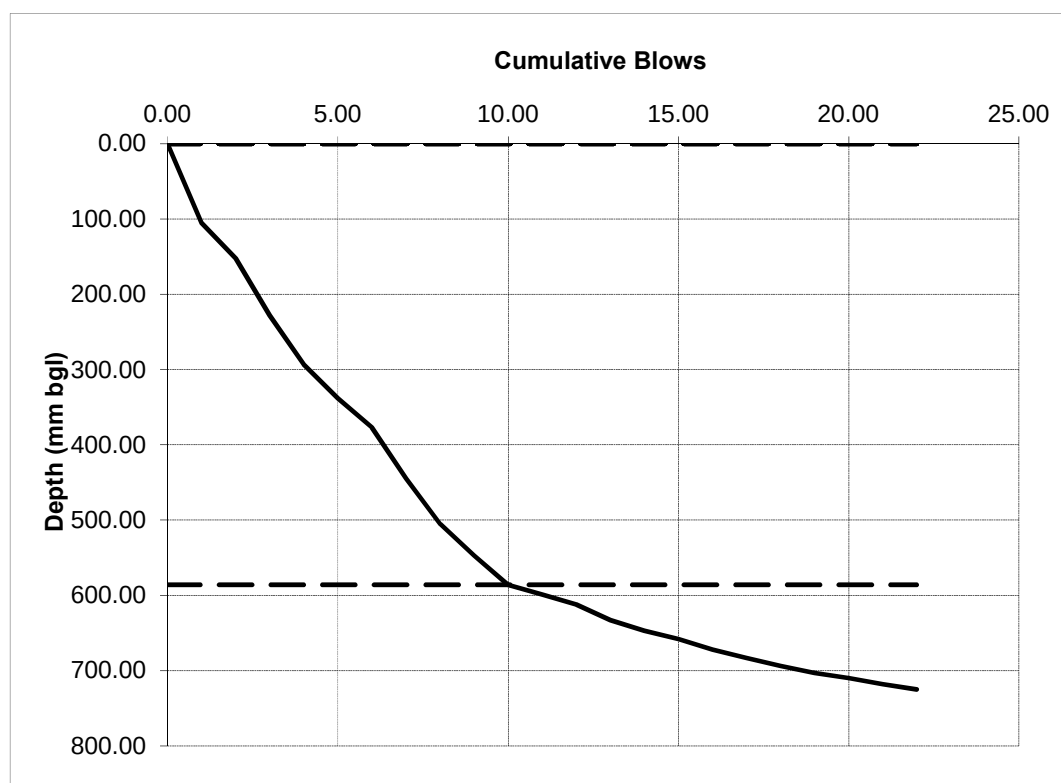
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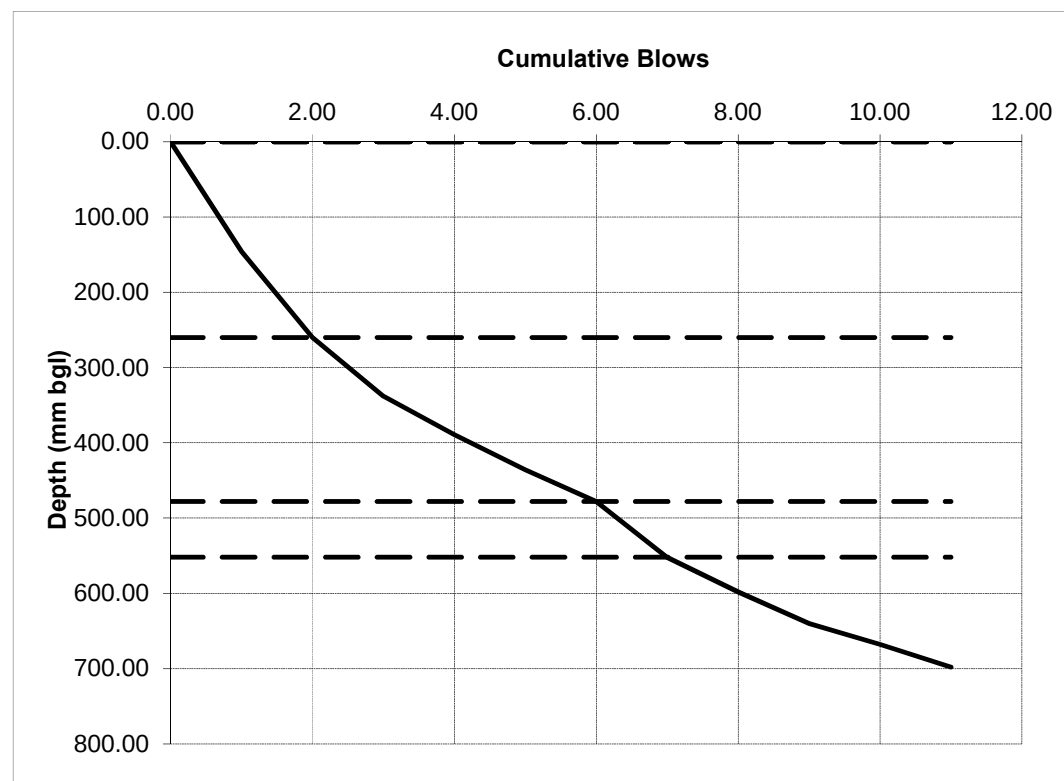
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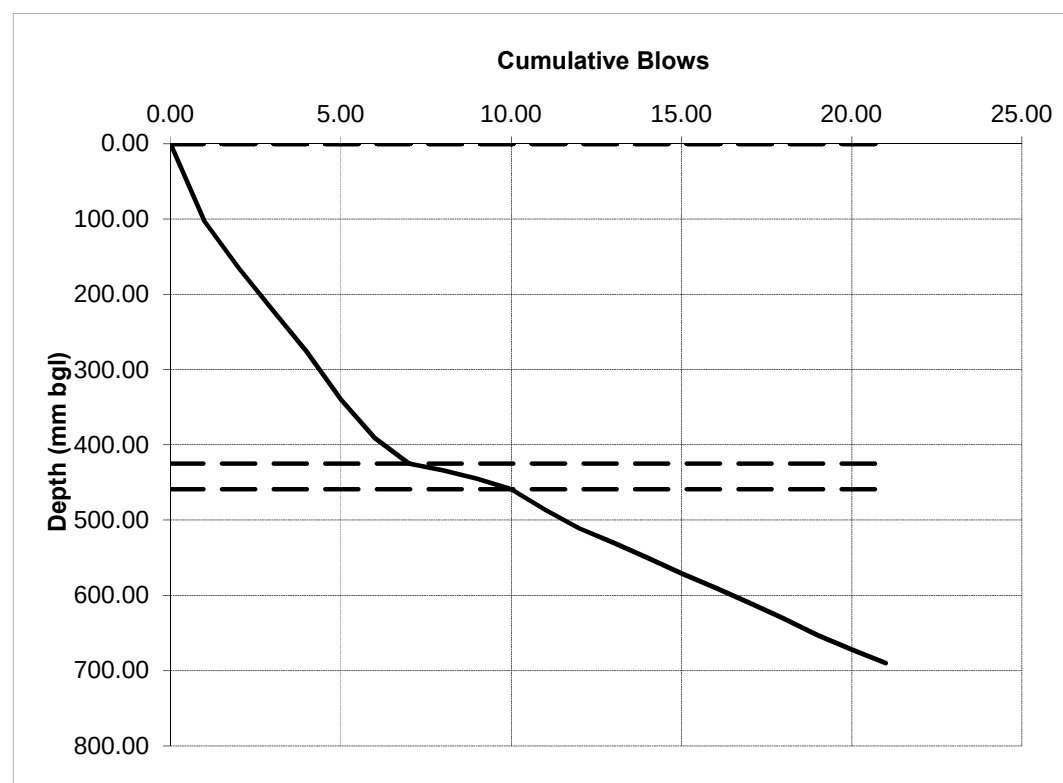
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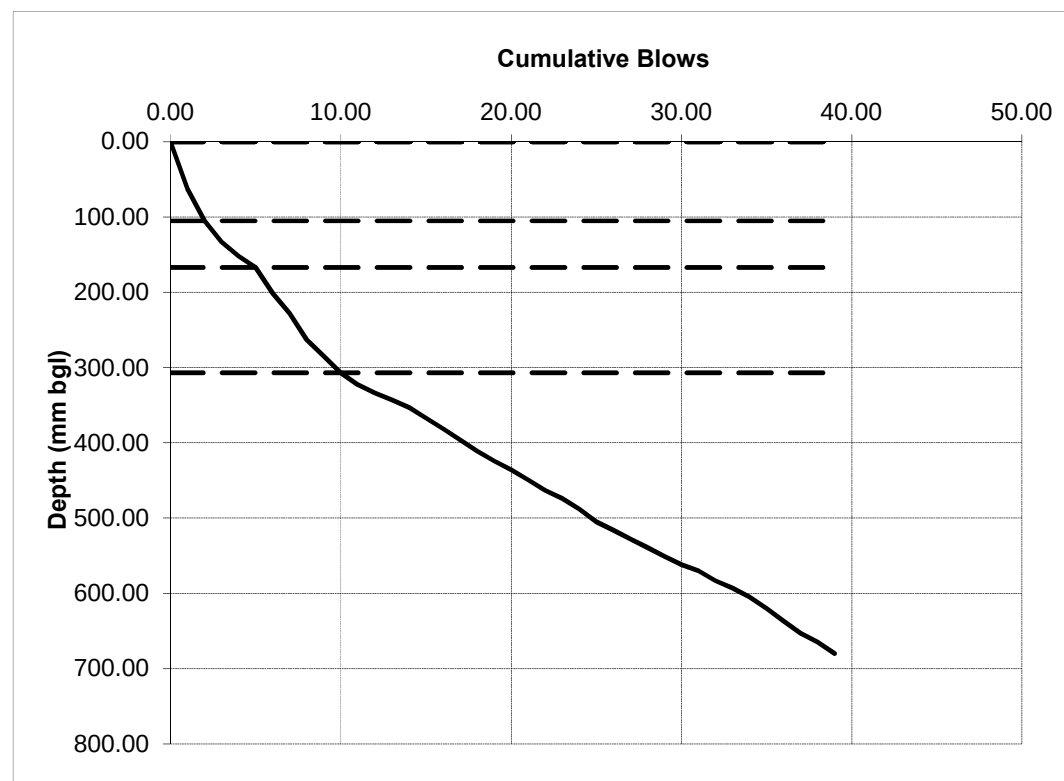
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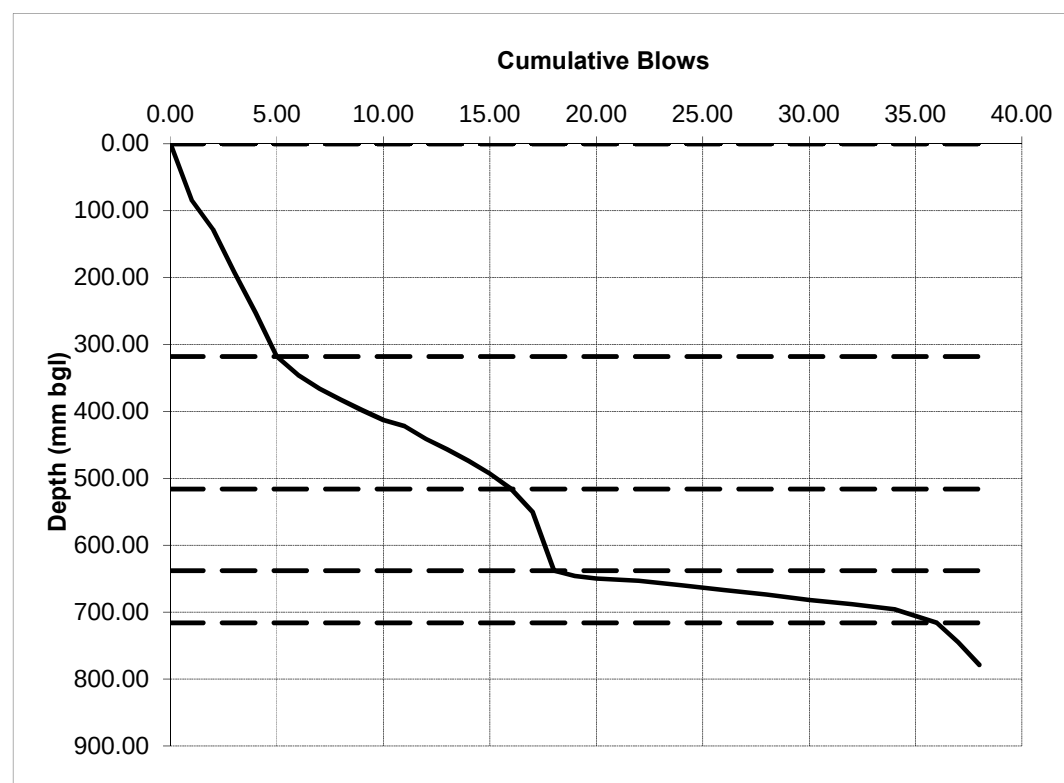
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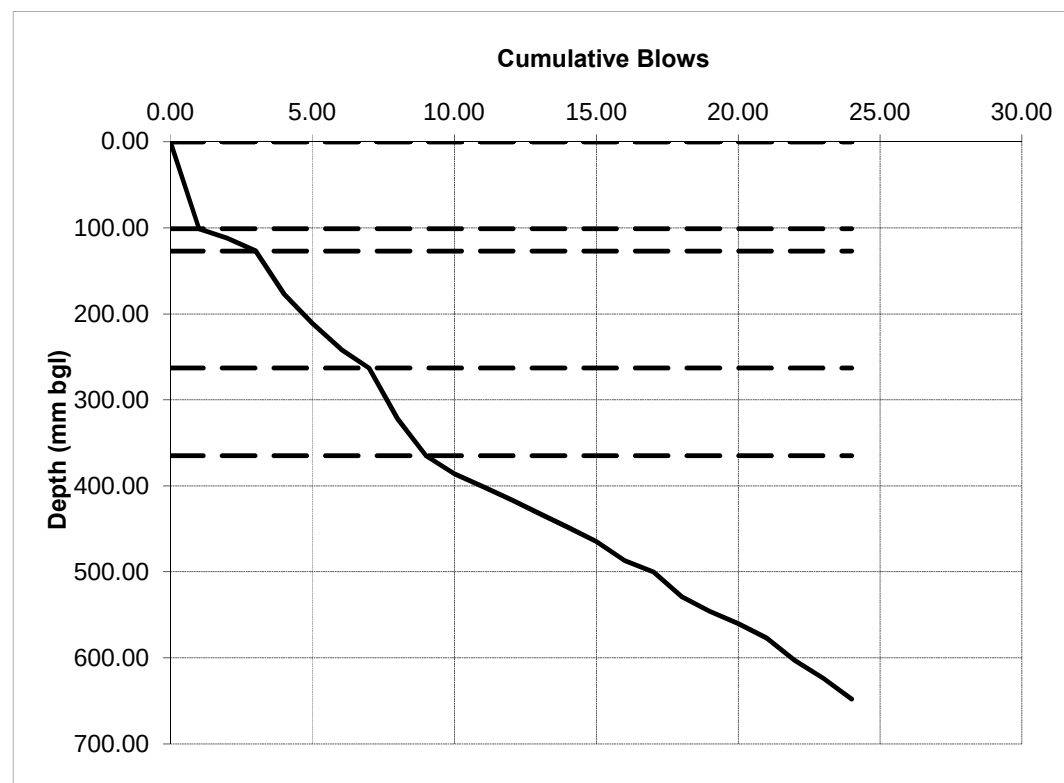
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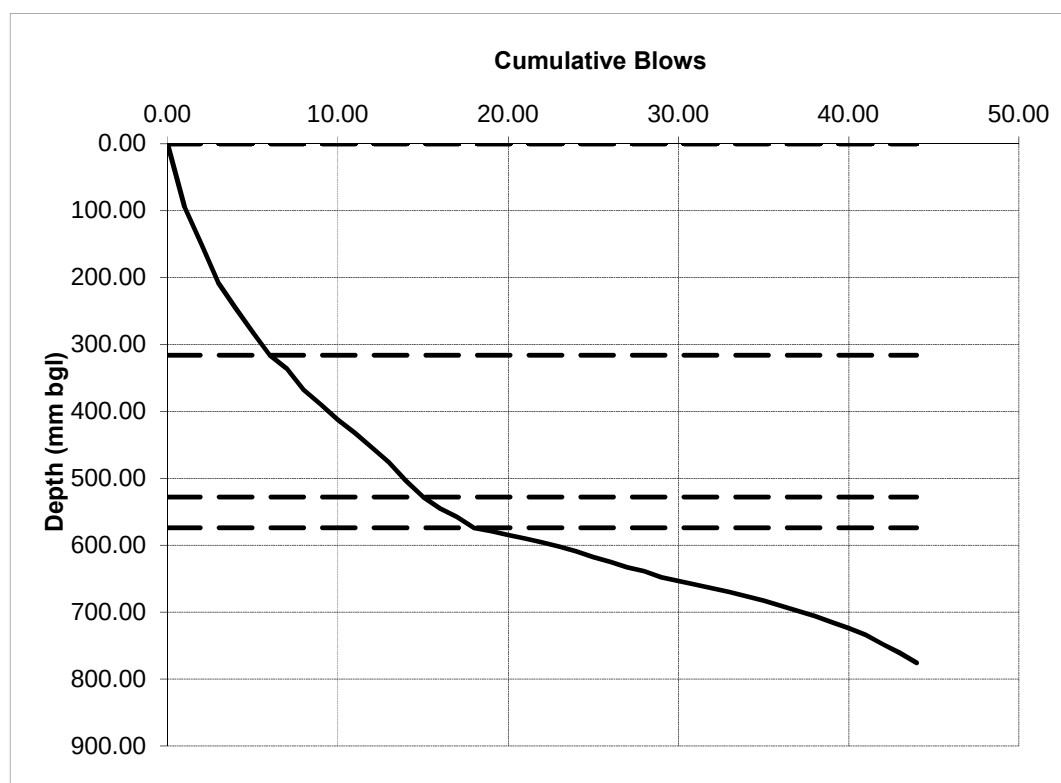
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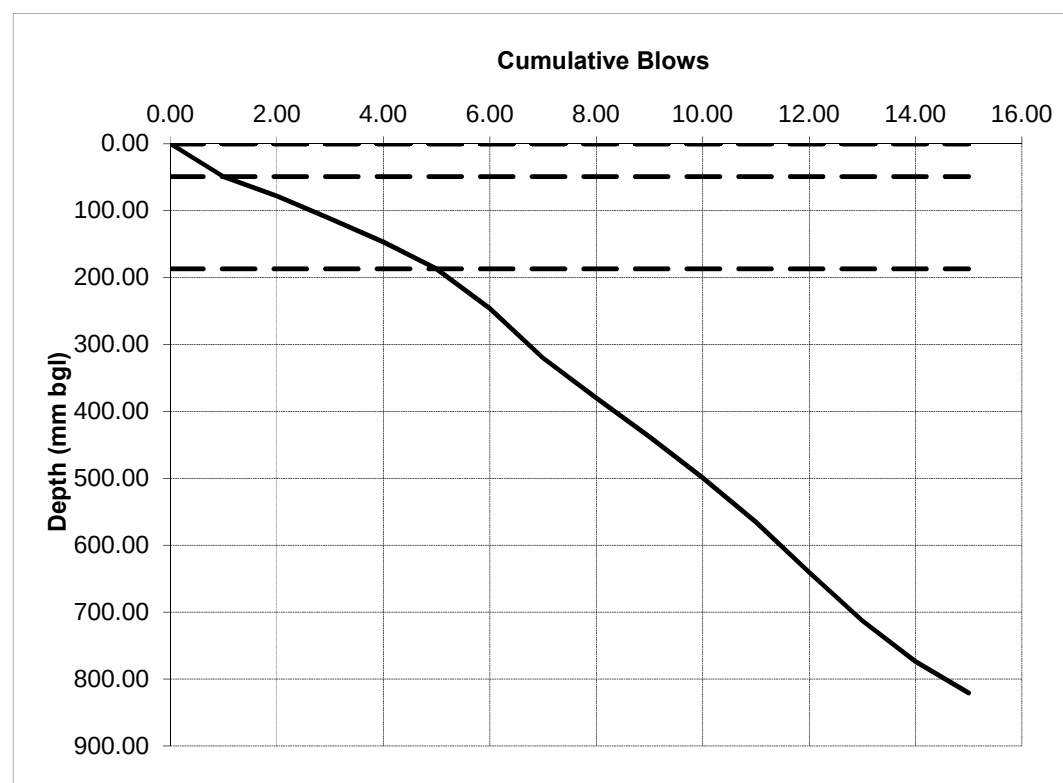
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BWB[illegible]

CBR Interpretation based on the TRL Equation: $\text{Log}_{10}(\text{CBR}) = 2.480 - [1.057 \times \text{Log}_{10}(\text{DCP Strength})]$

APPENDIX 10

DERIVATION OF BWB GSAC

BWB HUMAN HEALTH GENERIC QUANTITATIVE RISK ASSESSMENT (GQRA)

Human Health Generic Screening Criteria

The Environment Agency published the revised CLEA framework for assessing the risk to human health from soil contamination in January 2009. The framework comprises a technical background document (EA, 2009a), toxicological assessment EA 2009b and CLEA spreadsheet model (EA 2009c). The new framework supersedes the 2002 CLEA model and subsequent briefing notes. The 2002 CLEA software and CLEA 2005 have also been withdrawn and all previously published Soil Guideline Values (SGV) have been withdrawn. The EA have issued revised SGVs for the following substances.

- Arsenic
- selenium
- ethylbenzene
- Phenol
- cadmium
- benzene
- xylene
- Mercury
- nickel
- toluene
- dioxins and dioxin like PCBs

In the absence of an SGV for a particular contaminant Generic assessment criteria have been generated by BWB using the CLEA framework. This is a similar approach to Generic screening criteria published by LQM/CIEH and CLAIRE/EIC.

The Statutory Guidance on Part IIa of the Environment Act was revised in 2012 and introduced the concept of characterising Land into 4 categories. Categories 1 and 2 were classed as "Contaminated Land" and Categories 3 and 4 as "not Contaminated Land". DEFRA commissioned a research project to develop Category 4 Screening Levels (C4SLs) which would be used to rapidly screen sites as not contaminated land. These values would be less conservative than SGVs or equivalent GSACs but still be strongly precautionary. In 2014 DEFRA published the framework for deriving C4SLs and C4SLs for six substances:

Arsenic
Cadmium
Chromium VI
Lead
Benzo(a)pyrene
Benzene

The framework recommended changes to exposure parameters as well as introducing a new Health Criteria Value known as a "Low level of Toxicological Concern" (LLTC). This would be less conservative than the minimal risk approach used to derive TDIs and IDs under the 2009b CLEA framework.

In response LQM/CIEH published their third edition of Generic screening criteria for human health in January 2015. These were known as "Suitable for Use Levels" (S4ULs) and adopted the changes to exposure parameters that were developed under the Category 4 Screening Level methodology. The

report also reviewed toxicity information but adopted the minimal risk approach as set out in EA 2009b. This report presented revised data for some substances for which an SGV had been developed, therefore some of the existing SGVs have been superseded.

BWB have updated their GSACs to take into account the LQM/CIEH S4ULs and DEFRA C4SLs but have retained the CLEA exposure assumptions, the BWB GSACs represent the most conservative minimal risk approach.

The screening approach comprises tiered assessment of contaminant data against BWB GSACs in the first instance, then S4ULs and finally C4SLs if available.

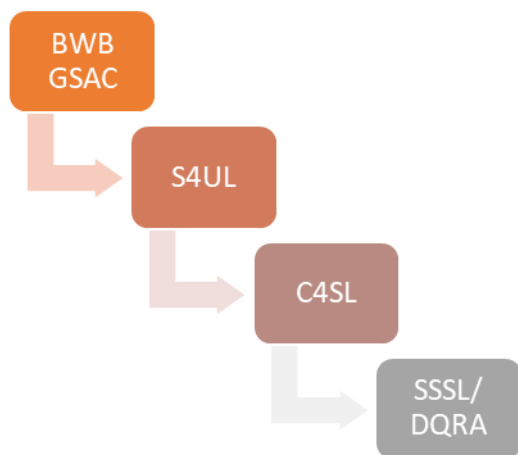


Figure 1 GSAC Hierarchy

Conceptual Site Model

The standard exposure pathways and Conceptual Models for human exposure to contaminants for different site uses are set out in the updated technical background to the CLEA model (Environment Agency 2009a).

Descriptive Conceptual Models (From Environment Agency 2009a)

Residential This generic scenario assumes a typical residential property consisting of a two-storey house built on a ground bearing slab with a private garden consisting of lawn, flower beds and a small fruit and vegetable patch. The occupants are assumed to be parents with young children, who make regular use of the garden area. The key assumptions for BWB GSACs are Critical receptor is a young female child (aged zero to six years old) Exposure duration is six years Exposure pathways include direct soil and indoor dust ingestion, consumption of homegrown produce, consumption of soil attached to home grown produce, skin contact with soils and indoor dusts, and inhalation of indoor and outdoor dust and vapours. Soil type is a Sandy Loam with 1% organic matter Building type is a two storey small terraced house
Commercial/Industrial There are many different kinds of workplace and work-related activities. This generic scenario assumes a typical commercial or light industrial property consisting of a three storey building at which employees spend most time indoors and are involved in office based or relatively light physical work. The key assumptions for BWB GSACs are Critical receptor is a working female adult (aged 16 to 65 years) Exposure duration is a working lifetime of 49 years Exposure pathways include direct soil and indoor dust ingestion, skin contact with soils and dusts, and inhalation of dust and vapours. Soil type is a Sandy Loam with 1% organic matter Building type is a three storey office (post 1970) (Representative of new buildings)

The 2009a report identifies 10 potential exposure pathways by which contaminated soils may impact human health and also sets out which pathways are applicable for four standard land uses. The pathways for the residential and commercial end uses are shown below.

Screening Criteria Modelling

The CLEA model version 1.071 has been used to calculate BWB GSACs. BWB have used the model to calculate Individual criteria for each relevant

pathway so, for example, in a residential with vegetable uptake scenario we would need six individual criteria:-

- Ingestion of soil and dust
- Ingestion of contaminated vegetables and soil attached to vegetables
- Dermal contact indoors and outdoors
- Particulate dust inhalation indoors and outdoors
- Vapour inhalation indoors
- Vapour inhalation outdoors

The final overall assessment criteria is calculated by adding together the reciprocal of the individual criteria for each pathway, therefore if several of the individual criteria are of similar magnitude the final criteria may be substantially lower than the lowest individual criteria so that total exposure is below the respective health threshold.

$$1/GSAC = \sum 1/ASC_{\text{ingestion}} + 1/ASC_{\text{inhalation}} + 1/ASC_{\text{dermal}}$$

By adopting this methodology BWB are able to provide a more flexible site specific approach to generic human health risk assessment.

Pathway Selection - Generic Site Assessment Criteria

Pathway	Residential	Commercial / Industrial
Ingestion of Soil	Yes	Yes
Ingestion of site derived household dust	Yes	Yes
Ingestion of contaminated homegrown produce	Optional	No
Ingestion of soil attached to homegrown produce	Optional	No
Dermal contact with Soil	Yes	Yes
Dermal contact with site derived household dust	Yes	Yes
Inhalation of fugitive soil dust	Yes	Yes
Inhalation of fugitive site derived household dust	Yes	Yes
Inhalation of vapours outside	Yes	Yes
Inhalation of vapours inside	Yes	Yes

Health Criteria Values

The general hierarchy for selecting health criteria values is as follows:

1. EA / DEFRA TOX report
2. Other UK authoritative body e.g. Committee on toxicity, Food Standards Agency
3. EU authoritative body
4. Other EU body e.g. RIVM
5. Other US/International Body

In the absence of updated TOX reports which take into account the recommendations of EA report (2009b) TOX reports produced under the old

regime have been used and GSACs will be updated accordingly as further authoritative information is issued.

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Residential Pathway Specific Assessment Sub Criteria derived May 2015 1% Organic Matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & dermal contact	Ingestion of Contaminated Vegetables and soil attached to vegetables	Particulate Dust Inhalation	Residential GSAC	Soil Saturation Limit
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	mg/kg	mg/kg
Arsenic	NR	NR	3.50E+01	4.29E+02	8.50E+01	3.24E+01	N/A
Barium	NR	NR	1.35E+03		4.25E+05	1.34E+03	N/A
Beryllium	NR	NR	1.56E+02	2.96E+03	1.21E+00	1.21E+00	N/A
Boron	NR	NR	1.08E+04	3.00E+02	3.65E+06	2.91E+02	N/A
Cadmium	NR	NR	1.21E+02	1.24E+01	1.27E+02	1.03E+01	N/A
Chromium III	NR	NR	1.98E+04	1.25E+06	6.37E+02	6.17E+02	N/A
Chromium VI	NR	NR	7.05E+01	1.22E+01	4.25E+00	4.25E+00	N/A
Copper	NR	NR	1.08E+04	3.54E+03	9.89E+03	2.10E+03	N/A
Lead						2.00E+02	N/A
Inorganic Mercury	NR	NR	5.71E+01	1.40E+02	2.55E+03	3.99E+01	N/A
Nickel	NR	NR	7.89E+02	1.64E+03	1.27E+02	1.27E+02	N/A
Selenium	NR	NR	4.31E+02	6.15E+02	1.36E+05	2.53E+02	N/A
Vanadium	NR	NR	1.17E+03	6.21E+02	1.03E+03	2.91E+02	N/A
Zinc	NR	NR	4.05E+04	4.13E+03	2.55E+07	3.74E+03	N/A
Cyanide (free)						4.30E+01	N/A
Cyanide (Complex)						2.13E+02	N/A
Phenol	3.43E+02	4.21E+05	6.56E+02	1.55E+02	3.22E+05	9.18E+01	4.16E+04
Benzene	2.69E-01	5.63E+03	2.58E+01	1.13E-01	5.95E+04	7.93E-02	1.22E+03
Toluene	6.38E+02	8.78E+06	1.98E+04	1.48E+02	5.92E+07	1.19E+02	8.69E+02
Ethylbenzene	5.86E+01	6.17E+05	8.88E+03	1.07E+02	3.11E+06	3.77E+01	5.18E+02
Total Xylene	5.57E+01	5.15E+05	1.60E+04	1.87E+02	2.28E+06	4.28E+01	4.78E+02
TPH (EC5-6) aliphatic	2.88E+01	2.41E+06	2.23E+05	4.90E+03	1.06E+08	2.86E+01	3.04E+02
TPH (>EC6-8) aliphatic	7.02E+01	3.76E+06	2.23E+05	1.53E+04	1.06E+08	6.99E+01	1.44E+02
TPH (>EC8-10) aliphatic	1.82E+01	4.61E+05	4.45E+03	2.17E+03	6.16E+06	1.80E+01	7.77E+01
TPH (>EC10-12) aliphatic	9.02E+01	1.03E+06	4.45E+03	1.67E+04	6.16E+06	8.79E+01	4.75E+01

Residential Pathway Specific Assessment Sub Criteria derived May 2015 1% Organic Matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & dermal contact	Ingestion of Contaminated Vegetables and soil attached to vegetables	Particulate Dust Inhalation	Residential GSAC	Soil Saturation Limit
TPH (>EC12-16) aliphatic	7.55E+02	2.97E+06	4.45E+03	2.32E+05	6.16E+06	6.43E+02	2.37E+01
TPH (>EC16-35) aliphatic	8.91E+04	8.47E+07	8.91E+04	1.15E+07	4.25E+07	4.43E+04	8.48E+00
TPH (>EC35-44) aliphatic	8.91E+04	8.47E+07	8.91E+04	1.15E+07	4.25E+07	4.43E+04	8.48E+00
TPH (>EC6-7) aromatic (benzene)	2.69E-01	5.63E+03	2.58E+01	1.13E-01	5.95E+04	7.93E-02	1.22E+03
TPH (>EC7-8) aromatic (toluene)	6.26E+02	8.62E+06	1.98E+04	1.48E+02	5.81E+07	1.19E+02	8.69E+02
TPH (>EC8-10) aromatic	3.22E+01	2.79E+05	1.78E+03	5.73E+01	1.28E+06	2.04E+01	6.13E+02
TPH (>EC10-12) aromatic	1.75E+02	6.50E+05	1.78E+03	8.34E+01	1.28E+06	5.47E+01	3.64E+02
TPH (>EC12-16) aromatic	1.94E+03	2.15E+06	1.78E+03	1.52E+02	1.28E+06	1.31E+02	2.37E+01
TPH (>EC16-21) aromatic	3.54E+04	5.95E+06	1.34E+03	3.06E+02	6.38E+05	2.47E+02	5.37E+01
TPH (>EC21-35) aromatic	3.99E+06	2.67E+07	1.34E+03	2.66E+03	6.38E+05	8.90E+02	4.83E+00
TPH (>EC35-44) aromatic	3.99E+06	2.67E+07	1.34E+03	2.66E+03	6.38E+05	8.90E+02	4.83E+00
Naphthalene	1.64E+00	3.17E+04	1.58E+03	2.72E+01	2.93E+04	1.55E+00	7.64E+01
Acenaphthylene	3.27E+03	1.26E+07	4.85E+03	1.84E+02	2.55E+06	1.68E+02	8.61E+01
Acenaphthene	3.47E+03	1.32E+07	4.85E+03	2.28E+02	2.55E+06	2.05E+02	5.70E+01
Fluorene	4.37E+03	1.17E+07	3.23E+03	1.79E+02	1.70E+06	1.63E+02	3.09E+01
Phenanthrene	5.09E+03	6.29E+06	1.00E+03	1.03E+02	5.30E+05	9.17E+01	3.60E+01
Anthracene	1.09E+05	1.48E+08	2.43E+04	2.55E+03	1.27E+07	2.26E+03	1.17E+00
Fluoranthene	2.84E+04	1.26E+07	1.01E+03	3.49E+02	5.31E+05	2.57E+02	1.89E+01
Pyrene	6.50E+04	2.87E+07	2.42E+03	7.43E+02	1.27E+06	5.63E+02	2.20E+00
Benzo(a)anthracene	2.40E+01	3.37E+03	1.25E+01	2.11E+01	6.37E+01	5.41E+00	1.71E+00
Chrysene	2.53E+02	5.87E+03	2.51E+01	2.90E+01	1.27E+02	1.16E+01	4.40E-01
Benzo(b)fluoranthene	9.32E+01	1.05E+03	3.15E+00	7.43E+00	1.61E+01	1.90E+00	1.22E+00
Benzo(k)fluoranthene	4.04E+03	3.28E+04	8.33E+01	2.85E+02	4.25E+02	5.51E+01	6.87E-01
Benzo(a)pyrene	1.04E+02	9.12E+02	2.51E+00	7.36E+00	1.27E+01	1.60E+00	9.11E-01
Indeno(123-cd)pyrene	8.78E+02	1.10E+04	3.58E+01	6.93E+01	1.83E+02	2.04E+01	6.14E-02
Dibenzo(ah)anthracene	5.23E+00	1.13E+02	2.51E-01	1.11E+00	1.27E+00	1.70E-01	3.93E-03

Residential Pathway Specific Assessment Sub Criteria derived May 2015 1% Organic Matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & dermal contact	Ingestion of Contaminated Vegetables and soil attached to vegetables	Particulate Dust Inhalation	Residential GSAC	Soil Saturation Limit
Benzo(g,h,i)perylene	2.34E+04	1.83E+05	2.78E+02	2.77E+03	1.40E+03	2.12E+02	1.54E-02
Tetrachloroethene (PCE)	1.26E-01	2.48E+04	4.92E+02	4.36E+00	2.34E+05	1.22E-01	4.24E+02
Trichloroethene (TCE)	1.21E-02	2.44E+03	4.45E+01	2.74E-01	2.42E+04	1.15E-02	1.54E+03
cis-1,2-Dichloroethene	1.20E-01	2.33E+04	4.82E+02	1.75E+00	2.30E+05	1.12E-01	3.94E+03
Vinyl Chloride (VC)	5.43E-04	3.59E+02	1.25E+00	3.70E-03	1.27E+04	4.73E-04	1.36E+03
1,1,2,2-Tetrachloroethane (PCA)	2.76E+00	1.17E+05	5.07E+02	2.72E+00	2.41E+05	1.37E+00	2.67E+03
1,1,1-Trichloroethane (TCA)	6.33E+00	1.79E+06	5.34E+04	3.22E+02	2.46E+07	6.21E+00	1.43E+03
1,2-Dichloroethane	6.46E-03	8.09E+02	1.07E+01	3.07E-02	5.10E+03	5.33E-03	3.41E+03
Carbon Tetrachloride	1.81E-02	5.07E+03	5.38E+02	3.00E+00	6.93E+04	1.80E-02	1.52E+03
Carbon disulphide	1.01E-01	3.42E+04	3.55E+02	3.20E+01	6.08E+05	1.01E-01	2.11E+03

ASC exceeds soil saturation limit

Residential Pathway Specific Assessment Sub Criteria derived May 2015 2.5% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & dermal contact	Ingestion of Contaminated Vegetables and soil attached to vegetables	Particulate Dust Inhalation	Residential GSAC	Soil Saturation Limit
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	mg/kg	mg/kg
Arsenic	NR	NR	3.50E+01	4.29E+02	8.50E+01	3.24E+01	N/A
Barium	NR	NR	1.35E+03		4.25E+05	1.34E+03	N/A
Beryllium	NR	NR	1.56E+02	2.96E+03	1.21E+00	1.21E+00	N/A
Boron	NR	NR	1.08E+04	3.00E+02	3.65E+06	2.91E+02	N/A
Cadmium	NR	NR	1.21E+02	1.24E+01	1.27E+02	1.03E+01	N/A
Chromium III	NR	NR	1.98E+04	1.25E+06	6.37E+02	6.17E+02	N/A
Chromium VI	NR	NR	7.05E+01	1.22E+01	4.25E+00	4.25E+00	N/A
Copper	NR	NR	1.08E+04	3.54E+03	9.89E+03	2.10E+03	N/A
Lead						2.00E+02	N/A
Inorganic Mercury	NR	NR	5.71E+01	1.40E+02	2.55E+03	3.99E+01	N/A
Nickel	NR	NR	7.89E+02	1.64E+03	1.27E+02	1.27E+02	N/A
Selenium	NR	NR	4.31E+02	6.15E+02	1.36E+05	2.53E+02	N/A
Vanadium	NR	NR	1.17E+03	6.21E+02	1.03E+03	2.91E+02	N/A
Zinc	NR	NR	4.05E+04	4.13E+03	2.55E+07	3.74E+03	N/A
Cyanide (free)						4.30E+01	N/A
Cyanide (Complex)						2.13E+02	N/A
Phenol	5.39E+02	5.28E+05	6.56E+02	2.88E+02	3.22E+05	1.46E+02	8.15E+04
Benzene	4.99E-01	7.68E+03	2.58E+01	2.30E-01	5.95E+04	1.57E-01	2.26E+03
Toluene	1.41E+03	1.30E+07	1.98E+04	3.41E+02	5.92E+07	2.71E+02	1.92E+03
Ethylbenzene	1.37E+02	9.44E+05	8.88E+03	2.58E+02	3.11E+06	8.88E+01	1.22E+03
Total Xylene	1.31E+02	7.89E+05	1.60E+04	4.50E+02	2.28E+06	1.01E+02	1.12E+03
TPH (EC5-6) aliphatic	5.28E+01	3.26E+06	2.23E+05	1.14E+04	1.06E+08	5.25E+01	5.58E+02
TPH (>EC6-8) aliphatic	1.57E+02	5.62E+06	2.23E+05	3.75E+04	1.06E+08	1.56E+02	3.22E+02
TPH (>EC8-10) aliphatic	4.44E+01	7.20E+05	4.45E+03	5.38E+03	6.16E+06	4.36E+01	1.90E+02

Residential Pathway Specific Assessment Sub Criteria derived May 2015 2.5% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & dermal contact	Ingestion of Contaminated Vegetables and soil attached to vegetables	Particulate Dust Inhalation	Residential GSAC	Soil Saturation Limit
TPH (>EC10-12) aliphatic	2.24E+02	1.62E+06	4.45E+03	4.00E+04	6.16E+06	2.12E+02	1.18E+02
TPH (>EC12-16) aliphatic	1.89E+03	4.69E+06	4.45E+03	3.64E+05	6.16E+06	1.32E+03	5.91E+01
TPH (>EC16-35) aliphatic	2.23E+05	1.34E+08	8.91E+04	1.16E+07	4.25E+07	6.32E+04	2.12E+01
TPH (>EC35-44) aliphatic	2.23E+05	1.34E+08	8.91E+04	1.16E+07	4.25E+07	6.32E+04	2.12E+01
TPH (>EC6-7) aromatic (benzene)	4.99E-01	7.68E+03	2.58E+01	2.30E-01	5.95E+04	1.56E-01	2.26E+03
TPH (>EC7-8) aromatic (toluene)	1.38E+03	1.28E+07	1.98E+04	3.41E+02	5.81E+07	2.70E+02	1.92E+03
TPH (>EC8-10) aromatic	7.88E+01	4.36E+05	1.78E+03	1.42E+02	1.28E+06	4.93E+01	1.50E+03
TPH (>EC10-12) aromatic	4.34E+02	1.02E+06	1.78E+03	2.07E+02	1.28E+06	1.30E+02	8.99E+02
TPH (>EC12-16) aromatic	4.83E+03	3.39E+06	1.78E+03	3.79E+02	1.28E+06	2.93E+02	5.91E+01
TPH (>EC16-21) aromatic	8.83E+04	9.40E+06	1.34E+03	7.61E+02	6.38E+05	4.82E+02	1.34E+02
TPH (>EC21-35) aromatic	9.98E+06	4.23E+07	1.34E+03	6.50E+03	6.38E+05	1.11E+03	1.21E+01
TPH (>EC35-44) aromatic	9.98E+06	4.23E+07	1.34E+03	6.50E+03	6.38E+05	1.11E+03	1.21E+01
Naphthalene	3.93E+00	4.91E+04	1.58E+03	6.63E+01	2.93E+04	3.70E+00	1.83E+02
Acenaphthylene	8.06E+03	1.97E+07	4.85E+03	4.56E+02	2.55E+06	3.96E+02	2.12E+02
Acenaphthene	8.57E+03	2.07E+07	4.85E+03	5.67E+02	2.55E+06	4.79E+02	1.41E+02
Fluorene	1.08E+04	1.84E+07	3.23E+03	4.45E+02	1.70E+06	3.77E+02	7.65E+01
Phenanthrene	1.27E+04	9.91E+06	1.00E+03	2.57E+02	5.30E+05	2.01E+02	8.96E+01
Anthracene	2.70E+05	2.33E+08	2.43E+04	6.34E+03	1.27E+07	4.93E+03	2.91E+00
Fluoranthene	7.08E+04	2.00E+07	1.01E+03	8.68E+02	5.31E+05	4.63E+02	4.73E+01
Pyrene	1.62E+05	4.54E+07	2.42E+03	1.85E+03	1.27E+06	1.04E+03	5.49E+00
Benzo(a)anthracene	6.00E+01	5.32E+03	1.25E+01	5.18E+01	6.37E+01	7.60E+00	4.28E+00
Chrysene	6.32E+02	9.28E+03	2.51E+01	7.15E+01	1.27E+02	1.58E+01	1.10E+00
Benzo(b)fluoranthene	2.33E+02	1.66E+03	3.15E+00	1.81E+01	1.61E+01	2.28E+00	3.04E+00
Benzo(k)fluoranthene	1.01E+04	5.19E+04	8.33E+01	6.87E+02	4.25E+02	6.27E+01	1.72E+00
Benzo(a)pyrene	2.61E+02	1.44E+03	2.51E+00	1.78E+01	1.27E+01	1.86E+00	2.28E+00
Indeno(123-cd)pyrene	2.20E+03	1.74E+04	3.58E+01	1.70E+02	1.83E+02	2.51E+01	5.30E-01

Residential Pathway Specific Assessment Sub Criteria derived May 2015 2.5% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & dermal contact	Ingestion of Contaminated Vegetables and soil attached to vegetables	Particulate Dust Inhalation	Residential GSAC	Soil Saturation Limit
Dibenzo(ah)anthracene	1.31E+01	1.79E+02	2.51E-01	2.65E+00	1.27E+00	1.91E-01	9.82E-03
Benzo(g,h,i)perylene	5.85E+04	2.89E+05	2.78E+02	6.27E+03	1.40E+03	2.23E+02	3.85E-02
Tetrachloroethene (PCE)	2.82E-01	3.71E+04	4.92E+02	1.02E+01	2.34E+05	2.74E-01	9.51E+02
Trichloroethene (TCE)	2.52E-02	3.53E+03	4.45E+01	6.09E-01	2.42E+04	2.42E-02	3.22E+03
cis-1,2-Dichloroethene	2.02E-01	3.02E+04	4.82E+02	3.35E+00	2.30E+05	1.90E-01	6.61E+03
Vinyl Chloride (VC)	7.02E-04	4.08E+02	1.25E+00	6.67E-03	1.27E+04	6.35E-04	1.76E+03
1,1,2,2-Tetrachloroethane (PCA)	5.65E+00	1.68E+05	5.07E+02	5.92E+00	2.41E+05	2.87E+00	5.46E+03
1,1,1-Trichloroethane (TCA)	1.29E+01	2.55E+06	5.34E+04	7.06E+02	2.46E+07	1.27E+01	2.92E+03
1,2-Dichloroethane	9.32E-03	9.72E+02	1.07E+01	5.56E-02	5.10E+03	7.98E-03	4.91E+03
Carbon Tetrachloride	3.97E-02	7.50E+03	5.38E+02	6.95E+00	6.93E+04	3.95E-02	3.32E+03
Carbon disulphide	2.02E-01	4.83E+04	3.55E+02	6.84E+01	6.08E+05	2.01E-01	4.21E+03

ASC exceeds soil saturation limit

Residential Pathway Specific Assessment Sub Criteria derived May 2015 6% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & dermal contact	Ingestion of Contaminated Vegetables and soil attached to vegetables	Particulate Dust Inhalation	Residential GSAC	Soil Saturation Limit
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	mg/kg	mg/kg
Arsenic	NR	NR	3.50E+01	4.29E+02	8.50E+01	3.24E+01	N/A
Barium	NR	NR	1.35E+03		4.25E+05	1.34E+03	N/A
Beryllium	NR	NR	1.56E+02	2.96E+03	1.21E+00	1.21E+00	N/A
Boron	NR	NR	1.08E+04	3.00E+02	3.65E+06	2.91E+02	N/A
Cadmium	NR	NR	1.21E+02	1.24E+01	1.27E+02	1.03E+01	N/A
Chromium III	NR	NR	1.98E+04	1.25E+06	6.37E+02	6.17E+02	N/A
Chromium VI	NR	NR	7.05E+01	1.22E+01	4.25E+00	4.25E+00	N/A
Copper	NR	NR	1.08E+04	3.54E+03	9.89E+03	2.10E+03	N/A
Lead						2.00E+02	N/A
Inorganic Mercury	NR	NR	5.71E+01	1.40E+02	2.55E+03	3.99E+01	N/A
Nickel	NR	NR	7.89E+02	1.64E+03	1.27E+02	1.27E+02	N/A
Selenium	NR	NR	4.31E+02	6.15E+02	1.36E+05	2.53E+02	N/A
Vanadium	NR	NR	1.17E+03	6.21E+02	1.03E+03	2.91E+02	N/A
Zinc	NR	NR	4.05E+04	4.13E+03	2.55E+07	3.74E+03	N/A
Cyanide (free)						4.30E+01	N/A
Cyanide (Complex)						2.13E+02	N/A
Phenol	9.95E+02	7.17E+05	6.56E+02	5.72E+02	3.22E+05	2.34E+02	1.74E+05
Benzene	1.04E+00	1.11E+04	2.58E+01	4.98E-01	5.95E+04	3.32E-01	4.71E+03
Toluene	3.20E+03	1.97E+07	1.98E+04	7.89E+02	5.92E+07	6.13E+02	4.36E+03
Ethylbenzene	3.22E+02	1.44E+06	8.88E+03	6.09E+02	3.11E+06	2.06E+02	2.84E+03
Total Xylene	3.06E+02	1.21E+06	1.60E+04	1.06E+03	2.28E+06	2.34E+02	2.62E+03
TPH (EC5-6) aliphatic	1.09E+02	4.68E+06	2.23E+05	2.62E+04	1.06E+08	1.08E+02	1.15E+03
TPH (>EC6-8) aliphatic	3.59E+02	8.49E+06	2.23E+05	8.91E+04	1.06E+08	3.57E+02	7.36E+02
TPH (>EC8-10) aliphatic	1.06E+02	1.11E+06	4.45E+03	1.27E+04	6.16E+06	1.03E+02	4.51E+02

Residential Pathway Specific Assessment Sub Criteria derived May 2015 6% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & dermal contact	Ingestion of Contaminated Vegetables and soil attached to vegetables	Particulate Dust Inhalation	Residential GSAC	Soil Saturation Limit
TPH (>EC10-12) aliphatic	5.38E+02	2.51E+06	4.45E+03	8.76E+04	6.16E+06	4.77E+02	2.83E+02
TPH (>EC12-16) aliphatic	4.53E+03	7.27E+06	4.45E+03	4.67E+05	6.16E+06	2.23E+03	1.42E+02
TPH (>EC16-35) aliphatic	5.34E+05	2.07E+08	8.91E+04	1.17E+07	4.25E+07	7.57E+04	5.09E+01
TPH (>EC35-44) aliphatic	5.34E+05	2.07E+08	8.91E+04	1.17E+07	4.25E+07	7.57E+04	5.09E+01
TPH (>EC6-7) aromatic (benzene)	1.04E+00	1.11E+04	2.58E+01	4.98E-01	5.95E+04	3.32E-01	4.71E+03
TPH (>EC7-8) aromatic (toluene)	3.14E+03	1.93E+07	1.98E+04	7.89E+02	5.81E+07	6.11E+02	4.36E+03
TPH (>EC8-10) aromatic	1.88E+02	6.73E+05	1.78E+03	3.38E+02	1.28E+06	1.13E+02	3.58E+03
TPH (>EC10-12) aromatic	1.04E+03	1.58E+06	1.78E+03	4.95E+02	1.28E+06	2.82E+02	2.15E+03
TPH (>EC12-16) aromatic	1.16E+04	5.25E+06	1.78E+03	9.07E+02	1.28E+06	5.71E+02	1.42E+02
TPH (>EC16-21) aromatic	2.12E+05	1.46E+07	1.34E+03	1.81E+03	6.38E+05	7.66E+02	3.21E+02
TPH (>EC21-35) aromatic	2.39E+07	6.54E+07	1.34E+03	1.48E+04	6.38E+05	1.23E+03	2.90E+01
TPH (>EC35-44) aromatic	2.39E+07	6.54E+07	1.34E+03	1.48E+04	6.38E+05	1.23E+03	2.90E+01
Naphthalene	9.28E+00	7.55E+04	1.58E+03	1.57E+02	2.93E+04	8.71E+00	4.32E+02
Acenaphthylene	1.92E+04	3.05E+07	4.85E+03	1.09E+03	2.55E+06	8.50E+02	5.06E+02
Acenaphthene	2.05E+04	3.20E+07	4.85E+03	1.36E+03	2.55E+06	1.01E+03	3.36E+02
Fluorene	2.58E+04	2.85E+07	3.23E+03	1.06E+03	1.70E+06	7.74E+02	1.83E+02
Phenanthrene	3.03E+04	1.53E+07	1.00E+03	6.14E+02	5.30E+05	3.75E+02	2.14E+02
Anthracene	6.48E+05	3.60E+08	2.43E+04	1.52E+04	1.27E+07	9.21E+03	6.96E+00
Fluoranthene	1.70E+05	3.09E+07	1.01E+03	2.07E+03	5.31E+05	6.75E+02	1.12E+02
Pyrene	3.89E+05	7.03E+07	2.42E+03	4.40E+03	1.27E+06	1.55E+03	1.32E+01
Benzo(a)anthracene	1.44E+02	8.24E+03	1.25E+01	1.20E+02	6.37E+01	9.01E+00	1.03E+01
Chrysene	1.52E+03	1.44E+04	2.51E+01	1.67E+02	1.27E+02	1.84E+01	2.64E+00
Benzo(b)fluoranthene	5.59E+02	2.57E+03	3.15E+00	4.12E+01	1.61E+01	2.47E+00	7.29E+00
Benzo(k)fluoranthene	2.43E+04	8.03E+04	8.33E+01	1.53E+03	4.25E+02	6.63E+01	4.12E+00
Benzo(a)pyrene	6.27E+02	2.23E+03	2.51E+00	4.01E+01	1.27E+01	1.98E+00	5.46E+00
Indeno(123-cd)pyrene	5.27E+03	2.69E+04	3.58E+01	3.90E+02	1.83E+02	2.76E+01	3.68E-01

Residential Pathway Specific Assessment Sub Criteria derived May 2015 6% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & dermal contact	Ingestion of Contaminated Vegetables and soil attached to vegetables	Particulate Dust Inhalation	Residential GSAC	Soil Saturation Limit
Dibenzo(ah)anthracene	3.14E+01	2.78E+02	2.51E-01	5.77E+00	1.27E+00	2.01E-01	2.36E-02
Benzo(g,h,i)perylene	1.41E+05	4.48E+05	2.78E+02	1.24E+04	1.40E+03	2.27E+02	9.23E-02
Tetrachloroethene (PCE)	6.47E-01	5.61E+04	4.92E+02	2.38E+01	2.34E+05	6.29E-01	2.18E+03
Trichloroethene (TCE)	5.60E-02	5.25E+03	4.45E+01	1.39E+00	2.42E+04	5.38E-02	7.14E+03
cis-1,2-Dichloroethene	3.93E-01	4.22E+04	4.82E+02	6.91E+00	2.30E+05	3.72E-01	1.29E+04
Vinyl Chloride (VC)	1.07E-03	5.05E+02	1.25E+00	1.22E-02	1.27E+04	9.83E-04	2.69E+03
1,1,2,2-Tetrachloroethane (PCA)	1.24E+01	2.49E+05	5.07E+02	1.33E+01	2.41E+05	6.34E+00	1.20E+04
1,1,1-Trichloroethane (TCA)	2.84E+01	3.78E+06	5.34E+04	1.59E+03	2.46E+07	2.79E+01	6.39E+03
1,2-Dichloroethane	1.60E-02	1.27E+03	1.07E+01	1.06E-01	5.10E+03	1.39E-02	8.43E+03
Carbon Tetrachloride	8.99E-02	1.13E+04	5.38E+02	1.61E+01	6.93E+04	8.94E-02	7.54E+03
Carbon disulphide	4.37E-01	7.10E+04	3.55E+02	1.52E+02	6.08E+05	4.35E-01	9.11E+03

ASC exceeds soil saturation limit

Commercial/Industrial Pathway Specific Assessment Sub Criteria derived May 2015 1% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & Dermal Contact	Particulate Dust Inhalation	Commercial GSAC	Soil Saturation Limit
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	mg/kg
Arsenic	NR	NR	6.35E+02	6.95E+02	6.40E+02	N/A
Barium	NR	NR	2.22E+04	3.48E+06	2.21E+04	N/A
Beryllium	NR	NR	3.97E+03	1.24E+01	1.24E+01	N/A
Boron	NR	NR	2.38E+05	2.99E+07	2.36E+05	N/A
Cadmium	NR	NR	3.99E+02	2.43E+02	2.30E+02	N/A
Chromium III	NR	NR	3.31E+05	9.09E+03	8.84E+03	N/A
Chromium VI	NR	NR	1.79E+03	3.48E+01	3.48E+01	N/A
Copper	NR	NR	1.89E+05	9.50E+04	6.33E+04	N/A
Lead					2.33E+03	N/A
Inorganic Mercury	NR	NR	1.18E+03	2.09E+04	3.60E+03	N/A
Nickel	NR	NR	2.22E+04	1.04E+03	1.04E+03	N/A
Selenium	NR	NR	1.23E+04	1.93E+06	1.30E+04	N/A
Vanadium	NR	NR	2.15E+04	9.58E+03	6.63E+03	N/A
Zinc	NR	NR	7.35E+05	2.09E+08	7.33E+05	N/A
Cyanide (free)					4.30E+01	N/A
Cyanide (Complex)					2.13E+02	N/A
Phenol	8.34E+04	1.09E+06	4.07E+04	3.28E+06	2.65E+04	4.16E+04
Benzene	2.97E+01	1.17E+04	5.53E+02	4.87E+05	2.81E+01	1.22E+03
Toluene	6.91E+04	1.83E+07	4.25E+05	4.86E+08	5.92E+04	8.69E+02
Ethylbenzene	6.28E+03	1.30E+06	1.91E+05	2.57E+07	6.05E+03	5.18E+02
Total Xylene	6.43E+03	1.17E+06	3.43E+05	2.03E+07	6.28E+03	4.78E+02
TPH (EC5-6) aliphatic	3.31E+03	5.01E+06	4.77E+06	8.69E+08	3.31E+03	3.04E+02
TPH (>EC6-8) aliphatic	8.06E+03	7.82E+06	4.77E+06	8.69E+08	8.04E+03	1.44E+02
TPH (>EC8-10) aliphatic	2.09E+03	9.59E+05	9.53E+04	5.04E+07	2.04E+03	7.77E+01
TPH (>EC10-12) aliphatic	1.04E+04	2.13E+06	9.53E+04	5.04E+07	9.33E+03	4.75E+01

Commercial/Industrial Pathway Specific Assessment Sub Criteria derived May 2015 1% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & Dermal Contact	Particulate Dust Inhalation	Commercial GSAC	Soil Saturation Limit
TPH (>EC12-16) aliphatic	8.68E+04	6.18E+06	9.53E+04	5.04E+07	4.51E+04	2.37E+01
TPH (>EC16-35) aliphatic	1.02E+07	1.76E+08	1.91E+06	3.48E+08	1.59E+06	8.48E+00
TPH (>EC35-44) aliphatic	1.02E+07	1.76E+08	1.91E+06	3.48E+08	1.59E+06	8.48E+00
TPH (>EC6-7) aromatic (benzene)	4.75E+01	1.17E+04	5.53E+02	4.87E+05	4.36E+01	1.22E+03
TPH (>EC7-8) aromatic (toluene)	6.88E+04	1.83E+07	4.25E+05	4.84E+08	5.90E+04	8.69E+02
TPH (>EC8-10) aromatic	3.70E+03	5.80E+05	3.81E+04	1.04E+07	3.35E+03	6.13E+02
TPH (>EC10-12) aromatic	2.02E+04	1.35E+06	3.81E+04	1.04E+07	1.31E+04	3.64E+02
TPH (>EC12-16) aromatic	2.25E+05	4.48E+06	3.81E+04	1.04E+07	3.22E+04	2.37E+01
TPH (>EC16-21) aromatic	4.59E+06	1.24E+07	2.86E+04	5.22E+06	2.82E+04	5.37E+01
TPH (>EC21-35) aromatic	7.57E+08	5.56E+07	2.86E+04	5.22E+06	2.84E+04	4.83E+00
TPH (>EC35-44) aromatic	7.57E+08	5.56E+07	2.86E+04	5.22E+06	2.84E+04	4.83E+00
Naphthalene	2.06E+02	7.85E+04	3.64E+04	2.85E+05	2.04E+02	7.64E+01
Acenaphthylene	3.76E+05	2.62E+07	1.10E+05	2.09E+07	8.45E+04	8.61E+01
Acenaphthene	3.87E+05	2.74E+07	1.10E+05	2.09E+07	8.50E+04	5.70E+01
Fluorene	5.10E+05	2.44E+07	7.31E+04	1.39E+07	6.35E+04	3.09E+01
Phenanthrene	6.87E+05	1.31E+07	2.28E+04	4.34E+06	2.19E+04	3.60E+01
Anthracene	1.41E+07	3.07E+08	5.49E+05	1.04E+08	5.25E+05	1.17E+00
Fluoranthene	4.36E+06	2.63E+07	2.29E+04	4.34E+06	2.26E+04	1.89E+01
Pyrene	1.02E+07	5.98E+07	5.49E+04	1.04E+07	5.43E+04	2.20E+00
Benzo(a)anthracene	4.04E+03	7.01E+03	2.84E+02	5.21E+02	1.71E+02	1.71E+00
Chrysene	5.01E+04	1.22E+04	5.67E+02	1.04E+03	3.54E+02	4.40E-01
Benzo(b)fluoranthene	1.86E+04	2.18E+03	7.13E+01	1.32E+02	4.52E+01	1.22E+00
Benzo(k)fluoranthene	8.14E+05	6.83E+04	1.88E+03	3.48E+03	1.20E+03	6.87E-01
Benzo(a)pyrene	2.10E+04	1.90E+03	5.67E+01	1.04E+02	3.60E+01	9.11E-01
Indeno(123-cd)pyrene	1.75E+05	2.29E+04	8.10E+02	1.49E+03	5.12E+02	6.14E-02
Dibenzo(ah)anthracene	1.01E+03	2.36E+02	5.67E+00	1.04E+01	3.60E+00	3.93E-03
Benzo(g,h,i)perylene	4.64E+06	3.81E+05	6.29E+03	1.15E+04	4.02E+03	1.54E-02

Commercial/Industrial Pathway Specific Assessment Sub Criteria derived May 2015 1% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & Dermal Contact	Particulate Dust Inhalation	Commercial GSAC	Soil Saturation Limit
Tetrachloroethene (PCE)	1.98E+01	7.63E+04	1.12E+04	2.83E+06	1.97E+01	4.24E+02
Trichloroethene (TCE)	1.31E+00	5.07E+03	9.53E+02	1.98E+05	1.30E+00	1.54E+03
cis-1,2-Dichloroethene	1.45E+01	5.26E+04	1.12E+04	2.04E+06	1.45E+01	3.94E+03
Vinyl Chloride (VC)	6.31E-02	7.47E+02	2.67E+01	1.04E+05	6.29E-02	1.36E+03
1,1,2,2-Tetrachloroethane (PCA)	2.98E+02	2.49E+05	1.10E+04	2.01E+06	2.90E+02	2.67E+03
1,1,1-Trichloroethane (TCA)	7.01E+02	3.81E+06	1.14E+06	2.07E+08	7.00E+02	1.43E+03
1,2-Dichloroethane	7.14E-01	1.68E+03	2.29E+02	4.17E+04	7.11E-01	3.41E+03
Carbon Tetrachloride	3.04E+00	1.65E+04	7.62E+03	8.85E+05	3.04E+00	1.52E+03
Carbon disulphide	1.16E+01	7.12E+04	9.53E+04	4.97E+06	1.16E+01	2.11E+03

 ASC exceeds soil saturation limit

Commercial/Industrial Pathway Specific Assessment Sub Criteria derived May 2015 2.5% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & Dermal Contact	Particulate Dust Inhalation	Commercial GSAC	Soil Saturation Limit
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	mg/kg
Arsenic	NR	NR	6.35E+02	6.95E+02	6.40E+02	N/A
Barium	NR	NR	2.22E+04	3.48E+06	2.21E+04	N/A
Beryllium	NR	NR	3.97E+03	1.24E+01	1.24E+01	N/A
Boron	NR	NR	2.38E+05	2.99E+07	2.36E+05	N/A
Cadmium	NR	NR	3.99E+02	2.43E+02	2.30E+02	N/A
Chromium III	NR	NR	3.31E+05	9.09E+03	8.84E+03	N/A
Chromium VI	NR	NR	1.79E+03	3.48E+01	3.48E+01	N/A
Copper	NR	NR	1.89E+05	9.50E+04	6.33E+04	N/A
Lead					2.33E+03	N/A
Inorganic Mercury	NR	NR	1.18E+03	2.09E+04	3.60E+03	N/A
Nickel	NR	NR	2.22E+04	1.04E+03	1.04E+03	N/A
Selenium	NR	NR	1.23E+04	1.93E+06	1.30E+04	N/A
Vanadium	NR	NR	2.15E+04	9.58E+03	6.63E+03	N/A
Zinc	NR	NR	7.35E+05	2.09E+08	7.33E+05	N/A
Cyanide (free)					4.30E+01	N/A
Cyanide (Complex)					2.13E+02	N/A
Phenol	1.31E+05	1.37E+06	4.07E+04	3.28E+06	3.01E+04	8.15E+04
Benzene	5.53E+01	1.60E+04	5.53E+02	4.87E+05	5.01E+01	2.26E+03
Toluene	1.52E+05	2.72E+07	4.25E+05	4.86E+08	1.12E+05	1.92E+03
Ethylbenzene	1.47E+04	1.99E+06	1.91E+05	2.57E+07	1.36E+04	1.22E+03
Total Xylene	1.51E+04	1.79E+06	3.43E+05	2.03E+07	1.43E+04	1.12E+03
TPH (EC5-6) aliphatic	6.07E+03	6.79E+06	4.77E+06	8.69E+08	6.06E+03	5.58E+02
TPH (>EC6-8) aliphatic	1.80E+04	1.17E+07	4.77E+06	8.69E+08	1.79E+04	3.22E+02
TPH (>EC8-10) aliphatic	5.11E+03	1.50E+06	9.53E+04	5.04E+07	4.83E+03	1.90E+02
TPH (>EC10-12) aliphatic	2.58E+04	3.37E+06	9.53E+04	5.04E+07	2.02E+04	1.18E+02

Commercial/Industrial Pathway Specific Assessment Sub Criteria derived May 2015 2.5% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & Dermal Contact	Particulate Dust Inhalation	Commercial GSAC	Soil Saturation Limit
TPH (>EC12-16) aliphatic	2.17E+05	9.77E+06	9.53E+04	5.04E+07	6.57E+04	5.91E+01
TPH (>EC16-35) aliphatic	2.56E+07	2.79E+08	1.91E+06	3.48E+08	1.76E+06	2.12E+01
TPH (>EC35-44) aliphatic	2.56E+07	2.79E+08	1.91E+06	3.48E+08	1.76E+06	2.12E+01
TPH (>EC6-7) aromatic (benzene)	5.53E+01	1.60E+04	5.53E+02	4.87E+05	5.01E+01	2.26E+03
TPH (>EC7-8) aromatic (toluene)	1.52E+05	2.71E+07	4.25E+05	4.84E+08	1.11E+05	1.92E+03
TPH (>EC8-10) aromatic	9.06E+03	9.08E+05	3.81E+04	1.04E+07	7.26E+03	1.50E+03
TPH (>EC10-12) aromatic	4.99E+04	2.13E+06	3.81E+04	1.04E+07	2.13E+04	8.99E+02
TPH (>EC12-16) aromatic	5.59E+05	7.06E+06	3.81E+04	1.04E+07	3.54E+04	5.91E+01
TPH (>EC16-21) aromatic	1.15E+07	1.96E+07	2.86E+04	5.22E+06	2.83E+04	1.34E+02
TPH (>EC21-35) aromatic	1.89E+09	8.79E+07	2.86E+04	5.22E+06	2.84E+04	1.21E+01
TPH (>EC35-44) aromatic	1.89E+09	8.79E+07	2.86E+04	5.22E+06	2.84E+04	1.21E+01
Naphthalene	4.93E+02	1.21E+05	3.64E+04	2.85E+05	4.84E+02	1.83E+02
Acenaphthylene	9.26E+05	4.11E+07	1.10E+05	2.09E+07	9.76E+04	2.12E+02
Acenaphthene	9.56E+05	4.31E+07	1.10E+05	2.09E+07	9.80E+04	1.41E+02
Fluorene	1.26E+06	3.84E+07	7.31E+04	1.39E+07	6.86E+04	7.65E+01
Phenanthrene	1.71E+06	2.07E+07	2.28E+04	4.34E+06	2.24E+04	8.96E+01
Anthracene	3.51E+07	4.84E+08	5.49E+05	1.04E+08	5.37E+05	2.91E+00
Fluoranthene	1.09E+07	4.16E+07	2.29E+04	4.34E+06	2.27E+04	4.73E+01
Pyrene	2.54E+07	9.45E+07	5.49E+04	1.04E+07	5.45E+04	5.49E+00
Benzo(a)anthracene	1.01E+04	1.11E+04	2.84E+02	5.21E+02	1.77E+02	4.28E+00
Chrysene	1.25E+05	1.93E+04	5.67E+02	1.04E+03	3.59E+02	1.10E+00
Benzo(b)fluoranthene	4.66E+04	3.45E+03	7.13E+01	1.32E+02	4.57E+01	3.04E+00
Benzo(k)fluoranthene	2.03E+06	1.08E+05	1.88E+03	3.48E+03	1.21E+03	1.72E+00
Benzo(a)pyrene	5.26E+04	3.00E+03	5.67E+01	1.04E+02	3.63E+01	2.28E+00
Indeno(123-cd)pyrene	4.38E+05	3.62E+04	8.10E+02	1.49E+03	5.17E+02	5.30E-01
Dibenzo(ah)anthracene	2.53E+03	3.73E+02	5.67E+00	1.04E+01	3.63E+00	9.82E-03
Benzo(g,h,i)perylene	1.16E+07	6.02E+05	6.29E+03	1.15E+04	4.03E+03	3.85E-02

Commercial/Industrial Pathway Specific Assessment Sub Criteria derived May 2015 2.5% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & Dermal Contact	Particulate Dust Inhalation	Commercial GSAC	Soil Saturation Limit
Tetrachloroethene (PCE)	4.43E+01	1.14E+05	1.12E+04	2.83E+06	4.41E+01	9.51E+02
Trichloroethene (TCE)	2.74E+00	7.34E+03	9.53E+02	1.98E+05	2.73E+00	3.22E+03
cis-1,2-Dichloroethene	2.43E+01	6.81E+04	1.12E+04	2.04E+06	2.42E+01	6.61E+03
Vinyl Chloride (VC)	8.16E-02	8.50E+02	2.67E+01	1.04E+05	8.13E-02	1.76E+03
1,1,2,2-Tetrachloroethane (PCA)	6.11E+02	3.56E+05	1.10E+04	2.01E+06	5.78E+02	5.46E+03
1,1,1-Trichloroethane (TCA)	1.43E+03	5.46E+06	1.14E+06	2.07E+08	1.43E+03	2.92E+03
1,2-Dichloroethane	1.03E+00	2.02E+03	2.29E+02	4.17E+04	1.02E+00	4.91E+03
Carbon Tetrachloride	6.67E+00	2.44E+04	7.62E+03	8.85E+05	6.66E+00	3.32E+03
Carbon disulphide	2.32E+01	1.00E+05	9.53E+04	4.97E+06	2.32E+01	4.21E+03

ASC exceeds soil saturation limit

Commercial/Industrial Pathway Specific Assessment Sub Criteria derived May 2015 6% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & Dermal Contact	Particulate Dust Inhalation	Commercial GSAC	Soil Saturation Limit
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	mg/kg
Arsenic	NR	NR	6.35E+02	6.95E+02	6.40E+02	N/A
Barium	NR	NR	2.22E+04	3.48E+06	2.21E+04	N/A
Beryllium	NR	NR	3.97E+03	1.24E+01	1.24E+01	N/A
Boron	NR	NR	2.38E+05	2.99E+07	2.36E+05	N/A
Cadmium	NR	NR	3.99E+02	2.43E+02	2.30E+02	N/A
Chromium III	NR	NR	3.31E+05	9.09E+03	8.84E+03	N/A
Chromium VI	NR	NR	1.79E+03	3.48E+01	3.48E+01	N/A
Copper	NR	NR	1.89E+05	9.50E+04	6.33E+04	N/A
Lead					2.33E+03	N/A
Inorganic Mercury	NR	NR	1.18E+03	2.09E+04	3.60E+03	N/A
Nickel	NR	NR	2.22E+04	1.04E+03	1.04E+03	N/A
Selenium	NR	NR	1.23E+04	1.93E+06	1.30E+04	N/A
Vanadium	NR	NR	2.15E+04	9.58E+03	6.63E+03	N/A
Zinc	NR	NR	7.35E+05	2.09E+08	7.33E+05	N/A
Cyanide (free)					4.30E+01	N/A
Cyanide (Complex)					2.13E+02	N/A
Phenol	2.42E+05	1.86E+06	4.07E+04	3.28E+06	3.39E+04	1.74E+05
Benzene	1.15E+02	2.30E+04	5.53E+02	4.87E+05	9.47E+01	4.71E+03
Toluene	3.46E+05	4.11E+07	4.25E+05	4.86E+08	1.90E+05	4.36E+03
Ethylbenzene	3.45E+04	3.04E+06	1.91E+05	2.57E+07	2.89E+04	2.84E+03
Total Xylene	3.53E+04	2.74E+06	3.43E+05	2.03E+07	3.16E+04	2.62E+03
TPH (EC5-6) aliphatic	1.25E+04	9.74E+06	4.77E+06	8.69E+08	1.25E+04	1.15E+03
TPH (>EC6-8) aliphatic	4.12E+04	1.77E+07	4.77E+06	8.69E+08	4.08E+04	7.36E+02
TPH (>EC8-10) aliphatic	1.21E+04	2.31E+06	9.53E+04	5.04E+07	1.07E+04	4.51E+02
TPH (>EC10-12) aliphatic	6.18E+04	5.22E+06	9.53E+04	5.04E+07	3.72E+04	2.83E+02

Commercial/Industrial Pathway Specific Assessment Sub Criteria derived May 2015 6% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & Dermal Contact	Particulate Dust Inhalation	Commercial GSAC	Soil Saturation Limit
TPH (>EC12-16) aliphatic	5.20E+05	1.51E+07	9.53E+04	5.04E+07	8.00E+04	1.42E+02
TPH (>EC16-35) aliphatic	6.14E+07	4.32E+08	1.91E+06	3.48E+08	1.83E+06	5.09E+01
TPH (>EC35-44) aliphatic	6.14E+07	4.32E+08	1.91E+06	3.48E+08	1.83E+06	5.09E+01
TPH (>EC6-7) aromatic (benzene)	1.15E+02	2.30E+04	5.53E+02	4.87E+05	9.48E+01	4.71E+03
TPH (>EC7-8) aromatic (toluene)	3.45E+05	4.09E+07	4.25E+05	4.84E+08	1.89E+05	4.36E+03
TPH (>EC8-10) aromatic	2.16E+04	1.40E+06	3.81E+04	1.04E+07	1.36E+04	3.58E+03
TPH (>EC10-12) aromatic	1.19E+05	3.29E+06	3.81E+04	1.04E+07	2.85E+04	2.15E+03
TPH (>EC12-16) aromatic	1.34E+06	1.09E+07	3.81E+04	1.04E+07	3.68E+04	1.42E+02
TPH (>EC16-21) aromatic	2.75E+07	3.03E+07	2.86E+04	5.22E+06	2.84E+04	3.21E+02
TPH (>EC21-35) aromatic	4.54E+09	1.36E+08	2.86E+04	5.22E+06	2.84E+04	2.90E+01
TPH (>EC35-44) aromatic	4.54E+09	1.36E+08	2.86E+04	5.22E+06	2.84E+04	2.90E+01
Naphthalene	1.16E+03	1.87E+05	3.64E+04	2.85E+05	1.11E+03	4.32E+02
Acenaphthylene	2.21E+06	6.35E+07	1.10E+05	2.09E+07	1.04E+05	5.06E+02
Acenaphthene	2.28E+06	6.67E+07	1.10E+05	2.09E+07	1.04E+05	3.36E+02
Fluorene	3.02E+06	5.94E+07	7.31E+04	1.39E+07	7.09E+04	1.83E+02
Phenanthrene	4.09E+06	3.20E+07	2.28E+04	4.34E+06	2.25E+04	2.14E+02
Anthracene	8.41E+07	7.50E+08	5.49E+05	1.04E+08	5.42E+05	6.96E+00
Fluoranthene	2.61E+07	6.44E+07	2.29E+04	4.34E+06	2.28E+04	1.12E+02
Pyrene	6.09E+07	1.46E+08	5.49E+04	1.04E+07	5.45E+04	1.32E+01
Benzo(a)anthracene	2.42E+04	1.72E+04	2.84E+02	5.21E+02	1.80E+02	1.03E+01
Chrysene	3.00E+05	2.99E+04	5.67E+02	1.04E+03	3.62E+02	2.64E+00
Benzo(b)fluoranthene	1.12E+05	5.34E+03	7.13E+01	1.32E+02	4.59E+01	7.29E+00
Benzo(k)fluoranthene	4.88E+06	1.67E+05	1.88E+03	3.48E+03	1.21E+03	4.12E+00
Benzo(a)pyrene	1.26E+05	4.65E+03	5.67E+01	1.04E+02	3.64E+01	5.46E+00
Indeno(123-cd)pyrene	1.05E+06	5.60E+04	8.10E+02	1.49E+03	5.20E+02	3.68E-01
Dibenzo(ah)anthracene	6.07E+03	5.78E+02	5.67E+00	1.04E+01	3.65E+00	2.36E-02
Benzo(g,h,i)perylene	2.78E+07	9.33E+05	6.29E+03	1.15E+04	4.04E+03	9.23E-02

Commercial/Industrial Pathway Specific Assessment Sub Criteria derived May 2015 6% Organic matter	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Soil Ingestion & Dermal Contact	Particulate Dust Inhalation	Commercial GSAC	Soil Saturation Limit
Tetrachloroethene (PCE)	1.02E+02	1.73E+05	1.12E+04	2.83E+06	1.01E+02	2.18E+03
Trichloroethene (TCE)	6.07E+00	1.09E+04	9.53E+02	1.98E+05	6.03E+00	7.14E+03
cis-1,2-Dichloroethene	4.73E+01	9.50E+04	1.12E+04	2.04E+06	4.71E+01	1.29E+04
Vinyl Chloride (VC)	1.25E-01	1.05E+03	2.67E+01	1.04E+05	1.24E-01	2.69E+03
1,1,2,2-Tetrachloroethane (PCA)	1.34E+03	5.27E+05	1.10E+04	2.01E+06	1.19E+03	1.20E+04
1,1,1-Trichloroethane (TCA)	3.14E+03	8.08E+06	1.14E+06	2.07E+08	3.13E+03	6.39E+03
1,2-Dichloroethane	1.77E+00	2.65E+03	2.29E+02	4.17E+04	1.76E+00	8.43E+03
Carbon Tetrachloride	1.51E+01	3.67E+04	7.62E+03	8.85E+05	1.51E+01	7.54E+03
Carbon disulphide	5.01E+01	1.48E+05	9.53E+04	4.97E+06	5.01E+01	9.11E+03

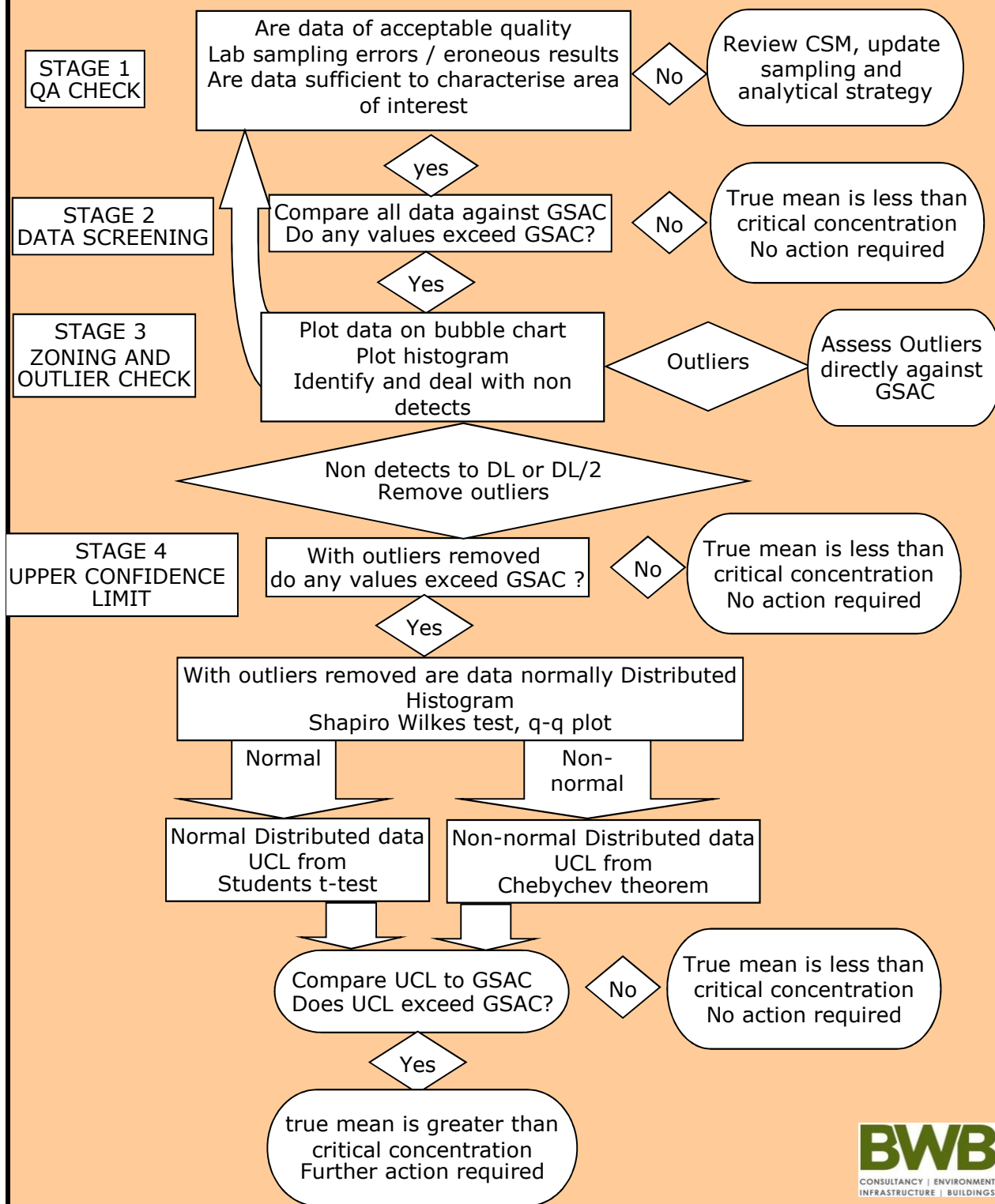
 ASC exceeds soil saturation limit

APPENDIX 11

CLEA FLOW CHART & SCREENING WORKSHEETS

STATISTICAL APPROACH FOR ASSESSING RISK TO HUMAN HEALTH FROM CONTAMINATED LAND 2008

CIEH/CLAIRE Guidance on Comparing Soil Contamination Data with a Critical Concentration May 2008



Human Health Generic QRA Worksheet



Plot J, Kingsway Business Park	MCS2374
Due to the limited dataset all the samples have been assessed together.	

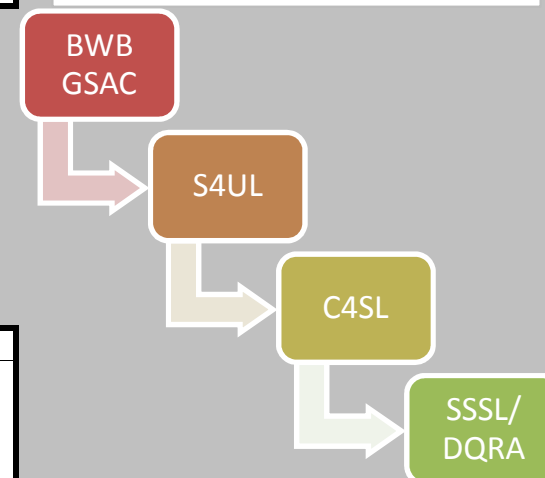
Define CSM – Is site represented by a standard land use?

- Residential with / without homegrown produce
- Commercial / Industrial
- Public Open Space - Residential (S4UL/C4SL only)
- Public Open Space - Park (S4UL/C4SL only)

GSAC Type (BWB, LQM S4UL, C4SL, Bespoke)	BWB_GSAC
Key Receptor/CSM (Residential/Commercial/POS)	Commercial
Organic Matter % (If unknown use 1%)	1

Exposure Pathway Selection for BWB GSAC (Residential/Commercial scenarios only)	
Soil Ingestion, dermal contact, particulate inhalation	TRUE
Ingestion of site grown vegetables and soil attached to vegetables	FALSE
Inhalation of vapours Indoors	TRUE
Inhalation of vapours Outdoors	TRUE

GSAC Hierarchy



Default pathways	
Residential	Commercial
TRUE	TRUE
Optional	FALSE
TRUE	TRUE
TRUE	TRUE

Generic Assessment Criteria
**Plot J, Kingsway Business Park
MCS2374**
**Commercial
mg/kg**

CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS
Source

Arsenic	640.00	BWB_GSAC
Barium	22075.98	BWB_GSAC
Beryllium	12.36	BWB_GSAC
Boron	236162.71	BWB_GSAC
Cadmium	230.00	BWB_GSAC
Chromium VI	34.10	BWB_GSAC
Chromium III	9086.88	BWB_GSAC
Copper	63257.96	BWB_GSAC
Lead*	2330.00	DEFRA_C4SL
Inorganic Mercury	3600.00	BWB_GSAC
Nickel	1042.26	BWB_GSAC
Selenium	13000.00	BWB_GSAC
Vanadium	6625.16	BWB_GSAC
Zinc	732811.46	BWB_GSAC
Cyanide (Free)	43.00	BWB_GSAC
Cyanide (Complex)	213.00	BWB_GSAC
Phenols (Total)	26470.70	BWB_GSAC
Benzene	28.13	BWB_GSAC
Toluene	59239.76	BWB_GSAC
Ethyl benzene	6048.35	BWB_GSAC
Total Xylene	6276.89	BWB_GSAC
TPH (EC5-6) aliphatic	3305.51	BWB_GSAC
TPH (>EC6-8) aliphatic	8038.06	BWB_GSAC
TPH (>EC8-10) aliphatic	2040.71	BWB_GSAC
TPH (>EC10-12) aliphatic	9333.90	BWB_GSAC
TPH (>EC12-16) aliphatic	45054.03	BWB_GSAC
TPH (>EC16-21) aliphatic	1586911.64	BWB_GSAC
TPH (>EC21-35) aliphatic	1586911.64	BWB_GSAC
TPH (>EC35-44) aliphatic	1586911.64	BWB_GSAC
TPH (>EC6-7) aromatic (benzene)	43.58	BWB_GSAC
TPH (>EC7-8) aromatic (toluene)	59016.08	BWB_GSAC
TPH (>EC8-10) aromatic	3351.91	BWB_GSAC
TPH (>EC10-12) aromatic	13056.78	BWB_GSAC
TPH (>EC12-16) aromatic	32247.11	BWB_GSAC
TPH (>EC16-21) aromatic	28204.67	BWB_GSAC
TPH (>EC21-35) aromatic	28428.54	BWB_GSAC
TPH (>EC35-44) aromatic	28428.54	BWB_GSAC
Total TPH	500.00	BWB_GSAC
Naphthalene	204.16	BWB_GSAC
Acenaphthylene	84484.45	BWB_GSAC
Acenaphthene	85039.57	BWB_GSAC
Fluorene	63477.55	BWB_GSAC
Phenanthrene	21919.25	BWB_GSAC
Anthracene	524854.95	BWB_GSAC
Fluoranthene	22641.89	BWB_GSAC
Pyrene	54271.58	BWB_GSAC
Benzo(a)anthracene	171.36	BWB_GSAC
Chrysene	354.05	BWB_GSAC
Benzo(b)fluoranthene	45.25	BWB_GSAC
Benzo(k)fluoranthene	1198.49	BWB_GSAC
Benzo(a)pyrene	35.97	BWB_GSAC
Indeno(1,2,3-c,d)pyrene	512.12	BWB_GSAC
Dibenzo(a,h)anthracene	3.60	BWB_GSAC
Benzo(g,hi)perylene	4016.76	BWB_GSAC

Location	Sample depth	Easting	Northing	Strata Type	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium VI	Chromium III	Copper	Lead	Inorganic Mercury	Nickel	Selenium	Vanadium	Zinc
Detection Limit					1	1	0.06	0.2	0.2	4	1	1	1	0.3	1	1	1	1
GSAC					640.00	22075.98	12.36	236162.7	230.00	34.10	9086.88	63257.96	2330.00	3600.00	1042.26	13000.00	6625.16	732811.5
TP01	0.75 - 0.85	391486	411489	Alluvium	1	130	0.42	2.4	0.2	4	14	5.9	7.6	0.3	8.5	1	13	17
TP02	0.55 - 0.65	391460	411548	Made Ground	7.8	80	0.68	0.7	0.2	4	20	27	33	0.3	19	1	23	45
TP05	0.20 - 0.30	391423	411485	Hummocky Glacial Deposits	12	75	0.53	1.1	0.2	4	12	25	54	0.3	16	1	26	63
TP06	1.50 - 1.60	391396	411538	Hummocky Glacial Deposits	3.4	37	0.47	0.4	0.2	4	18	13	7.2	0.3	16	1	22	32
TP09	2.40 - 2.50	391395	411433	Hummocky Glacial Deposits	3.6	20	0.3	0.5	0.2	4	8.5	11	6.1	0.3	11	1	10	23
TP11	1.00 - 1.10	391345	411479	Hummocky Glacial Deposits	5.9	25	0.54	0.4	0.2	4	15	17	7.5	0.3	16	1	18	28
TP13	0.10 - 0.20	391281	411524	Topsoil	18	100	0.73	0.9	0.2	4	17	34	110	0.3	16	1	35	74
TP16	0.20 - 0.30	391342	411408	Topsoil	16	99	0.85	1	0.2	4	19	39	68	0.3	16	1	32	81
TP19	0.40 - 0.50	391291	411353	Topsoil	15	77	0.78	0.9	0.2	4	19	34	68	0.3	17	1	25	57
TP21	0.10 - 0.20	391292	411417	Topsoil	14	55	0.66	0.7	0.2	4	17	32	54	0.3	16	1	28	47
TP23	0.75 - 0.85	391244	411456	Hummocky Glacial Deposits	5	31	0.41	0.6	0.2	4	17	18	7.7	0.3	15	1	20	27
TP25	2.40 - 2.50	391244	411400	Hummocky Glacial Deposits	5.7	69	0.63	0.5	0.2	4	20	18	8.5	0.3	20	1	21	38
TP27	1.75 - 1.85	391246	411320	Hummocky Glacial Deposits	5.7	36	0.58	0.4	0.2	4	22	16	10	0.3	19	1	22	32
TP29	0.50 - 0.60	391199	411364	Hummocky Glacial Deposits	3.4	25	0.3	0.5	0.2	4	14	8.2	6.9	0.3	11	1	20	19
TP30	0.35 - 0.45	391224	411301	Made Ground	10	80	0.63	0.6	0.2	4	19	25	41	0.3	15	1	19	49

Location	Sample depth	Cyanide (Free)	Cyanide (Complex)	Phenols (Total)	Benzene	Toluene	Ethyl benzene	Total Xylene	TPH (EC5-6) aliphatic	TPH (>EC6-8) aliphatic	TPH (>EC9-10) aliphatic	TPH (>EC10-12) aliphatic	TPH (>EC12-16) aliphatic	TPH (>EC16-21) aliphatic	TPH (>EC21-35) aliphatic	TPH (>EC6-7) aromatic (benzene)	TPH (>EC7-8) aromatic (toluene)	TPH (>EC8-10) aromatic	TPH (>EC10-12) aromatic	TPH (>EC12-16) aromatic	TPH (>EC16-21) aromatic	TPH (>EC21-35) aromatic	Total TPH
Detection Limit		1	1	1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	1	2	8	8	0.001	0.001	0.001	1	2	10	10	10
GSAC		43.00	213.00	26470.70	28.13	59239.76	6048.35	6276.89	3305.51	8038.06	2040.71	9333.90	45054.03	1586912	1586912	43.58	59016.08	3351.91	13056.78	32247.11	28204.67	28428.54	500.00
TP01	0.75 - 0.85	1	1	1																			44
TP02	0.55 - 0.65	1	1	1	1	1	1	1	0.001	0.001	0.001	1	2	8	8	0.001	0.001	0.001	1	2	10	10	10
TP05	0.20 - 0.30	1	1	1																			23
TP06	1.50 - 1.60	1	1	1	1	1	1	1	0.001	0.001	0.001	1	2	8	8	0.001	0.001	0.001	1	2	10	10	10
TP09	2.40 - 2.50	1	1	1																			10
TP11	1.00 - 1.10	1	1	1																			10
TP13	0.10 - 0.20	1	1	1	1	1	1	1	0.001	0.001	0.001	1	2	8	8	0.001	0.001	0.001	1	2	10	14	21
TP16	0.20 - 0.30	1	1	1																			10
TP19	0.40 - 0.50	1	1	1																			10
TP21	0.10 - 0.20	1	1	1	1	1	1	1	0.001	0.001	0.001	1	2	8	8	0.001	0.001	0.001	1	2	10	10	10
TP23	0.75 - 0.85	1	1	1																			10
TP25	2.40 - 2.50	1	1	1																			10
TP27	1.75 - 1.85	1	1	1																			10
TP29	0.50 - 0.60	1	1	1																			10
TP30	0.35 - 0.45	1	1	1	1	1	1	1	0.001	0.001	0.001	1	2	8	8	0.001	0.001	0.001	1	2.1	10	25	36

Location	Sample depth	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(e)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene
Detection Limit		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
GSAC		204.16	84484.4	85039.6	63477.6	21919.2	524854.9	22641.89	54271.58	171.36	354.05	45.25	1198.49	35.97	512.12	3.60	4016.76
TP01	0.75 - 0.85	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
TP02	0.55 - 0.65	0.05	0.05	0.05	0.05	0.4	0.05	0.51	0.44	0.24	0.29	0.35	0.16	0.32	0.05	0.05	0.05
TP05	0.20 - 0.30	0.18	0.05	0.2	0.05	0.91	0.05	0.81	0.69	0.5	0.39	0.45	0.23	0.42	0.05	0.05	0.05
TP06	1.50 - 1.60	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
TP09	2.40 - 2.50	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
TP11	1.00 - 1.10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
TP13	0.10 - 0.20	0.05	0.05	0.05	0.05	0.41	0.05	0.87	0.89	0.73	0.56	0.68	0.3	0.65	0.23	0.05	0.22
TP16	0.20 - 0.30	0.05	0.05	0.05	0.05	0.23	0.05	0.38	0.33	0.23	0.22	0.23	0.16	0.28	0.05	0.05	0.05
TP19	0.40 - 0.50	0.05	0.05	0.05	0.05	0.39	0.05	0.63	0.56	0.43	0.35	0.41	0.2	0.34	0.05	0.05	0.05
TP21	0.10 - 0.20	0.05	0.05	0.19	0.05	1.1	0.18	1.2	1	0.7	0.55	0.64	0.28	0.59	0.24	0.05	0.27
TP23	0.75 - 0.85	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
TP25	2.40 - 2.50	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
TP27	1.75 - 1.85	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
TP29	0.50 - 0.60	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
TP30	0.35 - 0.45	0.05	0.05	0.05	0.05	1.5	0.22	2.2	1.9	1.3	1.3	1.7	0.48	1.4	0.5	0.05	0.61

APPENDIX 12

SOIL LEACHATE ASSESSMENT SHEETS

*EQS Standard: Phenol and Benzene annual average of 300µg/l; Toluene 500µg/l for Freshwater, 400µg/l for Saltwater; 1,1,1-TCA 1,000µg/l.

Project Name:	Plot J, Kingsway Business Park
Project Number:	MCS2374
Assessment for:	Soil Leachate Assessment
Laboratory:	i2
Receptor:	Freshwater
Receptor Water Hardness:	<40 (No Data)

100 = Assessment Criteria Exceedance)

50 = M-BAT Bioavailability Assessment Required

Contaminant	Units	Detection Limit	Guideline Concentration	Source	Number of Samples	Min	Max	No of Exceedences	TP02	TP06	TP13	TP21	TP29	TP30
									0.55 - 0.65	1.5 - 1.60	0.10 - 0.20	0.10 - 0.20	0.50 - 0.60	0.35 - 0.45
Heavy Metals	Arsenic	µg/l	1.1	50	EQS Freshwater	6	1.10	1.80	0	1.10	1.10	1.80	1.10	1.10
	Barium	mg/l	0.05	700	UK DWS	6	0.00	0.02	0	0.02	0.00	0.01	0.01	0.00
	Beryllium	µg/l	0.2	None Available		6	0.20	0.30	0	0.20	0.30	0.20	0.20	0.20
	Cadmium	µg/l	0.08	0.08	EQS Freshwater	6	0.08	0.08	0	0.08	0.08	0.08	0.08	0.08
	Chromium III	µg/l	0.4	4.7	EQS Freshwater	6	0.40	1.60	0	0.70	0.40	0.90	0.80	1.60
	Copper	µg/l	0.7	1	EQS Freshwater	6	5.90	37.00	6	13.00	5.90	37.00	31.00	21.00
	Lead	µg/l	1	1.2	EQS Freshwater	6	1.20	6.70	5	2.70	1.20	6.70	3.50	2.70
	Mercury	µg/l	0.5	0.07	EQS Freshwater	6	0.50	0.50	6	0.50	0.50	0.50	0.50	0.50
	Nickel	µg/l	0.3	4	EQS Freshwater	6	0.30	2.50	0	0.90	0.30	2.50	1.80	0.80
	Selenium	µg/l	4	10	UK DWS	6	4.00	4.00	0	4.00	4.00	4.00	4.00	4.00
	Vanadium	µg/l	1.7	None Available		6	1.70	3.60	0	1.70	1.70	1.70	3.60	1.70
	Zinc	µg/l	0.4	10.9	EQS Freshwater	6	3.60	9.70	0	7.10	3.60	7.70	9.70	7.60
	Sulphate	mg/l	0.1	400	EQS Freshwater	6	1.70	2.70	0	2.70	1.70	2.10	1.90	2.70
	Boron	mg/l	10	2000	EQS Freshwater	6	0.01	0.02	0	0.01	0.01	0.02	0.01	0.01
Inorganics	pH					6	6.50	7.70	0	7.10	6.80	6.50	6.50	7.70
	Cyanide (total)	µg/l	10	1	EQS Freshwater	6	10.00	10.00	6	10.00	10.00	10.00	10.00	10.00

APPENDIX 13

GROUNDWATER ASSESSMENT SHEETS

*EQS Standard: Phenol and Benzene annual average of 300µg/l; Toluene 500µg/l for Freshwater, 400µg/l for Saltwater; 1,1,1-TCA 1,000µg/l.

Project Name:	Plot J, Kingsway Business Park
Project Number:	MCS2374
Assessment for:	Water Assessment
Laboratory:	i2
Receptor:	Freshwater
Receptor Water Hardness:	<40 (No Data)

100 = Assessment Criteria Exceedance)

50 = M-BAT Bioavailability Assessment Required

	Contaminant	Units	Detection Limit	Guideline Concentration	Source	Number of Samples	Min	Max	No of Exceedences	BH01	BH02	BH03	BH04	BH05	BH06
Heavy Metals	Arsenic	µg/l	1	50	EQS Freshwater	6	1.00	1.30	0	1.00	1.00	1.00	1.00	1.30	1.30
	Barium	mg/l	0.05	700	UK DWS	6	0.07	0.26	0	0.26	0.09	0.07	0.11	0.11	0.25
	Beryllium	µg/l	0.2	None Available		6	0.20	0.20	0	0.20	0.20	0.20	0.20	0.20	0.20
	Cadmium	µg/l	0.08	0.08	EQS Freshwater	6	0.08	0.08	0	0.08	0.08	0.08	0.08	0.08	0.08
	Chromium III	µg/l	0.4	4.7	EQS Freshwater	6	0.40	1.10	0	0.70	0.40	0.40	0.40	1.10	0.40
	Chromium VI	µg/l	5	3.4	EQS Freshwater	6	5.00	5.00	6	5.00	5.00	5.00	5.00	5.00	5.00
	Copper	µg/l	0.7	1	EQS Freshwater	6	2.50	10.00	6	2.50	3.00	6.30	3.30	10.00	4.50
	Lead	µg/l	1	1.2	EQS Freshwater	6	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00
	Mercury	µg/l	0.5	0.07	EQS Freshwater	6	0.50	0.50	6	0.50	0.50	0.50	0.50	0.50	0.50
	Nickel	µg/l	0.3	4	EQS Freshwater	6	1.40	12.00	4	12.00	7.20	3.70	1.40	7.20	7.30
	Selenium	µg/l	4	10	UK DWS	6	4.00	4.00	0	4.00	4.00	4.00	4.00	4.00	4.00
	Vanadium	µg/l	1.7	None Available		6	1.70	4.60	0	3.80	1.70	1.70	4.60	1.70	1.70
	Zinc	µg/l	0.4	10.9	EQS Freshwater	6	3.60	9.50	0	5.50	7.10	4.80	3.60	9.50	3.70
	Sulphate	mg/l	45	400	EQS Freshwater	6	11.50	105.00	0	36.70	12.40	16.90	11.50	13.70	105.00
	Boron	mg/l	10	2000	EQS Freshwater	6	0.01	0.03	0	0.02	0.03	0.02	0.02	0.01	0.03
	pH					6	5.90	6.50	0	6.10	6.50	6.10	6.00	6.20	5.90
Inorganics	Cyanide (total)	µg/l	10	1	EQS Freshwater	6	10.00	10.00	6	10.00	10.00	10.00	10.00	10.00	10.00
	Phenol*	µg/l	10	7.7	EQS Freshwater	6	10.00	10.00	6	10.00	10.00	10.00	10.00	10.00	10.00
BTEX	Benzene*	µg/l	1	10	EQS Freshwater	6	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00
	Ethylbenzene	µg/l	1	300	UK DWS	6	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00
	Toluene*	µg/l	1	74	EQS Freshwater	6	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00
Total Petroleum Hydrocarbons	Xylene	µg/l	0	30	EQS Freshwater	6	2.00	2.00	0	2.00	2.00	2.00	2.00	2.00	2.00
	Aliphatic C5-C6	µg/l	1	10	UK DWS	6	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00
	Aliphatic C6-C8	µg/l	1	10	UK DWS	6	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00
	Aliphatic C8-C10	µg/l	1	10	UK DWS	6	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00
	Aliphatic C10-C12	µg/l	10	10	UK DWS	6	10.00	10.00	0	10.00	10.00	10.00	10.00	10.00	10.00
	Aliphatic C12-C14	µg/l	10	10	UK DWS	6	10.00	10.00	0	10.00	10.00	10.00	10.00	10.00	10.00
	Aliphatic C14-C21	µg/l	10	10	UK DWS	6	10.00	10.00	0	10.00	10.00	10.00	10.00	10.00	10.00
	Aliphatic C21-C35	µg/l	10	10	UK DWS	6	10.00	10.00	0	10.00	10.00	10.00	10.00	10.00	10.00
	Aromatic EC5-EC7	µg/l	1	10	EQS Freshwater	6	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00
	Aromatic EC7-EC8	µg/l	1	74	EQS Freshwater	6	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00
	Aromatic EC8-EC10	µg/l	1	10	UK DWS	6	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00
	Aromatic EC10-EC12	µg/l	10	10	UK DWS	6	10.00	10.00	0	10.00	10.00	10.00	10.00	10.00	10.00
	Aromatic EC12-EC14	µg/l	10	10	UK DWS	6	10.00	10.00	0	10.00	10.00	10.00	10.00	10.00	10.00
	Aromatic EC14-EC21	µg/l	10	10	UK DWS	6	10.00	10.00	0	10.00	10.00	10.00	10.00	10.00	10.00
	Aromatic EC21-EC35	µg/l	10	10	UK DWS	6	10.00	10.00	0	10.00	10.00	10.00	10.00	10.00	10.00
	Total TPH (EC5-EC35)	µg/l	10	10	EQS Freshwater	6	10.00	10.00	0	10.00	10.00	10.00	10.00	10.00	10.00
Polycyclic Aromatic Hydrocarbons	Acenaphthene	µg/l	0.01	None Available		6	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01
	Acenaphthylene	µg/l	0.01	None Available		6	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01
	Anthracene	µg/l	0.01	0.1	EQS Freshwater	6	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01
	Benzo(a)anthracene	µg/l	0.01	None Available		6	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01
	Benzo(a)pyrene	µg/l	0.01	0.00017	EQS Freshwater	6	0.01	0.01	6	0.01	0.01	0.01	0.01	0.01	0.01
	Benzo(b)fluoranthene	µg/l	0.01	None Available		6	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01
	Benzo(k)fluoranthene	µg/l	0.01	None Available		6	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01
	Benzo(g,h,i)perylene	µg/l	0.01	None Available		6	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01
	Chrysene	µg/l	0.01	None Available		6	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01
	Dibenzo(a,h)anthracene	µg/l	0.01	None Available		6	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01
	Fluoranthene	µg/l	0.01	0.0063	EQS Freshwater	6	0.01	0.01	6	0.01	0.01	0.01	0.01	0.01	0.01
	Fluorene	µg/l	0.01	None Available		6	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01
	Indeno[1,2,3-c,d]pyrene	µg/l	0.01	None Available		6	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01
	Naphthalene	µg/l	0.01	2	EQS Freshwater	6	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01
	Phenanthrene	µg/l	0.01	None Available		6	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01
	Pyrene	µg/l	0.01	None Available		6	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01
	Benzene	µg/l	1	10	EQS Freshwater	6	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00
	Ethylbenzene	µg/l	1	300	UK DWS	6	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00
	Xylene	µg/l	0	30	EQS Freshwater	6	2.00	2.00	0	2.00	2.00	2.00	2.00	2.00	2.00
	Toluene	µg/l	1	74	EQS Freshwater	6	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00

APPENDIX 14

UKWIR VALUES

UK Water Industry Research (2010) Guidance on the Selection of Water Supply Pipes: Table 3.1 Pipe Selection

Note: concentrations are mg/kg

	Parameter Group	Polyethylene (PE)	Polyvinyl chloride (PVC)	Barrier pipe (Polyethylene-Aluminium-Polyethylene (PE-AL-PE))	Wrapped Steel	Wrapped Ductile Iron	Copper
1	Extended VOC Suite by purge and trap or head space and GC-MS with TIC	0.5	0.125	Pass	Pass	Pass	Pass
1a	BTEX + MTBE	0.1	0.03	Pass	Pass	Pass	Pass
2	SVOCs TIC by purge and trap or head space and GC-MS with TIC (Aliphatic and aromatic C5-C10)	2	1.4	Pass	Pass	Pass	Pass
2e	+Phenols	2	0.4	Pass	Pass	Pass	Pass
2f	+Cresols and chlorinated phenols	2	0.04	Pass	Pass	Pass	Pass
3	Mineral Oil C11-C20	10	Pass	Pass	Pass	Pass	Pass
4	Mineral Oil C21-C40	500	Pass	Pass	Pass	Pass	Pass
5	Corrosive (Conductivity, Redox and pH)	Pass	Pass	Pass	Corrosive if pH < 7 and conductivity > 400 μ S/cm	Corrosive if pH < 5 and Eh not neutral and conductivity > 400 μ S/cm	Corrosive if pH < 5 or > 8 and Eh positive
Specific suite identified as relevant following site investigation							
2a	Ethers	0.5	1	Pass	Pass	Pass	Pass
2b	Nitrobenzene	0.5	0.4	Pass	Pass	Pass	Pass
2c	Ketones	0.5	0.02	Pass	Pass	Pass	Pass
2d	Aldehydes	0.5	0.02	Pass	Pass	Pass	Pass
6	Amins	Fail	Pass	Pass	Pass	Pass	Pass

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