

Waterman Infrastructure & Environment Limited
11 Peter Street
Manchester
M2 5QR



Attention : Rachael Tempest
Date : 16th November, 2022
Your reference : WIE1943-100
Our reference : Test Report 22/16108 Batch 1 Schedule E 22/16108 Batch 1 Schedule F
Location : Rochdale Road, Manchester
Date samples received : 4th October, 2022
Status : Final Report
Issue : 1

Thirty five samples were received for analysis on 4th October, 2022 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Simon Gomery BSc
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE1943-100
Location: Rochdale Road, Manchester
Contact: Rachael Tempest
EMT Job No: 22/16108

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	16-18	19-21											
Sample ID	HDP102	HDP103											
Depth	0.60	0.40											
COC No / misc													
Containers	V J T	V J T											
Sample Date	29/09/2022	29/09/2022											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	04/10/2022	04/10/2022											
											Please see attached notes for all abbreviations and acronyms		
											LOD/LOR	Units	Method No.
Arsenic #	6.4	6.1									<0.5	mg/kg	TM30/PM15
Cadmium #	0.1	0.2									<0.1	mg/kg	TM30/PM15
Chromium #	90.6	127.3									<0.5	mg/kg	TM30/PM15
Copper #	24	52									<1	mg/kg	TM30/PM15
Iron	29460	15110									<20	mg/kg	TM30/PM15
Lead #	38	40									<5	mg/kg	TM30/PM15
Magnesium	502	1533									<25	mg/kg	TM30/PM15
Manganese #	1105	241									<1	mg/kg	TM30/PM15
Mercury #	0.1	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #	15.3	15.1									<0.7	mg/kg	TM30/PM15
Selenium #	2	<1									<1	mg/kg	TM30/PM15
Sulphur as S	0.04	0.05									<0.01	%	TM30/PM15
Total Sulphate as SO4 #	557	692									<50	mg/kg	TM50/PM29
Vanadium	22	18									<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.5	0.7									<0.1	mg/kg	TM74/PM32
Zinc #	56	57									<5	mg/kg	TM30/PM15
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1*	<0.1*									<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	1.4									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	7	6									<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	14	27									<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	123									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35 (EH+HS_CU_1D_AL)	21	157									<19	mg/kg	TM5/PM8/PM16/PM12/PM15
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	2.6	0.7									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	26	12									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	185	84									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	350	215									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 (EH+HS_CU_1D_AR) #	564	312									<19	mg/kg	TM5/PM8/PM16/PM12/PM15
Total aliphatics and aromatics(C5-35) (EH+HS_CU_1D_Total)	585	469									<38	mg/kg	TM5/PM8/PM16/PM12/PM15
MTBE #	<5	<5									<5	ug/kg	TM36/PM12
Benzene #	<5	10									<5	ug/kg	TM36/PM12
Toluene #	15	17									<5	ug/kg	TM36/PM12
Ethylbenzene #	12	9									<5	ug/kg	TM36/PM12
m/p-Xylene #	20	16									<5	ug/kg	TM36/PM12
o-Xylene #	20	11									<5	ug/kg	TM36/PM12

Element Materials Technology

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[illegible]

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
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EMT Job No: 22/16108

SVOC Report : Solid

EMT Sample No.	16-18	19-21										
Sample ID	HDP102	HDP103										
Depth	0.60	0.40										
COC No / misc												
Containers	V J T	V J T										
Sample Date	29/09/2022	29/09/2022										
Sample Type	Soil	Soil										
Batch Number	1	1										
Date of Receipt	04/10/2022	04/10/2022										
										LOD/LOR	Units	Method No.
SVOC MS												
Phenols												
2-Chlorophenol #	<10	<10								<10	ug/kg	TM16/PM8
2-Methylphenol	100	33								<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10								<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10	<10								<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10								<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10								<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10								<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10								<10	ug/kg	TM16/PM8
4-Methylphenol	215	55								<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10								<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10								<10	ug/kg	TM16/PM8
Phenol #	<10	<10								<10	ug/kg	TM16/PM8
PAHs												
2-Chloronaphthalene #	<10	<10								<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	1552	680								<10	ug/kg	TM16/PM8
Naphthalene	4141	1068								<10	ug/kg	TM16/PM8
Acenaphthylene	947	257								<10	ug/kg	TM16/PM8
Acenaphthene	1333	306								<10	ug/kg	TM16/PM8
Fluorene	1626	402								<10	ug/kg	TM16/PM8
Phenanthrene #	13704	3648								<10	ug/kg	TM16/PM8
Anthracene	3287	700								<10	ug/kg	TM16/PM8
Fluoranthene #	13642	3476								<10	ug/kg	TM16/PM8
Pyrene #	14638	3657								<10	ug/kg	TM16/PM8
Benzo(a)anthracene	6536	1563								<10	ug/kg	TM16/PM8
Chrysene	7922	1849								<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	9087	2499								<10	ug/kg	TM16/PM8
Benzo(a)pyrene	6347	1363								<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	2294	594								<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	960	211								<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	3162	768								<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	6543	1799								<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	2544	700								<10	ug/kg	TM16/PM8
Phthalates												
Bis(2-ethylhexyl) phthalate	<100	<100								<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100								<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	<100								<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100								<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100								<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100	<100								<100	ug/kg	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

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EMT Job No: 22/16108

SVOC Report : Solid

[illegible]

Note:

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where trace asbestos is reported the amount of asbestos will be <0.1%.

QF-PM 3.1.15 v10

Client Name: Waterman Infrastructure & Environment Limited

Matrix : Solid

Reference: WIE1943-100

Location: Rochdale Road, Manchester

Contact: Rachael Tempest

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/16108

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 22/16108

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 22/16108

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.	Yes		AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes

Waterman Infrastructure & Environment Limited
11 Peter Street
Manchester
M2 5QR

Attention : Rachael Tempest
Date : 17th November, 2022
Your reference : WIE1943-100
Our reference : Test Report 22/16108 Batch 1 Schedule G
Location : Rochdale Road, Manchester
Date samples received : 4th October, 2022
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Issue : 1

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Authorised By:



Paul Boden BSc
Senior Project Manager

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Matrix : Solid

2 of 8

Client Name: Waterman Infrastructure & Environment Limited

Reference: WIE1943-100

Location: Rochdale Road, Manchester

Contact: Rachael Tempest

[illegible]

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It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 22/16108

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	

Waterman Infrastructure & Environment Limited
11 Peter Street
Manchester
M2 5QR



Attention : Rachael Tempest
Date : 14th October, 2022
Your reference : WIE19453-100
Our reference : Test Report 22/16370 Batch 1 Schedule A 22/16370 Batch 1 Schedule B
Location : Rochdale Road Manchester
Date samples received : 7th October, 2022
Status : Final Report
Issue : 1

Fifty five samples were received for analysis on 7th October, 2022 of which ten were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Paul Boden BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19453-100
Location: Rochdale Road Manchester
Contact: Rachael Tempest
EMT Job No: 22/16370

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	5-7	22-24	52-54	64-66	81-83	90-92	102-104	117-119	123-125	129-131	Please see attached notes for all abbreviations and acronyms		
Sample ID	TP114	TP113	TP115	TP102	TP101	BH104	BH104	BH102	BH102	BH102			
Depth	1.00	1.00	2.00	2.00	1.00	1.00	5.00	3.80	5.80	8.80			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	04/10/2022	03/10/2022	03/10/2022	04/10/2022	04/10/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022			
Arsenic #	12.6	79.9	24.4	12.5	5.6	6.7	5.0	8.1	11.6	5.4	<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1	7.9	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Chromium #	83.0	73.5	107.0	77.9	71.5	64.9	44.6	56.1	65.6	39.3	<0.5	mg/kg	TM30/PM15
Copper #	45	85	588 ^{AA}	73	102	60	106	26	31	25	<1	mg/kg	TM30/PM15
Iron	32310	135600 ^{AA}	46820 ^{AA}	19140	26900	20150	34200	17720	34010	32960	<20	mg/kg	TM30/PM15
Lead #	360	3919 ^{AA}	721	474	<5	18	7	25	18	10	<5	mg/kg	TM30/PM15
Magnesium	8635	459	1965	1686	1000	1694	2028	1479	7189	19880	<25	mg/kg	TM30/PM15
Manganese #	597	314	338	321	121	196	196	137	376	796	<1	mg/kg	TM30/PM15
Mercury #	0.4	13.4	0.5	0.2	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #	29.0	5.2	64.9	17.6	43.0	25.0	48.0	14.1	28.7	33.3	<0.7	mg/kg	TM30/PM15
Selenium #	1	5	1	<1	1	<1	1	<1	<1	<1	<1	mg/kg	TM30/PM15
Sulphur as S	0.05	3.85	0.25	0.45	0.10	0.17	0.27	0.05	0.09	0.09	<0.01	%	TM30/PM15
Total Sulphate as SO4 #	714	153600 ^{AC}	3487	976	409	696	3089	1229	2257	12430 ^{AA}	<50	mg/kg	TM50/PM29
Vanadium	38	54	50	18	50	30	47	17	49	31	<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.9	0.2	2.7	0.9	0.4	0.7	0.4	0.7	1.3	0.9	<0.1	mg/kg	TM74/PM32
Zinc #	144	185	11200 ^{AA}	113	40	30	12	29	62	63	<5	mg/kg	TM30/PM15
Methyl Tertiary Butyl Ether #	-	-	-	-	-	<2 ^{SV}	<2 ^{SV}	<2	<2	<2	<2	ug/kg	TM15/PM10
Benzene #	-	-	-	-	-	152 ^{SV}	44 ^{SV}	32	283	<3	<3	ug/kg	TM15/PM10
Toluene #	-	-	-	-	-	523 ^{SV}	96 ^{SV}	87	646	8	<3	ug/kg	TM15/PM10
Ethylbenzene #	-	-	-	-	-	64 ^{SV}	150 ^{SV}	60	1148	8	<3	ug/kg	TM15/PM10
m/p-Xylene #	-	-	-	-	-	426 ^{SV}	197 ^{SV}	88	1948	17	<5	ug/kg	TM15/PM10
o-Xylene #	-	-	-	-	-	175 ^{SV}	87 ^{SV}	54	1197	8	<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	-	-	-	-	53 ^{SV}	51 ^{SV}	89	78	73	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	-	-	-	47 ^{SV}	43 ^{SV}	79	67	61	<0	%	TM15/PM10
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	0.3 ^{SV}	<0.1 ^{SV}	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	0.9 ^{SV}	<0.1 ^{SV}	<0.1	0.5 ^{SV}	<0.1 ^{SV}	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	0.3 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	0.4 ^{SV}	<0.1 ⁺	0.4 ⁺	6.0 ⁺	<0.1 ^{SV}	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	5.6	<0.2	<0.2	<0.2	0.5	3.9	8.4	28.8	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	10	84	<4	<4	<4	<4	21	11	127	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	20	1083	10	11	<7	<7	29	56	214	9	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	22	5294	149	23	<7	27	36	278	231	9	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35 (EH+HS_CU_1D_AL)	52	6467	159	34	<19	29	90	354	607	<19	<19	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19453-100
Location: Rochdale Road Manchester
Contact: Rachael Tempest
EMT Job No: 22/16370

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	5-7	22-24	52-54	64-66	81-83	90-92	102-104	117-119	123-125	129-131	Please see attached notes for all abbreviations and acronyms		
Sample ID	TP114	TP113	TP115	TP102	TP101	BH104	BH104	BH102	BH102	BH102			
Depth	1.00	1.00	2.00	2.00	1.00	1.00	5.00	3.80	5.80	8.80			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	04/10/2022	03/10/2022	03/10/2022	04/10/2022	04/10/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022	LOD/LOR	Units	Method No.
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	0.2 ^{SV}	<0.1 ^{SV}	<0.1	0.1 ^{SV}	<0.1 ^{SV}	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	0.4 ^{SV}	<0.1 ^{SV}	<0.1	0.4 ^{SV}	<0.1 ^{SV}	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	0.3 ^{SV}	<0.1 ⁺	0.1 ⁺	1.8 ⁺	<0.1 ^{SV}	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	5.5	13.7 ^{SV}	<0.2	<0.2	<0.2	8.9	63.8	79.5	352.0	1.6	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	78	76 ^{SV}	<4	<4	<4	32	198	168	1555	16	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	653	556 ^{SV}	85	<7	<7	145	667	887	6172	68	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	1237	2952 ^{SV}	460	42	<7	277	970	1328	7296	225	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 (EH+HS_CU_1D_AR) #	1974	3598 ^{SV}	545	42	<19	464	1899	2463	15377	311	<19	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics (C5-35) (EH+HS_CU_1D_Total)	2026	10065 ^{SV}	704	76	<38	493	1989	2817	15984	311	<38	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5 ^{SV}	<5 ^{SV}	<5 ^{SV}	<5 ^{SV}	-	-	-	-	-	<5	ug/kg	TM36/PM12
Benzene #	<5	26 ^{SV}	<5 ^{SV}	15 ^{SV}	<5 ^{SV}	-	-	-	-	-	<5	ug/kg	TM36/PM12
Toluene #	<5	26 ^{SV}	<5 ^{SV}	8 ^{SV}	<5 ^{SV}	-	-	-	-	-	<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5 ^{SV}	<5 ^{SV}	<5 ^{SV}	<5 ^{SV}	-	-	-	-	-	<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5 ^{SV}	<5 ^{SV}	19 ^{SV}	<5 ^{SV}	-	-	-	-	-	<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5 ^{SV}	<5 ^{SV}	12 ^{SV}	<5 ^{SV}	-	-	-	-	-	<5	ug/kg	TM36/PM12
Natural Moisture Content	22.1	55.8	27.3	12.9	7.1	9.6	12.1	10.2	25.7	15.2	<0.1	%	PM4/PM0
Ammoniacal Nitrogen as N	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	mg/kg	TM38/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Free Cyanide	<0.5	240.7 ^{AD}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	mg/kg	TM89/PM45
Total Cyanide #	<0.5	12293.9 ^{AE}	52.7 ^{AA}	15.4 ^{AA}	<0.5	<0.5	<0.5	<0.5	2.4	<0.5	<0.5	mg/kg	TM89/PM45
Complex Cyanide	<0.5	12053.2 ^{AD}	52.7	15.4	<0.5	<0.5	<0.5	<0.5	2.4	<0.5	<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	1.78	7.70	22.22	17.22	16.39	10.21	11.36	4.68	4.61	0.84	<0.02	%	TM21/PM24
Sulphide	<10	<10	<10	<10	<10	<10	<10	<10	33	<10	<10	mg/kg	TM107/PM45
Thiocyanate	<0.6	148.2	1.9	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	mg/kg	TM107/PM45
pH #	8.31	5.04	8.13	9.15	5.68	12.24	9.37	10.46	9.02	8.74	<0.01	pH units	TM73/PM11

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19453-100
Location: Rochdale Road Manchester
Contact: Rachael Tempest
EMT Job No: 22/16370

[illegible]

LOD/LOR	Units	Method No.
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QF-PM 3.1.3 v11

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

5 of 16

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19453-100
Location: Rochdale Road Manchester
Contact: Rachael Tempest
EMT Job No: 22/16370

VOC Report : Solid

EMT Sample No.	90-92	102-104	117-119	123-125	129-131						Please see attached notes for all abbreviations and acronyms		
Sample ID	BH104	BH104	BH102	BH102	BH102								
Depth	1.00	5.00	3.80	5.80	8.80								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1						LOD/LOR	Units	Method No.
Date of Receipt	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022								
VOC MS													
Dichlorodifluoromethane	<2 ^{SV}	<2 ^{SV}	<2	<2	<2						<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2 ^{SV}	<2 ^{SV}	<2	<2	<2						<2	ug/kg	TM15/PM10
Chloromethane #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
Vinyl Chloride	<2 ^{SV}	<2 ^{SV}	<2	<2	<2						<2	ug/kg	TM15_A/PM10
Bromomethane	<1 ^{SV}	<1 ^{SV}	<1	<1	<1						<1	ug/kg	TM15/PM10
Chloroethane #	<2 ^{SV}	<2 ^{SV}	<2	<2	<2						<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2 ^{SV}	<2 ^{SV}	<2	<2	<2						<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6 ^{SV}	<6 ^{SV}	<6	<6	<6						<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<7 ^{SV}	<7 ^{SV}	<7	<7	<7						<7	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4 ^{SV}	<4 ^{SV}	<4	<4	<4						<4	ug/kg	TM15/PM10
Bromochloromethane #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
Chloroform #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4 ^{SV}	<4 ^{SV}	<4	<4	<4						<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4 ^{SV}	<4 ^{SV}	<4	<4	<4						<4	ug/kg	TM15/PM10
Benzene #	152 ^{SV}	44 ^{SV}	32	283	<3						<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6 ^{SV}	<6 ^{SV}	<6	<6	<6						<6	ug/kg	TM15/PM10
Dibromomethane #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4 ^{SV}	<4 ^{SV}	<4	<4	<4						<4	ug/kg	TM15/PM10
Toluene #	523 ^{SV}	96 ^{SV}	87	646	8						<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
Chlorobenzene #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
Ethylbenzene #	64 ^{SV}	150 ^{SV}	60	1148	8						<3	ug/kg	TM15/PM10
m/p-Xylene #	426 ^{SV}	197 ^{SV}	88	1948	17						<5	ug/kg	TM15/PM10
o-Xylene #	175 ^{SV}	87 ^{SV}	54	1197	8						<3	ug/kg	TM15/PM10
Styrene	4 ^{SV}	6 ^{SV}	25	99	<3						<3	ug/kg	TM15_A/PM10
Bromoform	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
Isopropylbenzene #	10 ^{SV}	20 ^{SV}	4	204	<3						<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
Bromobenzene	<2 ^{SV}	<2 ^{SV}	<2	<2	<2						<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4 ^{SV}	<4 ^{SV}	<4	<4	<4						<4	ug/kg	TM15/PM10
Propylbenzene #	11 ^{SV}	8 ^{SV}	<4	175	<4						<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	39 ^{SV}	49 ^{SV}	20	629	5						<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3 ^{SV}	<3 ^{SV}	<3	<3	<3						<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5 ^{SV}	<5 ^{SV}	<5	<5	<5						<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	261 ^{SV}	276 ^{SV}	80	>>4242	26						<6	ug/kg	TM15/PM10
sec-Butylbenzene #	5 ^{SV}	<4 ^{SV}	<4	107	<4						<4	ug/kg	TM15/PM10
4-Isopropyltoluene	10 ^{SV}	29 ^{SV}	<4	401	<4						<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4 ^{SV}	<4 ^{SV}	<4	<4	<4						<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4 ^{SV}	<4 ^{SV}	<4	<4	<4						<4	ug/kg	TM15/PM10
n-Butylbenzene	11 ^{SV}	<4 ^{SV}	<4	243	<4						<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4 ^{SV}	<4 ^{SV}	<4	<4	<4						<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane	<4 ^{SV}	<4 ^{SV}	<4	<4	<4						<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene	<7 ^{SV}	<7 ^{SV}	<7	<7	<7						<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4 ^{SV}	<4 ^{SV}	<4	<4	<4						<4	ug/kg	TM15/PM10
Naphthalene	1606 ^{SV}	>>11376	>>13353	>>59672	422						<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene	<7 ^{SV}	<7 ^{SV}	<7	<7	<7						<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	53 ^{SV}	51 ^{SV}	89	78	73						<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	47 ^{SV}	43 ^{SV}	79	67	61						<0	%	TM15/PM10

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19453-100
Location: Rochdale Road Manchester
Contact: Rachael Tempest

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Asbestos sub-samples are retained for not less than 6 months from the date of analysis unless specifically requested.

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
22/16370	1	TP114	1.00	7	Charlotte Taylor	12/10/2022	General Description (Bulk Analysis)	brown soil/stones
					Charlotte Taylor	12/10/2022	Asbestos Fibres	Fibre Bundles
					Charlotte Taylor	12/10/2022	Asbestos ACM	NAD
					Charlotte Taylor	12/10/2022	Asbestos Type	Chrysotile
22/16370	1	TP113	1.00	24	Andrew Alker	12/10/2022	General Description (Bulk Analysis)	brown soil and stone
					Andrew Alker	12/10/2022	Asbestos Fibres	Fibre Bundles
					Andrew Alker	12/10/2022	Asbestos Fibres (2)	Fibre Bundles
					Andrew Alker	12/10/2022	Asbestos ACM	ACM Debris
					Andrew Alker	12/10/2022	Asbestos ACM (2)	ACM Debris
					Andrew Alker	12/10/2022	Asbestos Type	Amosite
					Andrew Alker	12/10/2022	Asbestos Type (2)	Chrysotile
22/16370	1	TP115	2.00	54	Charlotte Taylor	12/10/2022	General Description (Bulk Analysis)	brown soil/stones
					Charlotte Taylor	12/10/2022	Asbestos Fibres	NAD
					Charlotte Taylor	12/10/2022	Asbestos ACM	NAD
					Charlotte Taylor	12/10/2022	Asbestos Type	NAD
22/16370	1	TP102	2.00	66	Andrew Alker	13/10/2022	General Description (Bulk Analysis)	brown soil and stone
					Andrew Alker	13/10/2022	Asbestos Fibres	NAD
					Andrew Alker	13/10/2022	Asbestos ACM	NAD
					Andrew Alker	13/10/2022	Asbestos Type	NAD
22/16370	1	TP101	1.00	83	Andrew Alker	13/10/2022	General Description (Bulk Analysis)	black charcole and stones
					Andrew Alker	13/10/2022	Asbestos Fibres	NAD
					Andrew Alker	13/10/2022	Asbestos ACM	NAD
					Andrew Alker	13/10/2022	Asbestos Type	NAD
22/16370	1	BH104	1.00	92	Andrew Alker	13/10/2022	General Description (Bulk Analysis)	brown soil and stone
					Andrew Alker	13/10/2022	Asbestos Fibres	NAD
					Andrew Alker	13/10/2022	Asbestos ACM	NAD
					Andrew Alker	13/10/2022	Asbestos Type	NAD
22/16370	1	BH104	5.00	104	Andrew Alker	12/10/2022	General Description (Bulk Analysis)	brown soil and stone
					Andrew Alker	12/10/2022	Asbestos Fibres	NAD
					Andrew Alker	12/10/2022	Asbestos ACM	NAD
					Andrew Alker	12/10/2022	Asbestos Type	NAD

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19453-100
Location: Rochdale Road Manchester
Contact: Rachael Tempest

[illegible]

Client Name: Waterman Infrastructure & Environment Limited

Reference: WIE19453-100

Location: Rochdale Road Manchester

Contact: Rachael Tempest

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/16370

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution
AB	x10 Dilution
AC	x20 Dilution
AD	x100 Dilution
AE	x500 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 22/16370

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEPA 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes

EMT Job No: 22/16370

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEPA Method 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.	Yes		AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes

EMT Job No: 22/16370

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Waterman Infrastructure & Environment Limited
11 Peter Street
Manchester
M2 5QR



Attention : Rachael Tempest
Date : 21st October, 2022
Your reference : WIE19453-100
Our reference : Test Report 22/16370 Batch 1 Schedule C
Location : Rochdale Road Manchester
Date samples received : 7th October, 2022
Status : Final Report
Issue : 1

Fifty five samples were received for analysis on 7th October, 2022 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Simon Gomery BSc
Project Manager

Please include all sections of this report if it is reproduced

Note:

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where trace asbestos is reported the amount of asbestos will be <0.1%.

[illegible]

Contact: Rachael Tempest

[illegible]

3 of 8

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/16370

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 22/16370

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM131	Quantification of Asbestos Fibres and ACM based on HSG 248 Second edition:2021, HSG 264 Second edition:2012, HSE Contract Research Report No.83/1996, MDHS 87:1998, WM3 1st Edition v1.1:2018	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	Yes

Waterman Infrastructure & Environment Limited
11 Peter Street
Manchester
M2 5QR

Attention : Rachael Tempest
Date : 17th November, 2022
Your reference : WIE19453-100
Our reference : Test Report 22/16370 Batch 1 Schedule D
Location : Rochdale Road Manchester
Date samples received : 7th October, 2022
Status : Final Report
Issue : 1

Fifty five samples were received for analysis on 7th October, 2022 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Paul Boden BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Matrix : Solid

Location: Rochdale Road Manchester

Contact: Rachael Tempest

2 of 8

Client Name: Waterman Infrastructure & Environment Limited

Reference: WIE19453-100

Location: Rochdale Road Manchester

Contact: Rachael Tempest

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/16370

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

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Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

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Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

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REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

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Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

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NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
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AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 22/16370

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	

Waterman Infrastructure & Environment Limited
11 Peter Street
Manchester
M2 5QR



Attention : Rachael Tempest
Date : 28th October, 2022
Your reference :
Our reference : Test Report 22/16878 Batch 1
Location : Rochdale Road, Manchester
Date samples received : 14th October, 2022
Status : Final Report
Issue : 1

Thirty five samples were received for analysis on 14th October, 2022 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Simon Gomery BSc

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference:
Location: Rochdale Road, Manchester
Contact: Rachael Tempest
EMT Job No: 22/16878

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	13-15	19-21	79-81	82-84							Please see attached notes for all abbreviations and acronyms		
Sample ID	BH105	BH105	WS104	WS105									
Depth	7.00	10.00	0.80	1.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	06/10/2022	06/10/2022	07/10/2022	07/10/2022									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	14/10/2022	14/10/2022	14/10/2022	14/10/2022							LOD/LOR	Units	Method No.
Arsenic #	35.4	11.8	12.2	11.5							<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	0.3	0.3	<0.1							<0.1	mg/kg	TM30/PM15
Chromium #	33.7	38.4	30.3	43.8							<0.5	mg/kg	TM30/PM15
Copper #	28	26	62	339 ^{AA}							<1	mg/kg	TM30/PM15
Iron	32030	34760	21730	56280 ^{AA}							<20	mg/kg	TM30/PM15
Lead #	30	12	100	59							<5	mg/kg	TM30/PM15
Magnesium	14440	18900	5683	1602							<25	mg/kg	TM30/PM15
Manganese #	684	727	275	647							<1	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	0.1	0.1							<0.1	mg/kg	TM30/PM15
Nickel #	32.5	34.3	38.6	54.9							<0.7	mg/kg	TM30/PM15
Selenium #	1	1	<1	<1							<1	mg/kg	TM30/PM15
Sulphur as S	0.25	0.12	0.07	0.33							<0.01	%	TM30/PM15
Total Sulphate as SO ₄ #	4099	564	932	5741							<50	mg/kg	TM50/PM29
Vanadium	28	32	33	51							<1	mg/kg	TM30/PM15
Water Soluble Boron #	1.5	0.9	0.3	1.3							<0.1	mg/kg	TM74/PM32
Zinc #	79	148	348	39							<5	mg/kg	TM30/PM15
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2							<2	ug/kg	TM15/PM10
Benzene #	8	<3	<3	<3							<3	ug/kg	TM15/PM10
Toluene #	12	<3	<3	52							<3	ug/kg	TM15/PM10
Ethylbenzene #	45	<3	<3	44							<3	ug/kg	TM15/PM10
m/p-Xylene #	137	11	<5	166							<5	ug/kg	TM15/PM10
o-Xylene #	84	5	<3	152							<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	83	80	88	79							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	68	60	66	53							<0	%	TM15/PM10
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	0.2 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	0.2 ^{SV}							<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	1.5	<0.2	<0.2	<0.2							<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	17	<4	<4	<4							<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	40	<7	13	69							<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	63	<7	152	400							<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35 (EH+HS_CU_1D_AL)	122	<19	165	469							<19	mg/kg	TM5/PM8/PM16/PM12/PM15

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference:
Location: Rochdale Road, Manchester
Contact: Rachael Tempest
EMT Job No: 22/16878

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	13-15	19-21	79-81	82-84							Please see attached notes for all abbreviations and acronyms		
Sample ID	BH105	BH105	WS104	WS105									
Depth	7.00	10.00	0.80	1.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	06/10/2022	06/10/2022	07/10/2022	07/10/2022									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	14/10/2022	14/10/2022	14/10/2022	14/10/2022							LOD/LOR	Units	Method No.
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1 ^{SV}	<0.1 ^{SV}	<0.1 ^{SV}	0.1 ^{SV}							<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	10.2	<0.2	3.0	1.0							<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	72	<4	14	13							<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	257	<7	75	78							<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	384	<7	399	212							<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 (EH+HS_CU_1D_AR) #	723	<19	491	304							<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-35) (EH+HS_CU_1D_Total)	845	<38	656	773							<38	mg/kg	TM5/PM8/PM16/PM12/PM10
Natural Moisture Content	18.3	18.2	15.7	10.2							<0.1	%	PM4/PM0
Ammoniacal Nitrogen as N	4.6	<0.6	<0.6	64.6							<0.6	mg/kg	TM38/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3							<0.3	mg/kg	TM38/PM20
Free Cyanide	<0.5	<0.5	<0.5	<0.5							<0.5	mg/kg	TM89/PM45
Total Cyanide #	<0.5	<0.5	0.8	<0.5							<0.5	mg/kg	TM89/PM45
Complex Cyanide	<0.5	<0.5	0.8	<0.5							<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	0.92	0.61	2.72	15.12							<0.02	%	TM21/PM24
Sulphide	<10	<10	<10	<10							<10	mg/kg	TM107/PM45
Thiocyanate	<0.6	<0.6	<0.6	<0.6							<0.6	mg/kg	TM107/PM45
pH #	8.73	8.59	8.72	7.55							<0.01	pH units	TM73/PM11

Client Name: Waterman Infrastructure & Environment Limited

SVOC Report : Solid

Reference:

Location: Rochdale Road, Manchester

Contact: Rachael Tempest

EMT Job No: 22/16878

EMT Sample No.	13-15	19-21	79-81	82-84							Please see attached notes for all abbreviations and acronyms		
Sample ID	BH105	BH105	WS104	WS105									
Depth	7.00	10.00	0.80	1.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	06/10/2022	06/10/2022	07/10/2022	07/10/2022									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1							LOD/LOR	Units	Method No.
Date of Receipt	14/10/2022	14/10/2022	14/10/2022	14/10/2022									
SVOC MS													
Phenols													
2-Chlorophenol #	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	13	<10	<10	<10							<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	14	<10	<10							<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
Phenol #	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	273	63	121	453							<10	ug/kg	TM16/PM8
Naphthalene	1179	187	127	528							<10	ug/kg	TM16/PM8
Acenaphthylene	904	139	110	86							<10	ug/kg	TM16/PM8
Acenaphthene	221	39	236	202							<10	ug/kg	TM16/PM8
Fluorene	517	87	112	156							<10	ug/kg	TM16/PM8
Phenanthrene #	2891	541	2187	1709							<10	ug/kg	TM16/PM8
Anthracene	1079	201	577	337							<10	ug/kg	TM16/PM8
Fluoranthene #	3115	596	3238	1828							<10	ug/kg	TM16/PM8
Pyrene #	2116	417	3037	1660							<10	ug/kg	TM16/PM8
Benzo(a)anthracene	1045	220	1526	671							<10	ug/kg	TM16/PM8
Chrysene	929	190	1616	786							<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	1420	281	2380	959							<10	ug/kg	TM16/PM8
Benzo(a)pyrene	834	162	1565	525							<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	409	83	765	209							<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	141	26	242	79							<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	429	91	960	301							<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	1022	202	1714	690							<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	398	79	666	269							<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100	<100	521	13527							<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100	<100	1181							<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	<100	187	2694							<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100	<100	<100							<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100	<100	<100							<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100	<100	<100	240							<100	ug/kg	TM16/PM8

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited

SVOC Report : Solid

Reference:

Location: Rochdale Road, Manchester

Contact: Rachael Tempest

EMT Job No: 22/16878

EMT Sample No.	13-15	19-21	79-81	82-84							Please see attached notes for all abbreviations and acronyms		
Sample ID	BH105	BH105	WS104	WS105									
Depth	7.00	10.00	0.80	1.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	06/10/2022	06/10/2022	07/10/2022	07/10/2022									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	14/10/2022	14/10/2022	14/10/2022	14/10/2022							LOD/LOR	Units	Method No.
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
Azobenzene	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
Carbazole	278	48	164	139							<10	ug/kg	TM16/PM8
Dibenzofuran #	392	95	190	205							<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
Hexachlorobutadiene #	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
Isophorone #	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
Nitrobenzene #	<10	<10	<10	<10							<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	141 ^{SV}	140 ^{SV}	133 ^{SV}	130							<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	124	124	121	118							<0	%	TM16/PM8

Client Name: Waterman Infrastructure & Environment Limited

Reference:

Location: Rochdale Road, Manchester

Contact: Rachael Tempest

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Asbestos sub-samples are retained for not less than 6 months from the date of analysis unless specifically requested.

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
22/16878	1	BH105	7.00	15	Emma Woodward	24/10/2022	General Description (Bulk Analysis)	Brown soil
					Emma Woodward	24/10/2022	Asbestos Fibres	NAD
					Emma Woodward	24/10/2022	Asbestos ACM	NAD
					Emma Woodward	24/10/2022	Asbestos Type	NAD
22/16878	1	BH105	10.00	21	Emma Woodward	24/10/2022	General Description (Bulk Analysis)	Brown soil
					Emma Woodward	24/10/2022	Asbestos Fibres	NAD
					Emma Woodward	24/10/2022	Asbestos ACM	NAD
					Emma Woodward	24/10/2022	Asbestos Type	NAD
22/16878	1	WS104	0.80	81	Emma Woodward	24/10/2022	General Description (Bulk Analysis)	Brown soil stone
					Emma Woodward	24/10/2022	Asbestos Fibres	Trace Asbestos
					Emma Woodward	24/10/2022	Asbestos ACM	NAD
					Emma Woodward	24/10/2022	Asbestos Type	Chrysotile
22/16878	1	WS105	1.00	84	Emma Woodward	25/10/2022	General Description (Bulk Analysis)	soil stone
					Emma Woodward	25/10/2022	Asbestos Fibres	NAD
					Emma Woodward	25/10/2022	Asbestos ACM	NAD
					Emma Woodward	25/10/2022	Asbestos Type	NAD

Client Name: Waterman Infrastructure & Environment Limited

Matrix : Solid

Reference:

Location: Rochdale Road, Manchester

Contact: Rachael Tempest

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/16878

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 22/16878

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEPA 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes

EMT Job No: 22/16878

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEPA Method 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.	Yes		AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes

EMT Job No: 22/16878

[illegible]

Client ref:	Waterman Infrastructure & Environment Limited WIE19453-100	Sample ID	BH102		BH103		BH105		BH107		EQS Value
			Containers	VH/NH/P/G	Liquid	VH/NH/P/G	Liquid	VH/NH/P/G	Liquid		
										Sample Type	
CAS Number	Test	Method	Units	LOD							
7440-38-2	Dissolved Arsenic	TM50/PM14	ug/l	<2.5	4.4	8.8	9.2	<2.5		50	
7440-42-8	Dissolved Boron	TM50/PM14	ug/l	<12	115	366	367	169			
7440-43-9	Dissolved Cadmium	TM50/PM14	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5		0.25	
7440-70-2	Dissolved Calcium	TM50/PM14	mg/l	<0.2	72.9	616	591.8	142.5		N/A	
7440-47-3	Total Dissolved Chromium	TM50/PM14	ug/l	<1.5	<1.5	<1.5	<1.5	<1.5		4.7	
7440-50-8	Dissolved Copper	TM50/PM14	ug/l	<7	<7	<7	<7	<7		12	
7439-89-6	Total Dissolved Iron	TM50/PM14	ug/l	<20	103	95	212	259		1000	
7439-92-1	Dissolved Lead	TM50/PM14	ug/l	<5	<5	<5	<5	<5		1.2	
7439-98-4	Dissolved Magnesium	TM50/PM14	mg/l	<0.1	11.4	86.9	91.1	71			
7439-96-5	Dissolved Manganese	TM50/PM14	ug/l	<2	41	603	642	2142			
7439-97-6	Dissolved Mercury	TM50/PM14	ug/l	<1	<1	<1	<1	<1		0.07	
7440-02-0	Dissolved Nickel	TM50/PM14	ug/l	<2	<2	9	8	5		4	
7782-49-2	Dissolved Selenium	TM50/PM14	ug/l	<3	4	57	58	<3		20*	
7440-62-2	Dissolved Vanadium	TM50/PM14	ug/l	<1.5	2.3	<1.5	<1.5	<1.5			
7440-66-6	Dissolved Zinc	TM50/PM14	ug/l	<3	<3	23	16	14		20	
SULPHUR_TOT	Total Sulphur as S	TM50/PM14	ug/l	<10	4149	815702	842263	32048			
VOC MS											
75-71-8	Dichlorodifluoromethane	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
1634-04-4	Methyl Tertiary Butyl Ether	TM5/PM10	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1			
74-87-3	Chloromethane	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
75-01-4	Vinyl Chloride	TM5/PM10	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1			
74-83-9	Bromomethane	TM5/PM10	ug/l	<1	<1	<1	<1	<1			
75-00-3	Chloroethane	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
75-69-4	Trichlorofluoromethane	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
75-35-4	1,1-Dichloroethene (1,1 DCE)	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
75-09-2	Dichloromethane (DCM)	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
156-60-5	trans-1-2-Dichloroethene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
75-34-3	1,1-Dichloroethane	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
156-59-2	cis-1-2-Dichloroethene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
594-20-7	2,2-Dichloropropane	TM5/PM10	ug/l	<1	<1	<1	<1	<1			
74-97-5	Bromochloromethane	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
67-66-3	Chloroform	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
71-55-6	1,1,1-Trichloroethane	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
563-98-6	1,1-Dichloropropene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
56-23-5	Carbon tetrachloride	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
107-06-2	1,2-Dichloroethane	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
71-43-2	Benzene	TM5/PM10	ug/l	<0.5	<0.5	<0.5	<0.5	3.2		10	
79-01-6	Trichloroethene (TCE)	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
78-87-5	1,2-Dichloropropane	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
74-95-3	Dibromomethane	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
75-27-4	Bromodichloromethane	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
10061-01-5	cis-1-3-Dichloropropene	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
108-88-3	Toluene	TM5/PM10	ug/l	<5	<5	<5	<5	<5			
10061-02-6	trans-1-3-Dichloropropene	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
79-00-5	1,1,2-Trichloroethane	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
127-18-4	Tetrachloroethene (PCE)	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
142-28-9	1,3-Dichloropropane	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
124-48-1	Dibromochloromethane	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
106-93-4	1,2-Dibromoethane	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
108-90-7	Chlorobenzene	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
630-20-6	1,1,2-Tetrachloroethane	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
100-41-4	Ethylbenzene	TM5/PM10	ug/l	<1	<1	<1	<1	<1			
P_M_XYLENE	m,p-Xylene	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
95-47-6	o-Xylene	TM5/PM10	ug/l	<1	<1	<1	<1	2			
100-42-5	Styrene	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
75-25-2	Bromodrom	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
98-82-8	Isopropylbenzene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
79-34-5	1,1,2,2-Tetrachloroethane	TM5/PM10	ug/l	<4	<4	<4	<4	<4			
108-98-1	Bromobenzene	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
96-18-4	1,2,3-Trichloropropane	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
103-65-1	Propylbenzene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
95-49-8	2-Chlorotoluene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
108-67-8	1,3,5-Trimethylbenzene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
106-43-4	4-Chlorotoluene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
98-06-6	tert-Butylbenzene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
96-43-6	1,2,4-Trimethylbenzene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
135-98-8	sec-Butylbenzene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
99-87-6	4-Isopropyltoluene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
541-73-1	1,3-Dichlorobenzene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
106-46-7	1,4-Dichlorobenzene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
104-51-8	n-Butylbenzene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
95-50-1	1,2-Dichlorobenzene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
96-12-8	1,2-Dibromo-3-chloropropane	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
120-82-1	1,2,4-Trichlorobenzene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
87-69-3	Hexachlorobutadiene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
91-20-3	Naphthalene	TM5/PM10	ug/l	<2	<2	<2	<2	56		2	
87-61-6	1,2,3-Trichlorobenzene	TM5/PM10	ug/l	<3	<3	<3	<3	<3			
1634-04-4	Methyl Tertiary Butyl Ether	TM5/PM10	ug/l	<0.1	<0.1	<0.1	<0.1	<0.1			
71-43-2	Benzene	TM5/PM10	ug/l	<0.5	<0.5	<0.5	<0.5	3.2		10	
108-98-3	Toluene	TM5/PM10	ug/l	<5	<5	<5	<5	<5			
100-41-4	Ethylbenzene	TM5/PM10	ug/l	<1	<1	<1	<1	<1			
P_M_XYLENE	m,p-Xylene	TM5/PM10	ug/l	<2	<2	<2	<2	<2			
95-47-6	o-Xylene	TM5/PM10	ug/l	<1	<1	<1	<1	2			
SVOC MS											
Phenols											
95-57-8	2-Chlorophenol	TM5/PM10	ug/l	<1	<1	<1	<1	<1			
95-49-7	2-Methylphenol	TM5/PM10	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5			
88-75-5	2-Nitrophenol	TM5/PM10	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5			
120-83-2	2,4-Dichlorophenol	TM5/PM10	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5			
105-67-9	2,4-Dimethylphenol	TM5/PM10	ug/l	<1	<1	<1	95	1		7.7	
95-95-4	2,4,5-Trichlorophenol	TM5/PM10	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5			
88-06-2	2,4,6-Trichlorophenol	TM5/PM10	ug/l	<1	<1	<1	<1	<1			
59-50-7	4-Chloro-3-methylphenol	TM5/PM10	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5			
105-44-5	4-Methylphenol	TM5/PM10	ug/l	<1	<1	<1	<1	1			
100-02-7	4-Nitrophenol	TM5/PM10	ug/l	<10	<10	<10	<10	<10			
87-86-5	Pentachlorophenol	TM5/PM10	ug/l	<1	<1	<1	<1	<1			
108-95-2	Phenol	TM5/PM10	ug/l	<1	<1	<1	<1	<1		7.7	
PAHs											
91-58-7	2-Chloronaphthalene	TM5/PM10	ug/l	<1	<1	<1	<1	<1			
91-57-6	2-Methylnaphthalene	TM5/PM10	ug/l	<1	<1	<1	26	6		2	
91-20-3	Naphthalene	TM5/PM10	ug/l	<1	<1	<1	2	1.6		2	
209-96-8	Acenaphthylene	TM5/PM10	ug/l	<0.5	<0.5	5.5	32.8	1.5			
83-32-9	Acenaphthene	TM5/PM10	ug/l	<1	<1	4	40	7			
86-73-7	Fluorene	TM5/PM10	ug/l	<0.5	<0.5	1.4	19.4	8.6			
85-01-8	Phenanthrene	TM5/PM10	ug/l	<0.5	1	6.9	28.6	18.4			
120-12-7	Anthracene	TM5/PM10	ug/l	<0.5	<0.5	2.8	11.6	3.1		0.1	
206-44-0	Fluoranthene	TM5/PM10	ug/l	<0.5	1.9	20.6	16	7.9			
125-90-9	Pyrene	TM5/PM10	ug/l	<0.5	1.3	14.5	12.9	7.1			
56-55-3	Benzo[a]anthracene	TM5/PM10	ug/l	<0.5	1	8.3	4	2			
218-01-9	Chrysene	TM5/PM10	ug/l	<0.5	0.8	7.1	3.3	1.7			
BEN-BK-FLUORAN	Benzo[b]fluoranthene	TM5/PM10	ug/l	<1	1	12	4	2		0.00017	
50-32-8	Benzo[a]pyrene	TM5/PM10	ug/l	<1	<1	7	2	1		0.00017	
193-39-5	Indeno[1,2,3-c]pyrene	TM5/PM10	ug/l	<1	<1	3	<1	<1		0.00017	
53-70-3</											

CAS Number	WISCONSIN CEN Number	Disseminated from Location	Type	Method	Units	LEAD	ON-SITE				OFF-SITE	Notes
							Sample ID	Brand	Brand	Brand	Brand	
7460-20-2		Disseminated Arsenic	TMSPW004	µg/l	<15	4.4	8.8	9.2		<15		
7460-40-8		Disseminated Barium	TMSPW004	µg/l	<12	100	388	387		<15		
7460-40-9		Disseminated Cadmium	TMSPW004	µg/l	<0.5	<0.5	<0.5	<0.5		<0.5		
7460-70-7		Disseminated Calcium	TMSPW004	µg/l	<12	73.9	658	504.4		1415		
7460-47-3		Total Disseminated Chromium	TMSPW004	µg/l	<15	<15	<15	<15		<15		
7460-50-8		Disseminated Copper	TMSPW004	µg/l	<17	<17	<17	<17		<17		
7439-89-4		Total Disseminated Iron	TMSPW004	µg/l	<20	100	86	212		289		
7439-80-1		Disseminated Lead	TMSPW004	µg/l	<15	<15	<15	<15		<15		
7439-85-4		Disseminated Magnesium	TMSPW004	µg/l	<11	11.4	88.8	91.1		71		
7439-86-5		Disseminated Manganese	TMSPW004	µg/l	<17	41	803	642		2142		
7439-07-4		Disseminated Mercury	TMSPW004	µg/l	<1	<1	<1	<1		<1		
7460-20-2		Disseminated Nickel	TMSPW004	µg/l	<2	<2	9	8		5		
7782-40-2		Disseminated Selenium	TMSPW004	µg/l	<3	4	37	38		<3		
7460-60-2		Disseminated Vanadium	TMSPW004	µg/l	<15	3.3	<15	<15		<15		
7460-86-6		Disseminated Zinc	TMSPW004	µg/l	<3	<3	23	16		14		
SLLP442P_TOT		Total Sulphur as S	TMSPW004	µg/l	<10	4549	82702	82253		22048		
PHENOLS												
75-71-4		Chlorobenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
8558-04-4		Methyl Tertiary Butyl Ether	TMSPW003	µg/l	<0.1	<0.1	<0.1	<0.1		<0.1		
7440-3		Chlorobenzene	TMSPW003	µg/l	<1	<1	<1	<1		<1		
75-53-4		Vinyl Chloride	TMSPW003	µg/l	<0.1	<0.1	<0.1	<0.1		<0.1		
7443-9		Bromobenzene	TMSPW003	µg/l	<1	<1	<1	<1		<1		
75-05-3		Chlorobenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
75-68-4		Trichlorobenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
75-55-4		1,1-Dichlorobenzene (LL DCC)	TMSPW003	µg/l	<3	<3	<3	<3		<3		
75-58-2		Dichlorobenzene (DCM)	TMSPW003	µg/l	<3	<3	<3	<3		<3		
156-55-5		trans-1,2-Dichlorobenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
75-36-3		1,1-Dichlorobenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
156-58-2		cis-1,2-Dichlorobenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
188-05-7		2,2-Dichloropropane	TMSPW003	µg/l	<1	<1	<1	<1		<1		
7447-0		Bromobenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
87-63-8		Chlorobenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
71-55-6		1,1,1-Trichlorobenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
565-58-6		1,1-Dichloropropane	TMSPW003	µg/l	<3	<3	<3	<3		<3		
58-23-5		Chlorobenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
107-08-2		1,2-Dichlorobenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
71-43-2		Benzene	TMSPW003	µg/l	<0.5	<0.5	<0.5	<0.5		3.2		
74-82-4		Trichlorobenzene (TCL)	TMSPW003	µg/l	<2	<2	<2	<2		<2		
74-82-4		1,2-Dichloropropane	TMSPW003	µg/l	<2	<2	<2	<2		<2		
74-82-4		Dichlorobenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
75-72-4		Bromobenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
100-05-5		cis-1,2-Dichlorobenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
108-88-3		Toluene	TMSPW003	µg/l	<5	<5	<5	<5		<5		
1000-06-6		trans-1,2-Dichloropropane	TMSPW003	µg/l	<2	<2	<2	<2		<2		
74-82-4		1,1,1-Trichlorobenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
127-58-4		Trichlorobenzene (PCL)	TMSPW003	µg/l	<3	<3	<3	<3		<3		
140-28-9		1,3-Dichlorobenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
156-83-4		1,2-Dichlorobenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
108-87-7		Chlorobenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
630-20-6		1,1,1,2-Tetrachlorobenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
105-61-4		Dibenzene	TMSPW003	µg/l	<1	<1	<1	<1		<1		
84-64-6		m-Dichlorobenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
85-63-6		1,2,4-Trichlorobenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
125-88-8		iso-Butylbenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
84-67-6		n-Propylbenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
145-73-1		1,3-Dichlorobenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
108-87-7		1,4-Dichlorobenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
105-51-8		n-Butylbenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
84-12-8		1,2-Dichlorobenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
84-12-8		1,3-Dichloro-2-methylbenzene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
87-63-8		Chlorobenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
81-55-3		Naphthalene	TMSPW003	µg/l	<2	<2	<2	<2		58		
87-61-6		1,2,3-Trichlorobenzene	TMSPW003	µg/l	<3	<3	<3	<3		<3		
1034-04-4		Methyl Tertiary Butyl Ether	TMSPW003	µg/l	<0.1	<0.1	<0.1	<0.1		<0.1		
71-43-2		Benzene	TMSPW003	µg/l	<0.5	<0.5	<0.5	<0.5		3.2		
108-88-3		Toluene	TMSPW003	µg/l	<5	<5	<5	<5		<5		
105-61-4		Dibenzene	TMSPW003	µg/l	<1	<1	<1	<1		<1		
P_X_P442C		propylene	TMSPW003	µg/l	<2	<2	<2	<2		<2		
85-67-6		n-Butane	TMSPW003	µg/l	<1	<1	<1	<1		2		
PHENOLS												
85-67-6		2-Chlorophenol	TMSPW003	µg/l	<1	<1	<1	<1		<1		
85-75-5		2-Methylphenol	TMSPW003	µg/l	<0.5	<0.5	<0.5	<0.5		<0.5		
85-75-5		2-Nitrophenol	TMSPW003	µg/l	<0.5	<0.5	<0.5	<0.5		<0.5		
100-02-2		2,4-Dichlorophenol	TMSPW003	µg/l	<0.5	<0.5	<0.5	<0.5		<0.5		
105-67-0		2,6-Dichlorophenol	TMSPW003	µg/l	<1	<1	<1	86		1		
85-65-4		2,4,6-Trichlorophenol	TMSPW003	µg/l	<0.5	<0.5	<0.5	<0.5		<0.5		
84-60-2		2,4,6-Trichlorophenol	TMSPW003	µg/l	<1	<1	<1	<1		<1		
19-57-7		4-Chloro-2-methylphenol	TMSPW003	µg/l	<0.5	<0.5	<0.5	<0.5		<0.5		
105-64-2		4-Methylphenol	TMSPW003	µg/l	<1	<1	<1	<1		1		
100-03-7		4-Nitrophenol	TMSPW003	µg/l	<10	<10	<10	<10		<10		
87-61-6		Phenol	TMSPW003	µg/l	<1	<1	<1	<1		<1		
108-86-2		Phenol	TMSPW003	µg/l	<1	<1	<1	<1		<1		
81-55-7		2-Chlorophenol	TMSPW003	µg/l	<1	<1	<1	<1		<1		
81-67-6		2-Methylphenol	TMSPW003	µg/l	<1	<1	<1	25		6		
81-55-3		Naphthalene	TMSPW003	µg/l	<1	<1	2	82		44		
208-98-8		Acenaphthene	TMSPW003	µg/l	<0.5	<0.5	0.5	22.8		3.8		
83-32-9		Acenaphthene	TMSPW003	µg/l	<1	<1	4	40		7		
80-73-7		Fluorene	TMSPW003	µg/l	<0.5	<0.5	1.4	28.4		8.4		
85-61-8		Phenanthrene	TMSPW003	µg/l	<0.5	1	6.8	28.4		18.4		
120-12-7		Anthracene	TMSPW003	µg/l	<0.5	<0.5	2.8	11.6		3.1		
208-44-0		Fluorene	TMSPW003	µg/l	<0.5	1.8	28.4	38		7.8		
120-90-0		Pyrene	TMSPW003	µg/l	<0.5	1.3	18.5	12.9		7.1		
84-65-3		Benzophenanthrene	TMSPW003	µg/l	<0.5	1	8.2	8		2		
218-01-9		Chrysene	TMSPW003	µg/l	<0.5	0.8	7.1	3.1		1.7		
85-64-1		Benzophenanthrene	TMSPW003	µg/l	<1	1	12	4		2		
85-64-1		Benzophenanthrene	TMSPW003	µg/l	<1	<1	7	3		1		
109-39-5		Benzo[a]pyrene	TMSPW003	µg/l	<1	<1	3	<1		<1		
127-33-5		Dibenz[a,h]anthracene	TMSPW003	µg/l	<0.5	<0.5	1.1	<0.5		<0.5		
185-24-2		Benzo[k]fluoranthene	TMSPW003	µg/l	<0.5	<0.5	3.7	0.9		<0.5		
PHENOLS												
117-81-7		2-Methylphenol	TMSPW003	µg/l	<5	<5	<5	<5		<5		
85-67-7		2-Methylphenol	TMSPW003	µg/l	<1	<1	<1	<1		<1		
84-74-2		Di-nitrophenol	TMSPW003	µg/l	<15	<15	<15	<15		<15		
117-84-0		Di-nitrophenol	TMSPW003	µg/l	<1	<1	<1	<1		<1		
84-66-2		Dinitrophenol	TMSPW003	µg/l	<1	<1	<1	<1		<1		
131-12-3		Dimethylphenol	TMSPW003	µg/l	<1	<1	<1	<1		<1		
Other PCBs												
85-60-1		1,2-Dichlorobenzene	TMSPW003	µg/l	<1	<1	<1	<1		<1		
120-62-1		1,2,3-Trichlorobenzene	TMSPW003	µg/l	<1	<1	<1	<1		<1		
565-73-1		2-Nitrophenol	TMSPW003	µg/l	<1	<1	<1	<1		<1		
120-62-7		1,4-Dichlorobenzene	TMSPW003	µg/l	<1	<1	<1	<1		<1		
88-71-4		2-Nitrophenol	TMSPW003	µg/l	<1	<1	<1	<1		<1		
103-14-2		2,4-Dichlorobenzene	TMSPW003	µg/l	<0.5	<0.5	<0.5	<0.5		<0.5		
650-23-2		2,4-Dichlorobenzene	TMSPW003	µg/l	<1	<1	<1	<1		<1		
88-71-4		2-Nitrophenol	TMSPW003	µg/l	<1	<1	<1	<1		<1		
100-03-7		4-Nitrophenol	TMSPW003	µg/l	<1	<1	<1	<1		<1		
105-67-0												

Appendix D Risk Rating Matrix

Table C.1: Risk rating for contaminated land qualitative risk assessment

Level of Severity	Likelihood		
	Most Likely	Reasonably Foreseeable	Unlikely
Acute harm or severe chronic harm. Direct pollution of sensitive water receptors or serious pollution of other water bodies.	High	High	Low
Harm from long-term exposure. Slight pollution of sensitive receptors or pollution of other water bodies.	Medium	Medium	Low
No significant harm in either short or long term. No pollution of water that is likely to affect sensitive receptors. No more than slight pollution of other water bodies.	Low	Low	Low

Appendix E Generic Assessment Criteria

Human Health Generic Assessment Criteria

Generic Quantitative Risk Assessment Criteria

Table D.1: Residential and Allotment end-uses.

Proposed End Use	units	Residential with plant uptake			Residential without plant uptake			Allotment			Source
Soil Organic Matter Content	%	1	2.5	6	1	2.5	6	1	2.5	6	
Arsenic	mg/kg	37	37	37	40	40	40	49	49	49	DEFRA C4SLs
Antimony	mg/kg				550	550	550				CL:AIRE 2009
Barium	mg/kg				1300	1300	1300				CL:AIRE 2009
Beryllium	mg/kg	1.7	1.7	1.7	1.7	1.7	1.7	35	35	35	LQM S4ULs 2015
Boron (Water Soluble)	mg/kg	290	290	290	11000	11000	11000	45	45	45	LQM S4ULs 2015
Cadmium	mg/kg	22	22	22	150	150	150	3.9	3.9	3.9	DEFRA C4SLs
Chromium (Total)	mg/kg	910	910	910	910	910	910	18000	18000	18000	LQM S4ULs 2015
Chromium (VI)	mg/kg	21	21	21	21	21	21	170	170	170	DEFRA C4SLs
Copper	mg/kg	2400	2400	2400	7100	7100	7100	520	520	520	LQM S4ULs 2015
Lead	mg/kg	200	200	200	310	310	310	80	80	80	DEFRA C4SLs
Mercury	mg/kg	1.2	1.2	1.2	1.2	1.2	1.2	21	21	21	LQM S4ULs 2015
Molybdenum	mg/kg				670	670	670				CL:AIRE 2009
Nickel	mg/kg	130	130	130	180	180	180	53	53	53	LQM S4ULs 2015
Selenium	mg/kg	250	250	250	430	430	430	88	88	88	LQM S4ULs 2015
Vanadium*	mg/kg	410	410	410	1200	1200	1200	91	91	91	LQM S4ULs 2015
Zinc	mg/kg	3700	3700	3700	40000	40000	40000	620	620	620	LQM S4ULs 2015
Cyanide (Free)	mg/kg	26	26	26				4.1	4.1	4.1	Waterman GAC - CLEA v1.06

Proposed End Use	units	Residential with plant uptake			Residential without plant uptake			Allotment			Source
Soil Organic Matter Content	%	1	2.5	6	1	2.5	6	1	2.5	6	
Complex Cyanide	mg/kg	63000	63000	63000				1200	1200	1200	Waterman GAC - CLEA v1.06
Thiocyanate	mg/kg	230	230	230				46	46	46	Waterman GAC - CLEA v1.06
Aliphatic EC5 - EC6	mg/kg	42	78	160	42	78	160	730	1700	3900	LQM S4ULs 2015
Aliphatic EC6 - EC8	mg/kg	100	230	530	100	230	530	2300	5600	13000	LQM S4ULs 2015
Aliphatic EC8-EC10	mg/kg	27	65	150	27	65	150	320	770	1700	LQM S4ULs 2015
Aliphatic EC10-EC12	mg/kg	130	330	760	130	330	770	2200	4400	7300	LQM S4ULs 2015
Aliphatic EC12-EC16	mg/kg	1100	2400	4300	1100	2400	4400	11000	13000	13000	LQM S4ULs 2015
Aliphatic EC16-EC35	mg/kg	65000	92000	110000	65000	92000	110000	260000	270000	270000	LQM S4ULs 2015
Aliphatic EC35-EC44	mg/kg	65000	92000	110000	65000	92000	110000	260000	270000	270000	LQM S4ULs 2015
Aromatic C5-C7	mg/kg	70	140	300	370	690	1400	13	27	57	LQM S4ULs 2015
Aromatic C7-C8	mg/kg	130	290	660	860	1800	3900	22	51	120	LQM S4ULs 2015
Aromatic C8-C10	mg/kg	34	83	190	47	110	270	8.6	21	51	LQM S4ULs 2015
Aromatic C10-C12	mg/kg	74	180	380	250	590	1200	13	31	74	LQM S4ULs 2015
Aromatic C12-C16	mg/kg	140	330	660	1800	2300	2500	23	57	130	LQM S4ULs 2015
Aromatic C16-C21	mg/kg	260	540	930	1900	1900	1900	46	110	260	LQM S4ULs 2015
Aromatic C21-C35	mg/kg	1100	1500	1700	1900	1900	1900	370	820	1600	LQM S4ULs 2015
Aromatic C35-C44	mg/kg	1100	1500	1700	1900	1900	1900	370	820	1600	LQM S4ULs 2015
Benzene	mg/kg	0.087	0.17	0.37	0.38	0.7	1.4	0.017	0.034	0.075	LQM S4ULs 2015
Toluene	mg/kg	130	290	660	880	1900	3900	22	51	120	LQM S4ULs 2015

Proposed End Use	units	Residential with plant uptake			Residential without plant uptake			Allotment			Source
Soil Organic Matter Content	%	1	2.5	6	1	2.5	6	1	2.5	6	
Ethyl Benzene	mg/kg	47	110	260	83	190	440	16	39	91	LQM S4ULs 2015
Xylene - o	mg/kg	60	140	330	88	210	480	28	67	160	LQM S4ULs 2015
Xylene - m	mg/kg	59	140	320	82	190	450	31	74	170	LQM S4ULs 2015
Xylene - p	mg/kg	56	130	310	79	180	430	29	69	160	LQM S4ULs 2015
MTBE (Methyl tert-butyl ether)	mg/kg	49	84	160				23	44	90	CL:AIRE 2009
Naphthalene	mg/kg	2.3	5.6	13	2.3	5.6	13	4.1	10	24	LQM S4ULs 2015
Acenaphthylene	mg/kg	170	420	920	2900	4600	6000	28	69	160	LQM S4ULs 2015
Acenaphthene	mg/kg	210	510	1100	3000	4700	6000	34	85	200	LQM S4ULs 2015
Fluorene	mg/kg	170	400	860	2800	3800	4500	27	67	160	LQM S4ULs 2015
Phenanthrene	mg/kg	95	220	440	1300	1500	1500	15	38	90	LQM S4ULs 2015
Anthracene	mg/kg	2400	5400	11000	31000	35000	37000	380	950	2200	LQM S4ULs 2015
Fluoranthene	mg/kg	280	560	890	1500	1600	1600	52	130	290	LQM S4ULs 2015
Pyrene	mg/kg	620	1200	2000	3700	3800	3800	110	270	620	LQM S4ULs 2015
Benzo(a)anthracene	mg/kg	7.2	11	13	11	14	15	2.9	6.5	13	LQM S4ULs 2015
Chrysene	mg/kg	15	22	27	30	31	32	4.1	9.4	19	LQM S4ULs 2015
Benzo(b)fluoranthene	mg/kg	2.6	3.3	3.7	3.9	4	4	0.99	2.1	3.9	LQM S4ULs 2015
Benzo(k)fluoranthene	mg/kg	77	93	100	110	110	110	37	75	130	LQM S4ULs 2015
Benzo(a)pyrene	mg/kg	2.2	2.7	3	3.2	3.2	3.2	0.97	2	3.5	LQM S4ULs 2015
Indeno(1,2,3-cd)pyrene	mg/kg	27	36	41	45	46	46	9.5	21	39	LQM S4ULs 2015

Proposed End Use	units	Residential with plant uptake			Residential without plant uptake			Allotment			Source
Soil Organic Matter Content	%	1	2.5	6	1	2.5	6	1	2.5	6	
Di-benzo(a.h.)anthracene	mg/kg	0.24	0.28	0.3	0.31	0.32	0.32	0.14	0.27	0.43	LQM S4ULs 2015
Benzo(g,h,i.) Perylene	mg/kg	320	340	350	360	360	360	290	470	640	LQM S4ULs 2015
Phenol	mg/kg	280	550	1100	750	1300	2300	66	140	280	LQM S4ULs 2015
Pentachlorophenol (PCP)	mg/kg	0.22	0.52	1.2	27	29	31	0.03	0.08	0.19	LQM S4ULs 2015
1,1,2,2 Tetrachloroethane	mg/kg	1.6	3.4	7.5	3.9	8	17	0.41	0.89	2	LQM S4ULs 2015
1,1,1,2 Tetrachloroethane	mg/kg	1.2	2.8	6.4	1.5	3.5	8.2	0.79	1.9	4.4	LQM S4ULs 2015
1,1,1 Trichloroethane	mg/kg	8.8	18	39	9	18	40	48	110	240	LQM S4ULs 2015
Trichloroethene	mg/kg	0.016	0.034	0.075	0.017	0.036	0.08	0.041	0.091	0.21	LQM S4ULs 2015
Tetrachloromethane (Carbon Tetrachloride)	mg/kg	0.026	0.056	0.13	0.026	0.056	0.13	0.45	1	2.4	LQM S4ULs 2015
1,2- Dichloroethane	mg/kg	0.0071	0.011	0.019	0.0092	0.013	0.023	0.0046	0.0083	0.016	LQM S4ULs 2015
Chloroethene (Vinyl chloride)	mg/kg	0.00064	0.00087	0.0014	0.00077	0.001	0.0015	0.00055	0.001	0.0018	LQM S4ULs 2015
Trichloroethene	mg/kg	0.016	0.034	0.075	0.017	0.036	0.08	0.041	0.091	0.21	LQM S4ULs 2015
Tetrachloroethene	mg/kg	0.18	0.39	0.9	0.18	0.4	0.92	0.65	1.5	3.6	LQM S4ULs 2015
Trichloromethane (Chloroform)	mg/kg	0.91	1.7	3.4	1.2	2.1	4.2	0.42	0.83	1.7	LQM S4ULs 2015
Sum of PCDDs, PCDFs and dioxins like PCBs	ug/kg			8						8	CLEA SGVs 2009
Isopropylbenzene	mg/kg	11	27	64	12	28	67	32	79	190	CL:AIRE 2009
Propylbenzene	mg/kg	34	82	190	40	97	230	34	83	200	CL:AIRE 2009
Styrene	mg/kg	8.1	19	43	35	78	170	1.6	3.7	8.7	CL:AIRE 2009

Proposed End Use	units	Residential with plant uptake			Residential without plant uptake			Allotment			Source
Soil Organic Matter Content	%	1	2.5	6	1	2.5	6	1	2.5	6	
Bromobenzene	mg/kg	0.87	2	4.7	0.91	2.1	4.9	3.2	7.6	18	CL:AIRE 2009
1,1,2 Trichloroethane	mg/kg	0.6	1.2	2.7	0.88	1.8	3.9	0.28	0.61	1.4	CL:AIRE 2009
1,1-Dichloroethane	mg/kg	2.4	3.9	7.4	2.5	4.1	7.7	9.2	17	35	CL:AIRE 2009
1,1-Dichloroethene	mg/kg	0.23	0.4	0.82	0.23	0.41	0.82	2.8	5.6	12	CL:AIRE 2009
1,2,4-Trimethylbenzene	mg/kg	0.35	0.85	2	0.41	0.99	2.3	0.38	0.93	2.2	CL:AIRE 2009
1,2-Dichloropropane	mg/kg	0.024	0.042	0.084	0.024	0.042	0.085	0.62	1.2	2.6	CL:AIRE 2009
2-Chloronaphthalene	mg/kg	3.7	9.2	22	3.8	9.3	22	40	98	230	CL:AIRE 2009
Bromodichloromethane	mg/kg	0.016	0.03	0.061	0.019	0.034	0.07	0.016	0.032	0.068	CL:AIRE 2009
Bromoform	mg/kg	2.8	5.9	13	5.2	11	23	0.95	2.1	4.6	CL:AIRE 2009
Chloroethane	mg/kg	8.3	11	18	8.4	11	18	110	200	380	CL:AIRE 2009
Chloromethane	mg/kg	0.0083	0.0098	0.013	0.0085	0.0099	0.013	0.066	0.13	0.23	CL:AIRE 2009
Cis 1,2 Dichloroethene	mg/kg	0.11	0.19	0.37	0.12	0.2	0.39	0.26	0.5	1	CL:AIRE 2009
Dichloromethane	mg/kg	0.58	0.98	1.7	2.1	2.8	4.5	0.1	0.19	0.34	CL:AIRE 2009
Hexachloroethane	mg/kg	0.2	0.48	1.1	0.22	0.54	1.3	0.27	0.67	1.6	CL:AIRE 2009
Trans 1,2 Dichloroethene	mg/kg	0.19	0.34	0.7	0.19	0.35	0.71	0.93	1.9	4	CL:AIRE 2009
Bis (2-ethylhexyl) phthalate	mg/kg	280	610	1100	2700	2800	2800	47	120	280	CL:AIRE 2009
Butyl benzyl phthalate	mg/kg	1400	3300	7200	42000	44000	44000	220	550	1300	CL:AIRE 2009
Diethyl Phthalate	mg/kg	120	260	570	1800	3500	6300	19	41	94	CL:AIRE 2009
Di-n-butyl phthalate	mg/kg	13	31	67	450	450	450	2	5	12	CL:AIRE 2009
Di-n-octyl phthalate	mg/kg	2300	2800	3100	3400	3400	3400	940	2100	3900	CL:AIRE 2009

Proposed End Use	units	Residential with plant uptake			Residential without plant uptake			Allotment			Source
Soil Organic Matter Content	%	1	2.5	6	1	2.5	6	1	2.5	6	
Biphenyl	mg/kg	66	160	360	220	500	980	14	35	83	CL:AIRE 2009
2,4-Dinitrotoluene	mg/kg	1.5	3.2	7.2	170	170	170	0.22	0.49	1.1	CL:AIRE 2009
2,6-Dinitrotoluene	mg/kg	0.78	1.7	3.9	78	84	87	0.12	0.27	0.61	CL:AIRE 2009
Tributyl tin oxide	mg/kg	0.25	0.59	1.3	1.4	3.1	0.24	0.042	0.1	0.24	CL:AIRE 2009

Controlled Waters Generic Assessment Criteria

Table D.3: Water Quality Standards

Determinand	Concentration (µg/l)		
	Surface Water - EQS Freshwater (DEFRA Directions 2015)	UK Drinking Water Standard (DWS)	WHO Drinking Water Standard
Metals			
Arsenic	50	10	-
Barium	-	-	700
Beryllium	-	-	12
Boron	-	1000	-
Cadmium	0.25*	5	-
Copper	1 (bioavailable)	2000	-
Chromium (total)	4.7	50	-
Chromium (VI)	3.4	-	-
Chromium (III)	4.7	-	-
Iron	1000	200	-
Lead	1.2 (partial bioavailable)	10	-
Manganese	123 (bioavailable)	50	-
Mercury	0.07	1	-
Nickel	4 (bioavailable)	20	-
Selenium	-	10	-
Zinc	10.9+X** (bioavailable X is catchment related)	-	-
Non-Metals			
Cyanide	1	50	-
Chloride	-	250,000	-
Nitrate	-	50,000	-
Sulphate	-	250,000	-
Ammonia (total)	-	500	-
Nitrite	-	500	-
BTEX			
Benzene	10	1	-
Ethyl Benzene	-	-	300
Toluene	74	-	-

Determinand	Concentration (µg/l)		
	Surface Water - EQS Freshwater (DEFRA Directions 2015)	UK Drinking Water Standard (DWS)	WHO Drinking Water Standard
Metals			
Xylene (p+m)	30	-	500
MTBE	-	-	15***
Phenol	7.7	-	-
Petroleum Hydrocarbons			
Aliphatic EC5 - EC6	-	-	15,000
Aliphatic EC6 - EC8	-	-	15,000
Aliphatic EC8-EC10	-	-	300
Aliphatic EC10-EC12	-	-	300
Aliphatic EC12-EC16	-	-	300
Aromatic EC6-EC7 (Benzene)	10	1	
Aromatic EC7-EC8 (Toluene)	74	-	700
Aromatic EC8-EC10	-	-	300****
Aromatic EC10-EC12	-	-	90
Aromatic EC12-EC16	-	-	90
Aromatic EC16-EC21	-	-	90
Aromatic EC21-EC35	-	-	90
Polycyclic Aromatic Hydrocarbons			
Anthracene	0.1	-	1050
Acenaphthene	-	-	210*****
Acenaphthylene	-	-	210*****
Chrysene	-	-	1.085*****
Di-benzo(a,h.)anthracene	-	-	0.01085*****
Phenanthrene	-	-	43.75*****
Benzo(a)pyrene	0.00017	0.01	-
Benzo(b)fluoranthene	0.00017	0.1b	-
Benzo(g,h,i.) Perylene	0.00017	0.1	-
Benzo(k)fluoranthene	0.00017	0.1	-
Fluoranthene	0.0063	-	-
Indeno(1,2,3-cd)pyrene	0.00017	0.1	-
Naphthalene	2	-	70
Fluorene	-	-	140*****

Determinand	Concentration (µg/l)		
	Surface Water - EQS Freshwater (DEFRA Directions 2015)	UK Drinking Water Standard (DWS)	WHO Drinking Water Standard
Metals			
Benzo(a)anthracene	-	-	0.543*****
Pyrene	-	-	105*****
Volatile Organic Compounds			
Vinyl Chloride	-	0.5	-
1,1-dichloroethene	-	-	30
Trans 1,2-Dichloroethene	-	-	0.3
Chloroform	-	100c	-
1,2-Dichloroethane	10	3	-
Trichloroethene (TCE)	-	10	-
Bromodichloromethane	-	100	-
Tetrachloroethene (PCE)	-	10	-
1,3-Dichloropropane	-	100	40
Bromoform	-	100	-
1,4-Dichlorobenzene	-	-	300
1,2-Dichlorobenzene	-	-	1000
1,2-Dibromo-3-chloropropane	-	-	1

* Value for Class 5 water, assumes >200mgCaCO₃/L

** 10.9 + 2.9 (ambient background concentration for Humber catchment)

*** Odour and taste threshold

**** Value for ethylbenzene

***** Waterman-derived criteria based on guidance in WHO document and UK background data

b - Sum of 4 PAHs

c - sum of 4 trichlorohalides – Chloroform, bromoform, dibromoform and bromodichloromethane

Volatile Organic Compounds (VOCs)

The SoBRA Groundwater vapour GAC are detailed in the Tables below.

Table D.4: Petroleum Hydrocarbons

Chemical	CAS	GAC _{gw} vap (µg/l) 1,2		Aqueous Solubility (µg/l)
		Residential	Commercial	
1,2,4-Trimethylbenzene	95-63-6	24	2,200	559,000
Benzene 3	71-43-2	210	20,000	1,780,000
Ethylbenzene 3	100-41-4	10,000	960,000 (sol)	180,000
Isopropylbenzene	98-82-8	850	86,000 (sol)	56,000
Propylbenzene	103-65-1	2,700	240,000 (sol)	54,100
Styrene	100-42-5	8,800	810,000 (sol)	290,000
Toluene 3	108-88-3	230,000	21,000,000 (sol)	590,000
TPH Aliphatic EC5-EC6 3		1,900	190,000 (sol)	35,900
TPH Aliphatic >EC6-EC8 3		1,500	150,000 (sol)	5,370
TPH Aliphatic >EC8-EC10 3		57	5,700 (sol)	427
TPH Aliphatic >EC10-EC12 3		37	3,600 (sol)	34
TPH Aromatic >EC5-EC7 2,3		210,000	20,000,000 (sol)	1,780,000
TPH Aromatic >EC7-EC8 3		220,000	21,000,000 (sol)	590,000
TPH Aromatic >EC8-EC10 3		1,900	190,000 (sol)	64,600
TPH Aromatic >EC10-EC 12 3		6,800	660,000 (sol)	24,500
TPH Aromatic >EC12-EC16 3		39,000	3,700,000 (sol)	5,750
meta-Xylene 3,5	108-38-3	9,500	940,000 (sol)	200,000
ortho-Xylene 3,5	95-47-6	12,000	1,100,000 (sol)	173,000
para-Xylene 3,5	106-42-3	9,900	980,000 (sol)	200,000

Table D.5: Polycyclic Aromatic Hydrocarbons

Chemical	CAS	GAC gw vap (µg/l) 1,2		Aqueous Solubility (µg/l)
		Residential	Commercial	
Acenaphthene	83-32-9	170,000 (sol)	15,000,000 (sol)	4,110
Acenaphthylene	208-96-8	220,000 (sol)	20,000,000 (sol)	7,950
Fluorene	86-73-7	210,000 (sol)	18,000,000 (sol)	1,860
Naphthalene	91-20-3	220	23,000 (sol)	19,000

Table D.6: Pesticides

Chemical	CAS	GACgw vap (µg/l) 1,2		Aqueous Solubility (µg/l)
		Residential	Commercial	
Aldrin	309-00-2	47 (sol)	3,700 (sol)	20
<i>alpha</i> -Endosulfan	959-98-8	7,400 (sol)	590,000 (sol)	530
<i>beta</i> -Endosulfan	33213-65-9	7,500 (sol)	600,000 (sol)	280

Table D.7: Halogenated Organics

Chemical	CAS	GACgw vap (µg/l) 1,2		Aqueous Solubility (µg/l)
		Residential	Commercial	
1,1,1,2-Tetrachloroethane	79-34-5	240	22,000	1,110,000
1,1,1-Trichloroethane	71-55-6	3,000	290,000	1,300,000
1,1,2,2-Tetrachloroethane	79-35-4	1,600	150,000	2,930,000
1,1,2-Trichloroethane	79-00-5	520	49,000	4,491,000
1,1-Dichloroethane	75-34-3	2,700	260,000	3,666,000
1,1-Dichloroethene	75-35-4	160	16,000	3,100,000
1,2,3,4-Tetrachlorobenzene	634-66-2	240	31,000 (sol)	7,800
1,2,3,5-Tetrachlorobenzene	634-90-2	7.0	600	3,500
1,2,3-Trichlorobenzene	87-61-7	35	3,100	21,000
1,2,4,5-Tetrachlorobenzene	95-94-3	8.1	700 (sol)	600
1,2,4-Trichlorobenzene	120-82-1	68	7,200	41,400

Chemical	CAS	GACgwwap (µg/l) 1,2		Aqueous Solubility (µg/l)
		Residential	Commercial	
1,2-Dichlorobenzene	95-50-1	2,000	220,000 (sol)	133,000
1,2-Dichloroethane	107-06-2	8.9	850	8,680,000
1,2-Dichloropropane	78-87-5	22	2,600	2,050,000
1,3,5-Trichlorobenzene	108-70-3	7.4	660	6,000
1,3-Dichlorobenzene	541-73-1	31	2,800	103,000
1,4-Dichlorobenzene	106-46-7	5,000	460,000 (sol)	51,200
Bromobenzene	108-86-1	220	20,000	388,040
Bromodichloromethane	75-27-4	17	1,600	3,000,000
Bromoform (Tribromomethane)	75-25-2	3,100	400,000	3,000,000
Chlorobenzene	108-90-7	98	15,000	387,000
Chloroethane	75-00-3	10,000	1,000,000	5,742,000
Chloroethene (Vinyl Chloride)	75-01-4	0.62	63	2,760,000
Chloromethane	74-87-3	14	1,400	5,350,000
cis-1,2-Dichloroethene	156-59-2	130	13,000	7,550,000
Dichloromethane	75-09-2	3,300	370,000	20,080,000
Hexachlorobenzene	118-74-1	16 (sol)	1,400 (sol)	10
Hexachlorobutadiene	87-68-3	1.7	230	4,800
Hexachloroethane	67-72-1	8.5	740	49,900
Pentachlorobenzene	608-93-5	140	12,000 (sol)	500
Tetrachloroethene	127-18-4	34	4,600	225,000
Tetrachloromethane (Carbon Tetrachloride)	56-23-5	5.3	770	846,000
trans-1,2-Dichloroethene	156-60-5	160	16,000	5,250,000
Trichloroethene	79-01-6	5.7	530	1,370,000
Trichloromethane (Chloroform)	67-66-3	790	85,000	8,950,000

Table D.8: Others (Organic and Inorganic)

Chemical	CAS	GACgwwap (µg/l) 1,2		Aqueous Solubility (µg/l)
		Residential	Commercial	
2-Chloronaphthalene	91-58-7	160	14,000 (sol)	11,700
Biphenyl (Limonene)	92-52-4	15,000 (sol)	1,300,000 (sol)	4,060
Carbon disulphide	75-15-0	56	5,600	2,100,000
Mercury, elemental	7439-97-6	1.1	95 (sol)	56
Methyl tertiary butyl ether (MTBE)	1634-04-4	83,000	7,800,000	48,000,000

Appendix F Waste Classification Process

- **Regulatory Context**
- **HazWasteOnline™ Report**

Regulatory Context

Waste management practices and requirements in the UK are largely driven by the European Waste Framework Directive¹, which is implemented in the UK by a variety of regulatory instruments. A key component of the process is the need to determine the hazardous properties of a waste in accordance with the Hazardous Waste (England and Wales) Regulations 2005. The first step to deciding if a waste is hazardous or non-hazardous is by reference to the “European Waste Catalogue², a comprehensive list of all wastes split into 20 chapters, which is predominantly based on industry practice (e.g. construction and demolition wastes), with some chapters based on materials and processes (e.g. oily wastes). Each waste is coded by a 6 digit code, where wastes are either classified as hazardous or non-hazardous. It should be noted that inert waste is a sub-set of non-hazardous waste.

Hazardous wastes are signified by entries where the code is followed by an asterisk, where some wastes are deemed hazardous without further assessment and which are termed “Absolute Entries” e.g. most waste oils. Alternatively waste entries are termed “Mirror” entries, these require further assessment of hazardous properties, in order to determine whether they are hazardous waste or not (e.g. soil and stones).

Excavation wastes (soils, made ground and similar) are coded by mirror entries:

- 17 05 03* soil and stones containing hazardous substances; or
- 17 05 04 soil and stones other than those mentioned in 17 05 03

Therefore, soil and stones (or similar) can be either hazardous or non-hazardous waste, depending upon the concentrations of contaminants (e.g. diesel, asbestos, metals) in the waste. Other EWC codes may apply to excavation wastes containing asbestos and to road surfacing for example.

In order to determine if excavation waste is hazardous or not, the potential contaminants that may be present in the excavation wastes are identified based on the history of the waste (e.g. desk study of the source site for soils), with sufficient representative samples of the waste being subjected to appropriate laboratory chemical analysis. The data are compared to published thresholds, detailed in UK Environment Agencies guidance “WM3”³. Waterman chooses to use a commercially available tool referred to as HazWasteOnline™ to undertake the assessment. HazWasteOnline™ is web-based software which is regularly updated to reflect UK Environment Agencies guidance and European requirements. The system comprises an analysis and reporting web front-end and a calculation engine.

The hazard assessment does not define inert waste, nor does the hazard assessment confirm in the case of hazardous excavation waste whether or not the waste can be landfilled. Further Waste Acceptance Criteria (WAC)⁴ testing is required in these instances, explained in further Environment Agency guidance, referred to herein as “EA WAC guidance”⁵. WAC testing is therefore used to determine possible off site landfill disposal options for these wastes.

WM3 also provides guidance to show how waste classification and assessment is applied to construction and demolition wastes containing asbestos⁶ and waste containing coal tar⁷. The guidance is summarised below.

Construction and demolition wastes containing asbestos

¹ Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives

² Commission Decision 2000/532/EC as amended comprising the European Waste Catalogue.

³ Environment Agency Technical Guidance WM3 “Guidance on the classification and assessment of waste” (1st Edition v1.1 2018)” including additional guidance on sampling set out in Appendix D of this document

⁴ Council Decision 2003/33/EC Establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of, and Annex II to, Directive 1999/31/EC

⁵ Environment Agency “Waste Sampling and Testing for Disposal to Landfill” (March 2013)

⁶ WM3 – Chapter 3, Section 1

⁷ WM3 – Chapter 3, Section 2

The assessment of asbestos containing waste considers both the presence of asbestos as:

- Fibres that are free and dispersed, and
- Identifiable pieces of asbestos containing material.
- If the waste contains fibres that are free and dispersed then the waste soil will be hazardous if the waste as a whole contains 0.1% or more asbestos.
- If the waste contains any pieces of asbestos containing material that can be identified as potentially being asbestos containing materials by a competent person (if examined by the naked eye), then the pieces must be assessed separately. The waste is hazardous if the concentration of asbestos in the piece of asbestos containing material is 0.1% or more. The waste is regarded as a mixed waste and classified accordingly. The following codes should be assigned to the asbestos element of the waste as appropriate:
- 17 06 05* Construction material containing asbestos
- 17 06 01* Insulation material containing asbestos.

Waste containing coal tar

- The following applies only to Asphalt material classified in the List of Wastes as
- 17 03 01* bituminous mixtures containing coal tar
- 17 03 02 bituminous mixtures other than those mentioned in 17 03 01
- Where the concentration of benzo(a)pyrene is at or above 50mg/kg in the black top alone (excluding other material) then the amount of coal tar should be considered sufficient (0.1% or more) for material to be hazardous and thus coded 17 03 01*.
- Any sampling of black top would need to ensure that layers with different concentrations of benzo(a)pyrene are identified and sampled.

If waste is found to be hazardous the consignment note process set out in the Hazardous Waste (England and Wales) Regulations 2005 must be complied with. If waste is found to be non-hazardous the requirements of the “duty of care” set out in section 34 Environmental Protection Act 1990 and in the Waste (England and Wales) Regulations 2011 (content of the transfer note) must be complied with.

Options Assessment

Following the classification of excavation wastes, the options available for the waste can be considered in the context of the waste hierarchy:

- on-site reuse (with or without prior treatment);
- off-site reuse (with or without prior treatment) e.g. use of waste in construction;
- off-site processing for recycling or recovery e.g. screening; and
- off-site disposal (with or without prior treatment) i.e. landfill.

The storage, treatment and use of waste are subject to waste regulatory controls including authorisations issued by the UK Environment Agencies.

Interpretation of Laboratory Analysis Data

WM3 sets out the circumstances in which data can be subject to statistical analysis⁸. A sampling plan prepared in accordance with relevant standards should be implemented to recover the samples for laboratory analysis. These methods can permit the exclusion of data points in excess of hazardous waste thresholds or in excess of WAC thresholds.

⁸ WM3 Appendix D

It should be noted that these means of assessing the data need to be acceptable.

Appendix G Limitations and Constraints

The assessment was undertaken in accordance with the scope agreed between Waterman and McGoff Construction Limited, as documented in Waterman's fee letter (Ref. WIE19453-100-F-220803-RT Fee, dated 4th August 2022), and with Waterman's standard Terms of Appointment.

The benefit of this report is made to McGoff Construction Limited.

The information contained in this report is based on the findings of the Preliminary Environmental Risk Assessment, observations made on site, exploratory hole records, laboratory test results, groundwater monitoring and ground gas monitoring.

Constraints to the investigation include:

- A series of tunnels associated with the former use of the Site as a Gas Works were located at the northern boundary, which constrained the plant and machinery access this area. The presence of voids also constrained the extent of excavation deemed safe due to risk of collapse. Hand pitting was therefore employed in the buildings at the northern boundary for these reasons. In addition, trial pitting could only extend to the current maximum extent before voids were recorded;
- Previously unknown void area were recorded at a number of locations which were attempted to be further excavated but in all instances, the risk of collapse prevented further excavation;
- The loose nature of backfilled Made Ground resulted in the trial pit sides becoming unstable and therefore the majority of the trial pits terminated early;
- Significant in ground obstructions were recorded during the window sampling which resulted in early terminations of all locations.

The ground conditions reported relate only to the point of excavation and do not necessarily guarantee a continuation of the ground conditions throughout the non-inspected area of the site. Whilst such exploratory holes would usually provide a reasonable indication as to the general ground conditions, these cannot be determined with complete certainty.

Waterman has endeavoured to assess all information provided to them during this investigation but makes no guarantees or warranties as to the accuracy or completeness of this information.

The scope of this site investigation includes an assessment of the presence of asbestos containing materials in the ground at the site but not within buildings or structures or below ground structures (basements, buried service ducts and the like).

The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

UK and Ireland Office Locations

